



2025

URBAN WATER MANAGEMENT PLAN

City of California City



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ACRONYMS

Act	Urban Water Management Planning Act
AF	Acre-Feet
AFY	Acre-Feet per Year
AMI	Automatic Metering Infrastructure
AP	Allocation Plan
AVEK	Antelope Valley-East Kern Water Agency
Basin	Freemont Valley Groundwater Basin
BDCP	Bay-Delta Conservation Plan
BMP	Best Management Practice
CA DoF	California Department of Finance
CCC	Core Civic Detention Center
CDP	Census Designated Place
CDPH	California Department of Public Health
CFS	Cubic Feet per Second
CII	Commercial/Industrial/Institutional
CIMIS	California Irrigation Management Information System
CRA	Colorado River Aqueduct
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CWC	California Water Code
DBPs	Disinfection Byproducts
DDW	Division of Drinking Water
DMM	Demand Management Measure
DOE	Department of Energy
DWSAP	Drinking Water Source Assessment and Protection
DWR	Department of Water Resources
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
Eto	Evapotranspiration
GPCD	Gallons per Capita per Day
GPF	Gallons per Flush



GPM	Gallons per Minute
GW	Groundwater
HECW	High Efficiency Clothes Washer
HEN	High Efficiency Nozzle
HET	High Efficiency Toilet
HEW	High Efficiency Washer
HR	Hydrologic Region
IPR	Indirect Potable Reuse
IRP	Integrated Resources Plan
IWA	International Water Association
JWPCP	Joint Water Pollution Control Plant
LRWSP	Local, Reliable Water Supply Program
MAF	Million Acre-Feet
MBR	Membrane Bioreactor
MCL	Maximum Contaminant Level
MG	Million Gallons
MGD	Million Gallons per Day
MGY	Million Gallons per Year
mg/L	Milligrams per Liter
µg/L	Micrograms per Liter
MOU	Memorandum of Understanding
MPUD	Mojave Public Utility District
MWA	Mohave Water Agency
MWD	Metropolitan Water District of Southern California
MWEL	Model Water Efficient Landscape Ordinance
MTBE	Methyl Tertiary Butyl Ether
NDMA	N-Nitrosodimethylamine
ng/L	Nanograms per Liter
NPDWR	National Primary Drinking Water Regulations
NTU	Nephelometric Turbidity Units
PCA	Possible Contaminating Activities
PCE	Tetrachloroethylene
PFAS	Per- and Polyfluoroalkyl Substances
PHETs	Premium High Efficiency Toilets



PHG	Public Health Goal
PPCPs	Pharmaceuticals and Personal Care Products
QSA	Quantification Settlement Agreement
RHNA	Regional Housing Needs Assessment
SB	Senate Bill
SBx7-7	Senate Bill x7-7
SCADA	Supervisory Control and Data Acquisition
SCAG	Southern California Association of Governments
SDI	Sub-Division Improvement
SDP	Seawater Desalination Program
SDWA	Safe Drinking Water Act
SMSS	Soil Moisture Sensor System
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS Total	Dissolved Solids
TOC	Total Organic Carbon
USFWS	U.S. Fish and Wildlife Service
UWMP	Urban Water Management Plan
VOC	Volatile Organic Compound
WARN	Water Agency Response Network
WBIC	Weather-Based Irrigation Controller
WRP	Water Reclamation Plant
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan
WSDM	Water Surplus and Drought Management Plan
WSMP	Water System Master Plan
WSS	Watershed Sanitary Survey
WWTP	Wastewater Treatment Plant



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Section 1: Introduction

In accordance with the Water Code, an Urban Water Management Plan is required to be updated every five years.

1.1. PURPOSE AND SUMMARY

This is the 2025 Urban Water Management Plan (“UWMP” or “Plan”) for the City of California City (hereinafter “City”). This Plan has been prepared in compliance with the Urban Water Management Planning Act (Act), which was established in 1983 and has been codified into the California Water Code (CWC) sections 10610 through 10657. A copy of the Act can be found in **Appendix C**.

As part of the Act, the legislature declared that waters of the state are a limited and renewable resource subject to ever increasing demands; that the conservation and efficient use of urban water supplies are of statewide concern; that successful

implementation of plans is best accomplished at the local level; that conservation and efficient use of water shall be actively pursued to protect both the people of the state and their water resources; that conservation and efficient use of urban water supplies shall be a guiding criterion in public decisions; and that urban water suppliers shall be required to develop water management plans to achieve conservation and efficient use.

The Act requires “every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt, in accordance with prescribed requirements, an Urban Water Management Plan.”



These plans must be filed with the California Department of Water Resources (DWR) every five (5) years, describing and evaluating reasonable and practical efficient water uses, reclamation, and conservation activities. The CWC mandates that each water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one.



Figure 1-1 UWMPs are Governed by State Law

The Act has been amended multiple times since its initial passage in 1983. A summary of the amendments is provided in **Figure 1-2**. The intent of the amendments was to broaden the scope of the UWMPs, encourage public participation, and add financial incentives to the UWMPs. A significant amendment to the Act was a 2009 amendment (Senate Bill SBx7-7) signed by former Governor Arnold Schwarzenegger. The Senate Bill, also known as the “Water Conservation Act” required that per capita water use within an urban water supplier’s service area decrease by twenty percent (20%) by the year 2020 in order to receive

grants or loans administered by DWR or other state agencies. Each urban retail water supplier developed water use “targets” for 2015 and for 2020. The “target” date for 2020 passed on December 31, 2020. Urban water suppliers whose 2020 actual water use does not meet the target requirements established by this bill are not eligible for state water grants or loans. This included, but was not limited to, the following funding sources:

Amendments to the Act have added financial incentives to UWMPs.

- **Drinking Water State Revolving Fund:** Primarily a source of funds to help correct deficiencies
- **Proposition 1:** Primarily a source of funds related to supplies & infrastructure
- **Proposition 4:** Primarily a source of funds related to climate-related programs
- **Proposition 50:** Primarily a source of funds related to security & treatment technology
- **Proposition 84:** Primarily a source of funds related to protection from pollution

Agencies that submit their UWMPs past the July 2026 deadline are still technically eligible for grants or loans, provided that the

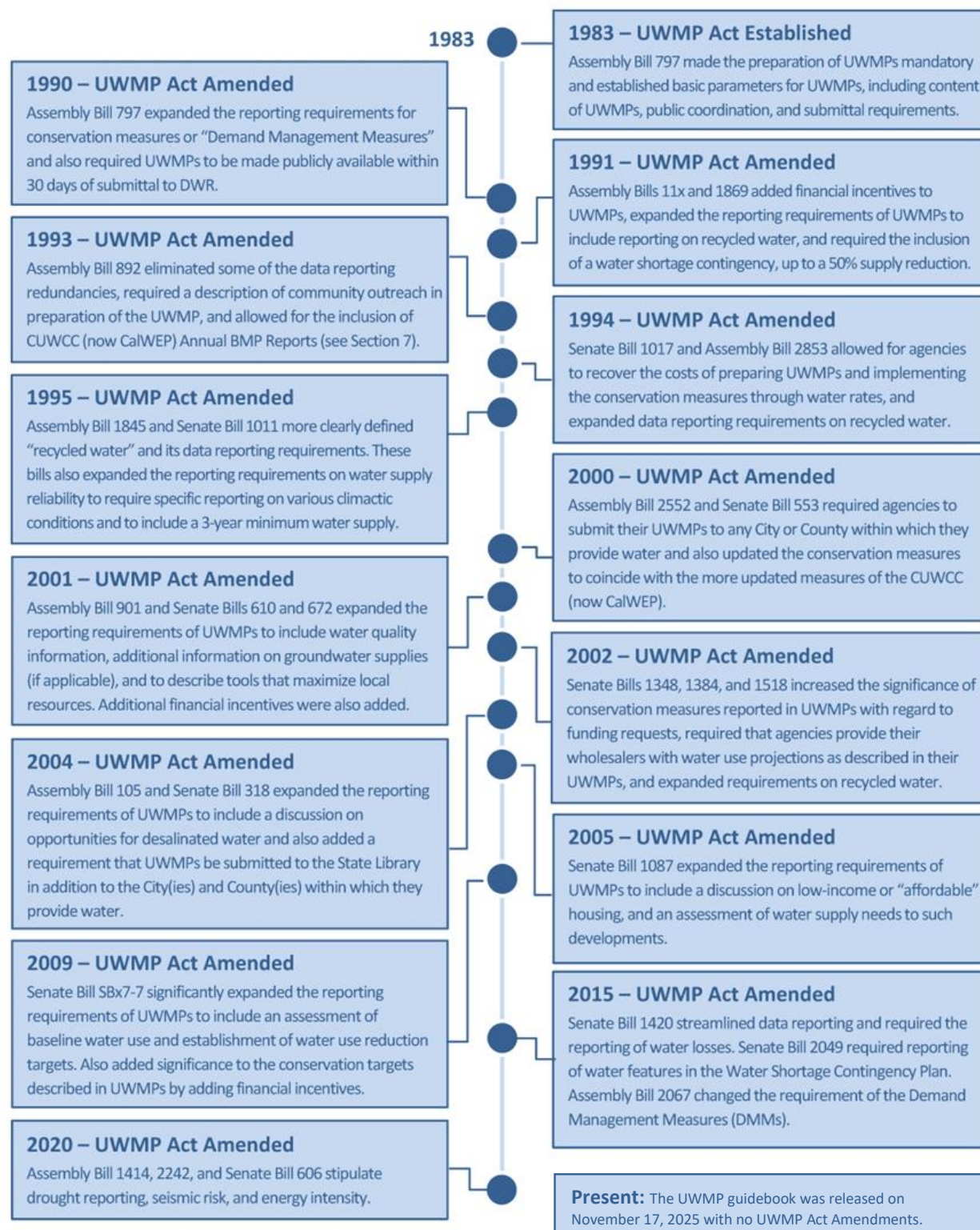


Figure 1-2 UWMP Act Establishment and Amendment



UWMP addresses the requirements of the Act. However, applications for such funds are subject to legal challenges coming from competing agencies for the same funding, if the competing agencies become aware of the timeframe in which an UWMP was submitted. UWMPs are considered to be a foundation document and a source of information for Water Supply Assessments (Senate Bill 610) and Written Verifications of Water Supply (SB 221). In addition, an UWMP may serve as a long-range planning document for water supply, a source of data for development of a regional water plan, and a source document for cities and counties as they prepare their General Plans. These planning documents are linked, and their accuracy and usefulness are interdependent.

One of the primary objectives of the Act is the assessment of demands and supplies over a 20-year or a 25-year planning horizon under normal rainfall conditions, as well as under various drought conditions. The Act also requires water shortage contingency planning and drought response actions to be included in the UWMP. In short, this Plan is a management tool that provides a general, long-term framework for action, rather than a detailed blueprint for supply and demand management. This Plan evaluates the City's supply and demand projections over a 25-year planning horizon, and what mix of programs

should be explored for ensuring that such water will be available. As part of the City's past and current water conservation policies, the City is currently implementing many facets of this plan already to achieve its water conservation goals.

1.2. COORDINATION

The process of preparing and submitting an UWMP is a transparent process that requires opportunities for outside-agency and general public involvement. In preparing this 2025 UWMP, the City has encouraged broad community participation. The City notified the agencies that the City interacts with more than sixty (60) days in advance of the City Council's adoption of the 2025 UWMP. The City also made the draft 2025 UWMP available at the City's Council Room and on the City's website, leading up to a public hearing on the 2025 UWMP. Notices of the public hearing were published in the local

The City's 2025 UWMP is a collaborative effort involving its own staff, outside agencies, and the general public.

press and on the City's website for a two-week period. On August 25, 2026, the City held a noticed public hearing to review and accept comments on the 2025 UWMP. Following the public hearing, the City officially adopted the 2025 UWMP through board resolution, of which a copy is included in **Appendix A**.



Table 1-1: Coordination and Public Involvement

Agency	Participated in Plan Preparation	Contacted for Assistance	Commented on Draft	Notified of Public Hearing	Attended Public Hearing
City Staff	X	X	X	X	X
City Council			X	X	X
Antelope Valley - East Kern Water Agency	X	X		X	
Kern County				X	
Mojave Public Utility District				X	
Regional Water Management Group				X	
State Water Resource Control Board				X	

Notes:

1. "60-Day" notice letters were sent out to all agencies (except the City own) as required by CWC § 10621(b):
2. 2-week and 1-week notices were published in the local newspaper.
3. **Appendix G** contains copies of the 60-day notice and the 2-week and 1-week notices.



As required by the Act, the 2025 UWMP is being prepared by the City and will be submitted to DWR, the California State Library, and any city or county within which it provides water to no later than thirty (30) days after adoption. The 2025 UWMP has been made available to the public on the City's website and at City Hall during normal business hours within thirty (30) days of submitting the 2025 UWMP to DWR.

1.3. DWR UPDATES FOR THE 2025 UWMPs

There have been minor changes to the CWC affecting the 2025 UWMPs. The changes include:

- **Clarified Reporting Requirements for SBx7-7:** Agencies must provide a description in the 2025 UWMP of how their water use goals of the 20x2020 were met. An urban retail water supplier's failure to meet those goals will be a violation of law and potentially result in a state administrative or judicial proceeding. If the agency did not achieve its targeted reduction in 2020, the agency must show in its 2025 UWMP whether it met their 2020 Target in 2025 to be eligible for state funds. Currently, the CWC does not set an end date for reporting on a supplier's progress in meeting the 2020 Target. (CWC § 10608.40)
- **Water Losses:** Retail Suppliers must

indicate the quantity of water losses for five years by reporting data from their Validated Water Loss Audits, discuss their progress toward compliance with the 2028 Water Loss Standard, and show whether they met the Water Loss Performance Standard enacted by the State Water Resources Control Board (SWRCB). (CWC § 10631 (d) (3) (C), SB 1414, 2019). Suppliers can simply provide a link to their water loss reports submitted to DWR's Water Loss Audit Program.

- **Updates to Demand Management Measures (DMMs):** Retail Suppliers with an annual actual water use above their Urban Water Use-Objective (UWUO) must include a narrative describing additional DMMs the supplier plans to use to achieve its UWUO by January 1, 2027. (CWC § 10609.25, AB 1414, 2019)
- **UWUO and Water Use Reporting:** The standard for indoor residential water use from January 1, 2025 to January 1, 2030 was lowered from 52 to 47 Gallons per Capita per Day (gpcd). Until January 1, 2025, the standard was fifty-five (55) gpcd. Beginning January 1, 2030 the standard was lowered from fifty (50) to forty-two (42) gpcd. DWR, in coordination with SWRCB, will conduct an investigation to determine if the date for the 2030 indoor residential use standard will be changed. The City will



not be subject to enforcement pursuant to this chapter solely for failing to meet the indoor residential use standard. (CWC § 10609.4).

• **Irrigation of Nonfunctional Turf:**

“Functional turf” is ground cover surface of turf located in a recreational use area or community space. “Nonfunctional turf” means any turf that is not functional turf, and includes turf located within street rights-of-way and parking lots. Turf enclosed by fencing or other barriers to permanently preclude human access for recreation or assembly is Nonfunctional turf. The use of potable

The use of potable water to irrigate nonfunctional turf is incompatible with state policy relating to climate change.

water to irrigate nonfunctional turf is wasteful and incompatible with state policy relating to climate change, water conservation, and reduced

reliance on the Sacramento-San Joaquin Delta ecosystem (CWC § 110). The use of potable water to irrigate Nonfunctional turf on all properties owned by the City are to be phased out by January 1, 2027. All other Commercial, Industrial, and Institutional (CII) properties are to be phased out by January 1, 2028. After which it will be prohibited with a few exceptions (CWC § 10618.14). The website saveourwater.com/ provides information and resources on converting

nonfunctional turf to native vegetation.

- **Definitions:** New definitions were added or existing definitions were modified, which include Nonfunctional Turf, CII water use, Large landscape, Gross water use, Potable reuse, Urban water use objective, Affordable housing, and Disadvantaged community to name a few (CWC § 10608.12).

In addition, there are several optional or voluntary categorical and data reporting changes to the UWMP Act. These include an optional Planning Tool that suppliers can use to report and assess water use and supply in order to better conduct the Reliability Assessment and Drought Risk Assessment, a Potable and Non-Potable Planning Tool, Potable and Non-Potable Submittal Tables, as well as various optional data reporting.

1.4. UPDATES TO THE CITY’S UWMP

In addition to the required updates described in the previous section, the City’s 2025 UWMP has undergone some changes from the 2020 UWMP. A summary of the key changes to the UWMP are:

- **New Format:** Format of the UWMP has been changed to include a new look and new arrangement of sections. The new arrangement helps the discussion of certain topics which precede other topics. See **Section 1.5** for the format of this 2025 UWMP.



- **DWR & Water Code:** A listing of DWR-required UWMP updates (see previous Section).
- **City Development Growth:** An updated review of development which took place in the City's service area since the 2020 UWMP.
- **Water Sources and Supplies:** A broader, more in-depth discussion of water sources and supplies.
- **Recycled Water:** An updated review of recycled water opportunities in the City.
- **Water Quality:** An update to new regulations and contaminants affecting water quality and treatment.
- **Water Use:** Updated information on recent water use quantities and a more in-depth discussion on water use parameters.
- **Supply v Demand:** Updated information on projected supplies vs demands, and a discussion on recent regional droughts affecting the City. There is also an expansion on the discussion of the City's source water reliability.
- **Contingency Planning:** Updated information on the City's contingency plans, including the City's Ordinances.

- **Conservation Measures:** Updated information on the City's conservation measures, which reflect the previous (2020) changes by DWR.

In addition to these changes, there are multiple minor changes. The changes reflect both those that are required by the CWC and those that are voluntarily included for the benefit of the City.

1.5. FORMAT OF THE 2025 UWMP

The information contained in this 2025 UWMP corresponds to the items in the UWMP Act and other amendments to the Water Code. The sections of the UWMP are:

Section 1 - Introduction

This section describes the UWMP Act, the UWMP preparation and adoption process, updates to the UWMP, and a lay description of this entire document.

Section 2 – Service Area Description

This section outlines the history and development of the City and the City's water supply system, a description of its existing service area, the local climate, population served, and basic statistics on the City's water distribution system.

Section 3 – Water Sources & Supplies

This section describes the existing potable water supplies available to the City, including groundwater from the Fremont



Valley Groundwater Basin (Basin) and imported surface water from the Antelope Valley - East Kern Water Agency (AVEK) and the Mojave Public Utility District (MPUD). In addition, this section evaluates potential future water supply sources.

Section 4 – Recycled Water Opportunities

This section discusses potential recycled water supplies, an assessment of potential customers, and methods to expand the use of recycled water.

Section 5 – Water Quality

This section discusses the quality of the City's potable water supply sources, including imported water and groundwater. This section also discusses drinking water standards and the effect that water quality has on management strategies and supply reliability.

Section 6 – Water Use

This section describes past, current, and projected water usage within the City's service area. Past and projected water use in this section is broken down by sector. This chapter also discusses the requirements of the 2009 Water Conservation Act (SBx7-7), including the 2020 Water Use Targets.

Section 7 – Reliability Planning

This section presents a drought risk assessment of the City's water system which compares projected future water demands

with expected available water supplies under three different hydrologic conditions: normal year; a single dry year; and multiple dry years. This 2025 UWMP concludes that if projected imported and local supplies are developed as anticipated, no water shortages are anticipated in the City's service area during the planning period.

Section 8 – Contingency Planning

This section serves as the City's Water Shortage Contingency Plan (WSCP). A WSCP is a response plan to water shortages, as well as the efforts that will be utilized in the event of water supply interruptions, such as power outages, earthquakes, or droughts. This section also describes regional response efforts to water supply interruptions.

Section 9 – Conservation Measures

This section addresses the City's compliance with water conservation measures that correspond to the seven (7) Demand Management Measures (DMMs) described in the 2025 UWMP Guidebook, which were previously the fourteen (14) DMMs listed in the Act. The DMMs also correspond to the current Best Management Practices (BMPs) from the California Water Efficiency Partnership (CalWEP).

Appendices

The Appendices contain references and specific documents that contain reference data used to prepare this 2025 UWMP.



1.6. LAY DESCRIPTION

To facilitate effective and efficient management of water supplies, and in compliance with the UWMP Act and the Water Conservation Act of 2009, the City has prepared this 2025 UWMP. This UWMP includes background information regarding the City's history, water system, and water supplies. This UWMP also analyzes recent water demands and projects future water supply capacity and water demands through 2050. The effects of water quality, drought, and emergencies on the City's water supply reliability are also analyzed.

As indicated by **Section 7**, the City does not expect to have a water supply shortage through 2050. Furthermore, this UWMP concludes that the City's water supplies, which are obtained from local groundwater basins and wholesale agencies, are resilient to droughts. A basic overview of the City's water system can be found in **Section 2**. Water quality concerns do have an occasional impact on the consistency of groundwater supplies, but the City's groundwater quality is not expected to be affected. These are described in **Section 5**.

This 2025 UWMP recommends that the City implement water operation management tools that maximize the use of local groundwater production and imported water to meet its water demands. This UWMP also recommends conservation tools that will enable the City's residents to conserve water and maximize water use efficiency. These are described in **Section 9**.

If the water consumption rates in the City decrease as this UWMP projects, the City can expect to have an adequate water supply in future years. This is in spite of projected population growth over the next twenty-five (25) years. Finally, this UWMP recommends that severe droughts or sudden supply interruptions be addressed by following the criteria of the WSCP (**Section 8**).

Since UWMPs are due for revision every five years, this UWMP is projected to be in effect until the year's end of 2030. At that time the City's 2030 UWMP will begin development and adoption.



Section 2: Service Area Description

The City's water service area is approximately 203.4 square miles or 130,200 acres

2.1. CITY AND WATER SYSTEM HISTORY

The City of California City (City) was incorporated on December 8, 1965. The City is geographically the third largest city in California with an area of 203.4 square miles or 130,200 acres. The City is near Highway 58 and Highway 14, which links the City to other parts of the State. California City is located in the northern portion of Antelope Valley, in the southeastern portion of Kern County, or roughly 100 miles north of Los Angeles

The single largest land use is open space, consisting of 63.3% of the land area. Most of the City's residents live in the "First Community" which contains about 9,600 acres and most of the multi-family and smaller single-family residential lots. The

"Second Community", which is located to the east of the center of the City, consists of larger lots and is currently sparsely populated. Sewer service is available in portions of the "First Community"; all other areas are served by septic tanks with onsite subsurface disposal. The City operates under a City Council/City Manager form of government. The City currently employs an at-large election system, in which voters of the entire City elect four (4) City Council members and one (1) Mayor. However, the City is transitioning from at-large to by-district elections. The City hosted five (5) public hearings on converting to by-district elections, and the City Council voted on April 22, 2025, on a final map, Draft A, with the odd-numbered districts up for election in 2026 and even-numbered districts up in



2028. The Mayor Pro Tem is decided among the elected City Council Members and Mayor, and the term varies. The City Manager, who serves on behalf of the City Council, runs the day-to-day operations of the City. Under the City Manager's general oversight, the City's Public Works Director runs the Public Works Department, which includes the City's Water Division. The City's Water Division performs all activities related to the water system. The current members of the Council Members are:

- **Marquette E. Hawkins -Mayor**
- **Jim Creighton – Mayor Pro Tem**
- **Ronald Smith – Councilmember**
- **Della Clark – Council Member**
- **Shawn Bradley – Council Member**

2.1.1. Early Stages

The City utilizes three (3) water sources, extraction of groundwater from aquifers surrounding the community using wells, surface water purchased from AVEK, and recycled water produced from the City's Wastewater Treatment Plant (WWTP). At

At the time of incorporation, the City provided water services to only 617 residents, and as of 2025 serves approximately 14,063.

The City's existing groundwater system includes six (6) wells, all with chlorination treatment facilities and hydropneumatic storage tanks, and approximately 313 miles

of water main lines in its existing distribution system. The system also incorporates five (5) above ground storage reservoirs totaling 5.85 million gallons (MG). Nearly all water produced from the City's wells is pumped directly to a series of water storage tanks northeast of the City. These tanks then feed the water distribution system.

As stated in the City's 2023 Water System Master Plan (2023 WSMP), the major deficiency in the existing water system is the integrity of steel water mains, with many having been replaced but a majority still remain (**Figure 2-7**). These mains, constructed originally in the early 1970's, are of used uncoated steel and have severely corroded and been prone to leak.

2.1.2. July 2025 Fire

On July 2, 2025 a fire broke out at the main building of the California City Public Works Yard. This City facility stored contracts, maps, and grant documentation dating back over thirty (30) years. Among other documents lost in the fire were physical copies of groundwater production from 2025 and previous years. Several City owned vehicles sustained minor damage including melted lights and burnt bumpers; two (2) of the City vehicles caught fire and were completely destroyed. It took fire crews several hours to completely extinguish the fire, which also threatened other areas of the Public Works Yard including the shop and several Connex



boxes. Fortunately, documentation was found elsewhere, with most being saved digitally. However, the City was unable to find any documentation regarding water use in 2021, and as a result has been excluded from the data analysis.

2.2. CURRENT WATER SERVICE AREA

The City’s water service area comprises one-hundred percent (100%) of the population residing within the City limits. The City’s Water Service Area is equivalent to the City’s total land area mentioned in **Section 2.1**.

Most of the City’s residents live in the “First Community” which contains approximately 9,600 acres and most of the multi-family and smaller single-family residential lots. The “Secondary Community”, which is located to the east of the center of California City, consists of larger lots and is currently sparsely populated.

With no wholesale customers, the City is a retail-only water agency and maintains residential, commercial, institutional, and landscape irrigation customers. Most of the water service accounts are single-family residences. The City is responsible for providing water services to its certificated water service area, which coincides with the City’s jurisdictional boundaries. The City’s Organization Chart is shown in **Figure 2-3**.

2.3. LAND USE & ECONOMY

The City is located in Kern County. Kern County encompasses an area of 8,163 square miles or 5.2 million acres, and is bordered on the west by Ventura County, on the north by Tulare County, on the south Los Angeles County, and on the east by San Bernardino County.

Table 2-1 provides basic statistics on current land use and economy for Kern County. **Figure 2-6** shows the City’s Land Use Maps with Zones.

2.3.1. City Land Use

The majority of development in the City has occurred within the central core. An area comprising approximately twelve (12) sections of land (7,680 acres) in the southwest portion of the land area within the City’s corporate limits. The remaining development in the City has occurred in the northeastern portion, and areas located about twelve (12) miles northeast of the central core along Twenty Mule Team Parkway and Randsburg-Mojave Road. Growth in the northeastern portion of the City has been limited by the lack of adequate infrastructure and public services. Scattered throughout the northeastern portion of the City are undeveloped subdivided tracts and parcel maps.

Growth in the northeastern portion of the City has been limited.



In the northeastern portion of the City there are twenty-seven (27) Subdivision Improvement Tracts (SDI) and two (2) tracts in the central core. These SDI Tracts were subdivided more than forty (40) years ago, with the developer providing provisional funding for water and roadway

improvement to the minimum City standard. All of the twenty-nine (29) tracts are subject to City Council and SDI Committee's approval, to supply water and roadway improvements.



Table 2-1 Current Land Use & Economic Statistics for Kern County

Land: Total		
Item	Kern County	City of California City
Land Area (square miles)	8,132	203.6
Land Area (acres)	5,204,429	130,200
Agricultural Land (acres)	2,300,000	0
Developed Land (square miles)	180	12.0*
Population		
Item	Kern County	City of California City
Population	927,068	14,063
Housing		
Item	Kern County	City of California City
Total Housing Units	312,134	N/A
Households	284,931	4,608
Median Home Price	\$338,300	\$278,000
Owner Occupancy Rate	60.1%	55.0%
Economy		
Item	Kern County	City of California City
Employed (16yrs +)	58.5%	48.7%
Median Household Income	\$70,210	\$60,113
Percent in Poverty	18.6%	22.8%
Manufacturing	\$7 Billion	N/A
Agriculture/Crops	\$7.6 Billion	N/A
Retail & Wholesale Sales**	\$15.6 Billion	\$51.399 Million

**The majority of development in the City has occurred within the central core. An area comprising approximately twelve sections of land (7,680 acres) in the southwest portion of the land area within the City's corporate limits. (City of California City General Plan, 2009)*

***Sum of sale from total merchant wholesaler and total retail*



2.4. CLIMATE

The City is located in the high desert with an elevation range of 2,300 to 4,000 feet above sea level. Its climate is semi-arid, which provides for warm, dry weather in the summer and mild cooler weather in the winter. Rainfall for the area is less than 6-inches annually, with about seventy-five percent (75%) occurring in December through March. The precipitation varies considerably from year to year, with a prolonged drought occurring from 1945 to 1964 and several shorter drought periods within the last ten (10) years. Because precipitation occurs predominantly in the winter months, when landscaping and agricultural water demand is at the lowest, summer water demand is three (3) to five (5) times that of the winter months. **Table 2-2** lists the historical average rainfall for the City:

Table 2-2 Historical Climate (1904-2016)
Mojave, California (045756)
(www.wrcc.dri.edu)

Month	Average Rainfall (in)
Jan	1.20
Feb	1.27
Mar	0.93
Apr	0.30
May	0.09
Jun	0.03
Jul	0.11
Aug	0.15
Sep	0.21
Oct	0.24

Month	Average Rainfall (in)
Nov	0.53
Dec	0.87
Annual:	5.93

The extreme high temperatures often exceed 100 degrees Fahrenheit from May through September. Because of its high desert location, humidity levels are very low and it is often windy. This gives the City one of the state's highest pan evaporation and reference evapo-transpiration (ETo) rates. The high evaporation and ETo rates result in significantly higher water usage for landscape irrigation than other areas in California. Recent ETo and rainfall for the City is listed in **Table 2-3**:

Table 2-3 Recent Climate (2025)
CIMIS Station 256 (Lancaster - Mojave High Desert)
(cimis.water.ca.gov)

Month	Rainfall (in)	ETo (in)
Jan (2025)	0.46	2.65
Feb (2025)	0.74	3.37
Mar (2025)	1.23	4.69
Apr (2025)	0.00	6.77
May (2025)	0.02	8.39
Jun (2025)	0.00	9.12
Jul (2025)	0.00	9.63
Aug (2025)	0.02	8.93
Sep (2025)	0.02	6.26
Oct (2025)	0.05	4.34
Nov (2025)	2.19	2.15
Dec (2025)	2.44	1.83
Totals:	7.2	68.13



2.4.1. Climate Change

The DWR Guidebook requires water suppliers to include a discussion of climate change in their UWMPs, specifically with regard to Drought Risk Assessments (DRA). **Section 7** provides an overview of droughts.

The rise of anthropogenic activities producing carbon dioxide in the world has changed the earth's climate by emitting greenhouse gasses responsible for global warming. This has resulted in extreme weather events occurring more frequently. The severity and frequency of climate change impacts on temperature and precipitation patterns can be difficult to forecast due to dramatic shifts in weather patterns as a result of increased concentrations of carbon dioxide in the atmosphere. While the precise timing, severity, and regional impacts of these temperature and precipitation changes are uncertain, climate researchers have identified several important issues of concern for water planners in California.

The climate change impacts of concern include increases in temperature, precipitation pattern changes, and sea-level rise. More winter precipitation falling as rain than snow leads to reduced snowpack water storage, reduced long term soil humidity, reduced groundwater and downstream flows, and reduced imported water deliveries. Higher temperatures alter

evapotranspiration rates and growing seasons become longer. Precipitation pattern changes leads to increase flooding from intense storms. Although the extent of these changes is uncertain, the City is already planning ahead to ensure long lasting reliability of its source for their customers.

The California Natural Resources Agency released a draft of the 2024 California Climate Adaptation Strategy (Strategy), which builds on the successes and lessons learned since the first iteration in 2009 and the California Adaptive Planning Guide issued in 2012. It also integrates and connects key elements of the latest specific State of California action plans, such as the Extreme Heat Action Plan, Water Supply Strategy, Climate Smart Lands Strategy, Wildfire and Forest Resilience Action Plan, and Climate Action Plan for Transportation Infrastructure. Key elements of the approach:

01.Set updated, strategic direction and identify outcome-based priorities:

The Strategy links the State's existing, planned, and resourced climate adaptation efforts, showing how they fit together to achieve broad climate resilience priorities. The Strategy also specifies needed actions, with timeframes and metrics, to drive progress and enable accountability.



02. Unify efforts across all sectors and regions:

The Strategy is organized around outcome-based priorities, rather than individual sectors, enabling a coordinated, integrated approach to building climate resilience. This approach recognizes how climate adaptation is implemented on the ground, and reflects our commitment to integrating climate resilience into the work of all state agencies. The priorities have been developed based on input from Californians across all regions of the state and in consultation with California Native American tribes.

03. Help all Californians understand and contribute to California's climate resilience:

The 2024 Strategy updates the interactive website that serves as a hub for state climate resilience action. This website will continue to be updated to enable easier navigation, to follow the state's progress and to find adaptation information and resources easily.

2.5. POPULATION

2.5.1. Service Area Population

The population of the City was consistently near 3,000 residents from 1965 to 1980. From 1980 to 1990, the population grew to approximately 6,000. From 1990 to 2000, the population continued to increase at a similar rate, reaching 8,385 citizens. Since 2000 the rate of growth has increased slightly to a total population of 12,878 in

2020, with an additional 2,140 incarcerated persons. Most growth was a result of employment opportunities at Edwards Air Force Base, Rio Tinto (Borax) Mine, Mojave Air and Space Port and the Core Civic Detention Center (CCC).

The CCC is also known as the California City Immigration Processing Center is a large, federally contracted detention center located in the City. Built in 1998 and later repurposed for federal use, the facility has served various agencies over the years, including the U.S. Marshals Service and Immigration and Customs Enforcement (ICE). With a capacity of 2,560 detainees, it is one of California's largest immigrant detention sites and operates under multi-level security standards. The center has undergone significant operational changes, including a transition from state prison use to federal immigration detention beginning in 2025.

According to the most recent population figures from the California Department of Finance (DOF), the current 2025 resident population of the City is approximately 13,317 persons. However, this does not account for the newly re-opened CCC, which in October 2025 had a total occupancy of 746 persons. This brings the City's total population in 2025 to 14,063 persons. Since the City's water service area comprises one-hundred percent (100%) of the population



residing within the City limits, the total current resident population served by the City's water system is also 14,063 persons. This is approximately 955 persons less than the population total in 2020. This is mostly attributed to the CCC being deactivated as a state prison on March 2024. **Table 2-4** lists the City's recent and current (2025) overall populations:

Table 2-4 California City Overall Population

Year	Population
2021	15,006
2022	15,045
2023	14,864
2024	13,189
2025	14,063

Table 2-4 shows the City's declined population number in 2023 after the CCC stopped holding state prisoners and increased in 2025 when it re-opened to house U.S. ICE detainees.

2.5.2. Prison Population

The population of the CCC for each year can be obtained from the State's website. **Table 2-5** provides the prison population since 2021 and shows the closure of the facility in 2023 and re-opening in 2025. The prison populations are factored into the City's population in both the Census and State estimates, the prison populations must be subtracted from the City's overall population

to provide a more accurate picture of population trends in the City.

Table 2-5: Prison Populations

Year	Population
2021	1,991
2022	2,034
2023	1,799
2024	0
2025	746

2.5.3. City Population Forecasts

In its 2020 UWMP, the City used the number of connections to determine the projected population for the service area through 2045. At that time the City utilized an annual population growth rate of 1.5% in its forecasts through 2025 and increased until reaching 1.8% through 2045. When applied to the DoF population values for 2020, which have been refined since the 2020 UWMP, this results in a 2025 population of 16,144. With the current 2025 population of approximately 14,063, it appears that this forecast was significantly higher than the actual population. This is a difference of 2,081, which could be due to a much lower growth factor than expected in 2020.

2.5.4. Adjusted Population Forecasts

As shown in Table 3.1 of the City's Housing Element Update 2023 – 2031, between 2010 and 2023, the City added 707 residents, or 0.39% annual growth rate, to its population.



The DoF projects that Kern County will have an annual growth rate of 0.38% from 2024 to 2050. As shown in **Table 2-4**, the City's annual growth rate from 2021 to 2025 was 0.58%. Future population projections were determined by utilizing the City's historical populations as a basis from which the projected growth rate for recent years for the City were applied. The growth rate is:

- 2026 – 2050: 0.6% annual growth

This growth rate was applied in order to project the population over the next twenty-five (25) years, as shown in **Table 2-6**.

As mentioned prior, the opening of the CCC will provide an additional population that will be included in the projections. By the end of 2025, the facility was housing approximately 746 detainees out of its total capacity of 2,560. After 2025 and by 2030, the facility is expected to be fully occupied, therefore an additional population of 1,814 was included in the projections from 2030 - 2050.

Table 2-6 California City Water Service Area Projected Population

Year	Population
2030	15,531
2035	15,930
2040	16,330
2045	16,729
2050	17,129

2.6. WATER SYSTEM

A basic overview of the City's water system is provided in the following sections. More information on the City's water sources, water treatment, and water demands can be found in **Sections 3 through 6**. As this report is a water-resource-management planning document, it does not provide technical or engineering detail on water system components.

2.6.1. Water System Background

Since its founding in 1950, the City has owned and operated a water and sewer system that has served the City's developed areas within its main core. The City currently utilizes three its groundwater wells and surface water purchased from AVEK for its water supply. All production wells are disinfected with sodium hypochlorite and meet all drinking water quality standards set by Federal and State health agencies. The wells are located in the First Community. Water levels in the wells range from 339 to 497 feet below ground surface.

The City maintains approximately 313 miles of water main lines ranging in size from 4 to 16- inches in diameter and a 20-inch transmission line connects the City wells to the reservoirs located in the foothills. The City has seven (7) different pressure zones to maintain pressure ranges between fifty (50) and 100 psi. One (1) zone has pressures as high as 130 psi and the city is planning on



installing a PRV to reduce this pressure. Most residential and commercial connections have pressure reducing regulators. Customer meters are typically located on the property line and the average length of customer service lines is twenty-five (25) feet.

2.6.2. City Water System Overview

The City's water system consists of the following components:

- Groundwater Wells
- Imported Surface Water
- Water Distribution Pipeline Network
- Emergency Transfer Interties
- Water Storage Facilities
- Booster Pump Stations

The City distributes water to approximately 4,980 service connections through over a 313-mile network of distribution mains. The water system is divided into seven (7) main pressure zones served by five (5) storage reservoirs, totaling 5.8 MG.

The City's main core system is also known as the City of California City system and is designated as Public Water System (ID # CA1510032) as defined by the California Health and Safety Code. The Wonder Acres area of the City has a separate water system also known as the Wonder Acres system and is designated as Public Water System (ID #

CA1500324). Within the Wonder Acres system are thirty-eight (38) service connections with water consumption remaining relatively consistent.

2.6.3. Groundwater and Imported Water

The City's sources of potable water supply are groundwater pumped from the Fremont Valley Groundwater Basin and imported water from AVEK. The Fremont Valley Basin is approximately 334,720 acres. The City owns and currently operates three (3) production wells located within the Fremont Valley Basin. The City also receives purchased water from AVEK but minimizes its use to reduce costs. It is also available in an event of an emergency. Recent basin levels and storage can be found in **Section 3.5**.

The main source of water for the City is through groundwater pumping. Continued groundwater pumping is also the main planned source of water in the future. Since the Fremont Valley Subbasin is a non-adjudicated basin, there are currently no restrictions on groundwater pumping.

Because there is no current restriction on groundwater pumping, the limit of available water is the pump capacity of the three (3) active existing wells to pump groundwater. These include Wells 2A (**Figure 2-2**), 14, and 15A. The pump capacity of the three (3) wells to pump groundwater is shown in



Table 2-7. The City's inactive wells are also shown for clarity. Well 3 needs a new motor and is mainly used for emergencies, Well 10 needs redrilling and Well 16 is inactive due to blowouts. The City's active wells are estimated to provide 1,367 million gallons per year (MGY) or 2,600 gpm based on recent production pumping capacities for each well site. **Table 2-7** deliberately excludes any AVEK water contribution.



Figure 2-1: Rancho Reservoir

Table 2-7 California City Active Wells

Well #	Source Capacity (GPM)	Status
1	550	Inactive
2A	1,000	Active
3	700	Inactive
10	478	Inactive
11	300	Inactive
14	600	Active
15A	1,000	Active
16	740	Inactive
Total	2,600	Active
Total	2,768	Inactive

The City maintains five (5) above ground water storage reservoirs totaling 5.725 MG. These tanks are Phase 1 (B1) (2.5 MG) (**Figure 2-1**), Phase 2 (D1) (1 MG), Phase 3 (E1) (1 MG), Phase 4 (F1) (1 MG), and Rancho Reservoir (0.225 MG). Assuming eighty-five percent (85%) of the storage tank listed capacity is available for water storage, 4.9 MG of storage is usable.



Figure 2-2: Groundwater Well 2A

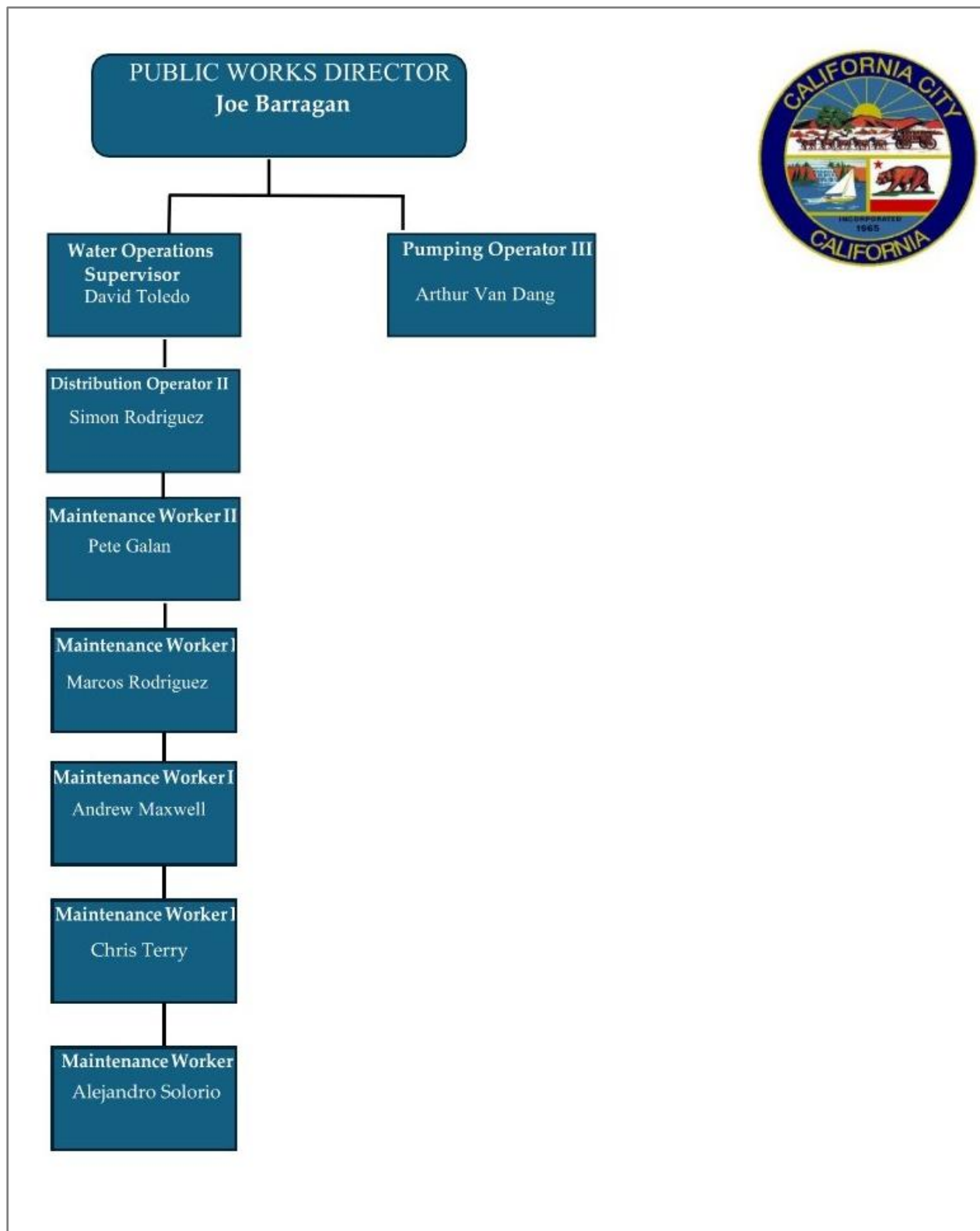
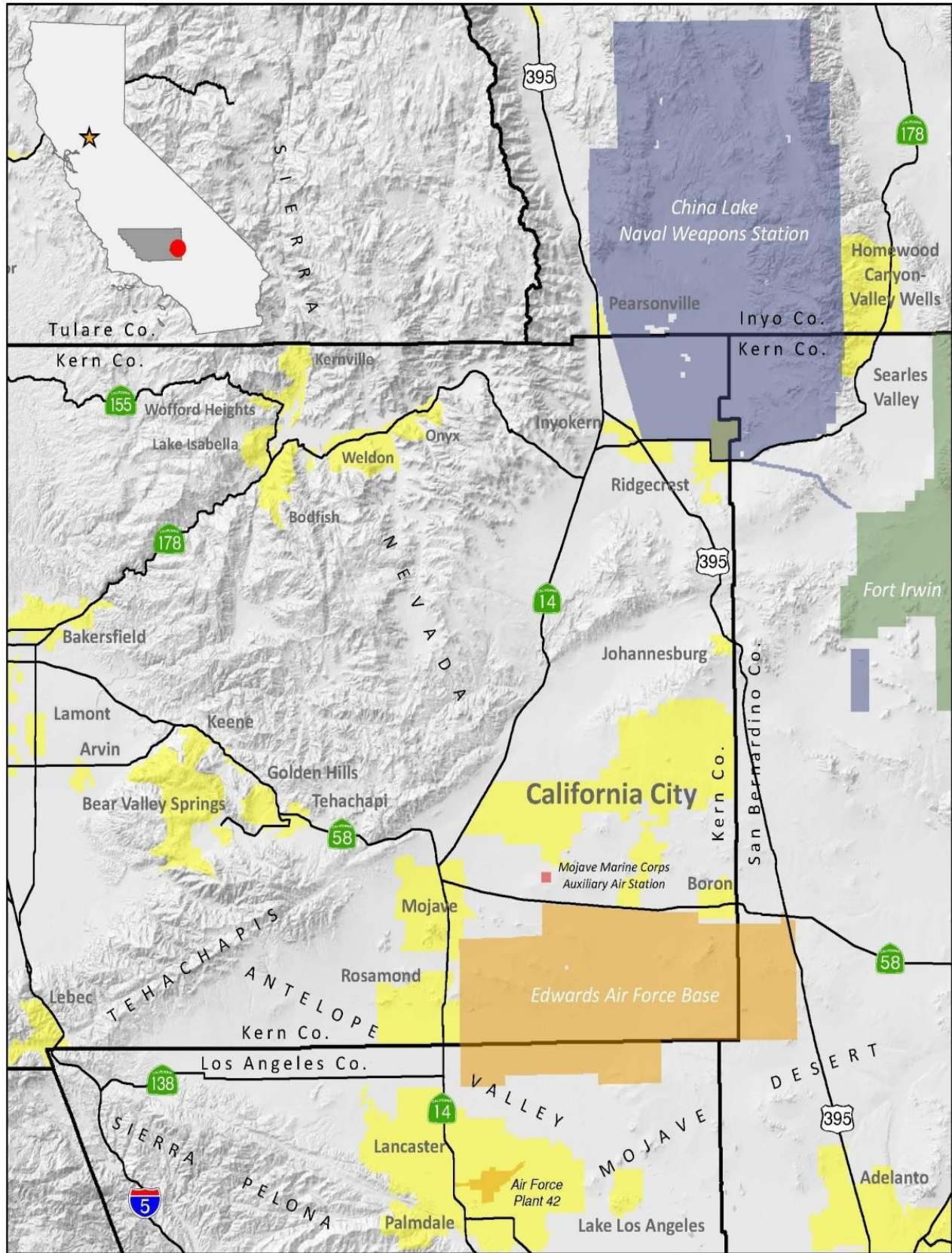


Figure 2-3 California City Organization Chart (July 2026)

36



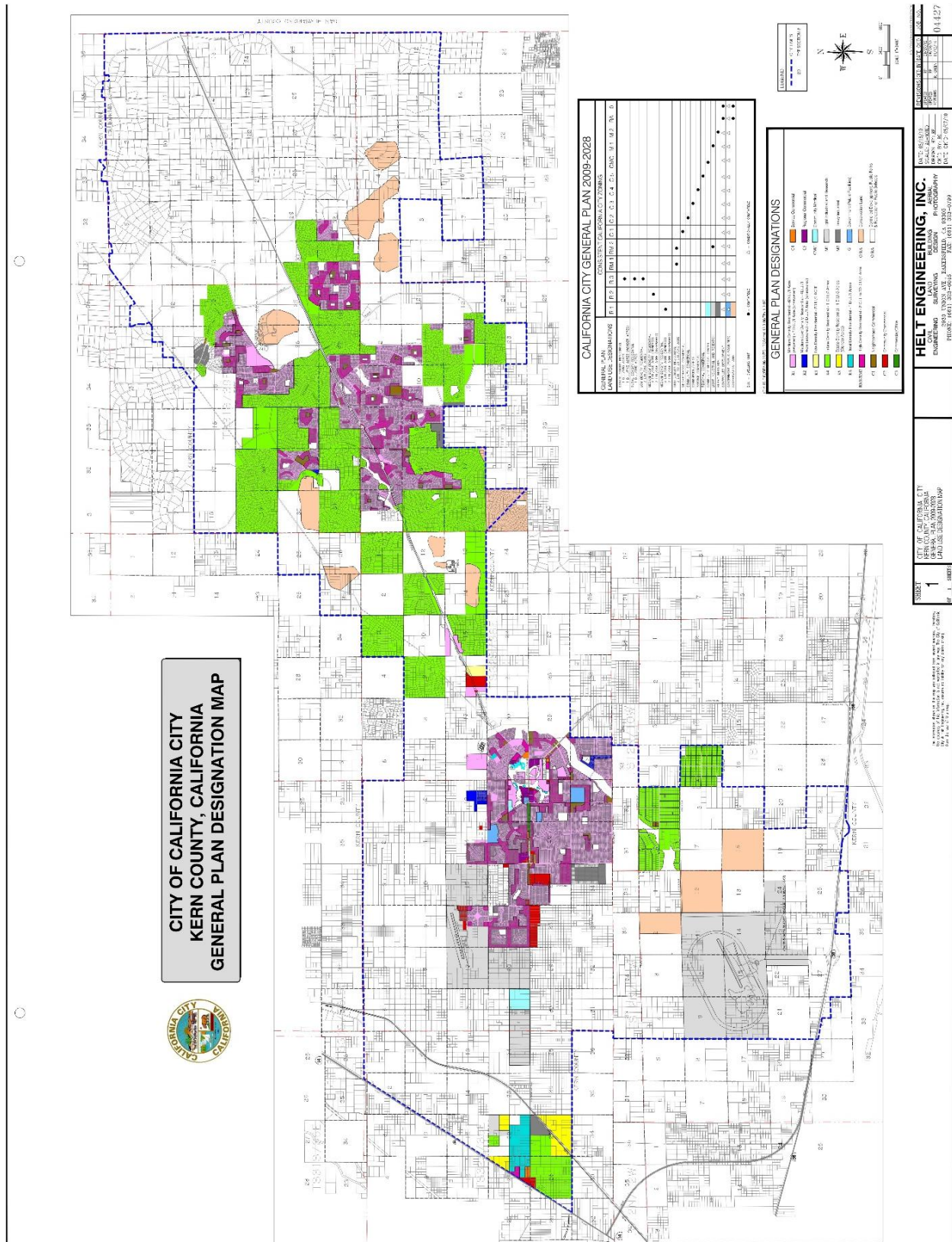


Figure 2-6 City of California City Land Use Map (May 2015)

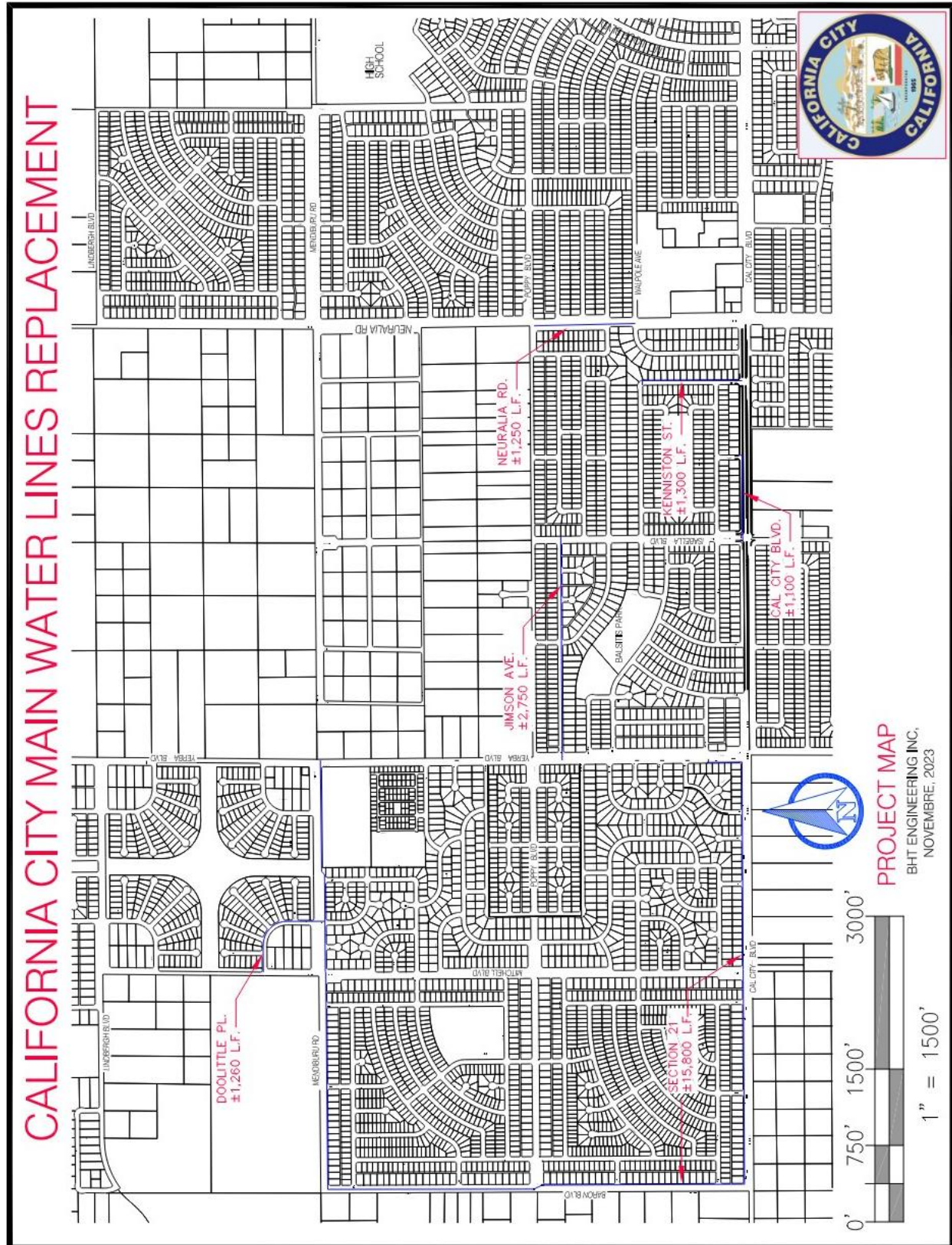


Figure 2-7 City of California City Water Main Replacements (2023)

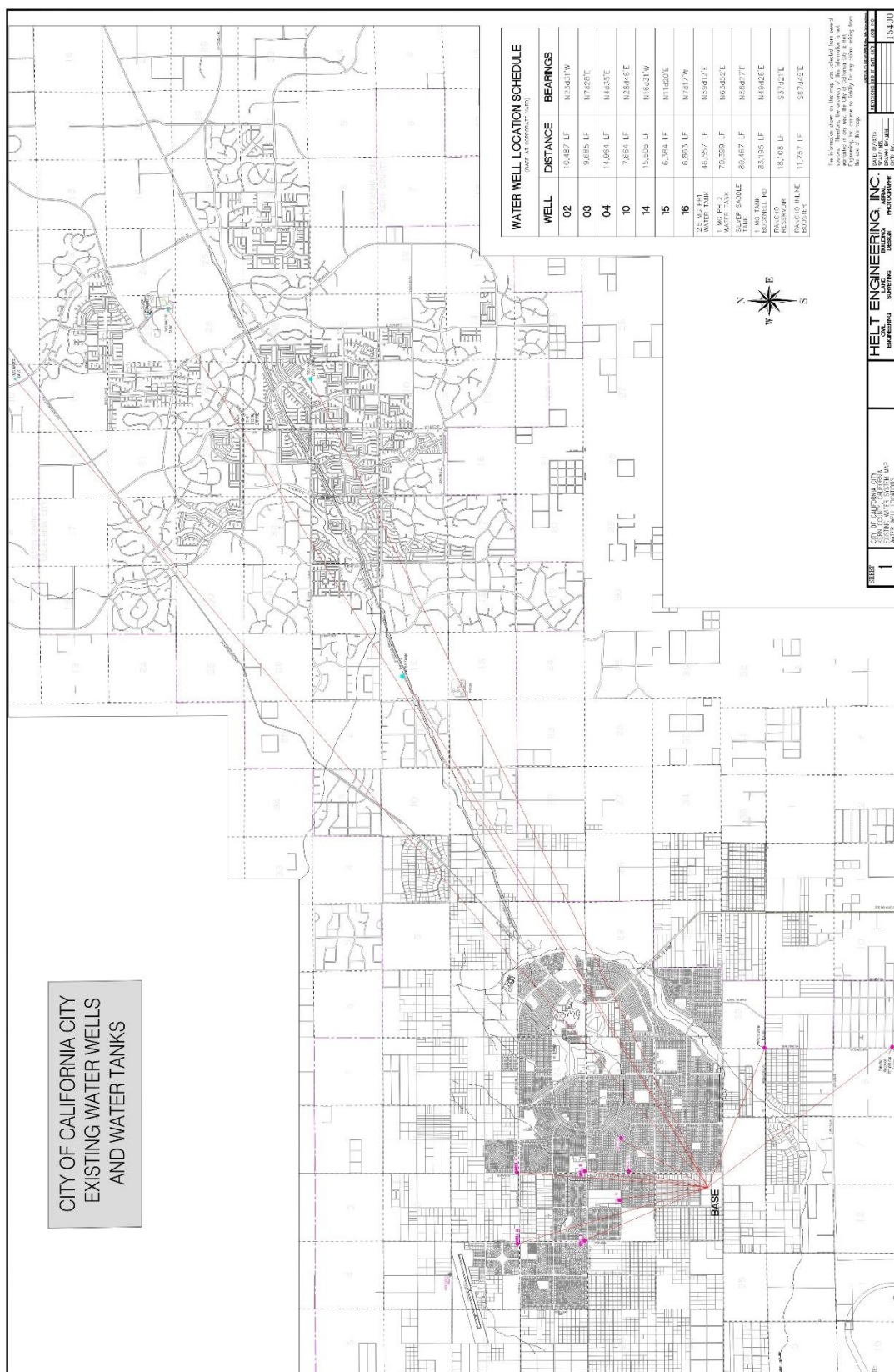


Figure 2-8 City of California City Groundwater Wells and Reservoir Locations (First and Second Community)

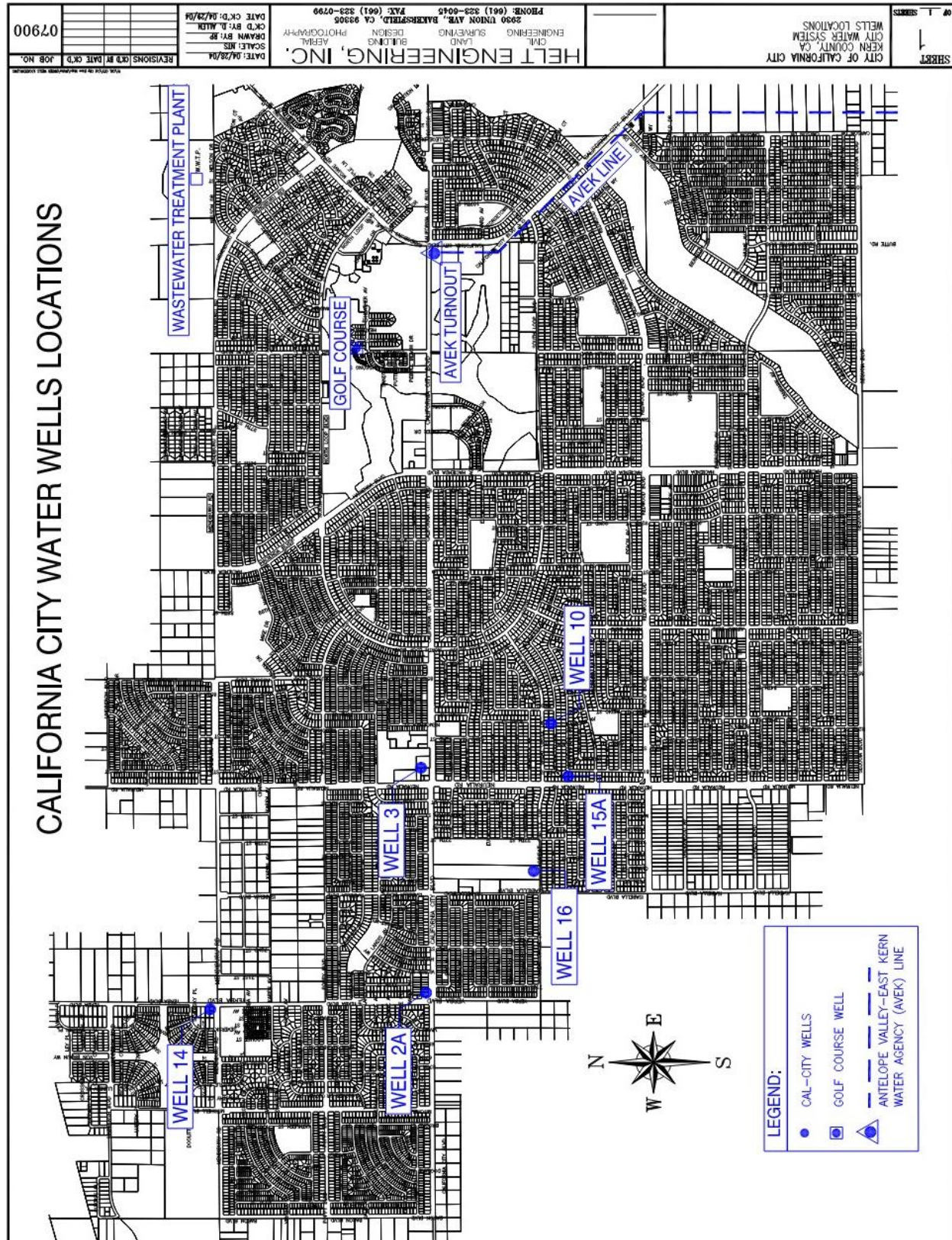


Figure 2-9 City of California City Groundwater Wells Locations (First Community)



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Section 3: Water Sources and Supplies

Supplies consist of groundwater produced from the Fremont Valley Groundwater Basin and imported water from AVEK.

3.1. INTRODUCTION

This Section describes the current and projected water resources available to the City over a 25-year period (from 2030 through 2050). This Section also provides background information on the overall water supplies available to the region. The City's water supplies consist of groundwater produced from the Fremont Valley Groundwater Basin (Basin), imported surface water from AVEK, and imported groundwater from MPUD. Approximately ninety-eight percent (98%) of the City's water consists of groundwater, while the remaining two percent (2%) consists of imported water. All of the City's groundwater wells are located in the First Community. The source of imported water supplies is the State Water Project (SWP).

This section discusses water supply, quality, and water reliability under all foreseeable hydrologic conditions from 2030 through 2050.

3.2. IMPORTED WATER SOURCES

The City utilizes three (3) water sources: groundwater, imported surface water and recycled water. Imported surface water can be purchased from AVEK and MPUD through standing agreements with the City. Additional supplies are available from AVEK, MPUD and increased groundwater pumping is also available. Recycled water is also an available water source. Recycled Water will be discussed in **Section 4**.

The Wonder Acres system purchases water from MPUD (Wells 21A and Well 22). MPUD



water is used exclusively in the Wonder Acres area, near Highway 14 and California City Boulevard. Discussions with the General Manager of the MPUD indicated that increased water supply to this community would not be a problem. The current agreement limits this water supply to a peak of 500 gpm.

The City has significantly more water rights than it currently uses. Further discussion of the groundwater will be covered in **Section 6.2**. The City's groundwater well production is not limited by water rights but by pumping capacity.

3.2.1. Antelope Valley-East Kern Water Agency (AVEK) Supply

The City routinely receives water from AVEK. AVEK water is more expensive for the City than pumping groundwater. For this reason, the City intends to retain and maintain its AVEK use and rights of use but will try to minimize its use to reduce costs. In the event of an emergency, it is possible the City may be able to increase the water supply from AVEK on a temporary basis. However, if the situation is drought-related, it is likely the water supplied from AVEK will be affected by the same situation and an increased supply to California City may not be possible. AVEK has developed water banking facilities (**Figure 3-1**) to mitigate the variability of SWP supply. The water supplied by AVEK originates from the Bay-Delta Via the SWP.



Figure 3-1 AVEK's Westside Water Bank



3.2.2. AVEK Water Banks and Recharge Projects

AVEK operates several groundwater banking and recharge facilities that expand regional storage SWP reliability. The Westside Water Bank, completed in 2010, provides 40,000 acre-feet per year (AFY) of recharge and recovery with 150,000 acre-feet of total storage. The Eastside Water Bank, completed in 2016, adds 2,200 AFY of recharge and 5,700 acre-feet of storage to support raw water quality needs. In partnership with MWD, the High Desert

The Westside Water Bank provides 40,000 AFY of recharge and recovery.

Water Bank is designed to recharge and recover up to 70,000 AFY, with a planned storage capacity of 280,000 acre-feet on a 1,500-acre site to

enhance SWP delivery reliability and AVEK's financial stability. The Upper Amargosa Creek Recharge Project, developed jointly with regional agencies, provides 1,600–2,350 AFY of recharge through eight spreading basins, supports local aquifer replenishment, improves flood management, and incorporates habitat restoration on a 75-acre site.

3.2.3. BAY-DELTA

The City has access to imported water from the Sacramento-San Joaquin River Delta in Northern California from AVEK. The Bay

Delta water system provides Southern California agencies with over 1 million acre-feet (MAF) of water annually.



Figure 3-2 Bay Delta

The Delta is often considered the nexus of California's statewide water system. Approximately half the total river flow in the State passes through this region, from which water is exported to the San Joaquin Valley, Southern California, and portions of the Bay Area to supply 1,130,000 acres of farmland and 23 million people in central and Southern California. The Delta provides an estimated 7 million acre-feet (MAF) of water per year, of which approximately 100,000 AF is exported to the San Francisco Bay Area, 1.7 MAF is used locally, and more than 5 MAF is exported to the San Joaquin Valley, coastal Central and Southern California via the State Water Project.



3.2.4. Bay Delta Conveyance Project

The Delta Conveyance Project is a modernization effort proposed by the State of California DWR to change how water is moved through the Sacramento–San Joaquin Delta for the State Water Project (SWP). The Delta Conveyance Project centers around constructing a new, single-tunnel conveyance facility that would divert a portion of Sacramento River flows through new intakes in the North Delta and deliver that water to the existing SWP pumping facilities in the South Delta. The goal is not to increase water exports, but to improve the system’s ability to capture water during periods of high availability and maintain water reliability during future droughts.

The Delta Conveyance Project is currently in the final stages of regulatory review and permitting, following the DWR’s approval of the project and certification of the Final Environmental Impact Report (EIR) in late 2023. During 2024–2025, DWR secured several major environmental permits, including the California Endangered Species Act Incidental Take Permit, and advanced federal permitting through the U.S. Army Corps of Engineers and NOAA Fisheries. The project continues to move forward but has not received final approval to begin construction.

3.2.5. State Water Project (Aqueduct)

The California State Water Project is a water storage and delivery system of reservoirs, aqueducts, power and pumping plants. Its main purpose is to store water and distribute it to twenty-nine (29) urban and agricultural water suppliers in Northern California, San Francisco Bay Area, San Joaquin Valley, Central Coast, and Southern California. Of the contracted water supply, seventy percent (70%) is delivered to urban users and thirty percent (30%) is delivered to agricultural users.

The State Water Project or "SWP" is a result of decades of planning and construction dating back to the 1940s.

In 1947, the California State Legislature funded a water resources investigation that led to the development of the SWP. This investigation resulted in the publication of the California Water Plan. The California Water Plan presented preliminary plans to meet the State’s ultimate water needs, including those facility works required for transferring surplus water from Northern California to Southern California. Financing for the construction of SWP facilities was authorized in 1959, when the State Legislature enacted the California Water Resources Development Act (known as the Burns-Porter Act). The Burns-Porter Act, formally known as the California Water Resources Development Bond Act, was placed



on the November 1960 ballot and approved by voters. Also known as Proposition One, the initial water projects included Oroville Dam and Lake Oroville, B.F. Sisk Dam (also known as San Luis Dam), San Luis Reservoir, South Bay Aqueduct, North Bay Aqueduct, and the California Aqueduct. Construction on the Oroville site began before the

passage of the Burns-Porter Act. A \$25 million emergency appropriation was passed in 1957 after a record late 1955 to early 1956 flood, which devastated Northern and Central California. Statewide, sixty-four (64) deaths were recorded due to the flooding, mostly in Sutter County and Yuba City, and more than \$200 million of property damage.



Figure 3-3 Sacramento-San Joaquin Bay Delta





Figure 3-5 State Water Project

The first SWP water deliveries were made in 1962, two years after construction began. The State of California DWR and the Metropolitan Water District of Southern California (MWD) signed the first water

Today 29 agencies have long-term water supply contracts with DWR

supply contract in 1960. Today twenty-nine (29) agencies have long-term water supply contracts with DWR. The service areas of those long-term

water supply contractors vary widely in size, location, climate, and population. The contractors' uses for SWP water also differ. In the San Joaquin Valley, SWP water is used

primarily for agriculture. In Southern California, SWP water is used primarily for urban and industrial needs.

Today, the SWP includes thirty-four (34) storage facilities, reservoirs, and lakes; twenty (20) pumping plants; four (4) pumping-generating plants; five (5) hydroelectric power plants; and approximately 701 miles of open canals and pipelines. The SWP is owned and managed by DWR.

3.3. IMPORTED WATER PURCHASES

Table 3-1 shows the City's recent imported water purchases from AVEK from 2020 to



2025, and compares them to 2015 to 2020. The City only imported water in 2020 & 2021 to meet an increase in demand due to the 2020-2022 Drought. The City was able to meet demand in years 2022-2025 from solely local sources.

Table 3-1 Imported Water Supply

Year	Purchases (MG)
2020	4
2021	46.6
2022	0
2023	0
2024	0
2025	0
Average:	25.2
2015 – 2020 Avg. (2020 UWMP)	4

3.4. GROUNDWATER SOURCES

3.4.1. Fremont Valley Groundwater Sub-Basin

The City lies within the Fremont Valley Groundwater Basin (Basin) of the South Lahontan Hydrologic Study Area. The sub-basin is identified as sub-basin 6-46 in the Department of Water Resources Bulletin 118. The basin is 523 square miles (334,720 acres) of which 203 square miles (129,920 acres) is located under California City proper. The Muroc Fault traverses the sub-basin, dividing it into two smaller sub-basins with the City on the north and Mojave on the south. The City sub-basin (CCSB) contains approximately

142,451 acres (Stetson 2008) and potentially 1,382,000 acre-feet of storage capacity; however, estimates of the storage capacity range greatly with a high estimate of 5,700,000 acre-feet in 1955, when the basin was considered full. Within the City boundary, the Basin groundwater storage was estimated at approximately 1,980,000 acre-feet in 1955 and 1,650,000 acre-feet in 2007 (Stetson 2008).

The CCSB is hydraulically connected to the Antelope Valley Groundwater Basin (AVGB) by the alluvial filled narrows between the Castle Butte and the Twin Buttes; groundwater is able to move between the two (2) valleys in this area. There are several other faults in the sub-basin, Garlock Fault and El Paso Fault system, which run on the north and west side of the sub-basin, respectively, which act as a restrictive groundwater barrier on the west and northwest side of the sub-basin between the Tehachapi, Piute and El Paso Mountains and the Basin.

The CCSB has one area of depression, the now-dry Koehn Lake. According to Stetson, groundwater in the sub-basin flows from the alluvial fans along the mountains towards this depression. This flow stems in part from the AVGB, which contributes up to 2,570 afy (Stetson 2008). The City, on average, pumps 3,300 acre feet (AF) or 1,075 MG per year from the aquifer, which provides the



customers with approximately seventy-five percent (75%) of their potable water supply. The City purchased all water rights based on an agreement/contract dated March 21, 1960 between Born Valley Water Development Company and Boron Valley Community Service District which later became California City Service District. The City owns the water right stated as follows “All water rights, all right, title and interest in and to all water in, on and underlying the surface of the land (herein referred to as “Water Rights”) within the boundaries of or which may subsequently flow into that area designated Area A (California City proper - 203 square miles). At that time the water right was producing 32,000 acre-feet (10,427 MG) 10.8 times more the current annual extraction rate of the city (964 MG). The city has 10.8 times more water right than they are currently pumping and at current maximum

pumping capacity of (2680.56 MG) they could only utilize 25.7% of the owned water right.

3.4.2. Integrated Regional Water Management Plan

California City, Mojave, and AVEK formed the Basin IRWMP and prepared the Fremont Basin Integrated Regional Water Management Plan (IRWMP) for the basin to protect their water rights from outside influences (**Appendix H**). The City is coordinating with the Fremont Basin IRWMP. The IRWMP was published in February 2019 and includes shows the GSP implementation items and the projected timeline. However, due to a lack of funding sources those projects to be performed by the City have not been planned.



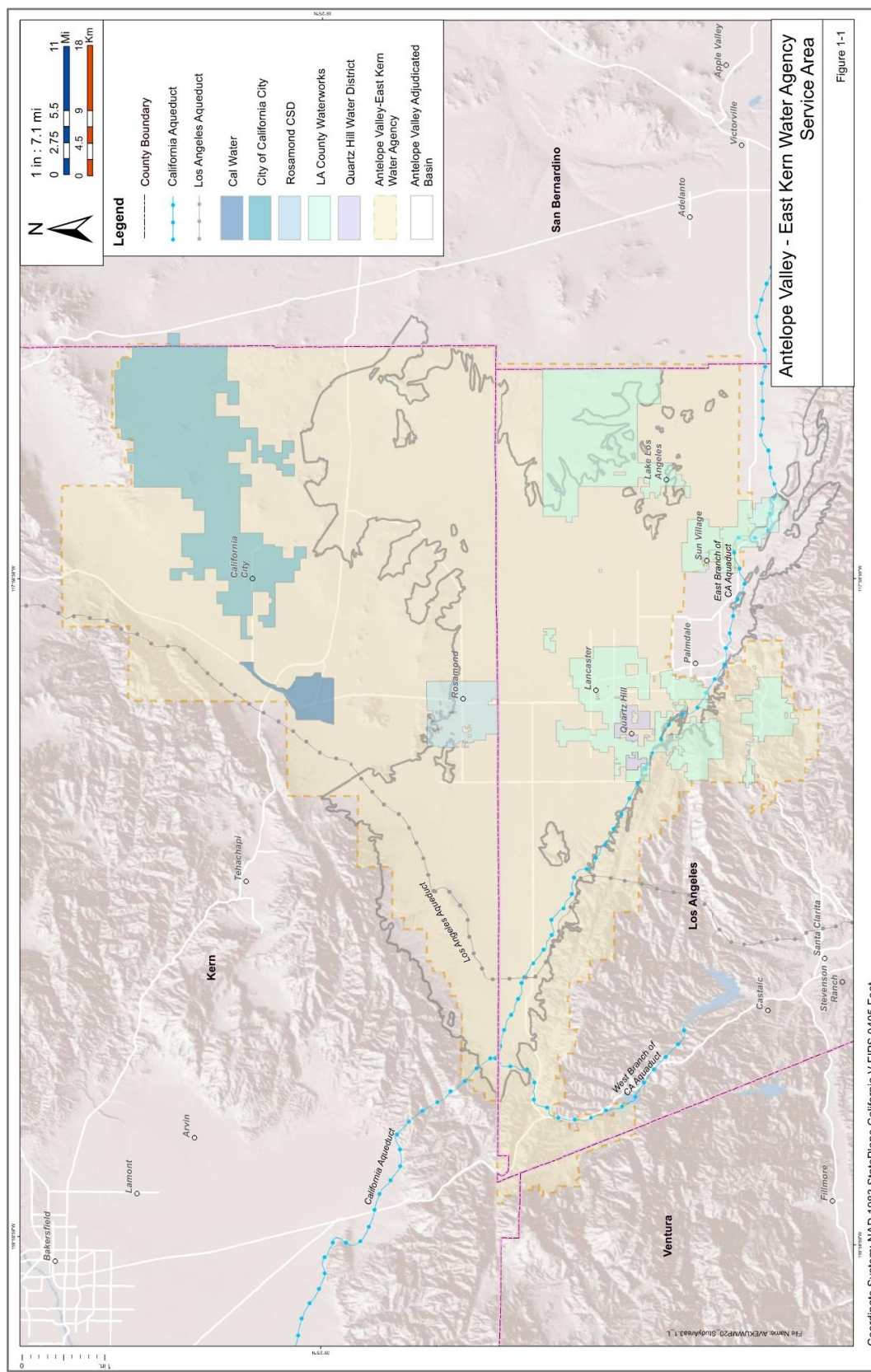


Figure 3-7 AVEK Service Area Map



3.5. BASIN LEVELS AND STORAGE

The depth to groundwater level in 2025, according to the USGS groundwater field data, was 359 feet, which is a decrease of approximately 33 feet from the groundwater elevation of 326 feet in 1967.

Currently the City, Mojave, and Cantil are the only major entities drawing significant quantities of water from the basin and the City is by far the largest. The basin (Number 6-046) is approximately 523 square miles (334,720 acres) per the DWR Bulletin 118. Based on basin area (4,402 acre-feet/334,720 acres) $\times$ (12in/1ft) = 0.1578 inches (2.7%) of the 5.93 inches of the average rain fall each year would need to make it into the basin aquifer to maintain recharge. The Western Regional Climate Center; Mojave, CA Station 045756 indicates an annual total average rainfall of 5.93 inches. This along with the fact that the basin sustained 32,000 acre-feet, over five (5) times more extraction, for ten (10) to fifteen (15) years during the 1960s to early 1970s, when the area was predominantly agricultural substantiate, combined with the fact that the current rate of extraction does not exceed the rate of recharge, the basin is expected to not be overdrafted.

3.6. GROUNDWATER MANAGEMENT

An adjudicated groundwater basin exists where, because of a lawsuit, the court decides who extracts from the basin, how

much they extract, and who will manage the basin. The Fremont Valley Subbasin is not adjudicated, as defined by California DWR. Therefore, there are no limitations placed on groundwater pumpage volumes due to adjudication.

The City is not required to form or join a groundwater sustainability agency (GSA) since it is not in a high or medium priority basin. The South Lahontan Basin is categorized as low priority.

3.7. OTHER CONDITIONS

As required by CWC section 10631(b)(2), for basins that have not been adjudicated, information as to whether DWR has identified the basin or basins as overed or has projected that the basin will become overed, an UWMP must include a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term over condition.

According to DWR, the Fremont Valley Subbasin is not listed as a critically overed basin (California Department of Water Resources, 2025). According to DWR Bulletin 118-80, "critical conditions of over" in a basin is "when continuation of present water management practices would probably result in significant adverse over-related environmental, social, or economic impacts" (DWR, 2025).



3.8. GROUNDWATER PRODUCTION

The City has historically relied on groundwater pumping for majority of its water supply (see **Table 3-2**). This table also show the quantities of groundwater the City has pumped over the last ten (10) years with a maximum of 1,241 MG in 2018. 1,241 MG is around 86.1% of the total pumping capacity 1,442 MG. The amount of groundwater pumped by the City over the last five (5) years is shown in **Table 3-2**.

Table 3-2: Overall Groundwater Production

Year	Production (MG)
2020	919
2021	886
2022	839
2023	799
2024	763
2025	797
Average:	834
2015-2020 Avg. (2020 UWMP)	1,170

As can be seen from the amounts shown, overall water production decreased slightly from 2021 to 2025. This is most likely a result of the lingering effects of the State mandated drought restrictions (see **Section**

7) and only a slight increase in the City's population.

3.9. PROJECTED WATER SUPPLIES

The amount of groundwater projected to be pumped in 5-year increments over the next twenty-five (25) years is shown in **Section 7**. AVEK, the City's wholesale supplier, has shown in its 2025 UWMP supply projections that it will be able to meet full service demands under all three (3) hydrologic scenarios.

CWC section 10631(k) requires the wholesale agency to provide information to the urban retail water supplier for inclusion in its UWMP which identifies and quantifies the existing and planned sources of water available from the wholesale agency. **Section 7.6** indicates the wholesaler's water availability projections by source for the next twenty-five (25) years as provided to the City by AVEK.

AVEK has shown in its 2025 UWMP supply projections that it will be able to meet full service demands under all three (3) hydrologic scenarios.

In addition to imported water supply availability, **Section 7.6** also shows the amount of groundwater supply available to the City over the next twenty-five (25) years.

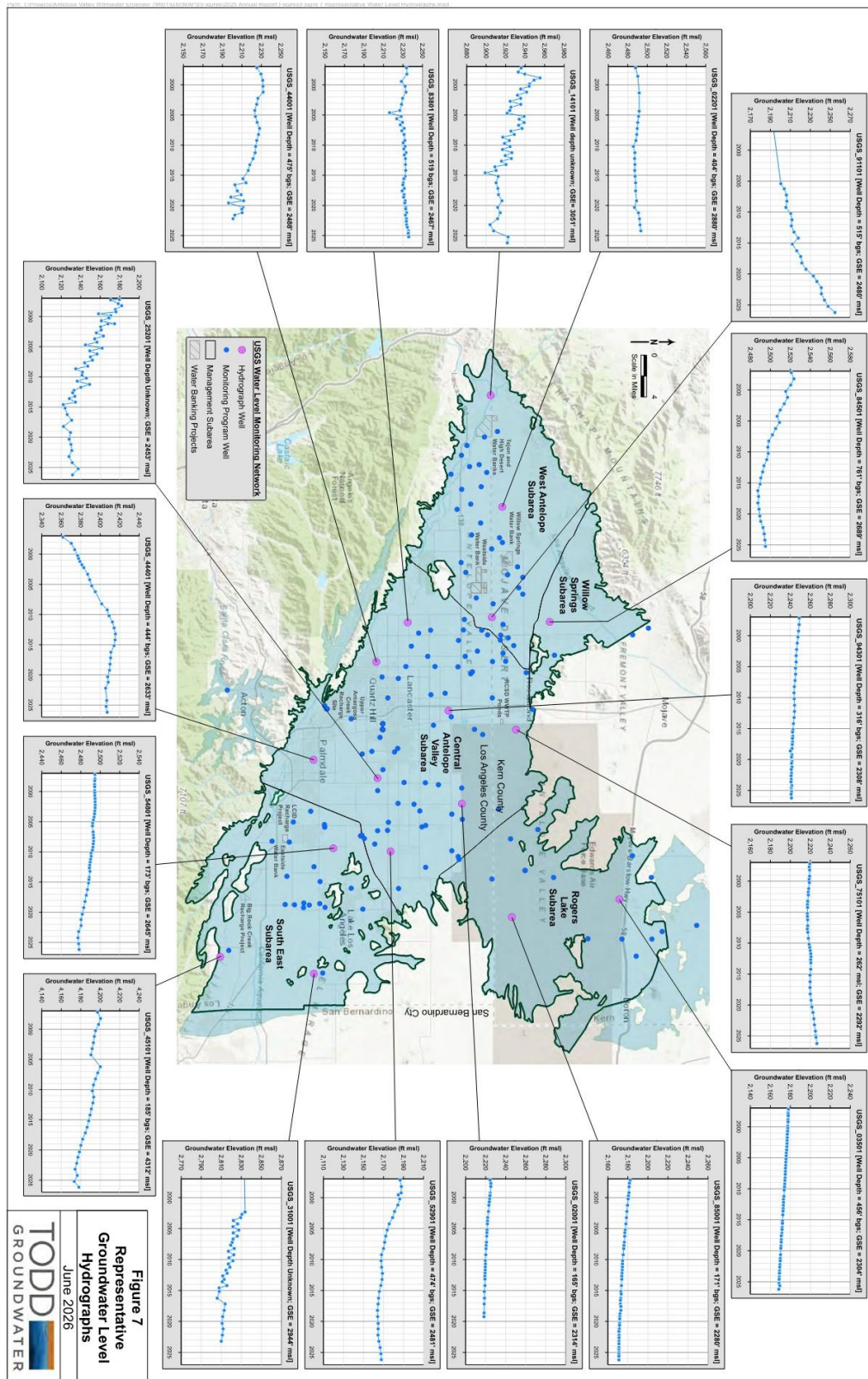


Figure 3-8 Representative Groundwater Level Hydrographs (June 2026)



3.9.1. Planned/Projected Supply Projects

The 2023 Water Master Plan recommends replacing at least five (5) miles of the aging steel water mains per year with PVC pipe (there are a total of approximately 85 miles of water main within the City of California City system). The completion of the water main replacement program is expected to substantially reduce the volume of “unaccounted” water lost by leakage. Other proposed projects are shown in Tables 7-1 & 7-2 of the 2023 Water Master Plan.

The City has no feasible opportunity for the development of a water desalination system as a long-term supply. With no nearby or convenient sources of saline water to desalinate, the cost of providing the water and then treating would outweigh the benefits.

3.10. ENERGY INTENSITY OF SUPPLY

According to the City’s groundwater production figures shown in **Table 3-2**, the City pumped an average of 1,516 gpm in 2025. With a total nominal pumping capacity of the combined wells of 2,600 gpm, this means that on average each well’s motor ran for a cumulative of fourteen (14) hours each day. The City uses approximately 2,300 kilowatts hours (kWh) per day per operating well, or approximately 828,000 kWh each year. The current industrial energy cost in the City is \$0.15410 per kWh (as of 05/31/2026). The typical annual energy cost

to run one of the City’s groundwater well motors (one motor) is shown in **Table 3-3**:

Table 3-3: Annual Energy Cost to Run Well Motor in City

Kilowatt-Hours (kWh)	Cost (\$) per kWh	Total Cost (\$)
828,000	\$0.15410	127,594

The cost shown in **Table 3-3** only includes the energy cost to run the motor of the well. The cost do not include smaller miscellaneous costs such as lighting, control valves, and instrumentation. However, since the motor is the most significant component of the total energy costs, the cost shown in **Table 3-3** provides an annual estimate of the power cost required to operate the City’s groundwater wells. These costs are expected to increase over the next five (5) years as shown in **Table 3-4**

Table 3-4: Projected Energy Cost to Run Well Motor in City

Year (as of 11/01)	Cost (\$) per kWh	Rate Increase (%)
2026	\$0.1818	18%
2027	\$0.2091	15%
2028	\$0.2300	10%
2029	\$0.2530	10%

Since the City mainly relies on groundwater for their water supply, the City cannot offset the energy costs required to run the City’s water system. In addition, the cost of



imported water from a wholesaler are significantly greater than the total production costs of groundwater, which include not only the energy cost shown above, but also additional costs of treatment and distribution. For any water agency that can produce water locally, it is more economical to produce local water than to purchase imported water. Therefore, the City intends to continue to pump groundwater.

3.11. SURFACE WATER

The City routinely receives water from AVEK. AVEK water is more expensive for the city than pumping ground water. For this reason, the City intends to retain and maintain its AVEK use and rights of use but will try to minimize its use to minimize costs. In the event of an emergency, it is possible the City may be able to increase the water supply from one or both these agencies on a temporary basis. However, if the situation is drought-related, it is likely the water supplied from AVEK will be affected by the same situation and an increased supply to the City may not be possible. AVEK has

developed water banking facilities to mitigate the variability of the State Water Project supply. With only eighty-six percent (86%) pumping capacity projected though 2050 under normal climatic conditions (**Table 7-1**), the City can easily increase its groundwater pumping and or implement restrictions on its customers to make sure demand does not exceed available supply.

3.12. TRANSFERS OR EXCHANGES

The City has two (2) interconnections with other agencies [AVEK and MPUD] that are capable of transferring water to the City during emergencies.

3.13. RELIABILITY OF SUPPLIES

The reliability of water supplies with regard to regular threats to reliability, including droughts and competition for supplies, is discussed in detail in **Section 7**. The reliability of supplies with regard to irregular threats to reliability, including catastrophic events or emergencies (earthquake/power outage) is discussed in **Section 8**.



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Section 4: Recycled Water Opportunities

Recycled water has increased overall water supply reliability for many cities throughout California.

4.1. OVERVIEW

Recycled water is defined as domestic wastewater purified through primary, secondary and tertiary treatment. The Southern California region, from Ventura County to San Diego County, discharges over one (1) billion gallons of treated wastewater to the ocean each day. Since recycled water is acceptable for a variety of non-potable water purposes such as irrigation, groundwater recharge, and commercial/industrial processes, it is considered a reliable and drought-proof water source and could greatly reduce the region's reliance on imported water. As technological improvements continue to reduce treatment costs, and as public perception and acceptance continue to

improve, more reuse opportunities should develop, which will increase demands for recycled water. Recycled water is a critical part of the California water picture because of the likelihood of droughts.

This Section describes the City's existing wastewater collection and treatment system, and identifies existing and future recycled water use in the City. This section also includes estimates of recycled water supply and demand through 2050.

4.2. WASTEWATER COLLECTION SYSTEM

The existing sewer system encompasses the City's collection system and treatment facilities. Within the City, approximately thirty-four percent (34%) of the existing residences are connected to the City sewer



system (1,100 units) and sixty-six percent (60%, 1,900 units) utilize onsite wastewater treatment and disposal (septic tanks and leach lines). Per the General Plan, the expected build out of the City would involve 11,578 EDUs (Equivalent Dwelling Units). An EDU is a source of wastewater which is equal to that produced by a typical single-family residence.

Table 4-1 estimates the average daily wastewater flows from residential users connected to the sewer system, estimated flows from current septic systems, a potential prison expansion of 1,512 beds in the next ten (10) to twenty (20) years, and the permitted WWTP capacity.

Table 4-1 Collection System Demand Projections

Scenario	EDUs	Residential Flow (MGD @ 240 gpd/EDU)	Prison (MGD)	Total Avg. Flow (MGD)	Avg. Permitted Flow (MGD)
Existing Connections	1,100	0.264	0.303 (current)	0.567	1.0
Existing Septic Units	1,900	0.456	0.303 (current)	1.023	1.0
City Buildout	11,578	2.779	0.663 (current + expansion)	3.442	1.0

The estimated cost of the expansion of the collection system is \$156.5 million (in 2022 dollars). At the City buildout of 11,578 EDUs, this would equate to \$13,500 per EDU. This does not include the cost to homeowners to abandon their septic system and connect to the collection system. This could cost an additional \$3,000 to \$4,000 per EDU.

An important consideration of the treatment plant approach is the need to accommodate system phasing. The City faces a number of existing issues at its Wastewater Treatment Plant, along with the need to expand

operation in order to accommodate growth, particularly from the future expansion at the prison. The existing plant is currently designed and permitted at 1.0 MGD average day flow; the plant currently treats roughly 0.65 MGD on average based on flow meter records. During peak days, the treatment facilities are reaching their treatment capacity. With an additional 0.3 to 0.66 MGD from a planned 1,512-bed expansion at the prison and 1.5 MGD from projected future flows within the community, the treatment plant needs to be upgraded to



accommodate up to 3.5 MGD average flows, and 6.0 MGD peak flows.

4.2.1. Wastewater Treatment

The City of California City faces a number of issues with its sanitary sewer collection system and wastewater treatment plant. Chief among these issues are concerns over existing treatment processes and accommodating future growth within the City.

Evaluating and analyzing the City's facilities and their capabilities on a regular basis is important for continuing to provide adequate service to City residents. State and Federal law changes also necessitate re-evaluating previous projections and

The sewer system now serves over 1,300 customers spanning forty-three (43) miles of pipe.

planning. The City of California City was incorporated in 1965, and the sewer system now serves over 1,300 customers. California City is the third-largest land area of any city in California, spanning 203.63 square miles. The largest customer of the City's existing wastewater flow and treatment capacity is the nearby California City Correctional Facility prison.

The City's existing treatment plant is permitted to treat 1.0 MGD average and peak flow of 2.0 MGD. The current waste

discharge requirements (WDR) that the treatment plant operates under were set by the State in 2000. Primary treatment consists of a headworks and two (2) aeration basins. Secondary treatment is composed of two (2) secondary clarifiers and a return activated sludge/waste activated sludge station. The treatment plants existing tertiary treatment is composed of a filter influent lift station, two (2) cell flocculation chambers, four (4) up-flow sand filtration units, and a chlorine gas disinfection chamber. Sludge is sent to ten (10) sand drying beds before being disposed of via landfill, with the City removing forty-nine (49) tons of sludge in the year 2020.

The sanitary sewer collection system currently spans forty-three (43) miles of pipe. As with the City's population and services, much of the infrastructure that serves the residents of California City are also in the City's main roads. The City and other reference sources were consulted in assembling data to conduct the analysis of the City for the implementation of a wastewater collection and treatment system. GIS Data obtained included land use, parcels, streets, digital contours, City boundaries, etc.



The data collected was reviewed within the context of wastewater production for the current year, a future 5- to 10-year period, and a 20-year period, with ultimate populations expected to inhabit the City and its SOI. GIS data for land uses, City boundaries, streets and digital contour data were used to create sub-catchments, or drainage sub-basins. Given the elevation and characteristics of each sub-catchment, a representative sewer trunk pipeline alignment was chosen. These facilities were loaded with the wastewater generation factors derived and modeled for conveyance to the wastewater treatment and disposal.

The analysis also determined that due to the relatively flat geography in much of the City,

sewage lift stations and force mains would be required in multiple locations to deliver this wastewater to the treatment facility. Several options were considered for the treatment plant including the development of facility staging strategies that would maximize the performance and cost effectiveness of long-term treatment and disposal options.

The 2023 Wastewater System Master Plan concluded with the development of the potential capital improvement requirements that may be needed to provide a system-wide sewer system for the area at build-out.

Figure 4-1 and **Figure 4-2** shows the City of California City's WWTP.



Figure 4-1 City of California City's WWTP (2023)



4.2.2. Wastewater Flows

The quantities of wastewater generated are proportional to the City’s population and the water used by its residents. The wastewater flows are metered at the influent and effluent of the WWTP, before being discharged. Total wastewater collected in the City over the past five (5) years is shown in **Table 4-2**.

Table 4-2 Wastewater Flows Collected in City

Year	Wastewater (AF)	Wastewater (MG)
2021	706	230
2022	707	230
2023	606	197
2024	456	148
2025	489	159
Avg:	593	193

Due to projected increase of detainees in the CCC, wastewater flows are expected to slightly change over this UWMP planning period (2050). The City anticipates that future wastewater flows can be estimated using the projected demands shown in **Table 6-8** multiplied by an average return rate of thirty-four percent (34%) from 2030 through 2050. **Table 4-3** shows the projected wastewater flows.

Table 4-3 Projected Wastewater Flows Collected in City

Year	Wastewater (AF)	Wastewater (MG)
2030	1,109	361
2035	1,133	369
2040	1,156	377
2045	1,180	385
2050	1,204	392

Since approximately thirty-four percent (34%) of the existing residences are connected to the City sewer system and the remaining sixty-six percent (66%) utilize onsite wastewater treatment, such a return rate was used for a conservative projection of future wastewater flows. The projected demands already accounted for increasing number of detainees.

The City’s WWTP is designed to treat an average permitted flow of 1.0 MGD, which is insufficient to handle the projected flow rates from 1.01 MGD (2035) to 1.07 MGD (2050).

4.3. CURRENT AND FUTURE RECYCLED WATER

The City currently has tertiary treatment facilities that are used to generate recycled water discharged to either onsite percolation ponds or the Central Park Lake (**Figure 6-1**) for use on the Tierra del Sol golf course. Effluent in the summer months is used for the golf course irrigation. During the



winter months, once storage basins are full, a percentage of approximately one percent (1%) or 2.2 MG is diverted to WWTP percolation ponds. **Figure 4-2** shows the City of California City's WWTP in relation to the Central Park Lake and Tierra del Sol golf course.

Total recycled water produced and/or used in the City was determined by taking the difference in effluent from the WWTP and amount discharged to the percolation ponds over the past five (5) years, and is shown in **Table 4-4**.

Table 4-4 Recycled Water Produced and/or Used in City

Year	Recycled Water Produced or Used (MG)
2021	172
2022	182
2023	181
2024	128
2025	120
Avg:	156

As it stands, the existing chlorine treatment facilities are at the end of their useful life, and expensive to operate/maintain when the golf course does not pay the City for this water in any capacity. In order to continue tertiary treatment, the City is investigating potential construction of new tertiary filters (MBR, disc filters, or multimedia filtration) and UV treatment processes (to replace the

chlorine gas addition and contact basin), totaling over \$2,000,000 in initial cost along with continued operation and maintenance (O&M) costs with no revenue generated for the City from the recycled water.

The second option considered was secondary disinfection of the effluent, with construction of a hypochlorite disinfection feed system, a new pump station, and a 250,000-gallon storage tank.

This recycled water would only be suitable for use in dust control for construction, with contractors paying for its usage. The remaining effluent would be disposed of in the onsite percolation ponds. To facilitate this, an additional 10-acre disposal pond would need to be constructed. The estimated construction cost for the hypochlorite disinfection system and 10-acre pond was determined by City staff to be approximately \$2,000,000.

The City is investigating potential construction of new tertiary filters.

4.3.1. Projected Recycled Water Use

As a result of these high costs and lack of funding sources, the City will no longer produce or discharge recycled water by 2028. Therefore, it is projected that recycled water will not be available within the City's service area from 2030 to 2050.



Figure 4-2 Existing WWTP and Disposal Site (Wastewater Master Plan, March 2023)



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Section 5: Water Quality

The City's groundwater Well 14 (pictured) is sampled and tested to ensure high quality drinking water.

5.1. OVERVIEW

The quality of a natural body of water varies over time and location, and these variables must be recognized by water agencies. During periods of intense rainfall, contaminants can be washed into receiving waters, although dilution of existing contaminants may also occur. Conversely, during a drought, the concentration of existing contaminants may increase without additional incoming flows. These principles apply to both surface water and groundwater. As groundwater levels fluctuate, groundwater passes through different layers of rock and sediment and receives substances native to those strata. Also, groundwater wells that have not been used over long periods of time can have

water quality issues resulting from stagnant water. For these reasons, City of California City (City) monitors its wells for water quality as required by State and Federal regulations.

This Section provides a general description of the City's water sources, water quality monitoring and reporting, and water treatment. A discussion of potential water quality impacts on the reliability of supplies is also provided.

5.2. WATER QUALITY STANDARDS

5.2.1. Federal Regulations

In 1974, Congress passed the Safe Drinking Water Act (SDWA) in order to protect public health by regulating the nation's municipal drinking water supply. As part of the SDWA,



powers were given to the Environmental Protection Agency (EPA) to regulate drinking water. The 1996 amendment to the SDWA required monitoring of new types of contaminants. Since the 1996 amendment to the SDWA, the EPA has identified over ninety (90) contaminants in its National Primary Drinking Water Regulations (NPDWR) or “primary standards”). The main categories the EPA has identified include: biological microorganisms, disinfectants, disinfection byproducts, inorganic chemicals, organic chemicals, and radionuclides. As required by the SDWA, water agencies must provide annual Water Quality Reports to its customers.

5.2.2. State Regulations

Water quality regulations have changed since the Safe Drinking Water Act in 1974. Several state, regional and county agencies have jurisdiction and responsibility for monitoring water quality. The actual regulations on water quality have also changed over the years. This is the result of the discovery of new contaminants, changing understanding of the health effects of previously known as well as new contaminants, development of new analytical technology, and the introduction of new treatment technology. All water purveyors are subject to drinking water standards set by the EPA and the State Water Resources Control Board (SWRCB). The California Department of Public Health

(CDPH) previously oversaw the water quality of the State's drinking water program and the environmental lab accreditation program. As of July 2014, those programs were transferred to the SWRCB. Under the SWRCB, the Division of Drinking Water (DDW) regulates public drinking water systems, including setting the maximum contaminant levels (MCLs) and regulating the operation of water systems. In addition to the SWRCB, several regional and county agencies have jurisdiction and responsibility for monitoring water quality and contaminant sites.

In 2014, the State's drinking water program was transferred from the Health Department to SWRCB.

5.2.3. State Drinking Water Standards

The State of California has established two (2) main types of drinking water standards:

1. Maximum Contaminant Level (MCL)
2. Public Health Goal (PHG)

MCLs are the drinking water standards to be met by public water systems. The levels set by the State consider a contaminant's health risk, detectability, treatability, and costs of treatment. MCLs are further broken down into two (2) types:

1. Primary MCL – Health Related
2. Secondary MCL – Taste & Odor



Secondary MCLs are not federally enforceable according to the most recent SDWA amendments. However, they are regulated by the State of California. DDW publishes a list of Secondary MCLs, which include Copper, Iron, and Zinc.

PHGs are established by the Office of Environmental Health Hazard Assessment (OEHHA). They are concentrations of drinking water contaminants that pose no significant health risk if consumed for a lifetime, provided risk levels are not exceeded. Public water systems often use PHGs to provide information regarding drinking water contaminants in their annual water quality reports. PHGs are not regulatory standards. However, state law requires the SWRCB to set drinking water standards for chemical contaminants as close to the corresponding PHG as is economically and technologically feasible.

5.2.4. Hexavalent Chromium (Cr6)

As of the 2020 UWMP, California had previously established a maximum contaminant level (MCL) of ten (10) parts per billion (ppb) for hexavalent chromium (Cr6), which took effect on October 1, 2024. This concentration can be described as one drop in an Olympic-size swimming pool. Prior to this, Cr6 was regulated under California's total chromium MCL of 50-ppb. The Federal Standard is currently set at 100-ppb. The SWRCB is currently evaluating treatment

technologies and cost estimates for Chromium-6 removal.

5.2.5. City Standards

To ensure quality of its water, the City conducts sampling and testing of water on a daily, weekly, and monthly basis. Testing is performed at several locations of the City's distribution system, as well as at the source (City wells). Results of the water quality testing are posted annually to the City's website. The City's water quality reports since 2014, are archived at the following link:

californiacity-ca.gov/CC/index.php/consumer-confidence-report

The testing is conducted on several parameters, including organic & inorganic chemicals, bacteriological contaminants, pesticides and herbicides, and radiological contaminants. The City contracts with certified laboratories to perform water quality testing. The City's Annual Water Quality Reports (also known as "Consumer Confidence Reports") are filed with DDW and released to customers. The annual reports identify regulated substances (Primary MCLs), secondary substances (Secondary MCLs), and unregulated substances (PHGs). The City identifies all detected substances in the annual reports. According to the City's 2024 Annual Water Quality Report, the results for this type of



testing indicate that lead and copper were not detected above the action level (AL).

5.3. QUALITY OF WATER SOURCES

The two (2) main sources of the City's water supply are Groundwater from the Fremont Valley basin and imported water from AVEK. Since AVEK draws the majority of its water from the SWP, the quality of the City's imported water supply is closely related to the quality of this source.

5.3.1. Imported Water Quality

AVEK is responsible for providing water of a high quality throughout its service area. The

water delivered by AVEK is tested both for currently regulated contaminants and for additional contaminants of concern. AVEK's supplies originate primarily from the SWP. The SWP contains low levels of total dissolved solids (TDS) while its level of organic materials is higher than most, lending to the formation of disinfection byproducts. One of the measures for determining drinking water quality is the concentration of a constituent known as trihalomethanes (THM). Implementing an award-winning water treatment method, "geopurification," AVEK has achieved record low levels of THM.



Figure 5-1 Native Rock adds to the Salinity of the Colorado River Water Supplies



5.3.3. Groundwater Quality

California's Groundwater Bulletin 118 characterizes the Fremont Valley Groundwater Basin as sodium bicarbonate in the southeast, sodium bicarbonate or calcium-sodium sulfate in the southwest, sodium sulfate-bicarbonate to sodium chloride in the north, and complex with variable mixtures of sodium, calcium, chloride, sulfate, and bicarbonate in the central region. These chemical compositions not only affect localized water quality (and therefore, groundwater pumping) but can also influence concentrations throughout the groundwater basin through groundwater flow resulting from high-volume pumping. The total dissolved solids (TDS) content of groundwater is high in this region. Some of the contaminants affecting groundwater use in the region include arsenic, gross alpha particle activity, uranium, fluoride, TDS, and boron.

5.4. IMPACTS OF WATER QUALITY

Water quality dictates the management strategies a water supplier will implement, including, but not limited to, the selection of water sources, treatment alternatives, blending options, and modifications to existing treatment facilities. A direct result of the degradation of a water source is the need to install wellhead treatment before consumption. The poorer quality of the source water, the greater the need (and cost) for treatment. This can also decrease

water supply reliability. Due to the number of groundwater wells in the City's water system, the City has a degree of redundancy in the event of water quality impairments with a particular well. **Figure 5-2** shows a general procedure that the City may take when one of the City's wells is detected to have water quality concerns.

The City's water system is and has been in compliance with all DDW water quality standards.

5.4.1. Impacts of Abandoned Wells

The presence of abandoned groundwater wells represents a potential hazard to the quality of the groundwater basin. Abandoned and improperly destroyed wells can act as conduits for contaminants to reach drinking water supplies. It is vital for the long-term protection of the basin that abandoned wells be

located and destroyed. While it is the landowner's responsibility to destroy an abandoned well, local water

Abandoned private wells can pose a water quality concern if left unaddressed.

agencies should be proactive about making sure that abandoned wells are in fact destroyed. The destruction of abandoned groundwater wells should be performed in accordance with state standards. CWC Section 13750.5 requires that those responsible for the destruction of water



wells possess a C-57 Water Well Contractor's License. Whenever a water well is destroyed, a report of completion must be filed with the California DWR within sixty (60) days of the completion of the work. DDW and Kern County (County) are responsible for permitting and inspecting construction and destruction of wells.

State policy for all functional and abandoned wells is to establish a "well site control zone", the area immediately surrounding the well alternatively referred to as the "wellhead". The purpose of this zone is to provide protection from vandalism, tampering, or other threats at the well site. The size of this zone can be determined by

using a simple radius, or an equivalent area. The well site control zone should be managed to reduce the possibility of surface flows reaching the wellhead and traveling down the unprotected casing. SWRCB-DDW regulations recommend a minimum radius of 50 feet for well site control zones for all public water systems in the state. The requirement applies to abandoned wells as well as functional activities that could potentially lead to "source water contamination" according to EPA regulations (IWRP, 2007). Additionally, well owners are responsible for destroying abandoned wells per the Public Health and Safety Code, Part 9.5, Section 115700.



Figure 5-2 Well 14 Chemical Injection



5.4.2. Groundwater Contamination Response

Currently, the City has a WSCP, Annex of the Kern County Hazard Mitigation Plan (HMP), Cross Connection Control Plan (CCCP) for both the City of California City system and Wonder Acres system, and Sewer System Management Plan (SSMP) that includes an Overflow Emergency Response Plan (OERP) that work in conjunction to handle the effects of potential groundwater contamination and mitigate disasters such as sudden water shortages. This information is provided in **Section 8**.

The WSCP can provide guidance for dealing with the effects of a water shortage, which may be due to groundwater contamination. The City also has emergency response policies in place to respond to emergencies. Two (2) recent tests of the City's emergency response network were seen in the year

The City will work with AVEK and the County's Emergency Operations Center.

2020, when the City responded to the Covid-19 pandemic, and in 2021, when Governor Newsom issued a State of Emergency due to drought that required Statewide correspondence with Level 2 of agency's WSCP. In the event of a groundwater contamination shortage, the City will work in conjunction with the County's Emergency

Operations Center to deal with the effects of potential water shortages.

5.4.3. Sanitary Surveys by DDW

The quality of water dictates numerous management strategies a water purveyor will implement, including, but not limited to, the selection of water sources, treatment alternatives, blending options, and modifications to existing treatment facilities. A direct result from the degradation of a water source is increased treatment cost before consumption. The poorer the quality of the source water, the greater the treatment cost. This in turn can decrease water supply reliability by potentially decreasing the total supply.

A Watershed Sanitary Survey examines the potential sources of contaminants in the watersheds and includes recommendations for managing these effects. Per DDW guidelines, the Watershed Sanitary Surveys must be updated every five (5) years. Since the City does not use any surface water directly, the City does not prepare Watershed Sanitary Surveys. However, the City is still subject to periodic inspections by DDW staff every three (3) years. The Sanitary Surveys conducted by DDW include inspection and evaluation of the following:

1. Water Sources
2. Treatment
3. Distribution System
4. Finished Water Storage



5. Pumping Facilities
6. Monitoring & Reporting
7. System Management/Operation
8. Operator Compliance (with State Requirements)

The City's previous Sanitary Survey Inspection occurred in 2022.

5.4.4. Impacts on Management & Reliability

As a result of the City's water quality policies, the City has not experienced water quality issues that affect its ability to meet demands. As shown in Figure 8-1, when wells are offline, additional groundwater will be available through other wells to supplement water supplies and additional water may be purchased from AVEK.

Therefore, the City does not anticipate any significant impacts to water supply reliability due to water quality issues.



6

Section 6: Water Use

Water use within the City's service area includes residential, commercial, institutional, and landscape irrigation.

6.1. OVERVIEW

The City's water consumption is subject to significant change from year to year. Further, water use within the City's service area is also variable over the course of a given month or due to climate conditions. This section explores the water usage trends within the City and quantifies total water usage per customer type. In addition, the provisions of Senate Bill x7-7 (Water Conservation Act) are explored in detail.

6.2. COVID PANDEMIC'S EFFECT ON THE WATER SYSTEM

As a result of the Coronavirus Disease 2019 (COVID-19) Pandemic, Commercial and Institutional water use had declined. On March 19, 2020, an Executive Order and

Public Health Order directed all Californians to stay home, except to go to an essential job or to shop for essential needs. It was then modified on May 4, 2020. The Regional Stay Home Order, announced December 3, 2020, triggered additional restrictions after the region was announced to have less than fifteen percent (15%) ICU availability. It prohibited private gatherings of any size, closed sector operations except for critical infrastructure and retail, and required 100% masking (with certain exceptions as indicated in guidance for use of face coverings) and physical distancing. The Regional Stay Home Order was lifted January 25, 2021. During his 2021 State of the State Address Governor, Gavin Newsom reported that California had administered nearly eleven (11) million doses of the vaccine, and



that the State was well on its way to seeing an end to this pandemic.

The DDW has stated that the PWS operations are designated as essential functions and staff and suppliers are not restricted by any current orders. This has allowed water system operators and maintenance workers to keep the PWS providing safe and clean drinking water to its customers.

The COVID-19 pandemic temporarily altered water-use patterns and utility operations across California. Stay-at-home orders in 2020 and 2021 led to higher residential water use, while commercial, industrial, and institutional demand declined due to widespread facility closures. Many agencies

The Covid-19 Pandemic has impacted water use in the residential and commercial sectors.

observed shifts in peak-hour demand and changes in spatial distribution, with more water used in neighborhoods and less in business districts. Although

these patterns gradually normalized as restrictions eased, the pandemic highlighted how quickly demand can shift during major disruptions.

Water utilities also experienced operational and financial impacts during the pandemic. Many households faced economic hardship,

leading to increases in delinquent customer payments and reduced revenue stability for some agencies. Utilities also had to deal with staffing shortages, supply-chain delays, and the need for enhanced safety protocols to maintain essential services. While most systems remained resilient, the pandemic underscored the importance of emergency planning, financial reserves, and operational flexibility for maintaining reliable water service during large-scale disruptions.

6.3. CURRENT CITY WATER NEEDS

Water use within the City's service area includes residential potable use, landscape irrigation use, commercial and institutional uses, and of course water losses. Water use is variable and depends on a number of factors which include seasonal climate changes, demographic shifts, changes in land use or redevelopment, and of course legislation. Since the City's service area is largely residential, changes in residential plumbing fixtures and customer usage habits can significantly affect water usage.

6.4. CLIMATE IMPACTS ON WATER USE

California faces changes in water use habits due to a variety of issues including population growth, regulatory restrictions, and climate change (including the severe drought of 2020-2022). More specifically, weather unpredictability (more extreme drought and flood events) poses additional challenges to water agencies, not only due to



impacts on water supplies but also due to impacts on water demands.

Since the preparation of the 2020 UWMP, there have been local and statewide influences on water use in the City. California experienced a multi-year drought from 2020 through 2022, with precipitation consistently below average and record-high temperatures which exacerbated water scarcity. Water year 2022, covering October

Snowpack, a critical water source, fell to 35% of average by April 1, 2022.

2021 to September 2022, ended with seventy-seven percent (77%) of average precipitation, following an even drier 2021, making the three-year stretch drier than the previous record dry period of 2013–2015. Snowpack, a critical water source, fell to thirty-five percent (35%) of average by April 1, 2022, despite a strong start in December. Drought severity varied regionally, with the Central Valley and northern basins experiencing the most extreme conditions.

Environmental Impacts: The drought led to dry soils, reduced water availability, and increased wildfire risk. Wildfire activity fluctuated, with 4.3 million acres burned in 2020, decreasing to 2.57 million acres in 2021 and 362,455 acres in 2022, reflecting both drought intensity and mitigation efforts. Reduced snowpack and low

precipitation stressed rivers, reservoirs, and groundwater systems, affecting ecosystems and water supply reliability.

Agricultural and Economic Impacts:

Agriculture was heavily affected, particularly in the Sacramento Valley and rice-producing counties. In 2022, 750,000 acres of farmland were idled, more than half in the Sacramento area. Direct economic losses to farm activity were estimated at \$1.2 billion in 2022, up from \$810 million in 2021, with additional losses of \$845 million in food processing industries, totaling \$2 billion in value-added losses and 19,420 jobs lost. Increased evapotranspiration due to higher temperatures further stressed crops, requiring more irrigation to maintain productivity.

Regional and Temporal Variability:

Drought intensity varied across the state and over time. In 2020, drought conditions were less severe, while 2021 and 2022 saw widespread and more intense drought, particularly in the Central Valley. Northern California basins faced early water curtailments, and the Sacramento Valley experienced unprecedented climatological stress due to limited groundwater pumping capacity. Despite these challenges, mitigation measures such as land idling, water trading, and increased groundwater pumping helped reduce potential losses.



Changes in water usage habits have a special concern for the State due to the interdependence of many agencies for the transfer and use of water. For example, some agencies are unable to produce water locally and are entirely dependent on imported water sources, while others are able to produce all water locally (i.e., groundwater). Also, some agencies are able to reduce demands with minimal economic

The State will likely face challenges in the near future to find the correct balance of water supply allocations.

impacts (only water sales revenues), while other agencies will suffer economically (i.e., agricultural & industrial users) if required by State or local agencies to reduce water

consumption. Therefore, the State will likely face challenges in the near future to find the correct balance of water supply allocations to meet demands under various weather conditions. For State Water Project (SWP) water rights holders, this is an extremely critical issue.

6.4.1. California Water Plan Update 2023

DWR's California Water Plan Update 2023 emphasizes the urgency of climate change impacts, the need for watershed resilience, and the importance of equity in water management. It is designed to ensure that all Californians benefit from water resources that are sustainable and resilient to climate

change. There are three themes including:

Addressing Climate Urgency: The plan recognizes the increasing variability in California's hydrology due to climate change and promotes adaptive infrastructure and emergency planning to enhance resilience.

Strengthening Watershed Resilience: It encourages coordinated efforts at the watershed level to integrate engineered systems with natural processes, to achieve multiple benefits across water, agriculture, and ecology.

Achieving Equity: For the first time, the update includes a dedicated chapter on the challenges and resources of California Native American Tribes, ensuring that Indigenous knowledge and priorities are integrated into statewide planning.

6.5. WATER USE

6.5.1. Past Water Use

As the population of the City has increased over the past decade, overall water use within the City's service area has also increased steadily. Annual water consumption from 2016 to 2020 listed in the 2020 UWMP ranged from a high of 989 MG in 2018 to a low of 655 MG in 2016 with an average of 789 MG as shown in **Table 6-1**.



Table 6-1 City Past Water Use

Year	Total Potable Consumption (MG)	Per Capita (GPCD)
2016	1,205	231.3
2017	1,223	228.5
2018	1,241	225.7
2019	1,260	226.5
2020	923	168.4
Average:	1,170	216.1

As indicated by **Table 6-1**, water use has remained consistent until decreasing in 2020. This correlates to a reduction in water loss that is shown in **Section 6.6.2**. Based on the values shown in **Table 6-1**, water use had decreased by approximately twenty-three percent (23%) from 2016 - 2020.

6.5.2. Recent Water Use

Table 6-2 shows the District's water consumption over the past five (5) years.

Table 6-2 City Recent Water Use

Year	Total Potable Consumption (MG)	Per Capita (GPCD)
2021	N/A	N/A
2022	839	152.8
2023	799	147.3
2024	763	158.5
2025	797	155.3
Average:	800	153.5
2020 Water Use Target:		270

As shown in **Table 6-2**, the City experienced a water demand of 797 MG in the year 2025. All water distributed through the City service area is potable drinking water. Annual water use since 2021 has ranged from approximately 763 MG to 839 MG, with an average of 800 MG. As indicated by **Table 6-2**, water use has been slightly trending downward, and the City has already reached their 2020 water use reduction target. It is expected that water-use efficiency will increase in future years due mostly to conservation practice and enforcement.

6.6. WATER USE BY SECTOR

6.6.1. Service Connections/Accounts

The City maintains records of water consumption and, as of July 1, 2025, bills its customers on a monthly basis for water and sewer service. Prior to this, customers were billed bi-monthly. Approximately fifty-one-and-a-half percent (51.5%) of the City's water demand is residential. CII sectors account for approximately sixteen-and-a-half percent (16.5%) of the City's potable water demand. The remaining portion of the City's demand pertains to irrigation purposes. The City does not provide any sales to agriculture, nor other agencies, saline water intrusion barriers, groundwater recharge, or conjunctive use. Water losses due to leakage or inaccurate water meters, are calculated in accordance with CWC 10631(e)(3)(B). The total number of service connections and water consumption is



shown in **Table 6-3**, respectively.

Table 6-3 Service Connections (2025)

Sector	Service Accounts
Single-Family Residential	4,750
Multi-Family Residential	121
Commercial/Institutional	87
Industrial	0
Landscape Irrigation	22
Other	0
Total Connections:	4,980

Approximately ninety-eight percent (98%) of the total service connections are residential (single- or multi- family), since the City consists primarily of residential properties. Single-family comprises the largest individual sector with eighty-four percent (95%) of the total service connections. Commercial and institutional accounts comprise approximately one-and-a-half percent (1.5%) of the total accounts. The City currently has no industrial accounts. The City has approximately twenty-two (22) landscape irrigation accounts, including

Central Park. There are multiple grass-covered landscapes in its service area (including sports fields and parks). The parks and schools within the City are not City-owned, but the City meters these locations and bills for the use of water.

The City's water rates are listed in **Section 8.14**. Water sales data is compiled by City water staff and submitted to DWR in the Electronic Annual Report (eAR). The total water consumption by customer type since 2021 is shown on **Table 6-4**. As indicated by **Table 6-4**, single-family Residential accounts are the highest consuming sector in the City since most of the City is zoned for single-family accounts (with higher densities for multi-family accounts).



Figure 6-1 Central Park Lake



Table 6-4 Recent Water Demand by Sector (MG)

Sector	2022	2023	2024	2025
Single-Family Residential	398.1	402.9	413.9	397.4
Multi-Family Residential	20.6	15.7	15.4	14.4
Commercial/Institutional	201.5	121.3	79	64.9
Industrial	0.83	0.73	0.74	0.2
Landscape Irrigation	12.4	62.4	46.9	80.3
Agricultural	0.94	0.4	1.2	0.04
Other	1.8	3.1	3.4	7.0
Total Water Sales:	636.2	606.5	560.5	564.1
Water Loss (Real Loss + Apparent Loss)	203	193	202	233
Total Water Consumption (Total Supply into System):	839	799	763	797

Notes: Estimated Water Loss values were determined from City internal supply/demand data. Insufficient data from the City for 2021 has been sorted as outlier and therefore not included in the data analysis.

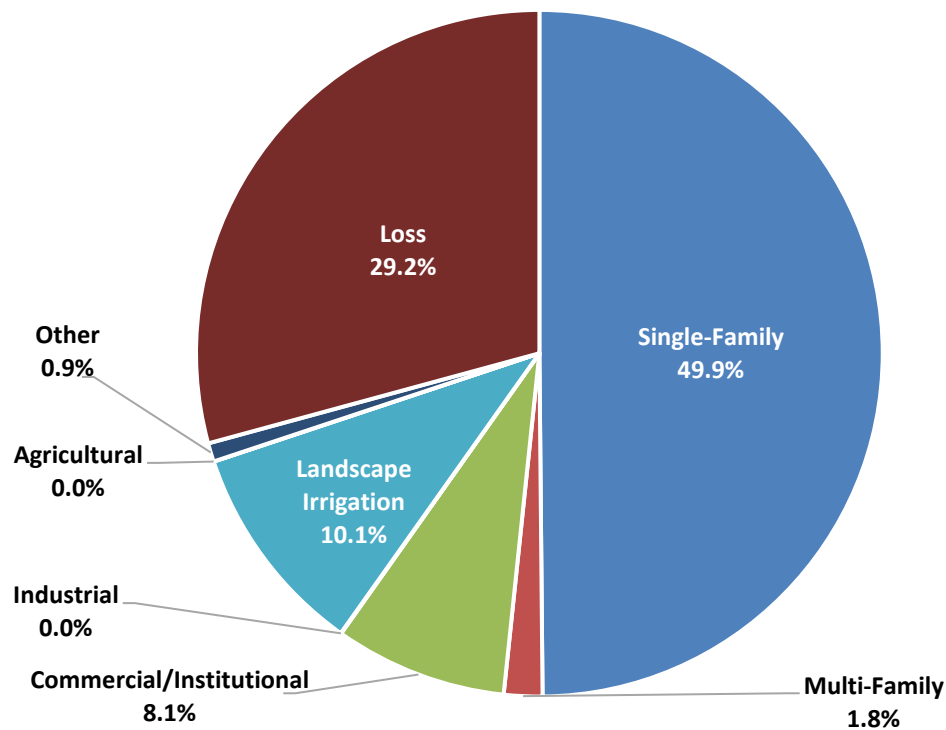


Figure 6-2 Current Water Demand by Sector (in 2025)



6.6.2. Distribution System Losses

Distribution system water losses (also known as “real losses”) are the physical water losses from the water distribution system and the supplier’s storage facilities, up to the point of customer consumption. These losses are reported in **Table 6-4**

Water Losses decreased from 550 MG in 2016 to 191 MG in 2020. It is currently estimated that the water losses from the City’s distribution system in 2025 are twenty-nine percent (29%) of water produced, and therefore the volume of water loss is reported as 233 MG. These losses are largely attributed to water line breaks and water theft.

As indicated by **Table 6-4**, the City's Water Loss ranged from 193 to 233 MG, which on average is approximately twenty-five percent (25%) of the total water supply into the City's distribution system. Water Loss is determined as the sum of apparent loss and real loss, as determined in each years Validated Water Loss Audit. Examples of Water Loss consists of routine flushing, unmetered use, and main breaks, to name a few. Although water losses have cost impacts on water agencies, they cannot be prevented entirely.

Instead, effort is directed at controlling the quantity of water losses (to a cost-effective extent) in order to reduce the cost impact of

water losses on water operations. For this reason, the City’s Staff prepares annual Water Loss Audits, using AWWA software. The 2020 Audit shows that the City’s Leakage Index (the ratio of real loss to unavoidable loss) was 2.9, which is below the 75th percentile and above the median of Water Purveyors. The City’s Validated Water Loss Audits can be found on DWR’s WUE Portal:

wuedata.water.ca.gov/awwa_plans

6.6.3. 2028 Water Loss Standard

CWC Section 10608.34 requires SWRCB to develop water loss performance standards for urban retail water suppliers. Executive Orders B-37-16 and B-40-17 direct SWRCB and DWR to minimize water waste through system leaks. Water loss performance standards became effective in 2023. As part of a proposed water conservation regulation, urban retail water suppliers (not individual households or businesses) will be held to "urban water use objectives." An urban water use objective is the sum of standard-based budgets for a subset of water uses, such as residential outdoor use, as further described in **Section 6.7**.

Retail Suppliers must meet water loss standards by January 1, 2028, calculated on a system level. Ongoing compliance will be on a three-year average basis. The baseline period for the 2028 Water Loss Standard is 2017-2020. Real loss and apparent losses



used to calculate the standard are the average real losses and apparent losses in the baseline period. SWRCB staff can initiate an adjustment process for any system that has significant changes in data compared to the baseline if at least three (3) compliance assessments have passed. Suppliers can request an adjustment to the baseline period data if significant data improvements have been made.

Suppliers must either meet their apparent loss standard (equivalent to their baseline period (2017-2020) apparent losses) or submit an inventory of all apparent losses. Meeting the apparent loss standard is not required as long as an inventory of apparent losses is submitted.

The City's Baseline Real Loss is 1,243.1 gallons per mile of pipe per day (gpm/d) and Real Loss Standard is 474.1 gpm/d, resulting in a Required Real Loss Reduction from Baseline of 62%. Apparent Loss Standard is 8.2 gallons per service connection per day (gpscd).

6.7. URBAN WATER USE OBJECTIVE

The "Making Conservation a California Way of Life" regulation went into effect on January 1, 2025 and establishes unique efficiency goals for each urban retail water supplier in California and provides those suppliers flexibility to implement locally appropriate solutions. The regulation seeks to

cultivate long-term practices that help communities adapt to California's ongoing water challenges. The regulation requires suppliers to:

- Annually calculate urban water use objectives for a subset of urban water uses: residential indoor water use, residential outdoor water use, real water loss, and commercial, industrial, and institutional (CII) landscapes with dedicated irrigation meters (DIMs).
- Carry out performance measures for CII water use.
- Annually report to SWRCB.

The City's Compliance Summary Report, prepared by SWRCB staff on September 30, 2025, summarizes the supplier's compliance with annual reporting requirements under the "Making Conservation a California Way of Life" regulation for the state fiscal year 2023-2024. This report was due on January 1, 2025. The City's fiscal year 2024-2025 report was not submitted; therefore, no Compliance Summary Report was further made available.

6.7.1. Key Highlights from the Report

The following points are a summary of **Sections 2 through 6** of the City's Compliance Summary Report for fiscal year 2023-2024:



- The report was initially submitted on January 15, 2025, but later revised and re-submitted on June 10, 2025.
- The supplier has met its calculated objective for fiscal year 2023-2024.
- The supplier has no approved variances or temporary provisions for fiscal year 2023-2024.
- The report contains three (3) data quality flags: Real water loss reported as 0, missing, or negative; DIMs and In-Lieu Tech did not explain "Other" BMP; No CII BMP customer identification method was specified.

The water use objectives will become progressively lower as standards change through 2040. **Table 6-5** compares the current water use objective and reported water use to future efficiency requirements; the full summary can be found in Section 7 of the City's Compliance Summary Report. While this table does not capture how future water use objectives will be influenced by changes in local climatology, service area population, square footage of irrigated landscapes, and other data that will factor into future water use efficiency objectives, it is provided as a tool for local planning purposes.

6.7.2. Objectives Calculated with Future Standards

Table 6-5 Objectives Calculated with Future Standards

Fiscal Year	FY 23-24 Use (MG)	Calculated/Projected Objective (MG)	Current use lower than objective?
24-25	470.7	542.6	Yes
25-26	470.7	500.4	Yes
30-31	470.7	474.5	Yes
35-36	470.7	444.2	No (objective is 5.6% lower)
40-41	470.7	429.9	No (objective is 8.6% lower)

As **Table 6-5** shows, the City has met its calculated objective for fiscal year 2023-2024. The City's Compliance Summary Report can be located on DWR's WUE Portal:

wuedata.water.ca.gov/uwuo_plans

6.8. WATER CONSERVATION ACT

6.8.1. Act Background (SBx7-7)

Due to the limited amount of water allowed to be pumped in the San Joaquin Delta, the California State Legislature drafted the Water Conservation Act of 2009 (SBx7-7) to



protect statewide water sources. The legislation called for a twenty percent (20%) reduction in water use in California by the year 2020. The legislation amended the Water Code to call for 2015 and 2020 water use targets in the 2010 UWMPs, updates or revisions to these targets in the 2015 and 2020 UWMPs, and allows DWR to enforce compliance to the new water use standards. In essence, the bill requires each urban retail water supplier to develop urban water use targets to help meet the twenty percent (20%) goal by 2020 and an interim ten percent (10%) goal by 2015.

The bill establishes methods for urban retail water suppliers to determine their targets to help achieve statewide water reduction targets, which may or may not be a strict twenty percent (20%) level. The retail water supplier must select one of the four target-setting methods as described in **Section 2.4.3**. The retail agency may also choose to comply with SBx7-7 as an individual or as a region in collaboration with other water suppliers. Under the regional compliance option, the retail water supplier is mandated to report the water use target for its individual service area. The bill also includes reporting requirements in the 2010, 2015, and 2020 UWMPs. Beginning in 2016, failure to comply with interim and final targets makes a retail agency ineligible for grants

and loans from the state needed to attain water self-sufficiency by 2020; however, if an agency which is not in compliance documents a plan and obtains funding approval to come into compliance, it could then become eligible for grants or loans.

In addition to an overall statewide twenty percent (20%) water use reduction, the objective of SBx7-7 is to reduce water use within each hydrologic region in accordance with the agricultural and urban water needs of each region. Currently, DWR recognizes 10 separate hydrologic regions in California as shown in **Figure 6-3**. Each hydrologic region was established for planning purposes and corresponds to the State's major drainage areas. The service area of the City is located in the South Lahontan Hydrologic Region (HR), as shown in **Figure 6-4**.

Wholesale water suppliers, including AVEK, are not required to determine baseline daily per capita water use, urban water use target, interim urban water use target, or compliance daily per capita water use. Instead, wholesale water suppliers are required to include in their UWMPs discussions of programs they intend to implement to support the retail water suppliers, such as the City, in attaining their reduction goals and targets.



Figure 6-3 California's 2020 Water Conservation Goals

South Lahontan Hydrologic Region Basin Map

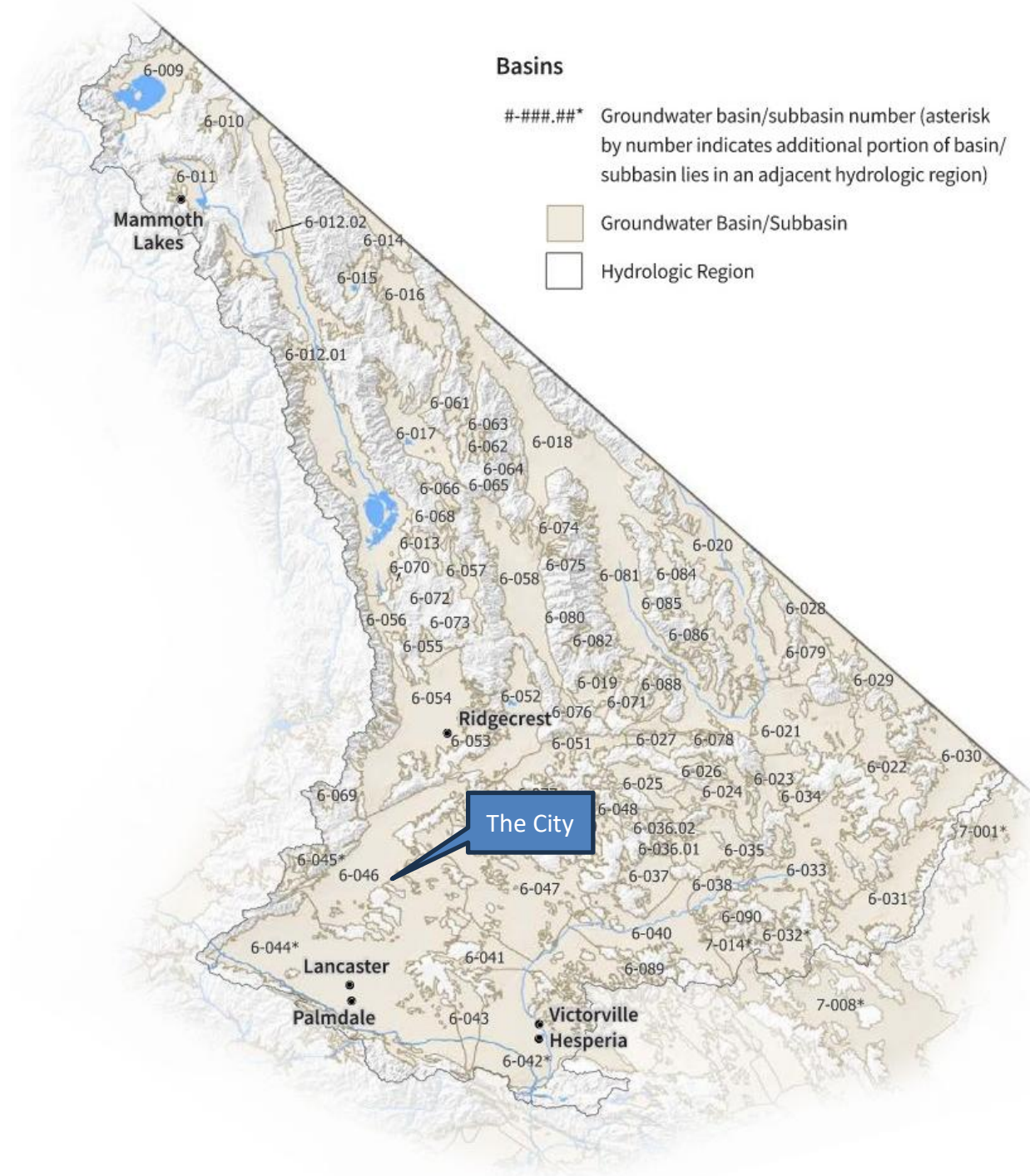


Figure 6-4 South Lahontan Hydrologic Region



6.8.2. Exempt Agencies

If an agency has a baseline per capita water use of 100 GPCD or less, that agency will not have to adhere to any reduction targets as that agency is already considered water efficient. In such a case, that agency must document in subsequent UWMPs that its water usage is still under 100 GPCD.

6.8.3. SBx7-7 Baseline & Target

The City previously established water use targets for 2015 and 2020. DWR provided guidelines for determining these targets in its *Methodologies* guidebook for the 2010 and 2015 UWMPs. In the 2010 and 2015 UWMPs, the City's baseline water use and targets were determined based on the procedures shown in **Figure 6-5** and **Figure 6-6**.

If an agency's 10-year baseline is slightly higher than the Hydrologic Region's target, that agency still must achieve a five percent (5%) reduction from its 5-year baseline. If an agency has a per capita water use of 100 GPCD or less, that agency will not have to adhere to any reduction targets as that agency is already considered water efficient.

Although the City does use recycled water, a 10-year instead of a 15-year rolling average was previously calculated. The City's baseline water use is 337.8 GPCD, which was calculated from a 10-year period from January 1, 2001 to December 31, 2010.

Table 6-6 shows historic (January 1, 2001 to

December 31, 2010) water use and provides the base period annual water use used to calculate the baseline water use for City. The data was used to calculate the continuous 10-year and 5-year average baseline. Regardless of the compliance method adopted by the City it will need to meet the minimum water use target of five percent (5%) reduction from a 5-year baseline as calculated.

As shown in **Table 6-7**, the City's 10-yr and 5-yr baselines were determined to be 337.8 GPCD and 324.4 GPCD, respectively. The City's baseline water use was then compared to the regional compliance target to determine the applicable reduction amounts per the SBx7-7 additions to the water code. The legal stipulations applicable to the City and the required target to be enforced by DWR are shown in **Table 6-7**.

The selected SBx7-7 target was 270 GPCD [twenty percent (20%) reduction from its 10-year baseline] because this amount is greater than 162 GPCD [five percent (5%) reduction from the South Lahontan HR's target]. Since the City's minimum reduction requirement of 308 GPCD [five percent (5%) reduction from its 5-year baseline] is greater than 270 GPCD, the City can select **Method 1** (270 GPCD) as its 2020 water use target. Therefore, the District's compliance target for 2020 per capita water consumption was **270 GPCD** in accordance with Section 10608.22 of the Code.

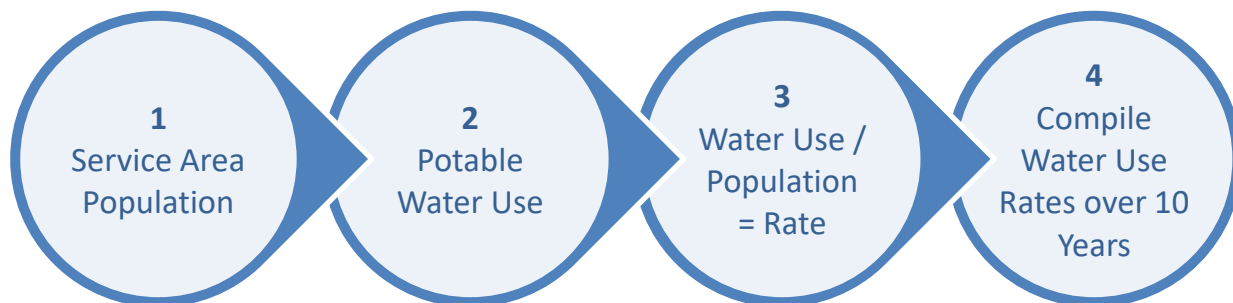


Figure 6-5 Procedure for Determining Baseline Per Capita Water Use

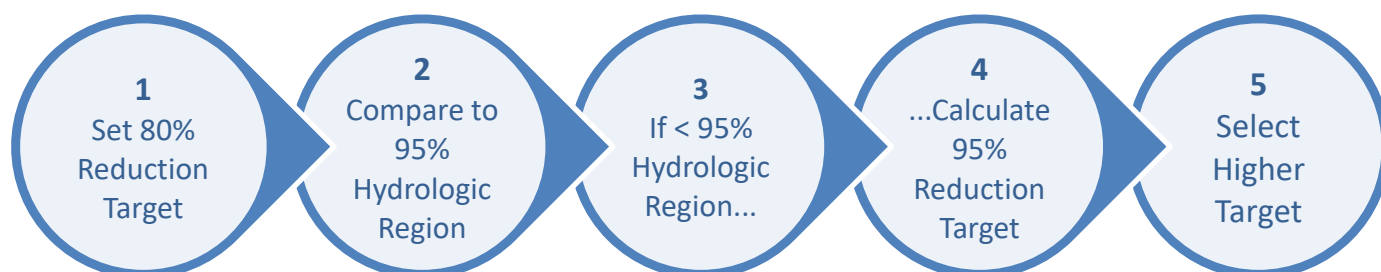


Figure 6-6 Procedure for Determining Target Per Capita Water Use



Table 6-6 California City Water Use

Year	Service Area Population	Total Potable Consumption (MG)	Per Capita (GPCD)
2001	10,816	1,308	331.3
2002	10,977	1,320	329.5
2003	11,138	1,335	328.4
2004	11,301	1,641	397.8
2005	11,687	1,573	368.8
2006	12,528	1,714	374.8
2007	13,705	1,764	352.6
2008	14,556	1,664	313.2
2009	14,338	1,598	305.3
2010	14,120	1,423	276.1
10-yr. Baseline (2001 - 2010) (SB7: 10608.20)			337.8
5-yr. Baseline (2006-2010) (SB7: 10608.22)			324.4
State Hydrologic Region Baseline			237
State Hydrologic Region Target			170

Table 6-7 California City SBx7-7 2020 Water Use Targets

Min. Reduction Requirement (10608.22)	20% Target (10608.20) (b)(1)	5% Reduction from Regional Target (10608.20) (b)(3)
308	270	162
2020 Per Capita Target:		270
Interim (2015) Target:		N/A



6.8.4. SBx7-7 Target Compliance

Although the requirements of SBx7-7 were stringent, the City has seen an increase in water efficiency in the past ten years. This is due in part to State legislation, stricter conservation measures, saturation of water-saving plumbing fixtures, and overall water conservation awareness. As indicated by **Table 6-7**, the City has achieved its 2020 target. The City can maintain its consumption rates below the SBx7-7 target by continuing to focus on water conservation.

6.9. PROJECTED WATER DEMAND

Future water use projections must consider significant factors which will affect water demand, such as development and/or redevelopment, and climate patterns. Climate conditions will continue to be a major influence on demand as it will lead to more frequent and severe drought conditions, that will increase demand at times when these supplies are limited.

6.9.1. Low-Income Water Demands

Future water projections include water savings as they are based on reducing gpcd by 2 gpcd per year through several water saving management methods the City is using. Regarding Low Income, the City is located in rural California where typically low income, very low income, moderate income, and higher income residence and homes are

mingled together throughout the City. The City does not solicit income information. Low-income projections are included in the single and multi-family dwelling line in **Table 6-8**.

6.9.2. Projected Water Use by Sector

For planning purposes, the City's projected water use for 2030-2050 is broken down by sector in **Table 6-8**. The estimates per sector are based on the ratios of water use by sectors shown in **Table 6-4** and the population projections shown in **Table 2-6**. **Figure 6-7** also shows the Projected Water Demand by Sector in 2050.



Table 6-8 Projected Water Demand by Sector (MG)

Sector	2030	2035	2040	2045	2050
Water Service Area Population	15,531	15,930	16,330	16,729	17,129
Consumption Rate (GPCD)	188.3	188.3	188.3	188.3	188.3
Demands					
Single-Family Residential	526	540	553	567	580
Multi-Family Residential	23	24	24	25	25
Commercial / Institutional	176	181	185	190	195
Landscape Irrigation	71	73	75	77	79
Industrial	1	1	1	1	1
Agricultural	1	1	1	1	1
Other	4	4	4	4	4
Total Water Sales:	802	823	844	864	885
Water Loss (Real Loss + Apparent Loss)	265	272	278	285	292
Total Water Consumption (Total Supply into System):	1,067	1,095	1,122	1,150	1,177

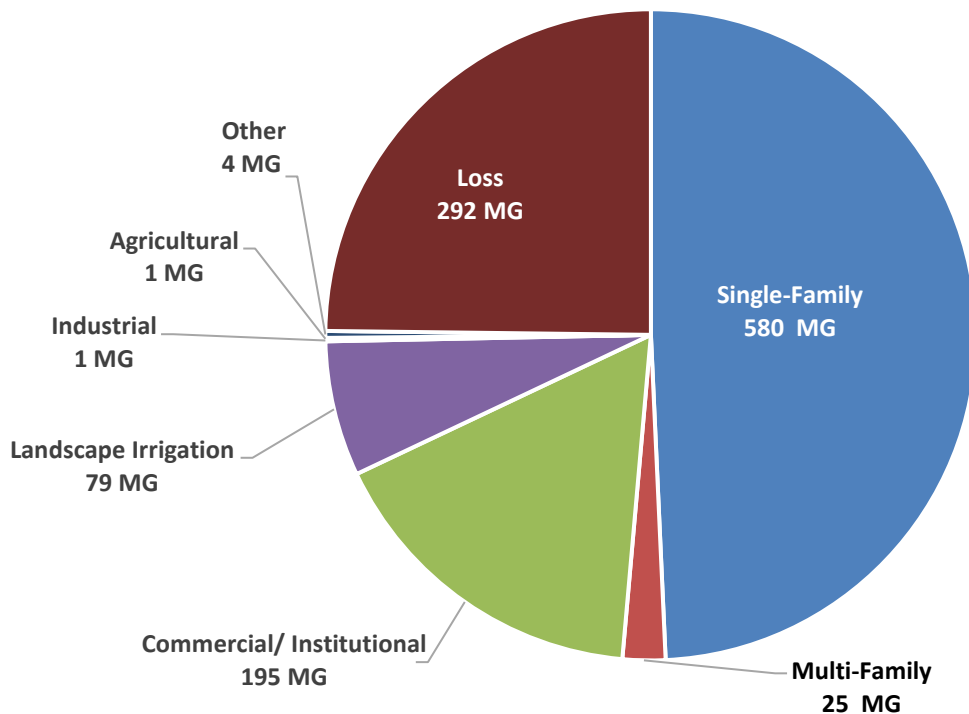


Figure 6-7 Projected Water Demand by Sector (in 2050)



7

Section 7: Reliability Planning

The City can purchase water from the State Water Project (pictured left) through AVEK, which enhances the City's supply reliability.

7.1. OVERVIEW

Drought conditions continue to be a critical issue for Southern California's water supply. The recent drought of 2020-2022 has impacted deliveries of imported water to Southern California cities. The documented deliveries of water from the State Water Project (SWP) for Water Year 2022 (October 1st, 2022, to September 30, 2023) indicate that the volume of water delivered to SWP Contractors was the lowest since Water Year 2020. Therefore, it is important that agencies manage water consumption and reduce reliance on imported water through local groundwater and surface water supplies. Water agencies should prepare for prolonged droughts for up to five (5) years to ensure a reliable supply of water.

Since the City does rely on imported water, drought conditions are a critical issue for the City's water supply. A strong understanding of water supply sources, and the current state, regional, and local issues affecting those sources, are a first step to properly managing supply and demand. Water agencies should prepare for prolonged droughts for up to five (5) years to ensure a reliable supply of water.

This Section discusses historic and recent droughts in the State and in the region. This Section also compares projected supply to projected demand over a 25-year planning period (through 2050) for various climate scenarios. Demand and supply projections are provided in **Table 7-1 - Table 7-7**.



7.2. HISTORIC DROUGHTS

Climate data has been recorded in California since 1858. Since then, California has experienced several periods of severe drought, including: 1928-34, 1976-77 and 1987-91, 2007-2009, 2011-2017 and most recently in 2020-2022. In addition to these, California has also experienced several periods of less severe drought. Among the previously listed droughts, the year 1977 is still considered to be the driest year of record in the Four Rivers Basin by DWR (these rivers flow into the Sacramento Delta and are the source of water for the State Water Project) which had an all-time low of 15 million acre-feet of average annual runoff.

In 1983, as a result of previous droughts, the State legislature enacted the UWMP Act, which requires the preparation of an UWMP. Several subsequent amendments have been made to the Act to include such elements as public coordination, recycled water, and contingency response plans are included in UWMPs.

In 1991, as a result of the 1987-1991 drought, over one hundred water agencies and environmental groups came together to form the California Urban Water Conservation Council (CUWCC) to manage the impacts of drought and promote water conservation. In January 2018, the CUWCC became the California Water Efficiency Partnership (CalWEP), and consists of over

two hundred (200) water agencies and private companies. CalWEP assists its member agencies with public policy, research, and education tools.

As a result of the drought of 2007-2009, Governor Schwarzenegger signed the Water Conservation Act of 2009 (SBx7-7), requiring mandatory water conservation up to twenty percent (20%) by 2020.

In January of 2014, Governor Brown declared a state of emergency and directed state officials to take all necessary actions to prepare for water shortages. As the drought continued into Water Year 2015, Governor Brown issued an executive order in April 2015, which mandated a statewide twenty-five percent (25%) reduction in water use, with each agency assigned specific target reductions.

At the local level, water agencies have enacted their own ordinances to deal with the impacts of drought. The City's WSCP, as contained in **Section 8**, deals with Water Conservation.

7.3. RECENT DROUGHT (2020-2022)

California experienced a significant and prolonged drought in 2020-2022. The drought depleted reservoir levels across the state, as reflected by **Figure 7-1**. On July 8, 2021, Governor Newsom declared a state of emergency and issued an Executive Order calling for a statewide voluntarily reduction



of fifteen percent (15%) from consumer's 2020 levels in order to preserve the State's surface and groundwater supplies, better prepare for the potential for continued dry conditions next year, and to join existing efforts by agricultural water users, public water systems, and governmental agencies to respond to water shortages. On October 19, 2021, Governor Newsom issued an Executive Order declaring a statewide drought emergency.



Figure 7-1 Governor Newsom at Lake Mendocino in Ukiah on April 21, 2021

In May 2022, Governor Newsom ordered the SWRCB to evaluate the adoption of regulations banning irrigation of “non-functional” turf (or grass), such as decorative grass adjacent to large industrial and commercial buildings. The ban would not include residential lawns or grass used for recreation, such as school fields, sports fields, and parks. The DWR estimated this ban alone would result in potential water savings of several hundred thousand acre-feet. An acre-foot of water serves the needs

of approximately three households for a year.

In March 2024 DWR finalized the 2024 State Water Project Long-Term Drought Plan. The 2024 State Water Project Long-Term Drought Plan consolidates information and actions taken during past droughts along with descriptions of the actions taken by the SWP to plan for and prepare for future droughts.

The scope of the SWP's drought planning activities is driven by the role the SWP plays within California's water management system during times of drought. The SWP's planning is specific to its role as a wholesale water provider. The SWP's drought planning is different from the planning by other water managers that are responsible for providing water directly to end-use customers. For these

2024 SWP Drought Plan consolidates information and actions taken during past droughts.

water managers, drought planning generally includes identifying a portfolio of different water supplies and demand management actions that ensure a minimum amount of water can be provided with a set degree of certainty. Retail water suppliers have a “duty to serve” water demand within their service areas and must have detailed contingency plans for meeting demand during drought conditions.



Although the recent droughts have more significantly impacted northern and central-valley agencies that use SWP water for agriculture, the City is indirectly impacted by the recent drought conditions on Northern California Waters since this water source is the majority source of water imported from the MWD.

7.4. STATE WATER SUPPLY RELIABILITY

As a result of continued drought challenges to the State's water supplies, SWP Contractors understand the unpredictability of imported water allocations from the SWP.

With participation of the SWP Contractors, DWR strives to meet the water needs of Southern California by developing new projects to increase the capacity of its supplies while encouraging its member agencies to develop local supply projects to meet the needs of its customers. Also, DWR is committed to developing and maintaining high-capacity storage reservoirs, including both DWR-owned and Contractor-owned (such as Diamond Valley Lake, an MWD-owned reservoir, the largest in Southern California), to meet the needs during times of drought and emergency.

The large reservoirs help to avoid the repercussions of reduced supplies not only from the SWP but also the Colorado River Aqueduct (CRA). Throughout the Southern California Region, a total of three (3) DWR-

owned reservoirs, nine (9) MWD-owned reservoirs, and twenty-four (24) SDCWA reservoirs contain up to 2.2 million acre-feet (MAF) of water storage.

One of the State's largest reservoirs, Lake Oroville in Butte County, experienced low water conditions at Enterprise Bridge (**Figure 7-5**). On this date (October 4, 2022), the water storage was 1.22 MAF, thirty-five percent (35%) of the total capacity.

Figure 7-6 shows an aerial view of high-water conditions at Enterprise Bridge. On this date (June 12, 2023), the water storage was 3.52 MAF, 100% of the total capacity. Rainfall during the 2024-2025 water year was also below the average, with a total recorded rainfall at the City's Main Office of 13.02 inches.

7.4.1. State Water Project (SWP) Reliability

As a SWP contractor, AVEK has a "Table A" allocation of up to 144,844 acre-feet per year (AFY). Since AVEK began receiving SWP water, however, the average amount of water received each year was approximately fifty-eight percent (58%) of the full Table A amount. On an annual basis, each of the twenty-nine (29) SWP Contractors request amounts of SWP water based on their anticipated yearly demand. Each SWP contractor's Water Supply Contract contains a "Table A" amount that identifies the



maximum amount of water that a contractor may request. However, the amount of SWP water actually allocated to contractors each year is dependent on a number of factors that can vary significantly from year to year.

SWP supplies are typically less than the maximum "Table A" amounts requested by the Contractors each year.

The availability of SWP supplies is generally less than their full Table A amounts in many years and can be significantly less in very dry years. After receiving the requests,

DWR assesses the amount of water supply available based on precipitation, snowpack on Northern California watersheds, volume of water in storage, projected carry over storage, and Sacramento-San Joaquin Bay Delta regulatory requirements. For example, according to the State Water Project Delivery Reliability Report (2023), the total SWP annual delivery of water to contractors ranged from a low of 278 thousand acre-feet (TAF) in 2022 to a high of 3,094 TAF in 2017.

Due to the uncertainty in water supply, contractors are not typically guaranteed their full Table A amount, but instead receive a percentage of that amount based on available supply. For instance, the current DWR Notice to Contractors 26-01 (January 2026) indicated that the initial allocation is set at thirty percent (30%), which higher than the ten percent (10%) per initial allocation. For AVEK, the current allocation based on the Notice to Contractors for this year is set at 43,454 AF (14,160 MG).

The reliability of the SWP impacts the Contractors ability to plan for future growth and supply. SWP Contractors can seek out other local supply sources or transfer agreements (such as transfers with Colorado River rights holders). Although not directly important for the City, matters involving the SWP do impact the City indirectly.



Figure 7-2 Lake Oroville During Drought of 2020-2022 (October 4, 2022)



Figure 7-3 Lake Oroville After Drought (June 12, 2023)



CALIFORNIA MAJOR WATER SUPPLY RESERVOIRS CURRENT CONDITIONS

Midnight - August 11, 2026

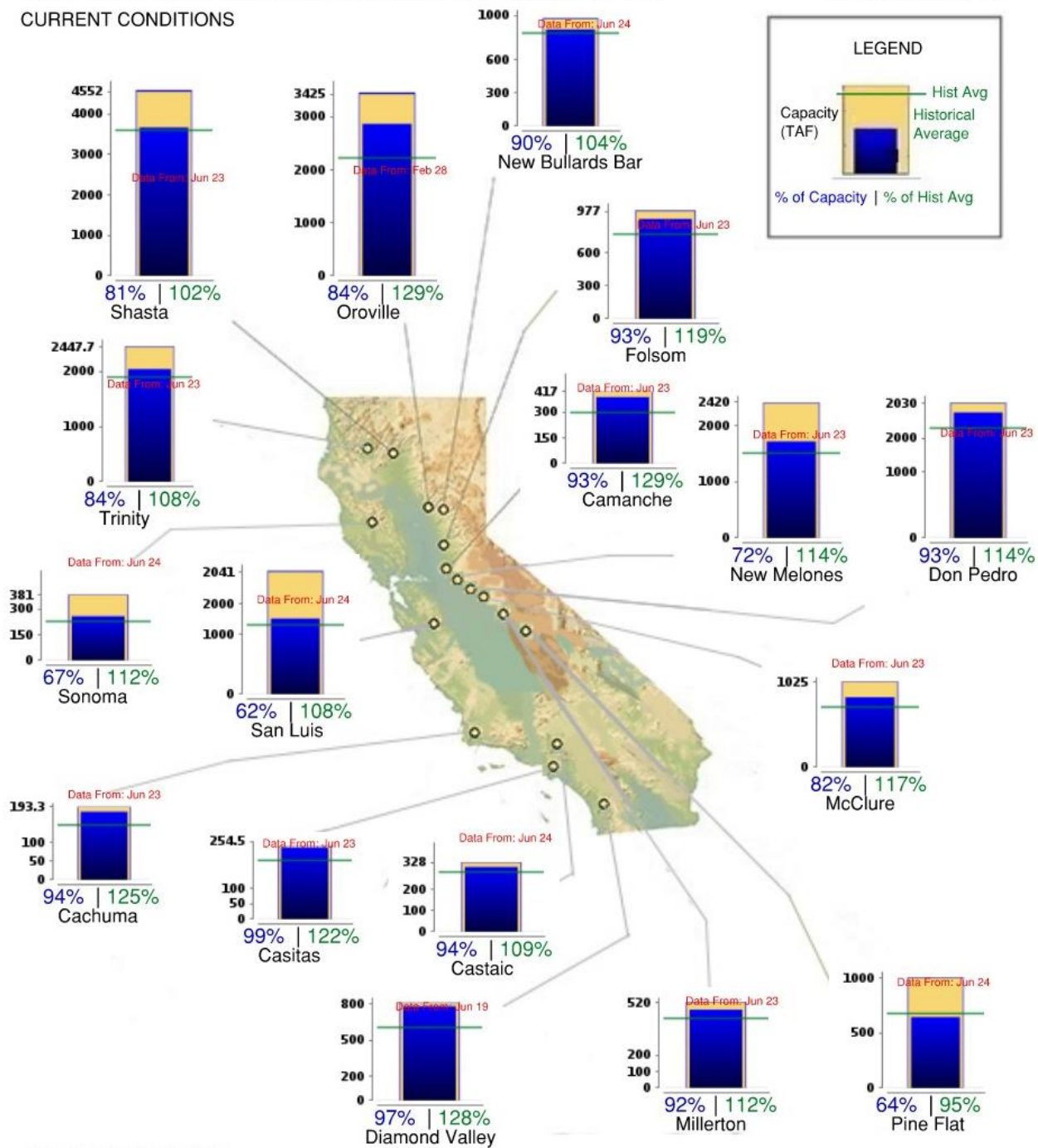


Figure 7-4 California State Reservoir Levels (May 2026)

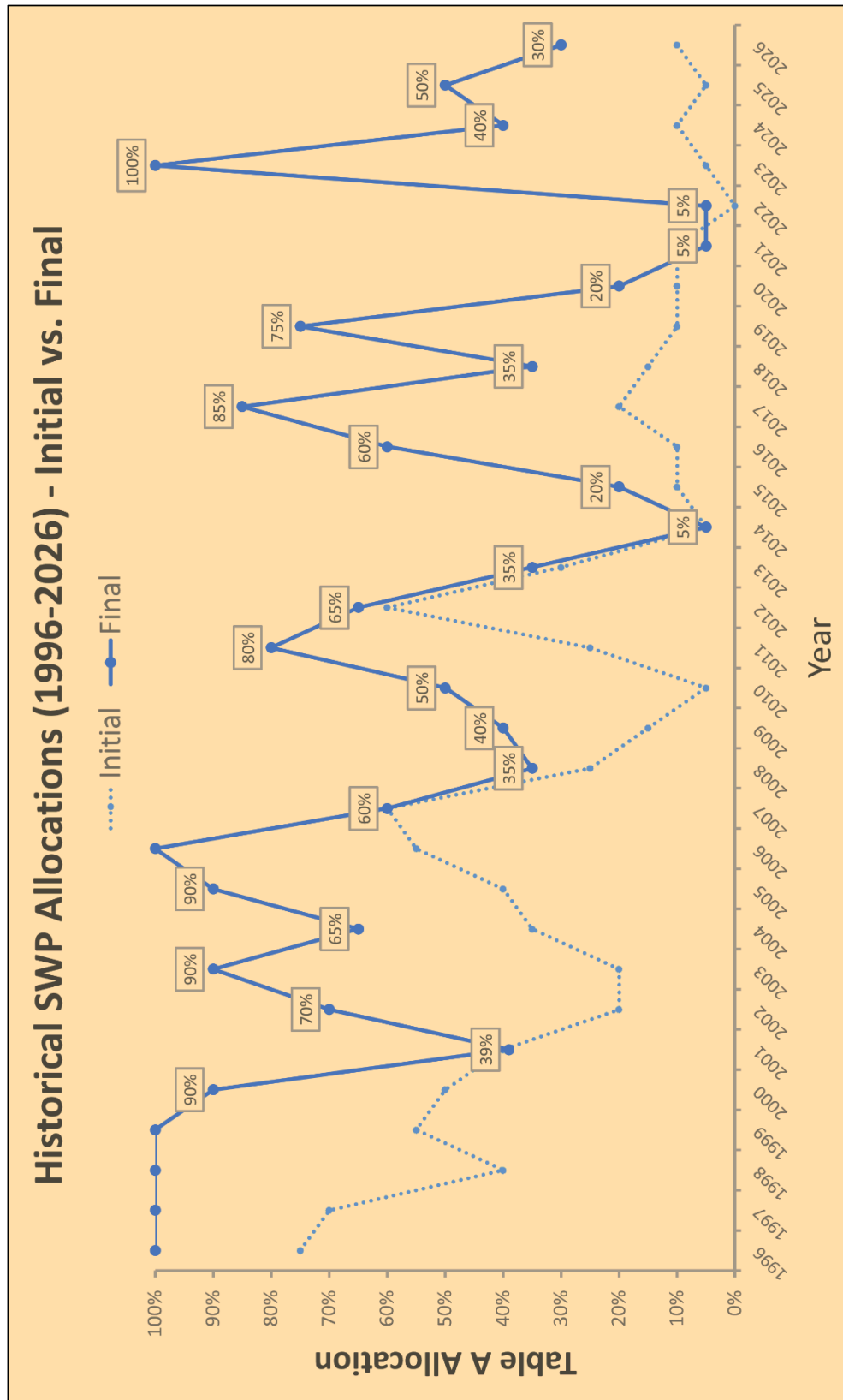


Figure 7-5 SWP Table A Deliveries



7.5. CITY SUPPLY RELIABILITY

As the City obtains its water sources from a combination of local groundwater and imported water, the supply reliability is based on the reliability of the Fremont Valley Groundwater Basin (Basin) and AVEK's agreements.

The Basin is considered to be a reliable source of supply since its current storage levels far exceed any planned pumping. The City has historically used mostly groundwater to meet all of their water demands. Groundwater supplies are not immediately impacted by droughts, and, as a result, there is no history of any water supply deficiencies for the City water system. Even during the 1976-1977 droughts, records indicate a sufficient supply of water.

Historically, the City has obtained approximately two-and-a-half percent (2.5%) of its water supply from AVEK. The source of AVEK water is the State Water Project with the water delivered through the California Aqueduct. The AVEK water is thus subject to variability in supply and in reliability. The supply variability is a function of hydrologic conditions in northern California. The reliability is a function of environmental conditions in the Sacramento-San Joaquin River Delta. The Delta is extremely vulnerable to earthquakes, rising sea levels and droughts. If there is a water shortage, AVEK or its customers could enact shortage

measures that protect against extended drought conditions. When this occurs, California City will utilize more groundwater.

Regarding the groundwater supply, the most likely reasons the City would have a deficiency would be due to coliform contamination, pump failure, well collapse or other mechanical or structural failure. Another scenario would be a declining groundwater table due to lack of recharge. In this scenario, well pumps would need to be lowered and/or the well deepened. The City has a goal to maintain sufficient standby well capacity to meet peak month water demand with the largest well out of service. With sufficient standby well capacity, a short term loss of a well would not affect overall water supply.

In addition, the most immediate threat of water shortage could arise from damage due to an earthquake, or an extended power outage. An exceptionally long hot spell during summer months or high winds causing power outages are the main concern due to climate. Customers are encouraged to water lawns during early morning hours and for shorter period of time when temperatures exceed normal. The water system is gravity fed from a 2.5 MG tank, kept a minimum two-thirds (2/3) full at all times. During an extended power supply emergency, the City can institute a water conservation emergency which would limit water use.



7.5.1. Reliability of Alternative Sources

Recycled Water Reliability

Since recycled water is produced from wastewater, this source has the advantage of consistently being available during any type of average, single-dry, or multiple-dry year as discussed in **Section 3**. If the City were to use recycled water at some point in the future, it would genuinely add to the City's overall supply reliability, especially since approximately seven percent (7%) of the City's water is used for landscape irrigation (i.e. lawns, parks, athletic fields, etc).

7.6. DROUGHT RISK ASSESSMENT

The quantity of supply available from different water supply sources can vary from one year to the next depending on hydrologic conditions. The drought risk assessment is an assessment of the reliability of the City's water supplies by comparing projected future water demands with expected available water supplies under three different hydrologic conditions: (1) normal water year, (2) single dry year, and (3) multiple dry years. The multiple dry-year period is taken to be five (5) years. Future supply and demand conditions can be determined from the following data:

- Population forecasts (**Section 2.5.3**)
- Water supply capacity (**Section 3**)
- Recent water use trends (**Section 6**)

7.6.1. Basis for Projected Demands

To project future demands, it was assumed that total demand will change annually based on changes in population multiplied by the individual demand per-person (also known as the "per-capita" consumption rate, see **Section 6**). The per-capita rates used in the future projections were based on actual water use data from the last ten (10) years, excluding 2021. The 2021 water use values were lost during the July 2025 Fire (**Section 2.1.2**) and was therefore excluded from average projections. The City's averages for the last ten (10) years were used as the basis to project demands through the year 2050. To project demands and supplies, the following was assumed:

- Consumption rate of 188.3 gallons per capita per day (GPCD) as the average consumption of the City in the last ten (10) years
- *Consistent* consumption rate of 188.3 GPCD throughout the reporting period (from 2026 to 2050)

The City's consumption rate in 2020 was 168.4 GPCD, and the City's consumption rate in 2025 was 155.3 GPCD. This amounts to an average decrease of approximately one-and-a-half percent (1.5%) annually.

For drought-period demands, it is expected that there will be a small degree of increase



due to the lack of rainfall on landscapes. To project demands during single and multiple (five) year drought periods, the following increase factors will be assumed:

- Dry Year: six percent (6%)
- Multiple Dry Years: eight percent (8%), thirty-four percent (34%), two percent (2%), ten percent (10%), and eighteen percent (18%)

The City's single dry year and multiple dry year demand rate increases are based on AVEK's rates, as shown in their 2025 UWMP. Although only a small portion of the City's supply is delivered through AVEK, its demand projections were used as a conservative basis for planning because AVEK relies heavily on State Water Project (SWP) supplies, which are the most likely to be constrained during drought conditions. Using AVEK's drought-year demand factors provides a conservative benchmark to ensure the analysis reflects potential reductions in SWP availability and associated impacts on regional supply reliability. These values are also reflected in **DWR Submittal Table 7-1 in Appendix E**.

During the drought of 2011 to 2017, water agencies in the State experienced an increase in water demands, until former

Gov. Brown's Emergency Declaration in 2015. Nevertheless, the increase factors listed are reasonable for the purposes of demand projections since they provide reasonable estimates of increases in water use for irrigation during dry years.

7.6.2. Basis for Projected Supplies

As for projected supplies, because the City's supplies are generally drought-proof as stated previously in this Section, it is very unlikely that supplies will be restricted, even during multi-year periods. Thus, for conservative planning purposes, the City's projected water supplies will be based off of 100% of its active well capacity and imported/purchased water. With a current total supply capacity of approximately 1,715 MGY (including the City's three (3) active wells and imported water supplies through AVEK).

7.6.3. Tabular Comparisons

Table 7-1 - Table 7-7, provide an analysis of the City's supply and demand projections to the year 2050. **Figure 7-6** and **Figure 7-7** show a visual pie-chart for years 2030 and 2050. Based on the data contained in these tables, the City can expect to meet future demands for all climate conditions through 2050.



Table 7-1 California City Water Supply Availability & Demand Projections
Normal Water Year (MG)

Water Sources	2030	2035	2040	2045	2050
Population					
Water Service Area Population	15,531	15,930	16,330	16,729	17,129
Consumption Rate (GPCD) ¹	188.3	188.3	188.3	188.3	188.3
Supply					
Groundwater Pumped (Total) ²	1,067	1,095	1,122	1,150	1,177
Recycled Water	0	0	0	0	0
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies³ <i>(Estimated Production)</i>	1,067	1,095	1,122	1,150	1,177
Minimum Available Supply	1,715	1,715	1,715	1,715	1,715
Demand					
Estimated Potable Water Demand	1,067	1,095	1,122	1,150	1,177
Estimated Recycled Water Demand	0	0	0	0	0
Total Estimated Demand	1,067	1,095	1,122	1,150	1,177
Compare to Avg. Demand from 2016-2025 (1,006 MG)	106%	109%	112%	114%	117%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity ⁴	648	621	593	566	538

Notes:

1. Total Demand = Consumption Rate x Projected Population
 - a. Average consumption rate of last 10 years = 188.3 gallons per capita per day (GPCD)
2. Minimum Available Supply is based on the following supply capacities:
 - a. Groundwater production capacity represents the City's three (3) active wells operating capacity of 2,600 gpm (1,367 MG)
 - b. Purchased water capacity represents the City's ability to purchase AVEK's one (1) month summer capacity disbursed evenly over a four (4) month period during a given year (349 MG). This excludes purchased water capacity from MPUD in order to plan more conservatively.
3. Projected groundwater pumping and purchased water is set equal to the projected water consumption (demands) shown in **Table 6-8**. Although, the City plans to utilize groundwater pumping to maximum capacity before purchasing water.
4. No other potable supply sources are expected to become available.



**Table 7-2 California City Water Supply Availability & Demand Projections
Single Dry Year (MG)**

Water Sources	2030	2035	2040	2045	2050
Population					
Water Service Area Population	15,531	15,930	16,330	16,729	17,129
Consumption Rate (GPCD)	188.3	188.3	188.3	188.3	188.3
Supply					
Groundwater Pumped (Total)	1,131	1,160	1,189	1,219	1,248
Recycled Water	0	0	0	0	0
Purchased Water	0	0	0	0	0
Total Anticipated Use of Supplies (Estimated Production)	1,131	1,160	1,189	1,219	1,248
Minimum Available Supply	1,715	1,715	1,715	1,715	1,715
Normal Year Supply	1,067	1,095	1,122	1,150	1,177
% of Normal Year	106%	106%	106%	106%	106%
Demand					
Total Dry Demand¹	1,131	1,160	1,189	1,219	1,248
Normal Year Demand	1,067	1,095	1,122	1,150	1,177
% of Normal Year	106%	106%	106%	106%	106%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity	584	555	526	497	468

Notes:

1. Dry Demand = Normal Year Demands x Single Dry Year Increase of 106%.
2. All other items determined in similitude to **Table 7-1**.



**Table 7-3 California City Water Supply Availability & Demand Projections
Multiple Dry Years (2026-2030) (MG)**

Water Sources	2026	2027	2028	2029	2030
Population					
Water Service Area Population	14,797	14,877	14,957	15,037	15,531
Consumption Rate (GPCD)	188.3	188.3	188.3	188.3	188.3
Supply					
Groundwater Pumped (Total)	1,098	1,367	1,048	1,137	1,259
Recycled Water	0	0	0	0	0
Purchased Water	0	3	0	0	0
Total Anticipated Use of Supplies (Estimated Production)	1,098	1,370	1,048	1,137	1,259
Minimum Available Supply	1,715	1,715	1,715	1,715	1,715
Normal Year Supply	1,017	1,022	1,028	1,033	1,067
% of Normal Year	108%	134%	102%	110%	118%
Demand					
Total Dry Demand¹	1,098	1,370	1,048	1,137	1,259
Normal Year Demand	1,017	1,022	1,028	1,033	1,067
% of Normal Year	108%	134%	102%	110%	118%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity	617	345	667	579	456

Notes:

1. Dry Demand = Normal Year Demands x Multiple Dry Year Increases of 108%, 134%, 102%, 110%, and 118%.
2. All other items determined in similitude to **Table 7-1**.



**Table 7-4 California City Water Supply Availability & Demand Projections
Multiple Dry Years (2031-2035) (MG)**

Water Sources	2031	2032	2033	2034	2035
Population					
Water Service Area Population	15,610	15,690	15,770	15,850	15,930
Consumption Rate (GPCD)	188.3	188.3	188.3	188.3	188.3
Supply					
Groundwater Pumped (Total)	1,158	1,367	1,105	1,198	1,292
Recycled Water	0	0	0	0	0
Purchased Water	0	78	0	0	0
Total Anticipated Use of Supplies (Estimated Production)	1,158	1,445	1,105	1,198	1,292
Minimum Available Supply	1,715	1,715	1,715	1,715	1,715
Normal Year Supply	1,073	1,078	1,084	1,089	1,095
% of Normal Year	108%	134%	102%	110%	118%
Demand					
Total Dry Demand¹	1,158	1,445	1,105	1,198	1,292
Normal Year Demand	1,073	1,078	1,084	1,089	1,095
% of Normal Year	108%	134%	102%	110%	118%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity	557	270	610	517	424

Notes:

1. Dry Demand = Normal Year Demands x Multiple Dry Year Increases of 108%, 134%, 102%, 110%, and 118%.
2. All other items determined in similitude to **Table 7-1**.



**Table 7-5 California City Water Supply Availability & Demand Projections
Multiple Dry Years (2036-2040) (MG)**

Water Sources	2036	2037	2038	2039	2040
Population					
Water Service Area Population	16,010	16,090	16,170	16,250	16,330
Consumption Rate (GPCD)	188.3	188.3	188.3	188.3	188.3
Supply					
Groundwater Pumped (Total)	1,188	1,367	1,133	1,228	1,324
Recycled Water	0	0	0	0	0
Purchased Water	0	115	0	0	0
Total Anticipated Use of Supplies (Estimated Production)	1,188	1,482	1,133	1,228	1,324
Minimum Available Supply	1,715	1,715	1,715	1,715	1,715
Normal Year Supply	1,100	1,106	1,111	1,117	1,122
% of Normal Year	108%	134%	102%	110%	118%
Demand					
Total Dry Demand¹	1,188	1,482	1,133	1,228	1,324
Normal Year Demand	1,100	1,106	1,111	1,117	1,122
% of Normal Year	108%	134%	102%	110%	118%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity	527	234	582	487	391

Notes:

1. Dry Demand = Normal Year Demands x Multiple Dry Year Increases of 108%, 134%, 102%, 110%, and 118%.
2. All other items determined in similitude to **Table 7-1**.



**Table 7-6 California City Water Supply Availability & Demand Projections
Multiple Dry Years (2041-2045) (MG)**

Water Sources	2041	2042	2043	2044	2045
Population					
Water Service Area Population	16,409	16,489	16,569	16,649	16,729
Consumption Rate (GPCD)	188.3	188.3	188.3	188.3	188.3
Supply					
Groundwater Pumped (Total)	1,218	1,367	1,161	1,258	1,356
Recycled Water	0	0	0	0	0
Purchased Water	0	152	0	0	0
Total Anticipated Use of Supplies (Estimated Production)	1,218	1,518	1,161	1,258	1,356
Minimum Available Supply	1,715	1,715	1,715	1,715	1,715
Normal Year Supply	1,128	1,133	1,139	1,144	1,150
% of Normal Year	108%	134%	102%	110%	118%
Demand					
Total Dry Demand¹	1,218	1,518	1,161	1,258	1,356
Normal Year Demand	1,128	1,133	1,139	1,144	1,150
% of Normal Year	108%	134%	102%	110%	118%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity	497	197	554	457	359

Notes:

1. Dry Demand = Normal Year Demands x Multiple Dry Year Increases of 108%, 134%, 102%, 110%, and 118%.
2. All other items determined in similitude to **Table 7-1**.



**Table 7-7 California City Water Supply Availability & Demand Projections
Multiple Dry Years (2046-2050) (MG)**

Water Sources	2046	2047	2048	2049	2050
Population					
Water Service Area Population	16,809	16,889	16,969	17,049	17,129
Consumption Rate (GPCD)	188.3	188.3	188.3	188.3	188.3
Supply					
Groundwater Pumped (Total)	1,247	1,367	1,189	1,289	1,367
Recycled Water	0	0	0	0	0
Purchased Water	0	189	0	0	22
Total Anticipated Use of Supplies (Estimated Production)	1,247	1,555	1,189	1,289	1,389
Minimum Available Supply	1,715	1,715	1,715	1,715	1,715
Normal Year Supply	1,155	1,161	1,166	1,171	1,177
% of Normal Year	108%	134%	102%	110%	118%
Demand					
Total Dry Demand¹	1,247	1,555	1,189	1,289	1,389
Normal Year Demand	1,155	1,161	1,166	1,171	1,177
% of Normal Year	108%	134%	102%	110%	118%
Supply/Demand Comparison					
Supply-Demand (Difference)	0	0	0	0	0
Supply/Demand (%)	100%	100%	100%	100%	100%
Available Supply Capacity	468	160	526	427	326

Notes:

1. Dry Demand = Normal Year Demands x Multiple Dry Year Increases of 108%, 134%, 102%, 110%, and 118%.
2. All other items determined in similitude to **Table 7-1**.

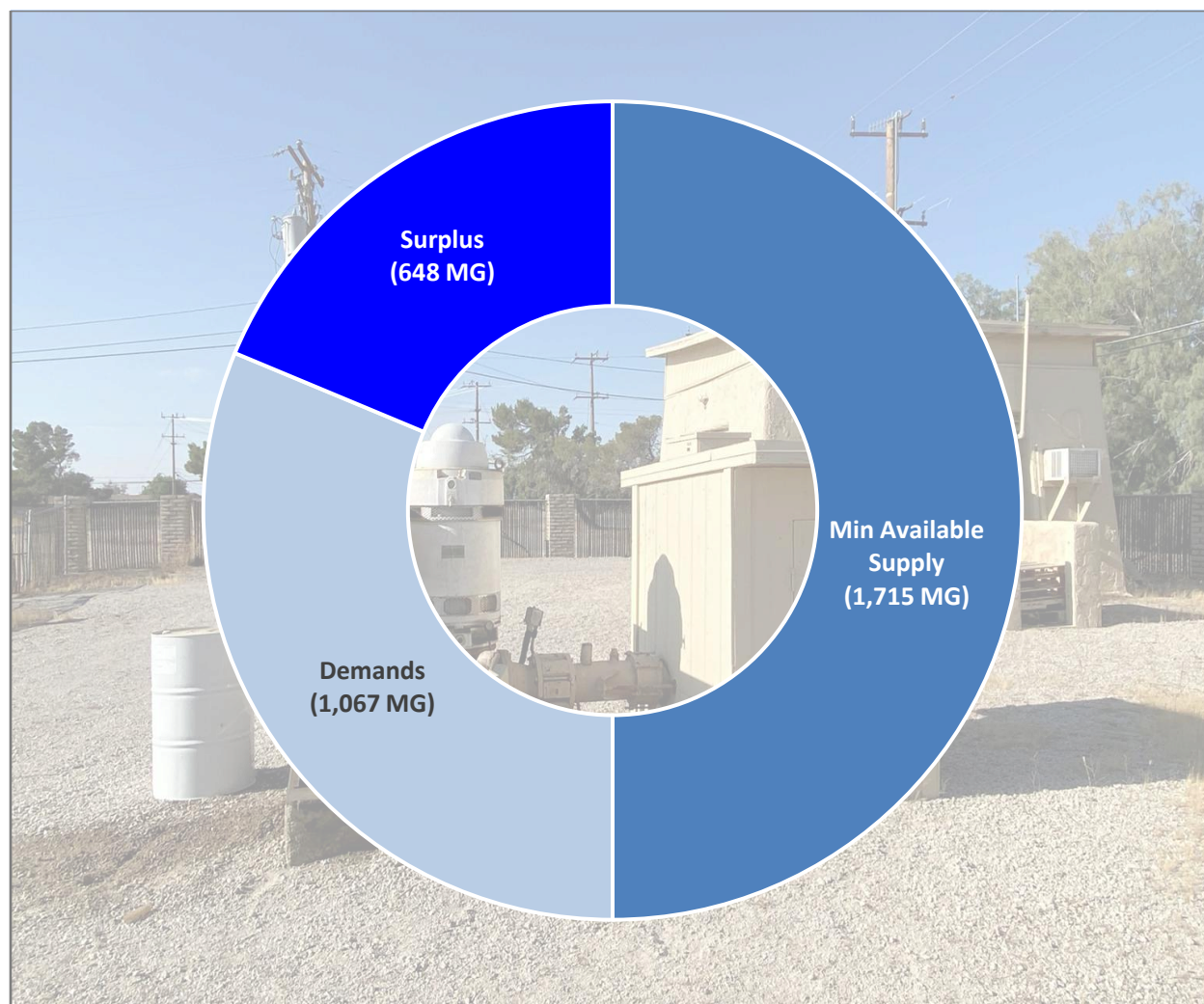


Figure 7-6 Projected Normal Water Supply: Year 2030

Notes:

1. See Notes Under **Table 7-1**.
2. Surplus = Minimum Available Supply – Demands

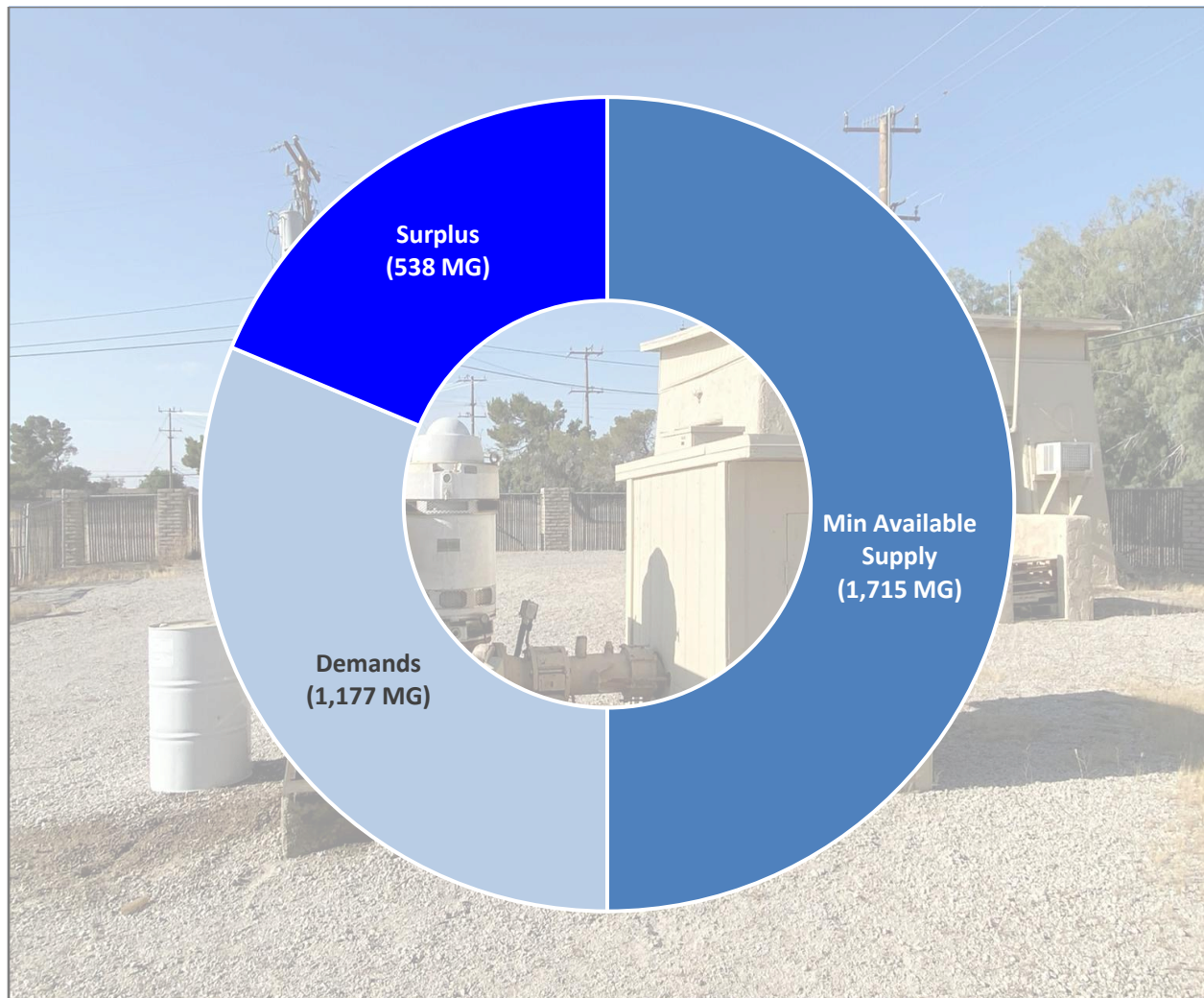


Figure 7-7 Projected Normal Water Supply: Year 2050

Notes:

1. See Notes Under **Table 7-1**.
2. Surplus = Minimum Available Supply – Demands



7.7. ENSURING ADEQUATE SUPPLY

As indicated by **Table 7-1** to **Table 7-7** and **Figure 7-6** to **Figure 7-7**, the City will be able to meet demands from 2026 through 2050 for all future climatic conditions. If supplies need to be increased in the future, this can most likely be accomplished through re-activation of the City's Water Treatment Plant and expansion to accommodate additional wells, through the drilling of new wells, additional imported water, or through purchasing of recycled water. Besides expanding water supplies, there is also the measure of demand management (water conservation), which has more immediate impacts and helps demands to be met using the supplies that are already at hand.

Finally, droughts will be addressed by following the criteria of the City's WSCP along with implementation of the regional contingency plans. These programs are discussed in **Section 8**. For these reasons, the City is confident that an adequate amount of supply can be provided to meet demands for all weather conditions through 2050.

7.8. WSCP SUPPLY AUGMENTATION

Although the City does not expect to have a water supply shortage through 2050, as indicated by **Table 7-1** to **Table 7-7**, severe and extent droughts may cause the WSCP to be enacted. The City will rely on the implementation of the WSCP to augment the City's reduced supply during consecutively dry years. The WSCP supply augmentation benefits during a five-year drought are shown in standard These values are also reflected in DWR Submittal Table 7-5 in **Appendix E**.



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Section 8: Contingency Planning

Diesel-powered pumps can provide emergency water supplies during sudden catastrophes.

8.1. INTRODUCTION

In addition to prolonged droughts that can gradually decrease water supplies, water supplies may be interrupted in a number of sudden, catastrophic ways. Sudden catastrophes may include earthquakes, power outages, pumping equipment failures, or spikes in groundwater contaminants that cannot be remedied quickly. Water shortages can also be a result of intentional or accidental manmade catastrophes, such as acts of terrorism or chemical spills into nearby canals or groundwater spreading grounds. It is important that the City of California City (City) has a plan in place to manage its water system during short or long-term water shortages. Long term, water shortages can be addressed through conservation and supply

augmentation. Short-term water shortages are best handled through a “Contingency Plan.” A Water Shortage Contingency Plan (WSCP) is a required component of the City’s UWMP, which provides guidance on stages of action to be undertaken by the City in response to water supply shortages. A WSCP is an independent document that is incorporated into the City’s UWMP.

This Section serves as the City’s WSCP. The City’s response to water shortages will be a coordinated effort between City staff and other local and regional water agencies. During a water shortage emergency, the City will activate this WSCP. The intent of the plan is to reduce the effect of shortages on the City’s customers. In compliance with the Water Code requirements, this plan has six (6)



water shortage levels (up to 10-, 20-, 30-, 40-, 50-percent, and greater than fifty percent (50%) shortage compared to the normal reliability condition).

8.2. NEED FOR CONTINGENCY PLANS

The recent drought of 2020-2022 significantly depleted the State's supply of water and posed a challenge to many agencies throughout the State. Following the drought, the State experienced a wet winter in 2022. Climate-driven weather extremes, long-term water supply uncertainty, and aging infrastructure are stressing a system built for a different era. The modernized California Water Plan 2028 is allowing the state's opportunity to respond with a clear, actionable, and durable approach to statewide water planning.

The modernization of the California Water Plan 2028 is being directed by Senate Bill 72 (SB 72). This legislation provides a clear directive: move statewide water planning from description to direction. The Water Plan will be modernized to:

- Identify and evaluate effective water management strategies, informed by economic considerations
- Quantify beneficial uses of water at a watershed scale throughout California
- Expand engagement across all sectors as DWR develops the Water Plan
- Establish clear water supply targets that help align state, regional, and local actions

8.2.1. Recent California Water Code Amendments

There have been minor changes to the CWC affecting the 2025 UWMPs, with only some affecting WSCPs. The changes are described in **Section 1.3**. In addition, the following measures were taken in recent years that affect WSCPs:

Starting January 1, 2025, major water suppliers were required to significantly reduce water delivery by 2040 to build drought resilience into everyday life.

The 2025 update to Title 24 (including the forthcoming enforcement beginning January 1, 2026 for many permit-applications) introduces a number of changes targeting reducing water consumption and improving system efficiency. Among the most important provisions:

- Lower maximum flow-rates for toilets, showerheads, and faucets (for example, toilets continue to be capped at approximately 1.28 gallons per flush in many cases).
- Requirements to reduce pipe sizing and hot-water wait times to reflect lower-volume fixtures and shorter delivery distances.
- Enhanced documentation and compliance measures: designers must show that plumbing layouts meet both water



efficiency and energy criteria under Title 24 Part 6 and CALGreen (Title 24, Part 11).

- Greater emphasis on seismic bracing of plumbing and efficient plumbing system design, reflecting California's dual challenges of drought and quake-risk.

The SWRCB has adopted emergency regulations to encourage Californians to use water wisely and make conservation a way of life.

8.3. LEGAL AUTHORITY

As indicated by **Sections 8.1** and **8.2**, the City has the legal obligation to prepare and implement a WSCP during times of drought or sudden supply interruptions. This WSCP includes a listing of shortage response actions per CWC § 10632 (a)(3)(A), including the means by which the City will declare a water shortage and authorize response actions. The remaining Sections describe the City's response actions in greater detail.

8.4. WATER SUPPLY RELIABILITY ANALYSIS

Southern California is expected to experience an increase in regional demands in the years 2030 through 2050 as a result of population growth. Although increases in demand are expected, future demands are effectively limited due to the requirements of SBx7-7. It can be reasonably expected that the majority of agencies have met or were near their compliance targets for 2020 and will continue to meet, or will soon meet, their per-capita

usage limit in the future.

The data in AVEK's 2025 UWMP shows supply reliability projections for average and single dry years and is important to effectively project and analyze supply and demand over the next twenty-five (25) years for many regional agencies. Projected supplies during single and multiple dry year scenarios indicate AVEK's projected supply will exceed its projected single dry year demands in all years. Likewise, for average years, AVEK's supply exceeds projected demands for all years.

Due to the semi-arid nature of the City's climate and as a result of past drought conditions, the City is vulnerable to water shortages due to its climatic environment and seasonally hot summer months. **Section 7** describes the water availability during single and multiple dry year scenarios. **Table 7.1** summarize the supply and demand comparisons during normal, single-dry year, and multiple dry year, respectively. As shown, the City is capable of providing a reliable supply of water to meet the future demands.

8.4.1. WSCP Re-Adoption

Once the WSCP is revised, the City Council will be required to re-adopt the revised WSCP. This will require a public hearing to receive public comments on the WSCP. The revised WSCP will replace the former WSCP, and will then remain effective until the City elects to update the WSCP.

A WSCP previously submitted in 2020 or later



may be reused; however, it must first be reviewed, and if no updates are needed, it can be readopted as is. It must be indicated in the UWMP that a review was conducted and that a previous WSCP is being readopted. Even when no changes are made, the WSCP must undergo a new review and adoption process as part of the 2025 UWMP document. **Section 7** of the 2025 UWMP may be used as a reference to the re-adopted WSCP.

8.5. City Staff Response

The City has completed a planning process to prepare for the impacts of hazards that could impact the City's service area. The City worked with its neighbors and stakeholders to prepare a detailed, multi-hazard plan and to identify steps to be taken in advance to mitigate impacts from those hazards. Through the hazard mitigation planning process, the City engaged its customers to inform them about risk and seek their input on ways that the City can reduce that risk and become more resilient.

The County of Kern Multi-Jurisdiction Hazard Mitigation Plan - City of California City Annex (**Appendix I**) is the City's first formal plan pursuant to the Disaster Mitigation Act of 2000 (Public Law 106-109). The plan promotes sound policy to protect the City's critical assets from the impacts of natural hazards. It identifies resources, information, and strategies for reducing risk from those hazards. Elements and strategies in the plan were selected because they meet a program

requirement and because they best meet the needs of the City and its community.

All residential and commercial the City customers are the ultimate beneficiaries of this hazard mitigation plan. The plan strives to reduce risk for City assets that are vital for its continuity of operations following hazard events. The City provides essential services (water supply and wastewater collection), and its ability to continue to provide these services will be critical to the area's ability to recover from a hazard event. This plan provides a viable planning framework for all hazards that are likely to impact the City. Participation in development of the plan by key stakeholders helped ensure that outcomes will be mutually beneficial. The plan's goals and recommendations lay the groundwork for implementing local mitigation activities and partnerships.

The City maintains ongoing mitigation actions to ensure continuity of essential services during hazard events. As part of this effort, backup power generators are installed across critical facilities, including water and wastewater infrastructure, emergency service buildings, and designated heating and cooling centers. This measure exemplifies the City's broader approach to reducing operational vulnerabilities and sustaining core functions during earthquakes, high-wind events, extreme heat, freeze conditions, and other hazards that may disrupt normal power supply.

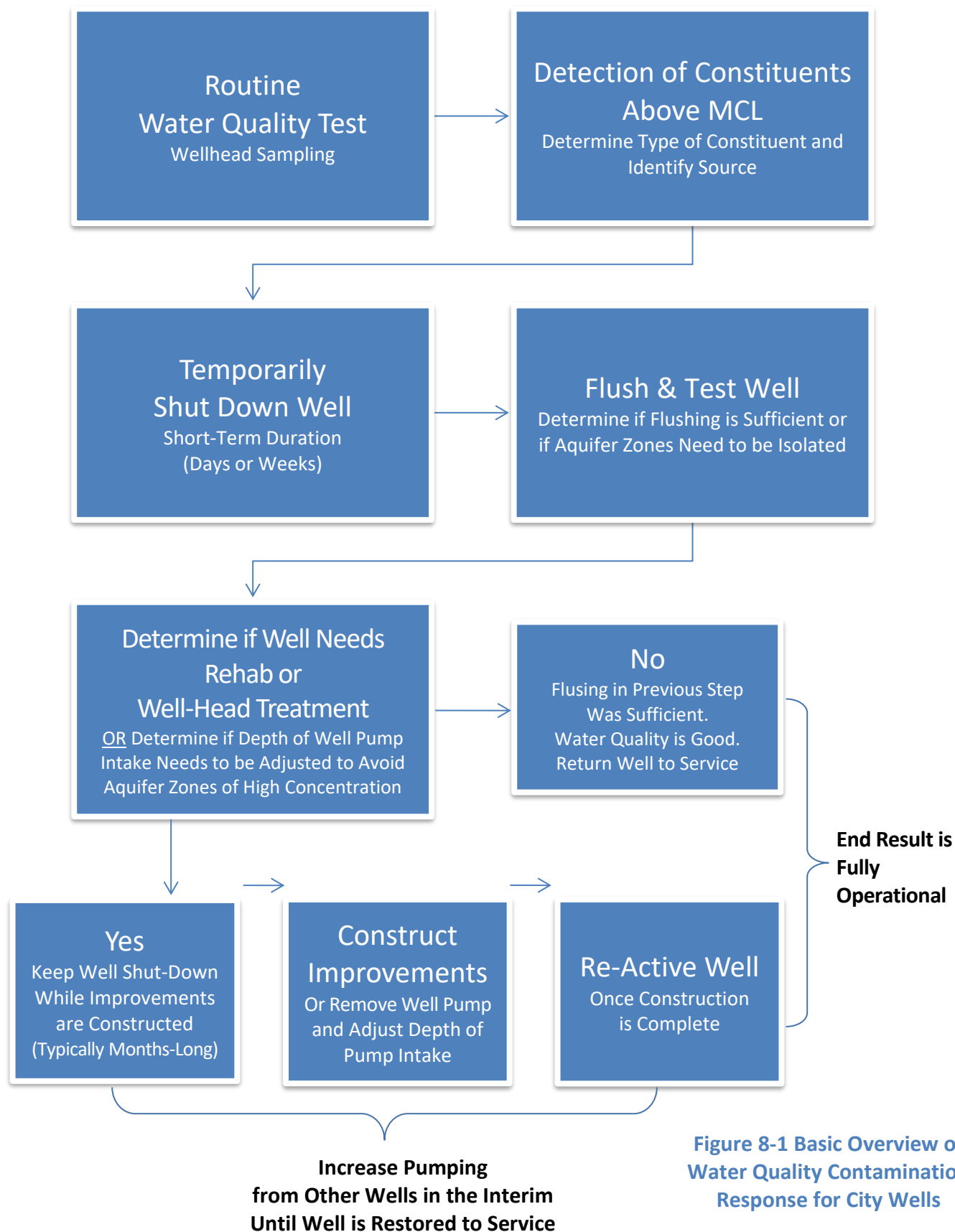


Figure 8-1 Basic Overview of Water Quality Contamination Response for City Wells



8.6. ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

Under CWC Section 10632(a)(2), beginning by July 1, 2022, each urban water supplier is required to prepare their annual water supply and demand assessment (Annual Assessment) and submit an Annual Water Shortage Assessment Report to DWR. The Annual Water Shortage Assessment Report will be due by July 1 of every year, as required by CWC Section 10632.1.

This section outlines City's procedures used in conducting an Annual Assessment, including the following: 1) written decision-making process for determining water supply reliability; and 2) key data inputs and assessment methodology for evaluating the water supply reliability for the current year and one dry year.

8.6.1. DECISION-MAKING PROCESS

The City's Annual Assessment will be primarily based on daily recorded water production and supply figures, which are reported to the

General Manager on a daily basis throughout the year. Water consumption is monitored regularly through the metering of all the City service connections in its distribution system. To determine its water supply reliability and actual reductions in water use during declared water shortages or emergencies, the City can rely on its daily records as well as the the City Water Production Reports including the monthly totals. These periodical analyses are used by the City to manage resources to meet projected demands and adjust to changing conditions (i.e., precipitation) throughout the year.

As of 2023, City staff has reviewed water production data and water consumption data starting in January of that year, with the intent to prepare an Annual Water Shortage Assessment Report to the City Council by May each year. The Final Report can then be submitted to DWR by July 1 of each year, which are shown on DWR's WUE Portal:

wuedata.water.ca.gov/wsda_plans



Figure 8-2: Sample Annual Assessment Decision-Making Process Timeline

8.7. WATER SHORTAGE CONTINGENCY PLANNING

This Section describes the City’s policies and ordinances to deal with water shortages. The City’s water supply comes mainly from groundwater pumping. As discussed in **Section 7**, the City has a reliable water supply and is not vulnerable to seasonal and climatic shortages for the normal, dry-year, and multiple dry-year scenarios through year 2050.

The City’s WSCP illustrates specific water supply conditions that trigger the activation of voluntary and mandatory rationing efforts. It explains what the ability is to meet projected short-term demands during extended dry periods and emphasizes some of the significant proactive measures that enhance the City’s ability to respond to interruptions in water supply should a natural or manmade disaster occur. The

contingency plan outlines the planned response to failures in the infrastructure of the water system in the event of an earthquake, extensive power outage, or another catastrophic event. Finally, this section provides details about prohibitions and penalties against specific water uses during water shortages and evaluates potential impacts to the water funds should water sales decrease because of supply shortages.

The City has enacted several actions related to water conservation. California City adopted an Emergency Response Plan in 1999. They also participated in a functional disaster exercise in conjunction with County or State officials. Emergency exercises will be conducted annually. Although utility loss is covered in the plan, a more precise water contingency plan is as follows:



Triggering Events

1. Reductions in specific water supplies
2. Dropping groundwater level
3. Changes in water quality
4. System failures
5. Disaster

Stages of Action

City personnel first will evaluate the water shortage and recommend actions to Council and call a special meeting if needed. Evaluation will be based on the following conditions:

1. Cause of water shortage
2. Possible duration of shortage
3. Amount of shortage based on percent (%) of normal water demand

8.8. STAGES OF ACTIONS

The City has prepared a 4-stage conservation plan to invoke during a declared water shortage. The plan includes voluntary and mandatory rationing depending on the severity of the water supply shortage.

Table 8-1 provides a summary of the one stage of action that has been enacted by the City's Council.



Table 8-1 Retail: Stages of Water Shortage Contingency Plan

Submittal Table 8-1 Water Shortage Contingency Plan Levels		
Shortage Level	Percent Shortage Range	Shortage Response Actions (Narrative description)
1	Up to 10%	Contamination loss or supply below normal
2	Up to 20%	Contamination loss or supply below normal
3	Up to 30%	Contamination loss or supply below normal
4	Up to 40%	Contamination loss or supply below normal
5	Up to 50%	Contamination loss or supply below normal
6	>50%	Contamination loss or supply below normal



8.10. PROHIBITION ON END USERS

In compliance with CWC section 10632(a)(4) and CWC section 10632(a)(5), prohibitions on end users are defined in the City of California City's "No Waste" Ordinance includes prohibitions on various wasteful water uses such as lawn watering during mid-day hours, washing sidewalks and driveways with potable water, and allowing plumbing leaks to go uncorrected more than 24 hours after customer notification. The Fire Department personnel will also be notified to stop flowing hydrants (except when necessary).

As the water purveyor, the City of California City must provide the minimum health and safety water needs of the community at all times. The rationing program triggering levels shown in **Table 8-2** were established

Rationing stages may be triggered by a shortage in one water source or a combination of sources.

to ensure that this goal is met. Rationing stages may be triggered by a shortage in one water source or a combination of sources. Although an

actual shortage may occur at any time during the year, a shortage (if one occurs) is usually forecasted by the Water Department on or near April 1 each year.

The City's potable water sources are groundwater and imported surface water. Rationing stages may be triggered by a

supply shortage or by contamination in one source or a combination of sources. Because shortages overlap stages, triggers automatically implement the more restrictive stage.

The City has established the following allocation method for each customer type.

- Single Family: Hybrid of Per-capita and Percentage Reduction
- Multi-family: Hybrid of Per-capita and Percentage Reduction
- Commercial: Percentage Reduction
- Industrial: Percentage Reduction
- Governmental/Institutional: Percentage Reduction
- Recreational: Percentage Reduction-vary by efficiency
- New Customers: Per-capita (no allocation for new landscaping during a declared water shortage).

Based on current and projected customer demand, the Emergency Plan indicates the water allocated to each customer type by priority and rationing stage during a declared water shortage.

Individual customer allotments are based on a five-year period. This gives the city a more accurate view of the usual water needs of each customer and provides additional flexibility in determining allotments and reviewing appeals. However, no allotment



may be greater than the amount used in the most recent year of the five-year based period.

The Public Works Director shall classify each customer and calculate each customer's allotment according to the Sample Water Rationing Allocation Method. The allotment shall reflect seasonal patterns. Each customer shall be notified of their classification and allotment by mail before

the effective date of the Water Shortage Emergency. New customers will be notified at the time the application for service is made. In a disaster, prior notice of allotment may not be possible, notice will be provided by other means. Any customer may appeal the Public Works Director's classification on the basis of use or the allotment on the basis of incorrect calculation. **Table 8-2** summarizes the mandatory restrictions and prohibitions placed on end users.

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

Shortage Level	Demand Reduction Actions	Additional Explanation or reference	Penalty, Charge, or Other Enforcement
Permanent	Landscape – Restrict or Prohibit runoff from landscape irrigation	Warning/ Penalty	Yes
Permanent	Landscape – Limit Landscape Irrigation to specific times	Warning/ Penalty	Yes
Permanent	Other – Customer must repair leaks, breaks, and malfunctions in a timely manner	Warning/ Penalty	Yes
Permanent	Other – Require automatic Shutoff hoses	Warning/ Penalty	Yes
Permanent	Other – Prohibit use of potable water for construction and dust control	Allowed but higher rates charged	Yes



8.10.2. Landscape Irrigation

The following summarizes landscape irrigation restrictions for Stage 1:

- Restrict or prohibit runoff from landscape irrigation;
- Limit landscape irrigation to specific times; and
- Limit landscape irrigation to specific days.

8.10.3. Commercial, Industrial, And Institutional (CII)

The following summarizes CII restrictions for Stage 1:

- None.

8.10.4. Water Features And Swimming Pools

The following summarizes restrictions on water features and swimming pools for Stage 1:

- Restrict water use for decorative water features, such as fountains.

8.10.5. Other Restrictions

The following summarizes other restrictions for Stage 1:

- Require automatic shut off hoses.

8.11. PENALTIES, CHARGES, OTHER ENFORCEMENT OF PROHIBITIONS

Any customer violating the regulations and

restrictions on water use set forth in the “No Water” Ordinance shall receive a written warning for the first such violation. Upon a second violation, the customer shall receive a written warning and the City may disconnect services if the violation continues. The violator shall pay the cost of service disconnection and re-connection. Any willful violation occurring subsequent to the issuance of the second written warning shall constitute a misdemeanor and may be referred to the Kern County District Attorney’s office for prosecution pursuant. If water service is disconnected, it shall be restored only upon payment of the turn-on charge fixed by the City Council.

8.12. CONSUMPTION REDUCTION METHODS

In compliance with CWC section 10632(a)(5), consumption reduction methods are actions that are taken by the City to reduce water demand within the service area whereas the prohibitions (see **Section 8.2**) limit specific uses of water. DWR allows water agencies, such as the City, to make their own determinations as to which methods and which stages for employing the methods are most appropriate for a service area.

8.12.1. Consumption Reduction Goals

The consumption reduction goals for Shortage Level 6 is greater than fifty (50%) reduction.



8.12.2. Categories Of Consumption Reduction Methods

The following consumption reduction methods listed in the Guidelines have been implemented by the City:

- Expand Public Information Campaign: Examples include begin or enlarge media campaign; create bill insert with conservation information; write articles for local newspaper; conduct water efficiency workshops for different customer sectors.
- Improve Customer Billing: Examples include billing all metered users.
- Offer Water Use Surveys: Examples include City staff working with water users to identify areas of water waste and areas of conservation.
- Decrease Line Flushing: Examples include City staff decreasing the frequency of water line flushing and the volume of water discharged during a flushing event.
- Reduce System Water Loss: Examples include City staff making water line repairs in a timely manner and working to decrease water theft.
- Increase Water Waste Patrols: Examples include implement Water Waste Patrol program; increase staffing for Water Waste Patrol; increase authority of Water Waste Patrol.

Table 8-3 provides a summary of the consumption reduction methods currently employed by the City.

Table 8-3 Retail Only: Stages of Water Shortage Contingency Plan – Consumption Reduction Methods

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce Shortage Gap?
Permanent	Expand Public Information Campaign	10%
Permanent	Improve Customer Billing	5%
Permanent	Offer Water Use Surveys	5%
Permanent	Decrease Line Flushing	5%
Permanent	Reduce System Water Loss	10%
1-4	Increase Water Waste Patrols	10%



8.13. DETERMINING WATER SHORTAGE REDUCTIONS

The following discussion is provided to comply with CWC section 10632(a)(9). The City's water system is supplied by groundwater wells and surface water. Each well has a flow meter that records the amount of water entering the City's distribution system. Additionally, the surface water supplied by AVEK is metered and monitored by the City. The City uses these meters to monitor actual reductions in water use within the service area.

8.14. REVENUE AND EXPENDITURE IMPACTS

The following discussion is provided to comply with CWC section 10632(a)(7). Most operating costs for water agencies are fixed rather than a function of the amount of water sold. Thus, when conservation programs are undertaken, it is frequently necessary to raise water rates because the revenue generated is based on lower total consumption while the costs, and resulting revenue required, are fundamentally fixed. Typically, water rates need to be increased by the rates listed in **Table 8-4** when the indicated stages are implemented. However, reductions in water demands, especially peak demands, can delay the need to develop costly new water sources in growing communities. The City currently charges water customers a flat fee based on meter size plus a volumetric charge for water use.

As of September 2023, the City is going through the Prop 218 process to adjust water rates to properly fund the water system and needed improvements.

The City does have an emergency fund for system upkeep. The City's water rates increased three percent (3%) a year per a Proposition 218 hearing in 2008. The increase was approved at the March 10, 2008 Council meeting. The City also reviews the water connection fees yearly for new developments. A portion of the fee is put in the capital improvements account, and the other portion is placed in a separate account to help pay for the KDWD (Kern Delta Water District) seeped water. The City is currently considering establishing a fund to mitigate the impacts of a water shortage, particularly considering SGMA. The fund would then be used to stabilize water rates during periods of water shortage.

The City has fixed base charges currently in the rate structure that generates some revenue even if no water is used. These rates range from \$30 per month for a 3/4-inch meter to \$4,240 per month for an 8-inch meter. Most residential customers use a 3/4-inch meter, which has a rate of \$30 per month. The base rates allow the City to avoid being impacted by revenue losses during water shortages. The following actions could take place under such circumstances:

- Implement a conservation surcharge



- Delay capital improvement projects
- Consider temporary increase of water rates to meet operation and maintenance costs

Table 8-4 City of California City Current Water Rates

Tier	Pricing (for ¾" Meter)
Base (0-6 HCF)	\$30 flat rate
Tier 2 (6-9 HCF)	\$5 per HCF
Tier 3 (10-15 HCF)	\$1 per HCF
Tier 4 (16-25 HCF)	\$2 per HCF
Tier 5 (26-40 HCF)	\$3 per HCF
Tier 6 (40+ HCF)	\$4 per HCF

A combination of the measures outlined may be used to offset or diminish the effects of lost revenues. The City issued an RFP in February 2026 seeking a comprehensive water and wastewater rate study that meets all State of California requirements, including full compliance with Proposition 218. As part of this effort, the City is proposing temporary rate increases to stabilize utility finances while long term rate structures are evaluated.

8.15. RESOLUTION OR ORDINANCE

In compliance with CWC section 10632(a)(8), the City Council initially responded with

urgency ordinances in 2015 to set forth State-issued and additional City water use policies and restrictions to achieve the conservation mandated for the City, which had been thirty-six percent (36%). Implementation of the urgency ordinance provisions did not yield the desired conservation results plus it became apparent to State and local officials that the drought and water crisis prompting mandated conservation would extend beyond 2015. Therefore, the Council later adopted Resolution No. 05-15-2623 to provide more consistent and long-term conservation policies and enforcement.

8.16. CATASTROPHIC SUPPLY INTERRUPTION

The following discussion is provided to comply with CWC section 10632(a)(3). The Act refers to catastrophic interruptions as regional power outages, natural disasters, and other disasters that stop the water supply.

A disaster that damages the main water lines causing leakage and to loss or contamination of stored water supplies and or a disaster that causes power outages for extended periods of time, not allowing well operation, could potentially deplete water storage reservoirs. Well #03 (700 gpm) (367.92 MG) is a Natural Gas well that can operate in the event of a power outage. Some of the risk associated with the disaster(s) are mitigated



by the fact that the water storage tanks are in different sections of the City, and the City's wells are located throughout the City. A disaster in one area hopefully would not affect or would have minimal effect on other areas.

8.17. SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

California City lies within the Mojave Desert's Mojave Block/Eastern California Shear Zone, an area of elevated seismic activity influenced by regional movement between the North American and Pacific Plates. Several active and potentially active faults are located near the Planning Area, most notably the Garlock Fault, approximately ten (10) miles northwest, which forms the northern boundary of the Mojave Block and has a history of moderate seismic events. The San Andreas Fault, California's most active fault system, is located about thirty-nine (39) miles southwest. Additional local structures include the Lockhart Fault within the Planning Area and the Muroc Fault to the southeast, though the latter has not shown Holocene activity.

In lieu of conducting their own seismic risk assessment, which can be a lengthy process, suppliers can comply with the CWC requirement by submitting the relevant local hazard mitigation plan or multi-hazard mitigation plan, if available. The City was one of the agencies that is included in the County of Kern Multi-Jurisdiction Hazard Mitigation Plan, specifically in the City of California City Annex (**Appendix I**).



9



Section 9: Conservation Measures

Conservation measures are an essential part of the City's policies.

9.1. OVERVIEW

This section provides a comprehensive description of the water conservation programs that the City of California City (City) has implemented, is currently implementing, and plans to implement to meet urban water reduction targets. The City is not a signatory to the Memorandum of Understanding regarding Urban Water Conservation in California and therefore, is not a member of the California Urban Water Conservation Council. For responding to the Act, the City will address the six (6) Demand Management Measures (DMMs) described in CWC section 10631(f)(1)(B). Descriptions of the City's DMMs are provided below.

The City has water conservation and recycling programs in place. It takes the issues of water conservation seriously and is implementing BMPs as necessary to achieve those goals. California DWR has expanded on typical BMPs in the form of DMMs, which are discussed below.

9.2. DWR DMMs FOR 2025 UWMPs

The DMMs are intended to reduce long-term urban demands from what they would have been without their implementation. The DMMs are in addition to programs which may be instituted during occasional water supply shortages.

- i. Water Waste Prevention Ordinances



- ii. Metering
- iii. Conservation Pricing
- iv. Public Education & Outreach
- v. Programs to Assess and Manage Distribution System Real Loss
- vi. Water Conservation Program Coordination and Staffing Support
- vii. Other Demand Management Measures that have a significant impact on water use

As with previous UWMPs, agencies that are members of CalWEP can submit the BMP annual reports in lieu of providing a description of each DMM in the UWMP.

9.3. CalWEP BMPs

An active member of the CalWEP has signed the MOU and implements the water conservation measures stipulated by the CalWEP (**Figure 9.1**). According to CalWEP, an agency “implements” a conservation measure by achieving *and* maintaining the level of activity called for in each BMP’s definition, as described in the MOU. This requires a minimum level of staffing and funding efforts. To document the implementation of a BMP, an agency is required to submit annual BMP reports to CalWEP that document the implementation of each BMP.



Figure 9-1 CUWCC became CalWEP in January 2018

The City is not currently a member of CalWEP. However, the City is implementing the same conservation measures as described in the previous sub-section.

9.4. CITY CONSERVATION MEASURES

The City is committed to implementing water conservation programs and encourages its customers to conserve water whenever possible. The CalWEP BMPs are broad measures aimed at reducing water use either directly (rebates and fixture changes), or indirectly (through awareness). As a smaller, low-density community surrounded by significant open space, the City is unique compared to many of the other urban, “built-out” member agencies. As such, the City’s conservation efforts are tailored to address the characteristics of their specific community. Over the past several years, the City has focused primarily on public information efforts, irrigation, and landscape limitations, and reducing water losses/waste. The City has focused less on rebates and retrofits as water efficient appliance and fixtures have saturated the market over the past few decades. Nevertheless, the City is committed to using



“good faith effort” to implement all of the BMPs as described in this section.

California City’s 2015 mandatory water measures required residents to cut potable water use by 25% during the statewide drought and prohibited wasteful outdoor practices such as irrigation that causes runoff, watering during or within 48 hours of rainfall, using potable water on sidewalks or driveways, operating non-recirculating fountains, and washing vehicles without a shut-off nozzle. Outdoor watering was restricted to specific days and banned between 9 a.m. and 6 p.m., and restaurants could only serve water upon request. New construction landscaping had to use drip or micro-spray systems. Violations carried fines up to \$500 per incident, with the city enforcing these rules under state emergency authority that allowed penalties up to \$10,000 per day for non-compliance.

9.5. WATER SURVEY PROGRAM

This program involves making free water audits available, upon request, to all residential customers. The audit would include identification of any leaks inside or outside the home, reviewing water usages with the customer and recommending improvements for the customer to implement.

City of California City has installed water meters on each water service connection.

Within the city service area, residential meters are read on a monthly basis. The City requires separate irrigation meters for customers with large landscaping areas to distinguish outdoor water from indoor water use and for the facilitation of recycled water conversions. The City’s CI, CII customers are required to have fire sprinkler systems, and since 2012, the City has required residential fire sprinklers in all new single and multi-family construction.

The City has been continuously replacing its metering infrastructure with AMI since 2006. With the AMI technology, meter readings are fed from meters to a handheld collector, which transmits meter reads to City computers. The information is then transformed into customer reports that detail water usages, time of use, and leak detection. The system increases meter reading accuracy and efficiency and provides hour-by-hour meter reads, significantly improving customer service levels. As of 2015, approximately twenty percent (20%) of the City customers are served by AMI.

Implementation of AMI will allow the City to automate meter reading and provide real-time water use data to City staff and customers that can be used to aggressively target leaks and atypically high-water use during normal years and periods of water shortage. Implementation of AMI will also increase City’s communication with



customers and allow customers to view water use in near real-time through the City's staff.

City crews provide water audits free of charge to customers who question or doubt the data being generated by their meters. The audits will at least consist of manual meter reads to confirm usage reported by a handheld data collection device used to electronically read meters.

City staff can also provide an assessment of a customer's water use by checking for leaks, irrigation use and signs of water wasting. Calls from customers requesting an audit total to less than six (6) per calendar year and are generally performed to the satisfaction of the customer.

Meter retrofits and outreaching programs currently have an annual budget of \$150,000 for mostly contractual work. The staff costs for implementing this DMM are absorbed by the water enterprise operational budget.

9.6. RESIDENTIAL PLUMBING RETROFIT

This DMM involves installing water savings devices within residences, business and other usage locations to reduce the amount of water used or to limit the amount of water delivered to the connection. These devices include low flow showerheads, faucet aerators with flow restrictors and low flow toilets. State law began requiring low-flow

fixtures on all new construction in 1978, with an increase in stringency of the regulation in 1992, which required Ultra-Low-Flush toilets.

The City requires all new construction to install low-flow devices such as toilets and showerheads but does not have an enforceable ordinance requiring the replacement of high flow fixtures for older homes and businesses with their low-flow counterparts. A citywide retrofit program for older service connections has not been conducted to date.

The City estimates that there over 3,500 single family units that were constructed before the low-flow fixture requirements. It's anticipated that funding and implementing retrofits for the older service connections would require one dedicated and certified staff member at an annual cost of \$100,000 per year plus the cost of specific materials which the water enterprise does not have funding for at the present time. No specific budget has been set-aside for this DMM at this time.

9.7. METERING AND COMMODITY RATES

The Metering DMM entails installing water meters on all new connections and implementing a plan to retrofit all existing unmetered connections.



The City's water system is fully metered and in full compliance with the State of California Assembly Bill No. 2572 (AB 2572). However, the continuing drought and water crisis along with the City's inability to consistently uphold the State's conservation standard has led to the citywide meter replacement and conversion to AMI reading system that will help in detecting usage abnormalities via radio communication. Once an AMI system is fully installed and operational, with a balance of approximately 2,000 meters needed to be upgraded and replaced. The coordination, funding and implementation of this plan is ongoing. Per the City's 2023 WSMP, annual cost for water meter replacement are approximately \$186,000, assuming five percent (5%) of the water meters would be replaced on an annual basis. Based on a 20-year typical life span of a meter, at five percent (5%) a year, all of the City's meters would be replaced every twenty (20) years.

9.8. CONSERVATION PRICING

This DMM would implement a tiered water rate structure to encourage conservation. The City already has implemented this type of rate structure.

The current meter rate plan was approved in 2014. The typical water bill is made up using a fixed monthly charge based on the size of meter and water usage billed by tiers. The following tables detail the current tiered

billing structure. At the time the current rate structure was approved, it was seen as a significant change, particularly for existing metered customers using the previous rate plan in which a fixed fee purchased an allowance of water before the usage rate could be assessed. Therefore, tiered usage rates and other more complicated plans that could have encouraged more conservation were not seen as practical options. Rather, the approved rates were seen as a first step and easier transition towards conservation that at least discouraged wasting. Since the current rates were approved, a multi-year statewide drought and the State's enforcement of conservation measures and standards has prompted to the City to revisit tiered rates and other rate alternatives to compel its customers to be more proactive with conservation and engaged with our water crisis.

9.9. PUBLIC EDUCATION AND OUTREACH

The following describes the public education and outreach efforts by the City to promote water conservation and other water-related topics.

As mentioned in **Section 5.2.5**, results of the water quality testing are shown in Consumer Confidence Reports posted annually to the City's website. The City uses mailings when necessary to provide customers additional information on water conservation and other demand management measures;



however most of this information is posted annually to the City's website. Display cases and bulletin boards at City facilities augment the mailings by providing a permanent posting of the most current City mailings.

The City monthly water bill distributed to all water service customers is another vehicle used by the City for public education purposes. The bill presents information regarding comparable previous year water usage so that the public can self-monitor their water demand. The bill also contains a space for public service announcements that are used to remind citizens of conservation and demand management measures. The City's water conservation measures can be found in the link:

californiacity-ca.gov/CC/index.php/water-conservation

9.10. PROGRAMS TO ASSESS AND MANAGE DISTRIBUTION SYSTEM REAL LOSS

The City has several programs to manage distribution system loss.

1) Leak detection program

- Daily water patrol helps to detect visible leaks.
- Customer calls on possible water leaks, when received, are inspected the same day.
- All leaks are repaired as soon as possible.

- When repairing a leak, 1) underground dig alert is notified to let other utilities know of underground excavations and 2) the water leak is repaired.

2) Regular meter testing

- Several meters are flow tested regularly throughout the City for accuracy.
- Meters are also flow tested by request of a customer.
- Meters are replaced, if needed.

9.11. WATER CONSERVATION PROGRAM AND STAFFING SUPPORT

The following provides a description of the City's water conservation program and staffing support.

A Water Conservation Coordinator (WCC) would be responsible for coordinating water conservation programs and activities including the public information program and education program.

The has a full-time WCC and has also utilized available staff on a part-time basis to patrol all service areas of the City to monitor water use and enforce the water use policies. These patrols were routinely used from 2015 to 2016, and played a major role in getting the City's water customers to reduce their water usage.



The City's 2016-2017 fiscal year budget called for funding the City's first full-time meter department technicians that would primarily read and install meters and support the Conservation Coordinator to enforce water use policies.

The City had budgeted approximately \$150,000 annually to fund the new meter technicians and Conservation Coordinator to ensure that water audit and leak detection programs are conducted.

The contact information for City-related water conservation program is provided below:

Joe Barragan, Public Works Director
(760) 373-7162

9.12. OTHER DEMAND MANAGEMENT MEASURES THAT IMPACT GPCD

The City does not currently employ any other DMMs that affect GPCD.

9.13. PLANNED IMPLEMENTATION TO ACHIEVE WATER USE TARGETS

The City plans to use all demand management measures, if needed, to achieve its water use targets.

APPENDICES A – I





Appendix A: Council Resolution Adopting 2025 UWMP

City of California City 2025 Urban Water Management Plan

RESOLUTION NO. 26-3275

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CALIFORNIA CITY ADOPTING THE 2025 URBAN WATER MANAGEMENT PLAN

The City Council of the City of California City (hereafter referred to as the “City”) does resolve as follows:

WHEREAS, the City is the California Legislature enacted Assembly Bill 797 (Water Code Section 10610 et seq.), known as the Urban Water Management Planning Act, during the 1983-1984 Regular Session, and as amended subsequently, which mandates that every supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, prepare an Urban Water Management Plan (UWMP), the primary objective of which is to plan for the conservation and efficient use of water; and; and

WHEREAS, the City is an urban supplier of water providing water; and

WHEREAS, the UWMP shall be periodically reviewed at least once every five years, and the City shall make any amendments or changes to its plan which are indicated by the review; and

WHEREAS, the UWMP update is required to be adopted and submitted to the California Department of Water Resources (DWR) no later than July 1, 2026; and

WHEREAS, the UWMP was prepared in accordance with DWR's 2025 UWMP Guidebook and includes updated population and water demand projections through 2050, water supply reliability assessments, demand management measures, and an updated Water Shortage Contingency Plan (WSCP). The key updates incorporated into the 2025 UWMP include: SBx7-7 conservation target reporting requirements; enhanced water loss audit and compliance reporting; additional demand management measures for suppliers exceeding their Urban Water Use Objective (UWUO); updated indoor residential water use standards; potable irrigation phase-out requirements for nonfunctional turf; new and revised water conservation and water use definitions; optional DWR planning and reporting tools to improve reliability and drought risk assessments; and

WHEREAS, the UWMP must be adopted after public review and hearing, and filed with the California Department of Water Resources within thirty days of adoption; and

WHEREAS, the City has therefore prepared and circulated for public review a draft UWMP, and a properly noticed public hearing regarding said UWMP was held by the City Council on August 25, 2026; and

WHEREAS, the City Council shall have filed said UWMP with the California Department of Water Resources within 30 days of adoption.

NOW, THEREFORE BE IT RESOLVED, DETERMINED, AND ORDERED BY THE CITY COUNCIL OF THE CITY OF CALIFORNIA CITY, CALIFORNIA, AS FOLLOWS:

SECTION 1: The City is in conformance with all applicable requirements of the Urban Water Management Planning Act.

SECTION 2: The City Clerk shall certify to the passage and adoption of this Resolution and the minutes of this meeting shall so reflect the presentation of the letter.

PASSED, APPROVED, AND ADOPTED by the City Council of the City of California City, this 25 day of August 2026.

Marquette Hawkins
Mayor

PASSED, APPROVED AND ADOPTED on this 25th day of August 2026 by the following roll call vote:

AYES: 5-0

NAYS:

ABSTAIN:

ABSENT:

Signed by:



F808C4516BD9417

Marquette E. Hawkins
Mayor

ATTEST:

Signed by:



FF83BA0620C6428
John Paul Maier, MBA, MMC
City Clerk

APPROVED AS TO FORM:

Signed by:



8B1DC0C2E284419
Victor M. Ponto
City Attorney

STATE OF CALIFORNIA }
COUNTY OF KERN } SS
CITY OF CALIFORNIA CITY }

I, John Paul Maier, City Clerk of the City of California City, do hereby certify that the foregoing Resolution was duly and regularly adopted by the City Council of the City of California City on the _____ day of _____ 2026, by the following vote:

Signed by:



FF83BA0820C6429

John Paul Maier, MBA, MMC
City Clerk



Appendix B: Final Transmittals to State Library

City of California City 2025 Urban Water Management Plan

2025 UWMP Submittal

From Jake Comer <jakec@westaeng.com>

Date Thu 9/24/2026 5:57 PM

To Reports, California@CSL <cal-agency-reports@library.ca.gov>

Good afternoon,

In accordance with the requirements of the Urban Water Management Plan (UWMP) Act and the California Water Code Section 10644(a)(1), we hereby submit one electronic (PDF) copy of the 2025 UWMP and 2025 Water Shortage Contingency Plan (WSCP), which is included as Section 8 of the 2025 UWMP, for the City of California City.

[2025 UWMP - California City](#)

Thank you,

JAKE COMER, P.E.

Civil Engineer | West & Associates Engineering, Inc.

Cell 949.335.2029 | jakec@westaeng.com

www.westaeng.com





Appendix C: UWMP Act

City of California City 2025 Urban Water Management Plan

Appendix A

California Water Code—Urban Water Management Planning

This material is for informational purposes only and is not to be used in place of official California Water Code.

This appendix presents updated sections of California Water Code (Water Code) as of the publication of this Guidebook and as compiled by California Department of Water Resources (DWR) staff. The selection here focuses on the portions of Water Code directly relevant to preparation of an Urban Water Management Plan (UWMP), and sections of Water Code that are contextually relevant to urban water suppliers and DWR.

Water Code published here also concerns the Urban Water Management Planning Act, the Water Conservation Act of 2009 (SB X7-7), which covers sustainable water use and demand reduction, and more. Further legislative information is available on the [California Legislative Information website](#).

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Water Conservation Act of 2009 (SB X7-7)

This section contains information extracted from Water Code Division 6, *Conservation, Development, and Utilization of State Water Resources*, [Part 2.55, Sustainable Water Use And Demand Reduction](#). Click on any section header below to read Water Code directly at the [California Legislative Information website](#).

Chapter 1. General Declarations and Policy, Sections 10608–10608.8

Section 10608.

The Legislature finds and declares all of the following:

- (a) Water is a public resource that the California Constitution protects against waste and unreasonable use.
- (b) Growing population, climate change, and the need to protect and grow California’s economy while protecting and restoring our fish and wildlife habitats make it essential that the state manage its water resources as efficiently as possible.
- (c) Diverse regional water supply portfolios will increase water supply reliability and reduce dependence on the Delta.
- (d) Reduced water use through conservation provides significant energy and environmental benefits, and can help protect water quality, improve streamflows, and reduce greenhouse gas emissions.
- (e) The success of state and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes related to water use or efficiency.
- (f) Improvements in technology and management practices offer the potential for increasing water efficiency in California over time, providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses.
- (g) The Governor has called for a 20 percent per capita reduction in urban water use statewide by 2020.
- (h) The factors used to formulate water use efficiency targets can vary significantly from location to location based on factors including weather, patterns of urban and suburban development, and past efforts to enhance water use efficiency.
- (i) Per capita water use is a valid measure of a water provider’s efforts to reduce urban water use within its service area. However, per capita water use is less

useful for measuring relative water use efficiency between different water providers. Differences in weather, historical patterns of urban and suburban development, and density of housing in a particular location need to be considered when assessing per capita water use as a measure of efficiency.

Section 10608.4.

It is the intent of the Legislature, by the enactment of this part, to do all of the following:

- (a) Require all water suppliers to increase the efficiency of use of this essential resource.
- (b) Establish a framework to meet the state targets for urban water conservation identified in this part and called for by the Governor.
- (c) Measure increased efficiency of urban water use on a per capita basis.
- (d) Establish a method or methods for urban retail water suppliers to determine targets for achieving increased water use efficiency by the year 2020, in accordance with the Governor's goal of a 20- percent reduction.
- (e) Establish consistent water use efficiency planning and implementation standards for urban water suppliers and agricultural water suppliers.
- (f) Promote urban water conservation standards that are consistent with the California Urban Water Conservation Council's adopted best management practices and the requirements for demand management in Section 10631.
- (g) Establish standards that recognize and provide credit to water suppliers that made substantial capital investments in urban water conservation since the drought of the early 1990s.
- (h) Recognize and account for the investment of urban retail water suppliers in providing recycled water for beneficial uses.
- (i) Require implementation of specified efficient water management practices for agricultural water suppliers.
- (k) Support the economic productivity of California's agricultural, commercial, and industrial sectors.
- (l) Advance regional water resources management.

Section 10608.8.

- (a)
 - (1) Water use efficiency measures adopted and implemented pursuant to this part or Part 2.8 (commencing with Section 10800) are water conservation measures subject to the protections provided under Section 1011.

- (2) Because an urban agency is not required to meet its urban water use target until 2020 pursuant to subdivision (b) of Section 10608.24, an urban retail water supplier's failure to meet those targets shall not establish a violation of law for purposes of any state administrative or judicial proceeding prior to January 1, 2021. Nothing in this paragraph limits the use of data reported to the department or the board in litigation or an administrative proceeding. This paragraph shall become inoperative on January 1, 2021.
- (3) To the extent feasible, the department and the board shall provide for the use of water conservation reports required under this part to meet the requirements of Section 1011 for water conservation reporting.
- (b) This part does not limit or otherwise affect the application of Chapter 3.5 commencing with Section 11340), Chapter 4 (commencing with Section 11370), Chapter 4.5 (commencing with Section 11400), and Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.
- (c) This part does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors.
- (d) The requirements of this part do not apply to an agricultural water supplier that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect. After the expiration of the Quantification Settlement Agreement, to the extent conservation water projects implemented as part of the Quantification Settlement Agreement remain in effect, the conserved water created as part of those projects shall be credited against the obligations of the agricultural water supplier pursuant to this part.

Chapter 2. Definitions, Section 10608.12

Section 10608.12.

Unless the context otherwise requires, the following definitions govern the construction of this part:

- (a) "Affordable housing" has the same meaning as defined in Section 34191.30 of the Health and Safety Code.
- (b) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor

for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. “Agricultural water supplier” does not include the department.

- (c) “Base daily per capita water use” means any of the following:
 - (1) The urban retail water supplier’s estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.
 - (2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the
 - (3) calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.
 - (4) For the purposes of Section 10608.22, the urban retail water supplier’s estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.
- (d) “Baseline commercial, industrial, and institutional water use” means an urban retail water supplier’s base daily per capita water use for commercial, industrial, and institutional users.
- (e) “CII water use” means water used by commercial water users, industrial water users, institutional water users, and large landscape water users.
- (f) “Commercial water user” means a water user that provides or distributes a product or service.
- (g) “Common area” means that portion of a common interest development or of a property owned or managed by a homeowners’ association or a community service organization or similar entity that is not assigned or allocated to the exclusive use of the occupants of an individual dwelling unit within the property.
- (h) “Common interest development” has the same meaning as in Section 4100 of the Civil Code.
- (i) “Community service organization or similar entity” has the same meaning as in Section 4110 of the Civil Code.
- (j) “Community space” means an area designated by a property owner or a governmental agency to accommodate human foot traffic for civic, ceremonial, or other community events or social gatherings

- (k) “Compliance daily per capita water use” means the gross water use during the final year of the reporting period, reported in gallons per capita per day.
- (l) “Disadvantaged community” means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.
- (m) “Functional turf” means a ground cover surface of turf located in a recreational use area or community space. Turf enclosed by fencing or other barriers to permanently preclude human access for recreation or assembly is not functional turf.
- (n) “Gross water use” means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:
 - (1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.
 - (2) The net volume of water that the urban retail water supplier places into long-term storage.
 - (3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.
 - (4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.
- (o) “Homeowners’ association” means an “association” as defined in Section 4080 of the Civil Code.
- (p) “Industrial water user” means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.
- (q) “Institutional water user” means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.
- (r) “Interim urban water use target” means the midpoint between the urban retail water supplier’s base daily per capita water use and the urban retail water supplier’s urban water use target for 2020.
- (s) “Large landscape” means a nonresidential landscape as described in the performance measures for CII water use adopted pursuant to Section 10609.10.
- (t) “Locally cost effective” means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater

than or equal to the present value of the local cost of implementing that measure.

- (u) “Nonfunctional turf” means any turf that is not functional turf, and includes turf located within street rights-of-way and parking lots.
- (v) “Performance measures” means actions to be taken by urban retail water suppliers that will result in increased water use efficiency by CII water users. Performance measures may include, but are not limited to, educating CII water users on best management practices, conducting water use audits, and preparing water management plans. Performance measures do not include process water.
- (w) “Potable reuse” means direct potable reuse, indirect potable reuse for groundwater recharge, and reservoir water augmentation as those terms are defined in Section 13561.
- (x) “Potable water” means water that is suitable for human consumption.
- (y) “Process water” means water used by industrial water users for producing a product or product content or water used for research and development. Process water includes, but is not limited to, continuous manufacturing processes, and water used for testing, cleaning, and maintaining equipment. Water used to cool machinery or buildings used in the manufacturing process or necessary to maintain product quality or chemical characteristics for product manufacturing or control rooms, data centers, laboratories, clean rooms, and other industrial facility units that are integral to the manufacturing or research and development process is process water. Water used in the manufacturing process that is necessary for complying with local, state, and federal health and safety laws, and is not incidental water, is process water. Process water does not mean incidental water uses.
- (z) “Public water system” has the same meaning as defined in Section 116275 of the Health and Safety Code.
- (aa) “Recreational use area” means an area designated by a property owner or a governmental agency to accommodate human foot traffic for recreation, including, but not limited to, sports fields, golf courses, playgrounds, picnic grounds, or pet exercise areas. This recreation may be either formal or informal.
- (ab) “Recycled water” means recycled water, as defined in subdivision (n) of Section 13050.
- (ac) “Regional water resources management” means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:
 - (1) The capture and reuse of stormwater or rainwater.
 - (2) The use of recycled water.

- (3) The desalination of brackish groundwater.
- (4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.
- (ad) “Reporting period” means the years for which an urban retail water supplier reports compliance with the urban water use targets.
- (ae) “Turf” has the same meaning as defined in Section 491 of Title 23 of the California Code of Regulations
- (af) “Urban retail water supplier” means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.
- (ag) “Urban water supplier” has the same meaning as defined in Section 10617.
- (ah) “Urban water use objective” means an estimate of aggregate efficient water use for the previous year based on adopted water use efficiency standards and local service area characteristics for that year, as described in Section 10609.20.
- (ai) “Urban water use target” means the urban retail water supplier’s targeted future daily per capita water use.
- (aj) “Urban wholesale water supplier” means a water supplier, either publicly or privately owned, that provides more than 3,000 acre- feet of water annually at wholesale for potable municipal purposes.

Chapter 2.5. Nonfunctional Turf

Section 10608.14.

- (a) The use of potable water for the irrigation of nonfunctional turf located on commercial, industrial, and institutional properties, other than a cemetery, and on properties of homeowners’ associations, common interest developments, and community service organizations or similar entities is prohibited as of the following dates:
 - (1) All properties owned by the Department of General Services, beginning January 1, 2027.
 - (2) All properties owned by local governments, local or regional public agencies, and public water systems, except those specified in paragraph (5), beginning January 1, 2027.
 - (3) All other institutional properties and all commercial and industrial properties, beginning January 1, 2028.

- (4) All common areas of properties of homeowners' associations, common interest developments, and community service organizations or similar entities, beginning January 1, 2029.
- (5) All properties owned by local governments, local public agencies, and public water systems in a disadvantaged community, beginning January 1, 2031, or the date upon which a state funding source is made available to fund conversion of nonfunctional turf on these properties to climate-appropriate landscapes, whichever is later.
- (b) Notwithstanding subdivision (a), the use of potable water is not prohibited by this section to the extent necessary to ensure the health of trees and other perennial nonturf plantings, or to the extent necessary to address an immediate health and safety need.
- (c) The board may, upon a showing of good cause for reasons including economic hardship, critical business need, and potential impacts to human health or safety, postpone a compliance deadline in subdivision (a) by up to three years for certain persons, institutions, and businesses, and may create a form to be used for compliance certification to the board by property owners.
- (d) Public water systems shall, by no later than January 1, 2027, revise their regulations, ordinances, or policies governing water service to include the requirements of subdivisions (a) and (b), as revised by the board pursuant to subdivision (c), and shall communicate the requirements to their customers on or before that date.
- (e)
 - (1) An owner of commercial, industrial, or institutional property with more than 5,000 square feet of irrigated area other than a cemetery shall certify to the board, commencing June 30, 2030, and every three years thereafter through 2039, that their property is in compliance with the requirements of this chapter.
 - (2) An owner of a property with more than 5,000 square feet of irrigated common area that is a homeowners' association, common interest development, or community service organization or similar entity shall certify to the board, commencing June 30, 2031, and every three years thereafter through 2040, that their property is in compliance with the requirements of this chapter.
- (f) Noncompliance by a person or entity with this chapter or regulations adopted thereunder shall be subject to civil liability and penalties set forth in Section 1846, or to civil liability and penalties imposed by an urban retail water supplier pursuant to a locally adopted ordinance or policy.

- (g)
- (1) A public water system, city, county, or city and county may enforce the provisions of this chapter.
 - (2) To avoid duplication of enforcement, any entity identified in paragraph (1) that is not a retail public water system shall notify the retail public water system 30 days prior to enforcement of the provisions of this chapter against a property served by such system.
 - (3) Nothing in paragraph (2) shall preclude enforcement by any entity identified in paragraph (1) once adequate notice is given.
- (h) The department shall, when using funds appropriated for water conservation for turf replacement, prioritize financial assistance for nonfunctional turf replacement to public water systems serving disadvantaged communities and to owners of affordable housing.
- (i) The department shall utilize the saveourwater.com internet website and outreach campaign to provide information and resources on converting nonfunctional turf to native vegetation.
- (j) The Governor’s Office of Business and Economic Development shall support small and minority-owned businesses that provide services that advance compliance with this chapter.

Chapter 3. Urban Retail Water Suppliers, Sections 10608.16–10608.44

Section 10608.16.

- (a) The state shall achieve a 20-percent reduction in urban per capita water use in California on or before December 31, 2020.
- (1) The state shall make incremental progress towards the state target specified in subdivision (a) by reducing urban per capita water use by at least 10 percent on or before December 31, 2015.

Section 10608.20.

- (a)
- (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

- (2) It is the intent of the Legislature that the urban water use targets described in paragraph (1) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.
- (b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):
 - (1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.
 - (2) The per capita daily water use that is estimated using the sum of the following performance standards:
 - (A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2017 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.
 - (B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.
 - (C) For commercial, industrial, and institutional uses, a 10- percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.
 - (3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.
 - (4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:
 - (A) Consider climatic differences within the state.
 - (B) Consider population density differences within the state.
 - (C) Provide flexibility to communities and regions in meeting the targets.

- (D) Consider different levels of per capita water use according to plant water needs in different regions.
 - (E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.
 - (F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.
- (c) If the department adopts a regulation pursuant to paragraph (4) of subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).
 - (d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.
 - (e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.
 - (f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.
 - (g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).
 - (h)
 - (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:
 - (A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area

population, indoor residential water use, and landscaped area water use.

(B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

- (2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its internet website, and make written copies available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.

(h)

- (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.
- (2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

(j)

- (1) An urban retail water supplier is granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow the use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.
- (2) An urban wholesale water supplier whose urban water management plan prepared pursuant to Part 2.6 (commencing with Section 10610) was due and not submitted in 2010 is granted an extension to July 1, 2011, to permit coordination between an urban wholesale water supplier and urban retail water suppliers.

Section 10608.22.

Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (c) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

Section 10608.24.

- (a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.
- (b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.
- (c) An urban retail water supplier's compliance daily per capita water use shall be the measure of progress toward achievement of its urban water use target.
- (d)
 - (1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:
 - (A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.
 - (B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.
 - (C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.
 - (2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.
- (e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial percentage of industrial water use in its service area may exclude process water from the calculation of gross water use to avoid a disproportionate burden on another customer sector.
- (f)
 - (1) An urban retail water supplier that includes agricultural water use in an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) may include the agricultural water use in determining

gross water use. An urban retail water supplier that includes agricultural water use in determining gross water use and develops its urban water use target pursuant to paragraph (2) of subdivision (b) of Section 10608.20 shall use a water efficient standard for agricultural irrigation of 100 percent of reference evapotranspiration multiplied by the crop coefficient for irrigated acres.

- (2) An urban retail water supplier, that is also an agricultural water supplier, is not subject to the requirements of Chapter 4 (commencing with Section 10608.48), if the agricultural water use is incorporated into its urban water use target pursuant to paragraph (1).

Section 10608.26.

- (a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:
 - (1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.
 - (2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.
 - (3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.
- (b) In complying with this part, an urban retail water supplier may meet its urban water use target through efficiency improvements in any combination among its customer sectors. An urban retail water supplier shall avoid placing a disproportionate burden on any customer sector.
- (c) For an urban retail water supplier that supplies water to a United States Department of Defense military installation, the urban retail water supplier's implementation plan for complying with this part shall consider the conservation of that military installation under federal Executive Order 13514.
- (d)
 - (1) Any ordinance or resolution adopted by an urban retail water supplier after the effective date of this section shall not require existing customers as of the effective date of this section, to undertake changes in product formulation, operations, or equipment that would reduce process water use, but may provide technical assistance and financial incentives to those customers to implement efficiency measures for process water. This section shall not limit an ordinance or resolution adopted pursuant to a declaration of drought emergency by an urban retail water supplier.
 - (2) This part shall not be construed or enforced so as to interfere with the requirements of Chapter 4 (commencing with Section 113980) to Chapter 13 (commencing with Section 114380), inclusive, of Part 7 of

Division 104 of the Health and Safety Code, or any requirement or standard for the protection of public health, public safety, or worker safety established by federal, state, or local government or recommended by recognized standard setting organizations or trade associations.

Section 10608.28.

- (a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:
 - (1) Through an urban wholesale water supplier.
 - (2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).
 - (3) Through a regional water management group as defined in Section 10537.
 - (4) By an integrated regional water management funding area.
 - (5) By hydrologic region.
 - (6) Through other appropriate geographic scales for which computation methods have been developed by the department.
- (b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

Section 10608.32.

All costs incurred pursuant to this part by a water utility regulated by the Public Utilities Commission may be recoverable in rates subject to review and approval by the Public Utilities Commission, and may be recorded in a memorandum account and reviewed for reasonableness by the Public Utilities Commission.

Section 10608.34.

- (a)
 - (1) On or before January 1, 2017, the department shall adopt rules for all of the following:
 - (A) The conduct of standardized water loss audits by urban retail water suppliers in accordance with the method adopted by the American Water Works Association in the third edition of Water Audits and Loss

Control Programs, Manual M36 and in the Free Water Audit Software, version 5.0.

- (B) The process for validating a water loss audit report prior to submitting the report to the department. For the purposes of this section, “validating” is a process whereby an urban retail water supplier uses a technical expert to confirm the basis of all data entries in the urban retail water supplier’s water loss audit report and to appropriately characterize the quality of the reported data. The validation process shall follow the principles and terminology laid out by the American Water Works Association in the third edition of Water Audits and Loss Control Programs, Manual M36 and in the Free Water Audit Software, version 5.0. A validated water loss audit report shall include the name and technical qualifications of the person engaged for validation.
 - (C) The technical qualifications required of a person to engage in validation, as described in subparagraph (B).
 - (D) The certification requirements for a person selected by an urban retail water supplier to provide validation of its own water loss audit report.
 - (E) The method of submitting a water loss audit report to the department.
- (2) The department shall update rules adopted pursuant to paragraph (1) no later than six months after the release of subsequent editions of the American Water Works Association’s Water Audits and Loss Control Programs, Manual M36. Except as provided by the department, until the department adopts updated rules pursuant to this paragraph, an urban retail water supplier may rely upon a subsequent edition of the American Water Works Association’s Water Audits and Loss Control Programs, Manual M36 or the Free Water Audit Software.
- (b)
- (1) On or before October 1 of each year until October 1, 2023, each urban retail water supplier reporting on a calendar year basis shall submit a completed and validated water loss audit report for the previous calendar year or the previous fiscal year as prescribed by the department pursuant to subdivision (a).
 - (2) On or before January 1 of each year until January 1, 2024, each urban retail water supplier reporting on a fiscal year basis shall submit a completed and validated water loss audit report for the previous fiscal year as prescribed by the department pursuant to subdivision (a).
 - (3) On or before January 1, 2024, and on or before January 1 of each year thereafter, each urban retail water supplier shall submit a completed and

validated water loss audit report for the previous calendar year or previous fiscal year as part of the report submitted to the department pursuant to subdivision (a) of Section 10609.24 and as prescribed by the department pursuant to subdivision (a).

- (4) Water loss audit reports submitted on or before October 1, 2017, may be completed and validated with assistance as described in subdivision (c).
- (c) Using funds available for the 2016–17 fiscal year, the board shall contribute up to four hundred thousand dollars (\$400,000) towards procuring water loss audit report validation assistance for urban retail water suppliers.
- (d) Each water loss audit report submitted to the department shall be accompanied by information, in a form specified by the department, identifying steps taken in the preceding year to increase the validity of data entered into the final audit, reduce the volume of apparent losses, and reduce the volume of real losses.
- (e) At least one of the following employees of an urban retail water supplier shall attest to each water loss audit report submitted to the department:
 - (1) The chief financial officer.
 - (2) The chief engineer.
 - (3) The general manager.
- (f) The department shall deem incomplete and return to the urban retail water supplier any final water loss audit report found by the department to be incomplete, not validated, unattested, or incongruent with known characteristics of water system operations. A water supplier shall resubmit a completed water loss audit report within 90 days of an audit being returned by the department.
- (g) The department shall post all validated water loss audit reports on its internet website in a manner that allows for comparisons across water suppliers. The department shall make the validated water loss audit reports available for public viewing in a timely manner after their receipt.
- (h) Using available funds, the department shall provide technical assistance to guide urban retail water suppliers' water loss detection programs, including, but not limited to, metering techniques, pressure management techniques, condition-based assessment techniques for transmission and distribution pipelines, and utilization of portable and permanent water loss detection devices.
- (i) No earlier than January 1, 2019, and no later than July 1, 2020, the board shall adopt rules requiring urban retail water suppliers to meet performance standards for the volume of water losses. In adopting these rules, the board shall employ full life-cycle cost accounting to evaluate the costs of meeting the performance standards. The board may consider establishing a minimum

allowable water loss threshold that, if reached and maintained by an urban water supplier, would exempt the urban water supplier from further water loss reduction requirements.

Section 10608.35.

- (a) The department, in coordination with the board, shall conduct necessary studies and investigations and make a recommendation to the Legislature, by January 1, 2020, on the feasibility of developing and enacting water loss reporting requirements for urban wholesale water suppliers.
- (b) The studies and investigations shall include an evaluation of the suitability of applying the processes and requirements of Section 10608.34 to urban wholesale water suppliers.
- (c) In conducting necessary studies and investigations and developing its recommendation, the department shall solicit broad public participation from stakeholders and other interested persons.

Section 10608.36.

Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

Section 10608.40.

Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

Section 10608.42.

- (a) The department shall review the 2015 urban water management plans and report to the Legislature by July 1, 2017, on progress towards achieving a 20-percent reduction in urban water use by December 31, 2020. The report shall include recommendations on changes to water efficiency standards or urban water use targets to achieve the 20- percent reduction and to reflect updated efficiency information and technology changes.
- (b) A report to be submitted pursuant to subdivision (a) shall be submitted in compliance with Section 9795 of the Government Code.

Section 10608.43.

The department, in conjunction with the California Urban Water Conservation Council, by April 1, 2010, shall convene a representative task force consisting of academic experts, urban retail water suppliers, environmental organizations, commercial water users, industrial water users, and institutional water users to develop alternative best management practices for commercial, industrial, and institutional users and an assessment of the potential statewide water use efficiency improvement in the commercial, industrial, and institutional sectors that would result from implementation of these best management practices. The taskforce, in conjunction with the department, shall submit a report to the Legislature by April 1, 2012, that shall include a review of multiple sectors within commercial, industrial, and institutional users and that shall recommend water use efficiency standards for commercial, industrial, and institutional users among various sectors of water use. The report shall include, but not be limited to, the following:

- (a) Appropriate metrics for evaluating commercial, industrial, and institutional water use.
- (b) Evaluation of water demands for manufacturing processes, goods, and cooling.
- (c) Evaluation of public infrastructure necessary for delivery of recycled water to the commercial, industrial, and institutional sectors.
- (d) Evaluation of institutional and economic barriers to increased recycled water use within the commercial, industrial, and institutional sectors.
- (e) Identification of technical feasibility and cost of the best management practices to achieve more efficient water use statewide in the commercial, industrial, and institutional sectors that is consistent with the public interest and reflects past investments in water use efficiency.

Section 10608.44.

Each state agency shall reduce water use at facilities it operates to support urban retail water suppliers in meeting the target identified in Section 10608.16.

Chapter 5. Sustainable Water Management,

Section 10608.50

Section 10608.50.

- (a) The department, in consultation with the board, shall promote implementation of regional water resources management practices through increased incentives and removal of barriers consistent with state and federal law. Potential changes may include, but are not limited to, all of the following:

- (1) Revisions to the requirements for urban and agricultural water management plans.
 - (2) Revisions to the requirements for integrated regional water management plans.
 - (3) Revisions to the eligibility for state water management grants and loans.
 - (4) Revisions to state or local permitting requirements that increase water supply opportunities, but do not weaken water quality protection under state and federal law.
 - (5) Increased funding for research, feasibility studies, and project construction.
 - (6) Expanding technical and educational support for local land use and water management agencies.
- (b) No later than January 1, 2011, and updated as part of the California Water Plan, the department, in consultation with the board, and with public input, shall propose new statewide targets, or review and update existing statewide targets, for regional water resources management practices, including, but not limited to, recycled water, brackish groundwater desalination, and infiltration and direct use of urban stormwater runoff.

Chapter 6. Standardized Data Collection, Section 10608.52

Section 10608.52.

- (a) The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.
- (b) At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24 and an agricultural water supplier's compliance with implementation of efficient water management practices pursuant to subdivision (a) of Section 10608.48. The form shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.

Chapter 7. Funding Provisions, Sections 10608.56–10608.60

Section 10608.56.

- (a) On and after July 1, 2016, an urban retail water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.
- (b) On and after July 1, 2013, an agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.
- (c) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for achieving the per capita reductions. The supplier may request grant or loan funds to achieve the per capita reductions to the extent the request is consistent with the eligibility requirements applicable to the water funds.
- (d) Notwithstanding subdivision (b), the department shall determine that an agricultural water supplier is eligible for a water grant or loan even though the supplier is not implementing all of the efficient water management practices described in Section 10608.48, if the agricultural water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the efficient water management practices. The supplier may request grant or loan funds to implement the efficient water management practices to the extent the request is consistent with the eligibility requirements applicable to the water funds.
- (e) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval documentation demonstrating that its entire service area qualifies as a disadvantaged community.
- (f) The department shall not deny eligibility to an urban retail water supplier or agricultural water supplier in compliance with the requirements of this part and Part 2.8 (commencing with Section 10800), that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan

is not implementing all of the requirements of this part or Part 2.8 (commencing with Section 10800).

Section 10608.60.

- (a) It is the intent of the Legislature that funds made available by Section 75026 of the Public Resources Code should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for grants to implement this part. In the allocation of funding, it is the intent of the Legislature that the department give consideration to disadvantaged communities to assist in implementing the requirements of this part.
- (b) It is the intent of the Legislature that funds made available by Section 75041 of the Public Resources Code, should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for direct expenditures to implement this part.

Chapter 9. Urban Water Use Objectives and Water Use Reporting, Sections 10609–10609.38

Section 10609.

- (a) The Legislature finds and declares that this chapter establishes a method to estimate the aggregate amount of water that would have been delivered the previous year by an urban retail water supplier if all that water had been used efficiently. This estimated aggregate water use is the urban retail water supplier's urban water use objective. The method is based on water use efficiency standards and local service area characteristics for that year. By comparing the amount of water actually used in the previous year with the urban water use objective, local urban water suppliers will be in a better position to help eliminate unnecessary use of water; that is, water used in excess of that needed to accomplish the intended beneficial use.
- (b) The Legislature further finds and declares all of the following:
 - (1) This chapter establishes standards and practices for the following water uses:
 - (A) Indoor residential use.
 - (B) Outdoor residential use.
 - (C) CII water use.
 - (D) Water losses.

- (E) Other unique local uses and situations that can have a material effect on an urban water supplier's total water use.
- (2) This chapter further does all of the following:
 - (A) Establishes a method to calculate each urban water use objective.
 - (B) Considers recycled water quality in establishing efficient irrigation standards.
 - (C) Requires the department to provide or otherwise identify data regarding the unique local conditions to support the calculation of an urban water use objective.
 - (D) Provides for the use of alternative sources of data if alternative sources are shown to be as accurate as, or more accurate than, the data provided by the department.
 - (E) Requires annual reporting of the previous year's water use with the urban water use objective.
 - (F) Provides a bonus incentive for the amount of potable recycled water used the previous year when comparing the previous year's water use with the urban water use objective, of up to 10 percent of the urban water use objective.
- (3) This chapter requires the department and the board to solicit broad public participation from stakeholders and other interested persons in the development of the standards and the adoption of regulations pursuant to this chapter.
- (4) This chapter preserves the Legislature's authority over long- term water use efficiency target setting and ensures appropriate legislative oversight of the implementation of this chapter by doing all of the following:
 - (A) Requiring the Legislative Analyst to conduct a review of the implementation of this chapter, including compliance with the adopted standards and regulations, accuracy of the data, use of alternate data, and other issues the Legislative Analyst deems appropriate.
 - (B) Stating legislative intent that the director of the department and the chairperson of the board appear before the appropriate Senate and Assembly policy committees to report on progress in implementing this chapter.
 - (C) Providing one-time-only authority to the department and board to adopt water use efficiency standards, except as explicitly provided in this chapter. Authorization to update the standards shall require separate legislation.

- (c) It is the intent of the Legislature that the following principles apply to the development and implementation of long-term standards and urban water use objectives:
 - (1) Local urban retail water suppliers should have primary responsibility for meeting standards-based water use targets, and they shall retain the flexibility to develop their water supply portfolios, design and implement water conservation strategies, educate their customers, and enforce their rules.
 - (2) Long-term standards and urban water use objectives should advance the state's goals to mitigate and adapt to climate change.
 - (3) Long-term standards and urban water use objectives should acknowledge the shade, air quality, and heat-island reduction benefits provided to communities by trees through the support of water-efficient irrigation practices that keep trees healthy.
 - (4) The state should identify opportunities for streamlined reporting, eliminate redundant data submissions, and incentivize open access to data collected by urban and agricultural water suppliers.

Section 10609.2.

- (a) The board, in coordination with the department, shall adopt long-term standards for the efficient use of water pursuant to this chapter on or before June 30, 2022.
- (b) Standards shall be adopted for all of the following:
 - (1) Outdoor residential water use.
 - (2) Outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use.
 - (3) A volume for water loss.
- (c) When adopting the standards under this section, the board shall consider the policies of this chapter and the proposed efficiency standards' effects on local wastewater management, developed and natural parklands, and urban tree health. The standards and potential effects shall be identified by May 30, 2022. The board shall allow for public comment on potential effects identified by the board under this subdivision.
- (d) The long-term standards shall be set at a level designed so that the water use objectives, together with other demands excluded from the long-term standards such as CII indoor water use and CII outdoor water use not connected to a dedicated landscape meter, would exceed the statewide conservation targets required pursuant to Chapter 3 (commencing with Section 10608.16).

- (e) The board, in coordination with the department, shall adopt by regulation variances recommended by the department pursuant to Section 10609.14 and guidelines and methodologies pertaining to the calculation of an urban retail water supplier's urban water use objective recommended by the department pursuant to Section 10609.16.

Section 10609.4.

(a)

- (1) Until January 1, 2025, the standard for indoor residential water use shall be 55 gallons per capita daily.
- (2) Beginning January 1, 2025, and until January 1, 2030, the standard for indoor residential water use shall be 47 gallons per capita daily.
- (3) Beginning January 1, 2030, the standard for indoor residential water use shall be 42 gallons per capita daily.

(b)

- (1) The department, in coordination with the board, shall conduct necessary studies and investigations to assess and quantify the economic benefits and impacts of the 2030 indoor residential use standard on water, wastewater, and recycled water systems and shall include saturation end-use studies. The studies and investigations shall build on the standards and potential effects identified pursuant to subdivision (c) of Section 10609.2 and shall also consider, and as appropriate incorporate, other regional and statewide studies that quantify the impacts on water, wastewater, and recycled water systems, and evaluate the long-term effects of telework. To facilitate these studies and investigations, the board may request necessary and relevant information from wastewater agencies, including monthly influent flow, actions taken to reassess treatment processes, and the impact of the implementation of this chapter on wastewater operations, maintenance, and capital investment. The department, in coordination with the board, shall summarize the findings of these studies and investigations in a report to the Legislature on or before October 1, 2028. The report shall be submitted in compliance with Section 9795 of the Government Code.
- (2) If the department, in coordination with the board, determines that the 2030 indoor residential use standard is likely to unduly impact affordability of water and wastewater services, the department and the board may jointly recommend to the Legislature an alternate date on which the 2030 indoor residential use standard shall take effect. This determination shall be made using at least two years of data reflecting application of the 2025 indoor residential use standard.

- (3) Based upon the studies and investigations conducted pursuant to paragraph (1), the department shall consider whether to recommend, for adoption by the board, additional variances to accommodate unique challenges related to residential indoor water use pursuant to Section 10609.2. Variance options may include, but are not limited to, stranded assets, impacts on disadvantaged communities, impacts to environmental flows, or adverse impacts to wastewater or recycled water operations.
- (4) The studies, investigations, and report described in paragraph (1) shall include timely and inclusive collaboration with, and input from, a broad group of stakeholders, including, but not limited to, environmental groups, experts in indoor plumbing, water, wastewater, and recycled water agencies.
- (c) An urban retail water supplier shall not be subject to enforcement pursuant to this chapter solely for failing to meet the indoor residential use standard.

Section 10609.6.

- (a)
 - (1) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor residential use for adoption by the board in accordance with this chapter.
 - (2)
 - (A) The standards shall incorporate the principles of the model water efficient landscape ordinance adopted by the department pursuant to the Water Conservation in Landscaping Act (Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code).
 - (B) The standards shall apply to irrigable lands.
 - (C) The standards shall include provisions for swimming pools, spas, and other water features. Ornamental water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, shall be analyzed separately from swimming pools and spas.
- (b) The department shall, by January 1, 2021, provide each urban retail water supplier with data regarding the area of residential irrigable lands in a manner that can reasonably be applied to the standards adopted pursuant to this section.
- (c) The department shall not recommend standards pursuant to this section until it has conducted pilot projects or studies, or some combination of the two, to ensure that the data provided to local agencies are reasonably accurate for the

data's intended uses, taking into consideration California's diverse landscapes and community characteristics.

Section 10609.8.

- (a) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, standards for outdoor irrigation of landscape areas with dedicated irrigation meters or other means of calculating outdoor irrigation use in connection with CII water use for adoption by the board in accordance with this chapter.
- (b) The standards shall incorporate the principles of the model water efficient landscape ordinance adopted by the department pursuant to the Water Conservation in Landscaping Act (Article 10.8 (commencing with Section 65591) of Chapter 3 of Division 1 of Title 7 of the Government Code).
- (c) The standards shall include an exclusion for water for commercial agricultural use meeting the definition of subdivision (b) of Section 51201 of the Government Code.

Section 10609.9.

For purposes of Sections 10609.6 and 10609.8, "principles of the model water efficient landscape ordinance" means those provisions of the model water efficient landscape ordinance applicable to the establishment or determination of the amount of water necessary to efficiently irrigate both new and existing landscapes. These provisions include, but are not limited to, all of the following:

- (a) Evapotranspiration adjustment factors, as applicable.
- (b) Landscape area.
- (c) Maximum applied water allowance.
- (d) Reference evapotranspiration.
- (e) Special landscape areas, including provisions governing evapotranspiration adjustment factors for different types of water used for irrigating the landscape.

Section 10609.10.

- (a) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, performance measures for CII water use for adoption by the board in accordance with this chapter.
- (b) Prior to recommending performance measures for CII water use, the department shall solicit broad public participation from stakeholders and other interested persons relating to all of the following:

- (1) Recommendations for a CII water use classification system for California that address significant uses of water.
 - (2) Recommendations for setting minimum size thresholds for converting mixed CII meters to dedicated irrigation meters, and evaluation of, and recommendations for, technologies that could be used in lieu of requiring dedicated irrigation meters.
 - (3) Recommendations for CII water use best management practices, which may include, but are not limited to, water audits and water management plans for those CII customers that exceed a recommended size, volume of water use, or other threshold.
- (c) Recommendations of appropriate performance measures for CII water use shall be consistent with the October 21, 2013, report to the Legislature by the Commercial, Industrial, and Institutional Task Force entitled “Water Use Best Management Practices,” including the technical and financial feasibility recommendations provided in that report, and shall support the economic productivity of California’s commercial, industrial, and institutional sectors.
- (b)
- (1) The board, in coordination with the department, shall adopt performance measures for CII water use on or before June 30, 2022.
 - (2) Each urban retail water supplier shall implement the performance measures adopted by the board pursuant to paragraph (1).

Section 10609.12.

The standards for water loss for urban retail water suppliers shall be the standards adopted by the board pursuant to subdivision (i) of Section 10608.34.

Section 10609.14.

- (a) The department, in coordination with the board, shall conduct necessary studies and investigations and, no later than October 1, 2021, recommend for adoption by the board in accordance with this chapter appropriate variances for unique uses that can have a material effect on an urban retail water supplier’s urban water use objective.
- (b) Appropriate variances may include, but are not limited to, allowances for the following:
 - (1) Significant use of evaporative coolers.
 - (2) Significant populations of horses and other livestock.
 - (3) Significant fluctuations in seasonal populations.
 - (4) Significant landscaped areas irrigated with recycled water having high levels of total dissolved solids.

- (5) Significant use of water for soil compaction and dust control.
- (6) Significant use of water to supplement ponds and lakes to sustain wildlife.
- (7) Significant use of water to irrigate vegetation for fire protection.
- (8) Significant use of water for commercial or noncommercial agricultural use.
- (d) The department, in recommending variances for adoption by the board, shall also recommend a threshold of significance for each recommended variance.
- (e) Before including any specific variance in calculating an urban retail water supplier's water use objective, the urban retail water supplier shall request and receive approval by the board for the inclusion of that variance.
- (f) The board shall post on its Internet Web site all of the following:
 - (1) A list of all urban retail water suppliers with approved variances.
 - (2) The specific variance or variances approved for each urban retail water supplier.
 - (3) The data supporting approval of each variance.

Section 10609.15.

To help streamline water data reporting, the department and the board shall do all of the following:

- (a) Identify urban water reporting requirements shared by both agencies, and post on each agency's Internet Web site how the data is used for planning, regulatory, or other purposes.
- (b) Analyze opportunities for more efficient publication of urban water reporting requirements within each agency, and analyze how each agency can integrate various data sets in a publicly accessible location, identify priority actions, and implement priority actions identified in the analysis.
- (c) Make appropriate data pertaining to the urban water reporting requirements that are collected by either agency available to the public according to the principles and requirements of the Open and Transparent Water Data Act (Part 4.9 (commencing with Section 12400)).

Section 10609.16.

The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, guidelines and methodologies for the board to adopt that identify how an urban retail water supplier calculates its urban water use objective. The guidelines and methodologies shall address, as necessary, all of the following:

- (a) Determining the irrigable lands within the urban retail water supplier's service area.
- (b) Updating and revising methodologies described pursuant to subparagraph (A) of paragraph (1) of subdivision (h) of Section 10608.20, as appropriate, including methodologies for calculating the population in an urban retail water supplier's service area.
- (c) Using landscape area data provided by the department or alternative data.
- (d) Incorporating precipitation data and climate data into estimates of a urban retail water supplier's outdoor irrigation budget for its urban water use objective.
- (e) Estimating changes in outdoor landscape area and population, and calculating the urban water use objective, for years when updated landscape imagery is not available from the department.
- (f) Determining acceptable levels of accuracy for the supporting data, the urban water use objective, and compliance with the urban water use objective.

Section 10609.18.

The department and the board shall solicit broad public participation from stakeholders and other interested persons in the development of the standards and the adoption of regulations pursuant to this chapter. The board shall hold at least one public meeting before taking any action on any standard or variance recommended by the department.

Section 10609.20.

- (a) Each urban retail water supplier shall calculate its urban water use objective no later than January 1, 2024, and by January 1 every year thereafter.
- (b) The calculation shall be based on the urban retail water supplier's water use conditions for the previous calendar or fiscal year.
- (c) Each urban water supplier's urban water use objective shall be composed of the sum of the following:
 - (1) Aggregate estimated efficient indoor residential water use.
 - (2) Aggregate estimated efficient outdoor residential water use.
 - (3) Aggregate estimated efficient outdoor irrigation of landscape areas with dedicated irrigation meters or equivalent technology in connection with CII water use.
 - (4) Aggregate estimated efficient water losses.
 - (5) Aggregate estimated water use in accordance with variances, as appropriate.

(d)

- (1) An urban retail water supplier that delivers water from a groundwater basin, reservoir, or other source that is augmented by potable reuse water may adjust its urban water use objective by a bonus incentive calculated pursuant to this subdivision.
- (2) The water use objective bonus incentive shall be the volume of its potable reuse delivered to residential water users and to landscape areas with dedicated irrigation meters in connection with CII water use, on an acre-foot basis.
- (3) The bonus incentive pursuant to paragraph (1) shall be limited in accordance with one of the following:
 - (A) The bonus incentive shall not exceed 15 percent of the urban water supplier's water use objective for any potable reuse water produced at an existing facility.
 - (B) The bonus incentive shall not exceed 10 percent of the urban water supplier's water use objective for any potable reuse water produced at any facility that is not an existing facility.
- (4) For purposes of this subdivision, "existing facility" means a facility that meets all of the following:
 - (A) The facility has a certified environmental impact report, mitigated negative declaration, or negative declaration on or before January 1, 2019.
 - (B) The facility begins producing and delivering potable reuse water on or before January 1, 2022.
 - (C) The facility uses microfiltration and reverse osmosis technologies to produce the potable reuse water.

(e)

- (1) The calculation of the urban water use objective shall be made using landscape area and other data provided by the department and pursuant to the standards, guidelines, and methodologies adopted by the board. The department shall provide data to the urban water supplier at a level of detail sufficient to allow the urban water supplier to verify its accuracy at the parcel level.
- (2) Notwithstanding paragraph (1), an urban retail water supplier may use alternative data in calculating the urban water use objective if the supplier demonstrates to the department that the alternative data are equivalent, or superior, in quality and accuracy to the data provided by the department. The department may provide technical assistance to an

urban retail water supplier in evaluating whether the alternative data are appropriate for use in calculating the supplier's urban water use objective.

Section 10609.21.

- (a) For purposes of Section 10609.20, and notwithstanding paragraph (4) of subdivision (d) of Section 10609.20, "existing facility" also includes the North City Project, phase one of the Pure Water San Diego Program, for which an environmental impact report was certified on April 10, 2018.
- (b) This section shall become operative on January 1, 2019.

Section 10609.22.

- (a) An urban retail water supplier shall calculate its actual urban water use no later than January 1, 2024, and by January 1 every year thereafter.
- (b) The calculation shall be based on the urban retail water supplier's water use for the previous calendar or fiscal year.
- (c) Each urban water supplier's urban water use shall be composed of the sum of the following:
 - (1) Aggregate residential water use.
 - (2) Aggregate outdoor irrigation of landscape areas with dedicated irrigation meters in connection with CII water use.
 - (3) Aggregate water losses.

Section 10609.24.

- (a) An urban retail water supplier shall submit a report to the department no later than January 1, 2024, and by January 1 every year thereafter. The report shall include all of the following:
 - (1) The urban water use objective calculated pursuant to Section 10609.20 along with relevant supporting data.
 - (2) The actual urban water use calculated pursuant to Section 10609.22 along with relevant supporting data.
 - (3) Documentation of the implementation of the performance measures for CII water use.
 - (4) A description of the progress made towards meeting the urban water use objective.
 - (5) The validated water loss audit report conducted pursuant to Section 10608.34.
- (b) The department shall post the reports and information on its internet website.

- (c) The board may issue an information order or conservation order to, or impose civil liability on, an entity or individual for failure to submit a report required by this section.

Section 10609.25.

As part of the first report submitted to the department by an urban retail water supplier no later than January 1, 2024, pursuant to subdivision (a) of Section 10609.24, each urban retail water supplier shall provide a narrative that describes the water demand management measures that the supplier plans to implement to achieve its urban water use objective by January 1, 2027.

Section 10609.26.

- (a)
 - (1) On and after January 1, 2024, the board may issue informational orders pertaining to water production, water use, and water conservation to an urban retail water supplier that does not meet its urban water use objective required by this chapter. Informational orders are intended to obtain information on supplier activities, water production, and conservation efforts in order to identify technical assistance needs and assist urban water suppliers in meeting their urban water use objectives.
 - (2) In determining whether to issue an informational order, the board shall consider the degree to which the urban retail water supplier is not meeting its urban water use objective, information provided in the report required by Section 10609.24, and actions the urban retail water supplier has implemented or will implement in order to help meet the urban water use objective.
 - (3) The board shall share information received pursuant to this subdivision with the department.
 - (4) An urban water supplier may request technical assistance from the department. The technical assistance may, to the extent available, include guidance documents, tools, and data.
- (b) On and after January 1, 2025, the board may issue a written notice to an urban retail water supplier that does not meet its urban water use objective required by this chapter. The written notice may warn the urban retail water supplier that it is not meeting its urban water use objective described in Section 10609.20 and is not making adequate progress in meeting the urban water use objective, and may request that the urban retail water supplier address areas of concern in its next annual report required by Section 10609.24. In deciding whether to issue a written notice, the board may consider whether the urban retail water supplier has received an informational order, the degree to which the urban retail water supplier is not

meeting its urban water use objective, information provided in the report required by Section 10609.24, and actions the urban retail water supplier has implemented or will implement in order to help meet its urban water use objective.

- (1) On and after January 1, 2026, the board may issue a conservation order to an urban retail water supplier that does not meet its urban water use objective. A conservation order may consist of, but is not limited to, referral to the department for technical assistance, requirements for education and outreach, requirements for local enforcement, and other efforts to assist urban retail water suppliers in meeting their urban water use objective.
 - (2) In issuing a conservation order, the board shall identify specific deficiencies in an urban retail water supplier's progress towards meeting its urban water use objective, and identify specific actions to address the deficiencies.
 - (3) The board may request that the department provide an urban retail water supplier with technical assistance to support the urban retail water supplier's actions to remedy the deficiencies.
- (c) A conservation order issued in accordance with this chapter may include requiring actions intended to increase water-use efficiency, but shall not curtail or otherwise limit the exercise of a water right, nor shall it require the imposition of civil liability pursuant to Section 377.

Section 10609.27.

Notwithstanding Section 10609.26, the board shall not issue an information order, written notice, or conservation order pursuant to Section 10609.26 if both of the following conditions are met:

- (a) The board determines that the urban retail water supplier is not meeting its urban water use objective solely because the volume of water loss exceeds the urban retail water supplier's standard for water loss.
- (b) Pursuant to Section 10608.34, the board is taking enforcement action against the urban retail water supplier for not meeting the performance standards for the volume of water losses.

Section 10609.28.

The board may issue a regulation or informational order requiring a wholesale water supplier, an urban retail water supplier, or a distributor of a public water supply, as that term is used in Section 350, to provide a monthly report relating to water production, water use, or water conservation.

Section 10609.30.

On or before January 10, 2024, the Legislative Analyst shall provide to the appropriate policy committees of both houses of the Legislature and the public a report evaluating the implementation of the water use efficiency standards and water use reporting pursuant to this chapter. The board and the department shall provide the Legislative Analyst with the available data to complete this report.

- (a) The report shall describe all of the following:
- (1) The rate at which urban retail water users are complying with the standards, and factors that might facilitate or impede their compliance.
 - (2) The accuracy of the data and estimates being used to calculate urban water use objectives.
 - (3) Indications of the economic impacts, if any, of the implementation of this chapter on urban water suppliers and urban water users, including CII water users.
 - (4) The frequency of use of the bonus incentive, the volume of water associated with the bonus incentive, value to urban water suppliers of the bonus incentive, and any implications of the use of the bonus incentive on water use efficiency.
 - (5) The early indications of how implementing this chapter might impact the efficiency of statewide urban water use.
 - (6) Recommendations, if any, for improving statewide urban water use efficiency and the standards and practices described in this chapter.
 - (7) Any other issues the Legislative Analyst deems appropriate.

Section 10609.32.

It is the intent of the Legislature that the chairperson of the board and the director of the department appear before the appropriate policy committees of both houses of the Legislature on or around January 1, 2026, and report on the implementation of the water use efficiency standards and water use reporting pursuant to this chapter. It is the intent of the Legislature that the topics to be covered include all of the following:

- (a) The rate at which urban retail water suppliers are complying with the standards, and factors that might facilitate or impede their compliance.
- (b) What enforcement actions have been taken, if any.
- (c) The accuracy of the data and estimates being used to calculate urban water use objectives.

- (d) Indications of the economic impacts, if any, of the implementation of this chapter on urban water suppliers and urban water users, including CII water users.
- (e) The frequency of use of the bonus incentive, the volume of water associated with the bonus incentive, value to urban water suppliers of the bonus incentive, and any implications of the use of the bonus incentive on water use efficiency.
- (f) An assessment of how implementing this chapter is affecting the efficiency of statewide urban water use.

Section 10609.34.

Notwithstanding Section 15300.2 of Title 14 of the California Code of Regulations, an action of the board taken under this chapter shall be deemed to be a Class 8 action, within the meaning of Section 15308 of Title 14 of the California Code of Regulations, provided that the action does not involve relaxation of existing water conservation or water use standards.

Section 10609.36.

- (a) Nothing in this chapter shall be construed to determine or alter water rights. Sections 1010 and 1011 apply to water conserved through implementation of this chapter.
- (b) Nothing in this chapter shall be construed to authorize the board to update or revise water use efficiency standards authorized by this chapter except as explicitly provided in this chapter. Authorization to update the standards beyond that explicitly provided in this chapter shall require separate legislation.
- (c) Nothing in this chapter shall be construed to limit or otherwise affect the use of recycled water as seawater barriers for groundwater salinity management.

Section 10609.38.

The board may waive the requirements of this chapter for a period of up to five years for any urban retail water supplier whose water deliveries are significantly affected by changes in water use as a result of damage from a disaster such as an earthquake or fire. In establishing the period of a waiver, the board shall take into consideration the breadth of the damage and the time necessary for the damaged areas to recover from the disaster.

Urban Water Management Planning Act

This section contains information extracted from Water Code Division 6, *Conservation, Development, and Utilization of State Water Resources*, [Part 2.6, Urban Water Management Planning](#). Click on any section header below to read Water Code directly at the [California Legislative Information website](#).

Chapter 1. General Declaration and Policy, Sections 10610–10610.4

[Section 10610.](#)

This part shall be known and may be cited as the “Urban Water Management Planning Act.”

[Section 10610.2.](#)

- (a) The Legislature finds and declares all of the following:
- (1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.
 - (2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.
 - (3) A long-term, reliable supply of water is essential to protect the productivity of California’s businesses and economic climate, and increasing long-term water conservation among Californians, improving water use efficiency within the state’s communities and agricultural production, and strengthening local and regional drought planning are critical to California’s resilience to drought and climate change.
 - (4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years now and into the foreseeable future, and every urban water supplier should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning.
 - (5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.
 - (6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require

specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

- (7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.
 - (8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.
 - (9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.
- (b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

Section 10610.4.

The Legislature finds and declares that it is the policy of the state as follows:

- (a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.
- (b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.
- (c) Urban water suppliers shall be required to develop water management plans to achieve the efficient use of available supplies and strengthen local drought planning.

Chapter 2. Definitions, Sections 10611–10618

Section 10611.

Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

Section 10611.3.

“Customer” means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

Section 10611.5.

“Demand management” means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

Section 10612.

“Drought risk assessment” means a method that examines water shortage risks based on the driest five-year historic sequence for the agency’s water supply, as described in subdivision (b) of Section 10635.

Section 10613.

“Efficient use” means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

Section 10614.

“Person” means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

Section 10615.

“Plan” means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

Section 10616.

“Public agency” means any board, commission, county, city and county, city, regional agency, district, or other public entity.

Section 10616.5.

“Recycled water” means the reclamation and reuse of wastewater for beneficial use.

Section 10617.

“Urban water supplier” means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

Section 10617.5.

“Water shortage contingency plan” means a document that incorporates the provisions detailed in subdivision (a) of Section 10632 and is subsequently adopted by an urban water supplier pursuant to this article.

Section 10618.

“Water supply and demand assessment” means a method that looks at current year and one or more dry year supplies and demands for determining water shortage risks, as described in Section 10632.1.

Chapter 3. Urban Water Management Plans

Article 1. General Provisions, Sections 10620–10621

Section 10620.

- (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).
- (b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.
- (c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.
- (d)
 - (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water

management planning where those plans will reduce preparation costs and contribute to the achievement of conservation, efficient water use, and improved local drought resilience.

- (2) Notwithstanding paragraph (1), each urban water supplier shall develop its own water shortage contingency plan, but an urban water supplier may incorporate, collaborate, and otherwise share information with other urban water suppliers or other governing entities participating in an areawide, regional, watershed, or basinwide urban water management plan, an agricultural management plan, or groundwater sustainability plan development.
- (3) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.
- (e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.
- (f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

Section 10621.

- (a) Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.
- (b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.
- (c) An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier's general rate case filings.
- (d) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).
- (e) Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.

- (f) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

Article 2. Contents of Plans, Sections 10630–10634

Section 10630.

It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied, while accounting for impacts from climate change.

Section 10630.5.

Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

Section 10631.

A plan shall be adopted in accordance with this chapter that shall do all of the following:

- (a) Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.
- (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:
 - (1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the

drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

- (2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.
- (3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.
- (4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:
 - (A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.
 - (B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater.
 - (C) For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).
 - (D) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.
 - (E) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water

supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

- (c) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.
- (d)
 - (1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:
 - (A) Single-family residential.
 - (B) Multifamily.
 - (C) Commercial.
 - (D) Industrial.
 - (E) Institutional and governmental.
 - (F) Landscape.
 - (G) Sales to other agencies.
 - (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
 - (I) Agricultural.
 - (J) Distribution system water loss.
 - (2) The water use projections shall be in the same five-year increments described in subdivision (a).
 - (3)
 - (A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.
 - (B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.
 - (C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met

the distribution loss standards enacted by the board pursuant to Section 10608.34.

(4)

- (A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.
 - (B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:
 - (i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.
 - (ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.
- (a) Provide a description of the supplier's water demand management measures. This description shall include all of the following:
- (1)
- (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.
 - (B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:
 - (i) Water waste prevention ordinances.
 - (ii) Metering.
 - (iii) Conservation pricing.
 - (iv) Public education and outreach.
 - (v) Programs to assess and manage distribution system real loss.
 - (vi) Water conservation program coordination and staffing support.
 - (vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

- (2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.
- (f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.
- (g) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.
- (h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five- year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

Section 10631.1.

- (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.
- (b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under

Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

Section 10631.2.

- (a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:
 - (1) An estimate of the amount of energy used to extract or divert water supplies.
 - (2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
 - (3) An estimate of the amount of energy used to treat water supplies.
 - (4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.
 - (5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
 - (6) An estimate of the amount of energy used to place water into or withdraw from storage.
 - (7) Any other energy-related information the urban water supplier deems appropriate.
- (b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.
- (c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

Section 10632.

- (a) Every urban water supplier shall prepare and adopt a water shortage contingency plan as part of its urban water management plan that consists of each of the following elements:
 - (1) The analysis of water supply reliability conducted pursuant to Section 10635.
 - (2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:
 - (A) The written decision making process that an urban water supplier will use each year to determine its water supply reliability.

- (B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:
 - (i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.
 - (ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.
 - (iii) Existing infrastructure capabilities and plausible constraints.
 - (iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.
 - (v) A description and quantification of each source of water supply.
- (3)
 - (A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.
 - (B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.
- (4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:
 - (A) Locally appropriate supply augmentation actions.
 - (B) Locally appropriate demand reduction actions to adequately respond to shortages.
 - (C) Locally appropriate operational changes.

- (D) Additional, mandatory prohibitions against specific water use practices that are in addition to state- mandated prohibitions and appropriate to the local conditions.
 - (E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.
- (5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:
- (A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.
 - (B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.
 - (C) Any other relevant communications.
- (6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.
- (7)
- (A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.
 - (B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.
 - (C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.
- (8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:
- (A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

- (B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).
- (C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.
- (9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.
- (10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.
- (b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.
- (c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

Section 10632.1.

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

Section 10632.2.

An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from

taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

Section 10632.3.

It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

Section 10632.5.

- (a) In addition to the requirements of paragraph (3) of subdivision of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.
- (b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.
- (c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106- 390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

Section 10633.

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

- (a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.
- (b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.
- (c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

- (d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.
- (e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.
- (f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.
- (g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

Section 10634.

The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Article 2.5. Water Service Reliability, Section 10635

Section 10635.

- (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.
- (b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included

in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:

- (1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.
 - (2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.
 - (3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.
 - (4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.
- (c) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.
- (d) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.
- (e) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Article 3. Adoption and Implementation of Plans, Sections 10640–10645

Section 10640.

- (a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.
- (b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of

Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

Section 10641.

An urban water supplier required to prepare a plan or a water shortage contingency plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

Section 10642.

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

Section 10643.

An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

Section 10644.

(a)

- (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.
- (2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall

include any standardized forms, tables, or displays specified by the department.

- (b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.
- (c)
 - (1)
 - (A) Notwithstanding Section 10231.5 of the Government Code, the department shall prepare and submit to the Legislature, on or before July 1, in the years ending in seven and two, a report summarizing the status of the plans and water shortage contingency plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans and water shortage contingency plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan and water shortage contingency plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans and water shortage contingency plans submitted pursuant to this part.
 - (B) The department shall prepare and submit to the board, on or before September 30 of each year, a report summarizing the submitted water supply and demand assessment results along with appropriate reported water shortage conditions and the regional and statewide analysis of water supply conditions developed by the department. As part of the report, the department shall provide a summary and, as appropriate, urban water supplier specific information regarding various shortage response actions implemented as a result of annual supplier-specific water supply and demand assessments performed pursuant to Section 10632.1.
 - (C) The department shall submit the report to the Legislature for the 2015 plans by July 1, 2017, and the report to the Legislature for the 2020 plans and water shortage contingency plans by July 1, 2022.
 - (2) A report to be submitted pursuant to subparagraph (A) of paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.
- (d) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

Section 10645.

- (a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.
- (b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

Chapter 4. Miscellaneous Provisions, Sections 10650–10657

Section 10650.

Any actions or proceedings, other than actions by the board, to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

- (a) An action or proceeding alleging failure to adopt a plan or a water shortage contingency plan shall be commenced within 18 months after that adoption is required by this part.
- (b) Any action or proceeding alleging that a plan or water shortage contingency plan, or action taken pursuant to either, does not comply with this part shall be commenced within 90 days after filing of the plan or water shortage contingency plan or an amendment to either pursuant to Section 10644 or the taking of that action.

Section 10651.

In any action or proceeding to attack, review, set aside, void, or annul a plan or a water shortage contingency plan, or an action taken pursuant to either by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

Section 10652.

The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the

plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

Section 10653.

The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the board and the Public Utilities Commission, for the preparation of water management plans, water shortage contingency plans, or conservation plans; provided, that if the board or the Public Utilities Commission requires additional information concerning water conservation, drought response measures, or financial conditions to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan that complies with analogous federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

Section 10654.

An urban water supplier may recover in its rates the costs incurred in preparing its urban water management plan, its drought risk assessment, its water supply and demand assessment, and its water shortage contingency plan and implementing the reasonable water conservation measures included in either of the plans.

Section 10655.

If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

Section 10656.

An urban water supplier is not eligible for a water grant or loan awarded or administered by the state unless the urban water supplier complies with this part.

Section 10657.

The department may adopt regulations regarding the definitions of water, water use, and reporting periods, and may adopt any other regulations deemed necessary or desirable to implement this part. In developing regulations pursuant to this section, the department shall solicit broad public participation from stakeholders and other interested persons.



Appendix D: Dept. of Water Resources UWMP Checklist

City of California City 2025 Urban Water Management Plan

2025 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	Relevant Submittal Table	2025 UWMP Location
Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and overview	n/a	Executive Summary
Chapter 1	10630.5	Each plan shall include a simple description of the Supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a Supplier may also choose to include a simple description at the beginning of each chapter.	Plan preparation	n/a	Executive Summary
Section 2.1	10620(b)	Every person that becomes a Supplier shall adopt UWMP within one year after it has become a Supplier.	Plan preparation	n/a	Section 1.2 / Appendix A
Section 2.5	10644	Supplier shall report the Public Water Systems number, volume of delivered water, and number of connections that are included in this UWMP.	Plan preparation	2-1	Section 2.6.2 & 6.6 / Appendix E
Section 2.5	10644	Supplier shall report if this UWMP is an individual UWMP and whether the Supplier belongs to a regional UWMP or regional alliance.	Plan preparation	2-2	Appendix E
Section 2.5	10644	Supplier shall report whether the data is in fiscal or calendar years and the units of measure used for reporting water volumes.	Plan preparation	2-3	Appendix E
Section 2.4	10642	Provide supporting documentation that the Supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan preparation	n/a	Section 1.2 / Section 8.4
Section 2.4.2	10620(d)(3)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other Suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan preparation	n/a	Section 1.2
Section 2.4.1	10631(h)	Retail Suppliers will include documentation that they have provided their Wholesale Supplier(s)—if any—with water use projections from that source.	Plan preparation	2-4 R	Section 3.9
Section 2.4.1	10631(h)	Wholesale Suppliers will provide their Suppliers with identification and quantification of the existing and planned sources of water available from the Wholesale Supplier to the Supplier during various water year types.	Plan preparation	2-4 W	N/A
Chapter 3.0	10631(a)	Describe the Supplier service area.	System description	n/a	Section 2.2
Section 3.3	10631(a)	Describe the climate of the Supplier's service area.	System description	n/a	Section 2.4
Section 3.4.1	10631(a)	Provide the current and projected service area populations for 2030, 2035, 2040, 2045 and optionally 2050.	System description	3-1	Section 2.5 / Table 2.4 & 2.5
Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the Supplier's water management planning.	System description	n/a	N/A
Section 3.5	10631(a)	Describe the land uses within the service area... include the current and projected land uses within the existing or anticipated service area affecting the Supplier's water management planning. Describe the land uses within the service area.	System description and baselines	n/a	Section 2.3
Sections 4.2.3 and 4.2.4	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System water use	4-1 and 4-2	Sections 6.5 & 6.6 / Section 6.9.3 Table 6.1 - 6.4 / Table 6.8
Section 4.3.1	10631(d)(3)(A)	Report the distribution system water loss for each of the five years preceding the plan update.	System water use	4-5	Sections 6.6.2 & 6.6.3 / Table 6.4
Section 4.3.2	10631(d)(3)(C)	Retail Suppliers shall provide data to show the distribution loss standards were met.	System water use	4-6	Sections 6.6 & 6.8 / Section 9.4.5
Section 4.2.5.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the Supplier.	System water use	4-3	Sections 6.9.2
Section 4.2.5.3	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System water use	4-3	Sections 6.9.1 & 6.9.3 / Section 9.4
Section 4.2.5.3	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System water use	4-3	Sections 6.8 & 6.9
Section 4.2.5.3	10631(d)(4)(B)(ii)	To the extent that a Supplier reports the information described in subparagraph (A), an urban water Supplier shall... Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.	System water use	4-3	N/A
Section 4.2.5.6	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System water use	n/a	Sections 7.1 - 7.3
Section 5.1	10608.36	Wholesale Suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their Retail Suppliers achieve targeted water use reductions.	Baselines and targets	n/a	N/A
Section 5.2	10608.4	Retail Suppliers shall report on their compliance in meeting their water use targets. Reporting requirements will vary depending on whether the Supplier: - Was considered an urban retail water supplier in 2020, - Met its 2020 target in 2020, or - Was part of a merger or consolidation since 2020. Chapter 5 Subsections 5.2.1, 5.2.2, and 5.2.3 address each of these situations.	Baselines and targets	5-1	Sections 6.8 & 6.9
Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System supplies	n/a	Section 3 / Sections 7.6 & 7.8
Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change.	System supplies	n/a	Sections 7.5 & 7.6
Section 6.2.2	10631(b)(4)(C)	Indicate whether groundwater is an existing or planned source of water available to the Supplier. If groundwater is identified as an existing or planned source of water... (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	Water supplies and recycled water	6-1	Sections 3.4 & 3.8
Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the Supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System supplies	n/a	Sections 3.4 & 3.8

Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System supplies	n/a	Section 3.4
Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the Supplier has the legal right to pump.	System supplies	n/a	Section 3.4
Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins... (include) information as to whether DWR has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin...	Water supplies and recycled water	n/a	N/A
Section 6.2.2	10631(b)(4)(B)	For unadjudicated basins... describe efforts by the Supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	Water supplies and recycled water	n/a	N/A
Section 6.2.2.	10631(b)(4)(C)	If groundwater is identified as an existing or planned source of water... (include) a detailed description and analysis of the location, amount and sufficiency of groundwater pumped by the Supplier for the past five years.	System supplies	n/a	Sections 3.4 & 3.8
Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System supplies	6-9	Sections 3.7 & 3.8
Section 6.1	10631(b)	Identify and quantify the existing and planned sources of water available for 2025, 2030, 2035, 2040, 2045 and optionally 2050.	System supplies	6-8 and 6-9	Sections 2.6 & 7.6 / Table 7.1 - 7.7
Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System supplies	n/a	Section 3.12
Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the Supplier's service area with quantified amount of collection and treatment and the disposal methods.	System supplies (recycled water)	6-2	Section 4.2
Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System supplies (recycled water)	6-3	Section 4.2.1
Section 6.2.5	10633(c)	Describe the recycled water currently being used in the Supplier's service area.	System supplies (recycled water)	6-4	Section 4.3
Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System supplies (recycled water)	6-4	Section 4.3.1
Section 6.2.5	10633(e)	Describe the projected use of recycled water within the Supplier's service area at the end of 5, 10, 15, and 20 years, and describe the actual use of recycled water in comparison to uses previously projected.	System supplies (recycled water)	6-4 and 6-5	Section 4.3
Section 6.2.5	10633(f)	Describe the actions that may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System supplies (recycled water)	6-6	Section 8.11
Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the Supplier's service area.	System supplies (recycled water)	n/a	Section 4.3
Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System supplies	6-7	N/A
Section 6.2.10	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water Supplier to address water supply reliability in average, single-dry, and for a period of drought lasting five consecutive water years.	System supplies	6-7	Sections 7.6 & 7.7
Section 6.3 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a Supplier can readily obtain.	System suppliers, energy intensity	O-1A, O-1B, O-1C, and O-2	N/A
Section 7.1	10634	Provide information on the quality of existing sources of water available to the Supplier and the manner in which water quality affects water management strategies and supply reliability.	Water supply reliability assessment	n/a	Section 5
Section 7.2	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the Supplier with the total projected water use over the next 20 years.	Water supply reliability assessment	7-2, 7-3, and 7-4	Sections 7.5 & 7.6
Section 7.2.3	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water supply reliability assessment	n/a	Sections 8 & 9
Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water supply reliability assessment	n/a	Section 7.5
Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive years.	Water supply reliability assessment	n/a	Sections 7.5 & 7.6
Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water supply reliability assessment	n/a	Section 8.4
Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the Supplier with the total projected water use for the drought period.	Water supply reliability assessment	7-5	Section 7.7 / Table 7.1 - 7.7
Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water supply reliability assessment	n/a	Sections 7.1 - 7.3
Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water shortage contingency planning	n/a	Section 8
Chapter 8	10632(a)(1)	Provide an analysis of water supply reliability (from Guidebook Chapter 7) in the WSCP.	Water shortage contingency planning	n/a	Sections 8.4
Section 8.2	10632(a)(2)(A)	Provide the written decision-making process and other methods that the Supplier will use each year to determine its water reliability.	Water shortage contingency planning	n/a	Sections 8.6.1
Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the Supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water shortage contingency planning	n/a	Sections 8.6
Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10%, 20%, 30%, 40%, 50% shortage, and greater than 50% shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water shortage contingency planning	n/a	Section 8.8
Section 8.3	10632(a)(3)(B)	Suppliers with an existing WSCP that uses different water shortage levels must cross reference their categories with the six standard categories.	Water shortage contingency planning	8-1	N/A
Section 8.4	10632(a)(4)(A)	Suppliers with WSCPs that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water shortage contingency planning	8-2	Section 8.8
Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water shortage contingency planning	8-3	Section 8.12
Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water shortage contingency planning	8-2	Sections 8.2
Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to State-mandated prohibitions are appropriate to local conditions.	Water shortage contingency planning	Table 8-3	Section 8.10
Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water shortage contingency planning	8-2 and 8-3	Section 8.8

Section 8.4.6	10632.5	The UWMP shall include a seismic risk assessment and mitigation plan.	Water shortage contingency plan	n/a	Section 8.17
Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water shortage contingency planning	n/a	Section 8.12
Section 8.5	10632(a)(5)(B), 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water shortage contingency planning	n/a	Section 8.12
Section 8.6	10632(a)(6)	Retail Supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water shortage contingency planning	n/a	Section 8.11
Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the Supplier to enforce shortage response actions.	Water shortage contingency planning	n/a	Section 8.3
Section 8.7	10632(a)(7)(B)	Provide a statement that the Supplier will declare a water shortage emergency per Water Code Chapter 3, <i>Water Shortage Emergencies</i> .	Water shortage contingency planning	n/a	Section 8.3
Section 8.7	10632(a)(7)(C)	Provide a statement that the Supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water shortage contingency planning	n/a	Section 8.3
Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Section 8.3
Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water shortage contingency planning	n/a	Section 8.3
Section 8.8	10632(a)(8)(C)	Retail Suppliers must describe the cost of compliance with Water Code Chapter 3.3, <i>Excessive Residential Water Use During Drought</i> .	Water shortage contingency planning	n/a	Section 8.3
Section 8.9	10632(a)(9)	Retail Suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data are collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water shortage contingency planning	n/a	Section 8.11
Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the WSCP to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water shortage contingency planning	n/a	Section 8.11
Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water shortage contingency planning	n/a	Section 8.11
Section 8.12	10632(c)	Make available the WSCP to customers and any city or county where it provides water within 30 days after adoption of the plan.	Water shortage contingency planning	n/a	Section 8.15
Sections 9.1	10631(e)(1)	Retail Suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand management measures	n/a	Section 9
Sections 9.2	10631(e)(2)	Wholesale Suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and Supplier assistance program.	Demand management measures	n/a	N/A
Chapter 10	10608.26(a)	Retail Suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan adoption, submittal, and implementation	n/a	Sections 1.2 & 8.15
Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the Supplier provides water that the Supplier will be reviewing the UWMP and considering amendments or changes to the plan.	Plan adoption, submittal, and implementation	10-1	Section 1.2
Section 10.4	10621(f)	Each urban water Supplier shall update and submit its 2025 plan to DWR by July 1, 2026.	Plan adoption, submittal, and implementation	n/a	Section 1.1
Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the Supplier made the UWMP and WSCP available for public inspection, published notice of the public hearing, and held a public hearing about the UWMP and WSCP.	Plan adoption, submittal, and implementation	n/a	Sections 1.2 & 8.15
Section 10.2.2	10642	The Supplier is to provide the time and place of the hearing to any city or county within which the Supplier provides water.	Plan adoption, submittal, and implementation	10-1	Sections 1.2 & 8.15
Section 10.3.2	10642	Provide supporting documentation that the UWMP and WSCP has been adopted as prepared or modified.	Plan adoption, submittal, and implementation	n/a	Sections 1.2 & 8.15
Section 10.4	10644(a)	Provide supporting documentation that the Supplier has submitted their UWMP to the California State Library.	Plan adoption, submittal, and implementation	n/a	Sections 1.2 & 8.15
Section 10.4	10644(a)(1)	Provide supporting documentation that the Supplier has submitted their UWMP to any city or county within which the Supplier provides water no later than 30 days after adoption.	Plan adoption, submittal, and implementation	n/a	Sections 1.2 & 8.15
Sections 10.4.1 and 10.4.2	10644(a)(2)	The UWMP, or amendments to the UWMP, submitted to DWR shall be submitted electronically.	Plan adoption, submittal, and implementation	n/a	Sections 1.2 & 8.15
Section 10.7.2	10644(b)	If revised, submit a copy of the WSCP to DWR within 30 days of adoption.	Plan adoption, submittal, and implementation	n/a	Sections 1.2 & 8.15
Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its UWMP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Sections 1.2 & 8.15
Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its WSCP with DWR, the Supplier has or will make the plan available for public review during normal business hours.	Plan adoption, submittal, and implementation	n/a	Sections 1.2 & 8.15
Section 10.6	10621(c)	If Supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan adoption, submittal, and implementation	n/a	N/A



Appendix E: Dept. of Water Resources UWMP Data Tables

City of California City 2025 Urban Water Management Plan

Submittal Table 2-1 Retail: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2025	Volume of Water Supplied 2025 (MG)
Add additional rows as needed			
CA1510032	City of California City System	4,942	791
CA1500324	Wonder Acres System	38	6
Total		4,980	797
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3. NOTES: See Section 2.6.2. Number of Municipal Connections for City of California City System was determined as difference in Total and Wonder Acres System. Volume of Water Supplied to Wonder Acres System was determined by applying ratio of Wonder Acres System Number of Municipal Connections to Total, multiplied by Total Volume of Water Supplied. WUE Portal does not recognize Wonder Acres System, therefore totals are shown in WUE submittal.			

Submittal Table 2-2: Plan Identification		
Select One	Type of Plan	Name of Regional Alliance or RUWMP (Drop Down List)
☒	Individual UWMP	
	If Water Supplier is also a member of a SB X7-7 Regional Alliance, select name from the drop-down.	
☐	Regional Urban Water Management Plan (RUWMP)	
	If Supplier selected RUWMP, select name from the drop-down.	
NOTES:		

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☐	Supplier is a wholesale supplier
☒	Supplier is a retail supplier
Fiscal or Calendar Year (select one)	
☒	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP (Select from the drop down list).	
Unit	MG
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.	
NOTES: 	

Submittal Table 2-4 Retail: Water Supplier Information Exchange Water Code Section 10631(h)	
The retail Supplier has informed the following wholesale supplier(s) of projected water use.	
Wholesale Water Supplier Name	
Add additional rows as needed	
Antelope Valley - East Kern Water Agency	
Mojave Public Utility District	
NOTES:	

Submittal Table 3-1 Retail: Population - Current and Projected Water Code Section 10631(a)						
Population Served	2025	2030	2035	2040	2045	2050(opt)
	14,063	15,531	15,930	16,330	16,729	17,129
NOTES: See Section 2.5						

Submittal Table 4-1 Retail: Total Uses for Potable and Non-Potable Water — Actual Water Code Section 10631(d)(1)			
Use Type	Additional Description (as needed)	2025 Actual Water Use	
Drop down list May select each use multiple times These are the only use types that will be recognized by the WUEdata online submittal tool		Potable or Non-Potable (OPTIONAL) Drop down list	Volume (MG)
Add additional rows as needed			
Single Family		Potable	397
Multi-Family		Potable	14
Commercial		Potable	65
Industrial		Potable	0
Landscape		Potable	80
Agricultural		Potable	0
Other (optional)		Potable	7
Distribution System Water Loss		Potable	233
Subtotal Potable			797
Subtotal Non-Potable			0
Total			797
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.			
NOTES: See Section 6.6.1			

Submittal Table 4-2 Retail: Total Uses for Potable, and Non-Potable Water — Projected Water Code Section 10631(d)(1)							
Use Type	Additional Description (as needed)	Projected Water Use (Report To the Extent that Records are Available)					
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool		Potable or Non-Potable (OPTIONAL) Drop down list	2030 (MG)	2035 (MG)	2040 (MG)	2045 (MG)	2050 opt (MG)
Add additional rows as needed.							
Single Family		Potable	526	540	553	567	580
Multi-Family		Potable	23	24	24	25	25
Commercial		Potable	176	181	185	190	195
Landscape		Potable	71	73	75	77	79
Industrial		Potable	1	1	1	1	1
Agricultural		Potable	1	1	1	1	1
Other (optional)		Potable	4	4	4	4	4
Distribution System Water Loss		Potable	265	271	279	285	292
Subtotal Potable			1,067	1,095	1,122	1,150	1,177
Subtotal Non-Potable			0	0	0	0	0
Total			1,067	1,095	1,122	1,150	1,177
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.							
NOTES: See Section 6.9.2							

Submittal Table 4-3 Retail: Inclusion in Water Use Projections Water Code Section 10631 (a), 10631 (d)(4)(A), and 10631 (d)(4)(B)	
Are Future Water Savings Included in Projections? Drop down list (y/n)	No
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found. Optional Suppliers may complete Optional Submittal Table 4-4 R to quantify the expected savings.	
Are Lower Income Residential Demands Included In Projections? Drop down list (y/n)	Yes
Optional If the method for accounting Lower Income Residential Demands has been included, provide page number where this accounting can be found.	Section 6.9.1
DWR NOTES: Additional guidance is provided in Appendix K.	
NOTES:	

Submittal Table 4-5 Retail: Water Loss Audit Reporting Water Code Section 10631(d)(3)(A)		
Public Water System ID # Reported in Table 2-1 R	Reporting Period	Submitted to DWR Water Loss Audit Program (yes/no)
Report submittal status for all five years for each Public Water System as available. Add rows as needed		
CA1510032	2020	Yes
	2021	No
	2022	No
	2023	No
	2024	No
CA1500324	2020	No
	2021	No
	2022	No
	2023	No
	2024	No
DWR NOTES: Suppliers will provide a link to the WUEdata submittals of their Water Loss Audit Reports.		
NOTES: See Section 6.6.2. WUE Portal does not recognize Wonder Acres System (CA1500324), which has not submitted a Water Loss Audit for the 2020-2024.		

Submittal Table 4-6 Retail: Progress Towards 2028 Water Loss Standard Water Code Section 10631(d)(3)(C)											
Public Water System ID # Reported in Submittal Table 2-1 R	Did the Water Board Calculate a Water Loss Standard for this Public Water System? (y/n) If no, Supplier will not complete this row.	Real Water Loss					Apparent Water Loss				
		State Water Board Standard		Most Recent AWWA Water Loss Audit			State Water Board Standard		Most Recent AWWA Water Loss Audit		
		2028 Real Water Loss Standard per Unit per day	Units for Real Water Loss Drop down list	Number of Units (Connections or Miles corresponding with units selected)	Volume of Total Real Loss (from AWWA Water Loss Audit) (MG)	Real Water Loss Per Unit per Day	2028 Apparent Water Loss Standard per Unit per Day	Units for Apparent Water Loss	Number of Connections	Volume of Total Apparent Loss (from AWWA Water Loss Audit) (MG)	Apparent Water Loss Per Unit per Day
Add additional rows as needed.											
CA1510032	Yes	474.1	Gallons per Mile per Day (GPMD)	4,980	188.5	103.7	8.2	Gallons per Service Connection per Day (GPSCD)	4,980	13.8	7.6
Water Board's Calculated Water Loss Standards											
DWR NOTES: Units of measure (AF, CCF, MG) for Water Loss MUST remain consistent with units reported in Submittal Table 2-3. The units reported in Submittal Table 2-3 are used in this table's calculations.											
NOTES: Section 6.6.3. Based off 2024 Water Loss Audit, which is underway and has not yet been Validated.											

Submittal Table 5-1 Retail: SB X7-7 2020 Target Progress Water Code Section 10608.40						
☐	Check the box if the Supplier was not an Urban Water Supplier during or before the 2020 UWMP reporting cycle. Proceed to the next table.					
Was Supplier part of a merger or consolidation since 2020?	Regional Alliance Target or Individual Target? Drop down list	2020 Target	Actual 2020 GPCD	Did Supplier Achieve Targeted Reduction for 2020?	Only for suppliers that did not meet the Target in 2020 See DWR NOTES below.	
					Actual 2025 GPCD (From SB X7-7 Compliance Form)	Did Supplier meet the 2020 Target in 2025?
No	Individual Target	270	168.4	Yes		NA
DWR NOTES: Suppliers calculating a 2025 GPCD will need to complete and submit SB X 7-7 Compliance Tables to verify the use of SB X7-7 Methodologies. Suppliers that were part of a merger or consolidation since 2020 see Chapter 5 and Appendix P for guidance. NOTES: See Section 6.8.3. Actual 2025 GPCD was 155.3						

Submittal Table 6-1 Retail: Groundwater Volume Pumped Water Code Section 10631(4) and 10631(4)(c)							
☐	Check the box if the Supplier does not pump groundwater. Proceed to the next table.						
☐	Check the box if all or part of the groundwater described below is desalinated. (OPTIONAL)						
Groundwater Type Drop Down List May use each category multiple times	Potable or Non-Potable (OPTIONAL) Drop down list	Location or Basin Name	2021 (MG)	2022 (MG)	2023 (MG)	2024 (MG)	2025 (MG)
Add additional rows as needed							
Alluvial Basin	Potable	Fremont Valley Groundwater Basin	886	839	799	763	797
Total			886	839	799	763	797
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3. NOTES: See Section 3.8							

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area
Water Code Section 10633(a)

☐	Check the box if there is no wastewater collection system. Proceed to the next table.			
	Percentage of 2025 service area served by wastewater collection system (OPTIONAL)			
	Percentage of 2025 service area population served by wastewater collection system (OPTIONAL)			
Wastewater Collection			Recipient of Collected Wastewater	
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? OPTIONAL Drop Down List	Volume of Wastewater Collected from UWMP Service Area 2025 (MG)	Name of Wastewater Treatment Plant (WWTP) and Place ID Number Drop down list	Is WWTP Located Within UWMP Area? Drop Down List
Add additional rows as needed				
City of California City	Metered	159	Calipatria City WWTP, Place ID 212739	Yes
Total Wastewater Received from UWMP Service Area in 2025:		159		
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3. Additional Guidance: See Appendix M, Section M.21 for detailed guidance on this table.				
NOTES: See Section 4.2				

Submittal Table 6-5 Retail: 2020 UWMP Recycled Water Use Projection Compared to 2025 Actual Water Code Section 10633(e)		
☐	Check the box if recycled water was not used in 2025 nor previously projected for use in 2020. Proceed to the next table.	
Use Type Drop Down list	2020 Projection for 2025 (MG)	2025 Actual Use (MG)
Add additional rows as needed		
Golf course irrigation	261	120
Total	261	120
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure reported in Submittal Table 2-3 Additional Guidance: See Appendix M, Section M.21 for detailed guidance on this table.		
NOTES: See Table 4-3 Values from the 2020 UWMP for the 2020 projections for the 2025 use.		

Submittal Table 6-6 Retail: Methods to Encourage Future Recycled Water Use Water Code Section 10633(f)			
☒	Check the box if the Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Section 4.3.1	Provide page location of narrative in the UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use (MG)
Add additional rows as needed			
Total (MG)			0
Unit Conversion to AF			0
DWR NOTES: Units of measure (AF, CCF, MG) MUST remain consistent with units reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3. The unit conversion to Acre Feet addresses the Water Code's requirement that this value be provided in acre-feet.			
NOTES: See Section 4.3.1.			

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs Water Code Section 10631(f)							
☐	Check the box if there are no expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Proceed to the next table.						
☒	Check the box if some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.						
Section 3.9 Provide page location of narrative in the UWMP							
Name of Future Projects or Programs	Joint Project with other suppliers?		Additional Description (as needed)	Potable or Non-Potable (after treatment if treated) (OPTIONAL) Drop Down list	Planned Implementation Year	Planned for Use in Year Type Drop Down List	Expected Increase in Water Supply to Supplier (This may be a range) (MG)
	Drop Down List (yes/no)	If Yes, Supplier Name					
Add additional rows as needed							
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure reported in Submittal Table 2-3.							
NOTES:							

Submittal Table 6-8 Retail: Water Supplies — Actual Water Code Section 10631(b)				
Water Supply	Additional Description (as needed)	2025		
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUedata online submittal tool		Potable or Non-Potable (after treatment if treated) (OPTIONAL) Drop Down list	Actual Volume (MG)	Total Entitlement (OPTIONAL) See 'DWR Notes' below (MG)
Add additional rows as needed				
Purchased or Imported Water	AVEK	Potable	0	
Groundwater (not desalinated)	Wells	Potable	797	
Subtotal Potable			797	0
Subtotal Non-Potable			0	0
Total			797	0
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3. Total Entitlement: e.g. Water Right, Groundwater Allocation, Contracted Amount.				
NOTES: See Section 3.3 & 3.8				

Optional Submittal Table O-1B: Recommended Energy Reporting - SINGLE DELIVERY PRODUCT - TOTAL UTILITY APPROACH

Water Delivery Product drop down list (If delivering more than one type of product recommend using Table O-1C)	Retail Potable Deliveries	Only for Water Delivery Products Under the Urban Water Supplier's Operational Control		
Start Date of Reporting Period	1/1/2025	Sum of All Water Management Processes	Non-Consequential Hydropower	
End Date of Reporting Period	12/31/2025			
Is upstream embedded energy in the values reported?	No	Total Utility See DWR NOTES	Hydropower	Net Utility
Units of Measure for Water	MG			
Volume of Water Entering Process		797		797
Energy Consumed (kWh)		828,000		828,000
Energy Intensity (kWh/vol. converted to MG)		1,039	-	1,039

DWR NOTES:

Total Utility: The volume of water entered in the "Total Utility" column should equal the volume of water entering the distribution system (excluding recycled water); in most cases, this is the total volume calculated in UWMP Table 4-1: 2025 Actual Total Uses for Potable and Non-Potable Water. Note if recycled water is included in your Submittal Table 4-1, you must exclude it from your volume in this table.

Optional Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)

Year Type	Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 2024- 2025, use 2025	Available Supplies if Year Type Repeats	
		☒	Check the box if quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location: Section 7
		Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available (AF)	% of Average Supply
Average Year			100%
Single-Dry Year			
Consecutive Dry Years 1st Year			
Consecutive Dry Years 2nd Year			
Consecutive Dry Years 3rd Year			
Consecutive Dry Years 4th Year			
Consecutive Dry Years 5th Year			

DWR NOTES: Supplier may use multiple versions of Submittal Table 7-1 R if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Submittal Table 7-1 R, in the "Note" section of each submittal table, state that multiple versions of Submittal Table 7-1 R are being used and identify the particular water source that is being reported in each submittal table.

Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table reports the units of measure reported in Submittal Table 2-3.

NOTES: Section 7

Submittal Table 7-2 Retail: Normal Year Supply and Use Comparison Water Code Section 10635 (a)					
	2030 (MG)	2035 (MG)	2040 (MG)	2045 (MG)	2050 (MG)
Supply totals (autofill from Submittal Table 6-9 R)	1,067	1,095	1,122	1,150	1,177
Use totals (autofill from Submittal Table 4-2 R)	1,067	1,095	1,122	1,150	1,177
Surplus/(shortfall)	0	0	0	0	0
OPTIONAL Planned WSCP Actions					
WSCP - supply augmentation benefit					
WSCP - use reduction savings benefit					
Revised Surplus/(shortfall)					
DWR NOTES : Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.					
NOTES: See Section 7.7					

Submittal Table 7-3 Retail: Single Dry Year Supply and Use Comparison Water Code Section 10635(a)					
	2030 (MG)	2035 (MG)	2040 (MG)	2045 (MG)	2050 (MG)
Supply totals	1,131	1,160	1,189	1,219	1,248
Use totals	1,131	1,160	1,189	1,219	1,248
Surplus/(shortfall)	0	0	0	0	0
OPTIONAL Planned WSCP Actions					
WSCP - supply augmentation benefit					
WSCP - use reduction savings benefit					
Revised Surplus/(shortfall)					
DWR NOTES : Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.					
NOTES: See Section 7.6					

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Use Comparison
Water Code Section 10635(a)

		2030 (MG)	2035 (MG)	2040 (MG)	2045 (MG)	2050 (MG)
First year	Supply totals	1,098	1,158	1,188	1,218	1,247
	Use totals	1,098	1,158	1,188	1,218	1,247
	Surplus/(shortfall)	0	0	0	0	0
	OPTIONAL Planned WSCP Actions					
	WSCP - supply augmentation benefit					
	WSCP - use reduction savings benefit					
	Revised Surplus/(shortfall)					
Second year	Supply totals	1,370	1,445	1,482	1,518	1,555
	Use totals	1,370	1,445	1,482	1,518	1,555
	Surplus/(shortfall)	0	0	0	0	0
	OPTIONAL WSCP Actions					
	WSCP - supply augmentation benefit					
	WSCP - use reduction savings benefit					
	Revised Surplus/(shortfall)					
Third year	Supply totals	1,048	1,105	1,133	1,161	1,189
	Use totals	1,048	1,105	1,133	1,161	1,189
	Surplus/(shortfall)	0	0	0	0	0
	OPTIONAL Planned WSCP Actions					
	WSCP - supply augmentation benefit					
	WSCP - use reduction savings benefit					
	Revised Surplus/(shortfall)					
Fourth year	Supply totals	1,137	1,198	1,228	1,258	1,289
	Use totals	1,137	1,198	1,228	1,258	1,289
	Surplus/(shortfall)	0	0	0	0	0
	OPTIONAL Planned WSCP Actions					
	WSCP - supply augmentation benefit					
	WSCP - use reduction savings benefit					
	Revised Surplus/(shortfall)					
Fifth year	Supply totals	1,259	1,292	1,324	1,356	1,389
	Use totals	1,259	1,292	1,324	1,356	1,389
	Surplus/(shortfall)	0	0	0	0	0
	OPTIONAL Planned WSCP Actions					
	WSCP - supply augmentation benefit					
	WSCP - use reduction savings benefit					
	Revised Surplus/(shortfall)					

DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.

NOTES: See Section 7.6

Submittal Table 7-5 Retail: Five-Year Drought Risk Assessment Water Code Section 10635(b)(3)	
2026	Total
Total Water Use (MG)	1,098
Total Supplies (MG)	1,098
Surplus/Shortfall w/o WSCP Action	0
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit (MG)	
WSCP - use reduction savings benefit (MG)	
Revised Surplus/(shortfall)	
2027	Total
Total Water Use (MG)	1,370
Total Supplies (MG)	1,370
Surplus/Shortfall w/o WSCP Action	0
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit (MG)	
WSCP - use reduction savings benefit (MG)	
Revised Surplus/(shortfall)	
2028	Total
Total Water Use (MG)	1,048
Total Supplies (MG)	1,048
Surplus/Shortfall w/o WSCP Action	0
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit (MG)	
WSCP - use reduction savings benefit (MG)	
Revised Surplus/(shortfall)	
2029	Total
Total Water Use (MG)	1,137
Total Supplies (MG)	1,137
Surplus/Shortfall w/o WSCP Action	0
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit (MG)	
WSCP - use reduction savings benefit (MG)	
Revised Surplus/(shortfall)	
2030	Total
Total Water Use (MG)	1,259
Total Supplies (MG)	1,259
Surplus/Shortfall w/o WSCP Action	0
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit (MG)	
WSCP - use reduction savings benefit (MG)	
Revised Surplus/(shortfall)	
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.	
NOTES: See Section 7.6	

Submittal Table 8-1: Cross-reference for Standard vs Supplier Shortage Levels Water Code Section 10632(a)(3)(B)			
☒	Check the box if the Supplier uses the Standard six levels of water shortage. Proceed to the next table.		
Standard Shortage Levels	Percent Shortage Range	Suppliers Shortage Levels	Percent Shortage Range
1	Up to 10%		
2	Up to 20%		
3	Up to 30%		
4	Up to 40%		
5	Up to 50%		
6	>50%		
NOTES: See Section 8.7			

Submittal Table 8-2 Retail: Supply Augmentation and Other Actions Water Code Section 10632(a)(4)(A),(C) and (E)				
Yes	Is the Supplier completing this table using the standard six levels? (yes/no)			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier Drop down list These are the only categories that will be accepted by the WUEdata online submittal tool	How much is this going to reduce the shortage gap?		Additional Explanation or Reference (OPTIONAL)
		Volume or Percentage Drop down	Shortage Gap Reduction Value (May be a range) (MG)	
Add additional rows as needed				
Permanent	Expand Public Information Campaign	Percentage	10	
Permanent	Improve Customer Billing	Percentage	5	
Permanent	Other Actions (describe)	Percentage	5	Offer Waver Use Surveys
Permanent	Other Actions (describe)	Percentage	5	Decrease Line Flushing
Permanent	Other Actions (describe)	Percentage	10	Reduce System Water Loss
1 to 4	Other Actions (describe)	Percentage	10	Increase Water Waste Patrols
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.				
NOTES: See Section 8.12 / Table 8.3				

Submittal Table 8-3 Retail: Demand Reduction Actions					
Water Code Section 10632(a)(4)(B),(D), and (E)					
Yes	Is the Supplier completing this table using the standard six levels? (yes/no)				
Shortage Level	Demand Reduction Actions Drop down list These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.	How much is this going to reduce the shortage gap?		Additional Explanation or Reference (OPTIONAL)	Penalty, Charge, or Other Enforcement? For Retail Suppliers Only Drop Down List
		Volume or Percentage Drop down	Shortage Gap Reduction Value (May be a range) (MG)		
Add additional rows as needed					
1	Other	Percentage	Up to 10%	Contamination loss or supply below normal	Yes
2	Other	Percentage	Up to 20%	Contamination loss or supply below normal	Yes
3	Other	Percentage	Up to 30%	Contamination loss or supply below normal	Yes
4	Other	Percentage	Up to 40%	Contamination loss or supply below normal	Yes
5	Other	Percentage	Up to 50%	Contamination loss or supply below normal	Yes
6	Other	Percentage	>50%	Contamination loss or supply below normal	Yes
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.					
NOTES: See Section 8.7.9 / Table 8.3					

Submittal Table 10-1 Retail: Notification to Cities and Counties		
Water Code Section 10621(b) and 10642		
City Name	60 Day Notice Drop Down (yes/no)	Notice of Public Hearing Drop Down (yes/no)
Add additional rows as needed		
City Staff	Yes	Yes
City Council	Yes	Yes
Antelope Vally - East Kern Water Agency	Yes	Yes
Mojave Public Utility District	Yes	Yes
Regional Water Management Group	Yes	Yes
State Water Resource Control Board	Yes	Yes
County Name Drop Down List	60 Day Notice Drop Down (yes/no)	Notice of Public Hearing Drop Down (yes/no)
Add additional rows as needed		
Kern County	Yes	Yes
NOTES: See Section 1.2		



Appendix F: Dept. of Water Resources SBx7-7 Tables

City of California City 2025 Urban Water Management Plan

SB X7-7 Table 0: Units of Measure Used in UWMP**(select one from the drop down list)*

Million Gallons

**The unit of measure must be consistent with Submittal Table 2-3*

NOTES:

SB X7-7 Table-1: Baseline Period Ranges

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	1,331	Million Gallons
	2008 total volume of delivered recycled water	251	Million Gallons
	2008 recycled water as a percent of total deliveries	19%	See Note 1
	Number of years in baseline period ^{1, 2}	10	Years
	Year beginning baseline period range	2001	
	Year ending baseline period range ³	2010	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2006	
	Year ending baseline period range ⁴	2010	
¹ If the 2008 recycled water delivery is less than 10 percent of total water deliveries, then the 10-15year baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater of total deliveries, the 10-15 year baseline period is a continuous 10- to 15-year period.			
² The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.			
³ The ending year for the 10-15 year baseline period must be between December 31, 2004 and December 31, 2010.			
⁴ The ending year for the 5 year baseline period must be between December 31, 2007 and December 31, 2010.			
NOTES:			

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☒	1. Department of Finance (DOF) or American Community Survey (ACS)
☐	2. Persons-per-Connection Method
☐	3. DWR Population Tool
☐	4. Other DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: Service Area Population		
Year		Population
10 to 15 Year Baseline Population		
Year 1	2001	10,816
Year 2	2002	10,977
Year 3	2003	11,138
Year 4	2004	11,301
Year 5	2005	11,687
Year 6	2006	12,528
Year 7	2007	13,705
Year 8	2008	14,556
Year 9	2009	14,338
Year 10	2010	14,120
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2006	12,528
Year 2	2007	13,705
Year 3	2008	14,556
Year 4	2009	14,338
Year 5	2010	14,120
NOTES:		

SB X7-7 Table 4: Annual Gross Water Use *							
Baseline Year <i>Fm SB X7-7 Table 3</i>	Volume Into Distribution System <i>This column will remain blank until SB X7-7 Table 4-A is completed.</i>	Deductions					Million Gallons
		Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water <i>This column will remain blank until SB X7-7 Table 4-B is completed.</i>	Water Delivered for Agricultural Use	Process Water <i>This column will remain blank until SB X7-7 Table 4-D is completed.</i>	Annual Gross Water Use
10 to 15 Year Baseline - Gross Water Use							
Year 1	2001	1,308		-		-	1,308
Year 2	2002	1,320		-		-	1,320
Year 3	2003	1,335		-		-	1,335
Year 4	2004	1,641		-		-	1,641
Year 5	2005	1,573		-		-	1,573
Year 6	2006	1,714		-		-	1,714
Year 7	2007	1,764		-		-	1,764
Year 8	2008	1,664		-		-	1,664
Year 9	2009	1,598		-		-	1,598
Year 10	2010	1,423		-		-	1,423
Year 11	0	-		-		-	-
Year 12	0	-		-		-	-
Year 13	0	-		-		-	-
Year 14	0	-		-		-	-
Year 15	0	-		-		-	-
10 - 15 year baseline average gross water use							1,534
5 Year Baseline - Gross Water Use							
Year 1	2006	1,714		-		-	1,714
Year 2	2007	1,764		-		-	1,764
Year 3	2008	1,664		-		-	1,664
Year 4	2009	1,598		-		-	1,598
Year 5	2010	1,423		-		-	1,423
5 year baseline average gross water use							1,633
* Units of measure (AF, MG , or CCF) must remain consistent throughout the UWMP, as reported in Table 2-3.							
NOTES:							

SB X7-7 Table 4-C.4: Process Water Deduction Eligibility				
Criteria 4				
Disadvantaged Community. A "Disadvantaged Community" (DAC) is a community with a median household income less than 80 percent of the statewide average.				
SELECT ONE				
"Disadvantaged Community" status was determined using one of the methods listed below:				
☐	1. IRWM DAC Mapping tool https://gis.water.ca.gov/app/dacs/			
If using the IRWM DAC Mapping Tool, include a screen shot from the tool showing that the service area is considered a DAC.				
☐	2. 2010 Median Income			
	California Median Household Income	Service Area Median Household Income	Percentage of Statewide Average	Eligible for Exclusion? Y/N
2010	\$60,883	\$45,735	75%	YES
NOTES:				

SB X7-7 Table 5: Baseline Gallons Per Capita Per Day (GPCD)				
Baseline Year <i>Fm SB X7-7 Table 3</i>		Service Area Population <i>Fm SB X7-7 Table 3</i>	Annual Gross Water Use <i>Fm SB X7-7 Table 4</i>	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	2001	10,816	1,308	331
Year 2	2002	10,977	1,320	329
Year 3	2003	11,138	1,335	328
Year 4	2004	11,301	1,641	398
Year 5	2005	11,687	1,573	369
Year 6	2006	12,528	1,714	375
Year 7	2007	13,705	1,764	353
Year 8	2008	14,556	1,664	313
Year 9	2009	14,338	1,598	305
Year 10	2010	14,120	1,423	276
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				338
5 Year Baseline GPCD				
Baseline Year <i>Fm SB X7-7 Table 3</i>		Service Area Population <i>Fm SB X7-7 Table 3</i>	Gross Water Use <i>Fm SB X7-7 Table 4</i>	Daily Per Capita Water Use
Year 1	2006	12,528	1,714	375
Year 2	2007	13,705	1,764	353
Year 3	2008	14,556	1,664	313
Year 4	2009	14,338	1,598	305
Year 5	2010	14,120	1,423	276
5 Year Average Baseline GPCD				324
NOTES:				

SB X7-7 Table 6: Baseline GPCD <i>Summary From Table SB X7-7 Table 5</i>	
10-15 Year Baseline GPCD	338
5 Year Baseline GPCD	324
NOTES:	

SB X7-7 Table 7: 2020 Target Method <i>Select Only One</i>		
Target Method		Supporting Tables
☒	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator <i>Located in the WUE Data Portal at wuedata.water.ca.gov Resources button</i>
NOTES:		

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	2020 Target GPCD
338	270
NOTES:	

SB X7-7 Table 7-E: Target Method 3				
Agency May Select More Than One as Applicable	Percentage of Service Area in This Hydrological Region	Hydrologic Region	"2020 Plan" Regional Targets	Method 3 Regional Targets (95%)
☐		North Coast	137	130
☐		North Lahontan	173	164
☐		Sacramento River	176	167
☐		San Francisco Bay	131	124
☐		San Joaquin River	174	165
☐		Central Coast	123	117
☐		Tulare Lake	188	179
☒	100%	South Lahontan	170	162
☐		South Coast	149	142
☐		Colorado River	211	200
2020 Target (If more than one region is selected, this value is calculated.)				162
NOTES:				

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target					
5 Year Baseline GPCD From SB X7-7 Table 5	Maximum 2020 Target ¹	Calculated 2020 Target ²			Confirmed 2020 Target ⁴
		As calculated by supplier in this SB X7-7 Verification Form	Special Situations ³		
			Prorated 2020 Target	Population Weighted Average 2020 Target	
324	308				308
¹ Maximum 2020 Target is 95% of the 5 Year Baseline GPCD except for suppliers at or below 100 GPCD.					
² Calculated 2020 Target is the target calculated by the Supplier based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target. Supplier may only enter one calculated target.					
³ Prorated targets and population weighted target are allowed for special situations only. These situations are described in Appendix P, Section P.3					
⁴ Confirmed Target is the lesser of the Calculated 2020 Target (C5, D5, or E5) or the Maximum 2020 Target (Cell B5)					
NOTES:					

SB X7-7 Compliance Form Introduction	
Does the supplier have more than one SB X7-7 2025 Compliance Form? ¹ :	N ▼
¹ If a supplier has multiple SB X7-7 Compliance Forms, contact UWMPhelp@water.ca.gov for special instructions.	
NOTES	

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

SB X7-7 Compliance Table 2: Method for Population Estimates	
Method Use to Determine Population (may check more than one)	
☒	1. Department of Finance (DOF) or American Community Survey (ACS)
☐	2. Persons-per-Connection Method
☐	3. DWR Population Tool
☐	4. Other <i>DWR recommends pre-review</i>
NOTES	

SB X7-7 Compliance Table 3: Service Area Population	
2025 Compliance Year Population	
2025	14,063
NOTES	

SB X7-7 Compliance Table 4: Annual Gross Water Use							
Compliance Year 2025	Volume Into Distribution System <i>(this column will remain blank until SB X7-7 Compliance Table 4-A is completed)</i>	2025 Deductions (MG)					2025 Gross Water Use
		Exported Water	Change in Dist. System Storage (+/-) (MG)	Indirect Recycled Water <i>(this column will remain blank until SB X7-7 Compliance Table 4-B is completed)</i>	Water Delivered for Agricultural Use (MG)	Process Water <i>(from SB X7-7 Compliance Table 4-D) (MG)</i>	
	797			0			797
* Units of measure (AF, MG, or CCF) must remain consistent throughout the UWMP, as reported in Table 2-3							
NOTES							

SB X7-7 Compliance Table 4-A: Annual Gross Water Use			
One Table for All Water Sources (Switch to Multiple Tables)			
This water source is:			
☒	The supplier's own water source		
☐	A purchased or imported source		
Compliance Year 2025	Volume Entering Distribution System ¹ (MG)	Meter Error Adjustment ² Optional (+/-) (MG)	Corrected Volume Entering Distribution System (MG)
	797		797
¹ Units of Measure (AF, MG, or CCF) must remain consistent throughout the UWMP, as reported in Table 2-3. ² Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document			
NOTES			

SB X7-7 Compliance Table 4-B: Indirect Recycled Water Use Deduction
Water Code Section 10608.20(e) and 10608.20(h)(1)(2)

2025 Compliance Year	2025 Surface Reservoir Augmentation					2025 Groundwater Recharge					Total Deductible Volume of Indirect Recycled Water Entering the Distribution System
	Volume Discharged from Reservoir for Distribution System Delivery (MG)	Percent Recycled Water	Recycled Water Delivered to Treatment Plant (MG)	Transmission / Treatment Loss (MG)	Recycled Volume Entering Distribution System from Surface Reservoir Augmentation (MG)	Volume Pumped from Groundwater for Distribution System Delivery (MG)	Percent Recycled Water (MG)	Recycled Water Delivered to Treatment Plan (MG)	Transmission / Treatment Losses	Recycled Volume Entering Distribution System from Groundwater Recharge	
			0		0			0		0	0

Units of Measure (AF, MG, or CCF) must remain consistent throughout the UWMP, as reported in SB X7-7 0 and Submittal Table 2-3. Suppliers will provide documentation to support the percentage of recycled water reported in this table.

NOTES

SB X7-7 Compliance Table 5: Gallons Per Capita Per Day (GPCD)

2025 Population <i>From SB X7-7 Compliance Table 3</i>	2025 Gross Water Use <i>From SB X7-7 Compliance Table 4 (MG)</i>	2025 GPCD
14,063	797	155
NOTES		

SB X7-7 Compliance Table 9: 2025 Compliance
Water Code Section 10608.24(d)

2025 Actual GPCD	Optional Adjustments for 2025 GPCD					2020 Target	Did Supplier Achieve Targeted Reduction for 2025?
	Enter "0" for adjustments not used			TOTAL Adjustments	Adjusted 2025 GPCD <i>(Adjusted if applicable)</i>		
	Extraordinary Events	Weather Normalization	Economic Adjustment				
155				0	155	270	YES
DWR NOTES: All values are reported in GPCD Suppliers that had a merger or consolidation since 2020 may use a population weighted average 2020 target. See Section P.1.2.1 of Appendix P.							
NOTES							



Appendix G: UWMP Notices: 60-Day Notice, 2-Week and 1 Week Notices

City of California City 2025 Urban Water Management Plan



CALIFORNIA CITY PUBLIC WORKS DEPARTMENT

760-373-7162
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PUBLIC WORKS DIRECTOR

Joe Barragan

WATER SUPERVISOR
David Toledo
WATER OPERATOR III

Art Van Dang

**CHIEF WWTP
OPERATOR**
Rick Vazquez

STREETS LEAD
Marion Cato

April 9, 2026

Matt Knudson
General Manager
Antelope Vally-East Kern Water
6450 West Avenue N
Palmdale CA 93551

Subject: **City of California City Urban Water Management Plan 2025 Update**
Notice Pursuant to Section 10621(b) of the California Water Code

Dear Mr. Knudson:

The purpose of this letter is to provide notice that the City of California City is in the process of developing its 2025 Urban Water Management Plan (UWMP) and 2025 Water Shortage Contingency Plan (WSCP) in compliance with the Urban Water Management Planning Act. The Urban Water Management Planning Act and the California Water Code requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five (5) years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

The City of California City will hold a public hearing to consider, and to receive public comments on its draft 2025 UWMP. The public hearing will be held a minimum of sixty (60) days from the date of this letter at the City's Council Chambers (located at 21000 Hacienda Blvd., California City, CA 93505). A public notice stating the specific date, time, and location of the public hearing will be issued two (2) weeks prior to said hearing.

All interested parties are invited to attend the public hearing and to comment on the City's Draft 2025 UWMP. Alternatively, interested parties may submit written comments to the City. Prior to the public hearing, a draft copy of the City of California City's 2025 UWMP will be made available at the City of California City, 21000 Hacienda Blvd., California City, California, and on the City's website.

Sincerely,

Joe Barragan
Public Works Director
21000 Hacienda Blvd
California City, CA 93505



CALIFORNIA CITY PUBLIC WORKS DEPARTMENT

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OPERATOR
Rick Vazquez

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Marion Cato

April 9, 2026

Craig M. Murphy
Director of Community Development Division
Kern County Planning and Natural Resources Department
2700 "M" Street, Suite 100
Bakersfield, CA 93301-2370

Subject: **City of California City Urban Water Management Plan 2025 Update**
Notice Pursuant to Section 10621(b) of the California Water Code

Dear Mr. Murphy:

The purpose of this letter is to provide notice that the City of California City is in the process of developing its 2025 Urban Water Management Plan (UWMP) and 2025 Water Shortage Contingency Plan (WSCP) in compliance with the Urban Water Management Planning Act. The Urban Water Management Planning Act and the California Water Code requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five (5) years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Joe Barragan
Public Works Director
21000 Hacienda Blvd
California City, CA 93505



CALIFORNIA CITY PUBLIC WORKS DEPARTMENT

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PUBLIC WORKS DIRECTOR

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David Toledo

WATER OPERATOR III

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CHIEF WWTP OPERATOR

Rick Vazquez

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Marion Cato

April 9, 2026

Kern County Water Agency
3200 Rio Mirada Drive
Bakersfield, CA 93308

Subject: **City of California City Urban Water Management Plan 2025 Update**
Notice Pursuant to Section 10621(b) of the California Water Code

To whom it may concern:

The purpose of this letter is to provide notice that the City of California City is in the process of developing its 2025 Urban Water Management Plan (UWMP) and 2025 Water Shortage Contingency Plan (WSCP) in compliance with the Urban Water Management Planning Act. The Urban Water Management Planning Act and the California Water Code requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five (5) years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Joe Barragan
Public Works Director
21000 Hacienda Blvd
California City, CA 93505



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David Toledo
WATER OPERATOR III

Art Van Dang

**CHIEF WWTP
OPERATOR**
Rick Vazquez

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Marion Cato

April 9, 2026

Phillip Peters
District Supervisor
Kern County
1115 Truxtun Avenue
Bakersfield, CA 93301

Subject: **City of California City Urban Water Management Plan 2025 Update**
Notice Pursuant to Section 10621(b) of the California Water Code

Dear Mr. Peters:

The purpose of this letter is to provide notice that the City of California City is in the process of developing its 2025 Urban Water Management Plan (UWMP) and 2025 Water Shortage Contingency Plan (WSCP) in compliance with the Urban Water Management Planning Act. The Urban Water Management Planning Act and the California Water Code requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five (5) years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Joe Barragan
Public Works Director
21000 Hacienda Blvd
California City, CA 93505



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PUBLIC WORKS DIRECTOR

Joe Barragan

WATER SUPERVISOR David Toledo WATER OPERATOR III

Art Van Dang

CHIEF WWTP OPERATOR Rick Vazquez

STREETS LEAD Marion Cato

April 9, 2026

Harold Smith
President
Mojave Public Utility District
21000 Hacienda Blvd.
California City, CA 93505

Subject: **City of California City Urban Water Management Plan 2025 Update**
Notice Pursuant to Section 10621(b) of the California Water Code

Dear Mr. Smith:

The purpose of this letter is to provide notice that the City of California City is in the process of developing its 2025 Urban Water Management Plan (UWMP) and 2025 Water Shortage Contingency Plan (WSCP) in compliance with the Urban Water Management Planning Act. The Urban Water Management Planning Act and the California Water Code requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five (5) years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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All interested parties are invited to attend the public hearing and to comment on the City's Draft 2025 UWMP. Alternatively, interested parties may submit written comments to the City. Prior to the public hearing, a draft copy of the City of California City's 2025 UWMP will be made available at the City of California City, 21000 Hacienda Blvd., California City, California, and on the City's website.

Sincerely,

Joe Barragan
Public Works Director
21000 Hacienda Blvd
California City, CA 93505



CALIFORNIA CITY PUBLIC WORKS DEPARTMENT

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Art Van Dang

CHIEF WWTP OPERATOR

Rick Vazquez

STREETS LEAD

Marion Cato

April 9, 2026

Regional Water Management Group
21000 Hacienda Blvd
California City, CA 93505

Subject: **City of California City Urban Water Management Plan 2025 Update**
Notice Pursuant to Section 10621(b) of the California Water Code

To whom it may concern:

The purpose of this letter is to provide notice that the City of California City is in the process of developing its 2025 Urban Water Management Plan (UWMP) and 2025 Water Shortage Contingency Plan (WSCP) in compliance with the Urban Water Management Planning Act. The Urban Water Management Planning Act and the California Water Code requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five (5) years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Joe Barragan
Public Works Director
21000 Hacienda Blvd
California City, CA 93505



CALIFORNIA CITY PUBLIC WORKS DEPARTMENT

760-373-7162
www.californiacity-ca.gov

PUBLIC WORKS DIRECTOR

Joe Barragan

WATER SUPERVISOR

David Toledo

WATER OPERATOR III

Art Van Dang

CHIEF WWTP

OPERATOR

Rick Vazquez

STREETS LEAD

Marion Cato

April 9, 2026

Eric Oppenheimer
Executive Director
State Water Resource Control
1001 I Street
Sacramento, CA 95814

Subject: **City of California City Urban Water Management Plan 2025 Update**
Notice Pursuant to Section 10621(b) of the California Water Code

Dear Mr. Oppenheimer:

The purpose of this letter is to provide notice that the City of California City is in the process of developing its 2025 Urban Water Management Plan (UWMP) and 2025 Water Shortage Contingency Plan (WSCP) in compliance with the Urban Water Management Planning Act. The Urban Water Management Planning Act and the California Water Code requires every urban water supplier providing water for municipal purposes, either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least every five (5) years. The UWMP is a planning document and a source document which reports, describes and evaluates water deliveries and uses, water supply sources and conservation efforts.

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Sincerely,

Joe Barragan
Public Works Director
21000 Hacienda Blvd
California City, CA 93505

AFFIDAVIT OF PUBLICATION

State of California

County of Kern

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the Mojave Desert News, a newspaper that has been adjudicated to be a newspaper of general circulation by the Superior Court of the County of Kern, State of California on October 13th 1939 Case number 34058 in and for the County of Kern State of California that the notice which the annexed is a true printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit
I certify under the penalty of perjury under the laws of the State of California that the foregoing is true.

08/05/2026

08/12/2026

Signed *Misty Hickok*

Misty Hickok

08/12/2026



NOTICE OF PUBLIC HEARING FOR 2025 URBAN WATER MANAGEMENT PLAN AND 2025 WATER SHORTAGE CONTINGENCY PLAN AVAILABILITY OF DRAFT PLAN FOR REVIEW

The City of California City hereby releases its Draft 2025 Urban Water Management Plan (UWMP) and 2025 Water Shortage Contingency Plan (WSCP) for public review. The UWMP and WSCP will be available through August 25, 2026 at the City's Council Chambers (located at 21000 Hacienda Blvd, California City, CA 93505). An electronic (PDF) copy can also be obtained by contacting the City and requesting a PDF copy.

A Public Hearing will be held as an agenda item of the City's regularly scheduled Council Meeting on Tuesday, August 25, 2026 to consider comments on the Draft 2025 UWMP and WSCP, and to formally adopt the UWMP and WSCP by separate resolutions. The Council Meetings are held at the City's Council Chambers. The time of the Public Hearing will be posted on the Council Agenda which will be released a few days prior to the August 25, 2026 Council meeting.

The City encourages the active involvement of its citizens. If you have any questions concerning the 2025 UWMP and WSCP, please contact: Joe Barragan, Public Works Manager by email at JBarragan@californiacity-ca.gov.

Published in The Mojave Desert News 08/05, 08/12/2026



Appendix H: Fremont Basin Integrated Regional Water Management Plan (2019)

City of California City 2025 Urban Water Management Plan

FREMONT BASIN

INTEGRATED REGIONAL WATER MANAGEMENT PLAN

F E B R U A R Y 2 0 1 9

IRWMP

Prepared by the Regional Water Management Group of the
Fremont Basin Integrated Regional Water Management Region

Fremont Basin Integrated Regional Water Management Plan

February 2019

Prepared by the Regional Water Management Group of the
Fremont Basin Integrated Regional Water Management Region

With assistance from Woodard & Curran



Acknowledgements

The Regional Water Management Group acknowledges the many working group members, representatives of agencies, non-governmental organizations, community members, and dedicated stakeholders for their participation in the development of this Integrated Regional Water Management Plan. In addition, we specifically acknowledge the California Department of Water Resources for their guidance and financial assistance in preparing this Plan.

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Fremont Basin Integrated Regional Water Management Plan

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List of Acronyms and Abbreviations

Acronym/Abbreviation	Definition
°F	degrees Fahrenheit
µg/L	Micrograms per Liter
µS/cm	Microsiemens per Centimeter
AB	Assembly Bill
ACS	American Community Survey
AF	Acre-Feet
AF/acre	Acre Feet per Acre
AFY	Acre-Feet per Year
AVEK	Antelope Valley-East Kern Water Agency
BLM	United States Bureau of Land Management
BMP	Best Management Practices
CA	California
Cal Water	California Water Service Company
CalEPA	California Environmental Protection Agency
California City	City of California City
CARB	California Air Resources Board
CASGEM	California Statewide Groundwater Elevation Monitoring
CDFW	California Department of Fish and Wildlife
Chromium-6	Hexavalent Chromium
CIMIS	California Irrigation Management System
CIP	Capital Improvement Program
City	City of California City
County	Kern County
CWA	Clean Water Act
CWC	California Water Code
CWSRF	Clean Water State Revolving Fund
DAC	Disadvantaged Community
DACI Program	Disadvantaged Community Involvement Program
Delta	Sacramento-San Joaquin Delta

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DMS	Data Management System
DOF	California Department of Finance
DPR	Direct Potable Reuse
DRECP	Desert Renewable Energy Conservation Plan
DWR	California Department of Water Resources
DWSRF	Drinking Water State Revolving Fund
EDA	Economically Distressed Areas
EHS	Kern County Public Health Services Department
EIR	Environmental Impact Report
ETc	Crop Evapotranspiration
ETo	Evapotranspiration
FEMA	Federal Emergency Management Agency
FVGB	Fremont Valley Groundwater Basin
GAMA	Groundwater Ambient Monitoring and Assessment Program
GAP	Gap Analysis Project
GHG	Greenhouse Gas Emissions
GIS	Geographic Information Systems
GPCD	Gallons per Capita per Day
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
GWMP	Groundwater Management Plan
in.	Inches
IPCC	Intergovernmental Panel on Climate Change
IPR	Indirect Potable Reuse
IRWM	Integrated Regional Water Management
Kc	Crop Coefficient
LADWP	Los Angeles Department of Water and Power
LID	Low Impact Development
LRWQCB	Lahontan Regional Water Quality Control Board
MAF	Million Acre-Feet
MCL	Maximum Contaminant Limit
MG	Million Gallons

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mg/L	Milligrams per Liter
MGD	Million Gallons per Day
MHI	Median Household Income
MOU	Memorandum of Understanding
MPUD	Mojave Public Utilities District
msl	Mean Sea Level
MW	Megawatts
N.D.	No Date
NAHC	California Native American Heritage Commission
NO ₃	Nitrate Oxide
O&M	Operations and Maintenance
PHG	Public Health Goal
ppb	Parts per Billion
QA/QC	Quality Assurance/Quality Control
RAP	Region Acceptance Process
RAS	Return Activated Sludge
RCP	Representative Concentration Pathway
RCWD	Rand Communities Water District
Region	Fremont Basin Integrated Regional Water Management Region
RMS	Resource Management Strategy
RWMG	Regional Water Management Group
SB	Senate Bill
SDAC	Severely Disadvantaged Community
SDWIS	Safe Drinking Water Information System
SGMA	Sustainable Groundwater Management Act
SNMP	Salt and Nutrient Management Plan
State Park	Red Rock Canyon State Park
SWP	State Water Project
SWRCB	State Water Resources Control Board
SWRP	Stormwater Resource Plan
TCCWD	Tehachapi-Cummings County Water District
TDS	Total Dissolved Solids

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TMDL	Total Maximum Daily Load
US	United States
USACE	United States Army Corps of Engineers
USBR	United States Department of the Interior Bureau of Reclamation
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
WAS	Waste Activated Sludge
WDL	Water Data Library
WEP	Water and Environmental Program
WIFIA	Water Infrastructure Finance and Innovation Act
Work Plan	Lahontan Funding Area DACI Work Plan
WSD	Water Storage District
WWTP	Wastewater Treatment Plant

1 Governance and Planning

1.1 Introduction

Integrated regional water management (IRWM) planning is a collaborative effort to manage all aspects of water resources in a region defined by either natural or artificial boundaries. IRWM crosses jurisdictional, water, and political boundaries; involves multiple agencies, stakeholders, individuals, and groups; and it attempts to address the issues and differing perspectives of all entities involved through mutually beneficial solutions. The IRWM process involves identifying and implementing water management solutions on a regional scale to increase regional self-reliance, reduce conflict, and manage water in a way that concurrently achieves social, environmental, and economic objectives.

1.1.1 Integrated Regional Water Management Overview

In 2002, the California legislature passed the Integrated Regional Water Management Planning Act (Senate Bill (SB) 1672) to encourage local agencies to work cooperatively to manage local and imported water supplies, and to improve water quality, quantity, and reliability. The IRWM Planning Act provided an avenue for self-identified regions to develop IRWM Plans and ultimately apply for grant funding to support IRWM Programs through related bond measures. The California Department of Water Resources (DWR) is the State agency that manages the IRWM Program through grant programs and technical and facilitation services. Since the creation of the IRWM Planning Act in 2002, California voters have passed various bond acts that have provided over \$1.5 billion in State funding to support and advance integrated, multi-benefit and regional projects. These bond acts include:

- Proposition 50 (2002), the *Water Security, Clean Drinking Water, Coastal and Beach Protection Act*, which provided \$510 million to fund competitive grants for projects consistent with an adopted IRWM Plan
- Proposition 1E (2006), the *Disaster Preparedness and Flood Prevention Bond Act*, which provided \$300 million for IRWM Stormwater and Flood Management
- Proposition 84 (2006), the *Safe Drinking Water, Water Quality, and Supply, Flood Control, River and Coastal Protection Bond Act*, which provided \$1 billion for IRWM planning and implementation
- Proposition 1 (2014), the *Water Quality, Supply, and Infrastructure Improvement Act*, which provided \$510 million for IRWM planning and implementation

An integral part of the IRWM Program is developing an IRWM Plan (IRWMP or Plan). An IRWMP is a comprehensive document that is the outcome of IRWM planning efforts. The Plan reflects efforts and objectives of all stakeholders within a defined region and documents the development and implementation of effective strategies that promote sustainable water use, guarantee a reliable water supply, improve water quality, and endorse environmental stewardship within the region. IRWMPs also describe the water supply portfolio and demands in the region, as well as highlight the existing and projected water management challenges with respect to climate change impacts and population changes.

1.1.2 Fremont Basin IRWM Region

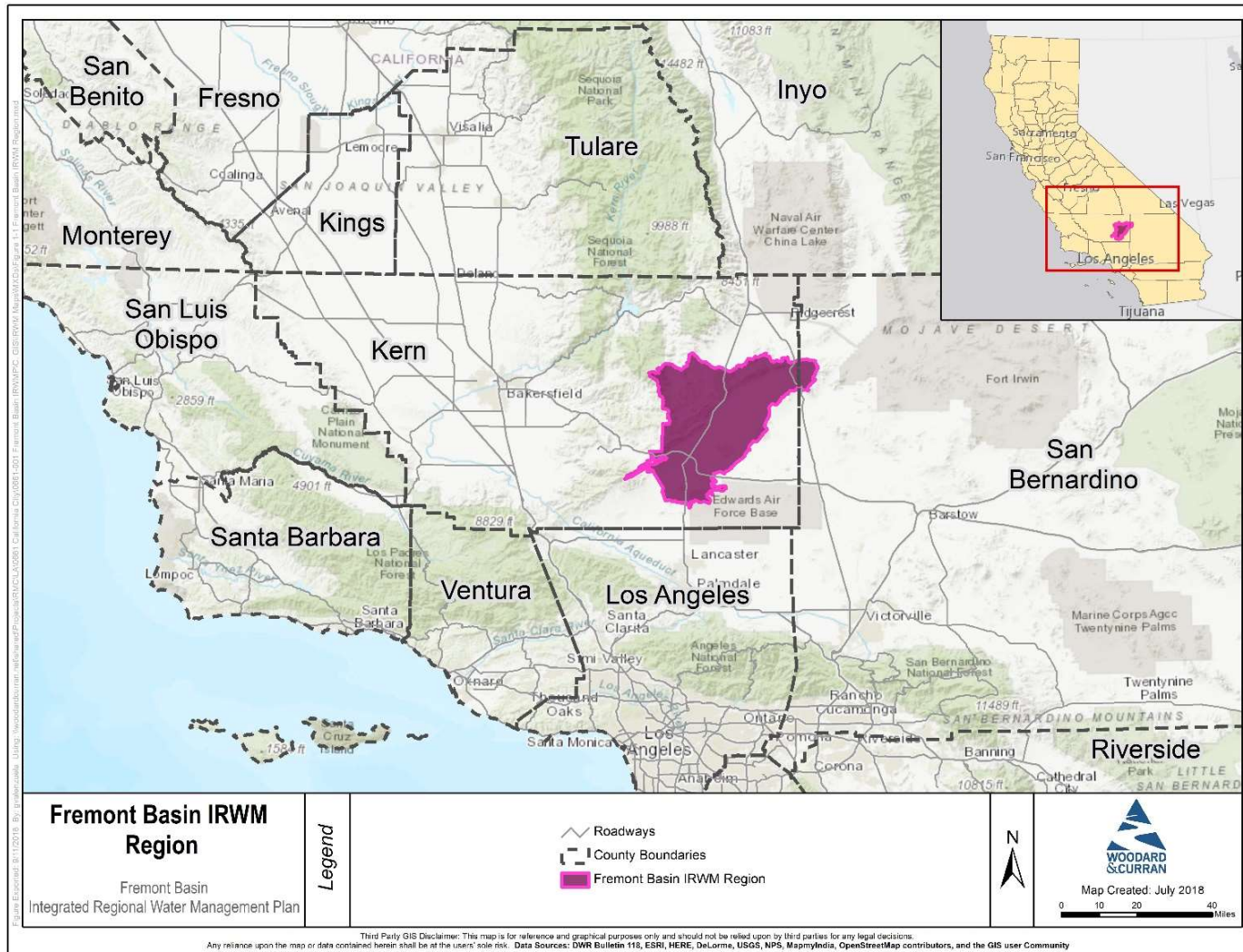
The Fremont Basin IRWM Region (Region) was approved by the DWR in September 2011 through the IRWM Region Acceptance Process (RAP). The Region boundaries were later updated in 2018 to incorporate the entirety of the underlying Fremont Valley Groundwater Basin (FVGB). The Region encompasses 992 square miles in eastern Kern County and western San Bernardino County in the western edge of the Mojave Desert, as shown in **Figure 1-1**. The only incorporated city in the Region is the City of California City (City), which is home to approximately 14,200 residents, most of whom reside within the FVGB (California City Water Department 2017). The primary defining water resources of the Fremont Basin IRWM Region is the FVGB. Additional information about the Region is described in *Chapter 2: Region Description*.



The Fremont Basin IRWM Region, located in the western edge of the Mojave Desert

Fremont Basin Integrated Regional Water Management Plan

Figure 1-1: Fremont Basin IRWM Region



1.2 Governance

1.2.1 Regional Water Management Group

Regional Water Management Groups (RWMGs) are formed to facilitate coordination, collaboration, and communication between all stakeholders in an IRWM Region. RWMGs must be composed of at least three local agencies, with at least two having statutory authority over water supplies. On October 21, 2014, the City of California City (California City or City), the Mojave Public Utilities District (MPUD), and the Antelope Valley-East Kern Water Agency (AVEK) signed a memorandum of understanding (MOU) forming the Fremont Basin RWMG. The MOU, included in the Plan as Appendix A, defines the organization, responsibilities, and governance structure for the Fremont Basin RWMG. The RWMG agreed to fund the development of the first Fremont Basin IRWMP, provide and share information for the Plan development, review drafts, adopt the final Plan, and assist with future IRWM grant applications (City of California City, AVEK, and MPUD 2014). Each of the RWMG members and their water management role in the Region are described below and are summarized in **Table 1-1**.

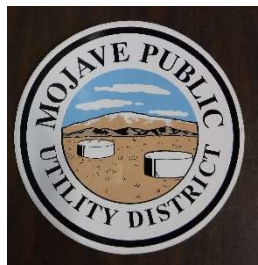
City of California City



The City of California City is the lead agency tasked with providing meeting organization and startup funding for the IRWMP. The City is a retail water supplier located in southeastern Kern County, serving over 14,000 residents. The City purchased all water rights to water in, on, and underlying the City in 1960 following an agreement between Boron Valley Water Development Company and Boron Valley Community Service District (later known as the California City Service District). The City is now the only water supplier in the municipality and has a service area encompassing 203 square miles. The

City uses six primary groundwater wells to meet water demands and intends to add two more wells in 2019. California City supplements its groundwater supplies with imported water purchased from AVEK (California City Water Department 2017). California City is also responsible for sewer services, land-use planning, flood management, and parks and recreation services within its service area.

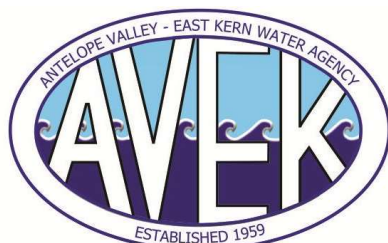
Mojave Public Utilities District



MPUD serves 19 square miles of unincorporated residential, commercial, industrial, and undeveloped land in the southeastern portion of Kern County at the western edge of the Mojave Desert. The agency's headquarters is located in the unincorporated community of Mojave, California, near State Highways 14 and 58. MPUD was chartered in 1938 and at that time it was responsible for operating the Southern Pacific Railroad Water Distribution System that had been in operation since the late 1800's. MPUD purchased the local water distribution system from Southern Pacific Railroad in 1940 and expanded

distribution facilities in 1958 with the purchase of additional pipelines, reserves, wells, and water rights (MPUD 2004). MPUD distributes water pumped from groundwater wells located northeast, southwest, and northwest of the town of Mojave, as well as imported water purchased from AVEK. MPUD is also responsible for the sewer services within its service area.

Antelope Valley-East Kern Water Agency



AVEK is a wholesale supplier of imported water from the State Water Project (SWP), with a service area covering approximately 2,400 square miles in northern Los Angeles and eastern Kern Counties, as well as a small portion of Ventura County. The agency was granted a charter by the State Legislature in 1959 and signed a water supply contract with DWR for the delivery of imported water supplies from the SWP in 1962. With a Table A Allocation of

144,844 AFY, AVEK has the third largest water allocation of the 29 SWP contractors, following the Metropolitan Water District of Southern California and Kern County Water Agency.

In addition to delivering imported water from the SWP, AVEK uses water from wells located within the Antelope Valley Groundwater Basin outside the Fremont Basin IRWM Region, and occupies one position on the court-appointed Watermaster Board for the Antelope Valley. As the wholesale water supplier in the Fremont Basin IRWM Region, AVEK has implemented several water exchange programs and intends to develop additional long-term exchange and storage programs to increase regional supply reliability.

To augment water supply reliability in its service area, AVEK also manages various groundwater banking programs. AVEK developed the Westside Water Bank Project in 2010 and the Eastside Water Banking and Blending Project in 2016 to store excess SWP water during wet periods. The stored water is extracted and used to supplement water supply during dry periods when water demand is high or when SWP deliveries are insufficient (AVEK 2016).

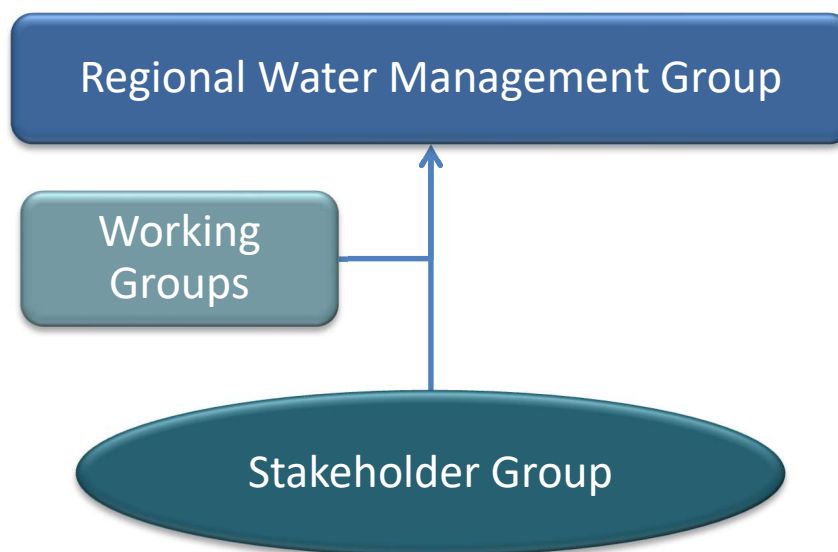
Table 1-1: RWMG Responsibilities in the Fremont Basin IRWM Region

RWMG Agency	Roles and Responsibilities
City of California City	Provides potable water, recycled water, sewer, land-use planning, environmental, flood management, and parks and recreation services within the City of California City
MPUD	Provides potable water and sewer services within its service area in portions of unincorporated Kern County in the south west edge of the Region
AVEK	Imported water wholesaler for the Region and manages groundwater banking programs

1.2.2 Governance Structure and Decision-Making

The RWMG acts as the oversight body for the Fremont Basin IRWM Region. The RWMG makes decisions about Plan development and implementation based on the recommendations and information received from the Fremont Basin IRWM stakeholder group and focused working groups that provide input on key topics. The governance structure for the Fremont Basin IRWM Region is depicted graphically in **Figure 1-2**.

Figure 1-2: Fremont Basin IRWM Region Governance Structure



The role of the RWMG is to provide leadership and guidance for IRWM planning and implementation in the Region. The RWMG directs program activities, reviews projects submitted for inclusion in the Plan, and submits grant applications to the State on behalf of the Region. The RWMG also performs strategic and financial decision-making, and conducts program advocacy to optimize water resources protection in the Region.

The role of the stakeholder group is to provide collaborative input to support IRWM outreach efforts, Plan development, and Plan implementation. Members of the stakeholder group are asked to attend Stakeholder Meetings, and represent the interests and concerns of their respective agency, organization, or interest group. They are a key component of the decision-making process as they provide critical information and support recommendations for the Region.

Working groups are groups of stakeholders that have volunteered to participate in specialized meetings that focus on particular topics, and advise the RWMG on the development and implementation of the Plan and its supporting documents. Those stakeholders with targeted expertise or interests were invited to join working groups (following Stakeholder Meetings) to provide additional input and information on key topics important to the Region during preparation of this IRWMP. The RWMG announces the opportunities to join working groups at the Stakeholder Meetings and welcomes any interested stakeholder, including representatives of disadvantaged communities (DACs) and tribes, to contact the RWMG about how they can participate further. Input and recommendations from the working groups inform the



Stakeholder Meeting #10 held on January 18, 2018 at the City Hall Chambers in California City, CA

recommendations of the stakeholder group during decision-making activities. Working groups meet on an as needed basis.

To perform its role and ensure long-term implementation of the Plan, the RWMG typically meets quarterly, and holds public meetings to discuss policy and project selection with Fremont Basin IRWM stakeholders, including DACs and tribal communities as needed. The RWMG seeks to achieve consensus from the stakeholder group on IRWM Program objectives and other key topics at Stakeholder Meetings. Decisions within the RWMG are made based on input and recommendations from the working groups, stakeholder group, DACs, and tribes using broad facilitated agreement, led by the RWMG.

1.3 Stakeholder Involvement

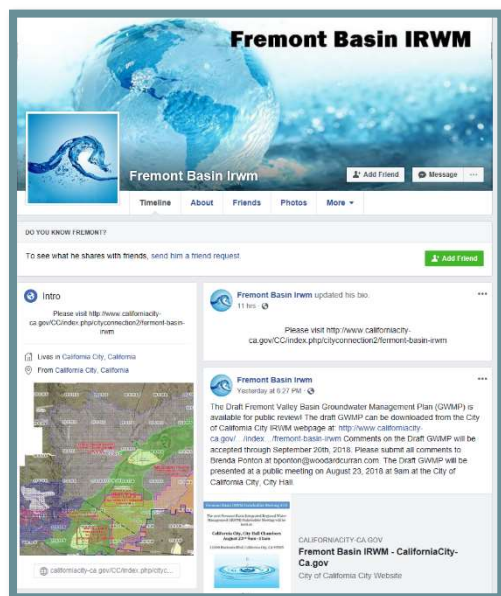
Stakeholders are an important part of the IRWM development process. Stakeholder involvement ensures the Plan is developed to incorporate the interests of a variety of stakeholders, including non-profit groups, public agencies, organizations, and individuals. Stakeholder participation is necessary to identify and address the objectives and resource management strategies of the IRWM Plan. Stakeholders are not required to provide financial contributions to be engaged in the regional planning effort. Instead, they are encouraged to participate in the IRWMP development through providing information and participation at meetings and in working groups.

1.3.1 Stakeholder Involvement and Public Outreach

The Fremont Basin IRWM Program encourages stakeholder involvement in both the development of the IRWM Plan and the continued implementation of the Plan objectives. When the Region was formed, the RWMG developed a potential stakeholder list to aid in publicizing the IRWM Program and soliciting groups that may want to participate in the Plan development. An email list was developed based on groups that had shown interest in the program. Emails providing IRWM background information and process updates were developed and distributed to the potential stakeholders to initiate participation and announce upcoming meetings. A website was developed for the Fremont Basin IRWM Region to inform the public of upcoming Stakeholder Meetings and other IRWM related-efforts. Through the email list and website, the RWMG solicits participation from interested stakeholders and keeps the public informed.



The Fremont Basin IRWM webpage on the City of California City's website



The Fremont Basin IRWM Facebook Page

post documents related to the IRWM Program, including meeting agendas, presentations, minutes, and the Plan itself.

The process the RWMG currently uses to identify and involve new stakeholders includes posting public announcements about the IRWM Stakeholder Meetings on the Fremont Basin IRWM webpages; soliciting recommendations for new groups to contact during Stakeholder Meetings; and targeting specific groups via email, phone calls, and letters. Stakeholders are welcome to join the stakeholder group and attend Stakeholder Meetings at any time. Anyone interested in being notified of upcoming meetings, or who wants to send information to the RWMG is welcome to contact the outreach coordinator for the program:

City of California City
21000 Hacienda Blvd.
California City, CA 93505
Phone: (760)373-7153
Fax: (760)373-7532
schavez@californiacity-ca.gov

The Fremont Basin IRWM stakeholders that have been identified and contacted through stakeholder outreach efforts represent a range of interests specific to the Region. The Fremont Basin IRWM stakeholders are listed in **Table 1-2**, and new stakeholders are identified on a continuous basis.

Table 1-2: Fremont Basin IRWM Stakeholders

Entity Type	Agencies and Organizations	
Wholesale, Retail Water Agencies, and Local Water Purveyors	• AVEK • Mojave Public Utilities District • California City • A.F.P. Mutual Water Company • Rancho Seco Inc. • Rand Communities Water District • California Water Service Company • Pinon Hill Water Company • Tehachapi-Cummings County Water District	• Quail Valley Water District-Eastside System • Quail Valley Water District-Westside System • Rosamond Community Services District • William Fisher Memorial Water Company • Kern County Water Agency
Wastewater Agencies	• Mojave Public Utilities District • City of California City	• Kern County Environmental Health Department
Flood Control Agencies	• City of California City	• Kern County Planning and Natural Resources Department
Municipal and County Governments and Special Districts	• City of California City • Community of Cantil • Kern County Planning and Natural Resources Department • Kern County Department of Agriculture and Measurement Standards	• Kern County Development Services Agency • Kern County Supervisor's Office • Surveying & Permit Services Dept. of Engineering • Mojave Chamber of Commerce
Environmental Organizations	• Desert Tortoise Preserve Committee • Friends of Jawbone Canyon	• Eastern Kern County Resource Conservation District • Red Rock Canyon State Park
Community Organizations	• Willow Springs Mobile Home Park	• Red Rock Canyon State Park
Energy Industry	• Beacon Solar NextEra Energy Resources LLC • GE Wind Energy • 8minutenergy	• Strata Equity Group • Next Era Energy • Los Angeles Department of Water and Power
Industry Organizations	• Honda Proving Center of California • Hyundai-Kia Motors • Kern County Farm Bureau • Golden Queen Mining	• California Portland Cement • Mojave Air and Space Port • Rio Tinto
Business	• Arciero & Son	• McMurtrey, Hartsock & Worth
Economic Development	• California City Economic Development Corporation • Kern Economic Development Corporation	• East Kern Economic Alliance
Self-Supplied Water Users / Land Owners	• Varied	

Entity Type	Agencies and Organizations	
State Agencies	• CA Department of Fish and Wildlife • Department of Water Resources • State Water Resources Control Board	• Lahontan Regional Water Quality Control Board • State Senate and Assembly Members
Federal Agencies	• Bureau of Land Management • U.S. Bureau of Reclamation • U.S. Environmental Protection Agency	• U.S. Army Corps of Engineers • U.S. Fish and Wildlife Service
Media	• Mojave Desert News	• Antelope Valley Press
School Districts	• Mojave United School District	
DAC Representatives	• Rancho Seco Inc. • Rand Communities Water District	• Eastern Kern County Resource Conservation District • Mojave Chamber of Commerce
Native American Tribes	• Tubatulabal Indian Tribe	• Tejon Indian Tribe

1.3.2 Disadvantaged Community Outreach

To ensure DAC issues and needs are equally represented in the IRWM Plan, the RWMG conducted targeted DAC outreach to identify, invite and involve groups that could represent DAC interests and needs. Using an initial list of potential DAC representatives developed by the RWMG and building on that list using input and recommendations from stakeholder meetings, the RWMG attempted to notify these groups of the Fremont Basin IRWM Program via email and phone calls.

Several working group meetings focused on ongoing DAC and public outreach efforts. These working groups included members of the RWMG as well as additional stakeholders who showed an interest in participating during Stakeholder Meetings. The goal of the DAC Outreach focused working groups was to encourage participation by DACs, solicit input for updates, and educate target audiences about the purpose and benefits of the IRWM Program.



The Rand Community Building in Johannesburg – one of the several Stakeholder Meeting locations

To facilitate participation of DACs in the IRWM Program, the Fremont Basin IRWM Region has made multiple efforts to reduce potential barriers to DAC involvement. For example, the RWMG holds Stakeholder Meetings in different locations throughout the IRWM Region, including more isolated areas where representatives of DACs will have better access to attend meetings. Because not all stakeholders have the same access to online sources and email, the Fremont Basin IRWM Stakeholder Meeting announcements are communicated through multiple media, including newspaper announcements, the City website, the Fremont Basin IRWM Facebook page, email notifications, and phone calls to

specific groups, when appropriate. The RWMG also made hard copies of the public draft IRWM Plan available at a variety of locations in the Region so that DACs had access to the document without needing access to a computer.

DACs are welcome to participate in the program at any time by attending meetings or by contacting a RWMG member. Specifically, DACs can contact the City of California City, the lead RWMG agency, at any time to request information, provide data, voice issues, discuss goals, submit projects, and contribute other information they want considered for inclusion in the Plan. The contact information for the DAC coordination representative is below:

DAC Coordinator
City of California City
21000 Hacienda Blvd.
California City, CA 93505
Phone: (760)373-7153
Fax: (760)373-7532
schavez@californiacity-ca.gov

DAC Involvement Program

In 2016, DWR's Proposition 1 allocated \$2.45 million dollars to the Lahontan Funding Area for the DAC Involvement Program (DACI Program). Though the DACI Program is distinct from the Proposition 1 IRWM Planning Grant Program, extensive coordination has occurred between the two programs. The three main goals of the DACI Program are to: 1) encourage IRWM regions to work collaboratively to involve DACs and Economically Distressed Areas (EDAs) in IRWM planning efforts; 2) identify water management-related needs of DACs/EDAs; and 3) develop strategies and long-term solutions that address the identified needs. The DACI Program provides a unique opportunity for the Fremont Basin IRWM Region to explore these barriers and DAC needs.

Throughout 2016 and 2017, the Fremont Basin IRWM Region convened with the Tahoe-Sierra, Inyo-Mono, Mojave, and Lahontan Basins IRWM Regions to develop the Lahontan Funding Area DACI Work Plan (Work Plan). The Work Plan promotes additional DAC outreach to communities new to the IRWM Program and strengthens existing relationships. The Work Plan also sets guidelines to aid in project identification and development to advance projects to the implementation stage. The Work Plan was approved by DWR in May 2017 (DACI 2017). Coordination with the other Lahontan Funding Area Regions and DWR is ongoing as the Work Plan is implemented.

1.3.3 Native American Tribal Outreach

Involving Native American Tribes in the IRWM planning and implementation process helps ensure tribal interests are equally represented in the IRWM development process and that IRWM objectives are properly identified. Though there are no federally recognized tribes or reservations in the Fremont IRWM Region, there is a Native American land parcel that is currently held in Trust by the U.S. government. Both the Bureau of Indian Affairs and the California Native American Heritage Commission (NAHC) were directly contacted via phone and email and were asked to identify the Native American individual or community who owns the land; they were also asked to determine if there are more tribal interests in the Region. However, communication with tribal representatives determined that there are no recognized tribes or nations in the Region. As such, there are no tribal

interests or water issues specific to Native American Tribal Communities identified through this outreach process. Tribal organizations will be contacted during future Plan updates to notify groups of Stakeholder Meetings in case representatives would like to participate in the future.

1.4 Regional Coordination

1.4.1 Coordination with Neighboring IRWM Regions

The Fremont Basin IRWM Region is bordered by four other IRWM Regions: the Inyo-Mono IRWM Region to the north, the Antelope Valley IRWM Region to the south, the Mojave IRWM Region to the east, and the Kern County IRWM Region to the west. The Inyo-Mono, Antelope Valley, and Mojave IRWM Regions share the Lahontan Funding Area with the Fremont Basin IRWM Region, in addition to two other IRWM Regions, Lahontan Basins and Tahoe Sierra. The Kern County IRWM Region is not in the same Funding Area, but it is adjacent to the Region and shares some of the same water resources challenges. While each of these regions share some similarities, they also have distinct water management issues and priorities. The boundary distinction for the Fremont Basin IRWM Region boundary is discussed in *Chapter 2: Region Description*. A map of the neighboring IRWM Regions is provided in **Figure 1-3**.

The Fremont Basin IRWM RWMG coordinated with neighboring IRWM regions prior to and during the development of the 2019 Fremont Basin IRWM Plan. As discussed in *Section 1.3.2: Disadvantaged Community Outreach*, the Region was part of the DACI Program for the Lahontan Funding Area and Work Plan development that involved coordination with other Regions in the Funding Area. Additionally, the Fremont Basin IRWM Boundary was modified during the development of the Plan, which involved coordination with neighboring Regions impacted by the boundary change. These correspondences are discussed further below.

Inyo-Mono IRWM Region

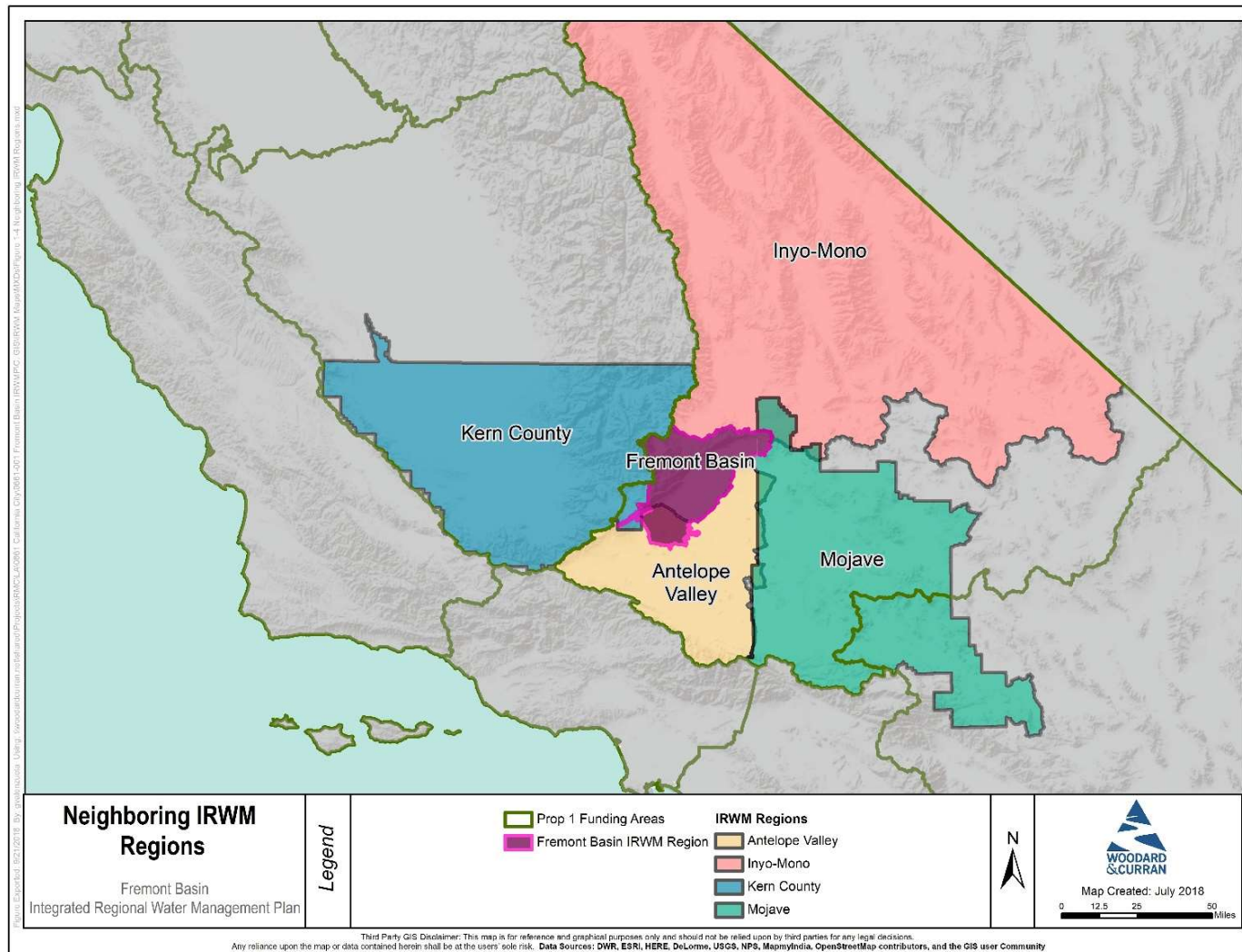
The Inyo-Mono Region is leading the DACI Grant Program for the Lahontan Funding Area. The Fremont Basin RWMG coordinates regularly with representatives from the Inyo-Mono IRWM Region as a part of this program.

Antelope Valley IRWM Region

The Antelope Valley IRWM Region is a part of the Lahontan Funding Area, but this region chose not to submit projects for the DACI Grant Program. The Antelope Valley IRWM Region did coordinate with the Fremont Basin IRWM Region and other Regions in the Funding Area prior to the DACI Grant application process to express their desire not to submit projects and to provide the needed information for the Work Plan.

The Antelope Valley and Fremont Basin IRWM Regions are both a part of the larger Antelope Valley watershed, but have distinct groundwater basins and water management priorities as discussed in *Chapter 2: Region Description*. Two of the Fremont Basin RWMG members, AVEK and MPUD, have service areas that span across both IRWM Regions. Therefore, these two agencies, in addition to other Fremont Basin IRWM stakeholders, attend Stakeholder Meetings for both IRWM Regions and develop projects that provide integration between Regions. The City of California City also has a portion of its City boundary within the Antelope Valley IRWM Region, and coordinates with the Antelope Valley RWMG on data, as needed.

Figure 1-3: Neighboring IRWM Regions



As part of the Fremont Basin IRWM Region boundary modification, the Fremont Basin RWMG coordinated with the Antelope Valley IRWM Region to discuss potential overlapping areas. Following discussions between key RWMG members, the two Regions decided to allow an overlap between the two Regions. Additional coordination will occur, as needed, if any projects in the overlapping areas seek funding through the IRWM Program

Mojave IRWM Region

The Mojave IRWM Region is a participant in the DAC Involvement Grant Program for the Lahontan Funding Area. The Fremont Basin RWMG coordinates regularly with representatives from the Mojave IRWM Region as a part of this program.

As part of the Fremont Basin IRWM Region boundary modification, the Fremont Basin RWMG coordinated with the Mojave IRWM Region to discuss potential overlapping areas and boundary change options. As a result of these discussion, both Regions modified their boundaries according to the Fremont Valley watershed and Cuddeback Valley watershed boundaries so that there is no overlap between Regions.

Kern County IRWM Region

The Kern County IRWM Region was consulted as part of the Fremont Basin IRWM Region boundary modification process. Following multiple correspondences with the Kern County IRWM Region contacts, it was decided that allowing a minor overlap between the Regions was the desired resolution. Additional coordination will occur, as needed, if any projects in the overlapping areas seek funding through the IRWM Program.

1.4.2 Coordination with State, Federal, and Local Agencies

Coordination with government agencies is a necessary component of IRWMP development and project implementation. State agencies, such as DWR, the California Environmental Protection Agency (CalEPA), the California Department of Fish and Wildlife (CDFW), the State Water Resources Control Board (SWRCB), and the Lahontan Regional Water Quality Control Board (LRWQCB) have authority over water resources in the Region and require coordination for permitting and environmental documentation during project development. Federal agencies, such as the U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), and U.S. Environmental Protection Agency (USEPA) are also involved with permitting and environmental documentation for water-related projects in the Region. Finally, local agencies such as Kern County have authority over land use, public works, and environmental health in the Region.

Several of these agencies, including DWR, the LRWQCB, and Kern County have been contacted directly to invite them to participate in Stakeholder Meetings. The LRWQCB attended several stakeholder meetings during the 2019 Plan development process, and provided guidance and review for the Fremont Valley Basin Salt and Nutrient Management Plan (SNMP). Should State or federal funding be obtained for future IRWMP project implementation, the RWMG will coordinate with the appropriate State and federal agencies. Additionally, ongoing coordination would occur during and after project implementation as part of project monitoring and data collection. As new State, federal and local contacts are identified, they will be added to the Fremont Basin IRWM stakeholder list and invited to future Stakeholder Meetings.

1.5 IRWM 2019 Plan Development

In 2017, the Fremont Basin IRWM Region was awarded a Proposition 1 IRWM Planning Grant to develop its first IRWMP in accordance with DWR's 2016 IRWM Grant Program Guidelines. This funding allowed the Region to establish Regional objectives and targets, assess potential water management strategies, and evaluate and prioritize projects to address the needs of the Region. Funding also supported stakeholder and DAC outreach and involvement as well as the development of a Groundwater Management Plan (GWMP) (provided as Appendix B of this IRWMP) and a SNMP (provided as Appendix C of this IRWMP) to support the technical analyses for the IRWMP.

Extensive outreach efforts were conducted to bolster stakeholder participation during Plan development. Outreach efforts included the development of working groups that focus on various subject areas (see *Section 1.2.2: Governance Structure and Decision Making*), conducting monthly Stakeholder Meetings, and conducting targeted outreach to DACs and tribal groups through emails, phone calls, and media advertisements. During Plan development, the Stakeholder contact list was updated regularly and additional contacts were added to reach underrepresented groups.

1.5.1 Public Notices

The RWMG posted a notice of intent to prepare the Plan in the local newspaper, the Mojave Desert News. The notice was posted on September 1, 2017, and September 8, 2017, in accordance with Section 6066 of the Government Code.

Following development of the IRWM Plan, the RWMG posted notice of the upcoming public review period and public meeting for the draft IRWM Plan in the Mojave Desert News on September 14, 2018 and October 5, 2018. The RWMG will post a notice of intention to adopt the final 2019 IRWM Plan in the Mojave Desert News in accordance with Section 6066 of the Government Code. Each agency adopted the Plan in a public meeting of their respective governing boards. Proof of public notices are provided as Appendix D.

1.5.2 Stakeholder Meetings

Stakeholder Meetings were a key component in the Plan development as they provided an opportunity for stakeholders to contribute information, express concerns, provide recommendations, and relay information to and from their organizations. A series of fifteen Stakeholder Meetings were held leading up to and during the development of the IRWMP. Meeting dates were announced on the Fremont Basin IRWM websites, as well as via email announcements sent to the stakeholder group and local hardcopy postings. Meeting locations are shown in **Figure 1-4**, and meeting topics, dates and locations are summarized in **Table 1-3**.

Figure 1-4: Stakeholder Meeting Locations

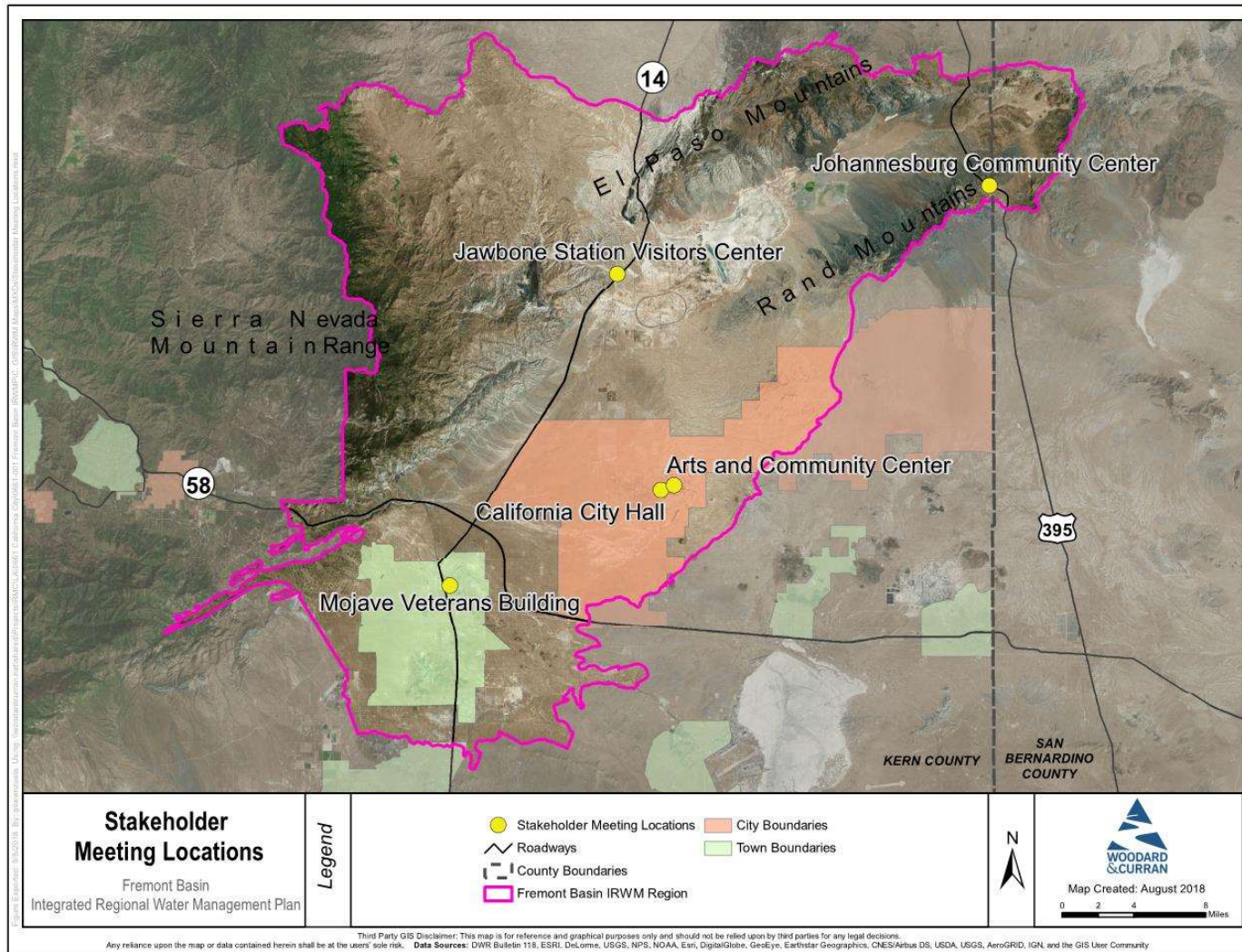


Table 1-3: Fremont Basin IRWM Stakeholder Meetings

#	Meeting Topic/Purpose	Meeting Date	Location
1	IRWM Planning and Grant Program	September 11, 2015	California City Hall, California City
2	IRWM Planning and Grant Program	October 30, 2015	California City Hall, California City
3	IRWM Planning and Grant Program	March 18, 2016	California City Hall, California City
4	Governance	July 27, 2017	Arts and Community Center, California City
5	Region Description	August 15, 2107	California City Hall, California City
6	Region Description cont., Regional Objectives	September 21, 2017	Jawbone Station Visitors Center, Cantil
7	Supply and Demand, Region Objectives	October 19, 2017	Mojave Veterans Memorial Building, Mojave
8	Objectives and Targets, Regional Management Strategies	November 16, 2017	Johannesburg Community Center
9	Climate Change	December 14, 2017	Arts and Community Center, California City
10	Project Review and Prioritization	January 18, 2018	California City Hall, California City
11	Project Prioritization and Scoring	February 15, 2018	Mojave Veterans Memorial Building, Mojave
12	Plan Implementation	March 15, 2018	Jawbone Station Visitors Center, Cantil
13	Draft GWMP	August 23, 2018	California City Hall, California City
14	Draft SNMP	September 20, 2018	Mojave Veterans Memorial Building, Mojave
15	Draft IRWM Plan	October 11, 2018	Arts and Community Center, California City

1.5.3 DAC Outreach for Plan Development

Outreach to DACs was an integral part of the IRWM 2019 Plan development. More than 90 percent of the Fremont Basin IRWM Region lies either within a block group, tract, or Census Designated Place that has a median household income (MHI) below 80% of the State's MHI and is classified as a DAC as discussed in *Chapter 2: Region Description*. A few groups were identified by the RWMG as key DAC representatives for the Region that could provide specific input on DAC water management issues and needs. These groups included representatives from Rand Communities Water District (RCWD), Rancho Seco, Cantil, Mojave, and the Eastern Kern County Resource Conservation District.

1.5.4 Media

The local newspaper, the Mojave Desert News, attended multiple Stakeholder Meetings and provided some coverage in the paper about the IRWM Plan development during the planning process. In addition to the newspaper articles, the RWMG posted notices of Plan preparation and Plan adoption in the Mojave Desert News.

1.5.5 Plan Adoption

Following completion of the 2019 IRWM Plan, the Plan was adopted by each of the three IRWM agencies: City of California City, MPUD, and AVEK. Several project proponents who submitted projects to the IRWM Plan intend to adopt the Plan including Rancho Seco Inc.

1.6 Technical Analysis

The RWMG used technical data and analyses to help understand and describe the water management needs in the Region over the planning horizon of 25 years. The technical analyses referenced or conducted in support of the IRWM Plan are summarized in **Table 1-4**.

Table 1-4: Technical Analyses

Data or Study	Analysis Method	Results/Derived Information	Use in IRWM Plan
2015 Urban Water Management Plans for City of California City¹, AVEK², and California Water Service³	Analysis of water supply reliability, water quality, water demands, and infrastructure	Current and projected supplies and demands, quality concerns, and facility descriptions	Used to describe current and projected supplies and demands in the Region, discuss drinking water quality concerns, and facilities. Also, used to identify water supply issues and needs.
2012-2016 American Census Survey (ACS) (US Census Bureau)⁴	Review of median household income for block groups, tracts and designated places	Housing and income data for the 5-year period from 2012 to 2016	Used to estimate median household income and DAC locations
1990/2000/2010/2015 Census (US Census Bureau)⁵	Review of census block groups, tracts and designated places	Populations and housing data for the year 2010 and 2015	Used to estimate current population for the Region, and calculate demand
Department of Finance⁶	Growth analysis	Demographics and population projections for unincorporated Kern County for the period 2010 to 2040	Used to determine demographics in the Region, estimate population growth, and calculate potential future demands
Basin Plan for the Lahontan Region⁷	Water quality analysis	Beneficial use designations and water quality objectives	Used to describe current water quality impairments, beneficial uses for surface waters, and quality objectives for surface and ground waters

Data or Study	Analysis Method	Results/Derived Information	Use in IRWM Plan
Fremont Valley Basin Groundwater Management Plan⁸	Groundwater elevation analysis, water quality issue identification	Estimates of natural recharge for the Fremont Valley Groundwater Basin and potential water quality issues	Used to describe groundwater supplies and quality condition and to estimate groundwater supply capacity to support increases in demands
Fremont Valley Basin Salt and Nutrient Management Plan⁹	Loading and antidegradation analysis	Assimilative capacity for the Fremont Valley Groundwater Basin and potential impacts of future development on groundwater quality	Used to describe potential impacts on groundwater quality from projected changes in land use
California Energy Management Information System¹⁰	Climate Change Analysis	Climate data for the Region	Used to describe current and projected climate conditions
Cal-Adapt¹¹	Climate Change Analysis	Climate change impacts on temperature, extreme heat days, wildfire risk, and precipitation in the Region through 2100	Used to describe climate change impacts on the Region

Sources: (1) California City Water Department. 2017. Urban Water Management Plan 2015 Update; (2) AVEK. 2016. 2015 Urban Water Management Plan; (3) California Water Service. 2016. 2015 Urban Water Management Plan; (4) American Community Survey (ACS). 2015. 2012-2016 ACS 5-Year Estimates; (5) United States Census Bureau. 2010. 2010 United States Census Demographics; (6) California Department of Finance. 2017. County Population Projections (2010-2060); (7) SWRCB Division of Drinking Water. 2015. Basin Plan for the Lahontan Region, 1995 with amendments effective through September 2015; (8) Woodard & Curran. 2018a. Fremont Valley Basin GWMP; (9) Woodard & Curran. 2018b. Fremont Valley Basin SNMP; (10) California Emergency Management & Natural Resources Agency. 2012. California Adaptation Planning Guide; (11) California Energy Commission. 2017. Cal-Adapt Tools.

1.7 Relation to Local Water and Land Use Planning

The Fremont Basin IRWM Plan was developed to be consistent with other local planning efforts being conducted in the Region. As discussed previously, the Fremont IRWM Plan was developed with input from a variety of regional stakeholders, including stakeholders with jurisdiction over local water and land use planning. The RWMG itself is composed of the three major water agencies in the Region, with one member, the City of California City, also being a local land use planning agency. Other water and land use planning agencies, such as Kern County, were consulted during the development of the Plan and invited to Stakeholder Meetings to ensure consistency and collaboration between planning efforts. Stakeholder Meetings will continue to be an avenue for coordination between the RWMG and local land use and water planning agencies.

Kern County was consulted during Plan development via email and phone calls to ensure updated information, consistent with water and land use planning in the unincorporated areas of the Region,

was included in the Plan. The County's involvement supports coordination that ensures information is translated between local and regional planning efforts. The Fremont Basin IRWM Region recognizes the importance of maintaining clear and consistent communication with the County and will continue to try to involve the County in the Region's IRWM planning efforts as the Plan is implemented and updated. The importance of the coordination between local and regional water and land use is further supported by the inclusion of this collaboration as one of the Regional Objectives and planning targets as described in *Chapter 4: Objectives*.

The following sections highlight the local water and land use planning efforts that relate to the Fremont Basin IRWMP.

1.7.1 Groundwater Management Plan

The FVGB is currently designated as a low priority groundwater basin under the Sustainable Groundwater Management Act (SGMA); thus, the agencies within the IRWM Region are not subject to SGMA requirements for the groundwater basin at this time. However, the City, AVEK, and MPUD initiated efforts to prepare the Region for development of a Groundwater Sustainability Plan (GSP) through the development of a GWMP for the FVGB. The Fremont Valley Basin GWMP was developed in coordination with the development of the Fremont Valley Basin SNMP and Fremont Basin IRWMP. The GWMP is intended to act as a "pre-GSP" document to later be revised to meet the requirements of SGMA. The City, AVEK, and MPUD, as well as other key stakeholders in the Region, may form a Groundwater Sustainability Agency (GSA) in the future and continue the GSP development process.

The City and Regional stakeholders recognize that cooperation across agencies involved in the basin management is essential to long-term groundwater basin sustainability, to supporting the new GWMP goals and objectives, and to streamlining data collection and reporting efforts from agencies involved in GWMP implementation. Therefore, the Fremont Valley Basin GWMP, SNMP and Fremont Basin IRWMP were developed in close coordination, utilizing similar objectives, management strategies, and projects to meet planning area goals.

1.7.2 Salt and Nutrient Management Plan

A SNMP was prepared for the FVGB to fulfill the requirements of the State's Policy for Water Quality Control for Recycled Water (Recycled Water Policy). The Fremont Valley Basin SNMP development was led by the City, AVEK, and MPUD, in collaboration with local and regional stakeholders and in accordance with the Recycled Water Policy. The primary purpose of the SNMP was to assist the City, AVEK, MPUD, and stakeholders in complying with the Recycled Water Policy regarding the use of recycled water from municipal wastewater treatment facilities. The Recycled Water Policy supports use of recycled water as a source of water supply while requiring the management of salts and nutrients from all sources on a sustainable basis to maintain water quality objectives and protect beneficial uses covered by each of the Regional Water Quality Control Board Basin Plans.

Recycled water is currently used in the City's Central Park Lake and is served to irrigate park and golf course areas, as discussed in *Chapter 2: Region Description*. Recycled water supply is projected to increase in the future as the City's population grows and the City expands its wastewater treatment plant. The Fremont Valley Basin SNMP is intended to inform future decisions for the use of recycled water and help streamline permitting of future recycled water projects while protecting the basin water quality objectives and beneficial uses. Information regarding the feasibility of recycled water

expansion in the Region and its impact on the groundwater basin was incorporated into the IRWM Plan.

1.7.3 Urban Water Management Plans

Urban Water Management Plans (UWMPs) are prepared by urban water suppliers to support long-term resource planning and ensure adequate water supplies are available to meet current and future water demands in their service areas. Preparation of an UWMP is a requirement of the Urban Water Management Planning Act for urban water suppliers with 3,000 or more connections or supplying more than 3,000 acre-feet (AF) of water annually. These plans must be updated and submitted to DWR every 5 years to comply with the Act and be eligible for State funding.

The UWMPs for the urban water suppliers in the Region were used to help describe and calculate the water supplies and demands in the Region. Both the City of California City and AVEK completed UWMPs in 2015 (California City Water Department 2017; AVEK 2016). These documents are a valuable tool for resource planning, including supply and demand management. The most recent UWMP prepared by MPUD was submitted to DWR in 2004 (MPUD 2004). Since that time, they have not been required to complete an UWMP because they have less than 3,000 connections and supply less than 3,000 AF of water annually. Information from UWMPs will be incorporated in future IRWM updates as it becomes available.

1.7.4 City and County General Plans

California law requires that each city and county in the State develop and adopt a general plan. General plans are comprehensive long-term plans for the physical development of the plan area and contain a list of development goals and policies for the county or city. The seven mandated elements of a general plan are: Land Use, Open Space, Conservation, Housing, Circulation, Noise, and Safety.

In 2009, the City Council of the City of California City adopted an updated General Plan. The General Plan outlines the vision for the City's future and includes implementation measures to meet the vision. Planning and development decisions are made consistent with the goals and policies delineated in the General Plan. The planning area is comprised of the City's corporate limits, totaling 130,200 acres of land located on the western edge of the Mojave Desert in eastern Kern County (California City 2009).

In 2004, Kern County adopted its General Plan and has completed several updates since then. The County General Plan's Land Use, Open Space, and Conservation element designates the proposed general distribution, location, and extent of land uses in unincorporated areas. The focus of the discussion is on ensuring future economic growth while conserving the County's agricultural, natural, and resource attributes (Kern County 2009).

Both the City and County General Plans were used to help describe the current and future land use conditions in the Region. The City of California City and the Kern County Planning and Natural Resources Department were consulted during Plan development to ensure current land use planning initiatives and processes were incorporated.

1.7.5 Regional Conservation Plans

The IRWM Region provides critical habitat for diverse flora and fauna that have adapted to high desert conditions. To protect the area's biodiversity and ecosystem, various restoration efforts are

underway. The CDFW, the California Department of Transportation, local jurisdictions, and other regional stakeholders collaborated with the United States Bureau of Land Management (BLM) to develop the West Mojave Plan in 2005. The plan is a habitat conservation and federal land use plan that provides management strategies for the desert tortoise, Mohave ground squirrel, and over 100 other plants and animals that are vital for the preservation of these two species. The planning area is located to the north of the Los Angeles metropolitan area and includes the IRWM Region within its boundaries.

The West Mojave Plan was used to help identify conservation areas in the Region and describe potential habitat issues and needs.

1.7.6 Stormwater Resource Plans

The development of a Stormwater Resource Plan (SWRP) is required in order to receive State funding for any stormwater and dry weather runoff capture project, with some exceptions¹. SWRPs must be incorporated into IRWMPs as part of compliance with Water Code Section 10562(b)(7) requirements. Currently, there are no SWRPs in the IRWM Region and no plans to develop any by municipalities in the Region. If any SWRP is developed in the Region in the future, the RWMG will incorporate the SWRP into the Plan, as applicable.

1.8 Plan Update Process

The IRWMP is a “living document” that will be updated regularly. As the Region continues to develop and regulatory requirements continue to evolve, it is expected that many components of the Plan will change and need revision. Adaptive management processes will be used to ensure the Plan remains relevant and useful for regional planning. For example, the Region may decide to update the plan to include:

- New water-related issues and needs
- New or modified objectives and targets
- New Plan projects and project prioritization
- Progress on Plan performance and/or project monitoring
- New local planning efforts

It is also anticipated that the RWMG will update the Plan to meet changing DWR requirements as funding becomes available. With this in mind, the RWMG plans to update the IRWMP no less than every five years to keep the Plan reflective of current regional issues, objectives, and water management strategies.

¹ SWRPs are not required of DACs with a population of 20,000 or less that are not a co-permittee for a Municipal Separate Stormwater System National Pollutant Discharge Elimination System permit issued to a municipality with a population greater than 20,000.

Future Plan updates will be coordinated through the RWMG and be similar in process to the Plan development process described previously in this document. Formal changes to the Plan may reflect significant changes to processes, organizational structure, water management conditions, or routine periodic updates of the Plan. For formal updates, Stakeholder Meetings will be conducted to ensure stakeholders, including DACs and tribal communities, are involved. The Fremont Basin IRWM websites and stakeholder email list will be used to communicate with stakeholders about meetings and Plan updates. Once an update is complete, RWMG member agencies will re-adopt the updated Plan, which will then be posted on the Region's websites.

Informal changes to material/content in the Plan such as minor processes, or water management changes that occur frequently, will not require a formal Plan update as they will not require decisions to be made by the RWMG. These changes will be included in the periodic Plan updates. Because projects will continue to be submitted to the RWMG for inclusion in the IRWM Project list between Plan updates, the RWMG will continue to review and update the IRWM project list, and post it to the webpage housed on the City of California City's website. The project review process is described in detail in *Chapter 6: Projects*.

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2 Region Description

2.1 Regional Overview

This chapter provides an overview of the Fremont Basin IRWM Region, including the physical characteristics, sources of supply and estimated demands, water quality, land use, and the social and cultural setting.

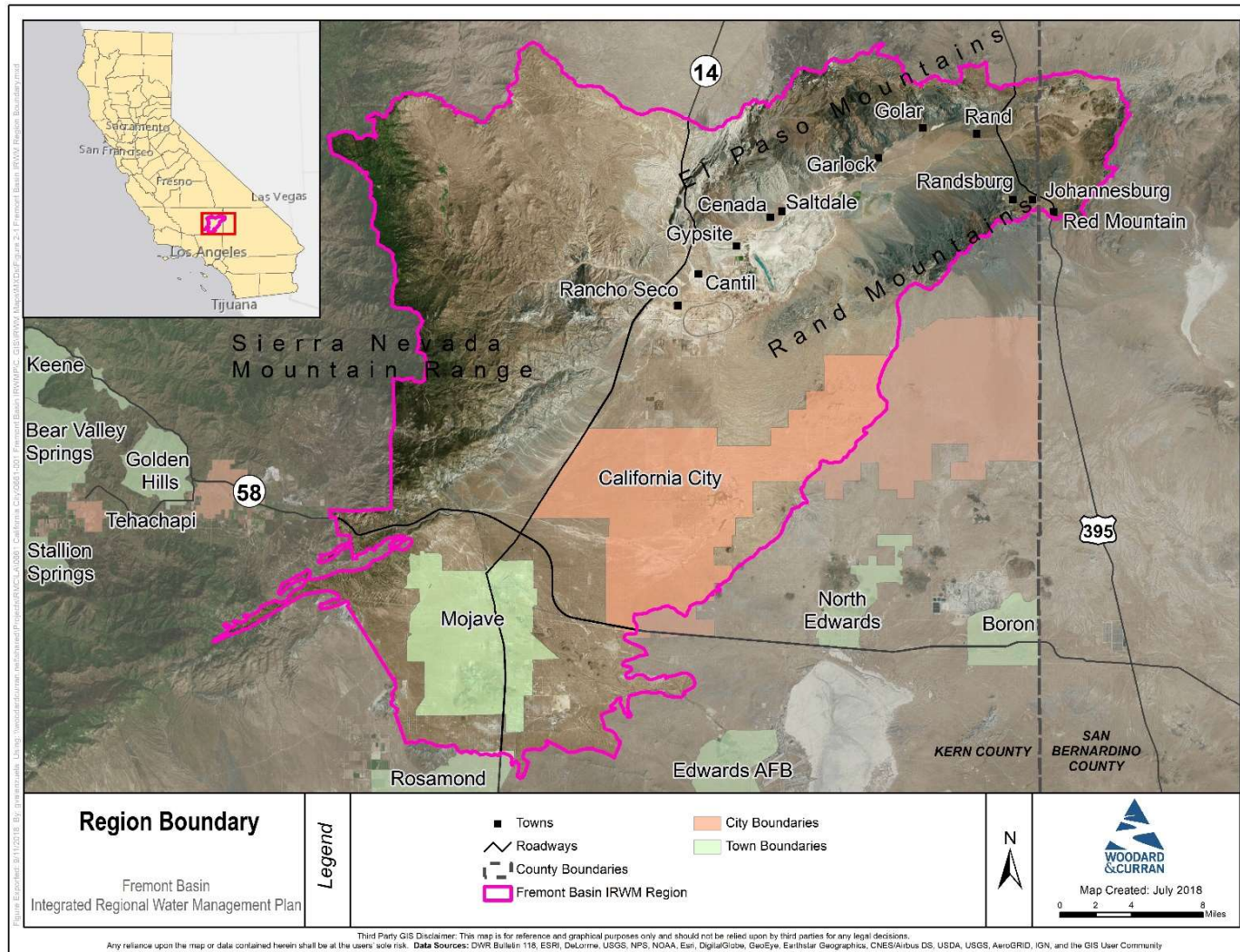
2.1.1 Fremont Basin IRWM Regional Boundary

The Fremont Basin IRWM Region is located in eastern Kern County and western San Bernardino County, within a distinct drainage basin (watershed) in the southern half of the Lahontan Hydrologic Region. The Region is bounded by the Antelope Valley to the south, the Rand Mountains to the north, the southern ranges of the Sierra Nevada Mountains to the west, and San Bernardino County to the east (see **Figure 2-1**). The City of California City, located on the western edge of the Mojave Desert, is the only Incorporated Place within the Region. Unincorporated communities in the Region include the town of Mojave (a Census Designated Place) as well as the small communities of Cantil, Rancho Seco, Gypsite, Ceneda, Saltdale, Garlock, Rand, Goler, Johannesburg, Randsburg, and Red Mountain. Major highways giving access to the Region include State Route 14, a north-south aligned highway that traverses the entirety of the Region, and State Route 58, a south-east aligned highway that crosses between Mojave and California City. The California City Municipal Airport, a 222-acre publicly owned facility located in California City, also provides access to the Region.

The IRWM Region boundaries were originally created to fill the existing void created by neighboring IRWM regions, which include Inyo-Mono, Kern County, Antelope Valley, and Mojave. This boundary was established through the RAP, approved by DWR in 2011. In 2018, the Fremont Basin IRWM Region boundaries were expanded to better represent the common water management needs in the Region. The revised IRWM boundaries now encompass 992-square miles and are a combination of the natural topography that outlines the Fremont Valley watershed and the FVGB. Though topographic considerations and jurisdictions were essential for the formation of the Region boundary, it also reflects water management issues, stakeholders, and water-related conflicts.

In addition, the Region may be identified by its unique water management priorities and issues, including those related to water supply, water quality, flood management, and environmental stewardship. Water resource planning at the regional level is useful for coordinating efforts to address these issues and help meet water demands with an integrated water supply portfolio while considering the unique characteristics of the Region. These unique characteristics are described in the sections that follow.

Figure 2-1: Fremont Basin IRWM Region Boundary



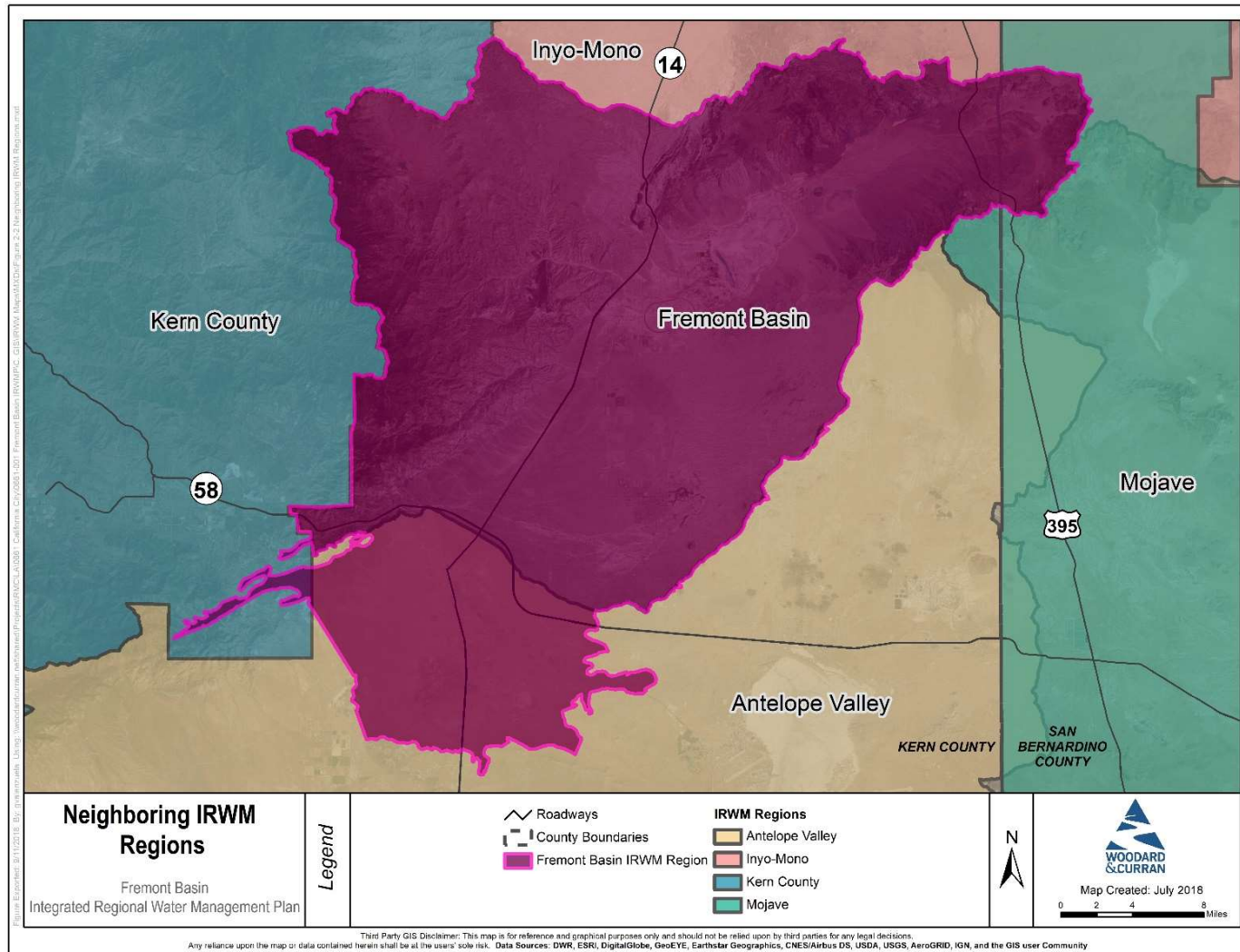
2.1.2 Neighboring IRWM Regions

As discussed in *Chapter 1: Governance and Planning*, the Fremont Basin IRWM Region is located in DWR's Proposition 1 Lahontan Funding Area. The Lahontan Funding Area encompasses 25,513 square miles along the eastern edge of the state of California. Within the Lahontan Funding Area, there are six individual IRWM Regions, including Fremont Basin, Mojave, Inyo-Mono, Antelope Valley, Tahoe Sierra, and Lahontan Basins. As shown in **Figure 2-2**, Fremont Basin is surrounded by the following four IRWM Regions:

- Inyo-Mono IRWM Region to the north; first IRWMP was adopted in 2010;
- Kern County IRWM Region to the west; first IRWMP was adopted in 2011;
- Antelope Valley IRWM Region to the south; first IRWMP was adopted in 2007; and
- Mojave IRWM Region to the east; first IRWMP was adopted in 2014.

The Region currently overlaps with both the Kern County and the Antelope Valley IRWM Regions. In the southwestern portion of the Fremont Basin IRWM Region, there exists a 4,700-acre overlap with the Kern County IRWM Region. In the southeastern portion of the Fremont Basin IRWM Region, there exists a 106,400-acre overlap with the Antelope Valley IRWM Region. These overlapping areas resulted after the Fremont Basin IRWM Region modified its boundary in 2018 to include the entirety of the FVGB, as described in *Chapter 1: Governance and Planning*.

Figure 2-2: Neighboring IRWM Regions



2.2 Physical Setting

2.2.1 Climate

The Fremont Basin IRWM Region is located in the high desert at an elevation of 2,300 to 4,000 feet above mean sea level (msl). The climate is semiarid and characterized by warm, dry summers and mild, cool winters. The mean daily temperatures range from 33°F in the winter to 98°F in the summer (Western Regional Climate Center N.D.). Native flora in the Region is dominated by sparse, drought-resistant vegetation that can tolerate both extreme heat and cold weather. Examples include Joshua trees, mesquite, sagebrush, desert cymopterus, and Mojave Creosote bush scrub. Carpets of wildflowers bloom during wet years, depending on rainfall intensity in the spring (City of California City N.D.a).



Joshua trees are a common vegetation type in the semiarid Fremont Basin IRWM Region

Average monthly precipitation in the Region ranges from 0.03 inches in June to 1.3 inches in February. The total annual average rainfall is 5.9 inches, with 70 percent of precipitation occurring between December and March and little to no rainfall in the summer months (California Irrigation Management System (CIMIS) N.D.). Because of the lack of rain during the summer months, water demand for landscaping and non-native plants increases.

Monitoring data indicates that the Fremont Valley area has experienced wet-dry cycles with a prolonged drought period from 1945 to 1964, a prolonged wet period from 1976 to 1984, and a drought period 2006 to the present. Precipitation on the valley floor may have significant losses from evaporation and transpiration; however, during an exceptionally wet season, flashfloods may occur and runoff may originate on or cross the valley floor to reach Koehn Lake located in the northeastern part of the Region (Stetson 2009). Precipitation is greater in the mountains than on the valley floor, with rainfall ranging from 2.5 inches to 27.8 inches and an average of approximately 10.1 inches annually (National Oceanic and Atmospheric Administration 2018).

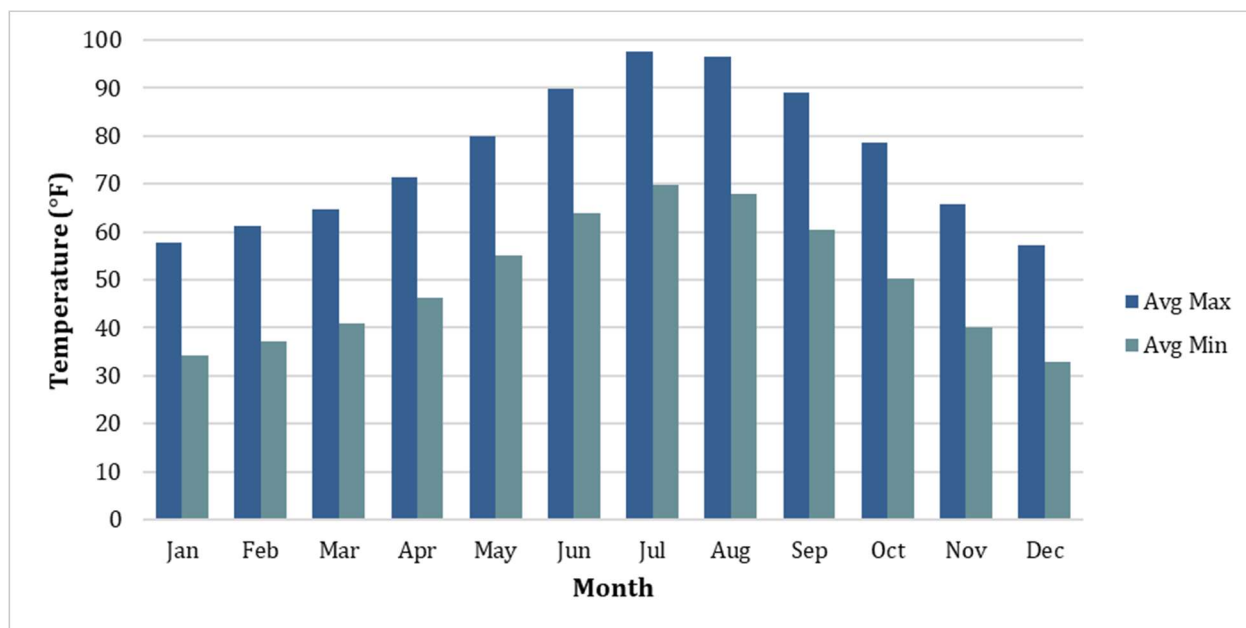
Table 2-1 presents a summary of the Region's climate based on data collected at the Mojave Station between 1904 and 2016. **Figure 2-3** indicates the average minimum and maximum temperatures in the Region and **Figure 2-4** indicates the average rainfall and monthly evapotranspiration (ET_o) in the Region.

Table 2-1: Climate in the Fremont Basin IRWM Region

Month	Average Monthly ETo (inches) ¹	Average Rainfall (inches) ²	Average Maximum Temperature (°F) ²	Average Minimum Temperature (°F) ²
January	2.31	1.20	57.8	34.2
February	3.16	1.27	61.2	37.1
March	5.01	0.93	64.7	41.0
April	6.47	0.30	71.3	46.3
May	8.28	0.09	79.9	55.1
June	9.19	0.03	89.9	63.8
July	9.61	0.11	97.6	69.7
August	8.74	0.15	96.4	68.0
September	6.35	0.21	89.0	60.3
October	4.48	0.24	78.5	50.3
November	2.85	0.53	65.7	40.2
December	2.07	0.87	57.2	32.9
Annual	68.52	5.93	75.8	49.9

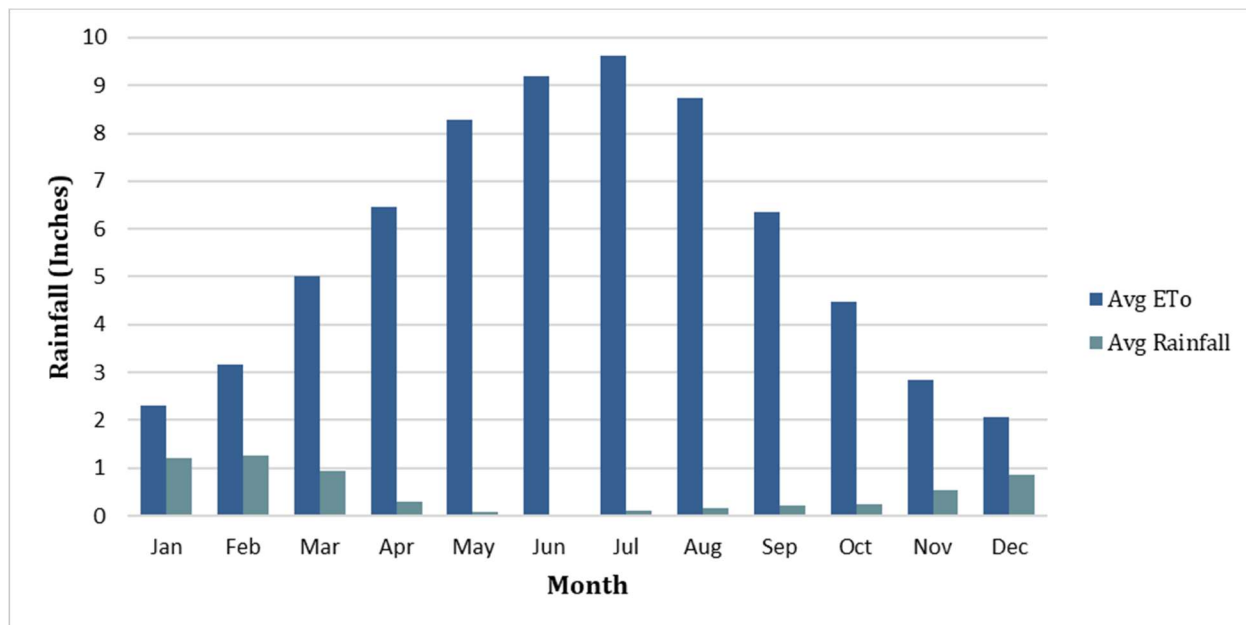
Sources: (1) CIMIS Data for Palmdale No. 197 Station since April 2005. Accessed 9 August 2017 from www.cimis.water.ca.gov/Stations.aspx (2) Western Regional Climate Center, Mojave Station (045756) for the Years 1904 to 2016.

Figure 2-3: Average Monthly Temperature in the Fremont Basin IRWM Region



Source: Western Regional Climate Center, Mojave Station (045756) for the Years 1904 to 2016.

Figure 2-4: Average Monthly Rainfall and Evapotranspiration (ETo) in the Fremont Basin IRWM Region



Sources: CIMIS Data for Palmdale No. 197 Station since April 2005; Western Regional Climate Center, Mojave Station (045756) for the Years 1904 to 2016.

2.2.2 Geology and Soils

The FVGB underlies the majority of the IRWM Region and is the primary water feature for the Region. The groundwater basins in the Region and their boundaries are discussed in *Section 2.3.3: Groundwater*. The geological structures and soils in the Region were described in detail as part of the Fremont Valley Basin GWMP and are summarized below. For a more detailed description of the geological setting, see the Fremont Valley Basin GWMP in Appendix B.

Structural Features

Several named and unnamed faults in the FVGB are identified on California geologic maps, as shown on **Figure 2-5**. Four major faults transverse the FVGB in a northeast-trending direction. The longest ones are the Garlock fault and El Paso fault system that run along the north and west sides of the basin, along the foothills of the Sierra Nevada and El Paso Mountains, and separates the consolidated rocks of the Tehachapi, Piute, and El Paso Mountains from the FVGB. The Cantil Valley fault, which appears to be a branch of the Garlock fault, runs from the Garlock fault near the town of Cantil, bisects the FVGB through Koehn Lake, and rejoins the Garlock fault approximately nine miles east of US 395. According to the DWR, the effects of the Cantil Valley fault on groundwater flow are not known; but the U.S. Geological Survey (USGS) and recent studies indicate that it serves as a partial barrier to groundwater flow (USGS 1977).

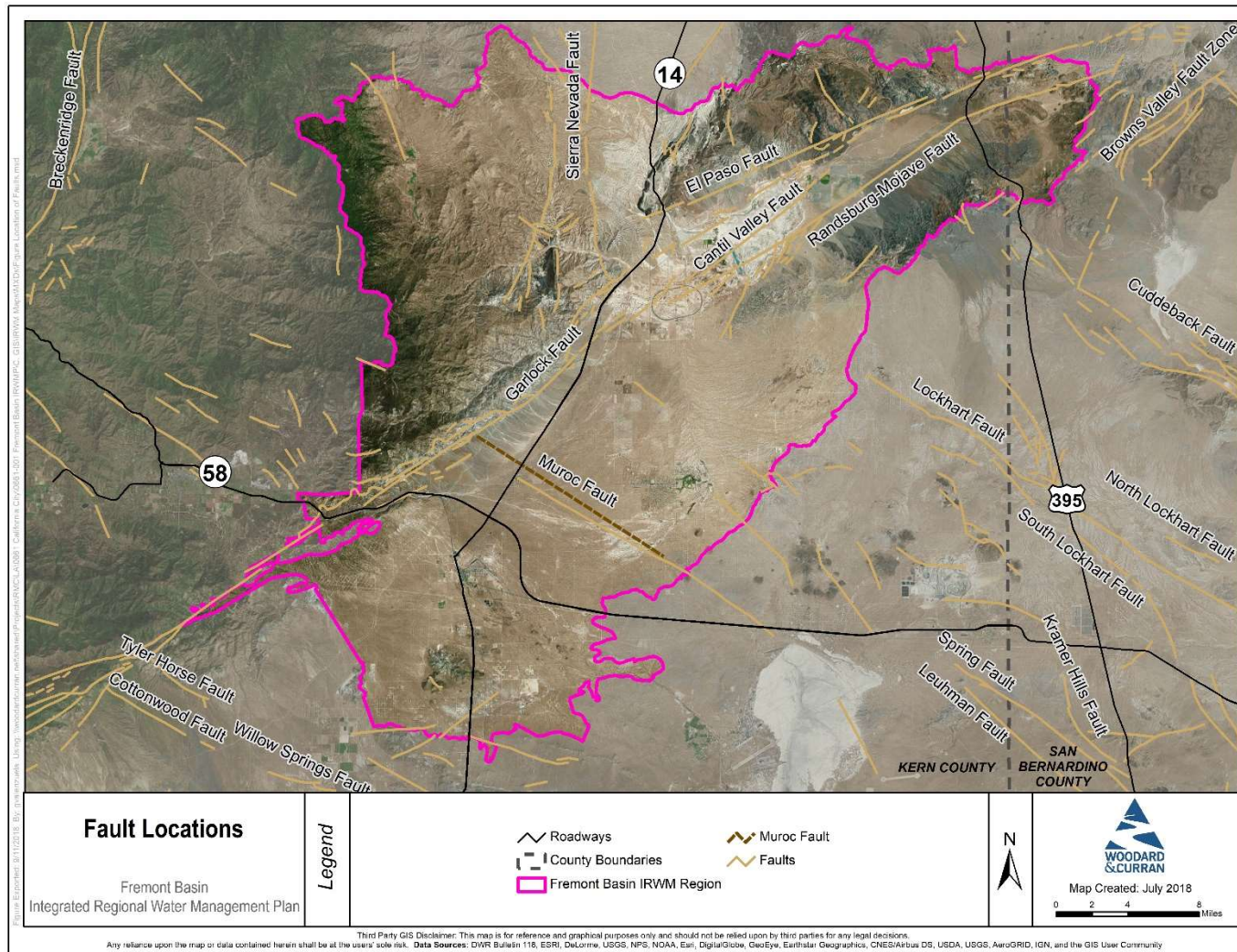


Mountains surrounding the Fremont Valley

The Randsburg-Mojave fault runs along the northeastern side of the basin and separates the consolidated rocks of the Rand Mountains from the FVGB. The southern boundary of the FVGB is bounded on the south by the east-west trending Rosamond fault. These faults form restrictive groundwater barriers on the west and northwest sides of the FVGB (Dibblee 1967).

The Muroc fault traverses the southern portion of the FVGB and forms a partial barrier to groundwater flow (DWR 1964). Previous studies by Stetson (2009) considered the Muroc fault as an intrabasin boundary dividing the basin into two subbasins: the California City subbasin to the north and the Mojave City subbasin to the south. The subsurface flow across the Muroc fault is reported to occur only when groundwater levels south of the fault are high enough to allow groundwater to overflow the groundwater barrier created by the fault. The subsurface flow appears to stop when groundwater levels south of the Muroc fault are lower than the barrier crest, which is estimated at an elevation of approximately 2,420 feet msl based on historical water levels near the Muroc fault.

Figure 2-5: Location of Faults in the Fremont Valley Groundwater Basin



Soils

Soil data for the Plan area were obtained from the U.S. Department of Agricultural (USDA) SSURGO and STATSGO2 databases. Data are discussed based on hydrologic soil groups as shown in **Figure 2-6**. Hydrologic soil groups are assigned based on measured rainfall, runoff potential, and infiltration. Soils groups vary from low runoff potential and high permeability (group A) to soils with high runoff potential and low permeability (group D). According to the data, most soils in the Plan area are either group A or group D with small areas of group B and group C. Areas with soils in group A and higher saturated hydraulic conductivities are more likely to be the potential recharge areas for the underlying groundwater basin, as discussed in the Fremont Valley Basin GWMP in Appendix B, though there may also be site-specific constraints to recharge, depending on land use or other factors.

Due to the high sand content and sparse rainfall in the Region, some portions of the Fremont Valley experience dust issues. Low rainfall and strong winds cause sand to blow and erode soils. This issue is prominent near the communities of Rancho Seco and Cantil in the northern Fremont Valley where sand dunes can cause damage to homes and roads. Sand management and restoration is an ongoing concern for the communities in this area.

2.2.3 Watersheds and Surface Water Features

The Fremont Basin IRWM Region is composed primarily of the Fremont Valley watershed in addition to including a portion of the Antelope Valley watershed in the southern portion of the Region. The Region is surrounded by the remaining portion of the Antelope Valley watershed, as well as the Grapevine, Kern River, Indian Wells Valley, Trona, and Cuddeback watersheds, as shown in **Figure 2-7**.

The portions of the Fremont Valley watershed not included in the IRWM Region are located west of the Kern County IRWM Region boundary. The Fremont Valley watershed is part of the larger Antelope-Fremont Valleys watershed, (Hydrologic Unit Code 18090206). The subwatersheds of the Fremont Valley watershed include the Koehn, East Tehachapi, Kelson Landis, and Dove Springs subwatersheds as shown in **Figure 2-8**.



Koehn Lake, the dry lake bed in the Region

The Fremont Valley watershed is a dry, closed basin area surrounded by mountain ranges that receives surface water runoff from Pine Tree Canyon, Cache Creek, and other ridges adjacent to the area. Surface runoff drains from the surrounding mountains and valley to Koehn Lake, a dry lake bed where the water either evaporates or percolates into the ground. The dry lake bed is located north of California City and is the lowest topographical location in the basin, with a bed elevation of approximately 1,880 feet above msl. In addition to natural surface water features, the Los Angeles Aqueduct passes through the Region, as a subterranean pipe, from the northern to the southern boundaries. These surface water features are also shown in **Figure 2-7**.

There is a small portion of the Antelope Valley watershed in the southern portion of the Region. This portion of the Antelope Valley watershed includes the town of Mojave and receives runoff from the San Gabriel Mountains. The primary subwatersheds of the Antelope Valley watershed within the Region include the Chaffee and Gloster subwatersheds as shown in **Figure 2-8**.

Figure 2-6: Hydrologic Soil Groups

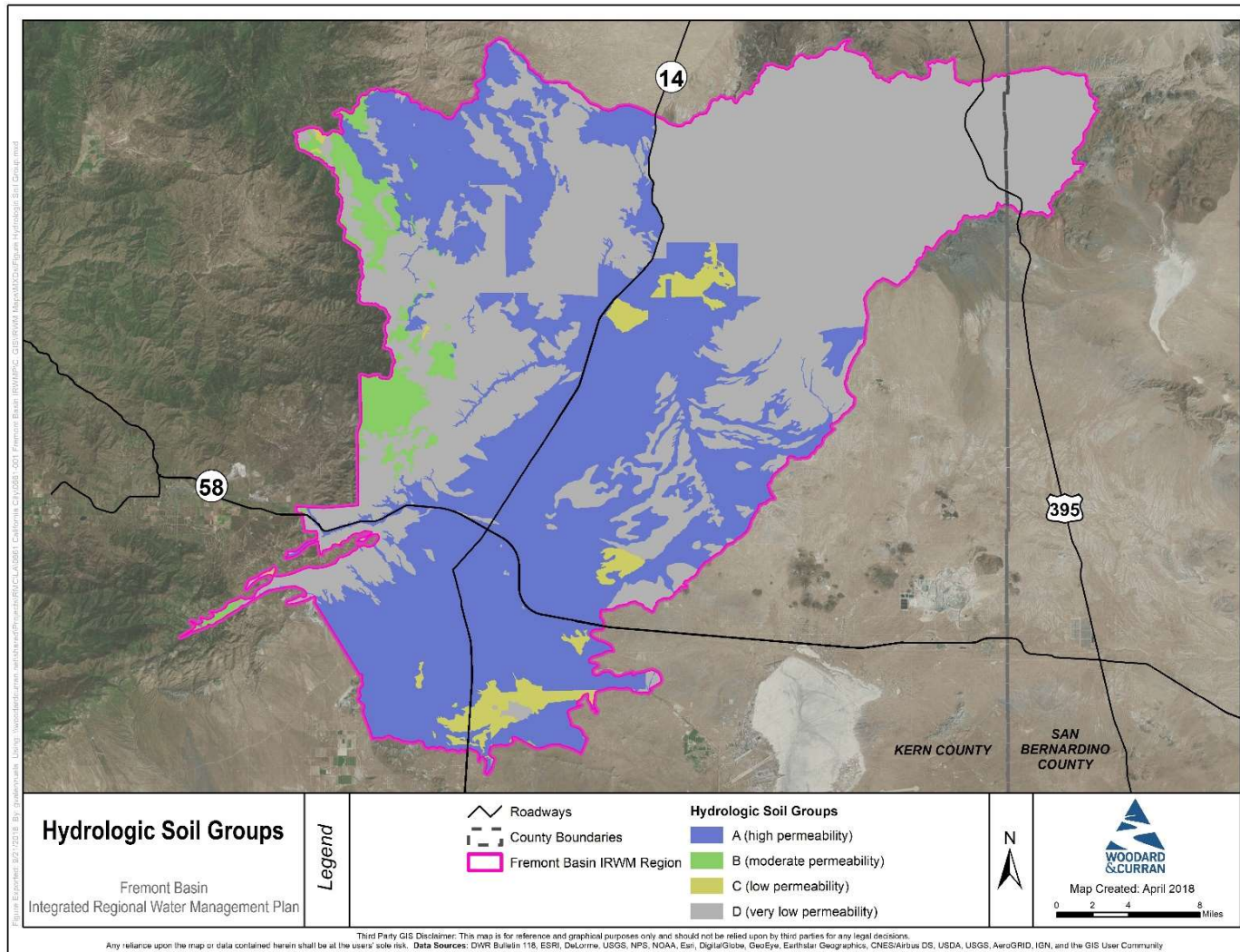


Figure 2-7: Watersheds and Surface Water Features

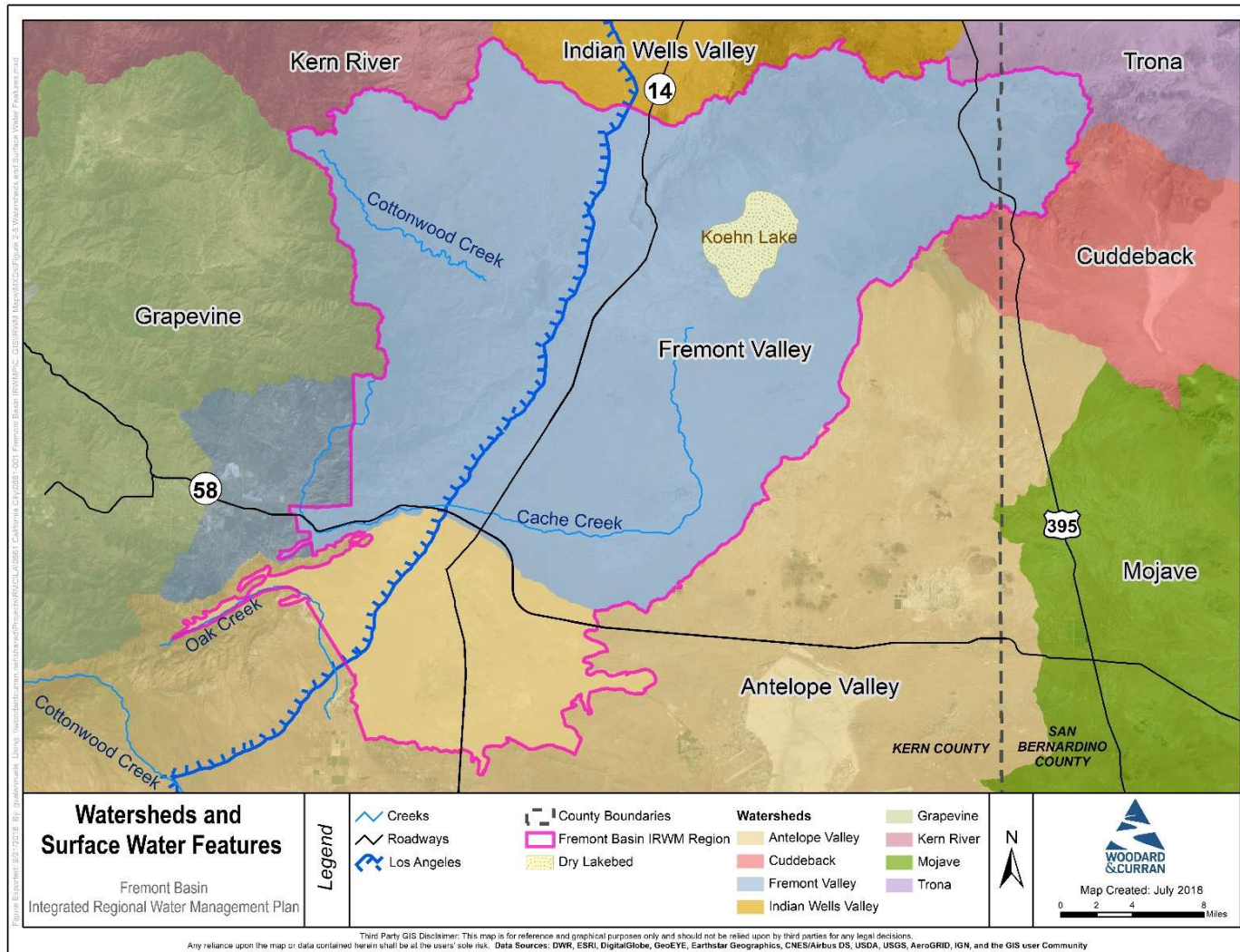
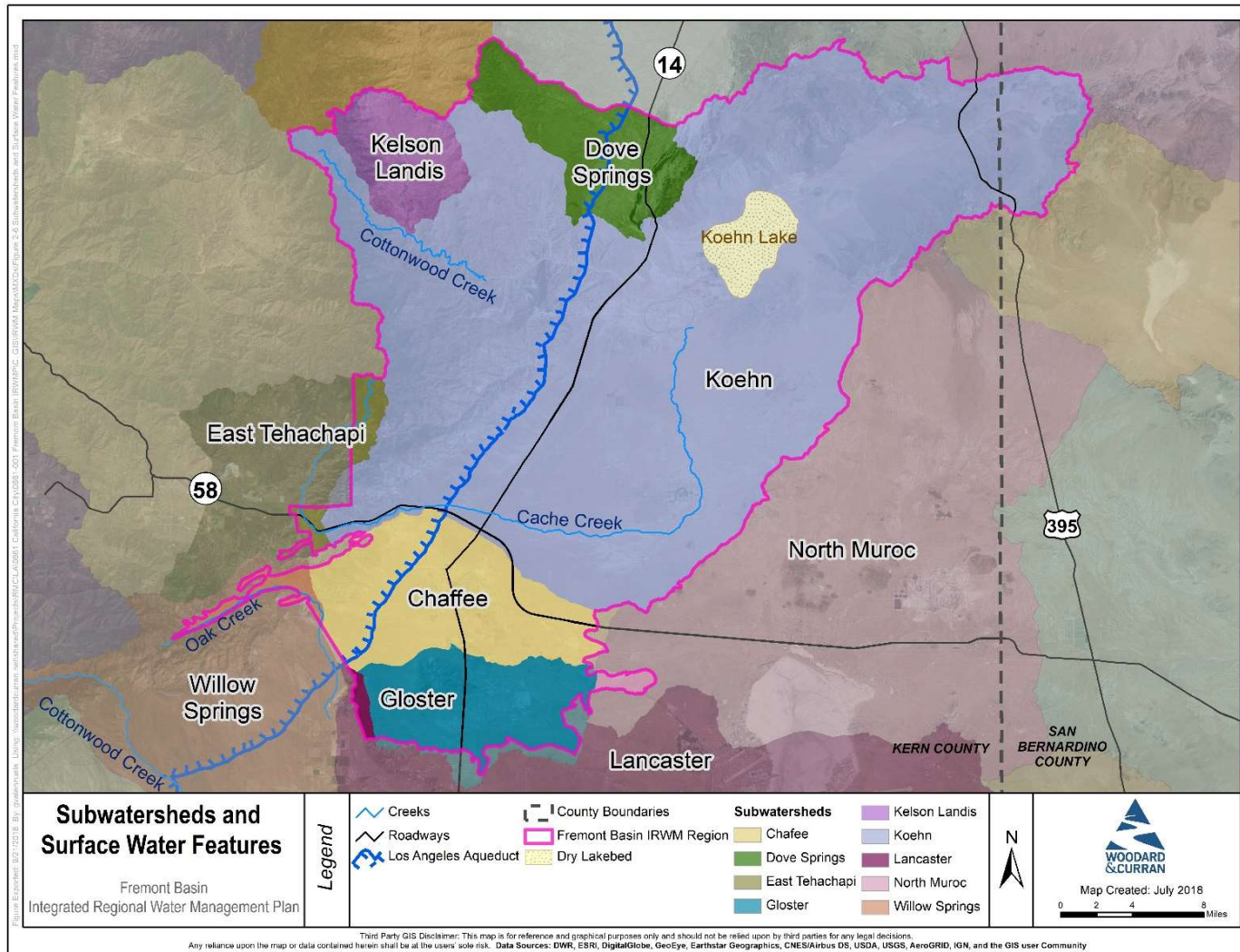


Figure 2-8: Subwatersheds and Surface Water Features



2.2.4 Internal Boundaries

This section discusses the various internal boundaries within the Region, including political jurisdictional boundaries (**Figure 2-9**), water purveyor service boundaries (**Figure 2-10**), wastewater service boundaries (**Figure 2-11**), flood control agencies (**Figure 2-12**), and land use agency boundaries (**Figure 2-13**).

Political Jurisdictional Boundaries

The Fremont Basin IRWM Region lies primarily within Kern County, with a small portion of the Region in western San Bernardino County. The only city within the Region includes is the City of California City. The remainder of the Region is unincorporated Kern and San Bernardino Counties. **Figure 2-9** depicts the county, municipality, and tribal boundaries within the Fremont Basin IRWM Region. The town of Mojave, though part of unincorporated Kern County, is a major township in the Region and, as such, is also identified in the figure. While a boundary for Native American lands held in trust by the U.S. government was identified and is shown in Figure 2-9, there were no federally recognized tribes identified in the Region.

Water Purveyor Service Areas

There are six public water agencies that supply water within the Fremont Basin IRWM Region. These include the City of California City, MPUD, AVEK, California Water Service Company (Cal Water), RCWD, and Rancho Seco Inc. AVEK is the Region's wholesaler, whose sphere of influence extends into the Region, and whose customers include California City and MPUD. California City serves the City of California City. MPUD's service area is entirely within the Fremont Basin IRWM Region, in the southern portion of the Region. Cal Water has a small district north of California City. RCWD covers the northeast portion of the Region, and Rancho Seco Inc. serves a small portion of the Region in the Cantil area. The Tehachapi-Cummings County Water District (TCCWD) is another wholesaler that has a small portion of their service area in the western edge of the Region, but does not provide supply within that area at this time. Other water systems within the Region include the American Honda Company, Red Rock Canyon Service, and Edwards Airforce Base service area. The boundaries of the public water agencies in the Region are shown in **Figure 2-10**, including the system service boundaries for California City, MPUD, and RCWD within their sphere of influence.

Wastewater Service Areas

Wastewater sewer service in the Region is provided by MPUD and California City. The remainder of the Region is on septic systems. Kern County Public Health Services Department is responsible for regulating onsite-wastewater treatment systems with septic tanks in the unincorporated areas of Kern County outside of municipal sewer service boundaries (Kern County EHS Department 2016). California City owns and operates a wastewater treatment plant (WWTP) and all domestic sewer collection systems within the City boundaries. City sewage is collected into sewage mains and delivered to the WWTP located in the northeast part of the City. Approximately 30 percent of the City is served by the WWTP; the remaining population relies on septic systems (California City Water Department 2017). MPUD also has one WWTP and provides wastewater services to its entire service area with the exception of the Cache Creek portion of its service area. The wastewater service area boundaries and facilities are shown in **Figure 2-11**.

Figure 2-9: Political Jurisdictional Boundaries

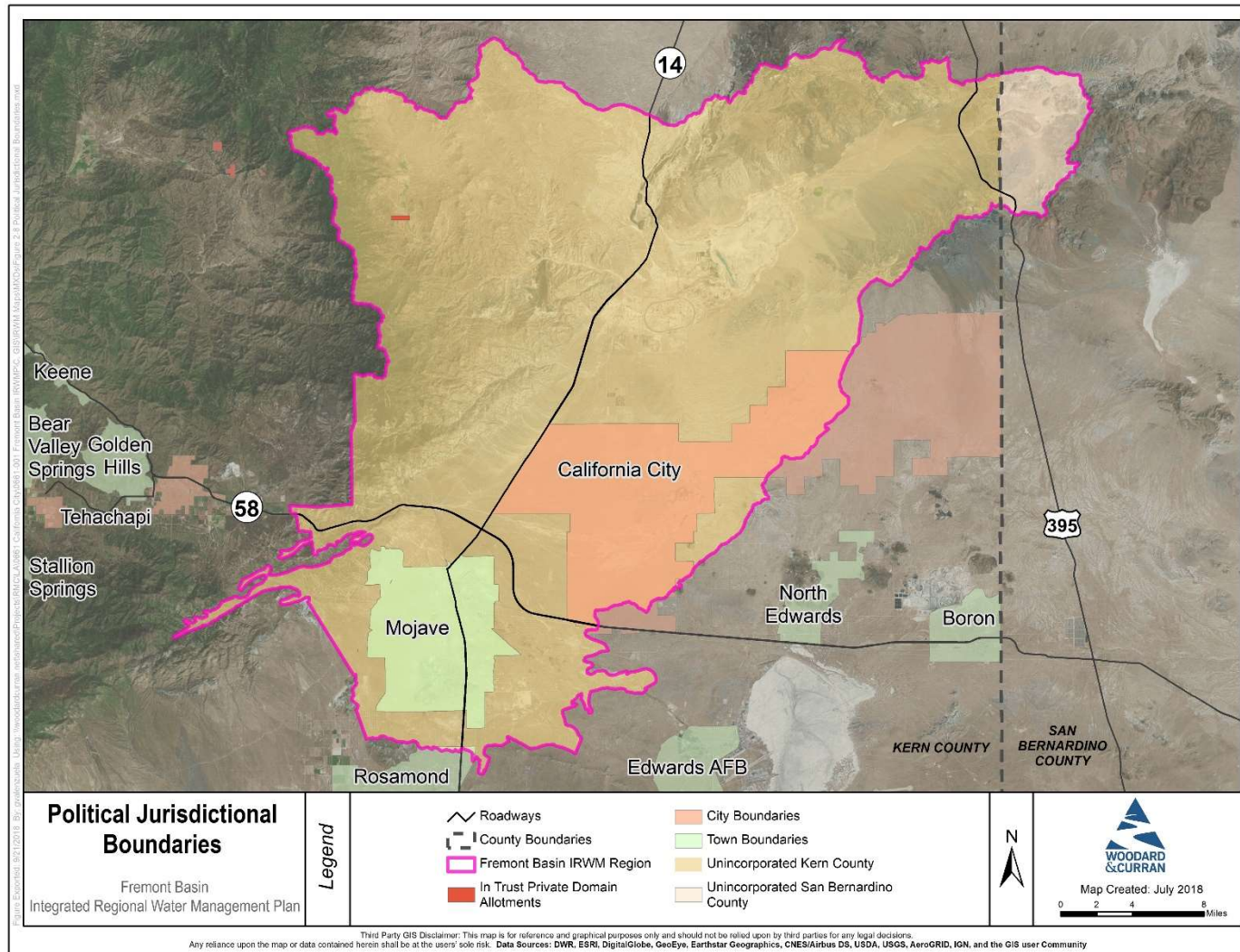


Figure 2-10: Regional Water Service Providers

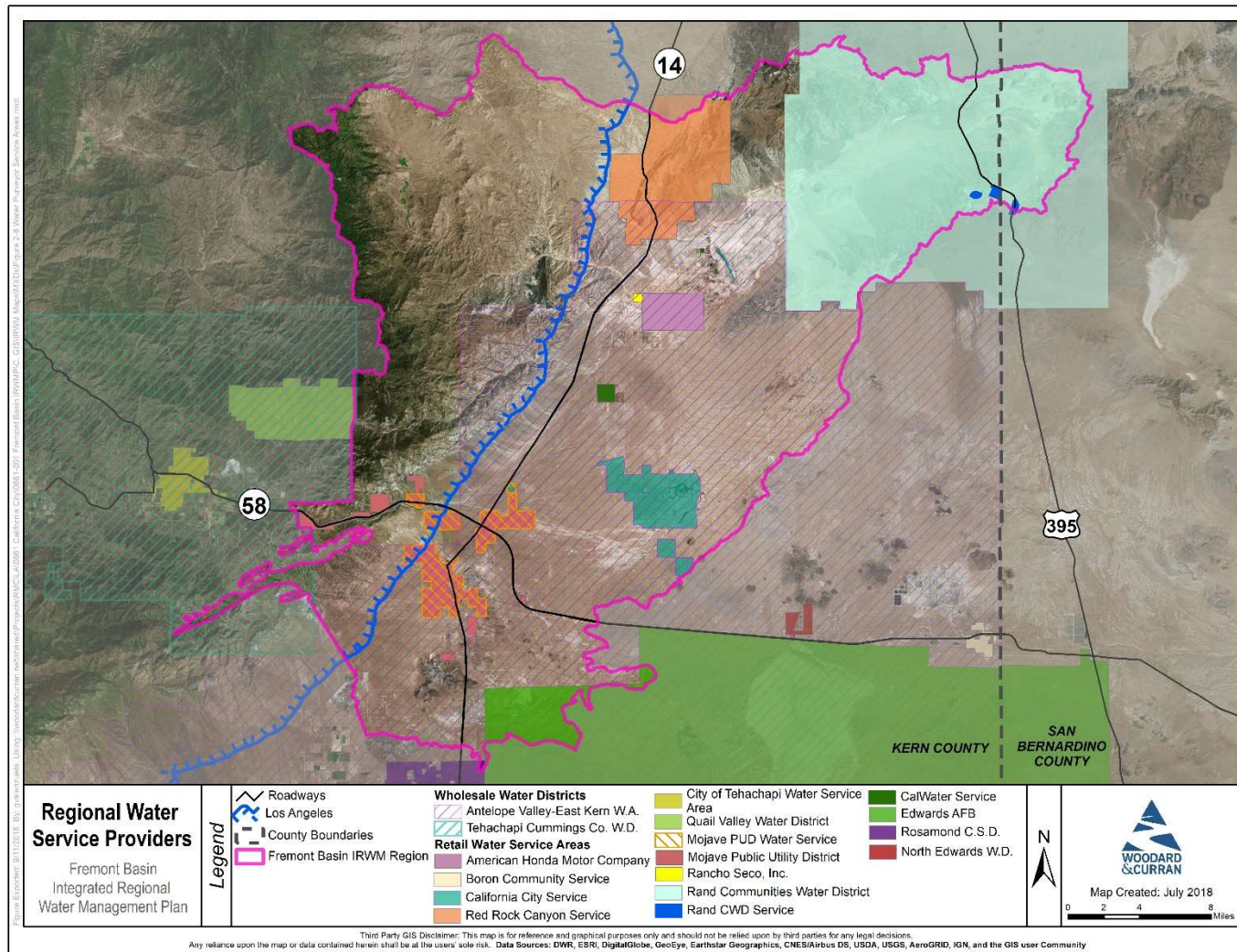


Figure 2-11: Wastewater Service Areas

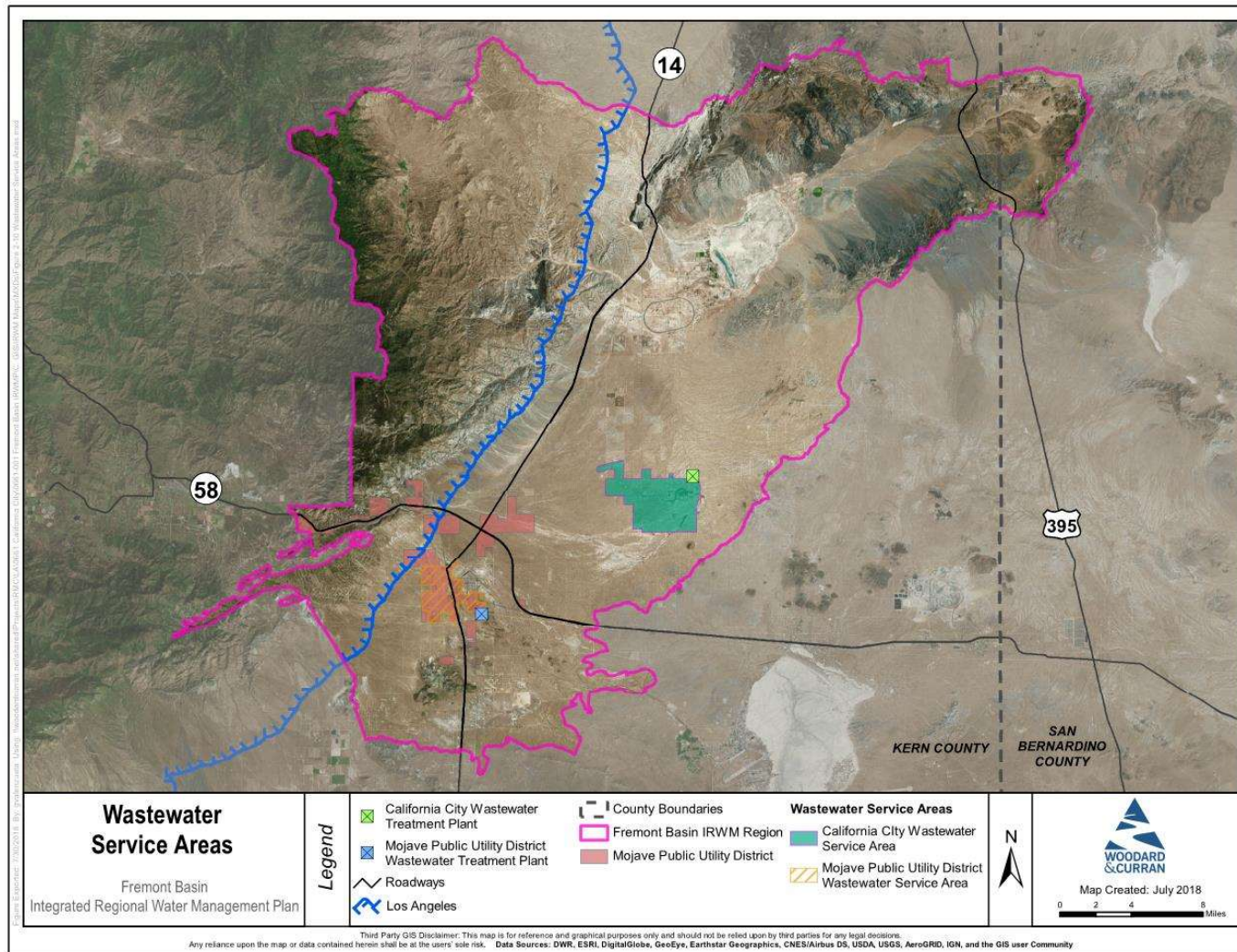


Figure 2-12: Flood Control Agencies

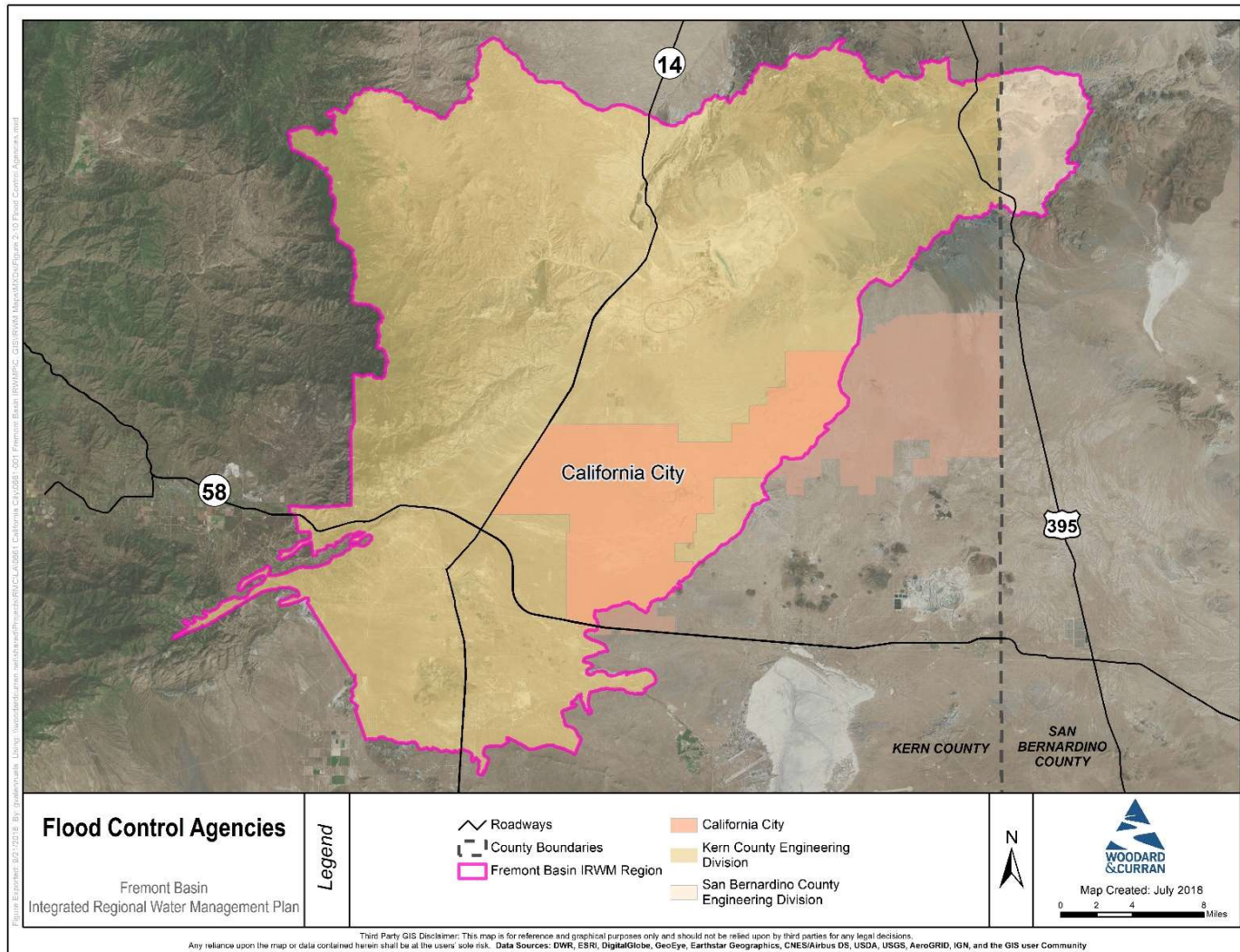
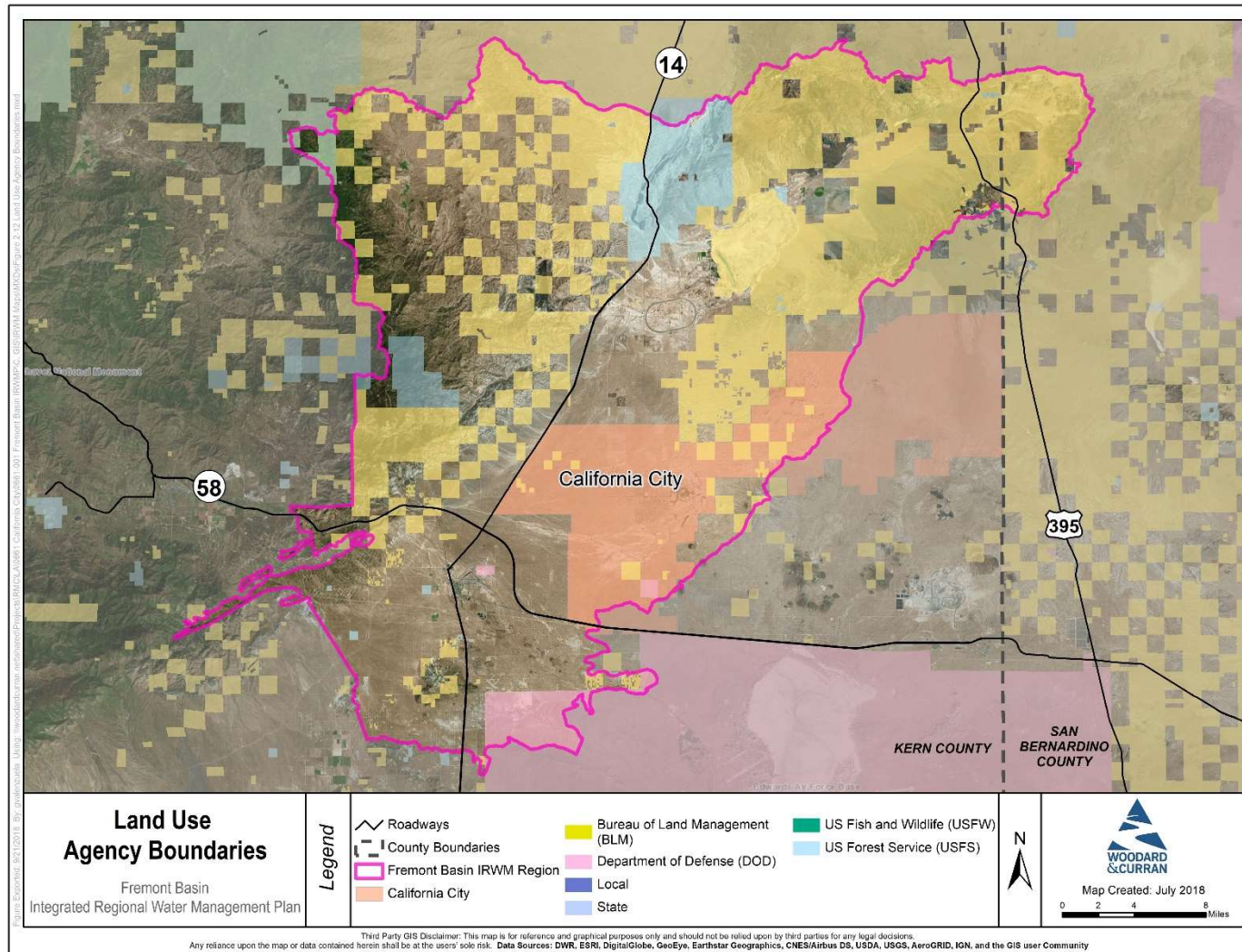


Figure 2-13: Land Use Agency Boundaries



Flood Control Boundaries

Flood control is managed by Kern County, San Bernardino County, and the City of California City, as shown in **Figure 2-12**. There are no flood control districts in the Region. The Kern County Engineering Division provides flood control to all areas prone to flood hazards, flood-related erosion hazards, and mudslide hazards within unincorporated regions of Kern County. They are also responsible for management of potential flood hazards created by new development encroaching on floodplains and imposing flood protection requirements, including hydrologic studies, flood mapping, rainfall and stream gauging, and implementation of the National Flood Insurance Program. Similarly, the San Bernardino County Flood Control Engineering Division prepares plans and implements flood control projects for the portion of the Region that lays in unincorporated San Bernardino County. The City has flood control jurisdiction within the municipality. More information on flood control in the Region is presented in *Section 2.5: Flood Control*.

Land Use Agency Boundaries

Land use policy within the Region is set by the City of California City, Kern County, San Bernardino County, and various state and federal agencies, including the U.S. Forest Service and BLM. The jurisdictions for the major city, State, and federal land use agencies are indicated in **Figure 2-13**. The Kern County and California City General Plans delineate major land uses for residential, commercial, industrial, conservation, government, and development, as discussed in *Section 2.7: Land Use*.

2.3 Sources of Supply and Infrastructure

The Fremont Basin IRWM Region utilizes a combination of water sources to meet regional water demand, including groundwater, imported water, and some recycled water. Supplies are delivered to customers by water agencies, or pumped on-site using private wells. The following sections discuss in detail each supply source used within the Region and the infrastructure required for its use.

2.3.1 Water Agencies

There are six retail water purveyors and one wholesale water agency that supply water in the Fremont Basin IRWM Region. These agencies include AVEK, MPUD, California City, Rancho Seco Inc., RCWD, and Cal Water. In addition to these purveyors, there are two water systems, Honda Proving Center and Red Rock Canyon, that supply water from private wells within their property. TCCWD is also a wholesaler that has a small portion of their service area in the Region but does not supply water to the Region. Each of these agencies and systems are described below.

Antelope Valley-East Kern Water Agency

AVEK is a wholesale water supplier that started delivering surface water to the Region in 1980. AVEK serves roughly 2,400 square miles in the western part of the Mojave Desert, serving Los Angeles, Ventura, and Kern Counties. AVEK's area of influence covers the southeastern portion of the Region, as shown in **Figure 2-10**. AVEK utilizes two water sources: imported water from the SWP and groundwater from wells located within the Antelope Valley Groundwater Basin. To maximize use of its SWP supplies, AVEK developed four exchange programs with agencies outside the Region and intends to develop more such programs in the future. Additionally, AVEK developed groundwater banking programs to increase imported water storage and supply reliability in the Antelope Valley

Region. These programs are critical for AVEK since they do not have direct control over any surface water supplies, nor do they beneficially use stormwater or distribute recycled water (AVEK 2016).

Mojave Public Utility District

MPUD has been distributing water since it was chartered in 1938 and currently serves roughly 19 square miles of unincorporated residential, commercial, industrial, and undeveloped land in the southeastern portion of Kern County at the western edge of the Mojave Desert. MPUD serves approximately 4,200 customers, entirely within the Region, with groundwater supplies located northeast, southwest, and northwest of the town of Mojave. MPUD also began purchasing some imported water from AVEK in 1979 (AVEK 2016).

City of California City

As the only water supplier to the City of California City, the California City Water Department currently serves approximately 4,411 connections in the southeastern portion of Kern County within the City. Almost all of the City's distribution system population is within the Region. The City uses six primary groundwater wells and intends to add two more wells in 2019. California City supplements its groundwater sources with imported SWP water purchased from AVEK (AVEK 2016). Water supply for the Wonder Acres area portion of the City is delivered through MPUD's system, for which California City pays a wheeling charge. The connection can deliver water to Wonder Acres from AVEK, though is currently only delivering MPUD pumped supply. The Wonder Acres System has been active since 1979 and had 38 service connections as of 2015.

Rancho Seco Inc.

Rancho Seco Inc. is a potable water purveyor in the northern portion of the Region that serves approximately 30 residents in Cantil. Supplies from Rancho Seco Inc. are entirely from groundwater pumped from a single well in the FVGB (SDWIS N.D.d). In 2015, Rancho Seco Inc. served approximately 9 AFY of potable water.

Rand Communities Water District

RCWD is a small community water system that has been active since 1976. RCWD currently serves approximately 400 residents in the communities of Johannesburg, Randsburg, and Red Mountain in the northern portion of the Fremont Basin IRWM Region. Pumped groundwater from the FVGB, supplied by two wells, is the sole water source for RCWD (SDWIS N.D.e; SWRCB 2016).

California Water Service Company

Cal Water, formed in 1926, is a large investor-owned water utility, serving more than 477,900 customers throughout the State. Cal Water's Antelope Valley District was formed in 2000 when it purchased the Antelope Valley Water Company. It serves approximately 1,400 connections in northeastern Los Angeles and southeastern Kern Counties and is comprised of four geographically distinct water systems. One of these, the Fremont Valley system, is located in the Fremont Basin IRWM Region. The Fremont Valley system serves an unincorporated community at the base of the Tehachapi Mountains north of California City. The Fremont Valley system includes two wells that pump from the FVGB, one storage tank, and one booster pump. In 2015, Cal Water served approximately 14 AF to a total of 76 connections in the Fremont Valley system. It is expected that groundwater will continue to be the sole source of water for Cal Water's Fremont Valley system (California Water Service 2016a; California Water Service 2016b).

American Honda Motor Company

American Honda Motor Company has a small water system that distributes pumped groundwater from the FVGB to the Honda Proving Center, an automotive testing center. The Honda Proving Center system is a non-community water system that does not provide water to residential users. The system became active in 2016 and now serves approximately 60 users in an industrial service area. Pumped groundwater, supplied by a single well, is the sole source for the system (SDWIS N.D.b).

Red Rock Canyon

Red Rock Canyon is a California State Park 25 miles northeast of the town of Mojave. The park has its own non-community water system, run by the California Department of Parks and Recreation, that has been active since 1976. It serves up to 400 transient, two non-transient, and six residential users within the recreational service area. Supply for the system is surface water from the Los Angeles Aqueduct treated at a pocket surface water treatment plant (SDWIS N.D.a).

Tehachapi-Cummings County Water District

The TCCWD service area encompasses approximately 266,000 acres in the Tehachapi Mountains west of the Region. TCCWD imports SWP as well as distributes groundwater from the Tehachapi, Brite, and Cummings groundwater basins (TCCWD 2018). Though a small part of the TCCWD service area extends into the western edge of the Region boundary, TCCWD does not supply water to the Region.

2.3.2 Imported Water Supplies

Imported water in the Region comes from Northern California via the SWP. The SWP is a water storage and delivery system of reservoirs, aqueducts, power plants, and pumping plants that store and distribute water to 29 urban and agricultural suppliers throughout California, known as “State Water Project Contractors” (DWR N.D.a). Owned and operated by DWR, the SWP helps meet regional water demand in the Fremont Basin IRWM Region in conjunction with local water supplies.

AVEK, the SWP contractor in the Region, signed a contract with DWR in the 1960s for a 75-year term that will expire in 2035, though it is anticipated that the SWP contracts will be extended through 2085. The contract allocates 144,844 AF per year to AVEK from the SWP, the third largest allocation of the 29 SWP contractors. To increase regional supply reliability, AVEK developed groundwater banking programs to store excess water, when available, from the SWP during wet periods, allowing for recovery during dry and high demands periods, or during a disruption in deliveries from the SWP. AVEK’s groundwater banking programs include the Westside Water Bank, which started operations in 2010, and includes approximately 400 acres of groundwater recharge basins and 9 groundwater recovery wells. These facilities have a recharge capacity of 36,000 AFY within the Antelope Valley Groundwater Basin, south of the Fremont Basin Region. AVEK’s Eastside Water Bank started operations in 2016 and has a recharge capacity of 5,700 AFY. The Eastside Water Bank facilities include three 2-acre recharge basins and three groundwater wells that allow the recharge and recovery of raw imported water into the Antelope Valley Groundwater Basin. While these projects lie outside the Region, the increase in supply reliability provides benefits to AVEK’s entire service area, including those customers within the Fremont Basin IRWM Region. Additional groundwater banks are planned by AVEK.

Within the Fremont Basin IRWM Region, AVEK delivers imported water to MPUD and California City. According to AVEK’s imported water record, historical imported water deliveries to the City have

averaged 669 AFY since 1980, and to MPUD averaged 208 AFY since 1979. **Table 2-2** shows the volume of imported water delivered to these agencies through AVEK in 2015. Based on historical SWP deliveries to AVEK, as summarized in **Table 2-3**, it is projected that only 59 percent² of the allotted 144,844 AF (85,500 AFY) will be delivered to AVEK in an average year. However, in 2014, supply allocations were as low as 8 percent due to the statewide drought (AVEK 2016). Current and projected deliveries of imported water are summarized in **Table 2-4**.

Table 2-2: AVEK Deliveries to Water Agencies in the Fremont Basin IRWM Region

Receiving Agency	Level of Treatment	2015 Volume (AF)
MPUD	Drinking Water	2
City of California City	Drinking Water	651

Source: AVEK 2016.

Table 2-3: Historical SWP Deliveries to AVEK

	1960	1970	1980	1990	2000	2010	2014
SWP Deliveries to AVEK (AF)	71,000	102,000	141,000	17,000	101,000	56,563	14,510

Sources: 1960-2010 data from AVEK 2016; 2014 data from California Natural Resources Agency 2015.

Table 2-4: Actual and Projected Imported SWP Deliveries to AVEK

	2015	2020	2025	2030	2035
SWP Deliveries to AVEK (AF)	29,938	89,803	89,803	89,803	89,803

Source: AVEK 2016.

Note: Values in this table are for assumed average water years.

2.3.3 Groundwater

Most of the Fremont Basin IRWM Region's water supply comes from groundwater. The Region overlays the entirety of the Fremont Valley and Kelso Lander Valley Groundwater Basins, and portions of six other groundwater basins, including the Indian Wells Valley, Harper Valley, Tehachapi Valley East, Cuddeback Valley, Antelope Valley, and Searles Valley groundwater basins. The groundwater basin boundaries are shown in **Figure 2-14** and discussed in further detail in the sections below. A summary of the groundwater basins in the Fremont Basin IRWM Region is provided in **Table 2-5**.

² The projected SWP water supply of 59 percent is based on the results of the DWR's 2015 Delivery Capability Report Early Long-Term scenario (California Natural Resources Agency 2015). This is lower than the 62 percent reported in the 2015 SWP Delivery Capability Report because the SWP Delivery Capacity Report estimates are an average of 1921-2003 deliveries and do not include the dry hydrologic conditions that led to the low 2014 SWP water supply allocation.

Figure 2-14: Groundwater Basin Boundaries

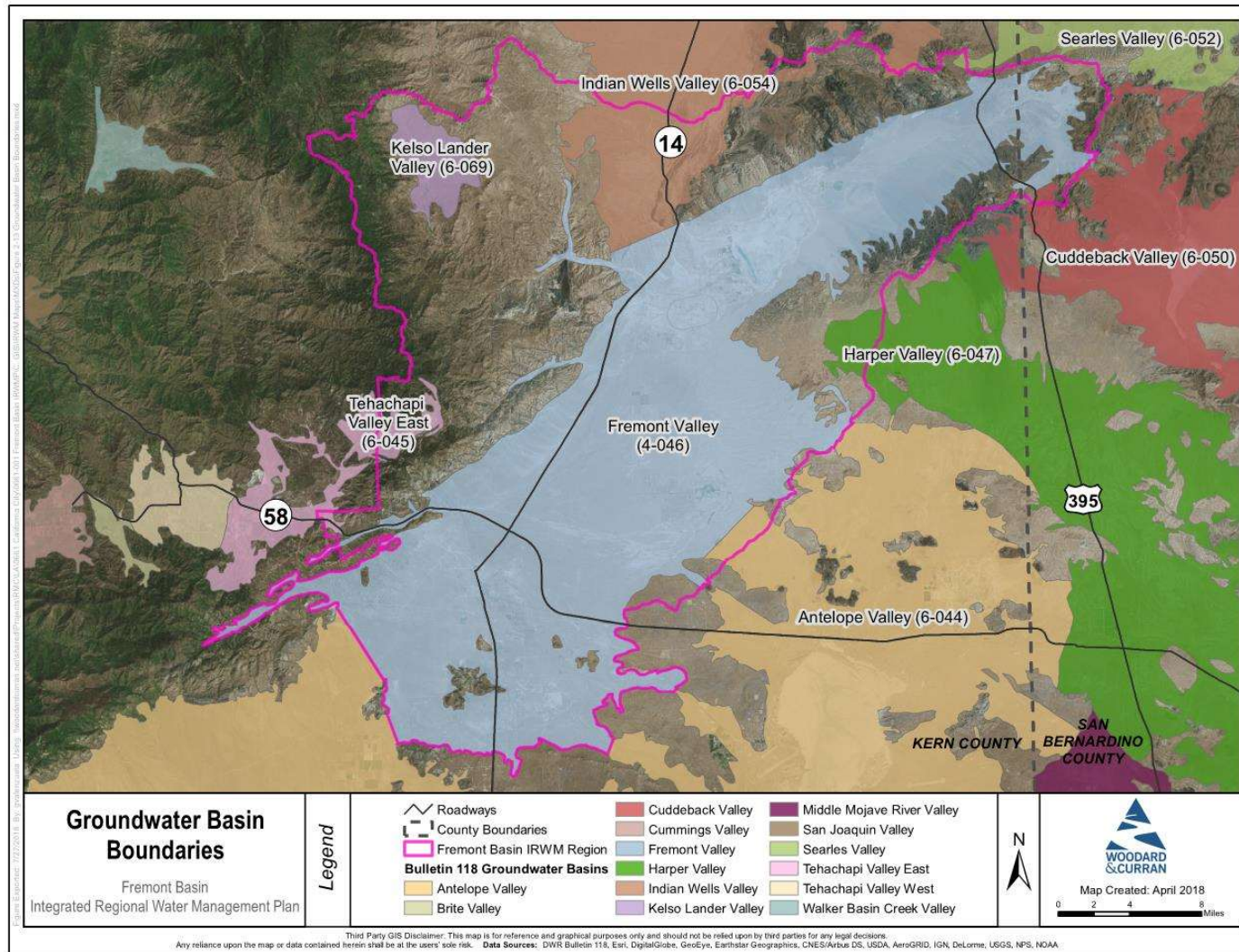


Table 2-5: Summary of Fremont Basin IRWM Region Groundwater Basins

	Fremont Valley	Indian Wells Valley	Kelso Lander Valley	Harper Valley	Tehachapi Valley East	Cuddeback Valley	Antelope Valley	Searles Valley
Total Surface Acres¹	336,682	383,492	11,208	411,827	24,055	95,418	1,014,596	198,115
Percent Acres Underlying Region²	100%	9%	100%	1%	21%	1%	0.3%	0.1%
Recharge Sources³	Percolation of ephemeral streams that flow from the Sierra Nevada	Percolation along southwest, west, north, and northeast edges	Percolation of runoff, infiltration of rainfall, and subsurface inflow	Percolation of runoff, infiltration of rainfall and subsurface inflow	Percolation from streamflow and infiltration of rainfall	Percolation of runoff, infiltration of rainfall and subsurface inflow	Percolation of perennial runoff, recycled water groundwater recharge	Percolation of runoff and subsurface inflow
Storage Capacity (AF)³	4,800,000	5,120,000	Unknown	6,975,000	150,000	1,380,000	70,000,000	2,140,000
Groundwater Stored (AF)³	Unknown	2,050,000	Unknown	101,500	Unknown	Unknown	Unknown	Unknown
Direction of Drainage³	North toward Koehn Lake	Northeast toward China Lake playa	South toward Jawbone Canyon	South toward Harper Lake	Split at drainage divide, moves east and west	Toward Cuddeback Lake in the central part of the basin	North from San Gabriel Mountains, south and east towards Rosamond, Rogers, and Buckhorn Lakes	Towards central part of the basin
Wells within the Region⁴	Private and public	Private	Private	None	Private and public ⁵	None	None	None

Fremont Basin Integrated Regional Water Management Plan

	Fremont Valley	Indian Wells Valley	Kelso Lander Valley	Harper Valley	Tehachapi Valley East	Cuddeback Valley	Antelope Valley	Searles Valley
Adjudicated?	No	No	No	No	Yes	No	Yes	No
CASGEM Priority	Low	High	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low
SGMA Status	Not required to comply	GSA: Indian Wells Valley Groundwater Authority	Not required to comply	Not required to comply	Not required to comply	Not required to comply	Not required to comply. GSAs: 1) Leona Valley, and 2) East Acton Groundwater Sustainability Agency	Not required to comply

Notes: (1) DWR 2014b; (2) Calculated using geographic information systems (GIS) using DWR Bulletin 118 boundary layer; (3) DWR 2004a-h;(4) Kern County GIS well database; (5) MPUD has 2 observation wells in the basin

Groundwater Management

Because the Region relies heavily on groundwater as a source of supply, proper management of this resource is critical to the Region's long-term water supply sustainability. Recognizing this, Kern County approved a Zoning Ordinance Section 19.118 in 1998 that prohibits the extraction and transportation of groundwater sources to areas outside the Fremont Valley Watershed and Kern County without a Conditional Use Permit. The ordinance applies to all native groundwater supplies in the Region, and excludes both artificially recharged groundwater and groundwater that originates outside the County (Kern County 1998).

On November 4, 2009, the State Legislature amended the Water Code with SBx7-6, which mandates a statewide groundwater elevation monitoring program to track seasonal and long-term trends in groundwater elevations in California's groundwater basins. In accordance with this amendment to the Water Code, DWR developed the California Statewide Groundwater Elevation Monitoring (CASGEM) program. The intent of the CASGEM program is to establish a permanent, locally-managed program of regular and systematic monitoring in all of California's alluvial groundwater basins. The CASGEM Groundwater Basin Prioritization process, implemented as part of the CASGEM program, is a statewide ranking of groundwater basin importance that incorporates groundwater reliance and focuses on basins producing greater than 90 percent of California's annual groundwater. The California Water Code (CWC) specifies the eight criteria to be used for prioritizing the basins. Criteria include overlying population, projected growth, public supply wells, total number of wells, reliance on groundwater as primary source and impacts on groundwater (i.e., overdraft, subsidence, etc.)

In 2014, the Water Code was amended again as a result of SGMA. SGMA requires groundwater-dependent regions to halt overdraft and bring basins into balanced levels of pumping and recharge by developing a basin-specific GSP. Using the CASGEM basin prioritization list finalized in May 2018, DWR determined which basins would be required to comply with SGMA. As a result of this prioritization, the Indian Wells Valley is the only basin in the Region that is required to comply. To comply, the basin's pumpers must organize to form at least one GSA and submit to DWR a SGMA-compliant GSP by January 31, 2020. SGMA applies to a total of 109 high and medium priority groundwater basins in California. Basins classified as low or very low priority, such as the FVGB, are not the focus of SGMA at this time, yet participation in SGMA through formation of a GSA and preparation of a GSP is still considered valuable in the Region as it provides local sustainable management of groundwater supplies.

Fremont Valley Groundwater Basin

Used as the primary groundwater supply source in the Fremont Basin IRWM Region, the FVGB underlies approximately 336,700 acres entirely within the Region from eastern Kern County to the northwestern region of San Bernardino County (DWR 2014b). The FVGB spans the largest area in the Region, covering approximately 53 percent of the Region's area; the basin extends from the northeastern boundary to the southwestern boundary of the IRWM Region. The Fremont Basin is bounded on the northwest by the El Paso Mountains and the Sierra Nevada Mountains and on the east by the Summit Range, Red Mountain, Lava Mountains, Rand Mountains, Castle Butte, Bissel Hills, and Rosamond Hills. The basin is bounded on the southwest by the Antelope Valley Groundwater Basin along a groundwater divide approximated by a line connecting the mouth of Oak Creek through Middle Butte to exposed basement rock near Gem Hill.

The FVGB is recharged from two sources: precipitation to the valley floor and percolation of runoff from mountains and neighboring watersheds. As the runoff migrates over the valley floor, losses occur by evaporation and transpiration. Infrequent, intense runoff reaches as far as Koehn Lake, in the northeastern part of the FVGB or the other small playas throughout the basin. Because the lake bed is nearly impermeable, most of the water is ponded and lost to evaporation (USGS 1977). Recharge to the FVGB also occurs from underflow in the creek channels that emanate from the mountains. There is no appreciable quantity of groundwater flowing out of the basin and surface drainage of the basin is of the closed type. An analysis conducted for the Fremont Valley Basin GWMP estimated natural recharge to the FVGB at approximately 13,800 AFY³ on average (Woodard & Curran 2018a).

Surface runoff within the Fremont Valley Watershed either recharges to the basin or drains toward Koehn Lake. The groundwater flow follows a similar path to surface runoff, with water in the southwestern portion flowing north towards the City of Mojave and then Koehn Lake; the rest of the basin flows directly toward Koehn Lake. Groundwater is generally unconfined except for near Koehn Lake.

Different estimates of groundwater storage are reported for the FVGB or portions of the basin. DWR reports a storage capacity of 4.8 million acre-feet (MAF), though the amount of groundwater in storage is currently unknown. Groundwater storage was reported to be 4.1 MAF in 1976 based on a USGS study (USGS 1977). A more recent investigation by Stetson (2009) estimated the groundwater storage for two portions of the groundwater basin identified in the study, the Mojave City and California City Subbasins, at approximately 5.66 MAF and 2.62 MAF, respectively. Groundwater storage under Koehn Lake, above the 500 feet depth, was estimated to be approximately 2 MAF (USGS 1977).

Long-term groundwater level data indicate that the groundwater levels in the FVGB have declined significantly since 1955, probably due to the prolonged drought period from 1945 to 1964 and increased groundwater extractions in the late 1950s through the 1970s.

In the southern portion of the FVGB, south of the Muroc fault, groundwater levels were the highest in the late 1950s, prior to the start of pumping by MPUD in 1960. Groundwater levels declined gradually until approximately 1968, when water levels began to decline at a greater rate. This coincides with increases in MPUD production. Around 1980, water levels continued to decline but at a much lower rate, which coincides with decreased pumping by MPUD when AVEK imported water deliveries became available in 1980. Groundwater levels increased in this area after 1974, possibly due to a reduction in irrigation pumping in the area.

Groundwater levels in the northern portion of the FVGB, north of the Muroc fault, have declined since the late 1960s, and trends have varied more drastically compared to the southern portion of the FVGB. Similar to the southern portion of the FVGB, there is an apparent trend of rising groundwater

³ This recharge estimate is higher than the 1977 USGS recharge estimate which noted a local groundwater recharge of 10,200 AFY. The difference in the recharge estimates is primarily due to the different basin footprint used in the USGS analysis.

levels after AVEK deliveries began in 1980. Additionally, there has been some recovery of groundwater levels in the northern portion of the FVGB following the reduction of heavy irrigation pumping that occurred through the 1970's. Groundwater levels and natural recharge to the FVGB are discussed in depth in the Fremont Valley Basin GWMP included as Appendix B.

The FVGB is identified as a low priority basin through the CASGEM program and is not the focus of SGMA at this time. Despite this, efforts to provide sustainable groundwater management for the FVGB are being explored by stakeholders in the Region. The Fremont Valley Basin GWMP (Appendix B) was developed as a precursor to development of a GSP for the FVGB as part of the 2019 IRWM planning process.

Indian Wells Valley Groundwater Basin

The groundwater basin that underlies the second largest area within the Region is the Indian Wells Valley Groundwater Basin, a critically over-drafted, CASGEM high-priority basin that spans 383,500 acres in the Inyo, Kern, and San Bernardino counties (DWR 2014b). Roughly 33,000 acres of the basin are within the northern part of the Region, though this is only 9 percent of the groundwater basin's total surface area. The Indian Wells Valley Basin is closed and bounded by the Sierra Nevada Range on the west, the Coso Range on the north, the Argus Range on the east, and the El Paso Mountains on the south. China Lake is the major surface water feature located at the center of the basin. The basin consists of an upper aquifer and a lower aquifer that serves as the primary producer of groundwater supplies. Groundwater extractions and recharge programs using recycled water outside of the Region have altered the natural flow of the basin (Warner 1975).

The Indian Wells Valley Basin has a groundwater storage capacity of approximately 5.12 MAF, though some studies have calculated storage capacity as low as 2.2 MAF (DWR 2014b). Between 1921 and 1985, groundwater levels decreased by 150,000 AF (DWR 2004e) due to overpumping. As a result of the CASGEM prioritization process, the Indian Wells Valley Groundwater Basin received a high-priority designation.

To combat overdraft, a Groundwater Management Plan was developed in 2006 to implement sustainable management practices for groundwater extractions (DWR 2006). Plan objectives include:

- Limiting large scale pumping in the area
- Distributing groundwater extractions so that adverse impacts are not localized
- Developing and implementing water conservation and education programs
- Encouraging recycled water use
- Exploring additional sustainable water management practices
- Continuing technical studies to better inform groundwater management
- Developing an interagency management framework to implement the Plan

Kelso Lander Valley Groundwater Basin

The Kelso Lander Valley Groundwater Basin, a CASGEM very low-priority basin, underlies 11,200 acres and lies entirely within the Region (DWR 2014b). The basin is located in the northwestern portion of the Region and is bounded by the Sierra Nevada Mountains. Some private wells exist in the

basin as reported by Kern County and USGS. Surface water in the Kelso Lander Valley flows to the Fremont Valley watershed from the Cottonwood Creek and through Jawbone Canyon. The current storage capacity, total groundwater stored, and groundwater level trends in the basin are unknown. Recharge occurs from runoff percolation in the alluvial fans, rainfall infiltration in the Kelso Lander Valley, and subsurface inflow. Similar to surface water movement, groundwater flows toward Jawbone Canyon (DWR 2004f).

Harper Valley Groundwater Basin

The Harper Valley Groundwater Basin, a CASGEM very low-priority basin, underlies 411,800 acres in the western San Bernardino and eastern Kern Counties (DWR 2014b). Approximately 5,000 acres of the basin lie on the eastern boundary of the Region. The basin is bounded on the north, east, and south by mountains and hills and on the west by a series of faults and hills. Seasonal streams in the Harper Valley drain toward Harper Lake, outside the Region. The groundwater is generally unconfined, except for near Harper Lake. The basin has a storage capacity of approximately 6.9 MAF, though groundwater storage in 1990 was estimated at 101,500 AF. Natural recharge occurs from percolation of rainfall and surface runoff in the alluvial fans around the valley as well as from flow from the Middle Mojave River Valley and Cuddeback Valley Groundwater Basins. Pumping from Harper Valley Groundwater Basin does not occur within the Region.

Tehachapi Valley East Groundwater Basin

The Tehachapi Valley East Groundwater Basin, a CASGEM very low-priority basin, underlies approximately 24,100 acres within Kern County, 5,000 of which lie in the northwestern part of the Region (DWR 2014b). The Sierra Nevada Mountains bound the northern portion of the basin, the Tehachapi Mountains bound the southern and eastern portions, and an alluvial high (surface drainage divide) bounds the western side. The alluvial high causes surface waters to the west of the boundary to flow to Tehachapi Creek and surface waters to the east of the boundary to flow to either Proctor Dry Lake or Cache Creek. The majority of wells that pump from the basin are located outside the Region, though there are a few private wells in the Region, as reported by Kern County and USGS.

The Tehachapi Valley East Groundwater Basin has a total storage capacity of approximately 150,000 AF, though the total groundwater stored has yet to be determined. Groundwater storage decreased by approximately 41,500 AF between 1951 and 1978. To mitigate these losses, imported SWP water was used both for supplementing groundwater supplies and for supplying groundwater recharge programs in 1973. Groundwater levels have rebounded since the basin's adjudication in the 1970's, effectively restoring 70,000 AF of groundwater to the basin. The natural recharge of the basin is estimated at approximately 3,000 AF from the percolation of streamflow (DWR 2004h).

Cuddeback Valley Groundwater Basin

The Cuddeback Valley Groundwater Basin, a CASGEM very low-priority basin, underlies 95,400 acres predominantly in the San Bernardino County (DWR 2014b). Only about 835 acres, or 1 percent of the basin's surface area, lie within the northeastern boundary of the Region. The basin is bounded by mountains to the north and west and by hills to the south and east. Surface waters in the Cuddeback Valley drain toward Cuddeback Lake, outside the Region. The basin is naturally recharged with stormwater runoff that percolates through the alluvial fans overlying the basin. Rainfall and subsurface inflow also recharge groundwater supplies. Groundwater in the Cuddeback Valley Groundwater Basin flows towards the Harper Valley Groundwater Basin, and may flow into Harper

Valley Groundwater Basin through an alluvial-filled gap between Fremont Peak and the Gravel Hills (DWR 2004b).

The Cuddeback Valley Groundwater Basin has a storage capacity of 1.380 MAF, yet the current stored volume is unknown. From 1917 and 1970, groundwater levels on the western region of the basin were between 150 and 230 feet below the surface (DWR 2004b).

Antelope Valley Groundwater Basin

CASGEM originally designated the Antelope Valley Groundwater Basin as a high-priority basin in 2014, but the basin was reclassified in 2018. As a result of the basin's recent adjudication, the Antelope Valley Groundwater Basin was changed to a very-low priority basin. The basin covers roughly 1.01 million acres in the Los Angeles, Kern, and San Bernardino counties (DWR 2014b). Of the total basin area, only about 3,100 acres, or 0.3 percent of the basin, lie in the southeastern portion of the Region.

The groundwater basin is bounded by the San Gabriel Mountains on the northwest and the Tehachapi Mountains on the southwest. Runoff from these mountains flows towards a closed basin at Rosamond Lake, located on the Edwards Air Force Base outside of the Region. Groundwater is recharged by perennial runoff from the mountains and hills, return of irrigation water, and septic system effluent. There is a small but significant amount of recycled water irrigation that occurs in the Antelope Valley Groundwater Basin; and there are plans underway to build and operate groundwater recharge projects using imported water, stormwater, and recycled water. AVEK operates groundwater banking projects in the Basin as well. Groundwater flow is constrained by the Garlock, San Andreas, Randsburg-Mojave, Cottonwood, and Willow Springs faults, along with several other fault zones in the area.

The basin has a confined lower aquifer and an unconfined upper aquifer. Permeability between these two aquifers is limited due to clays deposited during periods of heavy precipitation. The upper aquifer is the primary source of groundwater for the Antelope Valley. The Antelope Valley Groundwater Basin can store approximately 70 MAF, though storage capacity has permanently decreased by approximately 50,000 AF in the past couple of decades due to subsidence caused by severe groundwater overdraft. By 1992, groundwater pumping had caused 292 square miles of the Antelope Valley to subside more than one foot (DWR 2004a).

Between 1999 and 2000, two private groundwater users filed a lawsuit against nine public water agencies for unregulated groundwater pumping in the Antelope Valley Groundwater Basin. These lawsuits marked the start of the adjudication of all groundwater rights in the Basin. In 2011, the Basin was determined to be in a state of overdraft with a safe yield of 110,000 AFY. As a result of this lawsuit and subsequent technical work, the Basin was adjudicated in 2015 (Los Angeles County Superior Court 2014).

Searles Valley Groundwater Basin

The Searles Valley Groundwater Basin, a CASGEM very-low priority basin, is the smallest of the seven basins located in the Region; of the basin's 198,100 acres, only about 290 acres or 0.1 percent of the basin, fall within the northeastern border of the Region (DWR 2014b). The basin is bounded by the Argus Range and Spanger Hills on the western side adjacent to the Region. Surface waters in the basin drain to Searles Lake, outside the region. Groundwater movement is restricted by the Garlock fault. The Searles Valley Groundwater Basin has a groundwater storage capacity of approximately 2.14

MAF, though the current volume of groundwater stored is unknown. Recharge occurs from runoff percolation in the alluvial fans in the northern stretch of the Basin and inflow from the Salt Wells and Pilot Knob Valleys (DWR 2004g).

2.3.4 Surface Water

Imported water purchased from the SWP is the only surface water used to meet regional demands. Local surface waters are not reliable sources because most are ephemeral streams that are extremely limited by drought conditions. Much of the surface water in the Region percolates into the various groundwater basins. Additionally, high desert conditions cause water that does not percolate into the groundwater basin to evaporate (AVEK 2016; California City Water Department 2017).

2.3.5 Wastewater and Recycled Water

There are two WWTPs in the Region, owned and operated by MPUD and California City. The WWTP in California City is the only source of recycled water in the Region. The following sections provide more detail on the wastewater treatment facilities and information on recycled water production.

Wastewater

Wastewater service in the Region is provided by California City and MPUD. The remainder of the Region is on septic systems. California City is divided into two sections – the “First Community” and the “Second Community.” Most of the California City residents live in the First Community, which includes multi-family and smaller single-family residential lots. Portions of the First Community are served by the City’s sewer system. The Second Community, which is located east of the center of the City, includes sparsely populated lots served by septic tanks with subsurface disposal. The collection system in the First Community is gravity fed and only transports domestic wastewater, not stormwater runoff. The WWTP is owned and operated by the City, and the California City Sanitary Division is responsible for maintenance of the sewer system.

The primary treatment process at the California City WWTP includes an influent pump station, head works consisting of a Parshall flume, mechanical bar screen and sonic flow meter. Secondary treatment consists of one extended aeration activated sludge basin, (split into two cells) two clarifiers and a return activated sludge (RAS) waste activated sludge (WAS) pump station. The tertiary treatment facilities consist of filter influent pump station, a chemical mixing/flocculation tank, storage facilities for polymer, alum and chlorine, tertiary sand filters and sodium hypochlorite disinfection. In 2002, the capacity of the WWTP was expanded from 1 million gallons per day (MGD) to 1.5 MGD to accommodate population growth. Currently, the plant can treat an average flow of 1.5 MGD and a peak flow of 3.0 MGD, though the average influent is currently 0.8 MGD. Sludge is dewatered, dried, and disposed of at a landfill. There are plans to expand the sewer system through neighborhood sewer assessment districts (California City Water Department 2017), and plans are underway to provide service to the nearby California City Correctional Center.

MPUD provides wastewater services to communities west of California City. Between 2012 and 2016, the average annual wastewater inflow to the plant was



MPUD's wastewater percolation ponds

121.9 million gallons (MG) and average annual effluent discharge to the percolation ponds was approximately 33.8 MG. Most of the treated effluent remains on-site to evaporate from several evaporation ponds. Any solids remaining are sent to a specialized treatment facility off-site.

Residents in unincorporated areas of the Fremont Basin IRWM Region rely on septic systems that are regulated by the Kern County Public Health Services Department (EHS). These are almost exclusively for properties outside of municipal sewer service boundaries (Kern County EHS Department 2016).

Recycled Water

California City's WWTP, as indicated above, is capable of producing secondary and tertiary treated recycled water. Currently, the only permitted sites for use of the secondary and tertiary treated effluent are the City's eight existing percolation ponds, the Central Park Lake (used as recreational non-contact water) and the Tierra Del Sol Golf Course (used for landscape and course irrigation). The Central Park Lake is primarily a holding transfer point of tertiary treated effluent for the irrigation systems at Tierra Del Sol Golf Course.

On average, the City collects approximately 19 percent of total potable water production or 675 AF; 75 percent of this water, or 500 AF, is recycled and used for irrigation at the Tierra Del Sol Golf Course. When storage basins are full during the winter season, approximately 10 AF, or 1 percent of the recycled water produced, is diverted to percolation ponds to offset groundwater extractions. Expansion of the sewer system in the future will increase recycled water availability in the City. The City is exploring the feasibility of using recycled water on green belts, parks, and other facilities in the future, though capital costs have been a major deterrent. **Table 2-6** summarizes recycled water use in the Region between 2010 and 2015 (California City Water Department 2017).

Table 2-6: Recycled Water Use in the Fremont Basin IRWM Region

Year	Influent Flows (AF)	Pond Golf Course (AF)	Irrigation (%)	Percolation Pond (AF)	Percolation (%)	Process Evaporation and Losses (AF)	Losses (%)
2010	769	405	52.6%	20	2.5%	345	44.8%
2011	619	424	68.5%	9	1.4%	186	30.1%
2012	594	449	75.5%	5	0.8%	139	23.4%
2013	539	435	80.6%	0	0.0%	105	19.4%
2014	672	503	74.8%	5	0.8%	164	24.4%
2015	691	512	74.0%	6	0.9%	173	25.1%
1 Yr Average	675	506	75.0%	7	1.0%	162	24.0%

Source: California City Water Department 2017 (converted from MG)

2.4 Water Quality

2.4.1 Beneficial Uses

State policy for water quality control in California is directed toward achieving the highest water quality consistent with maximum benefit to the people of the State. Beneficial uses of individual water bodies in the Region are designated and maintained by the LRWQCB. The LRWQCB makes these designations to aid in the implementation of effective water quality criteria and control plans. The Water Quality Control Plan for the Lahontan Region (Lahontan Basin Plan) contains the beneficial uses and water quality objectives for the Lahontan Region. Beneficial uses defined in the Lahontan Basin Plan are summarized in **Table 2-7**. The Fremont Hydrologic Unit includes the Hydrologic Areas for Dove Springs (625.10), Kelson Landis (625.20), East Tehachapi (625.30), and Koehn (625.40), and the Antelope Hydrologic Unit includes the Hydrologic areas for Chaffee (626.10) and Gloster (626.30). The beneficial uses for these Hydrologic Areas are summarized in **Table 2-8**. The Lahontan Basin Plan also identifies the beneficial uses of groundwater basins. The beneficial uses of the groundwater basins in the Fremont Basin IRWM Region are summarized in **Table 2-9** (SWRCB Division of Drinking Water 2015).

Table 2-7: Beneficial Uses of Streams in the Fremont Basin IRWM Region

Hydrologic Unit / Subunit Drainage Feature	Beneficial Uses																					
	MUN	AGR	PRO	IND	GWR	FRSH	NAV	POW	REC-1	REC-2	COMM	AQUA	WARM	COLD	SAL	WILD	BIOL	RARE	MIGR	SPWN	WQE	FLD
Tucker Road Wetlands	X	X			X				X	X			X			X					X	X
Wetlands Above New Dam	X				X				X	X			X			X					X	X
E Most Spring in “Tucker Road” Transect	X	X			X				X	X			X			X						
Oak Creek Pass Springs	X	X		X	X				X	X			X			X						
Wetlands/Oak Cr. Pass, 0.5 Miles Downstream from Springs	X			X	X				X	X			X			X					X	X
Oak Creek Canyon Wetlands	X	X			X				X	X			X			X					X	X
Green Spring	X	X			X				X	X			X			X						
Quail Spring	X	X			X				X	X			X			X					X	
Upper Cottonwood Creek	X	X			X				X	X			X			X					X	
Upper Sand Creek	X	X			X				X	X			X			X						
Lower Sand Creek	X	X			X				X	X			X			X						
Upper Cache Creek	X	X			X				X	X			X			X						
Cache Creek	X	X			X				X	X			X			X						
Cache Creek 2	X				X				X	X			X			X						

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Hydrologic Unit / Subunit Drainage Feature	Beneficial Uses																		
	MUN	AGR	PRO	IND	GWR	FRSH	NAV	POW	REC-1	REC-2	COMM	AQUA	WARM	COLD	SAL	WILD	BIOL	RARE	MIGR
Proctor Dry Lake, South of HWY 58	X	X			X				X	X			X			X			
Springs South of Proctor Lake	X	X			X				X	X			X			X			
Wetlands/Cameron Canyon Rd. Off-ramp (W. Bound)	X				X				X	X			X			X			X
Lower Cache Creek	X				X				X	X			X			X			
Seep South of Cameron Canyon	X	X			X				X	X			X			X			
Seep on Slopes S. of Cameron Canyon Rd.	X	X			X				X	X			X			X			
Spring W. of Cameron Canyon Rd.	X	X			X				X	X			X			X			
Tehachapi Willow Springs Rd. Wetlands	X				X				X	X			X			X			X
Koehn Dry Lake	X	X	X	X	X				X	X			X		X	X			
Mesquite Springs	X	X			X				X	X			X			X			
Red Rock Canyon Creek	X				X				X	X			X			X			
Minor Surface Waters	X	X			X				X	X	X		X			X			
Minor Wetlands	X	X			X	X			X	X			X			X			X
MUN: Municipal and Domestic Supply AGR: Agricultural Supply PRO: Industrial Process Supply IND: Industrial Service Supply GWR: Groundwater Recharge FRSH: Freshwater Replenishment NAV: Navigation POW: Hydropower Generation REC-1: Water Contact Recreation REC-2: Noncontact Water Recreation COMM: Commercial and Sportfishing AQUA: Aquaculture											WARM: Warm Freshwater Habitat COLD: Cold Freshwater Habitat SAL: Inland Saline Water Habitat WILD: Wildlife Habitat BIOL: Preservation of Biological Habitats of Special Significance RARE: Rare, Threatened, or Endangered Species MIGR: Migration of Aquatic Organisms SPWN: Spawning, Reproduction, and Development WQE: Water Quality Enhancement FLD: Flood Peak Attenuation/Flood Water Storage								

Source: SWRCB Division of Drinking Water 2015

Table 2-8: Beneficial Uses of Hydrologic Areas in the Fremont and Antelope Hydrologic Units

Hydrologic Unit / Subunit Drainage Feature	Beneficial Uses																
	MUN	AGR	PRO	IND	GWR	FRSH	NAV	POW	REC-1	REC-2	COM	AQUA	WAR	COLD	SAL	WILD	BIOL
Dove Springs Hydrologic Area (625.10)																	
Minor Surface Waters	X	X			X		X		X	X			X			X	
Minor Wetlands	X	X			X	X			X	X			X			X	
Kelson Landis Hydrologic Area (625.20)																	
Minor Surface Waters	X	X			X		X		X	X			X			X	
Minor Wetlands	X	X			X	X			X	X			X			X	
East Tehachapi Hydrologic Area (625.30)																	
Minor Surface Waters	X	X			X		X		X	X			X			X	
Minor Wetlands	X	X			X	X			X	X			X			X	
Koehn Hydrologic Area (625.40)																	
Duck Ponds	X				X		X		X	X			X			X	
Koehn Lake	X				X		X		X	X			X			X	
Mesa Springs, Poison Springs	X	X			X		X		X	X			X			X	
Minor Surface Waters	X	X			X		X		X	X			X			X	
Minor Wetlands	X	X			X	X			X	X			X			X	
Chaffee Hydrologic Area (626.10)																	
Minor Surface Waters	X	X			X				X	X	X		X	X		X	
Minor Wetlands	X	X			X	X			X	X			X			X	
Gloster Hydrologic Area (626.20)																	
Minor Surface Waters	X	X			X				X	X	X		X	X		X	
Minor Wetlands	X	X			X	X			X	X			X			X	
MUN: Municipal and Domestic Supply AGR: Agricultural Supply PRO: Industrial Process Supply IND: Industrial Service Supply GWR: Groundwater Recharge FRSH: Freshwater Replenishment NAV: Navigation POW: Hydropower Generation REC-1: Water Contact Recreation REC-2: Noncontact Water Recreation COMM: Commercial and Sportfishing									AQUA: Aquaculture WARM: Warm Freshwater Habitat COLD: Cold Freshwater Habitat SAL: Inland Saline Water Habitat WILD: Wildlife Habitat BIOL: Preservation of Biological Habitats of Special Significance RARE: Rare, Threatened, or Endangered Species MIGR: Migration of Aquatic Organisms SPWN: Spawning, Reproduction, and Development WQE: Water Quality Enhancement FLD: Flood Peak Attenuation/Flood Water Storage								

Source: SWRCB Division of Drinking Water 2015

Table 2-9: Beneficial Uses of Groundwater Basins in the Fremont Basin IRWM Region

Basin DWR No.	Basin Name	Beneficial Uses					
		MUN	AGR	IND	FRSH	AQUA	WILD
6-44	Antelope Valley	X	X	X	X		
6-45	Tehachapi Valley East	X	X	X	X		
6-46	Fremont Valley	X	X	X	X		
6-47	Harper Valley	X	X	X	X		
6-50	Cuddeback Valley	X	X	X	X		
6-52	Searles Valley	X ¹		X			
6-54	Indian Wells Valley	X	X	X	X		
6-69	Kelso Lander Valley	X	X		X		
MUN: Municipal and Domestic Supply AGR: Agricultural Supply IND: Industrial Service Supply Notes: MUN designation does not apply to groundwater under the Searles Lake bed, or to the groundwater surrounding the lake. The PRO use applies to the groundwater under the Searles Lake bed.							
FRSH: Freshwater Replenishment AQUA: Aquaculture WILD: Wildlife Habitat							

Source: SWRCB Division of Drinking Water 2015

2.4.2 Groundwater Quality

According to the beneficial water use designations delineated in the Lahontan Basin Plan, groundwater basins in the Region are typically suitable for municipal and domestic supply, agriculture, industrial service supply, and freshwater replenishment. The groundwater quality in the Region is contingent upon historic and existing land use practices, water extractions, industrial discharges, urban and agricultural runoff, and natural conditions. Identification and characterization of salts and nutrients from imported water, recycled water, and other sources is necessary for quantifying pollutant loads and analyzing groundwater quality degradation.

The presence of pollutants such as sodium, calcium, chloride, sulfate, bicarbonate, boron, and nitrates has degraded the groundwater quality in the Fremont Basin IRWM Region. A significant portion of the groundwater basins in the Region contain elevated total dissolved solid (TDS) levels, or dissolved solids such as inorganic salts and small amounts of organic matter. High TDS concentrations can occur naturally depending on the geologic conditions and can lead to hard, odorous, corrosive, colored, and salty water (EPA N.D.c).

Arsenic, hexavalent chromium, nitrate, and perchlorate are constituents of concern in the Region's groundwater basins because they can cause severe adverse health effects. To protect drinking water supplies, the State Water Resources Control Board adopted a Maximum Contaminant Limit (MCL) to be met by public water systems for most of the constituents (i.e., arsenic, nitrate, and perchlorate) as discussed below. The MCL is informed by a Public Health Goal (PHG) that specifies a drinking water concentration that poses no significant health risk if consumed over a lifetime (SWRCB 2107a). While

there is currently no MCL for hexavalent chromium, California set a PHG of 0.02 ppb and the constituent is regulated under the MCL for total chromium as discussed below. The following is a summary of these constituents of concern, their sources, and the health effects.

Arsenic: Arsenic is an odorless and tasteless semi-metal element that occurs naturally in rocks and soil, water, air, plants, and animals. It enters drinking water supplies from natural deposits in the earth or from agricultural, industrial, and mining practices. Higher levels of arsenic tend to be found more in groundwater sources than in surface water sources. Arsenic can be toxic in high concentrations and is linked to increased risk of cancer when consumed over a lifetime at or above the regulated Primary MCL of 10 micrograms per liter ($\mu\text{g/L}$). Other effects include decreased production of red and white blood cells, abnormal heart rhythm, blood-vessel damage, and impaired nerve function (SWRCB 2017c).

Hexavalent Chromium: Chromium-6, is an oxidized form of the metal that is commonly found in low concentrations in drinking water. Chromium-6 occurs naturally in the environment from the erosion of natural chromium deposits, and it can also be produced by industrial processes. There are demonstrated instances of chromium being released to the environment by leakage, poor storage or inadequate industrial waste disposal practices. High concentrations of hexavalent chromium in groundwater are often associated with chrome plating, dyes and pigments, and leather and wood preservation. When ingested, hexavalent chromium can upset the gastrointestinal tract, damage the liver and kidneys, and increase the risk of cancer. California set a PHG of 0.02 ppb or 0.02 $\mu\text{g/L}$, for hexavalent chromium, and adopted an MCL of 10 $\mu\text{g/L}$ in 2014. However, the hexavalent chromium MCL for drinking water was revoked in 2017 because the California Department of Public Health failed to consider the economic feasibility of compliance when adopting the MCL. Chromium-6 is currently regulated under the 50 $\mu\text{g/L}$ MCL for total chromium (SWRCB 2017d).

Nitrate: Nitrate is a naturally occurring constituent formed when nitrogen-containing organic compounds are broken down in the presence of oxygen. However, elevated concentrations in groundwater are often associated with human activities such as wastewater discharge, fertilizer application and land application of animal wastes. A regulated drinking water contaminant, nitrate has an established California MCL of 10 mg/L as “nitrate as nitrogen” (as N) or 45 mg/L as “nitrate” (NO_3). Nitrate is known for causing “blue baby” syndrome among infants under six months. Symptoms include shortness of breath and blueness of the skin around the eyes and mouth. If untreated, “blue baby” syndrome can lead to coma or death (SWRCB 2017e).

Perchlorate: Perchlorate is a naturally occurring contaminant that has been detected in arid environments like the southwestern regions of the United States. High levels of perchlorate can also be attributed to the manufacturing or testing of solid rocket fuels, fireworks, rubber, and certain types of fertilizers. It is also present in matches, automotive air bag inflators, and hazardous waste sites. Common uses of perchlorate include leather tanning and electroplating. Perchlorate disrupts thyroid hormone production in humans, interfering with the body’s ability to regulate metabolism and physical growth. Pregnant women are most susceptible to perchlorate contamination, which can cause miscarriages or impaired brain and central nervous system development in fetuses and children. (SWRCB 2017f). Perchlorate has an established MCL of 6 $\mu\text{g/L}$ in drinking water (EPA N.D.b.).

The following sections provide a brief description of the groundwater quality for basins in the Region. Groundwater quality data was provided by the GeoTracker Groundwater Ambient Monitoring and

Assessment Program (GAMA) database maintained by the State Water Resources Control Board (SWRCB). For a more detailed description of the water quality in the FVGB refer to the Fremont Valley Basin GWMP and the Fremont Valley Basin SNMP in Appendix B and C, respectively.

Fremont Valley Groundwater Basin

Groundwater quality in the FVGB was assessed as part of the 2018 Fremont Valley Basin GWMP and Fremont Valley Basin SNMP. Constituent showing elevated concentrations in the basin included TDS near Koehn Lake, as well as localized areas of arsenic, hexavalent chromium, and nitrate. Perchlorate has not been identified as an issue in the Region. For a detailed discussion of water quality in the FVGB, see Appendix B and Appendix C. A summary of the GWMP and SNMP findings is below.

Generally, relatively low TDS concentrations (less than 500 mg/L) are observed throughout most of the basin. Elevated concentrations of TDS above 1,000 mg/L were generally observed around and north of Koehn Lake. If the basin experiences overdraft conditions, there is potential for saline water from under Koehn Lake to migrate into the less saline areas.

Though wells with elevated arsenic concentrations are found throughout the FVGB, two “hot spots” of elevated arsenic exist in the northeastern and southwestern regions of the FVGB, as detailed in the Fremont Valley Basin GWMP (Appendix B). Elevated levels of arsenic have resulted in one of RCWD’s wells in the northeastern portion of the FVGB being taken out of service. RCWD was awarded funding through the Proposition 84 Small Community Infrastructure Improvement Program in 2015 to conduct a feasibility study to drill two test wells and conduct a pilot study to investigate treatment options. The feasibility study was completed in 2017. RCWD continues to explore additional funding opportunities to continue to work toward remediating the issue. In the southwestern portion on the basin, some wells used by Golden Queen Mining Company are impacted by elevated levels of arsenic. A limited amount of water from these wells is treated by Golden Queen Mining Company using small treatment units.

Historically, average hexavalent chromium concentrations throughout the FVGB have remained below the previously enforced MCL of 10 µg/L. Average hexavalent chromium concentrations throughout the FVGB have averaged about 4.8 µg/L over the last five years, which is below the PHG of 10 µg/L (and the previously enforced MCL of 10 µg/L) and well below the current regulation of 50 µg/L of total chromium. One well in the central part of California City shows an increasing hexavalent chromium trend. The City plans to monitor water quality at this well and manage any increasing levels of hexavalent chromium. To prevent future hexavalent chromium exceedances, the City is considering options to manage or treat hexavalent chromium levels at this well.

Nitrate-N concentrations are generally low across the basin with most of the wells at concentrations of nitrate-N below the 10 mg/L MCL. A small number of exceedances was noted as part of the SNMP and GWMP. These are likely reflective of localized conditions and not a regional, widespread nitrate issue. One area of nitrate contamination has been identified in the Region at MPUD’s well 30. Well 30 was taken out of service due to high levels of Nitrate exceeding the MCL of 10 mg/L of Nitrate-N. The MCL of 45 mg/L of Nitrate-NO₃ has also been exceeded. All six of MPUD’s wells produce water with low levels of Nitrate-N. MPUD has proposed a nitrate-blending project at well 30 to help mitigate the high nitrate levels at this well and be able to continue to use water from that well as a supply. This project is discussed further in *Chapter 6: Projects*.

Indian Wells Valley Groundwater Basin

The Indian Wells Valley Basin has an average TDS concentration of 390 mg/L. The basin is impaired due to groundwater extractions that have caused poor-quality water from the shallow aquifer to leak into the higher-quality deep aquifer. The aquifer also contains high levels of chloride, boron, and arsenic. Water quality sampling in public supply wells concluded that three wells exceeded the inorganic MCL, two exceeded the radiological MCL, and one exceeded the nitrate MCL (DWR 2004e).

According to GeoTracker GAMA, arsenic has been detected at concentration levels almost 6 times higher than the adopted MCL in the past decade, nitrate has been detected at levels 3 times higher than the MCL, and hexavalent chromium concentration levels have been recorded 170 times higher than the PHG. There have been no perchlorate exceedances recorded in the past 10 years (SWRCB 2017b).

According to the *Indian Wells Valley Groundwater Project* (1993), the United States Department of the Interior Bureau of Reclamation (USBR) found that the southwest area of the Basin contains a significant quantity of high-quality groundwater. In contrast, groundwater in the northwest area was found to be of the poorest quality and has historically been used primarily for agricultural purposes. While areas of nitrate, arsenic and hexavalent chromium contamination have been identified in areas of the basin outside the Fremont Basin IRWM Region, the small portion of the groundwater basin within the Region has no identified areas of contamination for arsenic, hexavalent chromium, nitrate, or perchlorate to note at this time. Treatment systems have been developed at wells that pump groundwater outside the Region.

Kelso Lander Valley Groundwater Basin

Groundwater in the Kelso Lander Valley is characterized by calcium, sodium, bicarbonate, and sulfate. The basin is impaired because of elevated fluoride concentrations that range from 0.9 to 2.3 mg/L and high TDS content that ranges from 360 to 1,300 mg/L. Because of these conditions, the basin is designated for irrigation purposes only (DWR 2004f).

According to data provided by the GeoTracker GAMA database, there have been no detections of arsenic, hexavalent chromium, nitrate, and perchlorate in the Kelso Lander Valley Groundwater Basin. Because no areas of contamination for these constituents have been identified, there are no management actions at this time (SWRCB 2017b).

Harper Valley Groundwater Basin

Groundwater in northern Harper Valley Basin is characterized by sodium sulfate-bicarbonate with elevated concentrations of sodium, fluoride, and boron. In the western portion of the basin, water is predominantly of sodium chloride character also with high concentrations of sodium, fluoride, and boron. The TDS content in this portion ranges from 1,350 to 1,650 mg/L. On the west side of Harper Lake, groundwater contains sodium, chloride, bicarbonate, and sulfate, and an elevated TDS content up to 2,391 mg/L. In the southern part of the basin, groundwater is characterized by calcium-sodium sulfate with high sulfate, boron, and TDS concentrations ranging from 179 to 784 mg/L. The high concentrations of boron, fluoride, and sodium render the basin inferior for irrigation and domestic water uses (DWR 2004d).

Arsenic, hexavalent chromium, and nitrate have all been detected at concentrations higher than their adopted limits in the past decade in the Harper Valley Groundwater Basin. Notably, hexavalent chromium was detected at concentrations more than 96,000 times higher than the set PGH. The

Harper Valley Groundwater Basin has not reported any perchlorate exceedances (SWRCB 2017b). While these are constituents of concern in the larger groundwater basin, specific areas of contamination in the small portion (1 percent) of the Harper Valley Groundwater Basin within the Fremont Basin IRWM Region have not been identified. This portion of the groundwater basin has no identified wells within the Region; therefore, there are no management actions within the Region at this time.

Tehachapi Valley East Groundwater Basin

Groundwater in the Tehachapi Valley East Basin contains TDS ranging from 298 to 405 mg/L. There are no known groundwater impairments listed for the basin according to Bulletin 118 (DWR 2004h). According to data available on GeoTracker GAMA, arsenic has been detected in the Tehachapi Valley East Groundwater Basin at concentrations 8 times higher than the adopted MCL, and hexavalent chromium at concentrations 650 times higher than the PHG. Nitrate and perchlorate have also been detected in the Tehachapi Valley East Basin, but no exceedances have been reported. All GeoTracker GAMA monitoring wells are located outside the IRWM Region boundary (SWRCB 2017b). As such, there were no specific issues identified within the Region through the water quality monitoring data source.

MPUD operates four wells (well 6, 7, 8, and 9) on the southeastern edge of the Tehachapi Valley East Groundwater Basin near the Fremont Basin IRWM Region boundary along highway 58. Three of these wells (7, 8, and 9) have shown exceedances of arsenic above the MCL. MPUD currently treats water from these wells for arsenic. No additional actions have been identified to address the arsenic levels at this location since treatment is sufficient to treat water to meet drinking water standards.

Cuddeback Valley Groundwater Basin

Groundwater in Cuddeback Valley Basin contains sodium chloride-bicarbonate and sodium chloride. Impairments in the basin include high concentrations of chloride that range from 60 to more than 2,560 mg/L, especially in the northwest region of the basin. Elevated TDS content of 375 to 4,730 mg/L is another factor that impairs the Cuddeback Valley Basin (DWR 2004b).

Because only a small portion (1 percent) of the Cuddeback Valley Groundwater Basin is within the Fremont Basin IRWM Region and no wells were identified in that area, no areas of arsenic, hexavalent chromium, nitrate, or perchlorate contamination were able to be identified within the Region.

Antelope Valley Groundwater Basin

Groundwater quality in the Antelope Valley Groundwater Basin is high within the principal aquifer but degrades toward the northern portion of the dry lakes area. The groundwater is characterized by calcium bicarbonate near the surrounding mountains and by sodium bicarbonate or sodium sulfate in the central part of the Basin. On the eastern side, the upper aquifer has sodium-calcium bicarbonate type water and the lower aquifer has sodium bicarbonate type water. The TDS content ranges from 200 to 800 mg/L, which makes it suitable for domestic, agricultural, and industrial uses. The Basin is impaired by high levels of boron and nitrates (DWR 2004a).

Nitrate levels exceed the current MCL of 45 ppm for drinking water in the southern portion of the groundwater basin, outside the Fremont Basin IRWM Region. These exceedances are most likely due to agricultural fertilization practices and discharge of treated wastewater. Multiple water districts in the Antelope Valley Groundwater Basin have tested arsenic levels above the MCL of 10 ppb. To dilute arsenic concentrations, most wells are blended with surface and groundwater with arsenic

concentrations of less than 8 ppb. These wells are located outside the Fremont Basin IRWM Region. Multiple wells in the Antelope Valley Groundwater Basin have also detected hexavalent chromium concentrations significantly times higher than the PHG and some perchlorate exceedances have also been reported to be more than twice the MCL (SWRCB 2017b).

Because only a small portion (0.3 percent) of the Antelope Valley Groundwater Basin is within the Fremont Basin IRWM Region and no wells were identified in that area, no areas of arsenic, hexavalent chromium, nitrate, or perchlorate contamination were able to be identified within the Region.

Searles Valley Groundwater Basin

Groundwater in the northwest part of the Searles Valley Basin has calcium-sodium bicarbonate or sodium-calcium bicarbonate character, whereas in the southeast part of the basin it has calcium-magnesium chloride-bicarbonate character. Water near Searles Lake has sodium chloride character. Groundwater is designated for beneficial uses in the northwest part of the basin, though it is not used for domestic purposes. Groundwater from the southwest part of the basin near Searles Station is suitable for both domestic and irrigation uses. Groundwater near Searles Lake, however, is impaired and cannot be used for any beneficial uses because of high concentrations of fluoride, boron, sodium, chloride, and sulfate, as well as high TDS content that ranges between 12,000 to 420,000 mg/L beneath the lake (DWR 2004g).

Because only a small portion (0.1 percent) of the Searles Valley Groundwater Basin is within the Fremont Basin IRWM Region and no wells were identified in that area, no areas of arsenic, hexavalent chromium, nitrate, or perchlorate contamination were able to be identified within the Region.

2.4.3 Surface Water Quality

Under Section 303(d) of the Clean Water Act (CWA), states must submit to the U.S. EPA a list (known as the “303(d) List”) identifying surface waters that do not meet water quality standards. The 303(d) List identifies the pollutants causing impairment and establishes a schedule for developing a control plan. Listed pollutants are generally addressed through pollutant control plans called Total Maximum Daily Loads (TMDLs) that identify the pollutant load that a water body can accept while still meeting water quality standards. There are no surface water bodies within the Fremont Basin IRWM Region listed on the State’s 2012 303(d) list (DWR 2012).

2.4.4 Imported Water Quality

Effective monitoring of water diversions and SWP operations is vital for the continued preservation of the Sacramento – San Joaquin Delta’s (Delta) natural ecosystem. DWR monitors all SWP processes to ensure compliance with existing water quality standards. DWR regulates non-Delta waters entering the SWP, which typically originate from excess surface flows, flood waters, or “pump back” projects that store imported water in groundwater banks. Proposals for returning water to the SWP must demonstrate that the water is of consistent, predictable, and acceptable quality and will not result in a reduction of SWP water quality. An analysis conducted by AVEK in 2013 concluded that SWP water quality generally meets federal primary and secondary drinking water standards (AVEK 2016). **Table 2-10** compares the SWP water quality conditions (DWR N.D.b.) with current federal drinking water standards (Station KA023173, Check 27 between Edwards Air Force Base and California City).

Table 2-10: Comparison of SWP Water Quality Criteria (2017) to SWP Actual Data

Constituent	SWP Water Quality Data (Sta. KA023173) ^{(1)(d)}			Current Drinking Water Standards (2017) ⁽²⁾⁽³⁾
	Maximum	Minimum	Average	
Arsenic (Dissolved) (µg/L)	3	1	2	10
Boron (Dissolved) (µg/L)	300	200	200	No standard
Bromide (Dissolved) (µg/L)	350	120	225	No standard
Chloride (Dissolved) (mg/L)	108	45	74	250 ^(c)
Chromium (Dissolved) (µg/L)	(a)	(a)	(a)	100 (total)
Manganese (µg/L)	(b)	(b)	(b)	50 ^(c)
Nickel (Dissolved) (µg/L)	1	1	1	No standard
Nitrate as N (mg/L)	7.6	<R.L.	2.5	10
Selenium (Dissolved) (µg/L)	<1	< 1	< 1	50
Specific Conductance (uS/cm)	654	340	498	No standard
Sulfate (Dissolved) (mg/L)	72	23	42.4	250 ^(c)
TDS (mg/L)	358	188	283	500 ^(c)
Total Organic Carbon (mg/L)	6.2	1.9	3.85	No standard

Sources: (1) DWR N.D.b. - SWP Water Quality data collected by DWR between 3/5/2012 and 7/15/2014; (2) EPA N.D.a. - US EPA National Drinking Water Standards; (3) EPA N.D.c. - US EPA Secondary Drinking Water Standards

Notes: (a) Contaminant is lower than the Reporting Limit; (b) One sample available; (c) Denotes secondary standard; (d) SWP Water Quality data not shown was not sampled by DWR.

2.4.5 Recycled Water Quality

As discussed in *Section 2.3.5: Wastewater and Recycled Water*, the primary treatment process at the California City WWTP includes an influent pump station, head works consisting of a Parshall flume, mechanical bar screen and sonic flow meter. Secondary treatment consists of one extended aeration activated sludge basin, (split into two cells) two clarifiers and a RAS/WAS pump station. The tertiary treatment facilities consist of filter influent pump station, a chemical mixing/flocculation tank, storage facilities for polymer, alum and chlorine, tertiary sand filters and sodium hypochlorite disinfection. The average nitrate oxide concentration (NO₃) of the influent to the WWTP from 2012 – 2017 is 1.45 mg/L. Once treated, the recycled water meets the water quality standards for various end uses, including irrigation and groundwater recharge via percolation ponds (California City Water Department 2017).

2.5 Flood Control

The Mojave Desert is characterized by gently sloping alluvial plains with a series of steep rock buttes and arroyos and poorly defined drainage channels due to previous flooding, erosion, and sedimentation. During seasonal rains, the Region is vulnerable to flooding from drainage off the mountain foothills into the Fremont Valley. Flood problems arise when streams shift across the

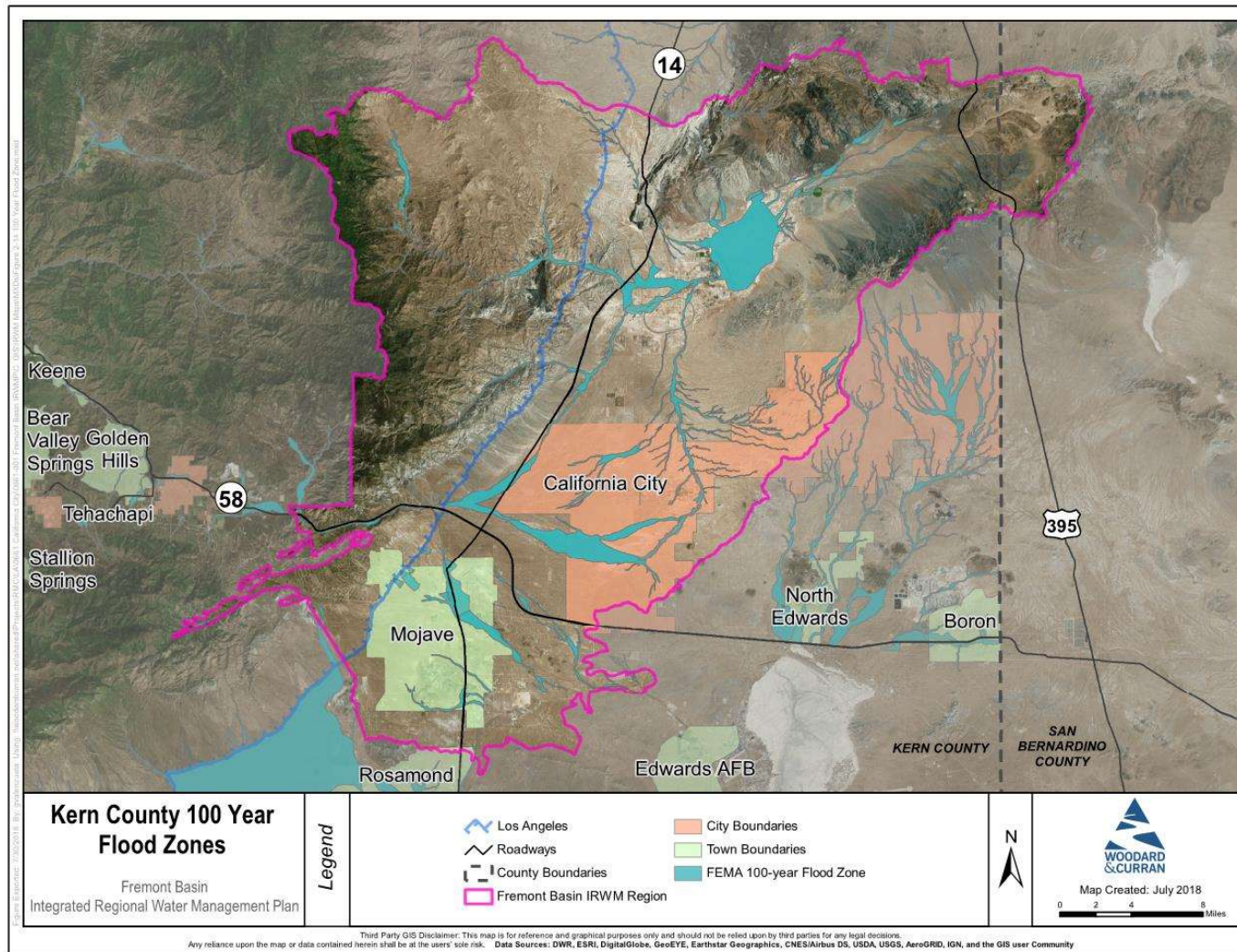
alluvial plains. Impervious surfaces such as roads and parking lots divert flows, further intensifying floods in the Region (Stetson 2009).

Several areas within the Region, particularly around Cache Creek, are prone to flooding during large storms. One portion of Cache Creek, if breached, could flood part of California City. Flooding issues also occur regularly near Red Rock Canyon and Randsburg Road where flood waters cross the road during major storms, as well as in the town of Mojave. These areas could benefit from improved flood control infrastructure.

The Federal Emergency Management Agency (FEMA) partners with states, communities, and local stakeholders through the Risk Mapping, Assessment, and Planning program to identify flood hazards, assess flood risks, and provide accurate data to guide stakeholders in taking effective mitigation actions that result in safer and more resilient communities. This data is incorporated into flood maps, known as Flood Insurance Rate Maps, that support the National Flood Insurance Program and provide the basis for community floodplain management regulations and flood insurance requirements. The FEMA flood map indicating the inundation areas for a 100-year flood in the Fremont Basin IRWM Region is shown in **Figure 2-15**. The 100-year flood is also referred to as the 1 percent annual exceedance probability flood, meaning that it has a 1 percent chance of occurring in any single year.

Flood control in the Region is managed at both the county level by Kern County and San Bernardino County and at the local level by California City. In its 2009 General Plan, California City has designated the majority of the drainages, floodplains, and flood-hazard areas within its limits as Open Space/Flood Control Facilities, to be used for the protection of residents and property (City of California City 2009). Kern County manages all areas susceptible to flood hazards within the jurisdiction of unincorporated Kern County. Kern County employs various regulations for reducing flood impacts, including restricted land uses in flood-prone areas and limited alternation of natural floodplains that may increase flood damage (Kern County Engineering, Surveying, and Permit Services N.D.). The County allows development within flood hazard areas in accordance with the General Plan and Floodplain Management Ordinance with the appropriate flood evaluations and studies. However, additional floodplain studies are necessary for defining the extent of flood-prone areas and better informing future land use designations (Kern County 2009). Similarly, the San Bernardino County Flood Control District manages areas susceptible to flood hazards in unincorporated areas of the County.

Figure 2-15: 100-Year Flood Zones in the Fremont Basin IRWM Region



2.6 Environmental Resources

The Region provides critical habitat for diverse flora and fauna that have adapted to high desert conditions. To protect the Region's biodiversity and ecosystem, various restoration efforts are underway. This section discusses the environmental resources of the Fremont Basin IRWM Region. **Figure 2-16** highlights the environmental resources of the Region.

2.6.1 Critical Habitats and Species of Special Concern

Desert Tortoise

The Region is home to California's desert tortoise (*Gopherus agassizii*). The desert tortoise is currently listed as threatened by USFWS and by the CDFW due to habitat loss and degradation, tortoise collection for personal or commercial purposes, disease, predation, inadequate regulatory mechanisms for tortoise protection, climate change, and other factors affecting its continued existence (USFWS 2014). The Desert Tortoise Preserve was established in 1974 north of California City, in the northeastern portion of the Fremont Basin IRWM Region, to promote the welfare of the desert tortoise. The Preserve is managed by the United States BLM and the Desert Tortoise Preserve Committee, a non-profit organization whose mission is to recover and conserve tortoises and other rare endangered species in the Mojave and Sonoran deserts. The Committee protects tortoises through land acquisition and stewardship, education, research, and collaborations with donors, stakeholders, and State and Federal government agencies (City of California City 2009; Desert Tortoise Preserve Committee, Inc. N.D.).

In 1988, the Fish and Game Commission established the Fremont Valley Ecological Reserve. The 4,100-acre area provides invaluable desert tortoise habitat and its designation as a Reserve was needed for the continued protection of desert tortoises. Prior to the establishment of the Reserve, the parcel was used for grazing and off-road-vehicle recreation (CDFW 2017).

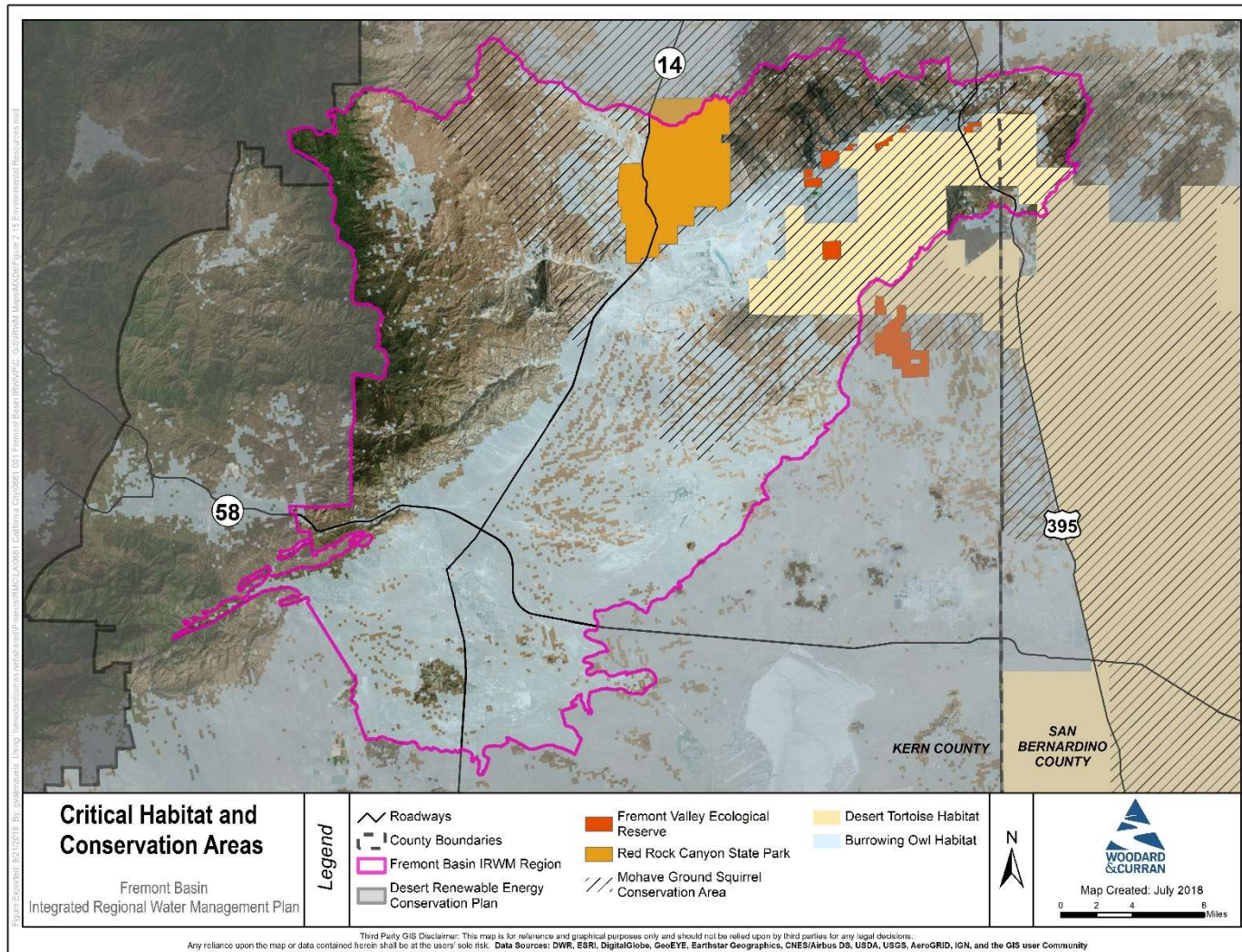
Mohave Ground Squirrel

The Mohave ground squirrel (*Citellus Mojavensis*) is endemic to the western Mojave Desert. Significant habitat degradation and fragmentation within the species' historic range has been a consequence of increased motorized recreation, mining, livestock grazing, and transportation infrastructure development in the Region. These anthropogenic pressures have led to a steady decrease in Mohave ground squirrel population numbers. The Mohave ground squirrel is currently listed as Threatened by the CDFW (City of California City N.D.a; Leitner 2015).

Burrowing Owl

The Mojave Desert is home to the burrowing owl (*Athene cunicularia hypugaea*). Burrowing Owl populations are threatened by declines in mammal populations like prairie dogs and ground squirrels whose burrows are used for roosting and nesting, habitat loss due to land development, predation, pollution, disease, and illegal hunting. The international Migratory Bird Treaty Act of 1918 protects Burrowing Owls in the United States, Canada, and Mexico. The Burrowing Owl is considered a Bird of Conservation Concern by the USFWS and a Bird Species of Special Concern by the CDFW (USFWS 2003).

Figure 2-16: Critical Habitats and Conservation Areas



Pacific Flyway

The Pacific Flyway is a major north-south migration route for birds, extending from Alaska to Patagonia. Each year, at least one billion birds migrate along the Pacific Flyway, following food sources, heading to breeding grounds, or traveling to wintering sites. This birds that rely on the Pacific Flyway depend on a diverse chain of habitats along the way as rest stops before continuing their migration. While there are limited surface water bodies in the Region, Central Park Lake and other smaller ponds provide habitat for the birds.



Birds using Central Park Lake as habitat along the Pacific Flyway

2.6.2 Regional Conservation Plans

West Mojave Plan

The CDFW, the California Department of Transportation, local jurisdictions, and other regional stakeholders collaborated with the BLM to develop the West Mojave Plan in 2005. The plan is a habitat conservation and federal land use plan that provides management strategies for the desert tortoise, Mojave ground squirrel, and over 100 other plants and animals that are vital for the preservation of these two species. The planning area is located to the north of the Los Angeles metropolitan area and includes the Fremont Basin IRWM Region within its boundaries.

The plan designated 18 Habitat Conservation Areas to be managed by the BLM, four of which were established as Desert Wildlife Management Areas for the protection of desert tortoises. These added a total of 1.5 million acres reserved for tortoise conservation (BLM 2005). The adopted plan also established a Mohave Ground Squirrel Conservation Area comprised of 1.73 million acres of public lands (Leitner 2015). The conservation regions add to the existing 1.15 million acres of land set aside to preserve desert tortoises and are necessary for tortoises to recover from diseases, raven predation, and other pressures. The plan ensures the longevity of tortoise populations, allows for genetic connectivity among tortoise populations, and reduces tortoise mortality resulting from anthropogenic influences (BLM 2005).

Desert Renewable Energy Conservation Plan

The Desert Renewable Energy Conservation Plan (DRECP) is a collaborative plan developed by the Renewable Energy Action Team, whose members include the California Energy Commission, CDFW, the BLM, and the USFWS. The plan covers 22.5 million acres of desert land in seven counties, including the Mojave Desert in Kern County. The DRECP promotes solar, wind, and geothermal energy development in desert regions by streamlining the permitting process for renewable energy projects. Simultaneously, the plan ensures that planning efforts meet state and federal policies, incorporate conservation objectives, and enhance natural ecosystems (BLM 2016).

2.6.3 Groundwater Dependent Ecosystems

Groundwater plays a fundamental role in supporting certain surface ecosystems by providing inflows that maintain adequate water levels, temperature, and chemistry. Springs, rivers, and wetland ecosystems whose health are directly impacted by groundwater conditions are called groundwater

dependent ecosystems. While there are low to high groundwater dependent ecosystems found north and west of the Region, there are none present in the Region (Howard & Merrifield 2010).

2.6.4 Red Rock Canyon State Park

Red Rock Canyon State Park is located in the northwestern portion of the Region where the Sierra Nevadas and El Paso Range meet. Roughly 91 percent of the park's 27,000 acres fall within the Fremont Basin IRWM Region. Prior to the State Park's establishment in 1968, the area was once home to the Kawaiisu Tribe and served as a Native American trade route. It also hosted mining operations around 1893. The State Park is now managed by the California Department of Parks and Recreation and offers a variety of recreational opportunities such as camping, hiking,



Red Rock Canyon State Park

equestrian use, and off-highway vehicle recreation. Roadrunners, squirrels, and hawks are a few of the species frequently encountered at the park (CA Department of Parks and Recreation 2005).

2.7 Land Use

Land use in the FVGB is predominantly comprised of undeveloped lands, urban lands, and a small percentage of developed agricultural lands. The major land use categories within the Region, as identified in the Kern County General Plan, are described below and depicted in **Figure 2-17**. A breakdown of each major land use category in the Region is defined as follows:

- Residential category uses include a mix of housing developed at varying densities. Residential densities in the Region range from “estate” (i.e., large lot parcels) to low, medium low, medium, and high densities. Single-family, multiple-family, condominium, mobile home, and senior housing are included within these categories.
- Commercial category includes commercial uses that offer goods for sale to the public (retail) and service and professional businesses housed in offices (doctors, accountants, architects, etc.). Neighborhood commercial includes retail businesses that serve local needs in a neighborhood area, such as restaurants, neighborhood markets, and dry cleaners. Community commercial businesses are those that serve community or regional needs, such as entertainment complexes, auto dealers, and furniture stores.
- Industrial category includes heavy industrial areas which are lands designated for intensive manufacturing, processing, and storing of materials. Light industrial and research is also included within this category. These non-intensive manufacturing processes are found in research and office park developments and areas adjacent to residential lands. Light

industrial activities include some types of assembly work, utility infrastructure and work yards, solar energy production, wholesaling, and warehousing.

- Resources category encompasses land used for private and public recreational open spaces, and local and regional parks. Recreational use areas include golf courses, cemeteries, water bodies and water storage. Also included in this category are conservation and restoration areas, as well as mineral exploration.
- Agriculture category includes areas devoted to the production of irrigated crops, including alfalfa and pistachio production in recent years, and in some cases goats and cattle.
- Public Facilities category includes facilities used for public or semi-public services including airports, treatment plants, and water spreading areas.
- Vacant lands are undeveloped lands that are not preserved in perpetuity as open space or for other public purposes.

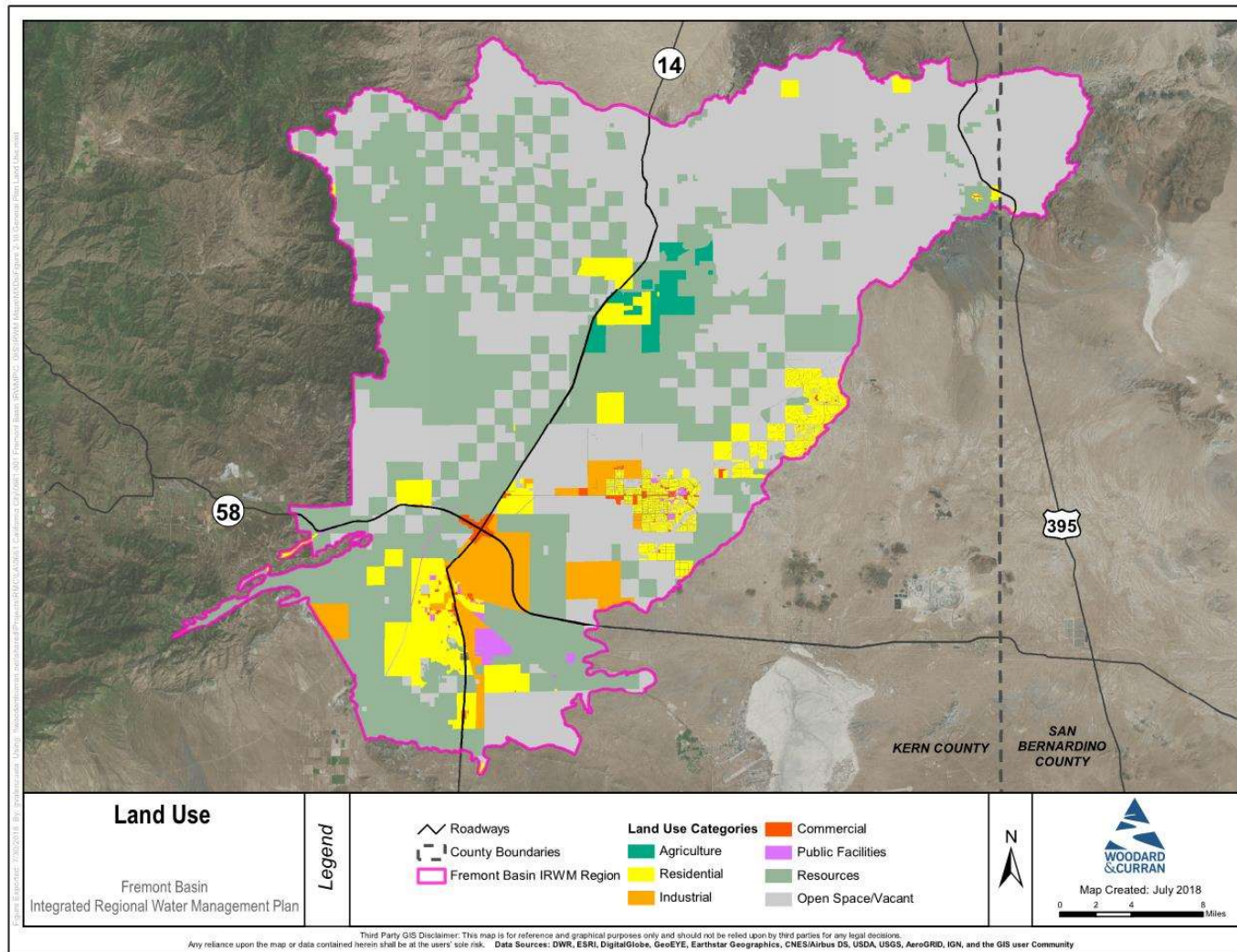
Growth in Kern County is expected to continue as a result of an influx of new residents from outside the County and by natural population increase in the area. This growth points to a need to balance new residential development against other land use requirements within the County. For example, urban expansion into agriculture or open space areas can create the potential for land use conflicts and make it difficult to provide public services to low density residential areas. Commercial and public facilities will likely need to expand to support the increasing residential population (Kern County 2009).

In 2009, the City Council of the City of California City adopted an updated General Plan. The General Plan outlines the vision for the City's future and includes implementation measures to meet the vision. Planning and development decisions are made consistent with the goals and policies delineated in the General Plan. The planning area is comprised of the City's corporate limits and its sphere of influence, totaling 130,200 acres of land located on the western edge of the Mojave Desert in eastern Kern County (City of California City 2009).

The General Plan for the City of California City designates 22,000 acres of land intended for future development in the central core of the City. While development in the northeastern portion of the City can still occur, as evidenced by the construction of the California City Correctional Facility, future development plans are expected to promote housing and open spaces, jobs, accommodate transportation needs, and reduce air and noise pollution (City of California City 2009). The major future developed planned currently is the expansion of the CoreCivic Correctional Facility.

One notable impact to future land use in the Region is cannabis production. In 2016, California voters legalized cannabis in the State of California. California City was one of the first municipalities in Kern County to permit cannabis cultivation, and land designation for these types of agricultural land uses is underway. The City expects a land use designation increase for indoor cultivation facilities, hemp outdoor cultivation facilities, processing and packaging facilities, distribution and transport facilities, and retail cannabis stores. In addition, a municipal ordinance enacted in 2017 increased the maximum number of each type of medical marijuana business that may operate at the same time within the City (City of California City N.D.b). The anticipated impacts on water use in the Region are discussed in *Chapter 3: Supply and Demand Assessment*.

Figure 2-17: Land Use in the Fremont Basin IRWM Region



In 2017, Kern County drafted a Cannabis Land Use Ordinance that proposed regulations for cannabis cultivation; this Ordinance did not pass and no legal cannabis cultivation is anticipated in the planning horizon for the unincorporated areas of the Region.

In 2004, Kern County adopted its General Plan and has completed several updates since then. The County General Plan's Land Use, Open Space, and Conservation element designates the proposed general distribution, location, and extent of land uses in unincorporated areas. The focus of the General Plan discussion is on ensuring future economic growth while conserving the County's agricultural, natural, and resource attributes (Kern County 2009).

Both the City and County General Plans were used to help describe the current and future land use conditions in the Region. The City of California City and the Kern County Planning and Natural Resources Department were consulted during Plan development to ensure current land use planning initiatives and processes were incorporated. Land use through 2028 according to the County and City General Plans is shown in **Figure 2-17**. Current land use is described in detail in the Fremont Valley Basin SNMP (Appendix C).

2.8 Social and Cultural Setting

2.8.1 Population and Demographics

The Fremont Basin IRWM Region is a lightly populated area with only one incorporated City. U.S. Census data for the City and the unincorporated areas of the Region was reviewed for population estimates in the Region and used with additional information about population spread within block groups based on water purveyor service area populations. In 2015, the Region's population is estimated to have reached approximately 19,400, as shown in **Table 2-11** and **Figure 2-18**. By 2040, Region population is expected to grow to approximately 29,400 residents.

Population in the unincorporated area of the Region was determined by normalizing U.S. Census data to the Region boundary using geographic information systems (GIS) mapping and verifying estimated populations with the various water purveyors in the Region. Population projections for the unincorporated areas of the Fremont Basin IRWM Region were determined using California Department of Finance data. It was assumed that the unincorporated area would have a similar growth rate to that of Kern County as a whole, which is estimated at approximately 1 percent per year through 2020, 1.4 percent to 2030, 1.3 percent to 2035, and 1.2 percent to 2040 (CA Department of Finance 2017). Projections indicate that the population in the unincorporated areas will reach approximately 5,500 individuals by 2020 and 7,200 individuals by 2040, as shown in **Table 2-11** and **Figure 2-18**. This represents an increase of approximately 37 percent compared to 2015 population estimates. In Kern County, the median age range is, and is expected to continue to be, 30-34 years through 2040.

Though not all of California City falls within the Region, the City is the only municipality in the Region and houses a large portion of the Region's population. Population estimates in the IRWM Plan assume that all residents are within IRWM Region boundaries. While the population in California City remained at approximately 3,000 individuals from 1965 to 1980, it steadily increased the following two decades, reaching approximately 8,385 residents by 2000. The City had a reduction in population from 2009 to 2012, following the 2008 nationwide economic downturn. Population has since rebounded and the City reached approximately 14,200 residents in 2015. As shown in **Figure 2-18**.

and **Table 2-11**. California City’s population within the Region is expected to reach approximately 22,300 by 2040 (California City Water Department 2017). These projections assume that the 1.5 percent growth rate provided by the Department of Finance for California City between 2016-2017 will remain constant through 2040.

Based on California City data collected for the 2010 U.S. Census:

- 59 percent of the population identified as male;
- Roughly 40 percent of residents identified as white, 38 percent as Hispanic or Latino, 14.5 percent as black or African American descent; the remaining 7.5 percent identified as ‘other;’
- Roughly two-thirds of residents owned their housing units; and
- The average household size was 2.8 residents.

Figure 2-18: Fremont Basin IRWM Region Population

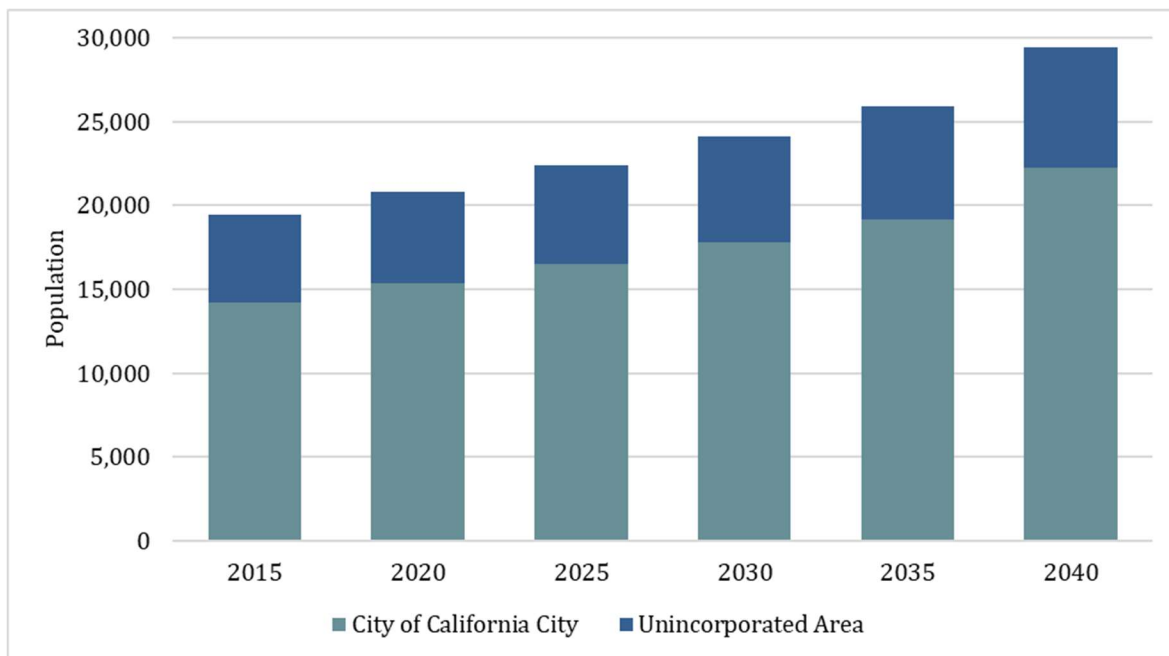


Table 2-11: Fremont Basin IRMW Region Population Projections

	2015	2020	2025	2030	2035	2040
Unincorporated Area Population ¹	5,200	5,500	5,900	6,300	6,700	7,200
California City Population ²	14,200	15,300	16,500	17,800	19,200	22,200
Total Region Population	19,400	20,800	22,400	24,100	25,900	29,400

Sources: (1) 2010 U.S. Census Data, normalized by the Region boundary and water purveyors service populations; (2) California City Water Department 2017

Note: Population estimates rounded to the nearest hundred.

2.8.2 Economic Factors

Historically, California City was a central hub for mining operations with labor provided by the Native American Paiute Tribe. In the 1880's, the Region became a vital passageway for the transportation of borax ore from Death Valley to the railhead in Mojave and for mines operating in the area. The Region then transitioned to sheep farming and cultivation of alfalfa and cotton. The economic base of the Region eventually grew to depend on land sales and development activities (City of California City N.D.a).

California City population has increased over the past few decades in response to increased employment opportunities. Employers in Kern County include the Air Force Base located four miles southeast of the City outside the Region, the Mojave Air and Space Port within the town of Mojave at the intersection of Highways 14 and 58, the Hyundai/Kia Automotive Test Facility, and the Honda Proving Center. The California Correctional Center is operated by the CA Department of Corrections and Rehabilitation and is the largest employer within California City. Extraction of borates by the Rio Tinto Mine (formerly U.S. Borax Boron Mine) fifteen miles east of the City, outside the Region, also provides lucrative employment opportunities for residents in the Region (California City Water Department 2017).



Mojave Air and Space Port in Mojave, CA

The emerging cannabis industry will also likely provide new employment opportunities for residents in the Region, specifically in the cultivation, processing, transport, and retail of medical and recreational marijuana.

For Kern County as a whole, energy development is and will continue to be vital for the economy. As a major producer of oil, natural gas, and electricity, as well as its proximity to gas and electric utilities, Kern County provides reliable employment opportunities to its residents. Kern County is a leader in wind energy production and has the potential to advance solar and high-temperature geothermal resources. Petroleum and renewable energy resources are invaluable to the State's electricity supply (Kern County 2009).

Within the Fremont Basin IRWM Region, solar energy production is a major industry. Beacon Solar, LLC currently operates a roughly 2,500-acre photovoltaic solar facility one mile southwest of Cantil and Rancho Seco (Kern County Planning and Community Development Department 2012). This facility consists of five solar power station projects and is anticipated to generate approximately 250 megawatts (MW) for the Los Angeles Department of Water and Power (LADWP).

Two other solar photovoltaic projects in the Region include Springbok and Barren Ridge 1 (Kern County 2013). Springbok solar farm, comprised of 3 projects (Springbok 1, 2, and 3), is located on the eastern side of highway 14 near Rancho Seco and Cantil. Springbok 1 and 2, constructed in 2016, provide a combined 328 MW. Springbok 3 is anticipated to be complete by the end of 2019 and will provide 115 MW. Barren Ridge 1 is a 78 MW facility located that along the western side of highway 14 north of California City that began operating in 2016. Recurrent Energy estimates that the project



Solar and wind energy production near Mojave, CA

will generate roughly \$9.6M in tax revenue for Kern County (Recurrent Energy n.d.). As with the Beacon Solar project, LADWP purchases power from Springbok and Barren Ridge 1. Additional solar and wind energy projects are located in the southern portion of the Region near the town of Mojave.

Other important industries in the Region include mining and manufacturing. In the southern portion of the Region, Golden Queen Mining Company uses conventional

open pit mining methods to extract gold and silver at the Soledad Mountain Mine, which is located 5 miles south of Mojave. Golden Queen Mining Company has been in operation since the 1980's, but did not begin mining production until 2015. Activities at the site include construction of infrastructure to support exploration activities, drilling, and mining. Since 2006, Golden Queen Mining has also invested more than half a million dollars to cleanup illegal dumping and remnants from historical mining operations in the northern slopes of Soledad Mountain (Golden Queen Mining N.D.).

The largest manufacturing company in the Region is the California Portland Company (CalPortland Company) that been in operation in the southern portion of the Region since the 1950's. CalPortland Company is the largest producer of sand, gravel and quarry rock in the Pacific Northwest. CalPortland Company owns and operates three cement plants in the United States, one of which is located in Mojave. The "Mojave Cement Plant" has an annual manufacturing capacity of 1.44 million tons of cement clinker, along with a nearby quarry to extract limestone and clay for use in cement production (EPA 2011).

2.8.3 Disadvantaged Communities

Disadvantaged communities (DACs) are defined as communities whose annual MHI is less than or equal to 80% of the statewide MHI. Using block group data from the 5-Year (2012-2016) American Community Survey (ACS) dataset, DACs are those communities with an MHI of \$49,191 or less. Severely disadvantaged communities (SDACs) have an MHI that is less than or equal to 60 percent of the statewide MHI (or \$36,893). The DAC area, roughly 228 square miles, and the SDAC area, roughly 688 square miles, are shown in **Figure 2-19**. The combined DAC and SDAC area covers 92 percent, or 916 square miles, of the Region's area, as documented in **Table 2-12**. Additionally, according to the 2012-2016 ACS dataset, there are 3 census designated places within the Region with recorded MHI information: the City of California City is classified as a DAC, and the unincorporated towns of Mojave and Johannesburg are classified as SDACs (ACS 2016).

Figure 2-19: Disadvantaged Communities in the Fremont Basin IRWM Region

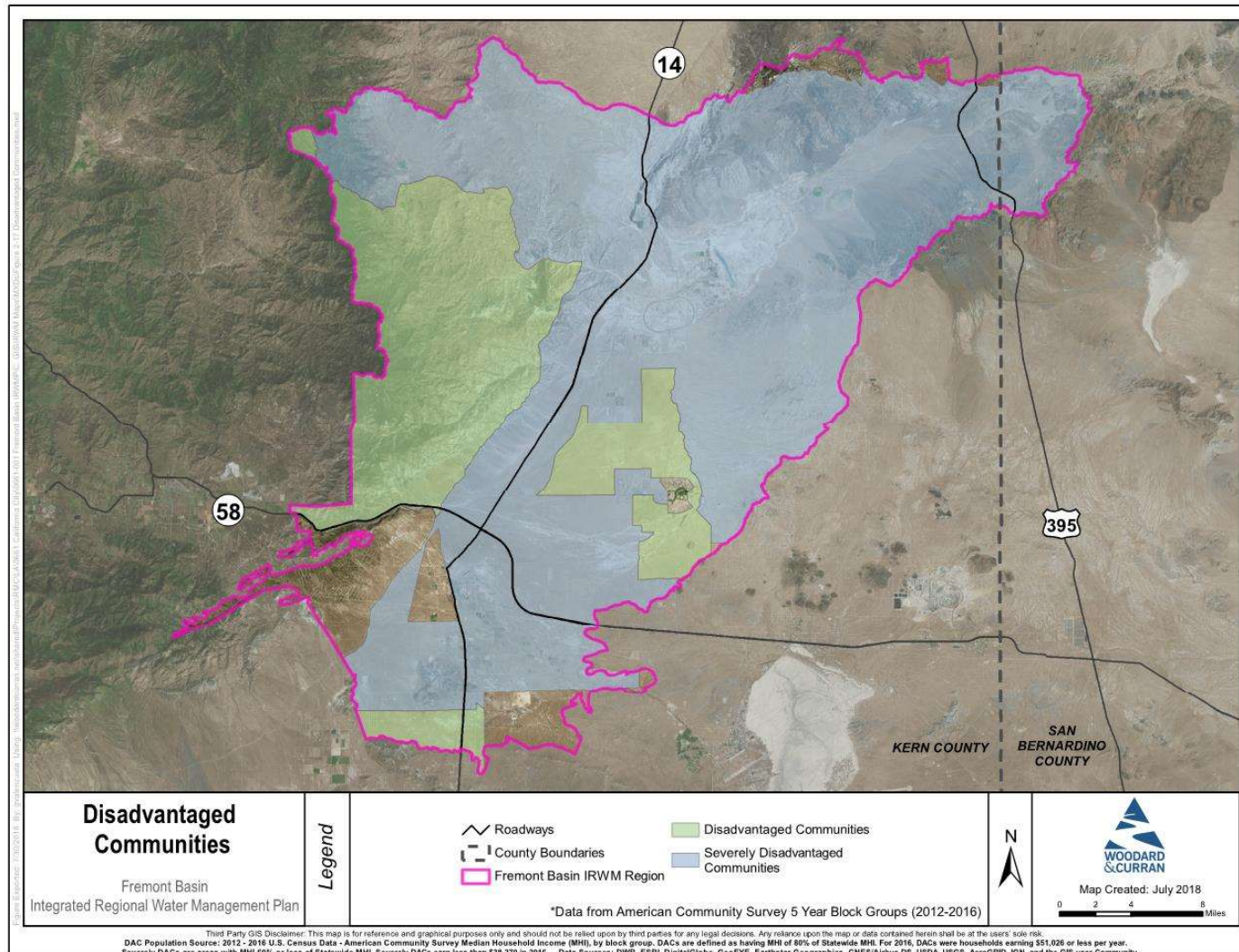


Table 2-12: Disadvantaged Community Area

Geographic Area Description	Area
Fremont Basin IRWM Region	992 square miles
DAC and SDAC Area within Fremont Basin IRWM Region	916 square miles
DAC/SDAC Coverage as % of Region Area	92%

Source: 5-Year 2012-2016 American Community Survey Block Group data

2.8.4 Tribal Communities

While there are no federally recognized tribes in the Region, there are some parcels of land currently held in Trust by the U.S. government and are known as a Public Domain Allotment. The parcels are not directly a part of a recognized reservation. Collectively, these areas amount to 163 acres of land as identified in **Figure 2-9** (DWR 2014a). The Fremont Basin IRWM Region contacted the NAHC to determine if the Region is home to any tribes or tribal interests. The NAHC responded with a list of 10 organizations representing 14 tribes, as identified in **Table 2-13**. Each of these tribes were contacted during the early stages of IRWMP development in October 2017 and again when the IRWM boundaries were being modified in spring 2018. Two tribes responded, potentially having ancestral territory in the Region: the San Manuel Band of Mission Indians and the Tejon Indian Tribe. IRWM information was emailed to both these tribes, inquiring whether the tribes were currently within the Fremont Basin IRWM Region and inviting the tribes to participate in Plan development. It is not clear which tribe originally lived on the parcel of land held in Trust within the Region. The San Manuel Band of Mission Indians deferred to the Tejon Indian Tribe as a potential stakeholder for consultation during the 2019 IRWMP development. Following further communication with the Tejon Indian Tribe, neither tribe chose to engage in the 2019 Plan development.

Table 2-13: Fremont Basin IRWM Region Tribal Notifications

Organization	Tribe(s) Representing
Big Pine Paiute Tribe of the Owens Valley	Paiute and Paiute-Shoshone
Chumash Council of Bakersfield	Chumash
Kern Valley Indian Community	Kawaiisu and Tubatulabal
Kitanemuk & Yowlumme Tejon Indians	Yowlumne and Kitanemuk
San Manuel Band of Mission Indians	Serrano
Santa Rosa Indian Community of the Santa Rosa Rancheria	Tache, Tachi, and Yokut
Tejon Indian Tribe	Kitanemuk
Tubatulabals of Kern County	Tubatulabal
Tule River Indian Tribe	Yokuts
Wuksache Indian Tribe/Ecshom Valley Band	Foothill Yokuts, Mono, and Wuksache

2.9 Climate Change

As anthropogenic greenhouse gas (GHG) emissions continue to rise, more solar energy is trapped in the atmosphere. This intensifies the greenhouse gas effect which leads to warmer average temperatures worldwide. Climate change is having a progressively more profound impact on California water resources; this impact is expected to intensify in the coming decades. The State's ability to effectively provide a reliable water supply, manage floods, protect ecosystems, and comply with other statewide objectives is threatened by climate change. To meet the needs of all water demands in California, effective resource management requires identifying state-wide impacts that will affect local water resources. Once identified, these impacts can inform water managers of appropriate mitigation and adaptation strategies (DWR, et al. 2011). The following are a few of the key Statewide impacts that temperature increases and precipitation changes will yield.

Impacts due to temperatures increases:

- More winter precipitation will fall as rain rather than snow, decreasing the average snow pack in the Sierra Nevada Mountains. As a result, long-term soil humidity, groundwater and downstream flows, and imported water deliveries will decrease.
- Sea level rise will threaten levees in the Delta and cause saltwater intrusion.
- Droughts, heat waves, storms, and wildfires will become more frequent, longer, and more severe.
- Species sensitive to extreme weather events will be in danger and invasive species will become harder to manage.
- Irrigation demands will increase as temperatures alter evapotranspiration rates, growing seasons become longer, and droughts become more common.
- Evaporation rates will increase, leading to surface water quality issues associated with changes in dissolved oxygen levels, increased algal blooms, and increased concentrations of salinity and other constituents.
- Habitats for temperature-sensitive fish and other life forms will be threatened, especially those susceptible to eutrophication.

Impacts due to precipitation changes:

- More intense storms will exacerbate flooding.
- Water supply will decrease because of the inability to capture precipitation from more intense storms.
- Water quality will decrease due to increased turbidity caused by more extreme storm events, leading to increased water treatment needs and impacts to habitat.
- Vegetation cover will change as a result of increased wildfires and less frequent, but more intense rainfall.

Since climate change projections are dependent on geography, GHG emissions, infrastructure, mitigation measures, and other influences, the extent of these changes is still uncertain. However, there is a strong consensus among the scientific community that change will occur. To effectively

incorporate mitigation and adaptation strategies into water resources planning, it is important to understand how these changes will manifest locally. Implementation of these strategies will require flexibility to incorporate new data and information as it becomes available (DWR, et al. 2011).

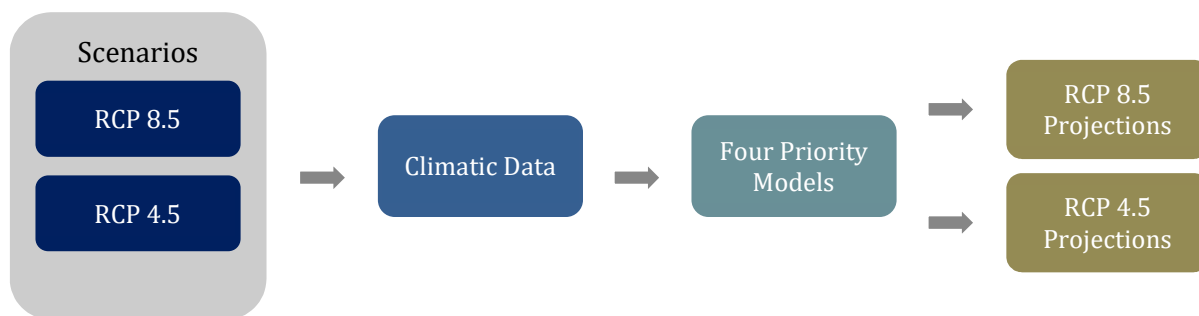
2.9.1 Climate Change Impacts on the Region

A vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with and adapt to the adverse effects of climate change (DWR, et al. 2011). Each region has unique vulnerabilities to climate change, and having a deeper understanding of these vulnerabilities is the first step toward integrating climate change considerations into future regional water management plans and measures.

Cal-Adapt Climate Tools

Estimating climate change impacts on precipitation and temperature on a regional level is challenging because of the coarse spatial scale of many global climate models. To better comprehend climate change impacts at a local level, the California Energy Commission funded and advised the development of Cal-Adapt, a web-based resource for projecting local risks posed by climate change. Cal-Adapt projects climate change impacts under two potential GHG emissions scenarios outlined in the Intergovernmental Panel on Climate Change's (IPCC) Climate Change 2014 Synthesis Report, a leading international assessment of climate change. The first scenario, Representative Concentration Pathway (RCP) 4.5, assumes GHG emissions will peak around 2040 and then decline. The second scenario, RCP 8.5, assumes that GHG emissions will continue to rise through 2100. Cal-Adapt synthesizes robust scientific data under the two scenarios and applies four models selected by California state agencies as priority models for research contributing to California's Fourth Climate Change Assessment. The climate change modeling process is shown in **Figure 2-20** (California Energy Commission 2017).

Figure 2-20: Cal-Adapt Model for Climate Change Impacts



Climate Change Projections for the Region

Cal-Adapt climate tools were used to project regional changes in temperature, precipitation, wildfire risk, and other impacts posed by climate change. The projections do not factor policy, technology, behavior, and other unidentified variables that influence the evolution of climate change in California. Climate change impacts were compared against historical annual means for 1961 to 1990, as was done by the IPCC when analyzing the global climate dataset. Where regional climate change impacts were not available through the Cal-Adapt website, other resources were utilized, including the California Adaptation Planning Guide (California Emergency Management & Natural Resources

Agency 2012) and the Using Future Climate Projections to Support Water Resources Decision Making in California report (DWR 2009). **Table 2-14** summarizes the impacts and effects of climate change on the Fremont Basin IRWM Region through 2100 under both GHG emission scenarios.

Table 2-14: Impacts of Climate Change on the Fremont Basin IRWM Region

Effect	Ranges
Temperature ¹	4°F (RCP 4.5) to 6°F (RCP 8.5) increase by 2050^(b) 6°F (RCP 4.5) to 11°F (RCP 8.5) increase by 2100^(c)
Extreme Heat Days ^{1(a)}	18 (RCP 4.5) to 28 (RCP 8.5) additional days above threshold by 2050^(b) 31 (RCP 4.5) to 60 (RCP 8.5) additional days above threshold by 2100^(c)
Wildfire Risk ¹	30 (RCP 4.5) to 104 (RCP 8.5) less hectares burned by 2050^(b) 70 (RCP 4.5) to 177 (RCP 8.5) less hectares burned by 2100^(c)
Precipitation ¹	0.8" (RCP 4.5) to -0.8" (RCP 8.5) change by 2050^(b) 0.1" (RCP 4.5) to 0.3" (RCP 8.5) change by 2100^(c)
Flood Management ²	Rapid snowmelt and intense rains will result in extreme, high-flow events
Supply ³	- SWP: delivery decrease of 7-10% by 2050, and 21-25% by 2100 - Changes to local supply not quantified, but supply could decrease based on precipitation effects described above
Demand	Changes to demand not quantified, but irrigation demand could increase as a result of less precipitation

Sources: (1) Cal-Adapt Climate website <http://cal-adapt.org/>; (2) California Emergency Management & Natural Resources Agency 2012; (3) California Climate Change Center 2009

Notes: (a) Impacts modeled for California City; (b) Average of 2045 to 2055 projections; (c) Average of 2095 to 2100 projections

Temperature

Between 1961 and 1990, the Region experienced a historical annual mean minimum temperature of 46.1°F and annual mean maximum temperature of 73.2°F. Average temperatures are expected to increase at least 6 to 11 degrees Fahrenheit by 2100 due to climate change (California Energy Commission 2017). This will have adverse impacts on the ecology and productivity of the Region. Threatened species are especially sensitive to climate variations and may have a lowered capacity to adapt to climate change. Foraging may become harder for the Desert Tortoise since their food source is highly dependent on cool season rains (USFWS 2014). Suitable habitats for Mohave Ground Squirrels are also expected to decrease with increased temperatures (Philip 2015). Invasive species that thrive in the warmer climate could become more prevalent and displace local native species.

A warmer climate will also have negative impacts on agriculture as it will increase evapotranspiration, decrease soil moisture, and increase agricultural water demand. Pistachio cultivation, a common crop in the Region, could be especially hindered since nut trees require adequate winter chill to produce viable yields (Semitropic Water Storage District 2015).

Extreme Heat Day

An extreme heat day is defined as a day in April through October where the temperature exceeds the 98th historical percentile of maximum temperatures based on daily temperature data between 1961 and 1990. From 1961 to 1990, California City experienced an average of four extreme heat days per year. Extreme heat days are expected to become significantly more frequent, longer, and more intense. Models project that California City will experience 31 to 60 days more extreme heat days

annually by 2100 (California Energy Commission 2017). Longer heat waves pose a serious public health issue as they increase the risk of heat strokes, heat exhaustion, dehydration, and mortality. Heat waves decrease work productivity and will particularly affect agricultural and construction workers as well as homeless populations, children, and women (IPCC 2014). Extreme heat days will also result in increased energy usage associated with air-conditioning, increasing GHG emissions and further perpetuating climate change.

Severe heat waves will also impact ecosystems and biodiversity in the Region. Species unable to adapt to longer and more intense heat waves are at risk of extinction, which will have cascading effects on other organisms connected through food webs and other interactions. Invasive species best suited to the changing conditions can outcompete native species not able to adapt to the changing conditions (EPA 2010).

Wildfire

Historically, an annual average of approximately 530 hectares per year is estimated to have burned in the Region between 1961 and 1990. Wildfire burn area is projected to decrease by roughly 70 to 180 hectares annually by 2100 due to projected decreases in vegetation cover. Reduced vegetation due to urbanization from population growth as well as declines in vegetation cover caused by the temperature and precipitation changes can reduce wildfire burn area, despite drier conditions.



Climate change can impact vegetation cover in the Fremont Valley.

Precipitation and Flood Management

Between 1961 and 1990, the Region received an average annual precipitation of 7.8 inches. Despite changing climate conditions, this annual average is expected to remain relatively unchanged through 2100 (California Energy Commission 2017). Despite the minimal impact on total annual precipitation, climate change is expected to result in a larger proportion of precipitation coming in the form of intense single-day events (EPA 2017). High-flow events will increase the risk of flooding as well as increase the difficulty of retaining water for flood attenuation and groundwater recharge (California Emergency Management & Natural Resources Agency 2012). Longer drought periods will strain water supplies in the Region, as water demand is expected to increase while supplies decrease. Increased precipitation variability will also have adverse impacts on ecosystems as it will endanger species that are unable to adapt to longer droughts and extreme storm events.

Water Supply

The Region receives imported SWP water from the Delta, a climate-sensitive watershed. The Sacramento and San Joaquin Rivers are the primary sources to the Delta, and both are supplied by snowmelt from the Sierra Nevada Mountains. Groundwater basins that supply water to the Region are also recharged from seasonal streams that originate in the Sierra Nevada Mountains. Because of increased temperatures, more precipitation will fall as rain instead of snow and any stored snow will melt earlier in the year. This change is expected to reduce the Sierra Nevada spring snowpack by 70

to 80 percent (California Energy Commission 2017). As a result, imported water supply deliveries from the SWP are projected to decrease by 21 to 25 percent (Climate Change Center 2009).

Water Demand

Water demand is likely to increase with climate change. Longer drought seasons will lead to greater agricultural and landscape irrigation demands, especially for nonnative and water intensive vegetation and crops. Water demand associated with recreational activities will also increase as extreme heat days increase.

2.9.2 Identification of Vulnerabilities

Because climate change impacts vary by geography, vulnerability to climate change also varies by geography. Determining region-specific climate change vulnerabilities is the first step in assessing a Region's water resource sensitivity to climate change, effectively guiding the development of Resource Management Strategies (RMS) and identifying mitigation and adaptation strategies. The IRWMP framework convenes stakeholders with varied priorities to collaboratively develop mitigation and adaptation strategies that satisfy all water uses and needs (DWR, et al. 2011). As discussed in *Chapter 5: Projects*, IRWM Plan projects in the Fremont Basin IRWM Region are evaluated, in part, based on their ability to adapt to water-related climate impacts.

The Vulnerability Assessment Checklist contained in Appendix B of the Climate Change Handbook for Regional Water Planning was used to determine climate change impacts and vulnerabilities specific to the Fremont Basin IRWM Region. Localized data and research were used to answer the qualitative assessment. The exercise analyzed climate change impacts to water demand, water supply, water quality, sea level rise, flooding, ecosystem and habitat, and hydropower. Of the forty potential climate change vulnerabilities assessed, twenty were considered applicable to the Region. The complete Vulnerability Assessment with a description of each vulnerability and its applicability to the Region is included in Appendix E.

2.9.3 Prioritization of Vulnerabilities

The twenty Region-specific vulnerabilities identified in the Vulnerability Assessment Checklist were distilled into ten main vulnerability areas that the Region will face as climate change impacts become more apparent. During the Stakeholder Meeting held on December 14, 2017, stakeholders were asked to prioritize the ten vulnerability areas. To better inform the prioritization process, local examples were provided for each vulnerability. The prioritization results were grouped into two categories: those vulnerabilities considered to be a high priority for the Region, and those considered to be a medium priority. Vulnerabilities prioritized as "high" had the highest perceived risk and importance and included vulnerabilities related to meeting demands, reductions in groundwater supply, and increases in flooding. The RWMG aims to help address these vulnerabilities through development of the IRWM Plan, GWMP, SNMP and continued project development in the Region. All high priority vulnerabilities and most medium priority vulnerabilities, with the exclusion those associated with Ecosystem and Habitat, were discussed as feasible climate change vulnerabilities for the RWMG to address through implementation of the IRWM Plan, GWMP, and SNMP. The meeting handout with the ten vulnerability issues is included in Appendix F. Results of the prioritization exercise from the Stakeholder Meeting are summarized in **Table 2-15**. Vulnerability prioritization will be revisited with future updates to the IRWM Plan, following additional data gathering and

analysis of the prioritized climate change vulnerabilities by the RWMG. The RWMG plans to gather additional data through coordination with stakeholders and State and federal government sources.

Table 2-15: Climate Change Vulnerability Issues for the Fremont Basin IRWM Region

Priority Level	Vulnerability Issue
High Priority	• Water Demand: Limited ability to meet future demand • Water Supply Decrease in groundwater supply • Flooding: Increase in inland flooding
Medium Priority	• Water Demand: Decreased ability to use groundwater storage to buffer drought • Water Demand: Limited ability to conserve further • Water Demand: Increase in crop demand • Water Supply: Decrease in imported supply • Water Quality: Increased constituent concentrations • Ecosystem and Habitat: Decrease in available necessary habitat • Ecosystem and Habitat: Increased impacts to sensitive or threatened species

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3 Water Supply and Demand Assessment

A comprehensive water supply and demand assessment can help respond to climate change, drought, land development impacts, and other factors that can threaten supply reliability. Understanding historical and projected water budget trends in the Region can help predict and prevent supply shortfalls, supporting the case for projects that can augment local water supplies. The Region utilizes a combination of water sources to meet water demand, including groundwater, imported water, and some recycled water. Supplies are used to meet urban, agricultural, and domestic water demands, and are delivered by water agencies or pumped from private wells. The following sections provide an overview of historical, current, and future projected water demand and supply sources within the Region.

3.1 Historical Water Demand

In the Region, water demands have historically been for urban and agricultural uses. Urban demand, comprised of residential, commercial, and industrial users served by the City, MPUD, Cal Water, Rancho Seco Inc., RCWD, and private pumping, has increased over time as presented in **Table 3-1**. For the purpose of this IRWM Plan, these demands include any commercial users served by the water purveyors and any associated distribution system water losses. Agricultural activities increased through the 1960s and 1970s and peaked in 1976, with groundwater extractions for agriculture reaching a maximum of approximately 60,000 AFY according to previous USGS investigations (USGS 1977). Increased groundwater production led to significant groundwater declines in the FVGB that persisted through the mid-1980's. Agricultural activities significantly decreased thereafter; when comparing cultivated acreage from USGS 1977 to 2010 aerial imagery, as of 2010, only one percent of lands cultivated in 1976 were still in production. Aerial maps were used to estimate the total area cultivated historically. It was not possible to confirm the types of crops produced in the Region based on visual inspections of aerial maps. Since alfalfa has been historically grown throughout the Region, agricultural demand estimates assume that alfalfa is the only crop cultivated in the Region for the purposes of estimating supply use only. Historical agricultural demands were estimated by applying a specific crop coefficient to the acres of land cultivated.

Historical urban water demands in the Region are based on estimated groundwater pumping data and imported water data provided by the City of California City, MPUD, and AVEK. For years with missing water records, demands were interpolated/extrapolated using:

- The population overlying the FVGB (provided by U.S. Census data)
- Historical growth rates in Kern County (provided by the Department of Finance (DOF))
- Average assumed gallons per capita per day (GPCD) for the City and MPUD (obtained from UWMPs).

Future projected water demand in the Region is presented in Section 3.2, based on population growth and potential agricultural expansion scenarios.

Table 3-1: Estimated Historical Urban and Agricultural Demand in the Region (AF)

	1960	1970	1976 ¹	1980	1990	2000	2010
Agricultural Demand ²	17,500	34,000	60,000	39,600	10,200	2,700	700
Urban Demand ³	2,800	3,200	3,600	3,900	5,100	5,200	5,700
Total Demand	20,300	37,200	63,600	43,500	15,300	7,900	6,400

Sources: (1) Values for 1976 are included because it was the peak year for agricultural demands; urban demands for 1976 were interpolated from 1970 and 1980 values; (2) Estimated from Cooperative Extension University of California Division of Agriculture and Natural Resources N.D.a. and N.D.b. and aerial maps; (3) Estimated from DOF growth rates for Kern County for the years 1960 through 2010 and U.S. Census data for 1990, 2000, and 2010.

Note: Data rounded to nearest hundred.

3.2 Current and Projected Water Demand

Water demand in the Region is comprised of urban and agricultural water demands. Urban demands can be further classified into residential water uses (including commercial and water loss for the purpose of this analysis) and industrial activities. An estimated 19,400 people reside within the Region boundaries as of 2015, and the population is expected to grow more than 35 percent by 2040 (see *Section 2.8.1: Population and Demographics*), based on Kern County and the City's annual growth projections. Most population growth is expected to occur within the City and Mojave. The FVGB also supports the existing solar, mining, and manufacturing industries and an emerging cannabis industry. The solar and cannabis industries are both expected to grow significantly in the next two decades. The basin-wide water demand described in the following sections is based on demands from individual sectors, including residential, agricultural, and industrial.

Total water demand in the Region is projected to increase more than 60 percent by 2040. Residential water use accounts for the biggest portion of current demand, making up approximately 70 percent of total demand. The current per capita water use for areas served by the water purveyors in the Region is summarized in **Table 3-2**. Residential demand will continue to be the largest component of total water demand through 2040. Industrial activities account for the second largest component of current water demand, making up approximately 20 percent. In comparison, agricultural activities account for less than 10 percent of all demand. Water loss associated with water purveyor distribution systems are not separated from the residential category for the purpose of this analysis but, it is important to note, are significant issues for many distribution systems in the Region. Water demand projections in this section do not consider climate change, natural disasters, or other catastrophic or emergency events that may affect water demand. Potential impacts of climate change on demands are discussed qualitatively in *Section 2.9: Climate Change*.

Table 3-2: Water Purveyor Population, Urban Demand and Per Capita Water Use

	2015 Population Served within Service Areas	2015 Total Demand (AF)	Average per Capita Water Use (GPCD)
California City ¹	14,233	3,606	226
Cal Water ²	189	14	66
MPUD ³	4,200	986	210
Rancho Seco ⁴	30	9	268
RCWD ⁵	400	47	105
Water Purveyor Total	19,052	4,662	-
Regional Average	-	-	218

Sources: (1) California City Water Department 2017; (2) California Water Service 2016a; (3) Estimated from U.S. Census 2010; (4) Data provided by Rancho Seco on January 18, 2018; (5) SDWIS. N.D.e.

Note: Total population and water demand shown only includes that served by water purveyors. Total population in the Region is estimated at 19,400 people.

A summary of water demand by land use is provided in **Table 3-3** and described in detail in Section 3.2.1 through 3.2.3. Residential demands include water purveyor potable system demands (including commercial and water loss), recycled water demands, and the estimated unincorporated Kern County private pumping demands. For the purposes of the demand analysis, 2015 was assumed to represent current conditions. **Table 3-3** reflects a “Baseline Condition” that assumes all residential and industrial demands steadily increase according to documented planned development documented in UWMPs or cited by City planning officials, whereas agricultural demands are assumed to remain static at 2015 levels. Currently, there are no specific plans to increase or decrease agriculture in the Region, therefore the Baseline Condition represented in **Table 3-3** does not adjust agricultural demands.

Three future agricultural growth scenarios (“light”, “medium”, and “heavy”) were developed and compared to the Baseline Condition as part of the SNMP. Though there are no formal plans to increase agriculture beyond current levels, the Baseline Condition plus the three agricultural “growth scenarios” were developed and analyzed to estimate water demands for potential growth and future agricultural activity. The agricultural growth scenarios are intended to illustrate how much additional groundwater demand would be required in the Region to support potential future agricultural growth and to inform the Region in future decisions for managing the basin sustainably. The Baseline Condition and agricultural growth scenarios are described in Section 3.2.2.

Table 3-3: Current and Projected Water Demand in the Region (AF) – Baseline Condition

	2015	2020	2025	2030	2035	2040
Residential ¹	5,278	7,339	7,686	8,045	8,408	9,328
Agricultural	647	647	647	647	647	647
Industrial	1,442	1,501	1,707	1,914	2,120	2,326
Region Total	7,367	9,487	10,040	10,606	11,175	12,301

Note: 1) Residential water demands include recycled water and unincorporated Kern County private pumping.

3.2.1 Current and Projected Residential Water Demand

A summary of the projected residential water demands is shown **Table 3-4**. The total current residential demand for 2015 in the Region is estimated to be 5,278 AFY for a total population of approximately 19,000. The water demand projections for the City are based on the 2015 UWMP and include demands for recycled water. Demands in the City service area are projected to increase by approximately 90 percent by 2040, primarily due to the planned expansion of the California City Correctional Center (California City Water Department 2017).

Table 3-4: Current and Projected Residential Water Demand (AF)

	2015	2020	2025	2030	2035	2040
California City ¹	4,124	6,125	6,386	6,650	6,917	7,743
Cal Water ²	14	15	16	17	18	19
MPUD ²	986	1,038	1,111	1,192	1,274	1,355
Rancho Seco ²	9	9	10	11	12	12
RCWD ²	47	49	53	57	61	65
Unincorporated Kern County Private Pumping ²	98	103	110	118	126	134
Region Total	5,278	7,339	7,686	8,045	8,408	9,328

Sources: (1) Projections based on DOF growth rates for the City; (2) Projections based on DOF growth rates for the unincorporated Kern County.

Note: Water demands shown in the table above include current and projected recycled water demands.

Current and future demands for MPUD, Cal Water, RCWD, and private pumping in unincorporated Kern County were calculated by applying estimated DOF Kern County population growth rates to each agency's 2015 water deliveries in the Region (DOF 2017; California Water Service 2016). Private

pumping demand in unincorporated Kern County was estimated to be 98 AF⁴, based on population in the areas outside of established service areas (U.S. Census 2010) and an average per capita water use value for the Region.

3.2.2 Current and Projected Agricultural Water Demand

Historically, agricultural activities have primarily been conducted in the northern portion of the FVGB and peaked in the 1970s with estimated groundwater extractions reaching up to approximately 60,000 AFY in 1976 (USGS 1977). Agricultural activities significantly decreased thereafter; and as of 2010, only 1 percent of lands cultivated in 1976 were still in production.

Agriculture continues to be an important component of the water demand for the Region and it is anticipated to be a source of significant demand in the FVGB in the future. Though it is assumed that only alfalfa has been historically cultivated in the Region for the purposes of estimating historical demand, both the Sustainable Groundwater Management tool provided by DWR and aerial maps confirmed that pistachios are currently cultivated in the Region in addition to alfalfa. To estimate current agriculture demands, approximately 207 acres of land in the Region were assumed to be cultivated; and for the purposes of estimating current and projected future agricultural water use, it is assumed that approximately half of the area was cultivated with alfalfa and the other half of the area was cultivated with pistachios in 2015. Agricultural water demands for these two crops were estimated based on the calculated monthly gross water requirements (ET_c) as the product of the reference evapotranspiration (ET_o) from the Palmdale CIMIS Station and a unique crop factor (K_c). K_c values account for specific daily evapotranspiration variations due to growth and development in different crops. Calculated monthly crop evapotranspiration estimates for alfalfa and pistachios are shown in **Table 3-5**. Alfalfa has an annual gross water requirement more than eight times greater than that of pistachios, which results in a significant difference in agricultural water demand for a given acreage (**Table 3-6**) (Cooperative Extension University of California Division of Agriculture and Natural Resources N.D.a. and ND.b.). Assuming an irrigation system efficiency of 75 percent under normal conditions (USDA 2013), crop ET_c is estimated at approximately 60.1 inches for alfalfa and 7.3 inches for pistachios, resulting in water demand estimates of 630 AF for alfalfa and 17 AF for pistachios in 2015. Alfalfa is a very water-intensive crop; and though it was assumed to be cultivated only on an estimated 50 percent of all farm lands in the FVGB in 2015, it accounts for more than 97 percent of the total agricultural water demand after average rainfall is taken into account.

⁴ The population estimate in unincorporated Kern County is based on discussions with the Fremont Basin RWMG and their knowledge of communities outside of established service areas.

Table 3-5: Crop Evapotranspiration Estimates for the Fremont Basin IRWM Region

Month	Evapotranspiration (ET _o)	Crop Factor (K _c)			Crop Evapotranspiration (ET _c)
	Cool-Season Grass ¹	Alfalfa ²	Pistachios ³	Alfalfa	Pistachios
January	2.3	0	0	0	0
February	3.2	0.6	0	1.9	0
March	5.0	1.1	0	5.7	0.1
April	6.5	1.0	0.3	6.3	0.6
May	8.3	1.0	0.8	8.1	1.8
June	9.2	1.0	1.1	9.4	2.5
July	9.6	1.0	0.9	10.0	1.5
August	8.7	1.0	0.4	9.0	0.8
September	6.4	1.0	0	6.1	0
October	4.5	1.0	0	4.3	0
November	2.9	0	0	0	0
December	2.1	0	0	0	0
Annual (in.)	68.5	--	--	60.7	7.4

Sources: (1) CIMIS. California Department of Water Resources. Data for Palmdale No. 197 Station from April 2005 through August 2017; (2) Cooperative Extension University of California Division of Agriculture and Natural Resources N.D.a; (3) Cooperative Extension University of California Division of Agriculture and Natural Resources N.D.b.

Table 3-6: Current (2015) Crop Water Requirements in the Region

	Alfalfa	Pistachios
Monthly Gross Water Requirements (in.)	60.7	7.4
Average Rainfall (in.)	5.9	5.9
Total Net Average Monthly Water Requirements (in.)	54.8	1.4
Irrigation Efficiency (%)	75%	75%
Total Water Net Usage (in.)	73.1	2.0
Total Net Water Demand (AF/acre)	6.1	0.2
Acreage (Acres)	103.5	103.5
Total Water Demand (AFY)	630	17
Total Agricultural Demand (AFY)	647	

To estimate future agricultural demands, a different approach was used. The viability of agricultural operations depends on several factors, including but not limited to available zoned land, the price of

water, market prices for various crop types, and local community support. The Kern County General Plan zoning and descriptions were reviewed for land use designations indicated as potential for irrigated cropland. Though there are no formal plans to increase agriculture beyond 2015 levels, available documents indicate that agricultural demands in the FVGB have been as high as 60,000 AFY in the 1970s, with cultivated acreage covering a much larger area than today. To plan for potential future agricultural activity or other growth that could significantly increase water use in the Region, the Baseline Condition plus three “growth scenarios” were developed and analyzed using the historical maximum of 60,000 AFY of water demand as a basis. These “growth” scenarios are based on a percentage of the historical agricultural maximum water use; but it is important to note that actual future demands could reflect the growth of other sectors in the Region that use a significant amount of water, including industry.

The Baseline Condition assumes that 2015 demands for agriculture remain unchanged at 647 AFY in future years (about one percent of the historical maximum of 60,000 AFY). Building on the Baseline Condition, each of the three growth scenarios assumes agricultural demand in the Region would increase to approximately 5, 10, and 15 percent of the historical maximum by 2040. These are referenced as the “light growth”, “medium growth”, and “heavy growth” agricultural scenarios, respectively. While pistachio farming may increase in the Region due to their low water use requirements, the FVGB demand analysis was designed to assess potential future demand scenarios and is not intended to represent precise future crop profiles. Because alfalfa requires significantly more water than pistachios, the projections assume that pistachio cultivation will remain constant through 2040 and all future agricultural demand growth would be from increased alfalfa cultivation. Alfalfa cultivation is also assumed to increase linearly from 2015 to 2040. The total acres cultivated in the Region under the Baseline Condition and each of the three growth scenarios are shown in **Table 3-7**. It should be noted that other crop combinations could be cultivated and that actual agricultural demands could remain constant or decrease. It is also possible that agricultural expansion could occur more rapidly, given historical cultivation levels; but the following future scenarios are considered to be reasonable projections for the purposes of this IRWMP by the RWMG and IRWM stakeholders.

Table 3-7: Growth Scenarios - Total Area Cultivated (acres)

Scenario	2015	2020	2025	2030	2035	2040
Baseline Condition	207	207	207	207	207	207
Scenario 1: Light Growth	207	284	362	439	516	593
Scenario 2: Medium Growth	207	383	559	735	910	1,086
Scenario 3: Heavy Growth	207	481	756	1,030	1,305	1,579

Assumptions: Each of the three growth scenarios assumes linear agricultural demand increase to approximately 5, 10, and 15 percent of the historical maximum by 2040. Pistachio cultivation is assumed to remain constant through 2040, and all future agricultural demand growth is assumed to be from increased alfalfa cultivation. Projections assume an irrigation system efficiency of 75 percent under normal conditions.

Given these parameters and assumptions, alfalfa production in the FVGB has the potential to increase by approximately five times by 2040 in Scenario 1 (light growth), approximately 10 times by 2040 in

Scenario 2 (medium growth), and approximately 14 times by 2040 in Scenario 3 (heavy growth) (Table 3-8).

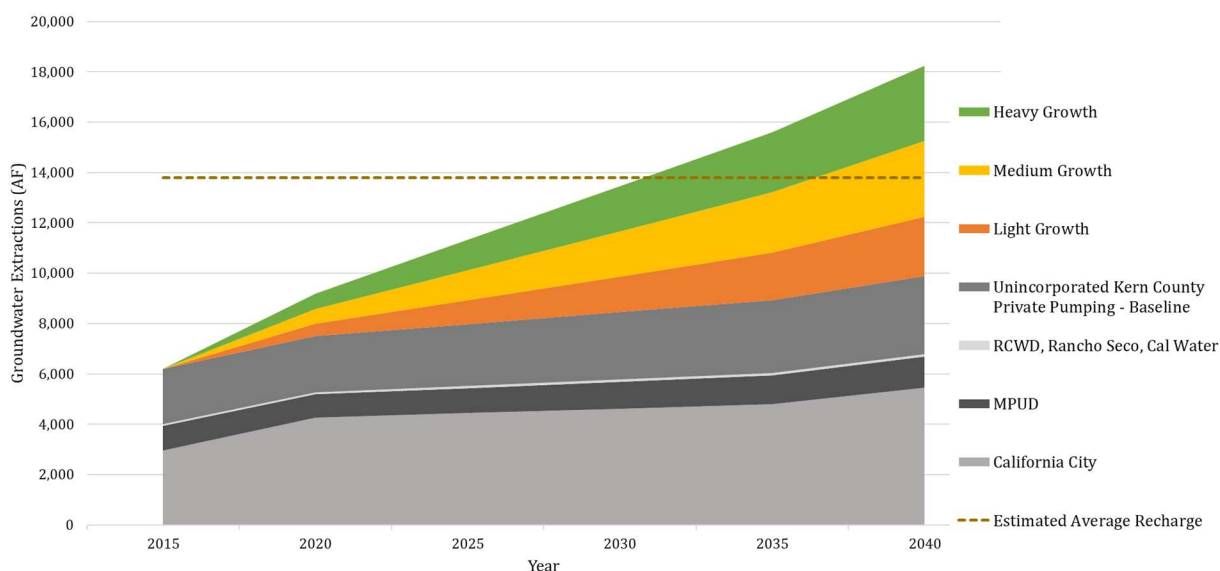
Table 3-8: Growth Scenarios - Current and Projected Water Demand in the Region (AF)

Scenario	2015	2020	2025	2030	2035	2040
Baseline Condition	647	647	647	647	647	647
Scenario 1: Light Growth	647	1,118	1,588	2,059	2,529	3,000
Scenario 2: Medium Growth	647	1,718	2,788	3,859	4,929	6,000
Scenario 3: Heavy Growth	647	2,318	3,988	5,659	7,329	9,000

Assumptions: Each of the three growth scenarios assumes linear agricultural demand increase to approximately 5, 10, and 15% of the historical maximum by 2040. Pistachio cultivation is assumed to remain constant through 2040, and all future agricultural demand growth is assumed to be from increased alfalfa cultivation. Projections assume an irrigation system efficiency of 75 percent under normal conditions.

Figure 3-1 summarizes the current and projected agricultural pumping water demands in the FVGB. Agricultural demand by 2040 is projected to be 3,000 AF for Scenario 1 (light growth), 6,000 AF for Scenario 2 (medium growth), and 9,000 AF for Scenario 3 (heavy growth). These demands are shown in comparison to the average estimated natural recharge volume for the FVGB of 13,800 AFY, as estimated in the Fremont Valley Basin GWMP. See Appendix B for additional details on the natural recharge estimate.

Figure 3-1: Groundwater Extractions in the Region – Current and Future Scenarios



3.2.3 Current and Projected Industrial Water Demand

In addition to agriculture, industrial processes are also an important component of the water demand in the Region. The four largest industrial water user categories are the solar, cannabis, mining and manufacturing industries. The cannabis industry, while traditionally thought of as an agricultural water use, is currently being regulated under the LRWQCB as an industrial water use for waste discharge requirements. Because of this, cannabis cultivation, specifically indoor cannabis cultivation, is being described in this Plan under the industrial water uses. Other types of industrial demands in the Region are assumed to be negligible, though small manufacturers may be included in future updates to the IRWM Plan. Industrial water demands are summarized in **Table 3-9**.

Table 3-9: Total Current and Projected Industrial Water Demand (AF)

	2015	2020	2025	2030	2035	2040
Solar ¹	6	6	6	6	6	6
Cannabis ²	0	59	265	472	678	884
Mining ³	1,105	1,105	1,105	1,105	1,105	1,105
Manufacturing ⁴	331	331	331	331	331	331
Total	1,442	1,501	1,707	1,914	2,120	2,326

Sources: (1) Frisvold, G., & Marquez, T. 2013; (2) Communication with California City Staff 2018; (3) Communication with Golden Queen Mining Company Management 2018; (4) Communication with CalPortland Company management 2018.

Assumptions: Energy production, mining and manufacturing processes assumed to remain constant through 2040. Cannabis cultivation will grow to 20 facilities by 2020 and approximately 300 facilities by 2040; each facility is projected to use approximately 2.9 AFY of potable water with 70 to 80 percent wastewater reuse.

Solar Energy Production

The Beacon Photovoltaic solar plant is the largest solar facility in the Region. Water use by all other solar power plants is assumed to be negligible due to their relative sizes. Previous studies have estimated that the Beacon Photovoltaic solar plant uses an average of 6 AFY for panel cleaning (Frisvold & Marquez 2013). Demand projections assume that solar demand will remain relatively constant through 2040, as shown in **Table 3-9**.

Cannabis Cultivation

Cannabis is a new industry being developed in the Region. The City expects continued development of this industry over the next few years. The City expects to approve roughly 20 permits for 20,000 square-foot indoor cannabis grow houses by 2020 and as many as approximately 300 permits by 2040. According to the California City Public Works Director, the facilities are anticipated to operate within municipal boundaries using approximately 2.2 AFY to 2.9 AFY of potable water per facility. This water use assumes that each facility will also reuse 70 to 80 percent of its irrigation wastewater internally. Demand projections for cannabis cultivation through 2040 conservatively assume a demand of 2.9 AFY per facility (**Table 3-9**).

Mining and Manufacturing

Golden Queen Mining Company uses open pit mining methods to extract gold and silver at the Soledad Mountain Mine near Mojave. The mining operations utilize water pumped from 5 production

wells and 9 domestic wells to support operations. CalPortland operates a plant in Mojave for cement production. The plant uses water pumped from a private well. Like the solar industry, water demands for mining and manufacturing are assumed to remain constant through 2040, and water use by all other manufacturing operations are assumed to be negligible. Future updates to the IRWMP may include additional demand estimates for small manufacturers pumping from the FVGB. General water demand estimates determined from communication with CalPortland Company management and Golden Queen Mining Company management are shown in **Table 3-9**.

3.3 Current and Projected Water Supplies

As described in *Chapter 2: Region Description*, water demand in the Region is met with local groundwater supplies, imported water from the SWP, and recycled water generated by the City's WWTP. Stormwater is not currently being captured for beneficial use in the Region. There are no planned stormwater capture projects at this time; therefore, stormwater was not included in the future supply analysis. The following is an analysis of the projected groundwater, imported water, and recycled water supplies in the Region through 2040 under normal conditions. The projected supplies are for an average year and do not account for climate change impacts, catastrophes, changes in legislation, and other events that can disrupt supply deliveries. Potential impacts of climate change on supplies are discussed in *Section 2.9: Climate Change*.

Total water supplied within the Region is expected to increase by approximately 180 percent by 2040 to match demand under the heavy growth scenario, as shown in **Table 3-10**. These projections assume agricultural demands will increase up to 9,000 AFY by 2040 which represents 15 percent of the historical maximum of 60,000 AFY (heavy growth scenario). The assumptions used in these projections are discussed below.

It should be noted that, assuming the average groundwater recharge value of 13,800 AFY estimated as part of the Fremont Valley Basin GWMP (Woodard & Curran 2018a), the light growth scenario is likely to be sustainable (i.e., not produce a condition of basin overdraft). The medium and heavy growth scenario, however, may not be sustainable (i.e., could produce a condition of overdraft).

Table 3-10: Total Current and Projected Water Supplies (AF)

	2015	2020	2025	2030	2035	2040
Baseline						
Groundwater	6,196	7,514	7,984	8,456	8,931	9,893
Imported Water	653	1,190	1,240	1,300	1,360	1,420
Recycled Water	518	783	816	850	884	988
Total	7,367	9,487	10,040	10,606	11,175	12,301
Scenario 1 (Light Growth): 5% of Historical Agricultural Maximum						
Groundwater	6,196	7,985	8,925	9,868	10,813	12,246
Imported Water	653	1,190	1,240	1,300	1,360	1,420
Recycled Water	518	783	816	850	884	988
Total	7,367	9,958	10,981	12,018	13,057	14,654
Scenario 2 (Medium Growth): 10% of Historical Agricultural Maximum						
Groundwater	6,196	8,585	10,125	11,668	13,213	15,246
Imported Water	653	1,190	1,240	1,300	1,360	1,420
Recycled Water	518	783	816	850	884	988
Total	7,367	10,558	12,181	13,818	15,457	17,654
Scenario 3 (Heavy Growth): 15% of Historical Agricultural Maximum						
Groundwater	6,196	9,185	11,325	13,468	15,613	18,246
Imported Water	653	1,190	1,240	1,300	1,360	1,420
Recycled Water	518	783	816	850	884	988
Total	7,367	11,158	13,381	15,618	17,857	20,654

Assumptions: For these supply/demand calculations, it is assumed that future engineered stormwater capture/recharge is negligible. The projected supplies are for an average year and do not account for climate change impacts, catastrophes, changes in legislation, and other events that can disrupt local and imported supply deliveries.

3.3.1 Groundwater

The FVGB provides the majority, if not all, of the groundwater supply within the Region. While a few wells exist in some of the surrounding groundwater basins within the Region boundaries, pumping from these wells for supply is considered minor or nonexistent, with the majority of groundwater supplies provided by the FVGB. These other groundwater basins include the Indian Wells Valley, Kelso Lander Valley, and Tehachapi Valley East groundwater basins.

Groundwater volumes pumped from the FVGB and distributed within the City for the year 2015 were documented in the City's 2015 UWMP. Because almost the entire population of the City is within the Region, all groundwater extractions occur from the FVGB and almost all are consumed within the FVGB boundary. Cal Water pumping data for the year 2015 reflects the groundwater supplies that

were distributed solely to the Fremont Valley System. MPUD and RCWD provided groundwater pumping data for 2015. Demands estimated for the portions of unincorporated Kern County not served by the City, MPUD, Cal Water, Rancho Seco Inc., or RCWD are assumed to be met by groundwater pumping.

Groundwater pumping is projected to increase over the next two decades due to population growth, cannabis cultivation, and agricultural growth scenarios, as shown in **Table 3-11**. The projected groundwater pumping is assumed to be the variable for supplies and is set to be equal to the total projected demand minus projected recycled and imported water supplies. The calculations are based on the following key assumptions:

- Agricultural demands assume the Baseline Condition; light agricultural growth; medium agricultural growth, and heavy agricultural growth by 2040.
- Groundwater is the only available water supply outside of the City and MPUD service areas.
- Groundwater pumping is used to make up supply shortfalls that are not met with other sources.

Since groundwater pumping is assumed to make up supply shortfalls in this Plan, the agricultural growth scenarios would increase dependence on groundwater pumping in the Region significantly. Future plans for agricultural growth, or other growth with high water demands, in the Region should be evaluated such that the FVGB is managed sustainably in the long-term without causing overdraft conditions similar to those that the basin has experienced historically.

Table 3-11: Current and Projected Groundwater Extractions in the Region (AF)

Source	2015	2020	2025	2030	2035	2040
California City ¹	2,955	4,273	4,450	4,620	4,793	5,455
Cal Water ²	14	15	16	17	18	19
MPUD ³	985	918	991	1,072	1,154	1,235
Rancho Seco ⁴	9	9	10	11	12	12
RCWD ⁵	47	49	53	57	61	65
Baseline^a						
Unincorporated Kern County Private Pumping ⁶	2,186	2,250	2,464	2,679	2,893	3,107
Total	6,196	7,514	7,984	8,456	8,931	9,893
Scenario 1 (Light Growth): 5% of Historical Agricultural Maximum^b						
Unincorporated Kern County Private Pumping ⁶	2,186	2,721	3,405	4,091	4,775	5,460
Total	6,196	7,985	8,925	9,868	10,813	12,246
Scenario 2 (Medium Growth): 10% of Historical Agricultural Maximum^c						
Unincorporated Kern County Private Pumping ⁶	2,186	3,321	4,605	5,891	7,175	8,460
Total	6,196	8,585	10,125	11,668	13,213	15,246
Scenario 3 (Heavy Growth): 15% of Historical Agricultural Maximum^d						
Unincorporated Kern County Private Pumping ⁶	2,186	3,921	5,805	7,691	9,575	11,460
Total	6,196	9,185	11,325	13,468	15,613	18,246

Sources: (1) California City Water Department 2017; (2) Cal Water pumping data for the Fremont Valley System; (3) MPUD pumping data; (4) Rancho Seco pumping data; (5) RCWD pumping data; (6) Estimated from supply shortfall

Note: Unincorporated Kern County Private Pumping captures private groundwater pumping for agricultural, industrial, and residential demands outside any given service area within the FVGB.

Assumptions: Projections assume that pistachio cultivation will remain constant through 2040 and all future agricultural demand growth would be from increased alfalfa cultivation; (a) 2015 demands for agriculture remain unchanged at 647 AFY in future years (about 1 percent of the historical maximum of 60,000 AFY); (b) Agricultural demand will increase to approximately 5 percent of the historical maximum by 2040; (c) Agricultural demand will increase to approximately 10 percent of the historical maximum by 2040; (d) Agricultural demand will increase to approximately 15 percent of the historical maximum by 2040.

3.3.2 Imported Water

AVEK delivers imported SWP water to both the City and MPUD. The 2015 imported water supplies and future projections for the City and MPUD were obtained from the City's and AVEK's 2015 UWMPs. The City's 2015 UWMP projects that imported water supplies will nearly double within the next two

decades, whereas MPUD's imported water supplies are expected to remain constant through 2040 as shown in **Table 3-12**.

Table 3-12: Current and Projected Imported Water Supplies (AF)

	2015	2020	2025	2030	2035	2040
California City ¹	651	1,070	1,120	1,180	1,240	1,300
MPUD ²	2	120	120	120	120	120
Total	653	1,190	1,240	1,300	1,360	1,420

Sources: (1) 2015 data from California City Water Department 2017; 2020-2040 data from AVEK 2016; (2) 2015 data from AVEK 2016; 2020-2040 projections per communication with the MPUD General Manager at the January 18, 2018 Working Group Meeting.

Assumptions: For an average water year; does not account for climate change impacts, catastrophes, changes in legislation, and other events that can disrupt imported supply deliveries.

3.3.3 Recycled Water

Recycled water generated by the City is utilized within the Region to irrigate the Tierra Del Sol Golf Course and as makeup water for Central Park Lake. Recycled water supply is projected to increase 90 percent by 2040 as shown in **Table 3-13**. As described in the City's 2015 UWMP, the increase is based on population growth that will increase potable water demand and produce higher wastewater flows to the WWTP. The City currently manages all available recycled water at eight percolation ponds, the Central Park Lake, and the Tierra Del Sol Golf Course. To increase recycled water supply and use, the City would need to expand the WWTP so that additional flows can be accepted and treated. While there are no specific plans to expand recycled water use at this time, the City is exploring the feasibility of using recycled water on green belts, parks, and other facilities, including the Par 3 Golf Course (California City Water Department 2017).

Table 3-13: Current and Projected Recycled Water Supplies (AF)

	2015	2020	2025	2030	2035	2040
Recycled Water	518	783	816	850	884	988

Source: California City Water Department 2017.

3.3.4 Water Supply Reliability in Dry Years

Water supply availability is dependent on multiple parameters, including water quality, legislation, environmental issues, catastrophes, and climatic factors. Urban water suppliers are required to develop water shortage contingency plans as part of UWMPs for supplementing or replacing the water sources in the event that water supplies are disrupted. Supply reliability can be assessed for both a single-dry and a multiple-dry year period. The following is a summary of a reliability assessment for imported water supplies and groundwater.

Imported Water Reliability

AVEK's SWP Table A allocation allows the agency to purchase up to 144,844 AFY from the SWP. Future conditions, such as climate change and drought, may alter the availability and reliability of imported water supply. The Bay Delta Conservation Plan is a collaborative effort by the federal, state, and local water agencies, environmental organizations, and other stakeholders to increase water supply reliability and restore the Delta ecosystem (DWR 2017).

The current average-year water delivery forecast of AVEK's SWP allocation (144,844 AFY) is 59 percent or 85,500 AFY. In 2014, however, SWP supply was as low as 8 percent of the average year deliveries. As a result, AVEK conservatively assumed 8 percent of average supply to be the worst-case scenario for a single-dry year. The multiple-dry year scenario is represented by the period between 1990 and 1992 when SWP allocations were 12 percent, 16 percent, and 24 percent, resulting in 20 percent, 27 percent, and 41 percent of AVEK's average supply available. Imported water supplies to AVEK during average, single-dry, and multiple-dry years are summarized in **Table 3-14** (AVEK 2016).

Table 3-14: AVEK Imported Water Supply Reliability

	Base Year	Percent of Average Supply Available	AF Available
Average Year	Average	100%	85,500
Single-Dry Year	2014	8%	7,200
Multiple-Dry Year: 1st Year	1990	20%	17,400
Multiple-Dry Year: 2nd Year	1991	27%	23,200
Multiple-Dry Year: 3rd Year	1992	41%	34,800

Source: AVEK 2016

Projections indicate that supply in single-dry and multiple-dry years will be insufficient to meet AVEK's water demand through 2040. AVEK supply shortages will also likely cause shortages for its customers, including California City and MPUD. To mitigate water deficiencies during multiple-dry years, AVEK developed an alternative 3-year plan for water supply that relies on groundwater extractions and banked water to meet demand. It may also implement several strategies to help water purveyors address water shortages in their service areas in the event of single-dry or multiple-dry years. Power outages, local earthquakes, aqueduct failure, and Delta levee failure are other potential catastrophes that can disrupt SWP supply. AVEK has also developed emergency contingency plans that outline activities should these events interrupt SWP supply (AVEK 2016).

To assess Regional supply reliability, it was assumed that the Region (California City and MPUD) would receive only a percentage of average year deliveries. The percentage of AVEK supply available under each climate condition shown in **Table 3-14** was applied to the Region's average year imported water supply to estimate imported water supply under single-dry and multiple-dry year conditions, as shown **Table 3-15**.

Groundwater Reliability

Because the Region relies primarily on groundwater extractions, drought conditions have minimal impacts on the Region's water supplies. The City of California City noted in their 2015 UWMP that

the City has capacity to increase pumping to compensate for reductions in imported water deliveries during a single dry or multiple-dry year. Therefore, any temporary reductions in imported water in the Region are assumed to be compensated with increased groundwater pumping (California City Water Department 2017), as shown in **Table 3-15**.

This analysis assumes that the water demands for agriculture will remain unchanged at 647 AFY in future years as projected under the baseline conditions (about 1 percent of the historical maximum of 60,000 AFY), that California City and MPUD will continue to be the only SWP customers in the Region, that recycled water will only be provided by California City, and that the remaining demands will be solely met with groundwater.

Table 3-15: Fremont Basin IRWM Region Total Projected Water Supply Reliability (AF)

		2015	2020	2025	2030	2035	2040
Demand		7,367	9,487	10,040	10,606	11,175	12,301
Average Year	Imported Water	653	1,190	1,240	1,300	1,360	1,420
	Recycled Water	518	783	816	850	884	988
	Groundwater	6,197	7,514	7,984	8,456	8,931	9,893
Single Dry Year	Imported Water	52	95	99	104	109	114
	Recycled Water	518	783	816	850	884	988
	Groundwater	6,797	8,611	9,126	9,652	10,182	11,200
Multiple-Dry Years 1st Year	Imported Water	130	238	248	260	272	284
	Recycled Water	518	783	816	850	884	988
	Groundwater	6,719	8,468	8,977	9,496	10,019	11,029
Multiple-Dry Years 2nd Year	Imported Water	176	321	335	351	367	383
	Recycled Water	518	783	816	850	884	988
	Groundwater	6,673	8,385	8,890	9,405	9,924	10,930
Multiple-Dry Years 3rd Year	Imported Water	267	488	508	533	558	582
	Recycled Water	518	783	816	850	884	988
	Groundwater	6,582	8,218	8,716	9,223	9,733	10,731

4 Objectives

This chapter provides an overview of objectives and planning targets developed specifically for the Fremont Basin IRWM Region, including a description of key Regional issues, the objectives and targets development process, and the prioritization of these objectives by stakeholders. Regional objectives serve as the foundation for the development of the IRWM Plan by informing the Resource Management Strategies (RMSs) and guiding project selection and implementation to ensure that selected projects are in-line with regional needs. Quantifiable targets are identified for each objective to establish a method for tracking implementation progress.

4.1 Issues and Needs

As an arid, rural, and surface water-limited area, the Fremont Basin IRWM Region has unique water management issues. Coupled with these challenges, the Fremont Basin IRWM Region is predominately comprised of DACs; 92 percent of the land area is characterized as DAC or SDAC. The following sections detail specific issues and needs in the Region associated with water supply, water quality, flood, environmental resources, land use, and climate change. These issues were informed by the technical studies and plans used to develop the IRWM Plan as discussed in *Chapter 1: Governance and Planning*. The identified issues were then discussed and modified during Stakeholder Meetings in September and October 2017 that were focused on defining the water management needs, issues, and challenges in the Region.

4.1.1 Water Supply

Due to the lack of surface water supplies in the Region, groundwater and imported water meet the majority of demands and will continue to do so. While the FVGB has historically been able to provide sufficient supply to meet demand, there is a limited understanding of storage and withdrawal capacity in the basin. Groundwater modeling and analyses for the basin are limited and, because the basin is not adjudicated, pumping is not currently managed by a Watermaster. The FVGB is also located near neighboring groundwater basins that are experiencing overdraft, like the Antelope Valley Groundwater Basin and the Indian Wells Valley Groundwater Basin (DWR 2014a; DWR 2004e). Some stakeholders in the Region have expressed concerns about efforts by others to export groundwater from the FVGB. With projected increases in demand from new development and new land uses such as cannabis cultivation and solar energy, sustainable management of the FVGB is important for continued regional supply reliability.

The Region is also partly dependent on imported water for supply. Imported water from the SWP experiences annual variability, particularly during droughts, and is susceptible to climate change, natural disasters, and catastrophic events. Additionally, imported water supplies can experience temporary interruptions, requiring the use of alternative supplies and stored water.

In addition to these potential supply issues, local water distribution systems in the Region are vulnerable to damage during seismic events. Several pipelines that transport water from wells to end users cross large fault zones, such as the Garlock Fault. These systems also often depend on a single pipeline, connection or well, further decreasing the reliability of the supply.

4.1.2 Water Quality

As discussed in *Chapter 2: Region Description*, groundwater quality is generally good within most parts of the Fremont Basin IRWM Region and is influenced by historic and existing land use practices, water extractions, industrial discharges, urban and agricultural runoff, and natural conditions. Preventing degradation of the groundwater quality is critically important to the Region. The FVGB, which meets the majority of the water demands in the Region, contains some areas with high arsenic, nitrate, and hexavalent chromium concentrations as described in *Section 2.4.2: Groundwater Quality*. While drinking water quality standards are still mostly achieved in these areas, exceedances have led to the shut down of some wells; changing regulations could result in additional exceedances (i.e., for hexavalent chromium) and could create the need to provide wellhead treatment or shut down additional wells. Imported water quality generally meets federal primary and secondary drinking water standards (AVEK 2016). Effective management of the specific water quality challenges of the Fremont Basin IRWM Region is critical to the long-term sustainability of the Region.

4.1.3 Flood

Stormwater flows from large storm events pose a number of serious issues for the Region. Some areas of the Region are at high risk for flooding, which is difficult to mitigate against when there is a high degree of aging or failing infrastructure. For example, this issue is of particular concern around Cache Creek and in the Cantil area where high flows from Jawbone Canyon endanger the railroad berm. Impervious surfaces that divert flows and seasonal drainages from surrounding creeks further intensify flood hazards in the Region. Despite these known challenges, there are few studies and evaluations completed on flood-prone areas (Stetson 2009). Climate change will also affect the frequency, duration, and intensity of flooding, as rapid snowmelt and intense rains are expected to result in extreme, high-flow events in the Region (California Emergency Management & Natural Resources Agency 2012). Another challenge faced by the Region is that flood waters typically flow to the dry lake bed, Koehn Lake, where they evaporate on the valley floor. Implementing projects that would beneficially reuse those flood flows would require new infrastructure to bring the flows from their origin to a place of beneficial use, such as for groundwater recharge.



Flood damage from the 1983 flood event in the Region

4.1.4 Habitat and Open Space

The Fremont Basin IRWM Region provides critical habitat for several species of special concern, including the desert tortoise, Mohave ground squirrel, and the burrowing owl. Limited wetted areas in the Region also provide critical habitats for migratory birds, making the Region an important component of the Pacific Flyway. These species are threatened by habitat loss and land degradation as urban areas expand and populations grow. Invasive species, which threaten the native ecosystem, are also a growing concern in the area as the climate changes. Successfully balancing the needs of the

Region's environmental resources with the needs of the Region's communities is critical to the health and integrity of the entire Region.

4.1.5 Land Use

While the majority of the Region consists of open space and habitat for the Region's desert flora and fauna, there are also areas of urban, agricultural, and industrial land use. Alfalfa and pistachios are grown in unincorporated areas of the Region, and indoor cannabis cultivation and sale in California City is expected to become a key component of the Region's economy. Solar power generation has also become a booming industry. The Region's population is expected to grow by approximately 40 percent by 2040. These diverse land uses cause challenges for managing the Region's water resources. As urban areas continue to expand, stresses on the local groundwater supply will increase. New and expanded land uses can also impact the location and extent of the potential contamination associated with these activities, posing new water quality issues for the Region. Flooding issues may also increase as the amount of urban, impervious area increases. As development continues in the Region, urban, industrial, and other land uses will encroach on spaces used for habitat or agriculture. Effective land management in the Region will balance these interests and create a land use framework for the benefits and issues associated with varying land uses. Promoting integrated land use planning concepts is essential for water resource managers in the Region.



Solar panels in the Region

4.1.6 Climate Change

Anthropogenic GHG emissions change the composition of Earth's atmosphere, altering Earth's energy balance and climate as a result. Because the Region is landlocked, rising sea levels are not an immediate concern, but sea level rise is expected to impact imported water supplies in the Delta that ultimately influence the Region. Locally, climate change will have profound impacts including rising temperatures (6 to 11°F increase), reduced SWP deliveries (21 to 25 percent reduction), and decreased rainfall (1 to 10-inch decrease) by 2100 (California Emergency Management & Natural Resources Agency 2012; Climate Change Center 2009). Increased temperatures combined with decreased rainfall could increase water demands in an already water-limited Region. Projections also indicate a rise in the likelihood of severe weather events, which will contribute to more intense flooding in the Region. Climate change could also negatively alter the current ecology of the Region, displacing the native flora and fauna with nonnative species that thrive in the new climate. Decreased precipitation will limit groundwater recharge and contribute to declining groundwater levels, making the basins even more susceptible to overdraft. Imported water supplies are particularly vulnerable to climate change, and reductions in SWP deliveries will require water purveyors to secure alternate sources of water. Addressing climate change impacts requires a twofold strategy that incorporates both mitigation and adaptation activities.

4.2 Objectives Development

IRWM planning recognizes that regional stakeholders are best positioned to understand the unique water management issues facing the Region. This process allows for more tailored management of regional water resources issues and development of strategic objectives. With a direct understanding of the issues, stakeholders can develop objectives that are regionally specific.

Objectives and targets development for the Fremont Basin IRWM Region was a collaborative process that incorporated input from all participating stakeholders. Existing and future water resources management issues in the Region were identified during the September 2017 Stakeholder Meeting. With an established list of regional water management issues, the RWMG drafted Regional objectives and initial planning targets. The draft objectives and targets were discussed and further refined in subsequent stakeholder and working group meetings in 2017. During these discussions, the stakeholders considered previously identified regional needs, the 2016 IRWM Grant Program Guidelines, and Water Code §10540(c) and §10541 requirements related to IRWMPs.



Identifying Regional issues and objectives during the September 21, 2017 Stakeholder Meeting at Jawbone Station Visitors Center in Cantil, CA

The RWMG and stakeholder group decided that identifying objectives with specific planning targets was the best way to represent the needs of the Region. Overall goals were not developed as an additional layer; instead objectives were grouped into categories including: Water Supply, Water Quality, Flood Management, Habitat and Open Space, Land Use, and Climate Change. Each objective has at least one planning target to help set realistic, measurable expectations and monitor progress toward meeting the objective. Each target delineates either qualitative or quantitative metrics, depending on which is most appropriate for the given objective, to track progress. It was also decided that because the Region is almost entirely DAC (92 percent), a separate objective to address DAC issues was not necessary and all objectives for the Region would contribute to addressing these issues.

Regional stakeholders agreed on the final list of objectives during Stakeholder Meeting #8 on November 16, 2017, as documented in the Stakeholder Meeting notes posted on the City of California City's Fremont Basin IRWM website. These objectives and planning targets are summarized in **Table 4-1** and are discussed further in *Section 4.3: Objectives and Planning Targets* below.

Table 4-1: Summary of Fremont Basin IRWM Region Objectives and Targets

Objective	Target
Water Supply	
Increase regional water supply reliability to meet demands	Increase recycled water use by 2025 compared to 2017
	Increase stormwater capture by 2025 compared to 2017
	Provide adequate supply reserves for single-dry (1,300 AFY) and multi-dry (3,000 AF over 3 years) years
	Maintain conservation programs
	Identify infrastructure at risk of being compromised by 2020
	Adapt to climate change impacts on runoff and recharge, and from sea level rise
Ensure sustainable use of the Fremont Valley Groundwater Basin	Begin developing a GSA and GSP for the Fremont Valley Groundwater Basin by 2019
	Define the safe yield of the Fremont Valley Groundwater Basin by 2027
	Manage the Fremont Valley Groundwater Basin such that the 10-year average change in groundwater levels is zero.
Water Quality	
Provide drinking water that meets regulatory requirements and customer needs	Meet federal and State water quality standards as well as customer standards for taste and aesthetics on an ongoing basis
Protect water quality in groundwater basins in the Region	Prevent degradation of groundwater basins with respect to Basin Plan objectives
	Map contaminant sites and movement in the Fremont Valley Groundwater Basin by 2027
Flood Management	
Reduce negative impacts of stormwater	Identify areas of highest flood risk in the Region by 2018
	Implement projects to provide flood protection to existing and future planned properties where benefits exceed costs
	Implement integrated, multi-benefit flood management projects, when feasible

Objective	Target
Habitat and Open Space	
Support water needs of open space/recreational/migratory habitat areas	Maintain multi-benefit use of Central Park Lake and other water habitat for species
Support protected habitats	Support existing protected habitats including the Fremont Valley Ecological Reserve
Land Use	
Maintain agricultural land uses	Support limited agricultural land uses
Improve integrated land use planning to support water management	Positive participation of Kern County and other stakeholders at public meetings; increased correspondence
Climate Change	
Mitigate against climate change	Implement mitigation strategies, when possible, that reduce energy consumption, ultimately reducing GHGs
	Support carbon sequestration and using renewable energy, when possible, to support Regional objectives
	Consider strategies adopted by CARB in its AB 32 Scoping Plan when developing projects to meet objectives

4.3 Objectives and Planning Targets

As a result of the collaborative stakeholder-driven process, the Fremont Basin IRWM Region has a total of 10 objectives with 22 planning targets. The objectives, described below, are organized by the six overarching Regional issue categories: water supply, water quality, flood management, habitat and open space, land use, and climate change. Targets for each objective are also identified, which will allow the Region to monitor progress on each objective.

Because nearly the entire Region is characterized as DAC, all Regional objectives would help address DAC issues and needs; thus, a specific DAC objective is not included.

4.3.1 Water Supply

Two strategic water supply management objectives and corresponding planning targets were developed in accordance with Water Code requirements, IRWM Guidelines, and the following key regional water supply issues:

- The FVGB meets the majority of demands in the Region
- Some surrounding basins are in critical overdraft
- The Region's local water distribution systems are vulnerable given the number of fault zones and potential for seismic events
- There is limited understanding of storage and withdrawal capacity in the FVGB
- There is a projected increase in regional water demands from new development and land uses
- The Region is partly dependent on imported water, a supply that has annual variability and is susceptible to interruptions

Objective: Increase regional water supply reliability to meet demands

Providing reliable supplies means that an expected amount of groundwater, recycled water, and imported water will be continuously delivered to the Region to meet demands. Deliveries depend on the availability of water from the source, the conditions of existing infrastructure necessary for water conveyance, and the regional demands. As discussed in *Chapter 3: Water Demand and Supply Assessment*, the demand of the Fremont Basin IRWM Region was approximately 7,400 AF in 2015. The estimated water supply from imported, recycled and groundwater sources to the Region was approximately 7,400 AF in 2015, effectively meeting the demand. Climate change, however, is expected to alter precipitation, increase water demands, and decrease imported water supply in the Region as discussed in *Section 2.9.1: Climate Change Impacts on the Region* (California Emergency Management & Natural Resources



California City water infrastructure

Agency 2012; Climate Change Center 2009). Furthermore, conveyance delivery systems, which are needed to transport groundwater and imported water in the Region, are vulnerable to earthquakes. By increasing regional reliability, the Region can reduce the likelihood that deliveries will be affected by climate change, drought, and other catastrophes. This objective will help increase regional water supply reliability by increasing recycled water use and stormwater capture, maintaining conservation programs, adapting to climate change impacts, identifying at-risk infrastructure, and planning for single dry and multiple dry years. Additionally, by increasing local supplies such as recycled water and stormwater capture for recharge of the groundwater supplies, the Region will be less dependent on imported water supplies from the Delta.

Targets

- Increase recycled water use by 2025 compared to 2017
- Increase stormwater capture by 2025 compared to 2017
- Provide adequate supply reserves for single dry (1,300 AFY) and multi-dry (3,000 AF over 3 years) years
- Maintain conservation programs
- Identify infrastructure at risk of being compromised by 2020
- Adapt to climate change impacts on runoff and recharge, and from sea level rise

Objective: Ensure sustainable use of the Fremont Valley Groundwater Basin.

Because of the annual variability of imported water sources, future supply projections assume that groundwater supply will compensate for any imported and recycled water supply shortfalls in the Region. To prevent critical overdraft of the FVGB, groundwater recharge (natural and engineered) must counter extraction volumes. This objective will help ensure sustainable use of the FVGB by supporting compliance with SGMA, defining safe yield for the basin, and ensuring that the 10-year average change in groundwater basin levels is zero.

Targets

- Begin developing a GSA and GSP for the FVGB by 2019
- Define the safe yield of the Fremont Valley Groundwater Basin by 2027
- Manage the FVGB such that the 10-year average change in groundwater levels is zero

4.3.2 Water Quality

Two water quality management objectives and planning targets were developed in accordance with Water Code requirements, IRWM Guidelines, and to address the following key regional water quality issues:

- There are some water quality constituent concentration exceedances in parts of the FVGB
- Recent (and potential future) regulatory changes related to concentration limits for hexavalent chromium

Objective: Provide drinking water that meets regulatory requirements and customer needs.

Imported water and groundwater are the only two water supply sources used to meet potable demands. As previously discussed, DWR monitors SWP water quality and ensures that deliveries comply with federal drinking water standards (DWR N.D.b.). The Tehachapi District from DWR's Division of Drinking Water Program regulates all water purveyors in the Region and ensures that the public drinking water systems meet federal primary and secondary drinking water standards. As such, the identified regional target promotes meeting federal and State water quality standards as well as customer standards for taste and aesthetics throughout the planning period. This objective will help the Region meet federal and State water quality standards.

Targets

- Meet federal and State water quality standards as well as customer standards for taste and aesthetics on an ongoing basis

Objective: Protect water quality in groundwater basins in the Region.

A wide range of groundwater contaminants have been identified in most basins in the Region. The FVGB meets the majority of the demands in the Region and contains variable mixtures of sodium, calcium, chloride, sulfate, and bicarbonate, with TDS concentrations ranging from 350 to over 1,000 mg/L. Several other basins in the Region show elevated levels of arsenic, lead, nitrate, sodium, fluoride, boron, and TDS. This objective will protect water quality in all Regional groundwater basins by preventing degradation of the basins and focusing on mapping contaminant sites and movement in the FVGB, the primary source of water supply in the Region.

Targets

- Prevent degradation of groundwater basins with respect to Basin Plan objectives
- Map contaminant sites and movement in the Fremont Valley Groundwater Basin by 2027

4.3.3 Flood Management

A flood management objective was developed in accordance with Water Code requirements, IRWM Guidelines, and to address the following key regional flooding issues:

- Some areas of the Region are at high risk for flooding during severe storms
- Some areas in the Region have aging or failing stormwater and flood infrastructure
- There is a potential for beneficial reuse of stormwater for recharge



Flood damage near the railroad tracks during the 1983 flood event

Objective: Reduce negative impacts of stormwater.

Proper stormwater management offers numerous benefits. In addition to mitigating floods caused by large storm events, proper management and implementation of stormwater capture projects can

also generate a local water supply. Reduction of negative stormwater impacts will be achieved by first identifying areas of highest flood risk in the Region and implementing projects to provide flood protection. This objective will help reduce the negative impacts of stormwater by identifying the highest flood risk areas and implementing projects to provide flood protection.

Targets

- Identify areas of highest flood risk in the Region by 2018
- Implement projects to provide flood protection to existing and future planned properties where benefits exceed costs
- Implement integrated, multi-benefit flood management projects, when feasible

4.3.4 Habitat and Open Space

Two habitat and open space objectives were developed in accordance with Water Code requirements, IRWM Guidelines, and to address the following key regional habitat and open space issues:

- The Region includes numerous protected habitats and open space areas used for recreation
- The Region is a critical part of the Pacific Flyway and the limited wetted areas in the Region provide habitat for birds



Central Park Lake in California City

Objective: Support water needs of open space/recreational/migratory habitat areas.

Because the Region is surface-water limited, protection of any existing surface water bodies, whether seasonal or perennial, is critical for the health of local habitat and ecosystems. This objective will support the water needs of open space/recreational/migratory habitat areas by maintaining Central Park Lake and other water habitats for species.

Target

- Maintain multi-benefit use of Central Park Lake and other water habitat for species

Objective: Support protected habitats.

The Fremont Basin IRWM Region is home to protected habitat for critical species, including the desert tortoise. Supporting protected habitats is key for safeguarding the health of flora and fauna that depend on those habitats for survival. This objective will support protected habitats by supporting areas such as the Fremont Valley Ecological Reserve.

Target

- Support existing protected habitats including the Fremont Valley Ecological Reserve

4.3.5 Land Use

Two land use objectives were developed in accordance with Water Code requirements, IRWM Guidelines, and to address the following key regional land use issue:

- The Region includes agricultural, energy, and other land uses that contribute to the overall economy

Objective: Maintain agricultural land uses.

Alfalfa and pistachios are grown in approximately 207 acres of farmland with an annual water demand of 647 AF. Baseline projections assume that agricultural land use and water demand will remain constant through 2040, though water demands may increase as climate change decreases annual precipitation in the Region. Additionally, agricultural land use could increase in the future as described in *Chapter 3: Supply and Demand Assessment*. This objective will support existing agriculture in the Region.

Target

- Support limited agricultural uses

Objective: Improve integrated land use planning to support water management.

A successful IRWM Plan requires coordination between land use planning agencies and water management agencies. Collaboration ensures all current and future water demands are met with respect to projected land use changes, land development, and population growth in the Region. Land use planning agencies working directly with water management agencies can more effectively address regional needs such as land, energy, and water supply deficiencies. Integrated planning allows agencies to cooperate with the infrastructure development and improvements necessary for sustaining regional growth. Most importantly, natural and economic resources are more sustainably managed under integrated land use planning. This objective will support improved integrated land use planning and water management by increasing correspondence with and positive participation of Kern County and other stakeholders at public meetings.

Target

- Positive participation of Kern County and other stakeholders at public meetings; increase correspondence

4.3.6 Climate Change

One climate change objective was developed in accordance with Water Code requirements, IRWM Guidelines, and to address the following key Regional climate change issue:

- The Region will implement projects that may contribute to the overall carbon footprint

It should be noted that the Fremont Basin IRWMP contains two objectives related to climate change. The first covers adaptation and is included under the water supply Regional objectives. The second covers mitigation and is include here, under the climate change Regional objective.

Objective: Mitigate against climate change.

For the purposes of this Plan, mitigating against climate change means reducing or abating activities that may accelerate climate change impacts. Implementing regional projects may contribute to the overall carbon footprint by releasing GHGs through construction activities. Because GHG emissions

are directly correlated with climate change, this objective will help implement mitigation strategies, when possible, that decrease GHGs or are GHG neutral. This objective will help mitigate against climate change by supporting carbon sequestration and renewable energy use and considering strategies identified in the Assembly Bill (AB) 32 scoping plan when developing projects.

Targets

- Implement mitigation strategies, when feasible, that reduce energy consumption, ultimately reducing GHGs
- Support carbon sequestration and using renewable energy, when feasible, to support Regional objectives
- Consider strategies adopted by CARB in its AB 32 Scoping Plan when developing projects to meet objectives

4.4 Objective Prioritization

The Regional objectives were reviewed and prioritized during the December 14, 2018 working group meeting. As part of the meeting, stakeholders discussed the objectives they felt were a higher priority for the Region. Handouts listing the Regional objectives and targets were distributed to the working group attendees. The working group was asked to rank the objectives as a high or medium priority for the Region using the handouts. The group agreed that the highest priority for the Region is protecting the FVGB. Most stakeholders felt the water supply and water quality objectives were the highest priority. The prioritized objectives are summarized in **Table 4-2**.

Table 4-2: Prioritized Regional Objectives

Objective	Priority Level
<i>Water Supply</i>	
Increase regional water supply reliability to meet demands	Highest Priority
Ensure sustainable use of the Fremont Valley Groundwater Basin	Highest Priority
<i>Water Quality</i>	
Provide drinking water that meets regulatory requirements and customer needs	Highest Priority
Protect water quality in groundwater basins in the Region	Highest Priority
<i>Flood Management</i>	
Reduce negative impacts of stormwater	Priority
<i>Habitat and Open Space</i>	
Support water needs of open space/recreational/migratory habitat areas	Priority
Support protected habitats	Priority
<i>Land Use</i>	
Maintain agricultural land uses	Priority
Improve integrated land use planning to support water management	Priority
<i>Climate Change</i>	
Mitigate against climate change	Priority

4.5 Plan Objectives and Statewide Priorities

In addition to meeting the regional issues and needs identified in *Section 4.1: Issues and Needs*, the adopted objectives are also in compliance with the Statewide Priorities endorsed by DWR. The following section defines the Statewide Priorities contained in the 2016 IRWM Guidelines and describes how the objectives address these Priorities.

4.5.1 Statewide Priorities

DWR compiled ten Statewide Priorities based on the 2014 California Water Action Plan to promote holistic water management throughout California. The Statewide Priorities incorporate all aspects of water resources management, ranging from water conservation to flood protection. Key actions were highlighted to help meet each of the Statewide Priorities, summarized in **Table 4-3**. The Fremont Basin IRWM Plan addresses 9 of the Statewide Priorities; the last Priority aimed to “identify sustainable and integrated financing opportunities” is not relevant as it only applies to state agencies and legislature.

4.5.2 Objective Compliance with Statewide Priorities

The Statewide Priorities served as a guiding tool for developing Regional objectives. As a result, the adopted objectives address not only regional issues but also statewide needs. **Table 4-4** summarizes how the ten Fremont Basin IRWM Plan objectives support the Statewide Priorities.

Table 4-3: Statewide Priorities

Statewide Priority	Regional Action	Included in IRWM Plan
Make Conservation a California Way of Life	• Build on current water conservation efforts • Expand agricultural and urban water conservation and efficiency • Provide funding for conservation and efficiency • Increase water sector energy efficiency and GHG reduction capacity • Promote local urban conservation ordinances and programs	Yes
Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government	• Ensure water security at the local level • Support and expand funding for Integrated Water Management planning and projects • Improve land use and water alignment • Provide assistance to DAC • Focus on projects with multiple benefits • Increase recycled water use	Yes
Achieve the Co-Equal Goals for the Delta	• Support projects that provide a more reliable water supply for CA • Support projects that protect, restore, and enhance the Delta ecosystem	Yes

Fremont Basin Integrated Regional Water Management Plan

Statewide Priority	Regional Action	Included in IRWM Plan
Protect and Restore Important Ecosystems	• Protect and restore the resiliency of ecosystems • Manage headwaters for multiple benefits • Water for wetlands and waterfowl • Enhance water flows in stream systems statewide	Yes
Manage and Prepare for Dry Periods	• Secure more reliable water supplies and improve drought preparedness • Revise operations to respond to extreme conditions • Encourage healthy soils	Yes
Expand Water Storage Capacity and Improve Groundwater Management	• Increase water storage for public and environmental benefits • Provide essential data to enable Sustainable Groundwater Management • Support funding partnerships for storage projects • Improve Sustainable Groundwater Management • Support distributed groundwater storage and recharge • Accelerate clean-up of contaminated groundwater and prevent future contamination	Yes
Provide Safe Water for All Communities	• Provide all Californians with safe, clean, affordable, and accessible water • Consolidate water quality programs • Provide funding assistance for vulnerable communities • Manage the supply status of community water systems • Include projects that help address the impacts caused by nitrate, arsenic, perchlorate, or hexavalent chromium contamination	Yes
Increase Flood Protection	• Plan for integrated flood and water management systems • Implement flood projects that protect public safety, increase water supply reliability, conserve farmlands, and restore ecosystems • Improve access to emergency funds • Better coordinate flood response operations • Prioritize funding to reduce flood risk and improve flood response • Encourage flood projects that plan for climate change and achieve multiple benefits	Yes
Increase Operational and Regulatory Efficiency	• Encourage local or regional projects that support increased operational efficiency of the SWP	Yes
Identify Sustainable and Integrated Financing Opportunities	• Directed towards State agencies and the legislature	No

Source: DWR 2016

Table 4-4: Conformance of Objectives with Statewide Priorities

IRWM Plan Objectives	Statewide Priority								
	Make Conservation a Way of Life	Increase Regional Self-Reliance and Integrated Water Management	Achieve the Co-Equal Goals for the Delta	Protect and Restore Important Ecosystems	Manage and Prepare for Dry Periods	Expand Water Storage Capacity and Improve Groundwater Management	Provide Safe Water for all Communities	Increase Flood Protection	Increase Operational and Regulatory Efficiency
Increase regional water supply reliability to meet demands	●	●	●		●	●	●	●	●
Ensure sustainable use of the Fremont Valley Groundwater Basin	○	●	○		○	●	●		
Provide drinking water that meets regulatory requirements and customer needs						●	●		●
Protect water quality in groundwater basins in Region				○	○	●	●		
Reduce negative impacts of stormwater		●						●	
Support water needs of open space/recreational/migratory habitat areas				●					
Support protected habitats				●					
Maintain agricultural land uses	●	○			●				
Improve integrated land use planning to support water management	○	●	○	●	○	○	●	○	●
Mitigate against climate change	●	○	○	○	○	○	○	○	●

Note: ● IRWM Plan objective directly supports the listed Statewide Priority; ○ IRWM Plan objective indirectly supports the listed Statewide Priority

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5 Resource Management Strategies

In 2013, the State of California prepared the California Water Plan Update 2013 (CWP 2013 Update). Designed to work in tandem with, and help implement, the Governor's Water Action Plan, the CWP 2013 Update includes strategies to: reduce water demand, increase water supply, improve water quality, practice resource stewardship, improve flood management, and recognize people's relationship to water. The CWP 2013 Update also includes other, emerging strategies that could potentially generate benefits to meet one or more water management objectives.

Known as resource management strategies (RMSs), these strategies are techniques, programs, or policies that help local agencies and governments manage their water and water-related resources. The 36 RMSs identified in the CWP 2013 Update are organized alphabetically under eight categories, which describe their primary objectives and emphases. The combination of strategies applicable to a particular IRWM region will vary, depending on climate, projected growth, existing water systems, environmental and social conditions, and regional goals. This chapter highlights the RMSs that are considered appropriate and valuable for the Fremont Basin IRWM Region.

5.1 Consideration of Resource Management Strategies

The new and continuing challenges of the Region's conditions require new and varied methods of managing water. Integrated water management relies on a diversified portfolio of water strategies to achieve multiple and sustainable uses and benefits while balancing the risks of an uncertain future. Adapting to and mitigating climate change impacts have become increasingly important factors in selecting and implementing a package of management strategies. To determine the strategies appropriate to the Fremont Basin IRWM Region, stakeholders considered the 36 RMSs described in the CWP 2013 Update during the November 2017 Stakeholder Meeting.

After discussing the strategies, the Region's stakeholders came to a consensus on whether each strategy was appropriate for the Fremont Basin IRWM Region. **Table 5-1** provides a brief description of the 36 RMSs considered for the IRWM Plan and details which management strategies were decided to be appropriate for the Region.

5.2 Objectives Assessment

Once the RWMG and Fremont Basin IRWM stakeholder group developed the Regional objectives and identified regionally-appropriate RMSs, an assessment was performed to determine how the regional strategies aligned with the chosen objectives. The assessment, provided in **Table 5-2** below, illustrates how each of the Regional objectives can be address by multiple RMSs and how a single RMS can address multiple Regional objectives.

Table 5-1: Resource Management Strategies in the Fremont Basin IRWM Region

Resource Management Strategy	Summary Description	Appropriate for the IRWM Region?
<i>Reduce Water Demand</i>		
Agricultural Water Use Efficiency	Using and applying scientific processes to control agricultural water delivery and use to achieve a beneficial outcome	✓
Urban Water Use Efficiency	Implementing activities that reduce urban water use by increasing water use efficiency	✓
<i>Improve Operational Efficiency and Transfers</i>		
Conveyance – Delta	Upgrading Delta conveyance structures to improve water supply reliability and distribution, provide greater operational flexibility, and improve ecosystem function	✓
Conveyance – Regional/Local	Implementing activities to improve regional and local conveyance structures including natural watercourses and human-made facilities like canals, pipelines, and flood bypasses	✓
System Reoperation	Changing existing operation and management with the goal of increasing desired benefits from the system	✓
Water Transfers	Temporary or long-term changes in the point of diversion, place of use, or purpose of use due to a transfer, sale, lease, or exchange of water or water rights	✓
<i>Increase Water Supply</i>		
Conjunctive Management and Groundwater Storage	Coordinated and planned use and management of both surface water and groundwater resources to maximize the availability and reliability of water supplies to meet various management objectives	✓
Desalination (Brackish and Sea Water)	Removal of salts from saline water – can include sea water or brackish groundwater	✓
Precipitation Enhancement	Artificially stimulating clouds to produce more rainfall or snowfall than they would produce naturally	
Municipal Recycled Water	Treating municipal wastewater to a specified quality that enables it to be used again	✓
Surface Storage – CALFED/State	Surface storage (human-made, above-ground reservoirs) located at one of the locations recommended as part of the CALFED Bay-Delta Program	
Surface Storage – Regional/Local	Regional and local surface storage options aside from those included in the Surface Storage – CALFED/State RMS	✓

Resource Management Strategy	Summary Description	Appropriate for the IRWM Region?
Improve Water Quality		
Drinking Water Treatment and Distribution	Development and maintenance of adequate water treatment and distribution facilities to provide reliable, high-quality, and safe water for human consumption	✓
Groundwater/Aquifer Remediation	Improving the quality of degraded groundwater for beneficial use by removing constituents that affect its beneficial use	✓
Matching Water Quality to Use	Recognizing that not all water uses require the same water quality	✓
Pollution Prevention	Reducing or eliminating waste at the source by modifying production processes, promoting the use of non-toxic or less toxic substances, reducing the generation and/or discharge of the pollutants, and preventing pollutants from entering the environment prior to treatment	✓
Salt and Salinity Management	Reducing salt loads that impact a region	✓
Urban Runoff Management	Managing stormwater and dry-weather runoff by reducing pollutant loading and the volumes and velocities or urban runoff discharged to surface waters	✓
Improve Flood Management		
Flood Management	Implementing activities that help manage floodwaters, including structural, nonstructural, restoration of natural floodplain functions, and flood emergency management approaches	✓
Practice Resources Stewardship		
Agricultural Lands Stewardship	Implementing activities that conserve and improve land for food, fiber, biofuel production, watershed functions, and soil, air, energy, plants, animals, and other conservation purposes with a primary focus on private land in agriculture including cultivated land and rangeland	✓
Ecosystem Restoration	Improving the condition of modified natural landscapes and biological communities to provide for their sustainability and for their use and enjoyment by current and future generations	✓
Forest Management	Implementing activities, on both public and privately-owned forest lands, whose goals specifically include improvement of the availability and quality of water for downstream users	
Land Use Planning and Management	Planning for the housing and economic development needs of a growing population, while providing for the efficient use of water, water quality, energy, and other resources	✓
Recharge Areas Protection	Implementing activities that ensure areas suitable for recharge continue to be capable of adequate recharge and prevent pollutants from entering the groundwater to avoid expensive treatment that may be necessary prior to beneficial use	✓

Resource Management Strategy	Summary Description	Appropriate for the IRWM Region?
Sediment Management	Implementing activities that address excessive sediment in watersheds	✓
Watershed Management	Creating and implementing plans, programs, projects, and activities to restore, sustain, and enhance watershed functions	✓
People and Water		
Economic Incentives Policy	Offering financial assistance, water pricing, and water market policies intended to influence water management	✓
Outreach and Engagement	Using tools and practices to facilitate contributions by public individuals and groups toward good water management outcomes	✓
Water and Culture	Recognizing the importance of linking cultural considerations to water management	✓
Water-Dependent Recreation	Implementing activities that ensure that the public can enjoy water-dependent recreation activities	✓
Other Strategies		
Crop Idling for Water Transfers	Removing lands from irrigation with the aim of returning the lands to irrigation at a later time	
Dewvaporation or Atmospheric Pressure Desalination	Evaporating brackish water by heated air, which deposits fresh water as dew on the opposite side of a heat transfer wall	
Fog Collection	Installing physical structures or nets to collect precipitation present in fog	
Irrigated Land Retirement	Removing farmland from irrigated agriculture	
Rainfed Agriculture	Directly providing crop consumptive water use by rainfall in real time	
Snow Fences	Installing fencing to strengthen forest and watershed management, protect sensitive environments, and facilitate slower snowmelt to extend runoff into the summer	
Waterbag Transport/Storage Technology	Diverting water in areas that have unallocated freshwater supplies, storing the water in large inflatable bladders, and towing them on the ocean to be used in other areas	

Table 5-2: Regional Objectives Compared to Region-Appropriate Resource Management Strategies

Resource Management Strategy	Water Supply		Water Quality		Flood Management	Habitat and Open Space		Land Use		Climate Change
	Increase regional water supply reliability to meet demands	Ensure sustainable use of the Fremont Valley Groundwater Basin	Provide drinking water that meets regulatory requirements and customer needs	Protect water quality in groundwater basins in Region	Reduce negative impacts of stormwater	Support water needs of open space/ recreational/ migratory habitat areas	Support protected habitats	Maintain agricultural land uses	Improve integrated land use planning to support water management	Mitigate against climate change
Reduce Water Demand										
Agricultural Water Use Efficiency	X	X		X				X	X	X
Urban Water Use Efficiency	X	X							X	X
Improve Operational Efficiency and Transfers										
Conveyance – Delta	X		X					X	X	X
Conveyance – Regional/Local	X		X		X			X	X	X
System Reoperation	X		X		X			X	X	X
Water Transfers	X	X	X					X	X	X
Increase Water Supply										
Conjunctive Management and Groundwater Storage	X	X		X	X				X	X
Desalination (Brackish)	X	X	X	X					X	X
Municipal Recycled Water	X	X				X			X	X
Surface Storage – Regional/Local	X	X				X			X	X
Improve Water Quality										
Drinking Water Treatment and Distribution	X		X	X					X	X
Groundwater/ Aquifer Remediation	X	X	X	X	X				X	X
Matching Water Quality to Use	X	X	X		X	X		X	X	X
Pollution Prevention	X	X	X	X	X			X	X	X
Salt and Salinity Management	X	X	X	X	X				X	X
Urban Runoff Management	X	X	X	X	X	X	X		X	X
Improve Flood Management										
Flood Management	X	X		X	X	X			X	X

Resource Management Strategy	Water Supply		Water Quality		Flood Management	Habitat and Open Space		Land Use		Climate Change
	Increase regional water supply reliability to meet demands	Ensure sustainable use of the Fremont Valley Groundwater Basin	Provide drinking water that meets regulatory requirements and customer needs	Protect water quality in groundwater basins in Region	Reduce negative impacts of stormwater	Support water needs of open space/ recreational/ migratory habitat areas	Support protected habitats	Maintain agricultural land uses	Improve integrated land use planning to support water management	Mitigate against climate change
Practice Resources Stewardship										
Agricultural Lands Stewardship	X	X		X	X		X	X	X	X
Ecosystem Restoration	X			X	X	X	X		X	X
Land Use Planning and Management	X	X	X	X	X	X	X	X	X	X
Recharge Area Protection	X	X	X	X	X	X	X	X	X	X
Sediment Management	X			X	X	X	X	X	X	X
Watershed Management	X	X		X	X	X	X	X	X	X
People and Water										
Economic Incentives Policy	X	X	X	X	X	X	X	X	X	X
Outreach and Education	X	X	X	X	X	X	X	X	X	X
Water and Culture	X	X	X	X	X	X	X	X	X	X
Water-Dependent Recreation	X					X	X		X	X

5.3 Overview of Resource Management Strategies

The RMSs identified as applicable to the Region are described in the sections below grouped by the CWP 2013 Update categories. These strategies are either currently being implemented in the Region or are considered strategies that could be used to help meet the Regional objectives and targets.

While addressing climate change is not a separate resource management strategy, climate change adaptation and mitigation activities are embedded in each RMS. Strategies can help the Region adapt to climate change by improving the resilience of water resources in the face of a changing climate and can help mitigate climate change by reducing the energy consumed or GHGs emitted to produce water supply. The following sections describe each RMS relevant to the Region, including how the RMS address the Region's climate change vulnerabilities.

5.3.1 Reduce Water Demand

Reducing water demand is a significant strategy to address supply reliability and adapt to and mitigate climate change impacts. By reducing water demand in the Region through the agricultural and urban water use efficiency strategies, GHG emissions associated with the energy needed to produce, treat and convey water also decrease. Implementing water use efficiency measures also helps the Region adapt to climate change by making conservation a way of life. These strategies can help address potential climate change impacts to water demand and water supply.

Agricultural Water Use Efficiency

Agricultural water use efficiency aims to increase crop productivity and manage costs. This strategy does not necessarily mean a reduction in the amount of water used to grow crops, but rather an increase in crop yield without increasing the amount of irrigation water that must be applied. Common agricultural water use efficiency practices include drip irrigation, covering crops to reduce evapotranspiration, selecting crops best suited to the local climate, and other methods that reduce water use while improving crop yield. This strategy also includes activities such as automating canal control structures, facilitating the financing of capital improvements for on-farm irrigation systems, and promoting customer pump testing and evaluation.

While there is currently only a small amount of agriculture in the Region, agricultural demands for groundwater have impacted the FVGB in the past. Agricultural water use efficiency measures are beginning to become more common in the Region to help support crop yields in the high desert environment.

Urban Water Use Efficiency

Activities under the urban water use efficiency RMS reduce urban water demands using best management practices (BMPs) or demand management measures. Examples include implementing low flow devices, high efficiency washing machines, plumbing retrofits, and rate structures to promote a reduction in urban water use.

In an effort to emphasize and increase water use efficiency, the California State Legislature directed urban retail water suppliers to reduce urban per-capita water use by 20 percent compared to their baseline water use by the year 2020. The City of California City and California Water Service reported progress on meeting their 20 percent reduction in demand in their respective 2015 UWMPs. Both agencies surpassed their 2020 targets by the year 2015 and expect to continue to meet or surpass their water use targets beyond the 2020 deadline.

Water agencies and companies in the Region continue to try to reduce water loss and implement demand management measures to ensure water reliability for their customers during dry periods. For example, the City of California City implements a number of demand management measures as part of their water conservation program, including conducting water survey programs, public landscape retrofitting, and requiring new construction to install low-flow devices. All agencies in the Region intend to improve water use efficiency by reducing water loss through system leaks.

5.3.2 Improve Operational Efficiency and Transfers

Improving operational efficiency and initiating transfers are approaches used by many water agencies to increase supply reliability and reduce water waste. These strategies can help address regional climate change vulnerabilities issues related to supply, water quality, and flooding. For example, improving conveyance systems reduces water loss and the GHG emissions associated with diverting, pumping, treating, and distributing water that is ultimately lost. Similarly, system reoperation encourages efficiencies that can lead to GHG emission reductions. Transfers can also help mitigate climate change if the transferred water eliminates the need to use a more energy-intensive source of water.

These RMSs can help adapt to climate change as well by providing larger conveyance capacity and storage to withstand changing conditions. Aspects of system reoperation can also help adapt to the impacts of a reduced snowpack and increased flooding by maximizing system efficiencies and resilience. Transfers can also help communities adapt to climate change by providing operational flexibility and greater water supply reliability. These RMSs are described further below.

Conveyance – Delta

The Delta is the confluence of the Sacramento and San Joaquin rivers as water is naturally conveyed westward to the Pacific Ocean. The Delta, a vital part of California's water system, supplies water for more than 25 million Californians and supports farms and ranches throughout the state. Water from the Delta is conveyed to the Region via the SWP through an imported water supplier, AVEK.

As a recipient of water from the Delta, the Region supports projects that improve delivery of this water. The Delta's future will be affected by increasing land subsidence, heightened seismic risk, and possible effects of climate change that include rising temperatures, changes in runoff timing, sea level rise, and changes in storm timing, intensity, and frequency. The Bay Delta Conservation Plan, now known as the California "WaterFix", aims to enhance the Delta's ecosystem processes and function, while also providing water supply reliability to the state (DWR 2017). AVEK supports the California WaterFix activities and continues to monitor new program developments.

Conveyance – Regional/Local

The focus of the regional/local conveyance strategy is to increase local supply mobility within the Region to allow resource sharing. Conveyance improvements can help increase local water supplies by incorporating groundwater recharge components, increasing interconnections between other conveyance systems, and increasing conveyance capacity. Improving regional and local conveyance can help reduce water losses, thus, reducing the amount of energy required to treat and distribute water. Upgrading water distribution systems can also improve water quality which reduces the energy required for additional water treatment.

The Fremont IRWM Region relies on regional and local conveyance infrastructure, including diversion structures, pipelines, canals, and pumps to deliver imported water and groundwater to

local users. By exploring ways to improve these distribution systems, water supply reliability can be increased.

System Reoperation

This strategy relates to changing existing operation and management procedures with the goal of increasing desired benefits from the system. Reoperation of existing facilities typically serves three basic purposes: (1) addresses a specific problem and/or need; (2) improves efficiencies; and (3) adapts facilities to anticipated future changes.

System reoperation provides a unique opportunity for the Fremont Basin IRWM Region to reduce inefficiencies in the local water systems and improve supply reliability for users in the Region. Some small water agencies are considering projects to update manual metering and pumping systems to automated systems to improve operational efficiencies.

Water Transfers

Water transfers can be a temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer, sale, lease, or exchange of water or water rights. Temporary water transfers have a duration of one year or less, while long-term water transfers have a duration of more than one year. Water transfers can become a form of system reoperation linked to many other RMSs and can provide a flexible approach to distributing available supplies.

While groundwater transfers are not implemented or supported in the Region at this time, imported water transfers are considered a viable strategy to increase supply reliability for AVEK, the wholesaler supplier in the Region. Such an arrangement could benefit both the Fremont Basin IRWM Region and its transfer partners by sharing excess imported water in years when one area is supply limited.

5.3.3 Increase Water Supply

Changes in the hydrologic cycle due to climate change will have significant impacts on water supplies in the Fremont Basin IRWM Region. As a result, RMSs that increase drought-resistant, local water supplies are key for mitigating climate change. Better management of groundwater, for instance, eliminates the need to pump from lower water table elevations, thereby decreasing energy use and reducing GHG emissions. Increased recycled water use also reduces the amount of energy needed to convey imported water supplies. Demineralization of groundwater supplies increase the availability of groundwater and can help reduce GHG emissions when renewable or sustainable energy sources are used for pumping.

Strategies that help increase water supplies serve as valuable climate change adaptation tools as well. For example, conjunctive use can improve groundwater management and increase storage of a drought-resistant water supply. Development of demineralization and recycled water as local supplies serve as climate change adaptation strategies as they are less sensitive to climate change than other sources of water supply. The strategies to increase water supplies are described further below.

Conjunctive Management and Groundwater Storage

Conjunctive management refers to the coordinated and planned use and management of both surface water and groundwater resources to maximize the availability and reliability of water supplies. Within the Region, storing excess surface water in the groundwater basin, when available, can be an

effective strategy for improving local supply reliability and ensuring sustainable use of the groundwater basins. This strategy can involve management of both imported water and stormwater to recharge the groundwater basin to prevent groundwater depletion and provide flood management and water quality improvement benefits.

As a precursor to potential future conjunctive management and groundwater storage projects in the Region, the RWMG developed a GWMP and SNMP as part of the IRWM planning process. These documents describe the groundwater conditions, including groundwater levels and water quality, to better prepare the Region for utilizing the FVGB in a sustainable manner. Future projects, including groundwater modeling and developing a GSP, will help the Region manage the basin for conjunctive use and groundwater storage.

Desalination (Brackish)

Desalination can be used to reduce salinity in many sources of water, including surface water, groundwater, and municipal wastewater. Because the Fremont IRWM Region is located inland, sea water desalination was not considered applicable to the Region, but brackish groundwater desalination is viewed as an appropriate strategy. Desalinated water can be used for potable uses, such as municipal drinking water, or non-potable applications, such as agricultural irrigation or industrial processes.

Within the Region, there are opportunities for brackish desalination near Koehn Lake where salts accumulate in the dry lake bed, leading to high TDS levels in the groundwater directly under the lake bed. Future projects could explore this strategy as a mechanism for increasing production in that portion of the groundwater basin.

Municipal Recycled Water

The municipal recycled water RMS addresses the recycling of municipal wastewater treated to a specified quality to enable its reuse for another beneficial purpose. Recycling municipal wastewater increases water supply reliability by providing an alternative supply source while reducing demands on higher-quality water potable water. This strategy involves non-potable reuse in which the treated recycled water is used for any application besides drinking water, such as irrigation. This strategy can also involve indirect potable reuse (IPR) wherein the treated recycled water is discharged to recharge basins to infiltrate into the groundwater aquifer or is sent to surface water reservoirs; it can also involve direct potable reuse (DPR) where advanced treated purified water is connected directly to the drinking water supply.

Currently, the Region implements non-potable reuse in California City where recycled water is used at Central Park Lake and for irrigation at the Tierra Del Sol Golf Course. Stakeholders in the Fremont Basin IRWM Region are committed to increasing regional water supply reliability to meet demands using strategies such as municipal recycled water. Recycled water expansion opportunities exist, primarily in California City where the existing recycled water system can be expanded to irrigate the other golf course in the City. However, additional opportunities for recycled water use may be limited to higher density areas near the wastewater treatment plants.

The Region's stakeholders are open to future opportunities with IPR and DPR.

Surface Storage – Regional/Local

Regional and local surface storage increases local supply through the construction of above-ground reservoirs to collect water for later use. Water storage is especially helpful for areas where regional

water demands do not match the natural water supply availability. While surface storage is not currently implemented in the Region, it could be used as a strategy in the future to increase local supply reserves where appropriate.

5.3.4 Improve Water Quality



MPUD water treatment plant and blending tank at well 9

Water quality improvement strategies apply to all types of water supplies and phases of distribution. These RMSs address improving water quality prior to contamination, treating contaminated supply sources, and ensuring quality water that meets regulations.

Strategies that improve water quality can provide significant climate change mitigation benefits. The Region can help mitigate climate change, for example, by improving energy efficiency related to water

treatment and distribution. Pollution prevention activities, such as reduced vehicle use and reduced fertilizer application, also help reduce the release of GHG emissions. Additionally, managing urban runoff and capturing stormwater for beneficial reuse can help decrease the energy required to import water.

These RMSs are also important tools for adapting to climate change. By managing flood flows through urban water management strategies, for example, the Region can adapt to climate change by slowing flows and reducing flood damage. Safeguarding water resources from high concentrations of salinity can also help the Region increase and diversify its supply portfolio. Other pollution prevention activities, such as impervious surface removal and onsite rainwater harvesting, can help increase the amount of water that is naturally treated and used onsite. The Region can also adapt to climate change by regionalizing water supply systems to add operational flexibility during periods of drought. The water quality improvement RMS are described further below.

Drinking Water Treatment and Distribution

This RMS encourages development and maintenance of water treatment and distribution facilities with the goal of delivering a reliable supply of safe drinking water. This entails upgrading deteriorating infrastructure, safeguarding source water quality, implementing innovative technology for water treatment, and attaining adequate financial assistance for infrastructure upgrades. Critical components of drinking water treatment and distribution include protecting public health and safety by meeting state and federal drinking water standards and monitoring existing and emerging contaminants of concern. Developing disaster preparedness plans can also help mitigate water supply disruption due to security breaches, acts of terrorism, and natural disasters.

This RMS is a critical strategy for the Fremont Basin IRWM Region. Changing MCLs for various constituents, including hexavalent chromium, can result in exceedances that will require extensive investment to correct. Blending can be used as a treatment technique in cases where removal treatment methods are cost-prohibitive.

Groundwater Remediation/Aquifer Remediation

Implementing groundwater and aquifer remediation efforts can help remove critical contaminants such as heavy metals, salts, and other constituents such as arsenic that degrade quality. Groundwater remediation can be accomplished by either extracting and treating groundwater outside of the basin or by treating groundwater within the basin through biodegradation and natural attenuation processes. Basin water quality may also be improved by recharging with noncontaminated water.

This RMS can help the Region increase the reliability of local supplies, increase storage for excess surface water and/or recycled water, decrease dependence on imported water, and prevent contamination from spreading. The Fremont Basin IRWM Region developed a GWMP for the FVGB to identify groundwater quality and quantity issues and develop potential implementation measures to combat these issues. The GWMP, as well as potential future groundwater modeling and GSP development, will help the Region identify, remediate, and monitor implementation of this strategy.

Matching Water Quality to Use

The underlying principle of matching water quality to use is to only treat water to the level that is required by the end use. This way of thinking encourages water quality to be consistent with its intended use and considers a substance a “contaminant” only when it has adverse impacts on the proposed water use. For instance, drinking water supplies are required to meet much more stringent treatment levels than non-consumptive water uses such as recreation or irrigation.

The City of California City currently implements this strategy by using treated wastewater for use in the Central Park Lake and for irrigation at the Tierra Del Sol Golf Course. Future projects may investigate using recycled water for additional non-potable uses or groundwater recharge.

Pollution Prevention

Pollution prevention aims to reduce contaminants at the source and promotes preventative activities such as: 1) the implementation of regulations or practices that reduce the generation and discharge of pollutants into the environment; 2) modifications to toxic production processes; 3) substitution of harmful pollutants with less toxic constituents, 4) utilization of technology to prevent pollutants from entering the environment, and 5) education and outreach. By preventing pollution at its source, there is a decreased need for more costly water treatment in the future. Clean surface water bodies also provide increased opportunities for water recreation and suitable habitat for wildlife. Because surface water and runoff recharge groundwater, overall surface water quality improvements also lead to groundwater quality improvements.

The majority of the Fremont Basin IRWM Region uses onsite septic systems. Septic systems can leak and degrade groundwater quality. Future projects in the Region might utilize the pollution prevention RMS by increasing the number of residents connected to a wastewater treatment plant, thereby preventing pollution of groundwater at one key source.

Salt and Salinity Management

Salinity in water is increased when calcium, sodium, sulfate, chloride, nitrate, and other substances enter a water body. These substances can be naturally released from minerals or come from anthropogenic activities like fertilizer application. High concentrations of salinity cause declines in agricultural production, soil degradation, higher utility rates, habitat loss, and corrosion of water and wastewater facilities. Proactive salt and salinity management maintains and recovers usable water supplies through combinations of source control, dilution, and treatment of water. Proper salt and

salinity management provides several benefits, including beneficial water use protection, increased water supplies, and economic stability.

As part of the IRWM planning process, the RWMG developed a SNMP for the FVGB. While there is no salinity TMDL for the Region, salt management is critical due to the use of recycled water. The SNMP provides a preventative measure to ensure sustainable use and water quality protection for the FVGB.

Urban Runoff Management

The urban runoff management strategy applies to both stormwater and dry-weather runoff management. Stormwater runoff is water that flows following a rainfall event, while dry-weather runoff is caused by activities such as over-irrigation and other types of discharge not associated with rainfall. Increases in the amount of impervious surface area caused by urbanization have intensified urban runoff and flood damage. Urban runoff can be managed by implementing low impact development (LID) strategies which are designed to reduce the pollutant loadings and lessen the volumes and velocities of urban runoff.

As climate change impacts precipitation patterns, the Fremont Basin IRWM Region may experience increases in the number and severity of flood events. Managing the urban runoff created by these events provides opportunities to reduce pollutant loading in surface water flows, while also promoting retention of stormwater for beneficial reuse.

5.3.5 Improve Flood Management

Flooding during storm events is an issue in many areas of the Region. Climate change is anticipated to cause more frequent and more severe flooding, which may result in a high vulnerability for the Fremont Basin IRWM Region. Improved flood management inherently helps adapt to climate change by strengthening flood management practices and adapting to these changes. If floodplain restoration is incorporated into a flood management strategy, this strategy can also help mitigate climate change by sequestering carbon in newly formed or restored floodplains.



Flooding in California City

Flood Management

Flood management as part of an integrated water management approach seeks a balance between exposure of people and property to flooding, the quality and functioning of ecosystems, the reliability of water supply and water quality, and economic stability that includes both economic and cultural considerations. The flood management strategy contains multiple potential approaches including:

- Nonstructural, such as land use planning and floodplain management
- Structural, including flood infrastructure and reservoir and floodplain storage and operations

- Restoration of natural floodplain functions, like promoting natural hydrologic, geomorphic, and ecological processes and reducing invasive species; and
- Flood emergency management, such as flood preparedness, emergency response, and post-flood recovery

There are many potential opportunities to improve flood management in the Region. Areas of the Region flood regularly during storm events and could benefit from structural and nonstructural approaches to flood management. As climate change increases flooding risk, this RMS will be critical for the Fremont Basin IRWM Region.

5.3.6 Practice Resources Stewardship

Practicing resource stewardship helps maintain and restore important natural ecosystem functions that contribute to sustainable water resources management. These strategies can play an important role in mitigating climate change while simultaneously protecting key resources. For example, agricultural land stewardship can help mitigate climate change by increasing carbon sequestration and limiting management practices that increase GHG emissions. Ecosystem restoration can also be used to expand vegetated areas to sequester carbon. GHG emission reductions can also be achieved by protecting recharge areas that allow use of local groundwater sources rather than other more energy-intensive water supplies. Sediment management strategies can also offset GHG emissions associated with sediment removal practices.

The resource stewardship strategies are also climate change adaptation tools. Land use planning and management promotes sharing information across sectors and allows regional planning for adverse impacts associated with climate change. Better management of agricultural lands, for instance, can lead to flexible cropping patterns, protection and enhancement of wildlife habitats, and prevention of wildfires with effective grazing. Similarly, ecosystem restoration and sediment management can restore natural floodplains and flows to improve flood management and capture more flood waters. The Region can also adapt to droughts, floods, and other impacts of climate change by protecting recharge areas and increasing groundwater supply and quality reliability. Structuring watershed management to provide multiple benefits, such as improved water quality, increased biodiversity, and restored ecological function, helps regions adapt to a changing climate. The resource stewardship strategies applicable to the Region are described further below.

Agricultural Lands Stewardship

The agricultural lands stewardship RMS focuses primarily on private land in agriculture, including cultivated land and rangeland. Land managers practice this RMS by conserving and improving land for food, fiber, biofuel production, watershed functions, and soil, air, energy, plants, animals, and other conservation purposes.

While the Fremont Basin IRWM Region has limited agricultural land in cultivation, stakeholders in the Region support assessing optimal farming crops and identifying ways to protect soil quality.

Ecosystem Restoration

Ecosystem restoration improves the condition of modified natural landscapes and biological communities to provide for their sustainability and for their use and enjoyment by current and future generations. Successful restoration increases the diversity of native species and biological communities and the abundance of habitats and connections between them. This strategy can include

reproducing natural flows in streams, controlling non-native invasive plant and animal species, and recovering wetlands so that they can store floodwater, recharge aquifers, filter pollutants, and provide habitat.

Within the Region, this strategy can involve restoring vital habitat for endangered species such as the Desert Tortoise. The Region's water management is also benefited from ecosystem restoration outside the Region. AVEK, the wholesale supplier to the Region, supports the Delta restoration planning work as part of the California WaterFix. The California WaterFix is designed to not only improve the Delta ecosystem but improve water supply reliability for SWP contractors like AVEK.

Land Use Planning and Management

The land use planning and management strategy cuts across many other strategies such as water use efficiency, groundwater quality, flood management and agricultural lands stewardship. For example, directing development away from agricultural lands permits multi-objective management of these lands for agricultural preservation, floodplain management, water quality, habitat conservation, and sustainable development. Stronger collaboration between land use planners and water managers can produce safer and more resilient communities.

Within the Fremont Basin IRWM Region, it is important for land use planning agencies to coordinate with water management agencies to ensure sustainable use of local water sources for future generations.

Recharge Area Protection

Recharge areas are those areas that provide the primary means of replenishing groundwater. Protection of recharge areas requires a number of actions based on two primary goals: (1) ensuring that areas suitable for recharge continue to be capable of adequate recharge rather than being covered by urban infrastructure, such as buildings and roads, and (2) preventing pollutants from entering groundwater to avoid expensive treatment that may be necessary prior to beneficial use. Protection of recharge areas is necessary to maintain the quantity and quality of groundwater in the aquifer.

Stakeholders across the Fremont Basin IRWM Region support protecting and enhancing recharge areas to improve groundwater sustainability.

Sediment Management

Sediment management relates to managing the sand, silt, or clay, suspended in or settled on the bottom of a water body. Pollutants, including those from stormwater, may also be absorbed onto fine-grained sediments and complicate management of contaminated sediment.

Because there is minimal surface water in the Fremont Basin IRWM Region, this RMS is not a major strategy for the Region but can be applicable in some cases. For example, Central Park Lake in the City of California City is used as a recreational area and migratory bird habitat. Sediment management could improve the water quality, habitat and recreational benefits provided by the lake.

Watershed Management

Watershed management is the process of creating and implementing plans, programs, projects, and activities to restore, sustain, and enhance watershed functions. A primary objective of watershed management is to increase and sustain a watershed's ability to provide for the diverse needs of the communities that depend on it, including local, regional, State, federal, and tribal stakeholders.

Specific activities under this strategy include adding wildlife corridors, increasing infiltration, and decreasing irrigated landscaping.

As part of the IRWM Program, the Fremont Basin RWMG is increasing awareness for watershed management in the Region. This RMS will be key as the Region works to integrate adaptive management strategies and collaborate on funding opportunities.

5.3.7 People and Water

Engaging the community in water resources is an important component of the IRWM Program. Several strategies target the connection between people and water to better implement water projects and programs.

Like the other RMSs, these strategies can help mitigate and adapt to climate change. Outreach and engagement can help mitigate climate change when efforts are focused on



Central Park Lake provides multiple benefits to the community and wildlife

reducing a community's carbon footprint and encouraging water and energy conservation. The Region can work to identify opportunities for water recycling and renewable energy and to promote water-dependent recreation activities that encourage residents to engage in less energy-intensive activities. Additionally, through outreach and engagement, communities can adapt to climate change by leveraging resources, collaborating on monitoring efforts, and improving information sharing. The Region can also work with community stakeholders to increase open space for recreation and promote resilient ecosystems.

Economic Incentives Policy

Economic incentives include financial assistance, water pricing, and water market policies that are intended to influence water management. These incentives can influence the amount and timing of water use, wastewater volume, and source of water supply. Examples of economic incentives include low interest loans, grants, and water rates and rate structures. Free services and rebates, such as toilet rebate programs, also have a direct effect on the way people use water. Incentives can be created or enhanced by facilitating water market transfers, by creating market opportunities where they did not exist, by expanding opportunities where they currently exist, or by reducing market transaction costs. In each case, new or enhanced market opportunities can influence water management decisions.

Agencies throughout the Fremont Basin IRWM Region, including MPUD, California City, and RCWD, actively pursue and apply for grants to fund water projects. Through participating in the IRWM Program and developing an IRWM Plan, water management agencies will be eligible to obtain funding dollars to support IRWM projects.

Outreach and Engagement

The outreach and education strategy employs the use of tools and practices to facilitate contributions toward good water management outcomes. These contributions may include adopting water-wise practices, providing insight to decision-makers on the best approaches for water management, and ensuring access to water management information and decision-making.

Outreach and education is a strategy often used to support other RMSs and can help address all Regional objectives. For example, water purveyors in the Region have used outreach and education to promote water use reductions during the drought. During the most recent drought around 2015, California City made conservation awareness and compliance pitches to customers and residents via the City website, Facebook, and other social and digital media sources. The City also conducted door to door canvassing, made radio station public service announcements, and provided information booths at special events funded by the City and other water service providers within Kern County.

Water and Culture

Water and culture are connected in myriad ways, with subtle and complex implications for managing water. This RMS works to consider culture and cultural activities in the framework of water management. Cultural activities that relate to water may include subsistence activities, recreation activities, spiritual activities, historic preservation, public art, and other shared passions, beliefs, histories, and experiences that bring people together. Utilizing cultural considerations in the framing, development, and promotion of management decisions is vital to ensuring legal compliance and sustainable practices. The benefits of this strategy include preserving a community's and a culture's understanding of the regional history and applying traditional knowledge and practices to better sustain and integrate water management.

The Fremont Basin IRWM Region is supportive of cultural connections to water and will continue to work to identify sustainable water management practices that do not conflict with cultural water needs.

Water-Dependent Recreation

The water-dependent recreation strategy involves planning for and supporting recreational water uses. By planning for water-dependent recreation activities in water projects, water managers play a critical role in ensuring that all Californians today and into the future are able to enjoy such activities.

While there is limited water-dependent recreation in the Region, California City's Central Park Lake provides some recreational opportunities for the surrounding community. While it has been used for non-contact recreation in the past, the lake has suffered from degraded water quality conditions, resulting in algae growth, low oxygen levels, and other impediments that have reduced its use by the community. Projects to improve the water quality of the lake could provide multiple benefits.

5.4 Addressing Climate Change Vulnerabilities

As discussed in *Section 2.9: Climate Change*, climate change is likely to have negative impacts within the Fremont Basin IRWM Region, including impacts on water demand, supply, flooding, water quality, and ecosystem and habitat. The RMSs discussed in this chapter can help address these regional climate change vulnerabilities, as summarized in **Table 5-3**.

Table 5-3: Addressing Climate Change Vulnerabilities with Resource Management Strategies

Resource Management Strategy	Water Demand				Water Supply		Water Quality	Flooding	Ecosystem and Habitat	
	Increase in crop demand	Decreased ability to use groundwater storage to buffer drought	Limited ability to conserve further	Limited ability to meet future demand	Decrease in groundwater supply	Decrease in imported supply	Increased constituent concentrations	Increase in inland flooding	Increased impacts to sensitive or threatened species	Decrease in available necessary habitat
Reduce Water Demand										
Agricultural Water Use Efficiency	✓	✓	✓	✓	✓					
Urban Water Use Efficiency		✓	✓	✓	✓	✓				
Improve Operational Efficiency and Transfers										
Conveyance – Delta		✓	✓	✓	✓	✓				
Conveyance – Regional/Local	✓	✓	✓	✓	✓	✓				
System Reoperation	✓	✓	✓	✓	✓	✓	✓	✓		
Water Transfers	✓	✓	✓	✓	✓	✓				
Increase Water Supply										
Conjunctive Management and Groundwater Storage	✓	✓	✓	✓	✓	✓	✓	✓		
Desalination (Brackish Water)	✓	✓	✓	✓	✓	✓	✓			
Municipal Recycled Water	✓	✓	✓	✓	✓	✓				
Surface Storage – Regional/Local	✓	✓	✓	✓	✓	✓				

Fremont Basin Integrated Regional Water Management Plan

Resource Management Strategy	Water Demand				Water Supply		Water Quality	Flooding	Ecosystem and Habitat	
	Increase in crop demand	Decreased ability to use groundwater storage to buffer drought	Limited ability to conserve further	Limited ability to meet future demand	Decrease in groundwater supply	Decrease in imported supply	Increased constituent concentrations	Increase in inland flooding	Increased impacts to sensitive or threatened species	Decrease in available necessary habitat
Improve Water Quality										
Drinking Water Treatment and Distribution				✓			✓			
Groundwater/Aquifer Remediation	✓	✓		✓	✓	✓	✓	✓		
Matching Water Quality to Use	✓		✓	✓	✓	✓	✓			
Pollution Prevention							✓		✓	
Salt and Salinity Management	✓	✓		✓	✓	✓	✓	✓		
Urban Runoff Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Improve Flood Management										
Flood Management		✓	✓	✓	✓	✓	✓	✓	✓	
Practice Resources Stewardship										
Agricultural Lands Stewardship	✓			✓	✓		✓	✓	✓	
Ecosystem Restoration								✓	✓	✓
Land Use Planning and Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Recharge Areas Protection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sediment Management							✓	✓	✓	✓

Resource Management Strategy	Water Demand				Water Supply		Water Quality	Flooding	Ecosystem and Habitat	
	Increase in crop demand	Decreased ability to use groundwater storage to buffer drought	Limited ability to conserve further	Limited ability to meet future demand	Decrease in groundwater supply	Decrease in imported supply	Increased constituent concentrations	Increase in inland flooding	Increased impacts to sensitive or threatened species	Decrease in available necessary habitat
Watershed Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>People and Water</i>										
Economic Incentives Policy	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Outreach and Engagement	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water and Culture	✓	✓	✓	✓	✓	✓			✓	✓
Water-Dependent Recreation				✓					✓	✓

6 Projects

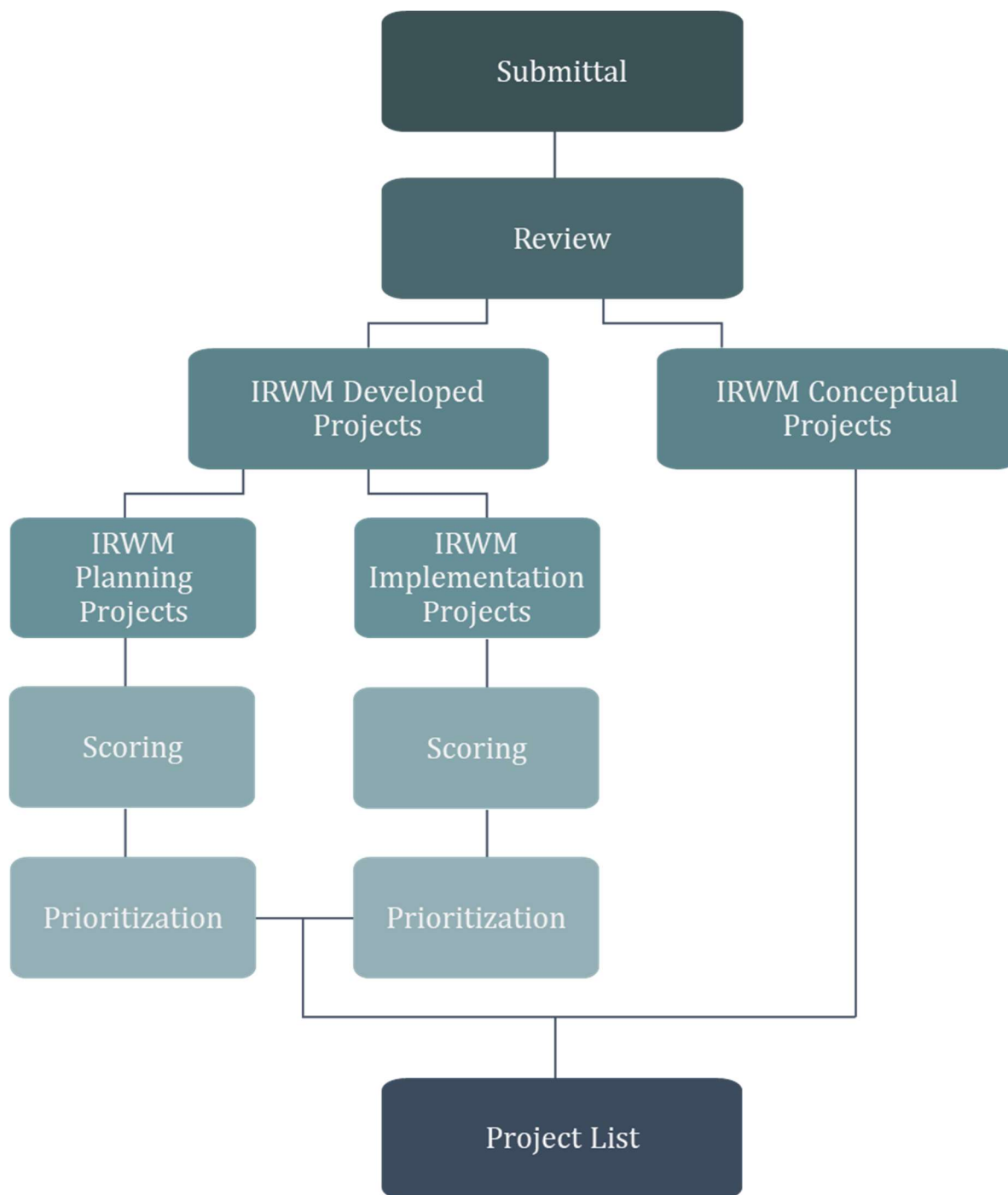
The IRWM Program is designed to support projects that promote regional approaches for the integrated management of water resources. The Program has been successful in encouraging local agencies to collaborate and implement water management solutions that maximize benefits on a regional scale. Projects accepted into an adopted IRWM Plan are eligible for grant funding through the IRWM Grant Program which supports projects that address the needs and goals of a Region. The Fremont Basin IRWM Plan is intended to be a “living document” that will be periodically updated to incorporate new projects and modify existing ones to help the Region move toward meeting its water management objectives, as defined in *Chapter 4: Objectives*. This chapter describes the framework used for project submittal, scoring, prioritization, and acceptance into the Fremont Basin IRWM Plan.

6.1 Overview

The project submittal and review process is a collaborative effort among local water agencies, municipalities, and other stakeholders; it is generally guided by the RWMG. The review process is intended to produce a list of prioritized projects that support pre-established Regional objectives. Then, using the project list, a subset of projects can be selected for specific IRWM Grant Program applications.

Projects submitted to the IRWM Plan are reviewed using the information provided on the Project Submittal Form, an example of which is included in Appendix G, to ensure they are appropriate for the Plan. Projects that meet at least one objective are eligible for inclusion. Once approved, projects are then classified as either “conceptual” or “developed” based on the project’s status, level of development, and readiness to proceed. Conceptual projects are those with minimal planning completed and that require further development to quantify project benefits. Conceptual projects are generally expected to evolve into developed projects as planning and design progress. Because conceptual projects are not typically eligible for funding, only developed projects go through the prioritization process based on their ability to produce the greatest Regional benefits. Developed projects are further sorted into “IRWM Planning Projects” and “IRWM Implementation Projects”. Both conceptual and developed projects are integrated into the IRWM Plan when approved by the RWMG and the stakeholder group. An overview of the project review process is provided in **Figure 6-1**.

Figure 6-1: Project Review Methodology



6.2 Project Submittal Process

6.2.1 Call for Projects

An initial Call for Projects was held during the August 15, 2017, Stakeholder Meeting to begin the project submittal process for the Region. Stakeholders were invited to fill out a Preliminary Project Information Request Form with basic information such as project name, lead agency, project location, description, and benefits. The purpose of this preliminary project request was to help stakeholders brainstorm and track project ideas while other components of the IRWM Plan were still being developed and discussed. Following the development of the Regional objectives described in *Chapter 4: Objectives* and discussion of the RMS's during stakeholder meetings, a more detailed Project Submittal Form was developed and distributed during the January 18, 2018, Stakeholder Meeting to gather additional information for the project review process.

As part of the Call for Projects, it was explained that projects that align with the water management needs of the Region and provide multiple benefits are highly valued in IRWM Planning. The types of project benefits that are most important for the Region's water management needs include:

- Increase regional water supply reliability to meet demands
- Ensure sustainable use of the Fremont Valley Groundwater Basin
- Provide drinking water that meets regulatory requirements and customer needs
- Protect water quality in groundwater basins in the Region
- Reduce negative impacts of stormwater
- Support water needs of open space/recreational/migratory habitat areas
- Support protected habitats
- Maintain agricultural land uses
- Improve integrated land use planning to support water management
- Mitigate against climate change

6.2.2 Project Submittal Form

To submit a project to the IRWM Plan, stakeholders must complete the IRWM Plan Project Submittal Form, an example of which is included in Appendix G. Hard copies of the form were initially distributed during the January 18, 2018, Stakeholder Meeting and were made available at all subsequent Stakeholder Meetings; hard copies are also available at the California City, City Hall front desk. Electronic versions are available on the Fremont Basin IRWM Facebook page and the City's IRWM web page. The Project Submittal Form requests the following information:

- **General Information:** The lead agency must provide the project name and the primary contact information for the agency endorsing the project. It must also identify any secondary contacts and project partners, if applicable.
- **Project Description:** The project sponsor must identify whether the project is either a conceptual or developed project and if it is classified as either an IRWM Planning Project or an IRWM Implementation Project. It must also specify the location for the project by using a

geographic coordinate system, if possible. The sponsor must provide a comprehensive project description that details how the project will address a pertinent water-related issue in the Region. Relevant supporting information should be provided.

- **Project Benefits:** Each submitted project must respond to the following information regarding project benefits:
 - *How the project contributes to the IRWM Plan Objectives.* To be adopted into the IRWM Plan, the project must help the Region meet at least one of the IRWM objectives outlined in Chapter 4 of this Plan. The submittal form asks that project sponsors identify which IRWM objectives the project will support and quantify those benefits, if possible.
 - *How the project relates to resource management strategies.* The project sponsor must identify at least one RMS that is a feature of the project.
 - *If and how the project provides specific benefits to critical DAC and Native American Tribal community water issues.* Project sponsors should indicate if and how the project will provide any specific benefits to critical water issues in DAC and Native American Tribal Communities.
 - *How the project addresses environmental justice considerations.* The Project Submittal Form asks the sponsor to also identify the project's benefits to stakeholders and to discuss the project's ability to address any environmental justice concerns. Environmental Justice is the meaningful involvement of all people regardless of race, color, sex national origin, or income with respect to the development and implementation of the projects. For water management projects, this can include:
 - Supporting community health, and a clean safe environment
 - Encouraging a more equitable distribution of economic benefits
 - Increasing awareness, understanding, and effective cooperation within and among communities
 - Diversifying the decision-making process by calling for involvement of all people and communities
 - Empowering communities themselves to take action towards improving conditions
 - *How the project contributes to adapting to the effects of climate change and/or reducing GHG emissions.* Projects sponsors must identify any additional sustainability features of the project, including how the project contributes to adapting to climate change effects. Furthermore, sponsors must indicate how the project contributes to climate change mitigation. Considerations for mitigation include using energy efficient appliances and reducing GHG emissions as compared to project alternatives. Use of solar power for a project is one example.
 - *If and how the project reduces reliance on imported water and water from the Delta.* Increasing local supply reliability is a critical objective for the Fremont Basin IRWM

and projects that can help reduce reliance on imported water can help contribute to meeting that objective.

- **Project Status and Schedule:** Project sponsors must provide the project's current status, also referred to as the project's readiness to proceed. Examples of project stages include initial study, planning design, environmental review, and in-construction phases. The sponsor must also propose a timeline for completion.
- **Project Costs and Funding:** The project sponsors should provide the total estimated project costs and list any potential sources of funding. If available, the project sponsors should also provide a basis for the project cost.
- **Project Technical and Economic Feasibility:** If available, the sponsor should provide a cost-effectiveness or cost-benefit analyses to justify the economic feasibility of the project. The economic analysis should include the types of benefits and the types of costs for the project, including capital costs, operation and maintenance (O&M) costs, and any potential adverse effects to others. The sponsor must also include any supporting documents that demonstrate the technical feasibility of the project, including any information that will help determine if the benefits of the project may realistically be achieved.
- **Strategic Considerations:** To maximize benefits on a regional scale, the project sponsor should determine the ability for the project to be integrated with other regional projects. The project sponsor must also specify whether the IRWM Plan has been adopted or will be adopted in the future.

Stakeholders were encouraged to submit Project Submittal Forms for the 2019 Fremont Basin IRWM Plan in one of three ways: 1) submit a printed project form to the RWMG lead agency (the City of California City) or to the consultant team helping prepare the IRWM Plan; 2) submit an electronic copy of the form via email to the City or the consultant team, or 3) request the consultant team to fill out the project submittal form on the sponsor's behalf following an in-person or phone interview. In the future, stakeholders will be encouraged to submit projects directly to the City to be reviewed and incorporated into the project list, as appropriate.

For the 2019 Fremont Basin IRWM Plan, projects proposals were accepted on an ongoing basis. The consultant team scheduled calls with project sponsors to further develop project concepts and proposals as needed. All submitted projects were compiled for further review, as outlined in the section below.

For ongoing project submittals to the IRWM Plan, project sponsors can receive a copy of the Project Submittal Form by doing one of the following:

- Download the Project Submittal Form from the Fremont Basin IRWM webpage on the City's website
- Email the City Public Works Department to request a copy.
- Obtain a hard copy of the form at the California City, City Hall Chambers, 21000 Hacienda Blvd, California City.

Project sponsors can submit completed forms via email or at the City Hall Chambers.

6.3 Project Review Process

All completed IRWM Plan Project Submittal Forms are reviewed by the Project Review Committee (Committee) using various review criteria. This section discusses the project review and selection process.

6.3.1 Project Review Committee

The Project Review Committee (Committee), comprised of all three RWMG member agencies, compiles and reviews the completed Project Submittal Forms to determine eligibility for inclusion in the IRWM Plan's project list, or IRWM grant funding as it becomes available. In collaboration with the stakeholder group, the Committee selects project proposals that align with the goals of the IRWM Plan. The Committee also works with project sponsors to provide feedback and guidance for projects that do not align with the IRWM Program or that require additional development to be eligible for inclusion.

6.3.2 Project Review Factors

During the project review process, the Project Review Committee looks for projects that provide integrated, multi-benefit solutions and that address the Region's water management needs; at least one IRWM Plan objective must be met. The Committee first reviews the Project Submittal Forms for accuracy and completeness. Project proposals are then categorized as either conceptual projects or developed projects based on the project's readiness to proceed. While not all projects may be in a stage where they are eligible for IRWM Planning or Implementation funding, projects in all stages are eligible to be included in the project list if they meet the basic criteria. Keeping a complete inventory of conceptual projects allows the Region to monitor progress toward meeting IRWM objectives and to identify potential opportunities for modifying or integrating project concept ideas with more fully-developed projects. Conceptual projects are compiled into a project list that is periodically reviewed. During these periodic reviews, projects that have become more developed are re-categorized as "developed" and are moved forward for prioritization. All developed projects are further reviewed to prepare for the next step in the project review process, project prioritization, which is further discussed in *Section 6.3.4: Project Prioritization*.

The initial project review is important for guaranteeing that projects align with the goals of the IRWM Plan. As such, the Project Review Committee confirms that each project supports at least one of the ten IRWM Plan objectives outlined in *Chapter 4: Objectives*, and if possible, that those benefits are quantified. The Committee also ensures that all projects utilize a minimum of one RMS delineated in *Chapter 5: Resource Management Strategies*. **Table 6-1** outlines the preliminary factors used by the Project Review Committee to determine which projects are included in the IRWM Plan, and whether they should be categorized as conceptual or developed. All of the requested information below is summarized in *Section 6.2.2: Project Submittal Form* and is contained in the IRWM Plan Project Submittal Form included as Appendix G. All information reviewed as part of the project review process is included in the Project Submittal Form.

Table 6-1: Factors for Project Review

Review Factor	Conceptual Project	Developed Project
General Information	✓	✓
Project Description	✓	✓
Project Benefits	✓	✓
Project Status and Schedule		✓
Project Costs and Funding		✓
Project Technical and Economic Feasibility		✓
Strategic Considerations		✓

After the Committee reviews each project and selects which projects are included in the IRWM Plan, the list of projects is presented to the stakeholder group for approval. Projects not selected for inclusion in the Plan are provided feedback on how those projects could be further developed to meet the minimum requirements for inclusion in the IRWM Plan.

As applicable, the Project Review Committee will be responsible for identifying and communicating potential project integration opportunities.

The Project Review Committee will review projects on an ongoing basis at an appropriate frequency, dependent on the number of Project Submittal Forms received and any time sensitivities expressed by the project sponsors. The RWMG will determine how often the Project Review Committee will need to meet to discuss project submittals.

6.3.3 IRWM Project List

Table 6-2 lists the projects that were submitted to and selected by the Project Review Committee for inclusion in the 2019 Fremont Basin IRWM Plan. These recommendations were presented to and approved by the stakeholder group during Stakeholder Meetings held during the 2019 Plan development. Details about the projects can be found in Appendix H. A copy of the IRWM project list is posted on the Fremont Basin IRWM websites, and updated as needed, to provide stakeholders access to the current project list.

Table 6-2: Projects in the Fremont Basin IRWM Region

Project Sponsor	Project Name
AVEK	Blending Intertie at Rosamond Water Treatment Plant
AVEK	North Feeder Chlorination Station
AVEK	North Feeder Pump Station
California City	Convert WWTP from Chlorine to UV
California City	Central Park Lake Restoration
California City	Chromium-6 Blending
California City	Fremont Valley Groundwater Basin Groundwater Sustainability Plan
California City	North Side and South Side Water Main Replacement
California City	Septic to Sewer Conversions
California City	Sewer Plant Headworks
California City	South Side Water Main Replacement Project
California City	Stormwater Capture and Recharge
California City	Well 4 Improvement
California City	Wonder Acres Tank and Booster Pump
Mojave Chamber of Commerce	Mojave H and I Streets Flood Control Project
MPUD	Wastewater Treatment Plant Headworks
MPUD	Well 30 Blending & Distribution System Enhancements
Rancho Seco	Booster Pump Building & Earth Work
Rancho Seco	Northern Fremont Valley Soil Stabilization and Revegetation
RCWD	Distribution System Isolation Valve
RCWD	Lockable Sampling Tabs
RCWD	New Water Meters for 300 Connections
RCWD	Shut-off Valves for Fire Hydrants

6.3.4 Project Prioritization

As previously mentioned, only developed projects selected by the Project Review Committee and stakeholder group advance to the project prioritization process. In this phase, developed projects are first labeled as either IRWM Planning Projects or IRWM Implementation Projects. IRWM Planning Projects support the development or the update of a plan or study, whereas IRWM Implementation Projects directly implement a program or a project (i.e., typically by constructing new facilities). To confirm that projects adopted into the IRWM Plan help the Region achieve its IRWM Plan objectives

and promote the RMSs, the Project Review Committee has developed project prioritization criteria and a scoring rubric. The prioritization process highlights projects that will deliver the most widespread benefits relative to the Region's specific needs and objectives. This prioritization process rewards projects that are sufficiently developed, demonstrate a need, are consistent with the goals of the IRWM Plan and provide multiple benefits to the Region. The prioritization methodology is designed so that the projects that provide the most benefit for the Region receive a higher score. Ranked projects are then grouped into low, medium, and high priority projects to eliminate minor discrepancies with the prioritization criteria and scoring rubric.

Prioritization Criteria

To help in the prioritization process, the RWMG developed several prioritization criteria, including funding, innovative technology, and Regional benefits. Each criterion was assigned a point value to create a scoring rubric, as shown in **Table 6-3**. The Project Review Committee uses this scoring rubric to evaluate developed projects and assign points for each criterion met. The prioritization criteria and scoring rubric was presented to and unanimously approved by the stakeholder group during Stakeholder Meeting #11, held on February 15, 2018. It is important to note that this rubric may be updated as the IRWM Plan's objectives and RMS evolve in the future. Projects with the highest overall score are intended to reflect the Region's priority projects.

Table 6-3: Project Prioritization Criteria and Scoring Rubric

Criteria	Consideration	Possible Points
Quantifies benefits	How many quantified benefits does the project provide? Are the benefits justified?	Each quantified benefit = 1 point Justification per benefit = 1 point
Addresses IRWM Plan Objectives	How many objectives does the project address?	Each IRWM Objective = 1 point
Utilizes RMS	How many RMS are utilized by the project?	1-2 RMS = 1 point 3+ RMS = 2 points
DAC Benefits	Does the project provide specific benefits to critical DAC water issues?	Yes = 1 point
Tribal Community Benefits	Does the project address water issues in Tribal Communities?	Yes = 1 point
Environmental Justice Considerations	Does the project encompass environmental justice considerations?	Yes = 1 point
Addresses Climate Change	Does the project adapt to climate change and/or reduce GHG emissions?	Yes = 1 point
Technical Feasibility	Is there any supporting documentation for the project (i.e., planning or design documents?)	Yes = 1 point
Economic Feasibility	Is there a complete cost/benefit analysis?	Yes = 1 point

A detailed table showing the individual scores for the developed projects is presented in Appendix I and available on the Fremont Basin IRWM Plan website at <http://www.californiacity-ca.gov/CC/index.php/fremont-basin-irwm>. The prioritized project recommendations were presented to the stakeholder group during the March 15, 2018, Stakeholder Meeting. The stakeholder group discussed the projects and scoring and agreed that some project scores could be improved

with additional information. The prioritized list of projects is a “snap shot” of the projects at their state of development at the time when this IRWM Plan was developed. The actual project list is a living document that will continue to be updated as new projects are reviewed and added to the list and as existing IRWM projects progress.

6.4 Project Integration

Integration is an important concept for the IRWM Program. Creating a system where integration can occur is one of the roles of the RWMG. Project integration involves combining existing projects to provide efficiencies through economies of scale where similar local interests can be met with a regional project. Project integration also encourages distinct projects that are geographically separated to collaborate and to meet a common set of objectives in the Region. The goal of project integration is to help projects meet a broader spectrum of benefits on a regional scale. Prior to funding solicitations, the RWMG plans to review the IRWM Plan projects and identify potential integration opportunities not previously identified among the submitted projects. During the review process, and as new projects are added to the project list, the Project Review Committee will assess project objectives and consider how new, expanded, or even different solutions can help meet multiple local needs. These integration opportunities for project efficiencies will then be communicated to the project sponsors and discussed at Stakeholder Meetings.

6.5 Project Review for the IRWM Grant Program

The project review and selection process for the IRWM Grant Program is a separate process from the review and selection for inclusion in the IRWM Plan. Standards and requirements for the IRWM Grant Program will be reviewed by the RWMG when guidelines for the various IRWM grant funding programs become available. If the Fremont Basin IRWM Region chooses to submit an application for a particular round of IRWM implementation grant funding, the RWMG will develop a specific process and criteria for submittal, review, and selection of projects to include in the Region’s IRWM implementation grant application. The projects selected for the application will need to be included in the IRWM Plan prior to being included in the grant application. When new rounds of grant funding are made available, the RWMG may conduct additional project solicitation efforts to bring new projects into the IRWMP. The process for project review and selection for the IRWM Grant Program is summarized in **Figure 6-2**

Figure 6-2: Process for Project Selection for the IRWM Grant Program



7 Implementation

7.1 Overview

This chapter provides a framework for the long-term implementation of the Fremont Basin IRWM Plan. It identifies the potential impacts and benefits of Plan implementation, both within the IRWM Region and between neighboring IRWM Regions. It also contains performance measures and monitoring methods to ensure that the IRWM objectives are achieved. The Plan delineates the process for data management, including data collection, storage, and dissemination to stakeholders and state agencies. Finally, it identifies funding sources for Plan implementation, including the projects discussed in *Chapter 5: Projects*. The policies, procedures, and management strategies contained in this chapter allow the Region to quickly adapt to changing conditions, including climate change, technological advances, and information availability.

7.2 Impacts and Benefits

To ensure the long-term success of the IRWM Plan, it is important to clearly communicate the effects of implementing the Plan. Increased transparency helps water resource managers and stakeholders understand and address any potential adverse effects that Plan implementation may have both on a regional and inter-regional scale. Because the Region is predominately comprised of DACs, impacts and benefits within the Region are correlated with potential impacts and benefits to DACs.

The Fremont Basin IRWM objectives may serve as a proxy for the IRWM Plan impacts and benefits as the objectives influence the projects that are selected and implemented through the IRWM effort. As specific projects in the Plan are implemented, the impacts and benefits of each objective will be realized. A more detailed, project-specific impacts and benefits analysis will occur prior to any grant application the project is included in. Review and update of the impacts and benefits of Plan implementation will occur as part of the IRWM Plan management and update activities.

The sections below discuss the impacts and benefits of each IRWM Plan objective.

Water Supply Objectives

To meet increasing water demands associated with population growth and regional economic growth, it is critical to secure reliable regional water supply sources and sustainably manage the FVGB. Reliability of FVGB supplies is particularly important to DACs that rely on pumped groundwater as their only water supply. The water supply IRWM objectives can be achieved through projects that augment regional water supply, such as increasing recycled water use and increasing stormwater capture. These types of measures will help adapt to potential climate change impacts as well as reduce the need to import water from the Delta, effectively decreasing the energy and GHG emissions associated with imported water conveyance. Adverse impacts from implementing these projects, however, include short-term construction disturbances and increased GHG emissions from construction processes. Sustainable management of the FVGB could possibly lead to restrictions on pumping if future demands increase significantly due to residential, commercial, and industrial growth. **Table 7-1** summarizes in greater detail the impacts and benefits expected from implementing projects that help meet the IRWM objectives related to water supply.

Water Quality Objectives

Protecting groundwater quality and providing safe drinking water in the Region can be achieved by implementing a wide range of projects, including but not limited to wastewater treatment plant upgrades, septic tank conversions, and pollution prevention and remediation. Implementing these IRWM objectives will improve regional water quality, which is a priority for the Region, particularly for DACs who rely on the FVGB as their only water supply. Potential adverse impacts within the Region include site-specific construction disturbances, restricted land use activities, increased land use monitoring, and increased energy use associated with water treatment. The benefits and impacts of projects that help implement water quality IRWM objectives are further explained in **Table 7-2**.

Flood Management Objective

The flood management IRWM objective can be achieved by implementing projects that reduce the negative impacts of stormwater, including projects that improve flood management infrastructure and stormwater capture. Flood management has the potential to reduce property damages associated with floods, improve water quality, and support adaptation to potential climate change impacts while augmenting local water supplies and decreasing regional dependence on imported water. Adverse impacts of flood management, however, include localized construction disruptions, land use restrictions, and ecosystem disturbances within the Region. **Table 7-3** summarizes the potential impacts and benefits expected from implementing projects that help meet the flood management IRWM objective.

Habitat and Open Space Objectives

IRWM objectives related to habitat and open space provide widespread benefits inside and outside the Region. Projects that meet these IRWM objectives, such as ecological preservation and restoration projects, protect native and endangered species such as the desert tortoise while balancing the open space needs local communities. Though these IRWM objectives take into account local economies and regional growth, they could potentially support the case for land use restrictions. The impacts and benefits expected from implementing projects that help meet habitat and open space IRWM Objectives are summarized in **Table 7-4**.

Land Use Objectives

IRWM objectives related to land use support the local economies of the Region, including renewable energy and agriculture. Maintaining agricultural land uses and improving integrated land use planning to support water management will support the regional economy and improve water supply, water quality, and flood control within the Region. Though benefits are widespread, implementing the IRWM objectives related to land use could potentially limit future land development in the Region. Effects on areas outside the Region are not expected. The impacts and benefits of implementing projects that help meet land use IRWM objectives are summarized in **Table 7-5**.

Climate Change Objective

Mitigating climate change will lead to widespread inter- and intra-regional benefits. Renewable energy use will support the local renewable energy industry as well as decrease GHG emissions. Reduced GHG emissions will also improve air quality both inside and outside the Region and abate potential climate change impacts in the future. There are no anticipated adverse impacts outside the Region associated with mitigating climate change; however, there may be increased costs associated with implementing mitigation measures for the Region. Impacts and benefits associated with implementing mitigation measures are summarized in **Table 7-6**.

Table 7-1: Impacts and Benefits Related to Water Supply Objectives

Objective	Within IRWM Region		Inter-Regional	
	Potential Impacts	Potential Benefits	Potential Impacts	Potential Benefits
Increase regional water supply reliability to meet demands	- Increased short-term construction and site-specific impacts - Increased energy use and GHG emissions associated with facilities for recycling water	- Increased ability to adapt to potential climate change impacts - Improved water system reliability - Support projected population growth and the regional economy - Decreased dependence on imported water from the Bay-Delta - Decreased energy use and GHG emissions associated with imported water	None identified	- Increased Bay-Delta water supply and associated environmental impacts - Decreased energy usage and GHG emissions associated with reduced imported water
Ensure sustainable use of the Fremont Valley Groundwater Basin	Potential future restricted local groundwater use	- Increased local water supply reliability and resilience - Increased groundwater quality - Increased ability to adapt to potential climate change impacts - Reduced groundwater overdraft and prevalence of dry wells - Decreased dependence on imported water from the Bay-Delta - Decreased energy usage and GHG emissions associated with imported water - Decreased energy usage associated with local pumping	None identified	- Increased Bay-Delta water supply and associated environmental impacts - Decreased energy usage and GHG emissions associated with reduced imported water

Table 7-2: Impacts and Benefits Related to Water Quality Objectives

Objective	Within IRWM Region		Inter-Regional	
	Potential Impacts	Potential Benefits	Potential Impacts	Potential Benefits
Provide drinking water that meets regulatory requirements and customer needs	- Increased energy use and GHG emissions associated with treating potable water - Increased water treatment costs	- Improved potable water quality and supply availability - Reduced public health issues associated with drinking water	None identified	None identified
Protect water quality in groundwater basins in the Region	- Increased short-term construction and site-specific impacts - Restricted activities that degrade groundwater and increased monitoring of specific land use practices - Increased energy use and GHG emissions associated with treating water for recharge	- Decreased degradation of the Fremont Valley Groundwater Basin and increased water quality and supply - Decreased dependence on imported water from the Bay-Delta - Reduced exceedances that could cause a need for wellhead treatment or to shut down wells - Decreased water treatment costs - Decreased energy consumption and GHG emissions associated with treating pumped groundwater	None identified	Increased Bay-Delta water supply and associated environmental impacts

Table 7-3: Impacts and Benefits Related to the Flood Management Objective

Objective	Within IRWM Region		Inter-Regional	
	Potential Impacts	Potential Benefits	Potential Impacts	Potential Benefits
Reduce negative impacts of stormwater	• Increased short-term construction and site-specific impacts • Increased land use restrictions • Changes in sediment loads and distribution • Natural habitat and open space deterioration from reduced flows	• Reduced flood risk to property and life • Decreased flood insurance costs • Increased aquifer recharge and increased water supply • Reduced runoff and improved water quality • Increased ability to adapt to potential climate change impacts • Decreased dependence on imported water from the Bay-Delta • Decreased energy usage and GHG emissions associated with imported water	• None identified	• Increased Bay-Delta water supply and associated environmental impacts

Table 7-4: Impacts and Benefits Related to Habitat and Open Space Objectives

Objective	Within IRWM Region		Inter-Regional	
	Potential Impacts	Potential Benefits	Potential Impacts	Potential Benefits
Support water needs of open space/ recreational/ migratory habitat areas	• Restricted land use and development • Decreased water supply available for other uses	• Protected native and endangered species • Improved water quality • Balance the needs of environmental resources and communities	• None identified	• Protected native and endangered species
Support protected habitats	• Limited urban land use development • Restricted agricultural practices • Reduced revenue associated with limiting land use	• Protected native and endangered species • Prevented habitat loss and land degradation • Improved recreation, education, water quality, water supply and flood control	• None Identified	• Protected native and endangered species

Table 7-5: Impacts and Benefits Related to Land Use Objectives

Objective	Within IRWM Region		Inter-Regional	
	Potential Impacts	Potential Benefits	Potential Impacts	Potential Benefits
Maintain agricultural land uses	- Limited urban land use development - Reduced revenue associated with limiting land use	- Support of the regional economy - Decreased impervious areas and associated flooding issues	None identified	None identified
Improve integrated land use planning to support water management	Reduced revenue associated with limiting land use	- Support of the regional economy - Improved water supply, water quality, flood control, habitat and recreation benefits	None identified	None identified

Table 7-6: Impacts and Benefits Related to the Climate Change Objective

Objective	Within IRWM Region		Inter-Regional	
	Potential Impacts	Potential Benefits	Potential Impacts	Potential Benefits
Mitigate against climate change	Increased costs associated with implementing mitigation actions	- Improved air quality associated with GHG emission reductions - Abatement of potential impacts of climate change - Support of local renewable energy industry	None identified	- Improved air quality associated with GHG emission reductions - Abate potential impacts of climate change

7.3 Plan Performance and Monitoring

Plan performance and monitoring is critical for measuring IRWM Plan implementation progress and evaluating outcomes relative to the expected benefits. Performance evaluation results are useful for determining whether the Plan effectively meets the needs of the Region and whether strategic changes need to be made. Because the IRWM Plan is a “living document”, the policies and procedures included in the IRWM Plan encourage adaptive management to meet the needs of the evolving Region. These will be adjusted as technology advances, new information becomes available, and climate change impacts manifest. To guarantee long-term success of the IRWM Program, the RWMG is accountable for monitoring Plan performance on an IRWM Plan level, and both the RWMG and project sponsors are responsible for evaluating performance on a project-specific level. This section outlines the procedures for evaluating Plan and project performance, including monitoring and information dissemination.

7.3.1 IRWM Plan Performance and Monitoring

At the IRWM Plan level, performance evaluations ensure that the RWMG is effectively addressing key Regional issues by meeting the IRWM objectives and planning targets. Led by the City of California City, the RWMG will collectively monitor progress towards meeting the IRWM objectives by reviewing the performance measures outlined in **Table 7-7**. Each performance measure identifies at least one data source that can be used to track the planning targets designed to achieve the IRWM objectives.

IRWM Plan performance and monitoring will be conducted by the RWMG prior to each Plan update and documented in the IRWM Plan. The updates will track the progress achieved for each planning target and describe the expected development by the next reporting cycle. Performance findings will be reported on the Fremont Basin IRWM Region website hosted by the City of California City at <http://www.californiacity-ca.gov/CC/index.php/fremont-basin-irwm>. This website will also serve as the Data Management System (DMS) for the Region. Plan performance evaluation results will be presented during Stakeholder Meetings, which will be held semi-annually or more frequently when a plan update is being conducted. The results will help the RWMG and stakeholders report IRWM Program successes as well as identify potential areas for improvement. This information will be used to guide subsequent IRWM Plan updates, including future project acceptance, prioritization, and implementation processes. Review of the Performance Measures will also signal the need to amend the IRWM objectives and account for new data and regional changes.

Table 7-7: Plan Performance Measures

Planning Targets	Indicators	Data Source	Monitoring Responsibility
Water Supply Objective: Increase regional water supply reliability to meet demands			
Increase recycled water use by 2025 compared to 2017	Recycled water supply data	Recycled water customer meters	City of California City
Increase stormwater capture by 2025 compared to 2017	Stormwater capture data	Project Performance Monitoring Plans	Local water purveyors; project sponsors
Provide adequate supply reserves for single-dry (1,300 AFY) and multi-dry (3,000 AF over 3 years) years	Current and projected water supply and demand data	Groundwater pumping records; imported water records	Local water purveyors
Maintain conservation programs	List of regional conservation programs	Conservation program data; UWMPs	Non-governmental organizations, local water purveyors
Identify infrastructure at risk of being compromised by 2020	List of infrastructure at risk	Capital Improvement Programs	Local water purveyors
Adapt to climate change impacts on runoff and recharge, and from sea level rise	Increase in local supply development projects	Project Performance Monitoring Plans, UWMPs	Local water purveyors; project sponsors; City of California City
Water Supply Objective: Ensure sustainable use of the Fremont Valley Groundwater Basin			
Begin developing a GSA and GSP for the Fremont Valley Groundwater Basin by 2019	GSP development status	Notes from preliminary GSA development meetings	City of California City
Define the safe yield of the Fremont Valley Groundwater Basin by 2027	Safe yield quantification	GSP	GSA
Manage the Fremont Valley Groundwater Basin such that the 10-year average change in groundwater levels is zero.	Groundwater level data	CASGEM and USGS well level data; GSP	GSA
Water Quality Objective: Provide drinking water that meets regulatory requirements and customer needs			
Meet Federal and State water quality standards as well as customer standards for taste and aesthetics throughout the planning period on an ongoing basis	Drinking water quality data	Consumer Confidence Reports	Local water purveyors

Planning Targets	Indicators	Data Source	Monitoring Responsibility
Water Quality Objective: Protect water quality in groundwater basins in Region			
Prevent degradation of groundwater basins according to Basin Plan	Groundwater quality data	SNMP Monitoring Plans; GeoTracker GAMA	RWMG
Map contaminant sites and movement in the Fremont Valley Groundwater Basin by 2027	Map of pollutant locations and transport	GSP	GSA
Flood Management Objective: Reduce negative impacts of stormwater			
Identify areas of highest flood risk in the Region by 2018	Map of flood risk areas	FEMA maps	RWMG
Implement projects to provide flood protection to existing and future planned properties where benefits exceed costs	Projects implemented	IRWMP	RWMG
Implement integrated, multi-benefit flood management projects, when feasible	Projects implemented	IRWMP	RWMG
Habitat and Open Space Objective: Support water needs of open space/recreational/ migratory habitat areas			
Maintain multi-benefit use of Central Park Lake and other water habitat for species	List of Central Park Lake uses	California City General Plan	City of California City
Habitat and Open Space Objective: Support protected habitats			
Support existing protected habitats including the Fremont Valley Ecological Reserve	Number of acres of protected habitats preserved or improved	Land use maps, satellite imagery; City and County General Plans,	RWMG
Land Use Objective: Maintain agricultural land uses			
Support limited agricultural land uses	Number of acres of agricultural lands in active rotation	CropScape, Annual satellite imagery; Kern County General Plan; California City General Plan	City of California City; RMWG
Land Use Objective: Improve integrated land use planning to support water management			
Positive participation of Kern County and municipalities at public meetings; increased correspondence	Public meeting and correspondence contact logs	Public meeting attendance; other correspondences with Kern County	City of California City

Planning Targets	Indicators	Data Source	Monitoring Responsibility
<i>Climate Change Objective: Mitigate against climate change</i>			
Implement mitigation strategies, when possible, that reduce energy consumption, ultimately reducing GHGs	Energy usage data; GHG emission data; mitigation strategies implemented in projects	IRWMP; project work plans	RWVG
Support carbon sequestration and using renewable energy, when possible, to support regional objectives	Sequestration and renewable energy projects	IRWMP; project work plans	RWVG
Consider strategies adopted by CARB in its AB 32 Scoping Plan when developing projects to meet objectives	CARB strategies implemented	IRWMP; project work plans	RWVG

7.3.2 Project-Specific Performance and Monitoring

On a project-specific level, performance reporting ensures that the RWMG implements the projects adopted and prioritized in the IRWM Plan and that each project complies with applicable laws, permits, and rules. The RWMG closely monitors implementation projects through all stages of development. Results from project-specific monitoring efforts will be used to improve the RWMG's ability to implement projects and ensure that the IRWM objectives can be met.

For grant-funded projects, sponsors are responsible for developing project-specific monitoring plans and monitoring activities prior to or in conjunction with project implementation. The project-specific monitoring plans will include monitoring activities to determine if the project is making progress towards meeting its intended benefits and to ensure that each project is monitored to comply with all applicable rules, laws, and permit requirements. Once completed, monitoring plans must be submitted to the RWMG for review. The monitoring data and plans submitted by project sponsors will be made publicly available on the City of California City website. Project sponsors must submit data collected and analysis performed as part of the performance monitoring plans submitted annually to the RWMG and appropriate statewide databases, along with required documentation and an evaluation of project performance. The City will be responsible for maintaining the DMS, and will require agencies submitting data for inclusion in the DMS to describe the quality assurance/quality control measures (QA/QC) used in developing the data, as described in *Section 7.4.4: Data Collection and Dissemination*.

Project sponsors are required to provide the following information in their project-specific monitoring plans:

- Description of what is being monitored for each project, in a table format
- Measures to address problems encountered during monitoring
- Location of monitoring
- Monitoring frequency
- Monitoring protocols and methodologies, including who will perform the monitoring
- Procedures to document monitoring data and a detailed strategy for incorporating the collected data into statewide databases
- Procedures for maintaining a monitoring schedule
- Measures for ensuring that adequate resources are available to maintain monitoring of the project throughout the scheduled monitoring timeframe

7.4 Data Management

The Data Management section is intended to promote the efficient use of available data, describe stakeholder access to data, and confirm that the data generated by IRWM implementation activities can be integrated into existing State databases.

To this end, the Fremont Basin IRWM Region has established data management practices for the IRWM Plan to be followed for projects and programs implemented as part of the IRWM program. Projects and programs implemented outside of the IRWM Program are encouraged to follow similar

protocols to maximize usefulness and compatibility of data collected throughout the Region, and to improve potential integration into statewide databases. The following sections identify existing monitoring efforts, regional data needs, and expected reporting procedures.

7.4.1 Existing Monitoring Efforts

There are several existing, ongoing monitoring efforts in the Region being implemented by State, local public, and local private entities to monitor compliance with existing regulations. The various existing monitoring programs are described below.

Groundwater Quality

Public Agencies

Groundwater quality is currently monitored by various public water purveyors in the FVGB (the City, MPUD, RCWD, Rancho Seco Inc., and Cal Water) to meet regulatory requirements, including drinking water regulations enforced by the California Department of Public Health, the SWRCB Division of Drinking Water, and the Kern County Environmental Health Department. The Kern County Water Well and Small Water Systems Program ensures that the public receives water that is safe to drink and the quantity supplied is adequate to meet the community's needs. The Water Well Program issues permits to construct, reconstruct, and destroy water wells. The Small Water System Program is involved with the permitting, inspection, and monitoring of small public water systems and the evaluation of the construction and water quality of existing water wells.

Geotracker-GAMA

The Geotracker- GAMA groundwater information system is California's comprehensive groundwater quality monitoring program that was created by the SWRCB in response to the Groundwater Quality Monitoring Act of 2001. The SWRCB was required to incorporate and display existing water quality data through a publicly accessible interactive online map from various monitoring programs throughout the State. Geotracker-GAMA is based on interagency collaboration with the SWRCB, Regional Water Boards, DWR, Department of Pesticide Regulations, USGS, and Lawrence Livermore National Laboratory. It also relies on cooperation from local water agencies and well owners.

Data reporting frequencies under Geotracker-GAMA range from every three years, to annual, to quarterly, depending on the well and constituent. In the FVGB, groundwater quality is monitored by public agencies at their wells in addition to the data reported on the Geotracker-GAMA online website.

USGS

In addition to the Geotracker-GAMA website, USGS maintains water quality data for groundwater basins in the National Water Quality Information System. USGS reports concentration values every three years. Most readings are taken in August.

Groundwater Levels

CASGEM

The CASGEM program was developed by DWR to track seasonal and long-term trends in groundwater elevations in California's groundwater basins and establish collaboration between local monitoring parties and DWR. The CASGEM program builds upon the many previously established local long-term groundwater monitoring and management programs to track seasonal and long-term groundwater elevation trends statewide.

The CASGEM website provides data for over 250 wells through 2010, but groundwater elevation monitoring occurs on a voluntary basis. Currently, the FVGB is categorized as a low priority basin and the majority of the FVGB is not covered by a GSA. The majority of reported wells have USGS and DWR listed as the monitoring agency. Data are generally reported annually and semi-annually.

USGS

Existing water levels are currently monitored by the USGS for many wells within the FVGB and data are reported on the USGS website <https://nwis.waterdata.usgs.gov/ca/nwis/gwlevels>. Data are reported annually to semi-annually, depending on the well.

Drinking Water Quality

Safe Drinking Water Act compliance monitoring and reporting

All public water systems are required to comply with the Safe Drinking Water Act. Specific monitoring is required and conducted regularly and reported to the SWRCB Division of Drinking Water. Monitoring information is published annually in Consumer Confidence Reports.

Water Supply and Demands

UWMPs

The Urban Water Management Planning Act requires urban water suppliers to prepare an UWMP every five years that summarizes current and projected water supplies and demands. UWMPs are required of every urban water supplier that either provides over 3,000 AF of water annually or serves more than 3,000 urban connections. California City, AVEK, and Cal Water are the only urban water suppliers serving enough water to need to prepare an UWMP.

Land Use Trends

CropScape

The USDA monitors land cover to provide agricultural acreage estimates to the Agricultural Statistics Board. Crop-specific land cover data is collected on an annual basis using satellite imagery and extensive agricultural ground truth. The geospatial data is publicly available on the CropScape website.

USGS

The Gap Analysis Project (GAP) led by the USGS provides detailed information about the land use patterns and vegetation throughout the United States. Digital maps are derived from satellite imagery, models, existing projects, and public data. The land use datasets are available on the USGS GAP Land Cover online data portal.

Google Earth

Google Earth is an interactive online tool developed by Google that shows three-dimensional landscapes throughout the world. Geospatial data is developed using satellite imagery, aerial photography, and GIS data. Google Earth data are available for years since the mid-1980s and is often used to monitor land use and land cover changes. The land use datasets are available on the Google Earth online portal.

7.4.2 Data Needs

Throughout the Fremont Basin IRWM Region, a variety of local, state, and federal agencies and non-governmental organizations collect data, but those data are not assembled in a uniform or

collaborative manner, and in many cases are neither compatible nor comparable. Many of the gaps discussed here are related to a need for regional, integrated planning and associated data support strategies. The local agencies in the Region have limited resources to support detailed and thorough monitoring programs and studies; they are in need of additional funding sources to improve existing monitoring efforts and to support future data collection, analysis, management, and dissemination. The Fremont Basin Region's IRWM planning process can help facilitate better information sharing and identify data needed by the Region's agencies and organizations, project proponents, and stakeholders to more efficiently analyze and understand water resource and environmental conditions within the Region.

Since a primary purpose of IRWM planning is to provide that regional focus, it is expected that this assessment of gaps will be updated and refined substantially over the next several years. Data gaps will continue to be identified through the IRWM program, the groundwater management and salt and nutrient management planning and implementation efforts, and other local and regional planning efforts. In implementing a DMS, the Region will have a single, consolidated location for data which will make identification of data gaps easier and reduce occurrences of unnecessary overlap or duplication of efforts. The DMS will also make it easier to direct users to a comprehensive source of information, increasing the likelihood of knowledge sharing across groups.

The following summarizes the specific data gaps that have been identified throughout the development processes for the 2019 IRWM Plan, the 2018 Fremont Valley Basin GWMP, and the 2018 Fremont Valley Basin SNMP. It is recommended that additional monitoring and studies be conducted to fill in these data gaps.

- Water demands for users served by domestic private wells
- Volume of water loss in municipal systems
- Actual water demands for industrial water users, including the solar, cannabis, and mining industries
- Actual historical and existing agricultural pumping
- Detailed historical and existing agricultural acreage by crop-type
- Consolidated regional data on groundwater levels and quality monitoring
- Consolidated regional data on flooding issues and flood mitigation needs
- Natural groundwater recharge
- Flood volumes and risk

The Fremont Valley Basin SNMP developed and proposed a preliminary monitoring network to monitor and evaluate salt and nutrient constituents in the FVGB. The SNMP monitoring plan proposes to monitor four primary parameters (electrical conductivity, pH, temperature, TDS and nitrate) on an annual basis. Using CASGEM and SGMA monitoring well density guidelines, seven wells from the pool of existing wells were selected for the SNMP monitoring plan. Additional information about the proposed monitoring plan can be found in the Fremont Valley Basin SNMP in Appendix C.

7.4.3 Coordination with Statewide Databases

The State maintains a number of databases for the collection and storage of data, including:

- California Environmental Data Network Exchange
- Water Data Library (WDL)
- GAMA
- CASGEM

To facilitate integration with these statewide databases, the Fremont Basin IRWM Region project proponents will be expected to prepare project-specific monitoring plans that adhere to the data collection techniques and procedures established by relevant statewide databases. This will ensure compatibility of data among projects implemented through the IRWM Program, as well as compatibility with appropriate and relevant statewide databases. As part of submitting data to the Region's DMS, project proponents will be responsible for submitting data to the relevant statewide database(s).

7.4.4 Data Collection and Dissemination

Data will be collected using common, standard techniques appropriate to the type of data collected, collection site conditions, resource availability, and how the data will be analyzed. Data collection techniques are typically described in reports associated with each dataset. All geospatial data collected and maintained by the Region will be accompanied by applicable metadata that describe the data set. Scientifically sound data will be considered for inclusion in the DMS, but methodologies will be the responsibility of the individual organizations. Substantial concerns relating to appropriateness of methodology may be addressed through removal from the DMS, at the discretion of the RWMG. Potential sources of data for the IRWM Program are listed below **Table 7-8**.

Table 7-8: Potential Sources for IRWM Data

Federal	State	Local
National Climate Data Center	California Irrigation Management Information System	Kern County
National Resource Conservation District	Department of Fish & Game	City Planning Departments
Army Corps of Engineers	Department of Public Health	Local Water Purveyors
Bureau of Reclamation	Department of Water Resources	Regional Water Purveyors
Fish & Wildlife Service	State Water Resources Control Board	Kern County Farmer's Bureau
U.S. Geologic Survey	Regional Water Quality Control Board	Stakeholders
National Marine Fisheries Service	California Natural Diversity Database	
U.S. Environmental Protection Agency	California Department of Pesticide Regulation	
U.S. Forest Service		

The City of California City will maintain a centralized DMS on their server, which will house all original data provided by project sponsors. The procedure for submitting data for inclusion in the DMS is as follows:

1. The project sponsor completes monitoring and data collection in accordance with the approved project-specific monitoring plan, including QA/QC procedures.
2. The project sponsor validates data consistent with data validation protocols outlined in the project-specific monitoring plan.
3. The project sponsor “spot-checks” data for accuracy at the time of entry to the database to identify any apparent errors.
4. The project sponsor submits the data to the City of California City for inclusion in the Region’s centralized DMS.
5. The project sponsor submits the data to the appropriate statewide database, as applicable.
6. The project sponsor provides the City of California City with confirmation that the data has been submitted to the appropriate statewide database.
7. The City of California City maintains the data in the centralized database.
8. The City of California City disseminates the data to stakeholders and members of the public through the Fremont Basin IRWM webpage on the City’s website.

Data collected will be compatible with statewide databases because the project-specific monitoring plans will be developed based on guidance provided for applicable statewide databases. Project sponsors will be responsible for submitting data to the appropriate statewide databases, but the City will coordinate with the agencies to confirm submittal has occurred. The DMS will serve the important function of assisting the RWMG in its goal to share collected data by requiring consistent methodologies for data collection and housing all data in a centralized location that is easily accessed by stakeholders and members of the public. Data collection methodologies will be described as part of the project performance monitoring plans as described in *Section 7.3.2: Project-Specific Performance and Monitoring*. In this way, the DMS supports the objectives by improving data comparability and accessibility.

7.5 Financing

This section of the 2019 IRWM Plan documents a plan for implementation and financing of the IRWM Program and IRWM projects included in this Plan. The RWMG understands the importance of identifying, tracking, and applying for funding as a way to help finance the Fremont Basin IRWM Program and implement critical projects in the Region.

7.5.1 Sources of Funding

There are a variety of funding sources available to help support implementation of the projects and programs in Fremont Basin IRWM Plan. These funding sources include operating funds, ratepayers’ assessments/fees/taxes, and local, State, federal grant and loan programs. With a wide range of funding sources available to formulate, maintain, and implement the Fremont Basin IRWM Plan, it is critical for the RWMG to understand current funding opportunities and track other opportunities that may become available in the future. New funding sources, particularly at the state level, are continually added as climate change and drought continue to have impacts on California’s water resources. **Table 7-9** below provides a summary of the funding opportunities that are available to the Region at the time of the IRWM Plan development. While some of these opportunities are available on an ongoing basis, many are dependent on forthcoming financial support from measures like the Proposition 1 Water Bond and the Proposition 68 Parks, Environment, and Water Bond.

Table 7-9: Fremont Basin IRWM Funding Opportunities

Funding Mechanism	Funding Administrator	Funding Description
Local / Regional Sources		
Capital Improvement Program Budgets	IRWM Project Sponsor	Funds project costs through Capital Improvement Program (CIP) budgets prepared and adopted by implementing agencies. CIP projects may also be funded, in part, by outside grants or financial assistance.
Private Grants	Foundations or Businesses	Tends to support environmental or restoration projects; Region would only be eligible if the Fremont Basin IRWM Program establishes itself as a 501(c)(3) organization.
Water User Rates	Water Purveyor	Funds projects from construction through operation and maintenance. This source is contingent upon the individual users' willingness to pay.
Taxes or Special Assessments	City or County	Contributes funding to IRWM implementation projects from construction through operation and maintenance. This source is contingent upon residents voting for an increase in taxes or a special assessment to support a project.
State Sources		
CalConserve Water Use Efficiency Revolving Fund	DWR	Provides grant funds for water efficiency upgrades, or low-interest loans to repair or replace water pipes to conserve water.
Clean Water State Revolving Fund (CWSRF)	SWRCB	Provides below-market rate financing to assist communities in preventing pollution of water resources. Eligible projects include but are not limited to the construction of publicly-owned treatment facilities, the implementation of nonpoint source projects to address pollution, and the development and implementation of estuary comprehensive conservation and management plans.
Drinking Water State Revolving Fund (DWSRF)	SWRCB	Provides low-interest loans and technical assistance to eligible entities for water system infrastructure improvements to correct system deficiencies and improve drinking water quality. Projects eligible for funding include treatment systems, distribution systems, interconnections, consolidations, pipeline extensions, water sources, water meters, and water storages.
Groundwater Sustainability Grant Program	SWRCB	Funds projects that prevent and clean up contamination of groundwater that serves as a source of drinking water. Three types of projects eligible for funding include: 1) planning/monitoring, 2) implementation projects, and 3) drinking water treatment.
Infrastructure State Revolving Fund Program	California Infrastructure and Economic Development Bank	Provides financing to public agencies and non-profit corporations, sponsored by public agencies, for a wide variety of infrastructure and economic development projects. Loans are available for the useful life of the project up to a maximum of 30 years.

Fremont Basin Integrated Regional Water Management Plan

Funding Mechanism	Funding Administrator	Funding Description
IRWM Grant Program - DAC Involvement Grant	DWR	Funds projects that support disadvantaged community (DAC) planning and project implementation. Applications are submitted by Funding Area (not IRWM Region) and require IRWM Regions to collaborate and disperse funds among the Regions in a Funding Area.
IRWM Grant Program - Planning Grant	DWR	Supports the development of a new IRWM Plan or the update of an existing IRWM Plan.
IRWM Grant Program - Implementation Grant	DWR	Funds implementation of programs and projects that are included in an existing IRWM Plan.
Site Cleanup Subaccount Program	SWRCB	Funds projects that remediate the harm or threat of harm to human health, safety, or the environment caused by existing or threatened surface water or groundwater contamination. Eligible projects may include site characterization, source identification, or cleanup implementation to remediate human-made contaminants.
Stormwater Grant Program	SWRCB	Funds stormwater-related projects, including green infrastructure, rainwater and stormwater capture, and stormwater treatment facilities. Projects must be included in a SWRP and in an adopted IRWMP to be eligible.
Water Recycling Funding Program	SWRCB	Promotes the beneficial use of treated municipal wastewater in order to augment fresh water supplies by providing technical and financial assistance in support of water recycling projects and research. Two types of grants offered include: 1) planning grants, and 2) construction grants.
Federal Sources		
Community Development Block Grants	U.S. Department of Housing and Urban Development	Funds local community development activities that expand economic opportunities, principally for low and moderate-income areas. The program can fund drinking water and wastewater projects.
Rural Development Water and Environmental Program (WEP)	USDA	Offers rural communities (populations < 10,000) funds to develop, construct, or improve water and wastewater infrastructure.
Title XVI Water Recycling and Reclamation Program and WIIN Subset of Title XVI	USBR	Provides grants for construction of water recycling treatment conveyance facilities, including planning, design, and construction costs.
Water & Waste Disposal Loan & Grant Program	USDA Rural Development	Provides funding for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and storm water drainage to households and businesses in eligible rural areas.

Funding Mechanism	Funding Administrator	Funding Description
Water Infrastructure Finance and Innovation Act (WIFIA)	US EPA	Establishes a new financing mechanism to accelerate investment of water infrastructure. Eligible projects include but are not limited to projects that are eligible for the DWSRF and CWSRF programs, aquifer recharge, and water recycling projects.
WaterSMART Water & Energy Efficiency Grants	USBR	Provides cost-shared funding for projects that save water; increase energy efficiency and the use of renewable energy in water management; support environmental benefits; mitigate conflict risk in areas at a high risk of future water conflict; and accomplish other benefits that contribute to water supply sustainability in the western United States.

7.5.2 Financing Plan

Given the low-density development and high coverage of DACs and SDACs in the Fremont Basin IRWM Region, project financing has proven to be a major obstacle to project implementation in the past. Demands on limited funds continue to increase, construction costs continue to rise, and existing aging infrastructure requires upgrades to reduce water loss, increase reliability and meet growing demands. In this economic climate, agencies are challenged to balance costs associated with supplying water for new growth while ensuring the highest standards of water quality and supply reliability for existing customers, protecting and enhancing the sensitive ecosystems within the Region, and minimizing costs incurred by end-users. Further, ongoing support and financing of the O&M of projects in this Plan must be considered in addition to one-time planning and construction costs.

The Fremont Basin RWMG understands the importance of considering, at a programmatic level, a financing plan for the IRWM Program to deal with these challenges. Grant and loan programs will likely be an important source of implementation funding for the Region, supported by local sources as noted in **Table 7-9**. Funds for ongoing operation and maintenance costs are expected to derive from many of the same local sources that are identified to fund project implementation, including operating budgets, user rates, and fees and assessments.

The financing plan for any project must be considered prior to implementation. For instance, O&M costs of a proposed implementation project should be evaluated as the overall viability of the project effort is determined. Any project that is advanced for implementation should include an analysis to determine the ability to operate and maintain the project and project benefits over the anticipated life of the project. A determination of the annual fiscal impact on user rates, and the willingness of ratepayers to accept any increased cost of service as may be required for project implementation, should be included in this analysis. The need for water and the economic hardship impacts that would occur, should the new source not be available, may also be considered as part of the analysis. Any benefits derived from replacing and/or updating existing systems can also be considered. The certainty and source of O&M funding for projects will be dependent on the particular project and project proponent. Potential sources of O&M funding for projects include project sponsors' operating budgets and user rates, but the certainty of these funds would be contingent upon funds allocated to operating budget and the customers' willingness to pay.

Table 7-10 on the following page outlines the financing plan for the IRWM Plan, and includes the approximate cost, funding source, and funding certainty for the various IRWM activities.

Table 7-10: Fremont Basin IRWM Plan Financing Plan

Activity	Approximate Total Cost	Funding Source	Funding Certainty/Longevity
IRWM Planning Efforts			
Initial IRWM Plan Development	\$880,000	In-Kind: RWMG Agencies Funds: RWMG Agencies, Prop 1 IRWM Planning Grant	Secure through spring 2019
Future IRWM Plan Updates	\$120,000	In-Kind: RWMG Agencies Funds: RWMG Agencies, IRWM Planning Grants	Local funds relatively secure but contingent upon agency staff allocations and operating budgets; grant funds less secure and contingent upon future grant programs and success of funding applications
IRWM Program Management			
RWMG Meetings	8 hrs/pp/quarter	In-Kind: RWMG Agencies	Funds relatively secure but contingent upon agency staff allocations
Outreach and Communication	48 hrs/year	In-Kind: RWMG Agencies Funds: RWMG Agencies	Funds relatively secure but contingent upon agency staff allocations and operating budgets of RWMG members
Data Management	120 hrs/year	In-Kind: RWMG Agencies Funds: RWMG Agencies	Funds relatively secure but contingent upon agency staff allocations and operating budgets of RWMG members
Project Review	12 hrs/year	In-Kind: RWMG Agencies Funds: RWMG Agencies	Funds relatively secure but contingent upon agency staff allocations and operating budgets of RWMG members
Funding Procurement			
Funding Applications	Cost varies by type of application and number of projects	In-Kind: RWMG; Project Sponsors Funds: RWMG; Project Sponsors	Many funding programs available, but securing funds is contingent upon on-going agency staff allocations and sponsor's operating budgets
Funding Management	Cost varies by funding type and number of projects	In-Kind: RWMG; Project Sponsors Funds: Project Sponsors	Contingent upon on-going RWMG and agency staff allocations and sponsor's operating budgets
Project Implementation			
Project Implementation	Cost varies by type and scale of project	In-Kind: Project Sponsors Funds: Project Sponsor; Local, State, and/or Federal Funding Programs	Contingent upon on-going agency staff allocations, and sponsor's Capital Improvement Program budgets as well as continued success in obtaining future grant funds

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Prepared with assistance from Woodard & Curran





Appendix I: County of Kern Multi-Jurisdiction Hazard Mitigation Plan

City of California City 2025 Urban Water Management Plan



KERN COUNTY

MULTI-JURISDICTION HAZARD MITIGATION PLAN

PARTICIPATING JURISDICTION ANNEX

MUNICIPALITY



CITY OF CALIFORNIA CITY



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Kern County

Multi-Jurisdiction Hazard Mitigation Plan

CITY OF CALIFORNIA CITY (CC.)

Municipal Participating Jurisdiction Annex

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Adoption Record

To comply with DMA 2000, the County Board of Supervisors and participating jurisdictions have officially adopted this Kern County Multi-Jurisdictional Hazard Mitigation Plan Volume 1 and Volume 2. The adoption of the MJHMP in its entirety recognizes the jurisdictions' commitment to reducing the impacts of natural hazards within the County and Cities. See below record of adoption.



Section 1. City of California City

1.1 Purpose

This Annex details the hazard mitigation planning elements specific to the City of California City. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document. As such, all sections of the umbrella plan, including the planning process and other procedural requirements apply to and were met by the City of California City. This Annex provides additional information specific to the City of California City, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community.

Hazard Mitigation Plan Point of Contact

Primary Point of Contact

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e-mail Address: citymgr@californiacity-ca.gov

1.2 Planning Methodology

The City of California City followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 1-1.

Table 1-1: Planning Committee Members

Planning Committee Members	Department
Jeremy Kosick	Fire Chief / Fire Marshal
Anna Linn	City Manager
David Orr	Fire Captain / Paramedic
Riuss Jensma	Administrator / EOC Coordinator

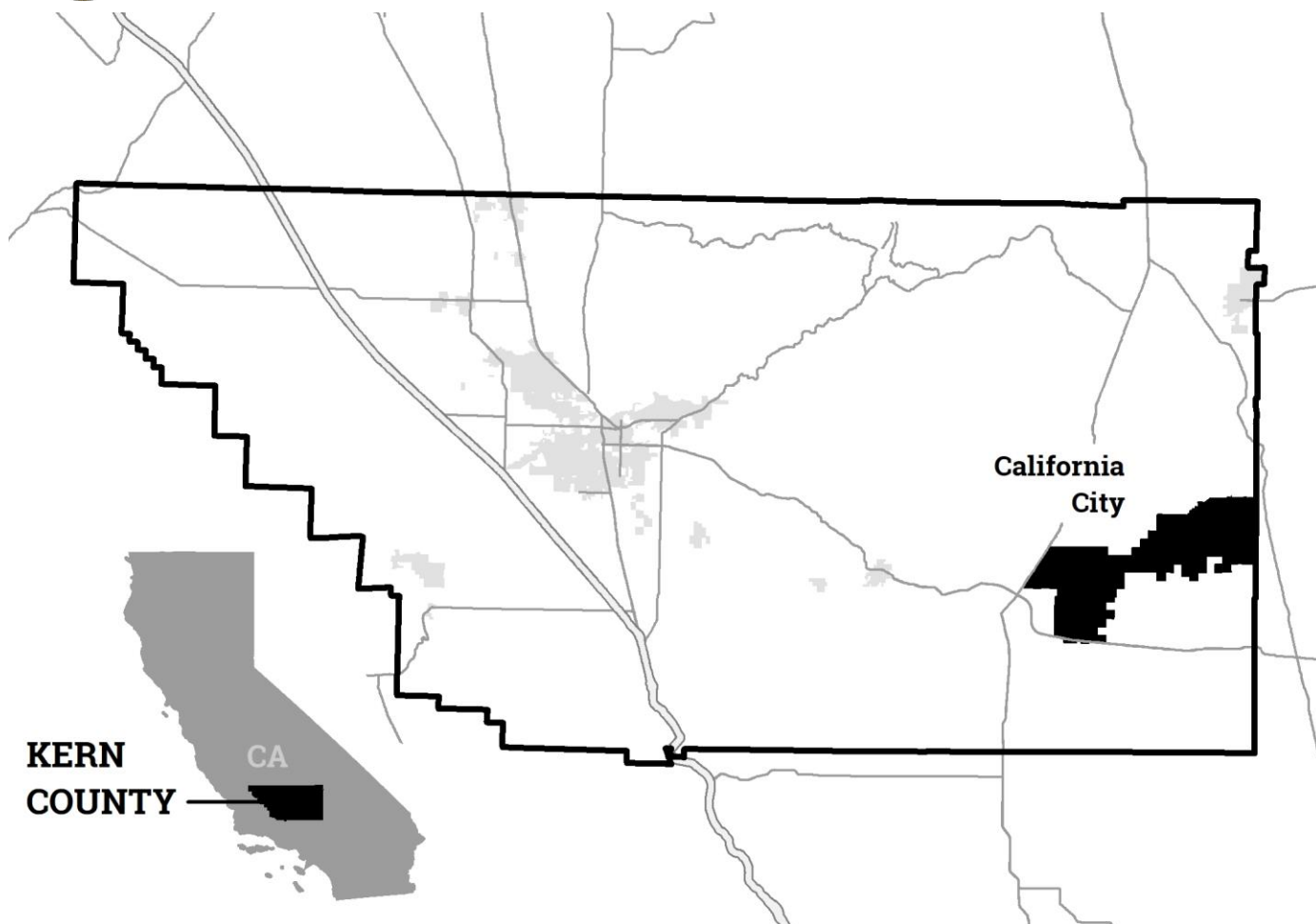


Figure 1-1 City of California City Location

1.3 What's New

The City of California City has been making improvements toward reducing natural hazard risks to life and property since the existing MJHMP was adopted.

The City reevaluated previous mitigation actions. Some mitigation actions have been completed and are highlighted in Table 1-3. The City determined to cancel some due to reprioritization, lack of funding, or other listed reasons. Table 1-2 lists those cancelled mitigation actions along with an explanation for why. Other mitigation actions are pending or ongoing and are included in Table 1-12.



Table 1-2 Cancelled Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Reason Cancelled
ma-FL-CC-159	Flood	Cancelled	2005	City of California City	Culvert Replacement: Randsberg-Mojave Road, North end of Cache Creek drainage	California City / Kern County Road and Bridge	Not a priority at this time.
ma-FL-CC-160	Flood	Cancelled	2005	City of California City	Culvert Replacement: California City Blvd, West end for Cache Creek drainage from Highway 14.	California City/ Kern County Road and Bridge	Not a priority at this time.
ma-FL-CC-74	Flood	Cancelled	2014	City of California City	Continue to Implement Sound Floodplain Management Practices through Participation in the National Flood Insurance Program	City of California City Public Works Department	Not a priority at this time.

1.3.1 Mitigation Successes

Table 1-3 displays multiple important mitigation actions that have been completed by the City of California City. Some of the City's success stories are described in more detail herein.

Table 1-3 Completed Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Responsible Party
ma-FL-CC-23	Flood	Completed	2014	City of California City	Culvert Replacement California City Blvd, North, and South end for Cache Creek drainage.	California City Public works
ma-FL-CC-24	Flood	Completed	2014	City of California City	Levee re-enforcement @ Cache Creek	California City Public Works
ma-FL-CC-25	Flood	Completed	2014	City of California City	Deepen Cache Creek to the depth at highway 14 and also provide cement to allow the flow to increase	California City Public Works
ma-EQ-CC-161	Earthquake	Completed	2017	City of California City	Replace or retrofit un-reinforced masonry Fire Station at 20890 Hacienda	California City



California City built a new Fire Station, displayed in Figure 1-2, that opened on July 1, 2017. Fire Station 19 was built with hazard resilient materials and was funded by the City's General Fund.

1.4 Risk Assessment

The intent of this section is to profile the City of California City's hazards and assess the City's vulnerabilities, distinct from that of the County wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.



Figure 1-2 New California City Fire Station

1.4.1 Hazard Screening Criteria

Planning Team members from each participating jurisdiction collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 1-4. Detailed hazard profiles of the most significant County wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously-prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the City of California City. Table 1-5 provides a crosswalk of hazards identified in Vol. 1 of this plan, the City of California City General Plan, and 2018 California State Hazard Mitigation Plan. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to the City of California City and which ones were not. Section 1.4.2 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to the City of California City.



Table 1-4. Hazard Prioritization

Hazard Type	Explanation
Climate Change	High priority county wide, profiled as part of Flood, Wildfire, and Severe Weather hazard.
Dam failure	High priority county wide, profiled hazard.
Drought	High priority county wide, profiled hazard
Dust Storms	High priority county wide; profiled as part of Severe Weather
Earthquake/ Geologic Hazards	High priority county wide, profiled hazard
Extreme Heat	Profiled as part of Severe Weather hazard
Extreme Cold	Extreme cold is rare in Kern County and not profiled in this plan
Flood	High priority county wide, profiled hazard
Hail	Hail events are rare in Kern County and not profiled in this plan
Fog	While fog events do occur within Kern County, they are rare and are not considered a priority
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this Plan.
High Winds/ Straight Line Winds	High priority county wide, profiled as part of Severe Weather
Insect Hazards	While insects including Africanized honey bee and pine bark beetle exist in Kern County, this was not considered a priority and pests are not profiled in this plan
Levee Failure	High priority county wide, profiled as part of Dam Failure
Lightning	Lightning was not identified as a priority for this plan.
Pandemic Disease	While pandemic disease can impact the County, there are better avenues to address this hazard outside this plan.
Radon	This hazard was not identified as a priority
Severe Thunderstorm	Severe thunderstorms are rare in Kern County and not profiled in this plan.
Slope Failure	High priority county wide, profiled hazard
Soil Hazards	High priority county wide, profiled hazard
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	High priority county wide, profiled hazard
Winter Storm / Freeze Events	Profiled as part of Severe Weather hazard



Table 1-5 Document Review Crosswalk

Hazards	2014 Kern County MJHMP	2009 California City General Plan	2009 Kern County General Plan	2018 California State HMP
Agricultural Pests				■
Climate Change	■			■
Dam Failure	■		■	■
Drought	■	■		■
Earthquake	■	■	■	■
Flood	■	■	■	■
Insect Hazards	■			
Landslide	■	■	■	■
Levee Failure	■			■
Manmade Hazards			■	■
Pandemic Disease	■			■
Sea Level Rise				■
Severe Weather	■			■
Soil Hazards	■	■	■	
Terrorism & Tech Hazards				■
Tsunami				■
Volcano	■			■
Wildfire	■		■	■

1.4.2 Hazard Risk Ranking

The City of California City's Planning Team used the same hazard prioritization process as the Kern County Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 1-3 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess the City of California City's vulnerability to the following hazards:

- severe weather (high wind, freezing weather, high heat)
- earthquake

All of these hazards have been profiled in Vol. 1 of this document. The purpose of this annex to specifically address the City of California City's vulnerability to these specifically-identified hazards.



1.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the City of California City are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.

1.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 1-3 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Kern County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to the City of California City. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics.

1.4.3.2 Snapshot Exposure Maps

The included snapshot maps, displayed below in Figure 1-5 through Figure 1-7, illustrate the City of California City's vulnerability to specific hazards. Figures include:

- Figure 1-5: California City 30-Yr Normal Minimum Temperature for January
- Figure 1-4: California City 30-YR Normal Maximum Temperature for July
- Figure 1-6: California City Annual Average Wind Speed (Power Class)
- Figure 1-7: California City EQ S San Andreas Mojave N. Vulnerability & Exposure Snapshot

Based on the above risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard.



Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY	Highly Likely	Highly likely - 100% annual probability. Or Likely to occur every year in your lifetime.
	Likely	Likely - between 10 & 100% annual probability. Or will occur several times in your lifetime.
	Possible	Possible - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
	Unlikely	Unlikely - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT			
Minor	Limited	Critical	Catastrophic
Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.	Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.	Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.	Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in Vol. 1 of this plan. Some hazards are discussed as subset hazards— e.g., "Dam Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix or are grey in color, the jurisdictional planning team felt the hazard had a minimal footprint within their planning area and was not ranked.

Hazard Information / Legend:



Climate change may change the frequency, duration and intensity of hazards within each planning area. If applicable Climate Change impacts are described at the end of each section.



Alluvial Fan deposits and issues in Kern County. This hazard is profiled and defined under "Slope Failure" in Vol. 1 of this plan.



Soil Stability in Kern County includes Land Subsidence and Wind Erosion. Definitions for each are described in Vol. 1. of this plan.

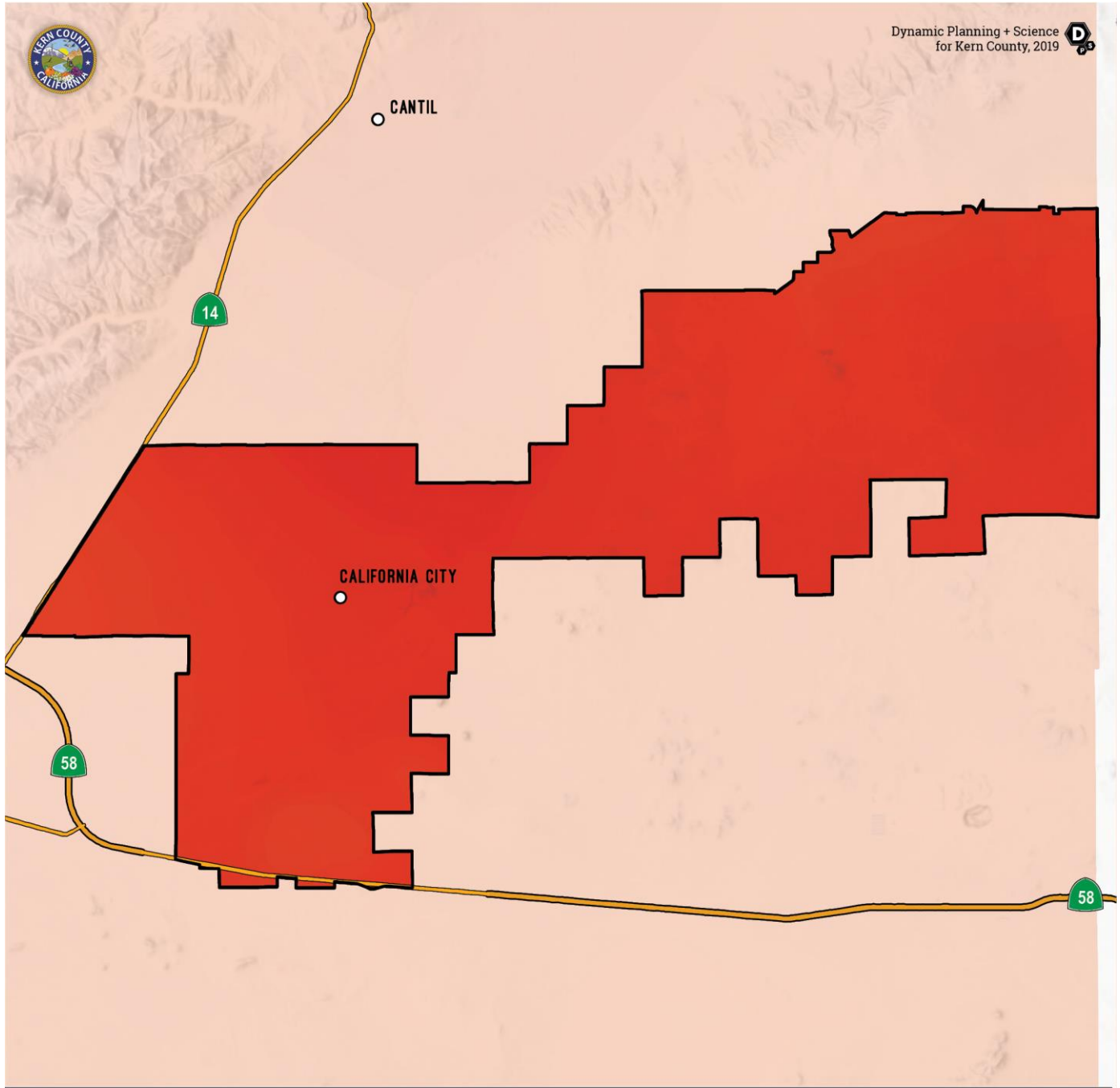


If hazard symbol is grey or not present, the jurisdictional planning team did not develop hazard vulnerability information related to the planning areas due to perceived probability and impact described above.

City Of California City Risk Matrix

		IMPACT			
		Minor	Limited	Critical	Catastrophic
PROBABILITY	Highly Likely	FLOOD	High	Extreme	Extreme
	Likely	Medium	EXTREME WEATHER	EARTHQUAKE	Extreme
	Possible	Low	SOIL STABILITY	High	High
	Unlikely	DAM FAILURE DROUGHT CLIMATE CHANGE SLOPE FAILURE WILDFIRE	Low	Medium	Medium

Figure 1-3: City of California City Risk Assessment



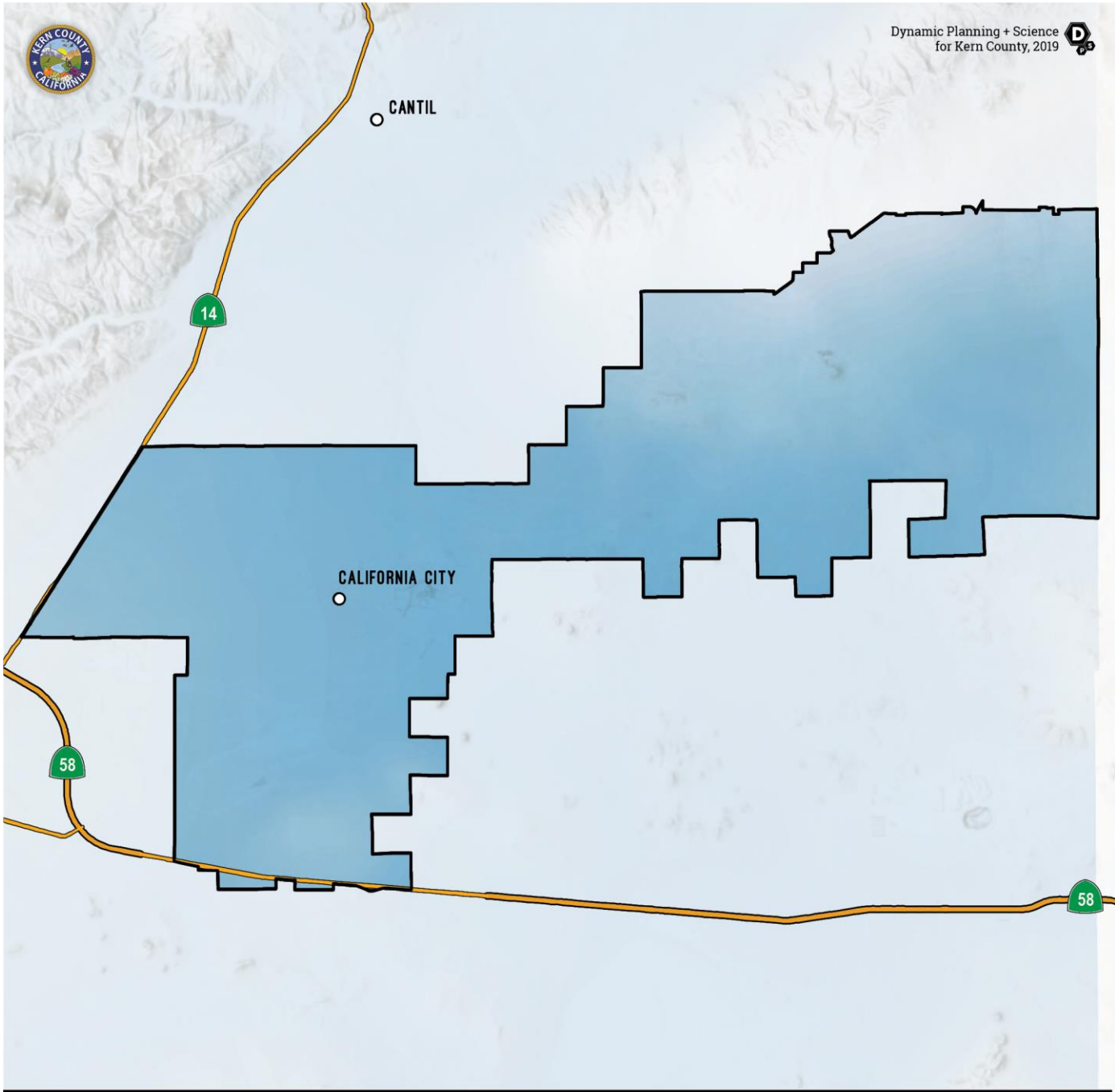
30-YR NORMAL MAXIMUM TEMPERATURE FOR JULY CALIFORNIA CITY

*Data sources: PRISM 800m Resolution 30-YR Normals.

MAP LEGEND



Figure 1-4: California City 30-YR Normal Maximum Temperature for July



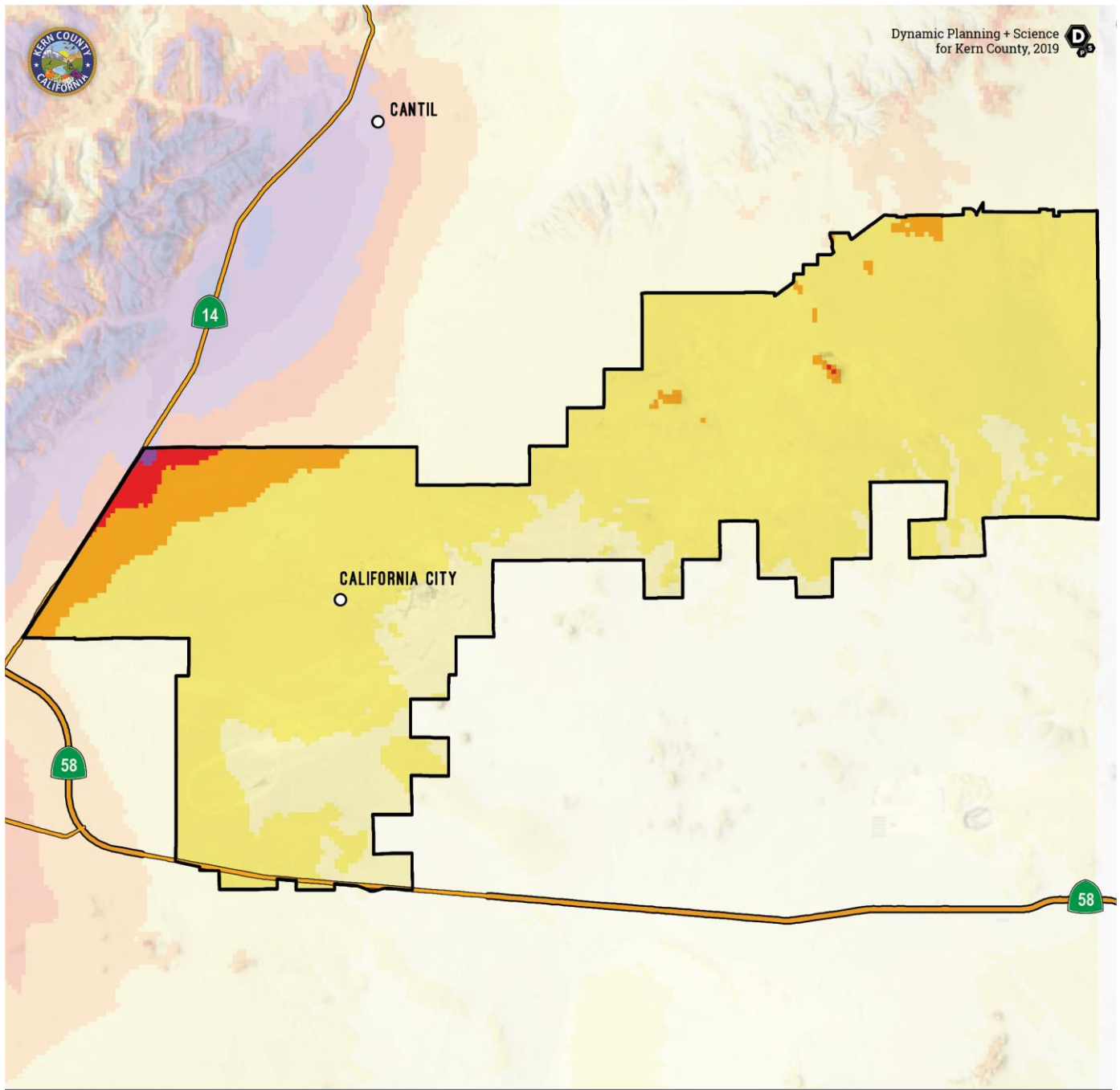
30-YR NORMAL MINIMUM TEMPERATURE FOR JANUARY CALIFORNIA CITY

*Data sources: PRISM 800m Resolution 30-YR Normals.

MAP LEGEND



Figure 1-5: California City 30-Yr Normal Minimum Temperature for January



ANNUAL AVERAGE WIND SPEED (POWER CLASS) CALIFORNIA CITY

*Data sources: NREL.

MAP LEGEND

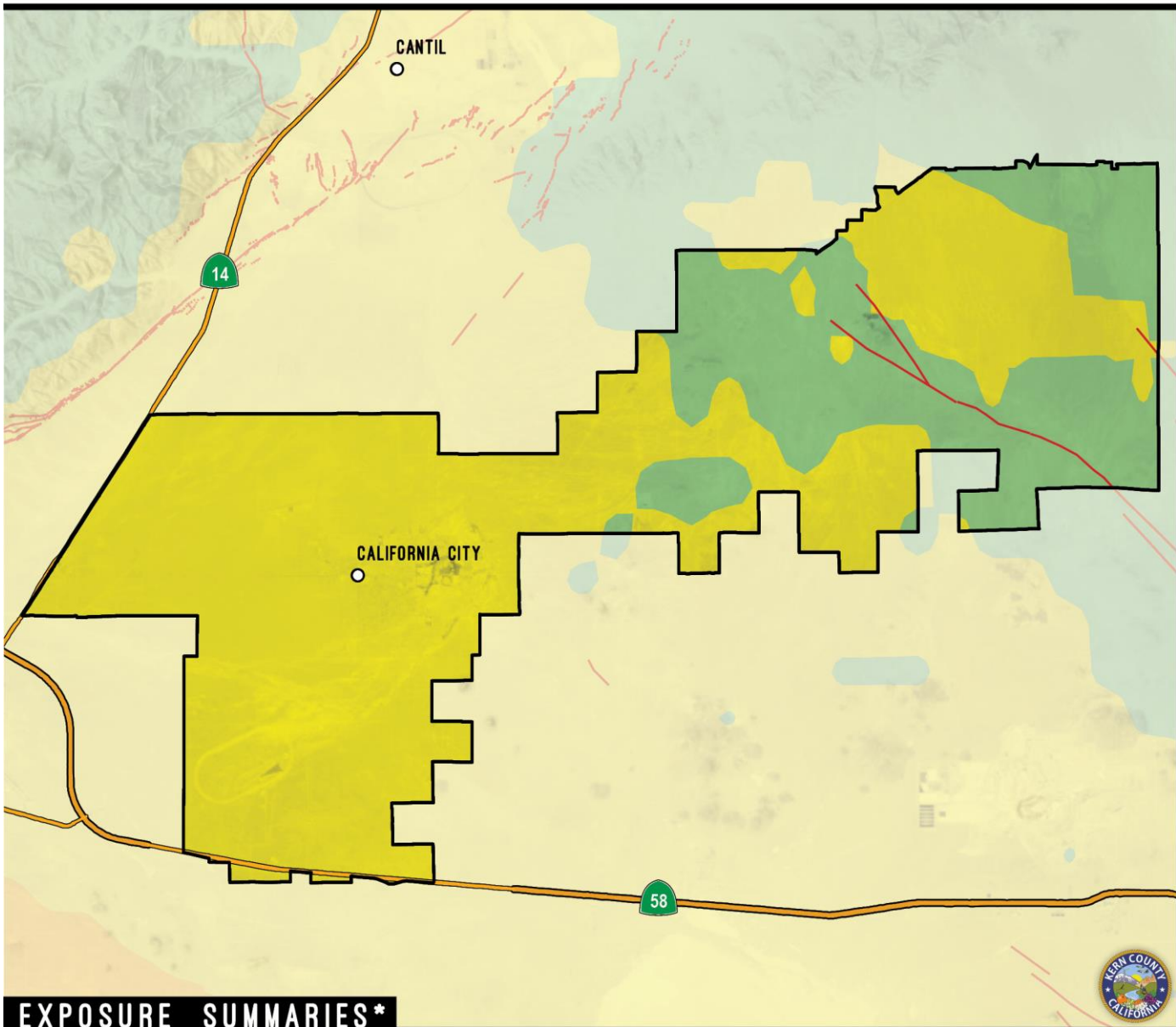


Figure 1-6: California City Annual Average Wind Speed (Power Class)



EQ - S. SAN ANDREAS MOJAVE N. VULNERABILITY & EXPOSURE SNAPSHOT

CALIFORNIA CITY



EXPOSURE SUMMARIES*

POPULATION		PARCEL		PARCEL VALUE		CRITICAL INFRASTRUCTURE																									
COUNT		COUNT		IMPROVEMENT		COUNT																									
9,538	72%	4,587	99%	\$435,670,883	100%	Essential Facilities	2 100%																								
				CONTENT		High Potential Loss	59 71%																								
				\$217,861,942	100%	Transportation & Lifeline	3 100% 677 69%																								
MAP LEGEND <table> <tr> <td>III</td><td>IV</td><td>V</td><td>VI</td><td>VII</td><td>VIII</td><td>IX</td><td>X</td> </tr> <tr> <td>WEAK</td><td>LIGHT</td><td>MODERATE</td><td>STRONG</td><td>VERY</td><td>SEVERE</td><td>VIOLENT</td><td>EXTREME</td> </tr> <tr> <td>MMI</td><td></td><td></td><td></td><td>STRONG</td><td></td><td></td><td></td> </tr> </table>								III	IV	V	VI	VII	VIII	IX	X	WEAK	LIGHT	MODERATE	STRONG	VERY	SEVERE	VIOLENT	EXTREME	MMI				STRONG			
III	IV	V	VI	VII	VIII	IX	X																								
WEAK	LIGHT	MODERATE	STRONG	VERY	SEVERE	VIOLENT	EXTREME																								
MMI				STRONG																											
*Exposure summaries include strong, very strong, and severe MMI classes. Hazard data source: USGS. (%) - Percent of respective category totals for jurisdiction.																															
Dynamic Planning + Science for Kern County, 2019																															

Figure 1-7: California City EQ S San Andreas Mojave N. Vulnerability & Exposure Snapshot



1.4.3.3 Past and Future Development

The City of California City is a general law city that crafts its own development regulations and is subject to State law. Future development is subject to compliance with state and local planning, zoning, subdivision, and architecture laws.

The City of California City's General Plan (GP) establishes long-range development policies. The GP is designed to help the City address issues related to land use, circulation (traffic), housing, open space, conservation, noise, and safety. The Land Use portion of the plan helps guide the City in determining the location of future development(s), including possible future annexation. In addition to the GP, the City has other plans that guide development in specific areas, including specific plans, policy plans, and master plans. These plans help to shape future development and dictate the City's Sphere of Influence (SOI). One of the central functions in these planning documents is to decrease risk of impact from natural hazards.

Development since Previous HMP

The City considered its growth since the last HMP and determined it had completed a central mitigation action and substantially decreased its vulnerability to hazards. The City replaced a culvert, it reinforced a levee, and it deepened Cache Creek to allow for increased water flow. This HMP Annex has been revised to reflect this substantial change in past development and continues to focus on avenues to better mitigate impacts from problematic past development. This is especially important as the District does not regulate future development and instead provides services and infrastructure to such development.

Future Development

City of California City is required to update building codes to meet the minimum standards to those required in the California Building Code last updated in 2019. California Building Codes provide some of the safest construction standards in the world and are meant to reduce risk to occupants from high wind, seismic activity, landslides, flood, wildfire, and other natural hazards. In addition to California minimum develop standards, all jurisdictions belong to the NFIP, as such, all development must meet minimum flood protection standards set forth by FEMA. See Section 4.3.5 of Volume 1 for more information about past and future development in Kern County.

As the General Plan is updated and incorporates information from this HMP, City of California City staff are continually improving hazard information through these hazard mitigation plan updates. With this 2020 update, improved online mapping about natural hazards available on RAMP will inform those responsible for future development to make better decisions where and how future development occurs.

City of California City reviewed its general plans under the capability assessments undertaken for this hazard mitigation plan. See Section 1.5.1. Deficiencies revealed by these reviews are identified as mitigation actions to decrease risks to move beyond past trends.



The City's municipal codes includes regulations to mitigate the impact of hazards on new and existing development, including:

- Drainage and stormwater retention requirements,
- Steep slope restrictions for new development,
- Waterbody buffer requirements,
- Floodplain management regulations,
- Zoning that prevents development in hazardous areas of the community such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas, and
- Building codes that include the most up-to-date California Fire Code, seismic standards, and many other provisions crafted to protect new construction from hazard events.

Even in the event that limited development did occur within a hazard area, the municipal code should ensure impacts from a hazard event are mitigated and losses are minimal. If development does occur in hazard areas, evacuation and emergency planning should take into consideration the anticipated local impacts of the hazard event, including potential interrupted services or the elimination of access.

The anticipated growth in the City will not cause significant change in vulnerability to the City for identified priority hazards.



National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Kern County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principle tool for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of California City has participated in the NFIP since 1982. The City of California City is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 1-6 for more information on the City's policies and historic flood insurance claims.

Table 1-6: NFIP Status Table

NFIP Status	Participating since 1/20/1982
Policies in Force	66
Policies in SFHA	49
Policies in non-SFHA	17
Total Claims Paid	0
Paid Losses	\$ 0
Repetitive Loss Properties	0
Severe Repetitive Loss Properties	0
Repetitive Loss Payment by NFIP on Building	N/D
Repetitive Loss Payment by NFIP on Contents	N/D

Note: N/D signifies no data.

See Volume 1, Section 4.5 for more information on the NFIP.



1.4.4 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 1-8. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 1-7.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 1-12 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 1-7 and Table 1-12.



IMPACT

Casualties
Property Damage
Business Interruption
Financial Loss
Environmental Contamination



VICTIM

School Children in Hazard High Hazard Areas
Care Facilities in High Hazard Area
Vulnerable Population Exposed to hazards



THREAT

Increased Fuels due to drought
Hotter, drier climates
More Intense Storms
Impervious surfaces = greater runoff
Increases of Invasive Species

Figure 1-8. Guidance for Problem Statements



Table 1-7 Problem Statements

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EQ-CC-531	Earthquake	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	City of California City	Older construction and particularly unreinforced buildings within the city will pose hazards during earthquakes.	ma-EQ-CC-161, ma-EQ-CC-162
ps-EQ-CC-532	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	City of California City	An earthquake will cause damage to the City's aging water system. The system will become inoperable due to the fragility of water distribution system.	ma-EQ-CC-581
ps-EQ-CC-533	Earthquake	Impact	ES - Emergency Services , SP - Structural Projects	City of California City	Disruption of the city's power grid. Lack of generators or alternate means of power to critical government and community buildings.	ma-AH-CC-185
ps-EQ-CC-534	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	City of California City	Damage to roadways and transportation corridors. California City only has two main roadways for supplies and emergency resources.	ma-EQ-CC-581
ps-EQ-CC-535	Earthquake	Impact	ES - Emergency Services	City of California City	Local capability overwhelmed by injuries and medical needs. Lack of a local hospital, clinics and medical resources.	ma-AH-CC-580
ps-EQ-CC-536	Earthquake	Victim	PRV - Prevention , PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	City of California City	14,000 residents would be subject to strong shaking resulting from 7.2 earthquake on the San Andreas/Garlock fault.	ma-EQ-CC-581
ps-EQ-CC-537	Earthquake	Threat	PE&A - Public Education & Awareness , ES - Emergency Services	City of California City	Roads will be unpassable causing a disruption of supply chain for food, water, fuel and critical mutual aid resources. Most emergencies will be beyond local capabilities.	ma-EQ-CC-581



COUNTY OF KERN

Kern Multi-Jurisdiction 2020 MJHMP Update

Problem No.	Hazard	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EW-CC-538	Extreme Weather	Impact	ES - Emergency Services , SP - Structural Projects	City of California City	Schedule power outages to California City due to power shortages and state wildland fire danger. Lack of generators or alternate means of power to critical government and community buildings.	ma-AH-CC-185
ps-EW-CC-539	Extreme Weather	Impact	ES - Emergency Services , SP - Structural Projects	City of California City	Long term power outage due to high wind event and having only one power transmission line that comes into the city. Lack of generators or alternate means of power to critical government and community buildings.	ma-AH-CC-185
ps-EW-CC-540	Extreme Weather	Impact	PPRO - Property Protection , SP - Structural Projects	City of California City	Older construction and particularly unreinforced buildings within the city will pose hazards during high wind events.	ma-EQ-CC-581
ps-EW-CC-541	Extreme Weather	Impact	ES - Emergency Services , SP - Structural Projects	City of California City	Disruption of the water distribution/ grid system due to freezing weather.	ma-AH-CC-185
ps-EW-CC-542	Extreme Weather	Victim	PE&A - Public Education & Awareness, ES - Emergency Services	City of California City	City wide power outage affecting 18,000 residences. High risk to the elderly population.	ma-AH-CC-185
ps-EW-CC-543	Extreme Weather	Threat	PE&A - Public Education & Awareness, ES - Emergency Services , SP - Structural Projects	City of California City	Loss of power leaves City unable to operate cooling centers for the elderly. Unable to operate water and sanitation pumps.	ma-AH-CC-185



1.4.4.1 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through <http://mitigatehazards.com/county-of-kern/>.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction's ability to apply for FEMA's Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through Cal OES.



1.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

1.5.1 Capabilities Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (Column 1, Status)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (Column 2, Current Mitigation Use)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (Column 3, Future Opportunity)

The capabilities assessment is easily-digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.



1.5.1.1 Planning and Regulatory Capabilities

Table 1-8. Planning and Regulatory Capabilities Summary

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				Adopts all parts of Title 24 every code cycle.
BCEGS Rating	N/A	N/A	N/A	
Public Protection (ISO Class)				Department participates in grading and is currently rated as a 3/3X
Hazard Related Development Standards				
Zoning Ordinance				Eg. Open Space Dist, § 9-2.2300; Flood Hazard Overlay, § 9-2.2406
Hazard-Specific Ordinance				Eg. Fire prevention, Code § 4-1
Growth Management Ordinance				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				
Erosion/Sediment Control Program				
Hazard-Related Public Outreach Program				See Education and Outreach Resource Capabilities.
Stormwater Management Program (Annual Inspections)				
Seismic Safety Program (Non-structural)				
Earthquake Modernization Plan (Building Safety)				
Hazard Plans				
General Plan Safety Element				2009 GP
Community Wildfire Protection Plan (CWPP)				Countywide CWPP expected 2021.



Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Floodplain Management Plan				Local EOP currently in place.
Stormwater Management Plan				
Emergency Operations Plan				
Climate Action Plan				
Ground Water Management Planning / Plans				
National Flood Protection Program (NFIP)				
Floodplain Management Regulations				
Flood Insurance Education and Technical Assist.				
Flood Hazard Mapping / Re-Mapping	N/A	N/A	N/A	County mapping completed
Community Rating System (CRS)				



1.5.1.2 Administrative and Technical Capabilities

Table 1-9. Administrative and technical capabilities summary

CAPABILITY ASSESSMENT LEGEND

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail	
	Status	Current Mitigation Use	Future Opportunity		
Administrative and Technical					
Community Planning and Development Services					
Community Planner				Shawn Monk	
Civil Engineer					
Building Code Official (Full time or Augmented)				Joe Barrigan/Robert King	
Floodplain Administrator					
Fire Marshal				Jeremy Kosick	
Dedicated Public Outreach Personnel					
GIS Specialist and Capability					
Emergency Manager					
Full-Time Building Official				Joe Barrigan	
Grant Manager, Writer, or Specialist					
Other					
Warning Systems/Services					
General					
Flood					
Wildfire					
Geological Hazards					



1.5.1.3 Financial Capabilities

Table 1-10. Financial capabilities summary

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				Currently funds public safety
Utilities Fees				Water and sewer
Benefit assessments				
System Development Fee				
General Obligation Bonds to Incur Debt				
Special Tax Bonds to Incur Debt				
Withheld Spending in Hazard-Prone Areas				
Stormwater Service Fees				
Capital Improvement Project Funding				



1.5.1.4 Education and Outreach

Table 1-11. Education and outreach capabilities summary

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Fire Department Website with limited topics
Dedicated Social Media				Nixel Alerts, Fire and Police dept Facebook pages
Hazard Info. Avail. at Library/ Planning Desk				
Annual Public Safety Events				National Night Out, Fire Prevention Week.
Ability to Field Public Tech. Assistance Requests				Limited staff, generally try to accomidate all requests.
Public Safety Newsletters or Printed Outreach				Limited on hand info at city hall, fire station and police dept.
Fire Safe Councils				
Resource Conservation Districts				
Other				



1.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction's priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 1-12 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

Each participating jurisdiction, including the City of California City, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local Jurisdiction level. the City of California City has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices. Volume 1, Section 5.5.2 provides a record of County wide mitigation actions, the status, and additional notes for each action.

Table 1-12 lists each mitigation action for the City of California City. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 1-12 meets the regulatory requirements of FEMA and DMA 2000.

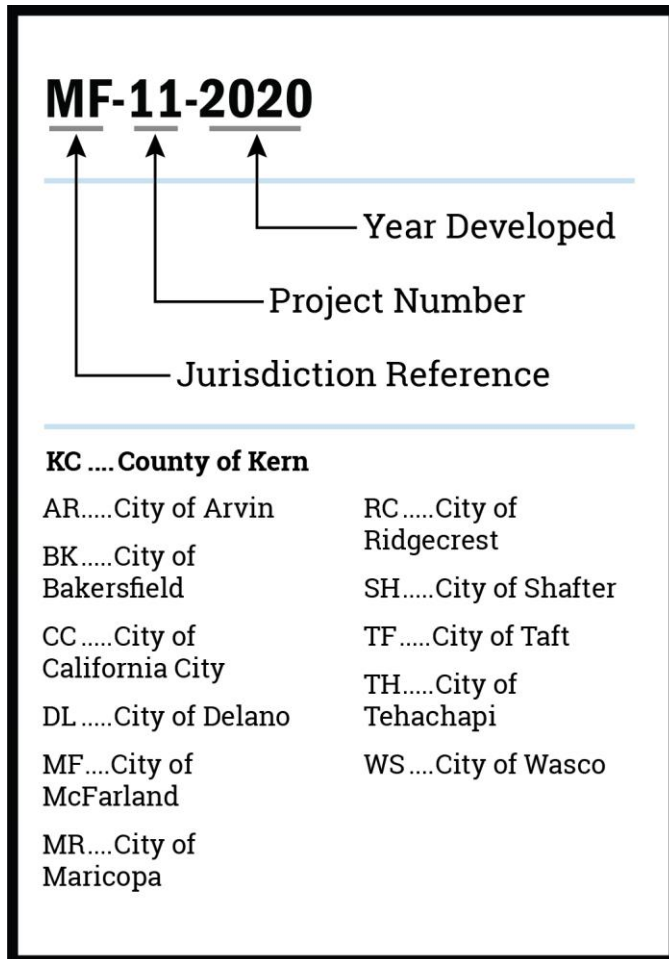


Figure 1-9. Mitigation Action Key



Table 1-12. City of California City Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-CC-185	All Hazard	ES - Emergency Services	Ongoing	2005	City of California City	Install backup power generators to support operation of critical facilities, including water and wastewater systems, emergency services, and cooling and heating centers during hazard event (EQ, high wind, high heat, freeze event, etc).	California City Public Works	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	5%	HMGP / BRIC	High	ps-EQ-CC-533, ps-EW-CC-538, ps-EW-CC-539, ps-EW-CC-542, ps-EW-CC-543, ps-EW-CC-541
ma-AH-CC-580	All Hazard	ES - Emergency Services	Pending	2020	City of California City	Local Healthcare Services: In collaboration with the County, pursue development of a local hospital, health care clinics, and other medical resources to increase capacity to treat injuries and address other medical needs associated with hazard events.	City Manager	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	5%	HMGP / BRIC	High	ps-EQ-CC-535
ma-EQ-CC-581	All Hazard	PPRO - Property Protection	Pending	2020	City of California City	Seismic Retrofit/Hardening of Critical Infrastructure: Retrofit / harden City-owned critical facilities and buildings to enhance their ability to withstand seismic shaking and high wind.	City of California City	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	ps-EQ-CC-532, ps-EQ-CC-534, ps-EQ-CC-537, ps-EQ-CC-536, ps-EW-CC-540
ma-EQ-CC-162	Earthquake	SP - Structural Projects	Pending	2005	City of California City	Replace or retrofit un-reinforced masonry City Hall at 21000 Hacienda	California City	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	ps-EQ-CC-531



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