



2020 Urban Water Management Plan

Bakersfield District
June 2021

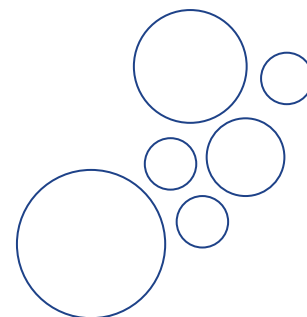


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List of Acronyms

AB	Assembly Bill
AF	acre-feet
AFY	acre-feet per year
AMI	Advanced Metering Infrastructure
AMR	Automatic Meter Reading
AWWA	American Water Works Association
CAP	Customer Assistance Program
CCR	California Code of Regulations
CII	Commercial, Institutional, and Industrial
CPUC	California Public Utilities Commission
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DDW	Division of Drinking Water
DMM	Demand Management Measure
DWR	Department of Water Resources
EPA	Environmental Protection Agency
ft	feet
GPCD	gallons per capita per day
GRC	General Rate Case
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HGWTP	Henry C. Garnett Water Treatment Plant
ILI	Infrastructure Leakage Index
IRWMP	Integrated Regional Water Management Plan
KCWA	Kern County Water Agency
KGA	Kern Groundwater Authority
KRGSA	Kern River Groundwater Sustainability Agency
kWh	kilowatt hours
kWh/AF	kilowatt hours per acre-foot
M&I	Municipal and Industrial
MCL	Maximum Contaminant Level
MGD	million gallons per day
NEBWTP	Northeast Bakersfield Water Treatment Plant
NGWTP	North Garden Water Treatment Plant
PWS	Public Water System
RA	Regional Alliance
RUWMP	Regional Urban Water Management Plan
SB	Senate Bill
SGMA	Sustainable Groundwater Management Act

SWP	State Water Project
SWRCB	State Water Resources Control Board
TAP	Technical Assistance Program
UWMP	Urban Water Management Plan
WSCP	Water Shortage Contingency Plan
WTP	Water Treatment Plant

Chapter 1

Introduction and Overview

This chapter discusses the importance and uses of this Urban Water Management Plan (UWMP or Plan), the relationship of this Plan to the California Water Code (CWC), the relationship of this Plan to other local and regional planning efforts, and how this Plan is organized and developed in general accordance with the UWMP Guidebook 2020.¹ Specifically, this chapter contains the following sections:

- 1.1 Background and Purpose
- 1.2 Urban Water Management Planning and the California Water Code
- 1.3 Relationship to Other Planning Efforts
- 1.4 Plan Organization
- 1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions
- 1.6 Lay Description

1.1 Background and Purpose

California Water Service Company (Cal Water) is an investor-owned public utility supplying water service to approximately 1.8 million Californians through over 481,000 connections. Its 25 districts serve 63 communities spanning from the Chico-Hamilton City District in the northern portion of the state to the Palos Verdes District in southern California. California Water Service Group, Cal Water's parent company, also provides water service to communities in Washington, New Mexico, and Hawaii.² While water rates are set separately for each of Cal Water's 25 districts, oversight of the water rate setting process and district operations is provided by the California Public Utilities Commission (CPUC).

Cal Water's Bakersfield District (also referred to herein as the "District") was formed in 1926 with the purchase of Bakersfield Water Works.

This UWMP is a foundational document and source of information about Bakersfield District's historical and projected water demands, water supplies, supply reliability and potential

¹ The UWMP Guidebook 2020 is available at: <https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans>

² In addition, Cal Water operates the City of Hawthorne's water system on behalf of the City.

vulnerabilities, water shortage contingency planning, and demand management programs. Among other things, it is used as:

- A long-range planning document by Cal Water for water supply and system planning; and
- A source for data on population, housing, water demands, water supplies, and capital improvement projects used in:
 - Regional water resource management plans prepared by wholesale water suppliers and other regional planning authorities (as applicable),
 - General Plans prepared by cities and counties, and
 - Statewide and broad regional water resource plans prepared by the California Department of Water Resources (DWR), the State Water Resources Control Board (SWRCB), or other state agencies.

The District's last UWMP was completed in 2016, referred to herein as the "2015 UWMP." This Plan is an update to the 2015 UWMP and carries forward information from that plan that remains current and relevant, and provides additional information as required by subsequent amendments to the UWMP Act (CWC §10610 – 10657). Although this Plan is an update to the 2015 UWMP, it was developed to be a self-contained, stand-alone document and does not require readers to reference information contained in previous UWMP updates.

1.2 Urban Water Management Planning and the California Water Code

The UWMP Act requires urban water suppliers to prepare an UWMP every five years and to submit this plan to the DWR, the California State Library, and any city or county within which the supplier provides water supplies. All urban water suppliers, 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 annually are required to prepare an UWMP (CWC §10617).

The UWMP Act was enacted in 1983. Over the years it has been amended in response to water resource challenges and planning imperatives confronting California. A significant amendment was made in 2009 as a result of the governor's call for a statewide 20 percent reduction in urban water use by 2020, referred to as "20x2020," the Water Conservation Act of 2009, and "SB X7-7." This amendment required urban retail water suppliers to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020. Beginning in 2016, urban retail water suppliers were required to comply with the water conservation requirements in SB X7-7 in order to be eligible for state water grants or loans. Chapter 5 of this plan contains the data and calculations used to determine compliance with these requirements.

A subsequent substantial revision to the UWMP Act was made in 2018 through a pair of bills (i.e., Assembly Bill 1668 and Senate Bill 606), referred to as "Making Water Conservation a California

Way of Life” or the “2018 Water Conservation Legislation.” These changes include, among other things, additional requirements for Water Shortage Contingency Plans (WSCPs), expansion of dry year supply reliability assessments to a five-year drought period, establishment of annual drought risk assessment procedures and reporting, and new conservation targets referred to as “annual water use objectives,” which will require retailers to continue to reduce water use beyond the 2020 SB X7-7 targets. The UWMP Act contains numerous other requirements that an UWMP must satisfy. Appendix A to this Plan lists each of these requirements and where in the Plan they are addressed.

1.3 Relationship to Other Planning Efforts

This Plan provides information specific to water management and planning by the Bakersfield District. However, water management does not happen in isolation; there are other planning processes that integrate with the UWMP to accomplish urban planning. Some of these relevant planning documents include relevant city and county General Plans, Water Master Plans, Recycled Water Master Plans, integrated resource plans, Integrated Regional Water Management Plans, Groundwater Management Plans, Groundwater Sustainability Plans, and others.

This Plan is informed by and helps to inform these other planning efforts. In particular, this Plan utilizes information contained in city and county General Plans and local and regional water resource plans to the extent data from these plans are applicable and available.

1.4 Plan Organization

The organization of this Plan follows the same sequence as outlined in the UWMP Guidebook 2020.³

Chapter 1 - Introduction and Overview

Chapter 2 - Plan Preparation

Chapter 3 - System Description

Chapter 4 - Water Use Characterization

Chapter 5 - SB X7-7 Baseline and Targets

Chapter 6 - Water Supply Characterization

³ The UWMP Guidebook 2020 is available at: <https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans>

Chapter 7 - Water Supply Reliability Assessment

Chapter 8 - Water Shortage Contingency Planning

Chapter 9 - Demand Management Measures

Chapter 10 - Plan Adoption, Submittal, and Implementation

In addition to these ten chapters, this Plan includes a number of appendices providing supporting documentation and supplemental information. Pursuant to CWC §10644(a)(2), this Plan utilizes the standardized forms, tables, and displays developed by DWR for the reporting of water use and supply information required by the UWMP Act. This Plan also includes additional tables, figures, and maps to augment the set developed by DWR, as appropriate. The table headers indicate if the table is part of DWR's standardized set of submittal tables.

1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions

Although not required by the UWMP Act, in the UWMP Guidebook 2020,⁴ DWR recommends that all suppliers that are participating in, or may participate in, receiving water from a proposed project that is considered a “covered action” under the Delta Plan—such as a (1) multiyear water transfer; (2) conveyance facility; or (3) new diversion that involves transferring water through, exporting water from, or using water in the Sacramento-San Joaquin Delta (Delta)—provide information in their UWMP to demonstrate consistency with the Delta Plan policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code of Regulations, Title 23, Section 5003).

The Bakersfield District derives its water supply from a combination of groundwater, untreated local surface water purchased from the City of Bakersfield, and treated local surface and imported water purchased from Kern County Water Agency (KCWA) Improvement District 4 (ID-4). KCWA is a contractor of the State Water Project (SWP) and imports water for Municipal and Industrial use in the urbanized area through the California Aqueduct. Appendix C of the draft KCWA ID-4 UWMP demonstrates KCWA ID-4's consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance.⁵ ID-4's service area, as a whole, reduces reliance on the Delta through investments in non-Delta water supplies, local water supplies and regional and local demand management measures. Additional details on the

⁴ The UWMP Guidebook 2020 is available at: <https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans>

⁵ KCWA ID-4, 2021. Draft Improvement District NO.4 Urban Water Management Plan 2020, dated May 2021.

demonstration of consistency with the Delta Plan is provided in ID-4 2020 UWMP and Section 6.10.2 of the plan.

1.6 Lay Description

☒ **CWC § 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.

This Urban Water Management Plan (UWMP or Plan) is prepared for the California Water Service Company (Cal Water) Bakersfield District (also referred to as the “District”), which serves drinking water to a population of approximately 286,300. This UWMP serves as a foundational planning document and includes descriptions of historical and projected water demands, and water supplies, and the resulting reliability during a set of defined water supply conditions over a 20-year planning horizon. This document also describes the actions the District is taking to promote water conservation, both by the District itself and by its customers (referred to as “demand management measures”), and includes a plan to address potential water supply shortages such as drought or other impacts to supply availability (the “Water Shortage Contingency Plan”). This UWMP is updated every five years in accordance with state requirements under the Urban Water Management Planning Act and amendments (Division 6 Part 2.6 of the California Water Code [CWC] §10610 – 10656). Past plans developed for the District are available on the California Department of Water Resources (DWR) Water Use Efficiency Data Portal website: <https://wuedata.water.ca.gov/>. This document includes 10 chapters, which are summarized below.

Chapter 1- Introduction and Overview

This chapter presents the background and purpose of the UWMP, identifies the Plan organization, and provides this lay description overview of the document. For districts that rely on water from the Sacramento-San Joaquin Delta, this section also discusses and demonstrates consistency with the Delta Plan. One of the supply sources for the Bakersfield District is treated local surface and imported water purchased from Kern County Water Agency (KCWA) Improvement District 4 (ID-4). KCWA is a contractor of the State Water Project (SWP) and imports water for Municipal and Industrial use in the urbanized area through the California Aqueduct. Appendix C of the draft KCWA ID-4 UWMP demonstrates KCWA ID-4’s consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance. Additional details on the demonstration of consistency with the Delta Plan is provided in the draft KCWA ID-4 UWMP and Section 6.10.2 of the Plan.

Chapter 2 - Plan Preparation

This chapter discusses key structural aspects related to the preparation of the UWMP, and describes the coordination and outreach conducted as part of the preparation of the Plan, including coordination with local agencies and other community organizations (i.e., City of Bakersfield and Kern County), relevant Groundwater Sustainability Agencies (GSAs), and the public.

Chapter 3 - System Description

This chapter provides a description of the Bakersfield District's water system and the service area, including information related to the climate, population, and demographics. The Bakersfield District operates two public water systems (PWS): Bakersfield PWS and North Garden PWS. The two PWSs are located in Kern County. The Bakersfield District has a population of approximately 286,300 and has a moderate climate characterized by hot dry summers and mild winters. The majority of the 7 inches of average annual precipitation falls between October and May. The service area includes mostly low-density residential, general commercial, and industrial land uses. All water customers are considered urban (i.e., non-agricultural water users).

Chapter 4 - Water Use Characterization

This chapter provides a description and quantifies the Bakersfield District's current and projected demands through the year 2045. The District provides drinking water (also referred to as "potable water") to customers. Water demands refer not only to the water used by customers, but also includes the water used as part of the system's maintenance and operation, as well as unavoidable losses inherent in the operation of a water distribution system. Water demand within the District was 58,572 acre-feet per year (AFY) on average between 2016 and 2020. Taking into account historical water use, expected population increase and other growth, climatic variability, and other assumptions, water demand within the District is projected to increase to 70,314 AFY by 2045, a change of 20 percent compared to the 2016-2020 average. In dry year periods, water demands are expected to be somewhat higher, potentially up to 72,382 AFY by 2045 during an extended five-year drought.

Chapter 5 - SB X7-7 Baseline and Targets

In this chapter, the Bakersfield District demonstrates compliance with its per capita water use target for the year 2020. The Water Conservation Act of 2009 (Senate Bill X7-7) was enacted in November 2009 and requires the state of California to achieve a 20 percent reduction in urban per capita water use by December 31, 2020. In order to achieve this, each urban retail water supplier was required to establish water use targets for 2015 and 2020 using methodologies established by DWR. The Bakersfield District is in compliance with its 2020 water use target of 235 gallons per capita per day (GPCD), having reduced its water use in 2020 to 185 GPCD. The

Bakersfield District is also a member of a “Regional Alliance” for purposes of SB X7-7 compliance. The Regional Alliance’s 2020 water use is 182 GPCD, which is in compliance with and below its 2020 target of 222 GPCD.

Chapter 6 - Water Supply Characterization

This chapter presents an analysis of the Bakersfield District’s water supplies, as well as an estimate of water-related energy-consumption. The intent of this chapter is to present a comprehensive overview of the District’s water supplies, estimate the volume of available supplies over the UWMP planning horizon, and assess the sufficiency of the District’s supplies to meet projected demands under “normal” hydrologic conditions.

The source of water supply for the Bakersfield District is a combination of groundwater, untreated local surface water purchased from City of Bakersfield, and treated local surface and imported water purchased from Kern County Water Agency (KCWA) Improvement District 4 (ID-4). There are no new sources of supply currently planned.

The Bakersfield District pumps groundwater from the Kern County Subbasin (DWR Basin No. 5-022.14) of the San Joaquin Valley Basin. The Kern County Subbasin is not adjudicated, however, the Kern County Subbasin has been prioritized by DWR as “high”, and is considered by DWR to be critically overdrafted. The Groundwater Sustainability Agencies (GSAs) which collectively represent the Kern County Subbasin completed five Groundwater Sustainability Plans (GSPs) in January 2020 per the Sustainable Groundwater Management Act (SGMA).

The District also purchases untreated Kern River surface water from City of Bakersfield, and treated Kern River or State Water Project (SWP) water from Kern County Water Agency (KCWA) Improvement District 4 (ID-4). Based on all available information, the combination of groundwater and purchased imported water supplies is expected to be sufficient to support the Bakersfield District’s projected water demand through 2045.

Calculating and reporting of water system energy intensity is a new requirement for the 2020 UWMPs. Energy intensity is defined as the net energy used for water treatment, pumping, conveyance, and distribution for all water entering the distribution system, and does not include the energy used to treat wastewater. The energy intensity for the Bakersfield District is estimated to be 533 kilowatt hours per acre-foot of water (kWh/AF).

Chapter 7 - Water Supply Reliability Assessment

This chapter assesses the reliability of the Bakersfield District’s water supplies, with a specific focus on potential constraints such as groundwater and surface water supply availability, water quality, and climate change. The intent of this chapter is to identify any potential constraints that could affect the reliability of the District’s supply (such as drought conditions) to support the

District's planning efforts to ensure that its customers are well served. Water service reliability is assessed during normal, single dry-year, and multiple dry-year hydrologic conditions. Based on this analysis, the Bakersfield District expects the available supplies to be sufficient to meet projected demands in all hydrologic conditions, including a five-year drought period, and considering the impacts of climate change.

Further, potential water quality issues are not expected to affect the quality of water served to the District's customers, as water quality is routinely monitored and the District is able to make all appropriate adjustments to its treatment and distribution system to ensure only high quality drinking water is served.

Chapter 8 - Water Shortage Contingency Planning

This chapter describes the Water Shortage Contingency Plan (WSCP) for the Bakersfield District. The WSCP serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. For example, implementing customer water budgets and surcharges, or restricting landscape irrigation to specific days and/or times. Consistent with DWR requirements, the WSCP includes six levels to address shortage conditions ranging from up to 10 percent to greater than 50 percent shortage.

Chapter 9 - Demand Management Measures

This chapter includes descriptions of past and planned conservation programs that Cal Water operates within each demand management measure (DMM) category outlined in the UWMP Act, specifically: (1) water waste prevention ordinances, (2) metering, (3) conservation pricing, (4) public education and outreach, (5) distribution system water loss management, (6) water conservation program coordination and staffing support, and (7) "other" DMMs. Cal Water has developed a suite of conservation programs and policies, which address each DMM category.

Chapter 10 - Plan Adoption, Submittal, and Implementation

This chapter provides information on a public hearing, the adoption process for the UWMP and WSCP, the adopted UWMP and WSCP submittal process, plan implementation, and the process for amending the adopted UWMP and WSCP. Prior to adopting the Plan, Cal Water held a formal public hearing to present information on its Bakersfield District UWMP and WSCP on June 1, 2021, 7:00 PM. This UWMP and the corresponding WSCP were submitted to DWR within 30 days of adoption and by the July 1, 2021 deadline.

Chapter 2

Plan Preparation

This chapter discusses the type of Urban Water Management Plan (UWMP or Plan) the Bakersfield District (also referred to herein as the “District”) has prepared and includes information that will apply throughout the Plan. Coordination and outreach during the development of the Plan is also discussed. Specifically, this chapter includes the following sections:

2.1 Public Water Systems

2.2 Regional Planning

2.3 Individual or Regional Planning and Compliance

2.4 Plan Preparation, Standard Units, and Basis for Reporting

2.5 Coordination and Outreach

2.1 Public Water Systems

The Bakersfield District operates the two Public Water Systems (PWS) listed in Table 2-1 (i.e., Bakersfield PWS and North Garden PWS). Public Water Systems are the systems that provide drinking water for human consumption and are regulated by the State Water Resources Control Board (SWRCB), Division of Drinking Water. The SWRCB requires that water agencies report water usage and other relevant PWS information via the electronic Annual Reports to the Drinking Water Program (eARDWP). These data are used by the state to determine, among other things, whether an urban retail water supplier has reached the threshold (3,000 or more connections or 3,000 acre-feet of water supplied) for submitting an UWMP.

Table 2-1. Public Water Systems (DWR Table 2-1)

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
CA1510003	Bakersfield	65,301	53,248
CA1510055	North Garden	6,849	6,171
TOTAL		72,150	59,418
NOTES: (a) Volumes are in units of AF.			

2.2 Regional Planning

Regional planning can deliver mutually beneficial solutions to all agencies involved by reducing costs for the individual agency, assessing water resources at the appropriate geographic scale, and allowing for solutions that cross jurisdictional boundaries. California Water Service Company (Cal Water) participates in regional water resources planning initiatives throughout California in the regions in which its 25 water districts are located. Cal Water participated in the 2020 Update of the Kern Integrated Regional Water Management Plan (IRWMP), which covers the Bakersfield District. Cal Water is also participating in the development of the Groundwater Sustainability Plans (GSPs) for the underlying groundwater subbasin.

2.3 Individual or Regional Planning and Compliance (Regional Alliance)

Urban water suppliers may elect to prepare individual or regional UWMPs. The Bakersfield District has elected to prepare an individual UWMP covering its two PWSs (see Table 2-2).

Urban retail water suppliers may report on the requirements of SB X7-7 (2009 California Conservation Act) individually or as a member of a “Regional Alliance.” As described in Chapter 5, the Bakersfield District is a member of a Regional Alliance and this UWMP provides information on the District’s compliance with its SB X7-7 water conservation targets both as an individual urban retail water supplier and as a member of a Regional Alliance.

Table 2-2. Plan Identification (DWR Table 2-2)

Select Only One	Type of Plan		Name of RUWMP or Regional Alliance <i>if applicable</i>
X	Individual UWMP		
		Water Supplier is also a member of a RUWMP	
	X	Water Supplier is also a member of a Regional Alliance	California Water Service - Tulare Lake Alliance
	Regional Urban Water Management Plan (RUWMP)		
NOTES: The Bakersfield District is a member of a Regional Alliance. Chapter 5 provides information on the District's progress towards meeting its water conservation targets under SB X7-7 both as an individual urban retail water supplier and as a member of its Regional Alliance.			

2.4 Plan Preparation, Standard Units, and Basis for Reporting

☑ **CWC § 10608.12 (t)**

“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.

☑ **CWC § 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.

☑ **CWC § 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.

☑ **CWC § 10621 (f)**

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

Per California Water Code (CWC) §10617, the Bakersfield District is an 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. It is therefore obligated under CWC §10621(f) to develop and submit an UWMP to the California Department of Water Resources (DWR) by July 1, 2021. The Bakersfield District is an urban retail water supplier, as identified in Table 2-3. The Bakersfield District is not a wholesale water supplier.

Annual volumes of water reported in this UWMP are measured in acre-feet (AF) and are reported on a calendar year basis (Table 2-3). Water use and planning data reported in this UWMP for calendar year 2020 cover the full twelve months of the year, as required by the UWMP Guidelines.

Table 2-3. Supplier Identification (DWR Table 2-3)

Type of Supplier	
	Supplier is a wholesaler
X	Supplier is a retailer
Fiscal or Calendar Year	
X	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	
Unit	AF
NOTES:	

2.5 Coordination and Outreach

☒ **CWC § 10620 (d) (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.

☒ **CWC § 10631 (a)** A plan shall be adopted in accordance with this chapter that shall do all of the following:

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.

☒ **CWC § 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. ...

Coordination with other water suppliers, cities, counties, and other community organizations in the region is an important part of preparing a UWMP and Water Shortage Contingency Plan

(WSCP). This section identifies the agencies and organizations Bakersfield District sought to coordinate with during preparation of this Plan.

2.5.1 Wholesale and Retail Coordination

☒ **CWC § 10631 (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).

Urban retail water suppliers relying on one or more wholesalers for water supply are required to provide these wholesalers with information regarding projected water supply and demand. As shown in Table 2-4, the Bakersfield District derives portions of its water supply from Kern County Water Agency and City of Bakersfield.

Table 2-4. Water Supplier Information Exchange (DWR Table 2-4)

The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.	
Wholesale Water Supplier Name	
Kern County Water Agency Improvement District No 4	
City of Bakersfield	
NOTES:	

2.5.2 Coordination with and Notice to Other Agencies and the Community

☒ **CWC § 10620 (d) (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.

☒ **CWC § 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.

The Bakersfield District coordinated with cities, counties, and other community organizations during preparation of this UWMP. Cal Water provided notice to these entities and the communities it serves 60 days prior to the public hearing it held on June 1, 2021, to present the draft of the UWMP, address questions, and receive comments. Cities and counties receiving the public hearing notification from Bakersfield District as required per CWC §10621 (b) are listed in Table 10-1 in Chapter 10 of this Plan.

Copies of correspondence with other agencies and public notices are provided in Appendix B and Appendix C, respectively.

2.5.3 Coordination with Land Use Authorities

☒ **CWC § 10631 (a)** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

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.

Cal Water coordinated with the City of Bakersfield and Kern County staff to review and confirm that appropriate land use assumptions were used to develop the UWMP demand projections. Correspondence with land use authorities is included in Appendix B.

Chapter 3

System Description

☒ CWC § 10631 (a)

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

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.

This chapter provides a description of the Bakersfield District (also referred to herein as the "District") water system and service area, including climate, population, demographics, and land uses to help in understanding various elements of water supply and demand. This chapter includes the following sections:

- 3.1 General Description
- 3.2 Service Area Boundary Map
- 3.3 Service Area Climate
- 3.4 Service Area Population and Demographics
- 3.5 Land Uses within Service Area

3.1 General Description

The District has served parts of the City of Bakersfield and surrounding areas since 1926, when California Water Service Company (Cal Water), an investor-owned water utility regulated by the California Public Utilities Commission (CPUC), purchased the Bakersfield Water Works. The District is comprised of two public water systems (PWS): the Bakersfield PWS and the North Garden PWS. The water system to the west of the District is owned by the City of Bakersfield but operated under contract by Cal Water. The Oildale Mutual Water Company and North of the River Municipal Water District serve Oildale and unincorporated lands to the north of the District. East Niles Community Services District provides service to the region east of the District.

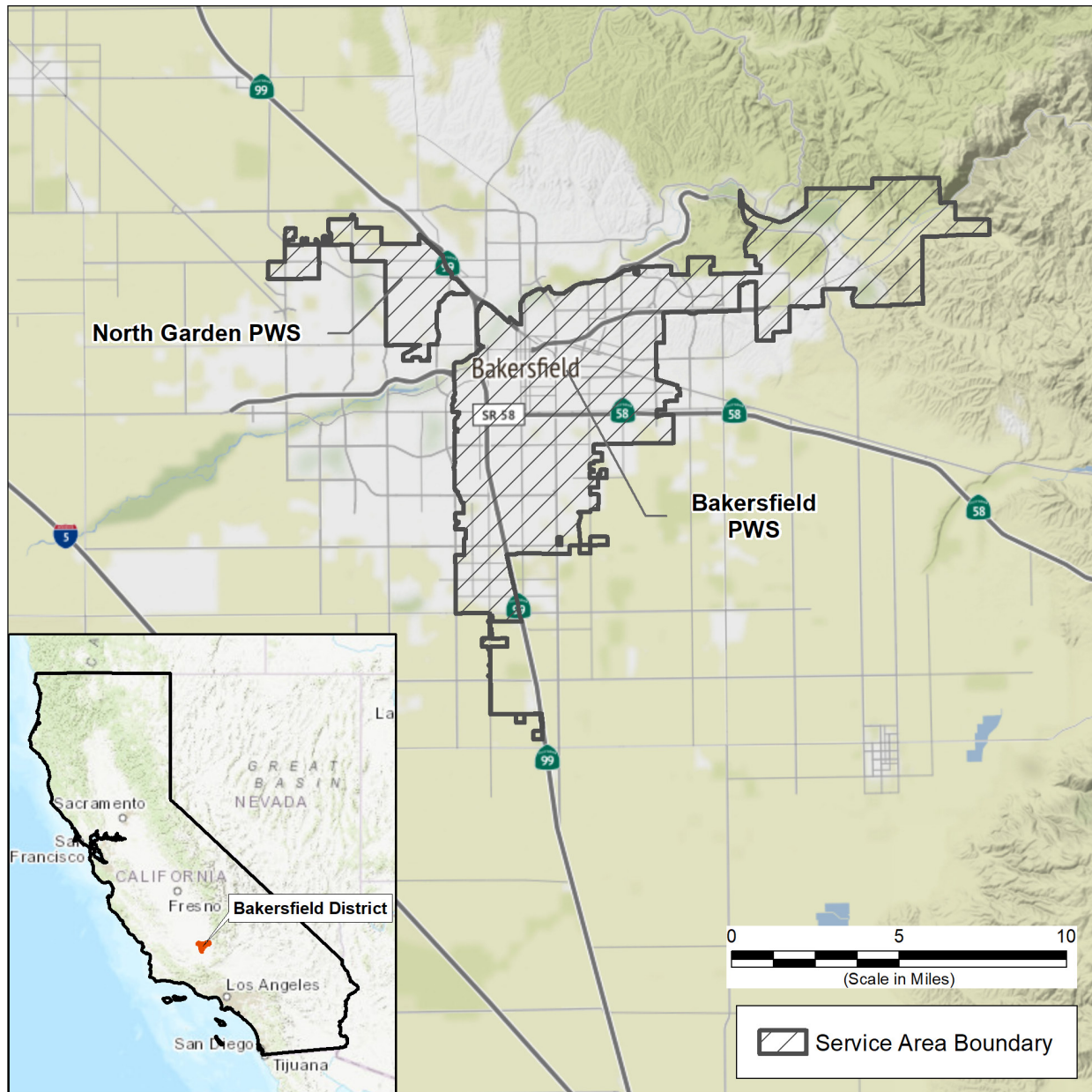
The District currently produces roughly 53 million gallons of water daily from local groundwater, surface water from the Kern River, and State Water Project water purchased from the Kern County Water Agency. The District delivers water to residential, commercial, industrial, and governmental customers. Residential customers account for most of the District's service connections and 65 percent of its water use. Non-residential water uses account for 25 percent of total demand, while distribution system losses account for 10 percent.

3.2 Service Area Boundary Map

Figure 3-1 shows the location of the District and its current service area boundaries. The District is located in Kern County and serves portions of the City of Bakersfield and segments of unincorporated Kern County lands adjacent to the City of Bakersfield. Bakersfield is the largest city in Kern County. Major transportation links in the District include the Golden State Highway (State Route 99), and Stockdale Highway (State Route 58). The Westside Freeway (Interstate 5) is approximately 15 miles to the southwest of the District at its closest point. The Southern Pacific Railroad and the Burlington Northern Santa Fe Railroad provide rail service to the region.

The District is situated in the Tulare Lake Hydrologic Region, within the Kern Valley Floor Rivers sub-area. The service area is built upon the alluvium of the Kern River flood plain and covers approximately 51 square miles.

Figure 3-1. District Location and Service Boundaries



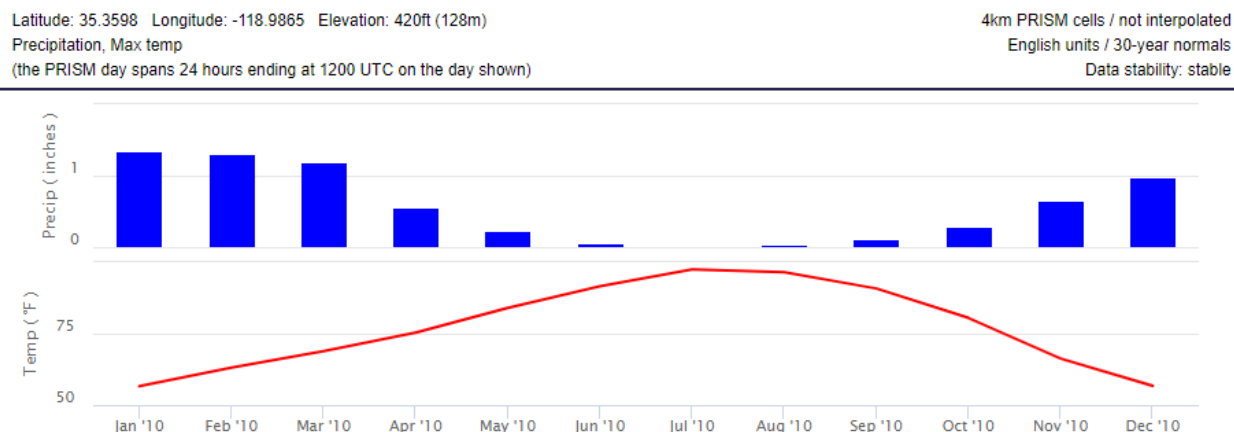
3.3 Service Area Climate

The District's climate is characterized by hot dry summers and mild winters (see Figure 3-2).⁶ Most rainfall occurs between October and May. Precipitation totals in the summer months are

⁶ Precipitation and temperature data downloaded from: <https://prism.oregonstate.edu/explorer/>. These data represent a 30-year period from 1980 through 2010. The x-axis reflects the end of the 30-year time series.

negligible. On average, the District receives 7 inches of rainfall annually. Maximum daily air temperature averages 94 degrees Fahrenheit during the summer months. In the winter, it averages 59 degrees Fahrenheit.

Figure 3-2. 30-Year Normals, Precipitation and Maximum Daily Air Temperature



Based on a review of data downloaded from the Oregon State PRISM dataset for 1895 to 2019, rainfall varies significantly from year-to-year, as it does in most of California.⁷ The standard deviation in annual rainfall is 2.3 inches, or about one-third of the average annual rainfall.⁸ Consecutive years of below average rainfall are fairly common. Since 1895, runs of below average rainfall lasting three or more years have occurred 11 times and runs lasting five or more years have occurred three times. The most recent run lasting five years was from 2011 through 2015. The years 2006 through 2009 also experienced below average rainfall. Thus, during the 10-year period 2006 to 2015, nine out of ten years had below average rainfall. While rainfall in the region is highly variable, there has been no statistically significant trend in the mean or variance of annual rainfall since 1895.

The District's climate has been warming. Since 1895, average daily temperature has increased at an average rate of 0.018 degrees Fahrenheit per year. Mean annual temperature for 2010-2019 was 2.8 degrees Fahrenheit higher than for 1900-1909.

3.4 Service Area Population and Demographics

It is estimated that the District's service area population was 286,310 in 2020.

⁷ Downloaded from: <https://prism.oregonstate.edu/explorer/>. The x-axis reflects the end of the 30-year time series.

⁸ Standard deviation measures the typical or average year-to-year variation in annual rainfall amount. Thus, it is typical for annual rainfall to fluctuate significantly in the District.

The District estimates its service area population using Census Block population counts from decadal Census data. The decadal Census estimates are converted to average population per single- and multi-family service, which are applied to service counts for years between the decadal Censuses. This method is similar to the approach used by the California Department of Water Resources (DWR) Population Tool and population estimates generated by the two methods have been shown to differ by less than a percent in most cases.⁹

Current and projected service area population are shown in Table 3-1. Projected population is based on population and employment forecasts for Kern County generated by the California Department of Transportation's (Caltrans) long-term socio-economic forecast model.¹⁰ Between 2020 and 2045, service area population is projected to increase at an average rate of 0.9 percent per year.

Table 3-1. Population – Current and Projected (DWR Table 3-1)

Population Served	2020	2025	2030	2035	2040	2045
	286,310	299,366	314,753	329,207	342,878	356,039
NOTES:						

Demographics for the City of Bakersfield are summarized in Table 3-2. These data are from the U.S. Census American Community Survey 2019 5-Year Estimates.¹¹ Relative to the rest of California, the City of Bakersfield's population is younger while racial composition is similar. Educational attainment is lower than for the state as a whole, as is median household income.

The City of Bakersfield's stock of housing is significantly newer than for California overall. Forty-six percent of the homes in Bakersfield were built after 1990 compared to 25.5 percent for all of California. Homes built after 1990 are more likely to have plumbing fixtures and appliances that are compliant with state and federal water and energy efficiency standards.

⁹ California Water Service, 2016. 2015 Urban Water Management Plan: Bakersfield District, dated June 2016.

¹⁰ California Department of Transportation's long-term socio-economic forecast model:
<https://dot.ca.gov/programs/transportation-planning/economics-data-management/transportation-economics/long-term-socio-economic-forecasts-by-county>

¹¹ U.S. Census Bureau, 2019. 2015-2019 American Community Survey 5-year Estimates, dated 2019. Retrieved from: <https://data.census.gov/cedsci/>.

Table 3-2. Demographic and Housing Characteristics

Demographics	City of Bakersfield	California
Median Age (years)	30.8	36.5
Racial Makeup (%)		
White	70.7	63.8
Black or African American	8.7	7.0
American Indian and Alaska Native	1.6	1.9
Asian	8.8	16.7
Native Hawaiian	0.5	0.8
Some other race	13.7	15.1
Hispanic or Latino (of any race) (%)	52.2	39.0
Educational Attainment (%)		
Bachelor's Degree or Higher	21.9	33.9
Primary Language Spoken at Home (%)		
English Only	86.1	82.2
Limited English-Speaking Households	6.4	8.9
Median Household Income (\$)	63,139	75,235
Population below Federal Poverty Level (%)	17.4	13.4
Housing	City of Bakersfield	California
Median Year Built	1988	1975
Year Housing Built (%)		
2010 or Later	6.5	3.5
2000 to 2009	23.7	11.2
1990 to 1999	15.8	10.9
Before 1990	53.9	74.5

3.5 Land Uses within Service Area

The land use pattern for City of Bakersfield and surrounding areas is shown in Table 3-3. These data are taken from the Metropolitan Bakersfield General Plan Update Environmental Impact Report and reflect the land use pattern circa 2002.¹² Agriculture is the most prominent land use

¹² Accessed from: <https://docs.bakersfieldcity.us/weblink/0/edoc/955915/Sec04-01.LandUse.pdf>

within the General Plan's Planning Area, occupying 78,962 acres or 32 percent of land uses. Low Density Residential is the second most prominent land use, comprising 10 percent of land uses. Residential land uses of all types comprise 29 percent of land uses.

Per the General Plan, development on the periphery of urban Bakersfield will be focused on ten mixed use centers located in the southwest, northwest, and northeast. It is expected that the southwest centers would include a mix of professional office and retail uses, moderate density residential, and would filter out to lower suburban-type densities. The northwest centers will contain retail commercial, light industrial, and moderate and high density residential, and will be surrounded by low and estate residential densities. In addition to the primary development centers, peripheral development will be focused in smaller community centers, such as in the Greenfield and Lamont areas, with local-serving commercial services and residential uses.

The most intensive development has occurred and is expected to continue to occur in and around the southwest centers. This area is outside of the District's current service boundary (see Figure 3-1).

Some of the expected development associated with the northwest and northeast centers will occur within the District's current service boundary. As shown in Table 3-1, the District is projecting that service area population will increase by 24 percent over the next 25 years. The total number of active services is expected to increase from just over 72,000 in 2020 to more than 98,000 in 2045.

Table 3-3. Metropolitan Bakersfield General Plan Update Land Use

Description		Land Use Acres	Percentage
Residential			
RR	Rural Residential	9,175	3.75
ER	Estate Residential	5,148	2.11
UER	Urban Estate Residential	2,128	0.87
SR	Suburban Residential	11,170	4.57
SR/LR	County Jurisdiction	1,122	0.46
LR	Low Density Residential	24,830	10.16
LMR/LR	County Jurisdiction	2,491	1.02
LMR	Low Medium Density Residential	7,721	3.16
LR/PS	County Jurisdiction	42	0.02
HMR	High Medium Density Residential	5,285	2.16
HR	High Density Residential	1,578	0.65
		70,689	28.92
Commercial			
HC	Highway Commercial	526	0.22
GC	General Commercial	5,364	2.19
OC	Office Commercial	629	0.26
MC	Major Commercial	480	0.20
MUC	Mixed Use Major/Office Commercial	320	0.13
		7,318	2.99
Industrial			
LI	Light Industrial	3,285	1.34
SI	Service Industrial	9,686	3.96
HI	Heavy Industrial	3,457	1.41
		16,429	6.72
Public Facilities			
P	Public Facilities	8,842	3.62
PS	Public and Private Schools	1,902	0.78
PT	Public Transportation Corridor	1,495	0.61
P-SW	Public and Private Schools/Parks	335	0.14
		12,615	5.14
Open Space			
OS	Open Space	8,393	3.43
OS-P	Parks and Recreational Facilities	3,414	1.40
OS-S	Slopes Exceeding 30%	4,894	2.00
		16,701	6.83
Resource			
R-IA	Intensive Agriculture	78,962	32.31
R-EA	Extensive Agriculture	15,086	6.17
R-MP	Mineral Petroleum	24,157	9.88
		118,205	48.36
ST FED	State and Federal Lands	657	0.27
		657	0.27
Other	Canals/Private Streets	1,831	0.75
		1,831	0.75
TOTAL ACRES:		244,405	100.00
Source: Land Use Map Database, revised April 2, 2002.			

Chapter 4

Water Use Characterization

☒ **CWC § 10631 (d) (1)** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

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).

This chapter provides a description and quantifies the Bakersfield District's (also referred to herein as the "District") past, current, and projected water uses through 2045. For the purposes of the Urban Water Management Plan (UWMP or Plan), the terms "water use" and "water demand" are used interchangeably. This chapter is divided into the following subsections:

4.1 Non-Potable Versus Potable Water Use

4.2 Past, Current, and Projected Water Uses by Sector

4.3 Climate Change Considerations

Appendix D provides additional information and data related to the development of the water demand projections presented in this chapter.

4.1 Non-Potable Versus Potable Water Use

This Plan maintains a clear distinction between recycled, potable, and raw water uses and supplies. Recycled water is addressed comprehensively in Chapter 6, but a summary of recycled

water demand is included in Table 4-3 of this chapter. The primary focus of this chapter is the historical and projected potable water uses in the District.

4.2 Past, Current, and Projected Water Uses by Sector

☒ **CWC § 10631 (d)**

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.

4.2.1 Past and Current Water Use

Table 4-1 shows water use in 2016-2020 by use type (referred to as “sector” in CWC §10631). Water use has been decreasing in the District since the early-2000s. Several factors have contributed to this reduction. First, most of the District’s residential customers were unmetered in 2000. The District has transitioned nearly all these customers to metered water service.¹³ A study completed by San Jose State University found that after six months of metering, previously unmetered households in the District reduced their water use by an average of 17 percent.¹⁴ Second, California Water Service Company (Cal Water) implemented conservation pricing starting in 2009, supplying stronger financial incentives to use water efficiently. Third, starting around 2012, Cal Water tripled the level of expenditure on conservation programs aimed at helping customers use water more efficiently. Fourth, appliance efficiency standards and plumbing codes have contributed to significant improvement over time in the average water use efficiency of the installed base of appliances and plumbing fixtures. For example, a new toilet

¹³ The District will be fully metered by no later than 2025.

¹⁴ Tanverakul, S. and J. Lee, 2015. Impacts of Metering on Residential Water Use in California, Journal AWWA 107:2, dated February 2015.

uses roughly one-third the amount of water as a toilet manufactured in the 1980s while a new clothes washer uses about half the amount of water as an older washer.¹⁵ Per capita water use in 2020 was 31 percent below its 2008 peak.

Water use in 2020 was 59,418 acre-feet (AF). Residential customers account for most of the District's service connections and 65 percent of its water uses. Non-residential water uses account for 25 percent of total demand, while distribution system losses account for 10 percent.

Table 4-1. Demands for Potable and Non-Potable Water - Actual (DWR Table 4-1)

Use Type	Additional Description (as needed)	Level of Treatment When Delivered	Volume (a)				
			2016	2017	2018	2019	2020
Single Family		Drinking Water	30,449	33,149	34,491	32,852	35,018
Multi-Family		Drinking Water	3,243	3,317	3,366	3,323	3,400
Commercial		Drinking Water	9,577	10,123	10,412	10,146	10,018
Institutional/Gov't		Drinking Water	4,597	5,380	5,412	4,785	4,976
Industrial		Drinking Water	38	46	39	40	42
Other Potable		Drinking Water	4,493	197	1,482	2,470	76
Landscape	(b)	Drinking Water	0	0	0	0	0
Losses	(c)	Drinking Water	2,775	6,360	4,572	2,909	5,890
TOTAL			55,171	58,572	59,773	56,525	59,418
NOTES:							
(a) Volumes are in units of AF.							
(b) District's billing system does not track this use type separate from other use types.							
(c) Real and apparent losses.							

4.2.2 Projected Water Use

Projected water use through 2045 is summarized in Table 4-2. Future water use is estimated as a function of expected service growth and a forecast of average water use per service for each of the use types shown in the table. Projected population and services are based on population and employment forecasts for Kern County generated by the California Department of Transportation's (Caltrans) long-term socio-economic forecast model.¹⁶ These projections are used to estimate the growth in services for each use type. Over the 25-year planning period

¹⁵ Water Research Foundation, 2016. Residential End Uses of Water, Version 2, prepared by DeOreo, William B., Peter Mayer, Benedykt Dziegielewski, and Jack Kiefer, dated April 2016.

¹⁶ California Department of Transportation's long-term socio-economic forecast model:
<https://dot.ca.gov/programs/transportation-planning/economics-data-management/transportation-economics/long-term-socio-economic-forecasts-by-county>

(2020-2045), the total number of services is projected to increase at an average rate of 1.1 percent annually. For sake of comparison, between 2000 and 2020, the total number of services increased at an average rate of 1.2 percent annually. As described later in the chapter, average water use per service is adjusted over the forecast period to account for anticipated reductions in use due to the ongoing effects of appliance standards and plumbing codes, the District's conservation and customer assistance programs, and growth in the inflation-adjusted cost of water service and household income. These factors, in combination, are projected to attenuate the increase in water use associated with future service and population growth.

Table 4-2. Use for Potable and Non-Potable Water – Projected (DWR Table 4-2)

Use Type	Additional Description (as needed)	Projected Water Use (a)				
		2025	2030	2035	2040	2045
Single Family		35,756	37,777	39,779	41,601	43,423
Multi-Family		3,394	3,457	3,533	3,596	3,651
Commercial		10,209	10,358	10,567	10,725	10,890
Institutional/Gov't		5,122	5,249	5,382	5,508	5,622
Industrial		43	44	44	45	46
Other Potable		171	171	171	171	171
Landscape	(b)	0	0	0	0	0
Losses	(c)	5,745	5,625	5,931	6,226	6,511
TOTAL		60,439	62,681	65,408	67,871	70,314
NOTES:						
(a) Volumes are in units of AF.						
(b) District's billing system does not track this use type separate from other use types.						
(c) Real and apparent losses.						

Future water demands are expected to be comprised only of potable water use, as shown in Table 4-3. As discussed in Chapter 6, recycled water from the City of Bakersfield's wastewater treatment facilities is used for agricultural irrigation. None of the recycled water generated by the City of Bakersfield's wastewater treatment facilities is expected to be used to meet the future water demands of District customers.

Table 4-3. Total Gross Water Use (Potable and Non-Potable) (DWR Table 4-3)

	2020	2025	2030	2035	2040	2045
Potable Water, Raw, Other Non-potable <i>From DWR Tables 4-1 and 4-2</i>	59,418	60,439	62,681	65,408	67,871	70,314
Recycled Water Demand <i>From DWR Table 6-4</i>	0	0	0	0	0	0
Optional Deduction of Recycled Water Put Into Long-Term Storage						
TOTAL WATER USE	59,418	60,439	62,681	65,408	67,871	70,314
NOTES: (a) Volumes are in units of AF.						

4.2.3 Distribution System Water Loss

☒ CWC § 10631 (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.

Table 4-4 shows distribution system water losses for the previous five years. Water loss is the sum of apparent and real losses. Apparent loss is associated with metering inaccuracies, billing and administrative errors, authorized unmetered uses (e.g., system flushing and firefighting), and unauthorized uses. Real loss is associated with physical water lost through line breaks, leaks and seeps, and overflows of storage tanks. Since 2016, urban retail water suppliers have been required under CWC §10608.34 and California Code of Regulations (CCR) §638.1 et seq to quantify distribution system water losses using the American Water Works Association (AWWA) Free Water Audit Software (referred to as “water loss audit reports”). The water loss audit reports the District submits to DWR provide the basis for the 2016-2019 estimates shown in Table 4-4 and are available through DWR’s Water Use Efficiency Data Portal.¹⁷ The District’s 2020 water loss audit report had not been completed at the time this Plan was prepared.¹⁸ The 2020

¹⁷ DWR’s Water Use Efficiency Data Portal: https://wuedata.water.ca.gov/awwa_plans

¹⁸ The District’s regulatory deadline for filing its 2020 water loss audit report to the state is October 1, 2021.

estimate shown in Table 4-4 is therefore drawn from the District's preliminary draft water loss audit results.

Table 4-4. Last Five Years of Water Loss Audit Reporting (DWR Table 4-4)

Reporting Period Start Date	Volume of Water Loss (a)
01/2016	2,775
01/2017	6,360
01/2018	4,572
01/2019	2,909
01/2020	5,890
NOTES: (a) Volumes are in units of AF.	

CWC §10631 (3)(c) requires that this UWMP demonstrate whether the distribution loss standards enacted by the State Water resources Control Board (SWRCB) pursuant to §10608.34 have been met. However, the SWRCB has yet to establish these standards, and thus consistency with these standards cannot be demonstrated herein.

4.2.4 Future Water Savings in Projected Water Use

☒ **CWC § 10631 (d) (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.

As affirmed in Table 4-5, both future water savings (discussed below) and lower income residential demands (discussed in 4.2.5) are included in the projections of future water use.

Table 4-5. Inclusion in Water Use Projections (DWR Table 4-5)

Are Future Water Savings Included in Projections?	Yes
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.	Section 4.2.4
Are Lower Income Residential Demands Included In Projections?	Yes
NOTES:	

As noted above, the District has adjusted the forecast of average water use per service for the effects of appliance standards and plumbing codes, conservation programs, and increases in the real cost of water service and household income. These adjustments are described below.

The District uses forecasts of per capita water savings from appliance standards and plumbing codes prepared for DWR to adjust its projections of average water use per service.¹⁹ These forecasts incorporate the effects of the following codes and regulations:

- Assembly Bill (AB) 715, enacted in 2007, requires that any toilet or urinal sold or installed in California on or after January 1, 2014 cannot have a flush rating exceeding 1.28 and 0.5 gallons per flush, respectively. AB 715 superseded the state's previous standards for toilet and urinal water use set in 1991 of 1.6 and 1.0 gallons per flush, respectively. On April 8, 2015, in response to the Governor's Emergency Drought Response Executive Order (EO B-29-15), the California Energy Commission approved new standards for urinals requiring that they not consume more than 0.125 gallons per flush, 75 percent less than the standard set by AB 715.
- Water use standards for residential and commercial clothes washers and dishwashers are established by the U.S. Department of Energy through its authority under the federal Energy Policy and Conservation Act. Water use efficiency is summarized by the water factor for the appliance which measures the gallons of water used per cycle per cubic foot of capacity. A typical top-loading residential clothes washer manufactured in the 1990s had a water factor of around 12. In 2015, the allowable water factor for top- and front-loading residential clothes was reduced to 8.4 and 4.7, respectively. In 2018, water factor standard for top-loading residential clothes washers will be reduced to 6.5. In 2010 the allowable water factor for top- and front-loading commercial clothes washers was reduced to 8.5 and 5.5, respectively. The maximum water factor for Energy Star compliant top- and front-loading washers is 3.7 and 4.3, respectively. The U.S. Environmental Protection Agency estimates that Energy Star washers made up at least 60 percent of the residential market and 30 percent of the

¹⁹ M.Cubed, 2016. Projected Statewide and County-Level Effects of Plumbing Codes and Appliance Standards on Indoor GPCD, technical memorandum prepared for the California Department of Water Resources, dated August 2016.

commercial market in 2011.²⁰ An Energy Star compliant washer uses about two-thirds less water per cycle than washers manufactured in the 1990s. Federal dishwasher water use efficiency standards were last updated in 2013. The maximum water use for standard and compact sized dishwashers is 5.0 and 3.5 gallons per cycle, respectively.

- New construction and renovations in California are now subject to CalGreen Code requirements. CalGreen includes prescriptive indoor provisions for maximum water consumption of plumbing fixtures and fittings in new and renovated properties. CalGreen also allows for an optional performance path to compliance, which requires an overall aggregate 20 percent reduction in indoor water use from a calculated baseline using a set of worksheets provided with the CalGreen guidelines.
- Senate Bill (SB) 407, enacted in 2009, mandates that all buildings in California come up to current State plumbing fixture standards within this decade. This law establishes requirements that residential and commercial property built and available for use on or before January 1, 1994 replace plumbing fixtures that are not water conserving, defined as “noncompliant plumbing fixtures.” This law also requires effective January 1, 2017 that a seller or transferor of single-family residential property show to the purchaser or transferee, in writing, the specified requirements for replacing plumbing fixtures and whether the real property includes noncompliant plumbing. Similar disclosure requirements went into effect for multi-family and commercial transactions January 1, 2019. SB 837, passed in 2011, reinforces the disclosure requirement by amending the statutorily required transfer disclosure statement to include disclosure about whether the property follows SB 407 requirements.

The District’s 2015 Conservation Master Plan forms the basis for the forecast of water savings from conservation programs. Cal Water used the Alliance for Water Efficiency’s Water Conservation Tracking Tool to estimate expected water savings from planned program implementation.²¹

Projected increases in water service costs and household income form the basis for the adjustments to average water use due to changes in the real cost of water service. The forecast uses the historical rate of increase in District water rates to project future water service costs. It uses Caltrans income projections for Kern County to estimate changes in household income. It uses empirically derived estimates of price and income demand elasticity to adjust future water demand for changes in these variables.²²

²⁰ EPA Energy Star Unit Shipment and Market Penetration Report Calendar Year 2011 Summary.

²¹ Alliance for Water Efficiency Water Conservation Tracking Tool:

<https://www.allianceforwaterefficiency.org/resources/topic/water-conservation-tracking-tool>

²² M.Cubed, 2018. California Water Service 2020 Test Year Sales Forecast: 2018 General Rate Case, prepared for California Water Service by M.Cubed, dated January 2018.

Table 4-6 shows the total water savings from plumbing codes and appliance standards, conservation programs, and increases in the real cost of water service.

Table 4-6. Future Conservation Savings (AF)

2025	2030	2035	2040	2045
1,724	3,319	4,062	4,889	5,648

4.2.5 Water Use by Lower Income Households in Water Use Projections

☒ CWC § 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 requirements 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.

California Senate Bill No. 1087 (SB 1087), Chapter 727, passed in 2005, amended Government Code §65589.7 and CWC §10631.1. This law requires that local governments supply a copy of their adopted housing element to water and sewer providers. Additionally, it requires that water providers grant priority for service allocations to developments that include housing units for lower income families and workers. The UWMP Act requires that water providers estimate water demands by lower income single and multi-family households.

Cal Water must serve all development that occurs within its service area, regardless of the income level of the future residents. Cal Water does not keep records of the income level of its customers and does not discriminate when supplying water to any development. It is the responsibility of the city or county with land use authority over a given area to approve or not approve developments within Cal Water's service areas. Cal Water has a Customer Assistance Program (CAP) to help with water service affordability. CAP discounts the monthly service charge of qualifying lower income households.

Table 4-7 shows projected water use by lower income households. These demands are part of the projected residential water use in Table 4-2. Cal Water used the City of Bakersfield's General

Plan Housing Element to estimate the number of lower income households which is the basis for the estimates in Table 4-7.²³

Table 4-7. Residential Demands of Lower Income Households (AF)

2025	2030	2035	2040	2045
12,528	13,195	13,860	14,463	15,064

4.2.6 Characteristic Five-Year Water Use

☒ CWC § 10635(b)(3)

(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...

*(3) A comparison of the total water supply sources available to the water supplier with **the total projected water use for the drought period.** (Emphasis added).*

CWC §10635(b) is a new requirement for 2020 UWMPs. A critical part of this new statutory language is the requirement to prepare a five-year Drought Risk Assessment (see Section 7.5). As a first step, DWR suggests that water suppliers estimate their unconstrained water demand for the next five years (2021-2025). Unconstrained water demand is water use in the absence of drought water use restrictions. Drought conditions cause unconstrained demands to increase. The Drought Risk Assessment presented in Section 7.5 accounts for this increase in unconstrained water demand. Cal Water's demand forecast model separately estimates water use for normal, wet, and dry weather conditions. Table 4-8 shows unconstrained demands for 2021-2025 for normal weather and multiple-dry-year scenarios.

Table 4-8. Characteristic Five-Year Water Use (AF)

Weather Scenario	2021	2022	2023	2024	2025
Multi-Year Dry	60,965	61,217	61,503	61,809	62,188
Normal	59,253	59,497	59,774	60,071	60,439
NOTES: The table shows unconstrained demand (i.e., demand in the absence of drought water use restrictions).					

²³ City of Bakersfield Housing Element 2015-2023, Table 18. Accessed from [https://docs.bakersfieldcity.us/weblink/0/edoc/1273910/Bakersfield%20Housing%20Element%20\(2015-2023\).pdf](https://docs.bakersfieldcity.us/weblink/0/edoc/1273910/Bakersfield%20Housing%20Element%20(2015-2023).pdf)

4.3 Climate Change Considerations

☒ **CWC § 10635(b)**

(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.

Climate strongly influences the level and seasonal pattern of District water demands. Cal Water has analyzed the effect of climate and weather variability on both aspects of demand.²⁴ Using this information, Cal Water has estimated the effect of alternative climate warming scenarios on future water demand.²⁵ Table 4-9 summarizes the results of this analysis. It shows that for plausible emission scenarios and corresponding temperature increases, climate change may, on average, increase future District demands by 2 to 3 percent compared to current climate conditions. Two points are worth noting. First, this is the average effect. There is significant variation about the mean. Second, this is a *ceteris paribus*, or all else equal, result. It assumes existing levels and types of landscaping. However, landscaping choices are partly a function of climate and as the climate changes, so too may these choices. It is reasonable to think households and businesses will adapt their landscaping as the climate warms. This adaptation may mitigate some of the expected demand increase shown in the table.

²⁴ A&N Technical Services, 2014. Cal Water Long-Term Water Demand Forecast Model. Report prepared for California Water Service Company. December 2014.

²⁵ Table 4-9 uses climate scenarios for the southwestern United States. These in turn rely on alternative greenhouse gas emission scenarios. Emissions under scenario A2 are higher than under scenario B2. The 80th percentile scenario is the 80th percentile temperature change for the full suite of emission scenarios. For further information, see Kunkel, K.E, L.E. Stevens, S.E. Stevens, L. Sun, E. Janssen, D. Wuebbles, K.T. Redmond, and J.G. Dobson, 2013. Regional Climate Trends and Scenarios for the U.S. National Climate Assessment. Part 5. Climate of the Southwest U.S., NOAA Technical Report NESDIS 142-5, dated 2013.

Table 4-9. Climate Change Effect on Demand

Emissions Scenario	Change in Mean Temperature by 2040 (degree F)	Change from Current Mean Temperature (%)	Effect on Demand (%)
Lower Emissions Scenario (B1)	2.5	3.4%	2.0%
Higher Emissions Scenario (A2)	2.7	3.7%	2.1%
80%ile Temperature Scenario	3.6	4.9%	2.8%
<p>NOTES:</p> <p>(a) Predicted temperature increases for Southwest United States for alternative emission scenarios reported in Kunkel et al. (2013). Predicted effect on demand derived from weather response models estimated with historical monthly water use, temperature, and rainfall data.</p> <p>(b) The physical climate framework for the 2013 National Climate Assessment is based on climate model simulations of the future using the high (A2) and low (B1) SRES emissions scenarios. The A1B emission scenario reflects a middle case between the A2 and B1 scenarios. The 80%ile scenario is the 80th percentile temperature change across the family of emissions scenarios. Further description of emission scenarios can be found at https://www.ipcc.ch/site/assets/uploads/2018/03/sres-en.pdf</p>			

Chapter 5

SB X7-7 Baseline and Targets

☒ **CWC § 10608.24 (b)**

Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

☒ **CWC § 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.

The Water Conservation Act of 2009, also known as Senate Bill (SB) X7-7, requires that urban retail water suppliers reduce their per capita water use by 20 percent by 2020. SB X7-7 defines an urban retail water supplier as “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” (CWC §10608.12). The Bakersfield District meets both criteria. The state will assess each urban retail water supplier’s 2020 per capita water use against the target it established in its 2015 urban water management plan (UWMP).

This chapter demonstrates the District’s compliance with its SB X7-7 per capita water use target and includes the following sections:

5.1 Wholesale Suppliers

5.2 Updates to the 2015 UWMP Calculations

5.3 Service Area Population

5.4 Baseline Periods, Baseline GPCD, and Confirmed SB X7-7 2020 Target

5.5 Demonstration of Compliance with SB X7-7 2020 Target

5.6 Demonstration of Compliance with Regional Alliance 2020 Target

5.1 Wholesale Suppliers

SB X7-7 does not directly apply to wholesale water suppliers. Wholesale suppliers may adopt programs and policies that support SB X7-7 compliance by the retail water suppliers they serve. They may also take part in a Regional Alliance (discussed below) set up to satisfy SB X7-7 requirements on a regional basis. As discussed in Chapter 2, the District is not a wholesale water supplier and does not receive water supply from any wholesale water supplier. This section therefore does not apply.

5.2 Updates to the 2015 UWMP Calculations

The District has updated its baseline GPCD, 2015 interim GPCD target, 2015 actual GPCD, and 2020 GPCD target. These updates were necessary because the District discovered in late 2020 that production from its treated surface water supply source was reported incorrectly in its 2010 and 2015 UWMPs. Per the *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use*, treated surface water should be measured at the point of entry into the distribution system.²⁶ The District had been reporting production for this water source at the point of diversion from the Kern River and thus was including the volume of water lost during transmission to the treatment plant and during the treatment process in the calculation of per capita water use. This resulted in an overstatement of baseline and compliance per capita water use.

The District has updated the calculations of its baseline GPCD, 2015 interim GPCD target, 2015 actual GPCD, and 2020 GPCD target using the corrected production data. None of the other data used in the 2010 and 2015 UWMPs to establish the District's baseline GPCD and GPCD targets has been altered. Specifically, the service area population and groundwater production estimates used in the previous UWMPs are unchanged.

The updated SBX7-7 Verification Forms establishing the District's 2020 GPCD target are provided in Appendix E.

²⁶ California Department of Water Resources (2016). *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use*, page 16 and Figure 1.

5.3 Service Area Population

Service area population estimation must satisfy the requirements in Methodology 2 – Service Area Population – of DWR’s *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use*. California Water Service Company (Cal Water)’s population estimation method is similar to the method used by DWR’s Population Tool.²⁷ DWR reviewed and accepted Cal Water’s population estimation method as part of the review of its 2015 UWMPs. Cal Water used this method to estimate the District’s 2020 service area population. As reported in Chapter 3, the District’s population was 286,310 in 2020.

5.4 Baseline Periods, Baseline GPCD, and Confirmed SB X7-7 2020 Target

Table 5-1 shows the District’s 5- and 10-year baseline periods, baseline per capita water use (GPCD), and SB X7-7 2020 target.²⁸

Table 5-1. Baselines and Targets Summary (DWR Table 5-1)

Baseline Period	Start Year	End Year	Average Baseline GPCD	Confirmed 2020 Target GPCD
10-15 year	1995	2004	294	235
5 Year	2003	2007	287	
NOTES:				

5.5 Demonstration of Compliance with SB X7-7 2020 Target

Service area population and water use in 2020 were 12,283 and 2,012 AF, respectively, resulting in per capita water use of 146 GPCD. This is less than target GPCD, as shown in Table 5-2.

²⁷ Cal Water estimates service area population using census block population data with the LandView 5 and MARPLOT software programs. In census years, the method estimates service area population using the population counts of census blocks with centroids falling within the District’s service boundary. In off-census years, the method estimates population by adjusting the census year estimates for changes in the number of single- and multi-family service connections and dwelling units. As shown in the District’s 2015 UWMP, estimates prepared using this method and DWR’s Population Tool typically differ by less than a percent. Cal Water prefers using its method to be consistent with its other planning documents.

²⁸ The population and water use data used to establish the District’s 2020 target GPCD are provided Appendix F.

Table 5-2. SB X7-7 2020 Compliance (DWR Table 5-2)

2020 GPCD			2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020?
Actual 2020 GPCD	2020 TOTAL Adjustments	Adjusted 2020 GPCD (Adjusted if applicable)		
185			235	Yes
NOTES:				

5.6 Demonstration of Compliance with Regional Alliance 2020 Target

An urban retail water supplier can satisfy SB X7-7 requirements either individually or as part of a Regional Alliance. The District formed a regional alliance with other Cal Water districts in the Tulare Lake Hydrologic Region. The name of this Regional Alliance is California Water Service – Tulare Lake Regional Alliance. Table 5-3 shows 2020 per capita water use for this Regional Alliance. Table 5-4 demonstrates compliance with the Regional Alliance’s SB X7-7 2020 target GPCD.²⁹

Table 5-3. SB X7-7 Regional Alliance – 2020 GPCD (DWR RA 2020 GPCD Table)

Participating Member Agency Name	2020 Actual GPCD*	2020 Population	(2020 GPCD) X (2020 Population)	Regional Alliance 2020 GPCD (Actual)
Cal Water Bakersfield District	185	286,310	53,045,181	
Cal Water Kern R. Valley District	126	5,501	693,126	
Cal Water Selma District	157	26,157	4,099,875	
Cal Water Visalia District	183	147,032	26,918,034	
Regional Alliance Totals	651	465,000	84,756,216	182
*All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6, Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable. These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.				

²⁹ The population and water use data used to establish the Regional Alliance’s 2020 target GPCD are provided in Appendix F.

Table 5-4. SB X7-7 Regional Alliance – 2020 Compliance (DWR RA 2020 Compliance Table)

2020 Actual GPCD	Optional Adjustment for Economic Growth ¹	Adjusted 2020 Actual GPCD	2020 Target GPCD ²	Did Alliance Achieve Targeted Reduction for 2020?
182			222	Yes
¹ Adjustments for economic growth can be applied to either the individual supplier's data or to the aggregate regional alliance data (but not both), depending upon availability of suitable data and methods. ² 2020 Target GPCD will be taken from the Regional Alliance's SB X7-7 Verification Form, Weighted Target Table.				

Chapter 6

Water Supply Characterization

☒ **CWC § 10631 (b)** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

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).

This chapter provides a description of the Bakersfield District’s (also referred to herein as the “District”) current water supplies, including its purchased water, a discussion of the underlying groundwater basin and its management, and potential supply sources, such as surface water, stormwater, and recycled water, as well as assessment of the energy intensity used to operate the Bakersfield District treatment and distribution system. This chapter includes the following sections:

6.1 Purchased Water

6.2 Groundwater

6.3 Surface Water

6.4 Stormwater

6.5 Wastewater and Recycled Water

6.6 Desalinated Water Opportunities

6.7 Water Exchanges and Transfers

6.8 Future Water Projects

6.9 Summary of Existing and Planned Sources of Water

6.10 Special Conditions

6.11 Energy Intensity

6.1 Purchased Water

☑ **CWC § 10631 (h)** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

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).

California Water Service Company (Cal Water) currently purchases water from two sources to meet demands in its Bakersfield District: (1) untreated Kern River water purchased from City of Bakersfield (City), and (2) treated Kern River water and imported water purchased from Kern County Water Agency-Improvement District 4 (ID-4).

6.1.1 Purchases from City of Bakersfield

The City of Bakersfield holds pre-1914 appropriative rights to Kern River water. Cal Water has a signed long-term supply agreement with the City for up to 67,200 acre-feet per year (AFY) of this water supply. As described herein, Cal Water purchases untreated Kern River surface water from City and treats the water at the following water treatment facilities.

Northeast Bakersfield Water Treatment Plant

In June 2003, Cal Water commenced operation of the Northeast Bakersfield Water Treatment Plant (NEBWTP). The NEBWTP currently has a base load treatment capacity of 20 million gallons per day (MGD; or 22,403 AFY) and peaking capacity of 23 MGD.

Two planned additional expansions of the NEBWTP will provide additional treated water to the District. Phase 2 will add another 20 MGD (22,400 AFY) of base load treatment capacity to bring the total to 40 MGD (44,800 AFY) with a peaking capacity 46 MGD. Phase 2 is projected to be online by 2030. Phase 3 will add yet another 20 MGD (22,400 AFY) of base load capacity to bring the total to 60 MGD (67,200 AFY) with a peaking capacity of 69 MGD. Phase 3 is not projected to be online during the planning horizon of this Urban Water Management Plan (UWMP or Plan).

North Garden Water Treatment Plant

Cal Water has constructed a micro-filtration plant at the North Garden Water Treatment Plant (NGWTP) in North West Bakersfield that treats Kern River water and serves the area. The plant has a base load treatment capacity of 8.0 MGD (8,960 AFY) and a 10.4 MGD peaking capacity. Half of the plant's capacity is used to supply the City of Bakersfield under contract.

Southwest Bakersfield Water Treatment Plant

Phase 1 of the proposed Southwest Bakersfield Water Treatment Plant (WTP) will provide a base load treatment capacity of 20 MGD (22,400 AFY) with a peaking capacity of 23 MGD. Half of the plant's capacity will be used to supply the City of Bakersfield under contract.

Phase 2 of the proposed Southwest Bakersfield WTP will provide another 20 MGD (22,400 AFY) of base load treatment capacity to bring the total to 40 MGD (44,800 AFY) with a peaking capacity of 46 MGD. Again, half of the plant's Phase 2 capacity will be used to supply the City of Bakersfield under contract.

Implementation of Phases 1 and 2 will depend on the rate of growth in the southwest portion of the service area and is not anticipated within the planning horizon of this UWMP.

6.1.2 Purchases from Kern County Water Agency Improvement District 4

Cal Water also purchases imported water from ID-4. The Kern County Water Agency (KCWA) is a contractor of the State Water Project (SWP) and imports water for Municipal and Industrial (M&I) and agricultural use through the California Aqueduct. The KCWA also holds water rights to, and diverts water from, the Kern River.

The ID-4 built and operates a surface water treatment plant, the Henry C. Garnett Water Treatment Plant (HGWTP), that serves Cal Water, the East Niles Community Services District, and the North of the River Water District. The ID-4 obtains its water supply from KCWA entitlements to SWP supplies and Kern River flows and uses the water to recharge groundwater aquifers and to supply its conventional multi-media high-rate filtration plant (i.e., the HGWTP). The total treatment plant capacity of the HGWTP is about 47 MGD (53,000 AFY).

Rapid growth is occurring in the northwest Bakersfield area. To provide a reliable supply for this area, Cal Water entered into an agreement with KCWA for expansion of the HGWTP and construction of the Northwest feeder pipeline to convey water from the expanded plant. The Northwest feeder pipeline has been constructed and Cal Water has a contract with ID-4 to purchase 20,500 AFY of treated water from the HGWTP during normal hydrologic conditions, as well as access to a peaking capacity of 15.5 MGD. Further, depending on the needs of other water suppliers and the production capabilities of the plant, Cal Water can purchase up to 15 percent more than its contracted amount.

Every year Cal Water prepares a monthly demand schedule for this water and submits it to ID-4. The schedule is weighted so that the greatest volume of deliveries occurs during the peak summer demand period. The water acquired from ID-4 is obtained through five service connections.

6.2 Groundwater

☒ CWC § 10631

(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:

(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. 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).

(C) 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.

Groundwater makes up an important portion of the Bakersfield District's water supply. This section includes information regarding the underlying basin description, groundwater management, and Cal Water's coordination with the relevant Groundwater Sustainability Agencies (GSAs), followed by a discussion of historical pumping and supply sufficiency, which is further supported by Section 7.1.1.

6.2.1 Basin Description and Status

As shown on Figure 6-1, the Bakersfield District overlies the Kern County Subbasin (also referred to herein as the "Basin") of the San Joaquin Valley Groundwater Basin (California Department of Water Resources [DWR] Basin No. 5-022.14). The Kern County Subbasin is not adjudicated,

however, in its recent evaluation of California groundwater basins, DWR determined that the Basin is in a condition of critical overdraft.³⁰

The Kern County Subbasin is designated as a high priority basin under DWR's 2019 Phase 2 Basin Prioritization.³¹ Under this prioritization process, basins are ranked on eight components, and if a basin is assigned more than 21 total points, it is defined as "high priority." The main factors driving the Basin's designation include population growth (5 out of 5 possible points), irrigated acreage per square mile (4 out of 5 possible points), groundwater reliance (4.5 out of 5 possible points), and documented impacts including declining groundwater levels and subsidence (4 out of 5 possible points).³² However, because the Basin is critically overdrafted, the Basin is assigned 40 priority points, which is the maximum total points under DWR's ranking system.

The Kern County Subbasin covers an area of approximately 1,813,800 acres (2,834 square miles) and is located at the southern end of the San Joaquin Valley and contains the City of Bakersfield. The Basin is bounded on the west, southwest, and east by the bedrock formations of the coast range, San Emigdio Mountains, and Sierra Nevada, respectively. It is separated from the White Wolf Subbasin on the southeast by the White Wolf Fault. The northern boundary is generally coincident with the Kern County line.³³

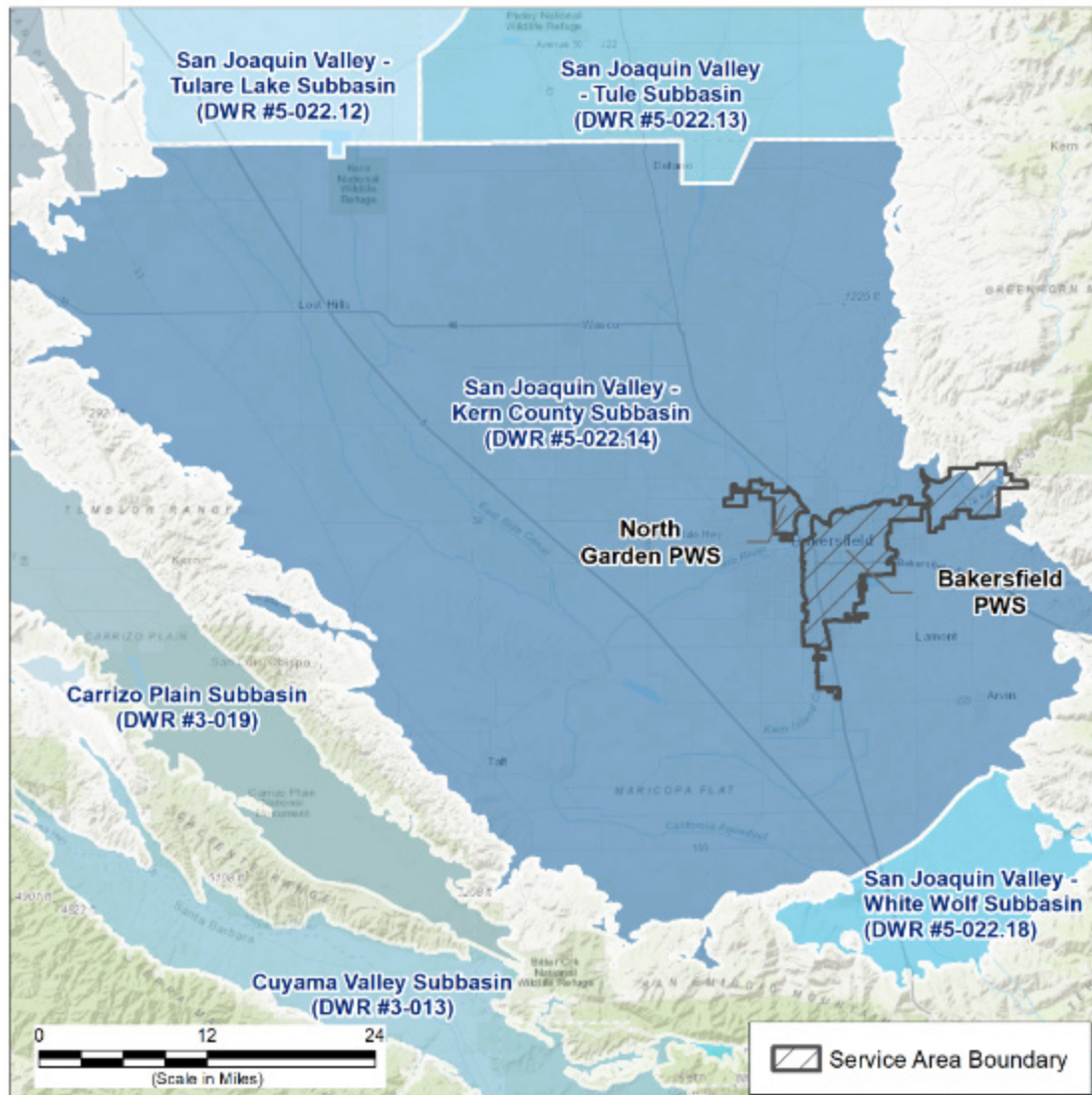
³⁰ DWR, 2019. Sustainable Groundwater Management Act 2018 Basin Prioritization, State of California, dated January 2019.

³¹ Ibid.

³² DWR's 2019 Phase 2 Basin Prioritization used the basin's total possible ranking points assigned to each of the eight components to determine the priority. A basin is defined as High Priority if it has more than 21 total ranking points.

³³ DWR, 2018. B118 Basin Description, Kings Subbasin, dated March 2018.

Figure 6-1. Groundwater Basin Underlying the Bakersfield District



Additional details on the Kern County Subbasin are given in the DWR's Groundwater Bulletin 118, as well as in the key documents described below related to groundwater management of the Basin, which are incorporated into this Urban Water Management Plan (UWMP or Plan) by reference:

- Final GSPs include current groundwater conditions, hydrogeologic conceptual model, water budget, local sustainable management criteria, and projects and management actions for reaching sustainability in the Basin by 2040, are available on the DWR Sustainable Groundwater Management Act (SGMA) Portal website. The final GSP for the Kern Groundwater Authority Groundwater Sustainability Agency (KGA GSA) can be accessed here:

<https://sgma.water.ca.gov/portal/gsp/preview/36>

The final GSP for the Kern River Groundwater Sustainability Agency (KRGSA) can be accessed here:

<https://sgma.water.ca.gov/portal/gsp/preview/54>

The final GSP for the Olcese GSA can be accessed here:

<https://sgma.water.ca.gov/portal/gsp/preview/44>

- The final GSPs prepared by other GSAs within the Basin³⁴ are available on the DWR SGMA Portal website:

<https://sgma.water.ca.gov/portal/gsp/all>

- The Kern Integrated Regional Water Management Plan (IRWMP), including detailed descriptions of basin hydrogeology, groundwater conditions, and groundwater monitoring practices, is available on the Kern IRWMP website:

<http://kernirwmp.com/documents.html>

6.2.2 Non-SGMA Groundwater Management

Prior to the passage of SGMA, water agencies in the Kern County Subbasin cooperated in water supply and groundwater management efforts. The Basin was included in the Kern IRWMP and the Greater Bakersfield Subregion of the Kern IRWMP Region covers the Bakersfield District. Section 3 of the Kern IRWMP describes the physical, environmental, social, and demographic characteristics of the Greater Bakersfield Subregion, the hydrologic features and overall water reliability, major water related infrastructure, and the identified subregional issues, needs, challenges and priorities.³⁵

The most recent update to the Kern IRWMP was adopted in March 2020. The five regional goals stated in the IRWMP include: (1) increase water supply, (2) improve operational efficiency, (3) improve water quality, (4) promote land use planning and resource stewardship, and (5) improve

³⁴ Five GSAs that prepared GSPs include the Kern Groundwater Authority GSA, Kern River GSA, Olcese GSA, Henry Miller Water District GSA, and Buena Vista Water Storage District GSA.

³⁵ Provost & Pritchard Consulting Group, 2020. Kern Integrated Regional Water Management Plan, dated March 2020.

regional flood management.³⁶ These regional goals were used to inform the measurable objectives and potential project proposals to accomplish the goals of the region. The GSPs (discussed below) supersede the IRWMP as the groundwater management plan for the Bakersfield District portion of the Basin.

6.2.3 SGMA Groundwater Management

In 2014, the California State Legislature enacted SGMA with subsequent amendments in 2015. Among other things, SGMA requires the formation of GSAs and the development and implementation of GSP for groundwater basins that are designated by DWR as medium or high priority. As a high priority, critically overdrafted and non-adjudicated basin, the Kern County Subbasin is subject to the requirements of SGMA.

Eleven GSAs were formed to collectively assume responsibility for sustainable groundwater management of the Basin. The Bakersfield District falls within the jurisdiction of the KRGSA, the KGA GSA, and the Olcese GSA.

The eleven GSAs coordinated to prepare five GSPs within the Basin (i.e., KGA GSA GSP, KRGSA GSP, Olcese GSA GSP, Henry Miller Water District GSA GSP, and Buena Vista Water Storage District GSA GSP), but certain technical efforts (e.g., development of the Basin level Water Budget) were cooperatively developed through a Coordination Agreement. The majority of the Bakersfield District falls within the jurisdiction of the KRGSA GSP, which covers an area of 230,830 acres in the southeast-central portion of the Basin, including most of the City of Bakersfield. Small portions of the Bakersfield District also fall within the jurisdiction of the KGA GSA GSP and the Olcese GSA GSP. All of the Basin GSPs were submitted to DWR on or before the January 30, 2020 deadline.³⁷

As defined under SGMA, sustainable yield means “the maximum quantity of water, calculated over a base period representative of long-term conditions in a basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing undesirable results.”³⁸ Based on development and application of a numerical groundwater flow model for the Kern County Subbasin (C2VSimFG-Kern), the sustainable yield of the Basin is estimated to be approximately 1,313,000 AFY, plus or minus 10 percent, but was not further allocated.³⁹ The Basin-level estimate was supplemented by local water budget information presented in each GSP, but again the local sustainable yield was not formally allocated. For example, the KRGSA GSP estimated an initial sustainable yield of about 290,000 AFY to 320,000 AFY for its portion of

³⁶ Ibid.

³⁷ In total, five GSPs have been prepared by GSAs within the Basin.

³⁸ California Water Code (CWC) §10721(w)

³⁹ KGA GSA, 2020. Kern Groundwater Authority Groundwater Sustainability Plan, dated January 2020.

the Basin⁴⁰ and the Olcese GSA GSP estimated a sustainable yield of 890 AFY to 1,840 AFY for its portion of the Basin.⁴¹

Projects and management actions to support achievement of the Basin's sustainability goal under SGMA are proposed by the GSAs and documented in their respective GSPs. Specifically, for the GSPs that include the Bakersfield District:

- The "Phase One" projects described in the KRGSA GSP include: water allocation plan, Kern River optimized conjunctive use, expand recycled water use, conversion of agricultural lands to urban use, water system consolidation, and possible water exchange. These projects will begin being implemented prior 2025, but will require adjustment and possible re-direction over time to optimize project performance and avoid undesirable results.⁴² In addition, the KRGSA proposed ten management actions to provide a framework for overall groundwater management including establishing GSP policies and filing data gaps that are also part of their planned Phase One.
- The projects and management actions described in the Olcese GSA GSP include: install a shallow monitoring well to evaluate potential hydraulic connection between Olcese sand aquifer unit and the shallow alluvium, conduct a study of shallow alluvium groundwater level response to pumping in the principal aquifer, and develop a subsidence monitoring network.
- The projects and management actions described in the KGA GSA GSP include: basin-wide subsidence monitoring, basin-wide groundwater modeling, study of native yield of the basin, KGA monitoring network improvement, and basin-wide coordination. The KGA GSA GSP also listed the projects and management actions that are proposed by the KGA member agencies. The details of each proposed project and management action can be found in each member agency's management area plan.

The long-term impacts of SGMA implementation in the Kern County Subbasin are still uncertain; however, it is the intent of the projects and management actions planned by the GSAs within the Basin to stabilize water levels and provide for sustainable management of the groundwater resource.

6.2.4 Cal Water Coordination with Groundwater Sustainability Agencies

Cal Water's groundwater basin management philosophy continues to be to work collaboratively with all stakeholders in the basins where we operate and to do what is best for the groundwater

⁴⁰ Ibid.

⁴¹ Olcese GSA, 2020. Olcese Groundwater Sustainability Agency Groundwater Sustainability Plan, dated January 2020.

⁴² KRGSA, 2020. Kern River Groundwater Sustainability Agency Groundwater Sustainability Plan, dated January 2020.

basin including the sharing of burden(s) and benefits on an equitable basis with said stakeholders. Cal Water recognizes and deeply supports the goals, objectives, and intended outcomes of the SGMA. Moreover, the company recognizes the numerous challenges of implementing the legislation along a variety of technical, legal, political, and financial/economic dimensions, particularly when the geographical diversity of the Cal Water's service territory is considered. Nonetheless, Cal Water intends to take an active role in the local and state-wide management of groundwater resources over the next five to 25+ years by fully supporting and participating in the principal edicts of SGMA. A number of specific steps that Cal Water has taken with respect to this position and role include (among others):

- Coordination with public agencies to ensure that Cal Water's presence, rights and interests, as well as historical and current resource management concerns are honored/incorporated within the GSA and GSP formulation process(es);
- Coordination with applicable local and regulatory agencies to ensure that Cal Water is at full participation, while also meeting the requirements and expectations set forth by SGMA;
- Enhanced use of digital/electronic groundwater monitoring equipment and other new technology aimed at measuring withdrawal rates, pumping water levels, and key water quality parameters within the context of day-to-day operations;
- Participation in the development of GSP's and formulation of groundwater models being constructed in basins where Cal Water has an operating presence;
- Participation in individual and/or joint projects aimed at mitigating seawater intrusion and other "undesirable results" where appropriate;
- Inclusion of sound groundwater management principles and data in all applicable technical reports, studies, facility master plans, and UWMPs (including this 2020 update), particularly as these undertakings relate or pertain to water resource adequacy and reliability; and,
- Inclusion of sound groundwater management principles and data in all general rate case (GRC) filings and grant applications to ensure that resource management objectives remain visible and central to Cal Water's long-term planning/budgeting efforts.

6.2.5 Historical Pumping and Supply Sufficiency

The groundwater used by the Bakersfield District is extracted from the underlying Kern County Subbasin. The District has a total of 130 wells located within the District service area boundaries shown in Figure 6-1.

There are 56 surface storage structures, enabling the groundwater wells to pump to storage during non-peak demand periods and provide peak day demand. The District has sufficient production capacity to supply all of the District's current annual average day and maximum day demand.

As noted above, groundwater is a portion of the supply for the Bakersfield District. Table 6-1 lists the amount of groundwater pumped by Cal Water over the past five years. The available groundwater supply and the purchased water supply have been sufficient to meet all of the District's demands in the past five years and all prior years.

Section 7.1.1 presents an analysis of the availability of supply for the District based on historical surface water and groundwater use and review of available information regarding future supply availability to the Bakersfield District, including the impacts of SGMA. Based on the available information, the available groundwater supply and the purchased water supply are expected to be sufficient to meet the projected future demands of the District in normal and multiple dry year periods through 2045. It should be noted that the Kern County Subbasin is not adjudicated, and the projected groundwater supply volumes are not intended to and do not determine, limit or represent Cal Water's water rights or maximum pumping volumes. Any determination of Cal Water's water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.

Table 6-1. Groundwater Volume Pumped (DWR Table 6-1)

	Supplier does not pump groundwater. The supplier will not complete the table below.					
	All or part of the groundwater described below is desalinated.					
Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
Alluvial Basin	Kern County Subbasin	30,552	31,669	32,498	27,895	29,249
TOTAL		30,552	31,669	32,498	27,895	29,249
NOTES: (a) Volumes are in units of AF.						

6.3 Surface Water

Cal Water purchases untreated local surface water from the City of Bakersfield, and treated local surface and imported water from KCWA ID-4, as described above in Section 6.1.

6.4 Stormwater

There are no plans to divert stormwater for beneficial uses in the Bakersfield District.

6.5 Wastewater and Recycled Water

☒ **CWC § 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.

The recycling of wastewater offers several benefits to Cal Water and its customers. Perhaps the greatest of these benefits is to help maintain a sustainable groundwater supply either through direct recharge, or by reducing potable supply needs by utilizing recycled water for appropriate uses (e.g., landscape irrigation) now being served by potable water. Currently, no wastewater is recycled for direct reuse from the domestic or industrial wastewater streams in the District. Indirect recycling occurs through the recharge of groundwater. The potential amount of recycled water that can be produced is proportional to the amount of wastewater that is generated by the District, and is discussed in the following sections.

6.5.1 Recycled Water Coordination

The Bakersfield District relies on and coordinates with the City of Bakersfield Public Works Department, Kern Sanitation Authority, and North of River Sanitation District Number 1 for relevant wastewater collection, treatment, and discharge. There are no current plans to bring recycled water into the District area.

6.5.2 Wastewater Collection, Treatment, and Disposal

☒ **CWC § 10633 (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.

☒ **CWC § 10633 (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.

Four wastewater treatment plants serve the City of Bakersfield (and the District). The City of Bakersfield owns, operates, and maintains the sewer collection system for Wastewater Treatment Plant No.2 and Wastewater Treatment Plant No.3. The Kern Sanitation Authority and North of River Sanitary District Number 1 also own and maintain the sewer systems for their respective treatment plants. None of the wastewater treatment plants are located within the District's boundaries.

Table 6-2 includes an estimate of the volume of wastewater collected from District customers in 2020. The estimate is calculated by annualizing 90 percent of January water use in the service area. As shown in Table 6-3, no wastewater is treated or disposed of within the District.

The City's collection systems contain approximately 1,069 miles of sewer main, six inches in diameter and greater, and raw sewage pump and lift stations.⁴³ All four wastewater treatment plants servicing the District utilize secondary treatment. Wastewater Treatment Plant No.2 is a trickling filter facility with a design capacity of 25 MGD and current average daily flow of 13.7 MGD. Wastewater Treatment Plant No.3 is an activated sludge plant facility with a design capacity of 32 MGD and a current average flow of 17.3 MGD.⁴⁴ The Kern Sanitation Authority wastewater treatment plant treats approximately 4.0 MGD of industrial, commercial, and domestic wastewater via a headworks screening unit, two primary clarifiers, an anaerobic digester, two trickling filters, two secondary clarifiers, and recirculation pumps.⁴⁵ Effluent from the Kern Sanitation Authority wastewater treatment plant is used to irrigate 1,100 acres of adjacent farmland.⁴⁶ North of River Sanitary District Number 1 wastewater treatment plant treats approximately 7.5 MGD of domestic and commercial wastewater, and the effluent is recycled on adjacent irrigated farmland.⁴⁷

Currently, as shown in Table 6-3, no wastewater is recycled for direct reuse within the Bakersfield District service area. The cost of implementation of a recycled water system for reuse in the District is not planned at this time and will likely only be considered if conditions related to District supply change significantly in the future. As such, as shown in Table 6-4, there is no projected recycled water supply for the District through the year 2045.

⁴³ City of Bakersfield, 2014. City of Bakersfield Public Works Department Sewer System Management Plan, dated December 2014.

⁴⁴ City of Bakersfield Department of Public Works website:

https://www.bakersfieldcity.us/gov/depts/public_works/sewer/wastewater_treatment_plants.htm

⁴⁵ Kern Public Works website: <https://kernpublicworks.com/building-and-development/sewer-information/>

⁴⁶ Ibid.

⁴⁷ North of River Sanitary District website: <https://www.norsd.com/services>

Table 6-2. Wastewater Collected Within Service Area in 2020 (DWR Table 6-2)

	There is no wastewater collection system. The supplier will not complete the table below.					
	Percentage of 2020 service area covered by wastewater collection system <i>(optional)</i>					
	Percentage of 2020 service area population covered by wastewater collection system <i>(optional)</i>					
Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2020	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? <i>(optional)</i>
City of Bakersfield	Estimated	14,290	City of Bakersfield	Wastewater Treatment Plant No.2	No	
City of Bakersfield	Estimated	9,249	City of Bakersfield	Wastewater Treatment Plant No.3	No	
Kern Sanitation Authority	Estimated	3,619	Kern Sanitation Authority	Kern Sanitation Authority Wastewater Treatment Plant	No	
North of River Sanitation District	Estimated	3,773	North of River Sanitation District	North of River Sanitation District Wastewater Treatment Plant	No	
Total Wastewater Collected from Service Area in 2020:		30,931				
NOTES:						
(a) Volumes are in units of AF.						

(b) North of River Sanitation District Wastewater Treatment Plant serves the North Garden PWS only, and the other three wastewater treatment plants listed herein serve both Bakersfield PWS and North Garden PWS.

Table 6-3. Wastewater and Discharge Within Service Area in 2020 (DWR Table 6-3)

X	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.										
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number <i>(optional)</i>	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 volumes				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
						Total					
NOTES:											

6.5.3 Recycled Water System and Recycled Water Beneficial Uses

☒ **CWC § 10633 (c-g)**

(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.

As shown in Table 6-4 and Table 6-5, the Bakersfield District does not have any current or projected beneficial use of recycled water.

Table 6-4. Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4)

X	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.									
Name of Supplier Producing (Treating) the Recycled Water:										
Name of Supplier Operating the Recycled Water Distribution System:										
Supplemental Water Added in 2020 (volume)										
Source of 2020 Supplemental Water										
Beneficial Use Type	Potential Beneficial Uses of Recycled Water (Describe)	Amount of Potential Uses of Recycled Water (Quantity)	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
				Total:						
2020 Internal Reuse										
NOTES:										

Table 6-5 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual
(DWR Table 6-5)

X	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below.		
Beneficial Use Type		2015 Projection for 2020	2020 Actual Use
Total			
NOTES:			

6.5.4 Actions to Encourage and Optimize Future Recycled Water Use

At this time, as shown in Table 6-6, Cal Water does not have plans to initiate/expand the use of recycled water within the Bakersfield District. Cal Water's supply portfolio in some districts already includes recycled water; elsewhere, Cal Water is participating in studies of the possibility of adding this supply source. Cal Water is eager to expand its portfolio to provide recycled water to its customers wherever feasible, and to form partnerships with other agencies and jurisdictions to accomplish this. However, any such project must be economically feasible and approval of such an investment by the California Public Utilities Commission (CPUC) is contingent on a demonstration that it is beneficial to ratepayers.

Table 6-6. Methods to Expand Future Recycled Water Use (DWR Table 6-6)

X	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 6.5.4	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Total			
NOTES:			

6.6 Desalinated Water Opportunities

☒ **CWC § 10631 (g)** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

The Bakersfield District is located in the southern Central Valley, many miles from the nearest source of saline water. As such, there are no opportunities for the development of desalinated water in the District.

6.7 Water Exchanges and Transfers

☒ **CWC § 10631 (c)** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

6.7.1 Exchanges

Cal Water is not pursuing water exchanges involving the Bakersfield District and other entities at the time.

6.7.2 Transfers

Cal Water is not pursuing water transfers involving the Bakersfield District and other entities at the time.

6.7.3 Emergency Interties

The District currently has interties with ID-4, as discussed in Section 6.1, as well as with the City of Bakersfield.

6.8 Future Water Projects

☑ **CWC § 10631** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

(b) (3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

(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.

Cal Water has an active well maintenance program to monitor all of the wells and identify which wells need to be replaced to maintain the reliability of the system. Cal Water will maintain sufficient wells and distribution facilities to meet the anticipated increases in future demand as needed.

As discussed in Section 6.1.1, phase 2 expansion of the NEBWTP will provide additional treated water to the District and it is projected to be online by 2030. Other potential construction or expansions of Cal Water's water treatment plants are discussed in Section 6.1.1; however, those are not projected to be online during the planning horizon of this UWMP. Table 6-7 shows the planned future water supply projects or programs that are expected to provide a quantifiable increase to the District's water supply.

Table 6-7. Expected Future Water Supply Projects or Programs (DWR Table 6-7)

	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier
	Y/N	If Yes, Supplier Name				
Northeast Bakersfield Water Treatment Plant expansion	Yes	City of Bakersfield	Increased water treatment plant base load capacity	2030	Average Year	14,463
<p>NOTES:</p> <p>(c) Volumes are in units of AF.</p> <p>(d) Based on the entire purchase record, the District's historical maximum purchase from the City of Bakersfield is 14,463 AFY between 2003 and 2020 for NEBWTP. Given that the NEBWTP will have an expansion that will double its capacity by 2030, the projected purchased water from City of Bakersfield that is treated in the NEBWTP is also assumed to be double by 2030 (i.e., the available supply from the NEBWTP increases from 14,463 AFY to 28,926 AFY). Therefore, the expected increase in water supply to supplier presented here is 14,463 AFY.</p>						

6.9 Summary of Existing and Planned Sources of Water

☒ **CWC § 10631 (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).

☒ **CWC § 10631 (b) (2)**

When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.

☒ **CWC § 10631 (b) (4) (D)** 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.

Table 6-8 summarizes the actual volumes of purchased water and groundwater production for calendar year 2020, as applicable.

As discussed above, and shown in Table 6-9, Cal Water has signed a long-term supply agreement for up to 67,200 AFY of untreated Kern River water with the City of Bakersfield. Cal Water also has a contract with KCWA ID-4 to purchase up to 20,500 AFY of treated water.

While the exact split between the District's future use of groundwater and surface water is unknown, the projected volume of purchased water from both sources shown in Table 6-9 is based on: (1) the historical maximum amount purchased to date by the District from each source as shown in Appendix D, rounded to the hundreds (i.e., 17,400 AFY from the City and 18,900 AFY from ID-4)⁴⁸, and (2) the assumed availability of an additional 14,500 AFY of water purchased from City once the increased treatment capacity becomes available at the NEBWTP in 2030.⁴⁹

Once the other planned water treatment plant expansion projects are completed, Cal Water would have the capacity to utilize even more of its full contractual allocation. It should be noted that the projected purchased water supply volumes shown in Table 6-9 are less than the District's contractual allocations, and do not represent the total water supply available to the District in a given year.

In the interim, and during any surface (purchased) water supply shortages, groundwater supply will be used to serve any remaining District demand that is not met with purchased water supplies. Therefore, the sum of purchased water and groundwater supply amounts shown in Table 6-9 equal the projected demand in each year (see Section 7.1.1).

It should also be noted that the Kern County Subbasin is not adjudicated, and the projected groundwater supply volumes are not intended to and do not determine, limit or represent Cal Water's water rights or maximum pumping volumes. Any determination of Cal Water's water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.

⁴⁸ Based on the entire purchase record, the District's historical maximum purchase from the City of Bakersfield is 14,463 AFY between 2003 and 2020 for NEBWTP and 2,920 AFY between 2010 and 2020 for NGWTP, for a total of 17,382 AFY. The District's historical maximum purchase from KCWA ID-4 is 18,879 AFY between 1980 and 2020.

⁴⁹ Given that the NEBWTP, which treats purchased water from the City of Bakersfield, will have an expansion that will double its capacity by 2030, the projected purchased water from City of Bakersfield that is treated in the NEBWTP is also assumed to be double by 2030 (i.e., the available supply from the NEBWTP increases from 14,463 AFY to 28,926 AFY, and the total available supply from the City of Bakersfield increases from 17,400 to 31,900 AFY).

Table 6-8. Water Supplies – Actual (DWR Table 6-8)

Water Supply	Additional Detail on Water Supply	2020		
		Actual Volume	Water Quality	Total Right or Safe Yield <i>(optional)</i>
Groundwater (not desalinated)	Kern County Subbasin	29,249	Drinking Water	
Purchased or Imported Water	KCWA ID-4	16,807	Drinking Water	20,500
Purchased or Imported Water	City of Bakersfield	13,362	Drinking Water	67,200
Total		59,418		
NOTES: (a) Volumes are in units of AF.				

Table 6-9. Water Supplies – Projected (DWR Table 6-9)

Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Purchased or Imported Water	Surface water purchased from KCWA ID-4	18,900	20,500	18,900	20,500	18,900	20,500	18,900	20,500	18,900	20,500
Purchased or Imported Water	Surface water purchased from City of Bakersfield	17,400	67,200	31,900	67,200	31,900	67,200	31,900	67,200	31,900	67,200
Groundwater (not desalinated)	Kern County Subbasin	24,139		11,881		14,608		17,071		19,514	
Total		60,439		62,681		65,408		67,871		70,314	
NOTES: (a) Volumes are in units of AF. (b) The Kern County Subbasin is not adjudicated, and the projected groundwater supply volumes are not intended to and do not determine, limit or represent Cal Water's water rights or maximum pumping volumes. Any determination of Cal Water's water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.											

6.10 Special Conditions

6.10.1 Climate Change Effects

Cal Water is committed to incorporating climate change into its ongoing water supply planning. Section 4.3 of this Plan includes a description of plausible changes to projected demands under climate change conditions, and Cal Water is currently working to consider the effects of climate change in future demand modeling. The impact of climate change on District supplies is addressed in detail in the key resources described below, which are incorporated into this Plan by reference:

- Cal Water is currently in the process of developing a multi-phase climate change study. Phase 1, which primarily consisted of a literature and tools review of previous and complementary studies, was completed in December 2020.⁵⁰ Phase 2 will include District-level vulnerability assessments of Cal Water's facilities and operations, including developing an assessment approach that evaluates climate impacts to Cal Water, identifies asset vulnerabilities, and prioritizes climate risks. Phase 3 will focus on an assessment of climate-driven impacts to water supply resources and demand. Phase 2 is expected to be completed by December 2021. The executive summary of Phase 1 of this study is included in this Plan in Appendix F.
- In 2016, Cal Water completed a study of climate change impacts on a representative subset of its districts to gain a better understanding of the potential impacts of climate change on the availability of its diverse supplies.⁵¹ The 2016 study relied on the best available projections of changes in climate (temperature and precipitation) through the end of the century to examine how surface water flows and groundwater recharge rates may change. The executive summary of this study is included in this Plan in Appendix F.
- SGMA dictates that GSPs include basin-wide water budget models under various climate change scenarios, including future conditions which account for the effects of estimated climate change. The final KGA GSA, KRGSA, and Olcese GSA GSPs are available on the DWR website:

<https://sgma.water.ca.gov/portal/gsp/all>

⁵⁰ ICF, 2020. California Water Service Climate Change – Water Resource Monitoring and Adaptation Plan – Phase 1, prepared by ICF, dated December 17, 2020.

⁵¹ California Water Service Company, 2016. Potential Climate Change Impacts on the Water Supplies of California Water Service, prepared by Gary Fiske and Associates, Inc. and Balance Hydrologics, Inc., dated January 2016.

6.10.2 Regulatory Conditions and Project Development

Emerging regulatory conditions (e.g., issues surrounding the Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary [Bay-Delta Plan]) may affect planned future projects and the characterization of future water supply availability and analysis. The District does not have any current plans to develop additional supply sources. If the District does move forward with any plans to develop supply projects, emerging regulatory conditions will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

Detailed information is provided below regarding Delta Reliance. The source for the information is the draft KCWA ID-4 2020 UWMP Appendix C provided by ID-4.

[Draft KCWA ID-4 2020 UWMP Appendix C](#)

ID4's service area, as a whole, reduces reliance on the Delta through investments in non - Delta water supplies, local water supplies and regional and local demand management measures. ID4's purveyors coordinate reliance on the Delta through ID4, an improvement district of the Agency [KCWA] providing a supplemental water supply to the metropolitan Bakersfield area.

ID4 purveyors, indirectly reduce reliance on the Delta through their collective efforts. ID4 purveyors do not control the amount of Delta water they receive from the Agency [KCWA] as ID4 manages an integrated conveyance system consisting of its participation in the SWP, local water management programs and its participation in groundwater banking facilities. ID4 and the purveyors implement demand management measures (DMMs) applicable to both wholesale and retail urban water suppliers to increase the future reliability of water resources for the metropolitan Bakersfield area. In addition, DMMs provide systemwide benefits by decreasing the demand for imported water, which helps to decrease the burden on the purveyors' infrastructure and reduce system costs.

ID4's costs are funded almost entirely from its service area, with the exception of grants received from government programs. Zone of Benefit No. 7 (coterminous with ID4 boundaries) was established to account for the revenues collected through ad valorem assessments and expenditures associated with the purchase of SWP water for the metropolitan Bakersfield area. All of ID4's operating revenues are collected directly from the purveyors to pay for the costs associated with the provision of a wholesale water supply. Thus, ID4's purveyors fund nearly all operations undertaken to reduce reliance on the Delta, including water management programs, water exchanges and continued investment in groundwater banking facilities.

Because of the integrated nature of ID4's systems and operations, it is infeasible to quantify each of the purveyor's individual reliance on the Delta. It is infeasible to attempt to segregate an entity and a system that were designed to work as part of ID4's integrated system.

In addition to the purveyors funding ID4's regional efforts, they also invest in their own local programs to reduce their reliance on any imported water. Moreover, the customers of those purveyors may also make investments to reduce water demand. However, to the extent those efforts result in reduction of demands on ID4, that reduction does not equate to a like reduction of reliance on the Delta. Demands on ID4 are not commensurate with demands on the Delta because all of ID4 purveyors receive blended resources from ID4 as determined by ID4. The resource blend varies from month - to - month and year - to year due to hydrology, operational constraints, use of storage and other factors.

Storage Investments/Facilities

Surface and groundwater storage are critical elements of ID4's water resources strategy and help reduce its reliance on the Delta. Because California experiences dramatic swings in weather and hydrology, storage is important to regulate those swings and mitigate possible supply shortages. Surface and groundwater storage provide a means of storing water during normal and wet years for later use during dry years, when imported supplies are limited. ID4 has invested in numerous groundwater banking facilities for purposes of meeting demands during times of shortage, regulating system flows and ensuring system reliability in the event of a system outage.

Future Water Projects

ID4 plans to implement the second phase of the Cross Valley Canal (CVC) Extension Lining Project. The westerly 17 miles of the CVC (Pool Nos. 1 – 6) are concrete - lined to minimize water losses. ID4 completed the first phase of the CVC Extension Lining Project in 2017 by constructing a concrete liner in Pool No. 7 to reduce infiltration losses. Phase 2 consists of lining Pool No. 8 and is expected to be constructed within the next 5 years.

By installing the concrete liner in Pool Nos. 7 and 8, infiltration losses are expected to be reduced by at least 80 percent. Reducing infiltration losses in dry years is especially important as ID4 recovers banked groundwater and delivers it to the Henry C. Garnett Water Purification Plant. Implementing Phase 1 enabled ID4 will be able to reduce groundwater pumping in dry years by an estimated annual average of 1,000 af (50,500 af over the 50 - year life of the project). Implementing Phase 2 will enable ID4 to further reduce groundwater pumping in dry years by an estimated annual average of 850 af (42,500 af over the 50 - year life of project).

ID4 Demand Management Measures

In 1991, ID4 became a signatory to the Memorandum of Understanding (MOU) of the California Urban Water Conservation Council (CUWCC) and complied with all of the Best Management Practices (BMPs) applicable to wholesale water suppliers. The CUWCC was a consensus - based partnership of agencies and organizations concerned with water supply and conservation of natural resources in California until its sunset. ID4 continues to participate in the successor

organization, the California Water Efficiency Partnership, to stay informed of California water issues, challenges and opportunities within a broad collaborative framework.

Public Information and Water Education Programs

ID4 undertakes efforts throughout its service area that help achieve water savings without the use of rebates. As detailed in section 9.1.2, ID4's 30 - year implementation of public information and water education DMMs include:

- Participation in regional water conservation public information campaigns.
- Hosting water education workshops for teachers.
- Conducting an annual water awareness poster contest.
- Offering educational assemblies and presentations to students in grades K – 12.

Public Information and Water Education Programs

The accounting of regional investments that contribute to reduced reliance on supplies from the Delta watershed is straightforward to calculate and report at the regional aggregate level. However, any similar accounting is infeasible for the purveyors or their customers. As described above, ID4 makes significant investments in projects, programs and other resources that reduce reliance on the Delta. In fact, all of ID4's investments in groundwater and surface storage, future water projects, water management programs, water exchanges and DMMs that reduce reliance on the Delta are collectively funded by revenues generated from the purveyors through rates and charges.

ID4's revenues cannot be matched to the demands or supply production history of an individual purveyor. Accounting at the regional level allows for the incorporation of the local supplies and water use efficiency programs done by purveyors and their customers through both the regional programs and through their own specific local programs. As shown above, despite the infeasibility of accounting reduced Delta reliance below the regional level, ID4's member agencies and their customers have together made substantial contributions to the region's reduced reliance.

Additional details on reduced reliance calculation is provided in the Appendix C of the draft KCWA ID-4 2020 UWMP.

6.10.3 Other Locally Applicable Criteria

Other locally applicable criteria may affect characterization and availability of an identified water supply (e.g., changes in regional water transfer rules may alter the availability of a water supply that had historically been readily available). The District does not have any current plans to develop additional supply sources. If the District does move forward ahead with any plans to

develop supply projects, locally applicable criteria will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

Under SGMA, GSAs have the authority to implement projects and management actions that help the Kern County Subbasin reach its sustainability goal, including such actions as setting allocations for groundwater pumping, prohibiting development of new groundwater wells, or implementing fees for pumping volumes. As described in Section 6.2, the GSPs for Basin were completed in January 2020. As such actions are implemented, Cal Water will consider them as a part of its future supply planning efforts.

6.11 Energy Intensity

☒ CWC § 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.*

The “Total Utility Approach” as defined by DWR in the UWMP Guidebook 2020 is used to report water-related energy-consumption data for the Bakersfield District. Calendar year 2019 is selected as the one-year reporting period, and utility bills for the associated time period are used as the source for energy consumption data. Utility bills reported the following energy consumption data for the Bakersfield District during calendar year 2019:

$$\begin{aligned} & \textit{Total Energy Consumed by the Bakersfield District} \\ & = 30,141,730 \text{ kilowatt hour (kWh)} \end{aligned}$$

Table 6-10 shows the energy consumed for each acre-foot (AF) of water entering the distribution system in the Bakersfield District, including energy associated with the pumping, treatment, conveyance, and distribution of drinking water, but not including energy associated with the

treatment of wastewater. Based on this, the energy intensity is estimated to be 533 kilowatt hours per acre-foot (kWh/AF).

Table 6-10. Recommended Energy Intensity – Total Utility Approach (DWR Table O-1B)

Urban Water Supplier:

Bakersfield District

Water Delivery Product

Retail Potable Deliveries

Enter Start Date for Reporting Period	1/1/2019	Urban Water Supplier Operational Control		
End Date	12/31/2019			
Is upstream embedded in the values reported?		Sum of All Water Management Processes	Non-Consequential Hydropower	
<i>Water Volume Units Used</i>	AF	Total Utility	Hydropower	Net Utility
<i>Volume of Water Entering Process (volume unit)</i>		56,525	0	56,525
<i>Energy Consumed (kWh)</i>		30,141,730	0	30,141,730
<i>Energy Intensity (kWh/volume)</i>		533	0.0	533
Quantity of Self-Generated Renewable Energy				
N/A		kWh		
Data Quality				
Metered Data				
Data Quality Narrative:				
Utility bills for the associated time period are used as the source for energy consumption data.				
Narrative:				
Total energy consumption represents the energy consumed during pumping, treatment, conveyance, and distribution.				

Chapter 7

Water Supply Reliability Assessment

☒ **CWC § 10620 (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.

☒ **CWC § 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.

This chapter describes the reliability of the Bakersfield District's (also referred to herein as the "District") water supplies. Assessment of water supply reliability is complex and dependent upon a number of factors, such as the number of water sources, regulatory and legal constraints, hydrological and environmental conditions, climate change, and expected growth, among others. Based on available historical information and projections of future water uses, regulatory and legal constraints, and hydrological and environmental conditions, including climate change, California Water Service Company (Cal Water) has made its best determination of future water supply reliability of for the District. This chapter includes the following sections:

7.1 Constraints on Water Sources

7.2 Reliability by Type of Year

7.3 Supply and Demand Assessment

7.4 Water Supply Management Tools and Options

7.5 Drought Risk Assessment

7.1 Constraints on Water Sources

Groundwater and purchased water from City of Bakersfield (City) and Kern County Water Agency - Improvement District No. 4 (ID-4) are the supply sources for the Bakersfield District. Cal Water has identified several potential constraints on future purchased water and groundwater supply availability, including water quality and climate change. These constraints, along with associated management strategies are summarized in the following sections.

7.1.1 Supply Availability

As discussed in Chapter 6, Cal Water expects that, under all hydrologic conditions, the combination of its purchased water and groundwater supply for the Bakersfield District will fully meet future demands. This assessment is based on the available information regarding purchased water and groundwater supply availability to the District and the additional information presented below.

Purchased Water

Purchased water supplies to the District are available pursuant to long-term supply agreements between Cal Water and two wholesalers, the City of Bakersfield and ID-4.

The agreement with the City of Bakersfield allows the District to receive untreated Kern River surface water at a rate of up to 67,200 acre-feet per year (AFY) regardless of water year type (i.e., 100 percent reliable). The City holds pre-1914 appropriative rights to the Kern River surface water. The surface water is treated at the Northeast Bakersfield Water Treatment Plant (NEBWTP), which currently has a capacity of 22,403 AFY, and the North Garden Water Treatment Plant (NGWTP), which has a capacity of 8,960 AFY.⁵² The NEBWTP is undergoing a phase 2 expansion that will add another 22,400 AFY of base load capacity to bring the total to 44,800 AFY. This expansion is projected to be online by 2030.

The agreement with ID-4 allows the District to receive up to 20,500 AFY of treated Kern River surface water and imported State Water Project (SWP) water during normal hydrologic conditions. Cal Water can purchase up to 15 percent more than this amount depending on the needs of other water suppliers and the production capabilities of the ID-4 treatment plant (which has a total capacity of about 53,000 AFY). Based on the information provided by ID-4,⁵³ ID-4's supplies are adequate to meet its projected demands on average in normal year, single dry year, and multiple dry years.

In case of purchased water supply shortages, groundwater supply will be used to serve any remaining projected demand that is not met with purchased water supplies. Given that Cal Water's agreements with the City of Bakersfield and ID-4, purchased water supplies (in combination with groundwater supply discussed below) are expected to be sufficient to meet projected water demands of the District under all hydrologic conditions, including in normal, single dry, and multiple dry years.

⁵² Half of the total base load (4,480 AFY, 4.0 MGD) of the treated surface water from NGWTP is supplied to the City of Bakersfield under contract.

⁵³ Draft Table 7-2 to 7-4 of the ID-4 UWMP provided by KCWA ID-4 on April 27, 2021.

Groundwater

Historically, the groundwater supplies available to the Bakersfield District from the underlying Kern County Subbasin (Basin) have always been sufficient to meet District demands and the Cal Water supply wells have not dewatered, even during historical drought periods. Due to successful conservation efforts and response to the historic drought spanning water years 2012-2015, water demand (and thus District groundwater pumping volumes) were significantly lower from 2016 through 2020 (i.e., averaging 30,373 AFY) than they had been in the previous ten years (i.e., averaging 45,878 AFY from 2006 through 2015), as shown in Appendix D.

It is also important to note that from a regional and Basin-wide standpoint, Bakersfield District pumping is only a small fraction of total groundwater pumping. Based on Figure 2-53 presented in the Kern Groundwater Authority (KGA) Groundwater Sustainability Agency (GSA) Groundwater Sustainability Plan (GSP), also shown on Figure 7-1 below, average annual groundwater pumping from water year 1995 to 2014 within the Basin was approximately 1,590,373 AFY.⁵⁴ Approximately 78 percent of that pumping was for irrigated agriculture, while total municipal and Industrial (M&I) pumping (inclusive of the District) only accounted for approximately 12.5 percent of total pumping. It is therefore likely that management of agricultural groundwater use, rather than M&I use, will be a much larger determining factor in maintaining groundwater sustainability in the Basin in the future.

⁵⁴ Ibid.

Figure 7-1. Groundwater Pumping by Type for Kern County Subbasin Figure from the KGA GSP

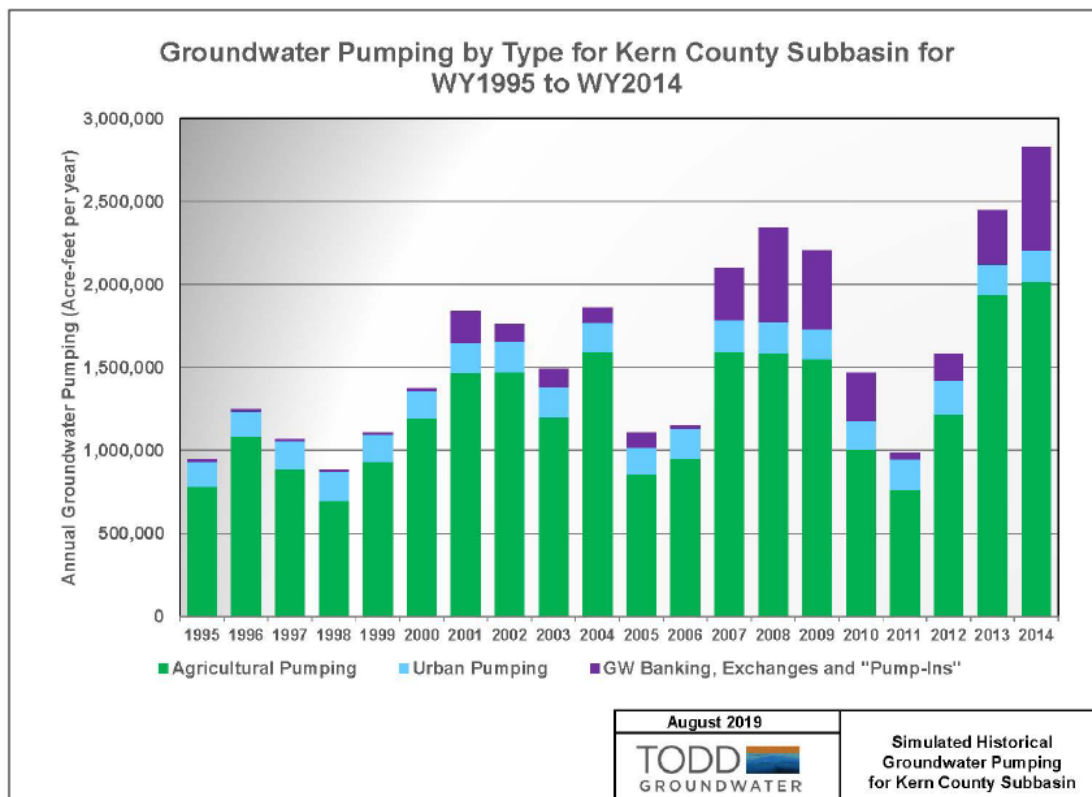


Figure 2-53. Groundwater Pumping by Type for Kern County Subbasin for WY1995 to WY2014

Further, although a significant amount of growth is projected in the Bakersfield District over the planning horizon (i.e., the District is projecting that service area population will increase by approximately 24 percent over the next 25 years), as discussed in Section 3.4, it is anticipated that some land currently used for agricultural production will be converted to residential and non-residential urban uses to accommodate future growth. Irrigated agriculture typically uses more water on a per-acre basis than urban uses, thus, some future growth within the District will likely result in a net decrease in water use within the Basin. Based on the Kern River GSA GSP, which covers the majority of the District, approximately 10,000 acres of current KRGSA agricultural lands are expected to be urbanized representing a projected demand reduction of 27,000 AFY.⁵⁵

Cal Water holds certain water rights to groundwater it has pumped and used as an overlying owner and appropriator. Cal Water's water rights have been dedicated to a public use, and Cal Water is required by the California Public Utilities Commission (CPUC) to provide water to all customers within its designated service area under reasonable rules and regulations. Further,

⁵⁵ KRGSA, 2020. Kern River Groundwater Sustainability Agency Groundwater Sustainability Plan, dated January 2020.

under California law municipal water rights and uses have a higher priority and are entitled to more protection than other uses of water, including in connection with the Sustainable Groundwater Management Act (SGMA). Use of water for domestic purposes is recognized as the “highest use” of water in the State of California pursuant to California Water Code (CWC) §106, and the rights of urban water purveyors should be protected to the fullest extent necessary for existing and future uses, pursuant to CWC §106.5.

SGMA was intended to preserve the security of water rights in the state to the greatest extent possible, and was not intended to determine, modify or alter any surface water or groundwater rights or priorities. (CWC §10720.1(b), 10720.5(a) and (b).) SGMA should therefore not reduce, adversely impact or limit Cal Water’s present or future exercise of its domestic water rights or its obligation to serve its municipal customers, and Cal Water’s rights should be subject to less restrictions and limitations than any other types of water rights or uses.

Because of the demonstrated ability of the Bakersfield District to meet historical demands with the purchased water and groundwater supplies, the available supplies are considered to be equal to District demands under all conditions (i.e., current and projected, and for normal, single dry, and multiple dry years including a five-year drought period).

7.1.2 Water Quality

☒ **CWC § 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.

Impaired water quality also has the potential to affect water supply reliability. Cal Water has and will continue to meet all state and federal water quality regulations. All drinking water standards are set by the U.S. Environmental Protection Agency (USEPA) under the authorization of the Federal Safe Drinking Water Act of 1974. In California, the State Water Resources Control Board (SWRCB), Division of Drinking Water (DDW) can either adopt the USEPA standards or set more stringent standards, which are then codified in Title 22 of the California Code of Regulations. There are two general types of drinking water standards:

- **Primary Maximum Contaminant Levels (MCLs)** are health protective standards and are established using a very conservative risk-based approach for each constituent that takes into potential health effects, detectability and treatability, and costs of treatment. Public water systems may not serve water that exceeds Primary MCLs for any constituent.

- **Secondary MCLs** are based on the aesthetic qualities of the water such as taste, odor, color, and certain mineral content, and are considered limits for constituents that may affect consumer acceptance of the water.

Cal Water routinely monitors its wells and the water that is treated and served to customers to ensure that water delivered to customers meets these drinking water standards. The results of this testing are reported to the SWRCB DDW following each test and are summarized annually in Water Quality Reports (also known as “Consumer Confidence Reports”), which are provided to customers by mail and made available on Cal Water’s website: <https://www.calwater.com/waterquality/water-quality-reports/>. Additionally, a detailed review of the water quality conditions of the underlying groundwater basin are provided in the GSPs, available on the DWR SGMA Portal website: <https://sgma.water.ca.gov/portal/gsp/all>.

Although there is the potential for some regulated constituents to be present in source water, as documented in the Water Quality Reports, the District’s monitoring, management, and treatment of its water results in high quality drinking water meeting all drinking water standards being served to customers. Cal Water tracks changes in constituent concentrations to proactively address water quality issues before they impact supply reliability.⁵⁶ In the event that water quality constituents are detected in source water at concentrations requiring treatment, the District is able to take impacted source(s) offline to implement appropriate treatment. Further, as part of the siting process for all new wells, Cal Water evaluates the presence of groundwater contamination and avoids placing wells in areas of known contamination.

Given Cal Water’s proactive monitoring and management of water quality in its source water supplies, water quality is not expected to impact the reliability of the District’s available supplies within the planning horizon (i.e., through 2045).

7.1.3 Climate Change

☒ **CWC § 10631 (b) (1)**

...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.

Section 6.10 provides a summary of the assessments of the applicable climate change on supplies that Cal Water has previously performed and those planned for the near term, as well as those related to SGMA efforts for the Kern County Subbasin. The GSP water budget modeling efforts in the Basin incorporated climate change factors for hydrology and surface water supplies using the California Department of Water Resources (DWR) Central Tendency climate change scenarios to obtain estimated climate change impacts. Section 4.3 of this Urban Water Management Plan

⁵⁶ Cal Water, 2018. Direct Testimony of Director of Water Quality, 2018 CPUC Rate Case Filing.

(UWMP or Plan) presents information on how the impacts of climate change are factored into projected demands in the District. Cal Water is actively working to further quantify and consider future climate change impacts as part of its ongoing supply and operations planning.

7.2 Reliability by Type of Year

☒ CWC § 10631 (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:

☒ CWC § 10631 (b)(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.

☒ CWC § 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.

Per the UWMP Guidebook 2020, the water service reliability assessment includes three unique year types:

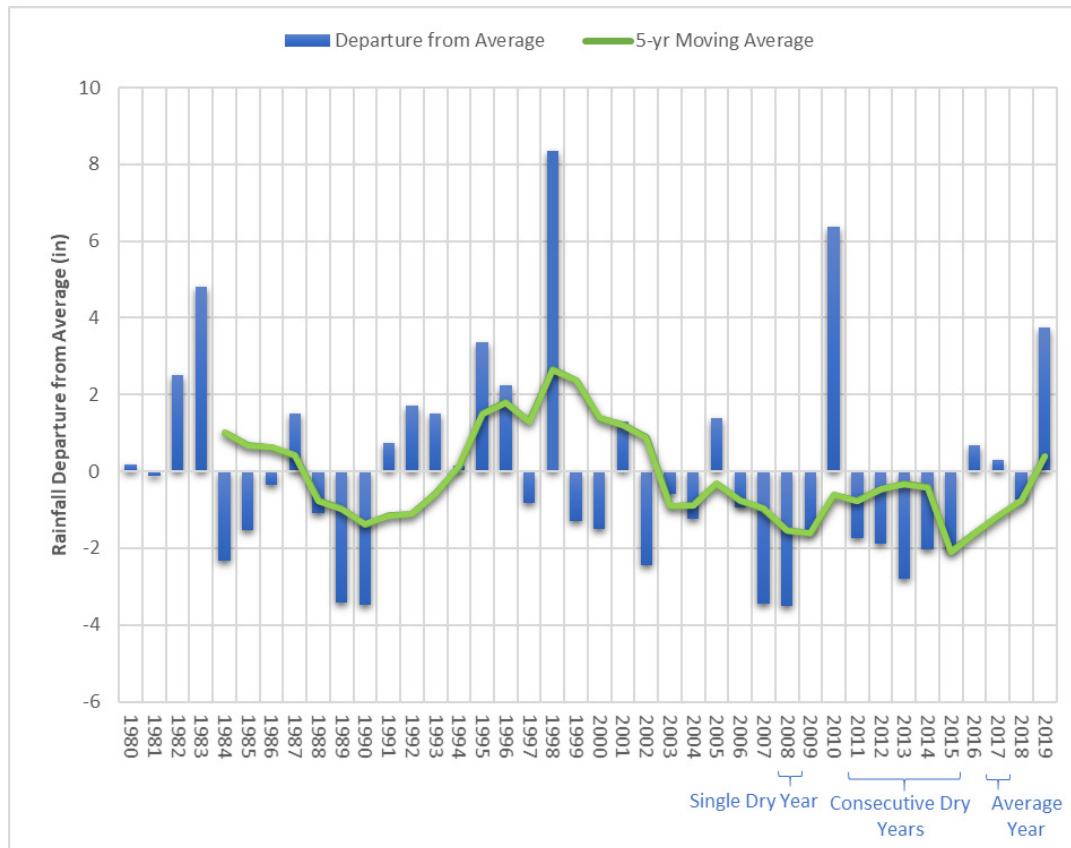
- A normal hydrologic year represents the water supplies available under normal conditions, this could be an averaged range of years or a single representative year,
- A single dry year represents the lowest available water supply, and
- A five-consecutive year drought represents the driest five-year period in the historical record.

Identification of these dry year periods consistent with the UWMP Guidebook 2020 methodology is provided below.

Figure 7-2 compares annual rainfall to the historic average (6.55 inches). The designation of Base Years for drought planning shown in Table 7-1 below comes from the data underlying this chart. The Cal Water production data record for the Bakersfield District begins in the year 1980; therefore, the following year type analysis uses the historical period from 1980 to 2019.

A normal hydrologic year occurred in 2017 when precipitation was approximately 4.6 percent above the historic average for the period from 1980 to 2019. The driest year occurred in 2008 when the rainfall was approximately 54 percent below average (3.04 inches). This is taken as the single dry year shown in Table 7-1. The multiple dry water years used to represent a five-consecutive year drought are 2011 through 2015. This period represents the driest five-year period on record for the historical period from 1980 to 2019, with an average precipitation of 4.44 inches per year.

Figure 7-2. Deviation of Annual Rainfall from Long-Term Average



Source: PRISM Climate Group, Oregon State University, <http://prism.oregonstate.edu>

As discussed in Section 7.1.1, purchased water from the City of Bakersfield is 100 percent reliable regardless of water year type, and purchased water from ID-4 is reliable during normal hydrologic conditions. In case of any purchased water supply shortages, groundwater supply will be used to serve any remaining projected demand that is not met with purchased water supplies. Therefore, total supplies from both purchased water and groundwater are expected to be sufficient to meet projected water demands of the District under all hydrologic conditions, including in normal, single dry, and multiple dry years.

As such, the projected “volume available” estimates presented in Table 7-1 are equal to the maximum demands across projected years and year types shown in Table 7-2, Table 7-3, and Table 7-4. For example, the assumed volume available in a representative single dry year in Table 7-1 is equal to the projected single dry year demand for the year 2045 as shown in Table 7-3.

It should be noted that supply volumes in Table 7-1, Table 7-2, Table 7-3, and Table 7-4 do not represent the total amount of purchased water and groundwater supply that may be available to the District in a given year, but rather reflect the fact that the combination of available purchased water and groundwater supply sources has always been sufficient to meet demands, and is projected to continue to be sufficient to meet demands in the future. It should also be noted that the Kern County Subbasin is not adjudicated, and the projected groundwater supply volumes are not intended to and do not determine, limit or represent Cal Water’s water rights or maximum pumping volumes. Any determination of Cal Water’s water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.

Table 7-1. Basis of Water Year Data (Reliability Assessment) (DWR Table 7-1)

Year Type	Base Year	Available Supplies if Year Type Repeats	
			Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____
		X	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year	2017	70,314	
Single-Dry Year	2008	71,592	
Consecutive Dry Years 1st Year	2011	72,382	
Consecutive Dry Years 2nd Year	2012	72,382	
Consecutive Dry Years 3rd Year	2013	72,382	
Consecutive Dry Years 4th Year	2014	72,382	
Consecutive Dry Years 5th Year	2015	72,382	
NOTES:			
(a) Volumes are in units of AF.			
(b) As discussed in Section 7.1, total supplies are considered to be equal to the projected demand under all year types. Therefore, available volumes presented here are the maximum demands across projected years in Table 7-2, 7-3, and 7-4.			

7.3 Supply and Demand Assessment

Water supply and demand patterns change during normal, single dry, and multiple dry years. Cal Water has relied on the demand modeling described in Chapter 4 to forecast demands for normal, single dry and multiple dry years. As described above, Cal Water's groundwater supply for the Bakersfield District is expected to be able to serve those demands in all year types through 2045.⁵⁷

Table 7-2 shows the projected supply and demand totals for a normal year. The supply and demand totals are consistent with those in Table 6-9 and Table 4-3, respectively. Table 7-3 shows the projected supply and demand totals for the single dry year, and Table 7-4 shows the projected supply and demand totals for multiple dry year periods extending five years. It should be noted that the supply values shown in Table 7-2 through Table 7-4 do not represent the total supply available to the District in a given year, but rather reflect the fact that the available purchased water and groundwater supplies are sufficient to meet the demands as needed. It should also be noted that the Kern County Subbasin is not adjudicated, and the projected supply volumes are not intended to and do not determine, limit or represent Cal Water's water rights or maximum pumping volumes. Any determination of Cal Water's water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.

Table 7-2. Normal Year Supply and Demand Comparison (DWR Table 7-2)

	2025	2030	2035	2040	2045
Supply totals <i>From DWR Table 6-9</i>	60,439	62,681	65,408	67,871	70,314
Demand totals <i>From DWR Table 4-3</i>	60,439	62,681	65,408	67,871	70,314
Difference	0	0	0	0	0
NOTES: (a) Volumes are in units of AF. (b) The Kern County Subbasin is not adjudicated, and this projected supply volumes, which include groundwater, do not comprise a determination of water rights or maximum allowable pumping.					

⁵⁷ The balance between supply and demand totals excludes usage reductions that are not directly a function of Cal Water supplies, but are externally-imposed by other entities, such as the 2015 State-mandated cutbacks.

Table 7-3. Single Dry Year Supply and Demand Comparison (DWR Table 7-3)

	2025	2030	2035	2040	2045
Supply totals	61,520	63,807	66,588	69,100	71,592
Demand totals	61,520	63,807	66,588	69,100	71,592
Difference	0	0	0	0	0
NOTES:					
(a) Volumes are in units of AF.					
(b) The Kern County Subbasin is not adjudicated, and this projected supply volumes, which include groundwater, do not comprise a determination of water rights or maximum allowable pumping.					

Table 7-4. Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4)

		2025	2030	2035	2040	2045
First year	Supply totals	62,188	64,504	67,318	69,860	72,382
	Demand totals	62,188	64,504	67,318	69,860	72,382
	Difference	0	0	0	0	0
Second year	Supply totals	62,188	64,504	67,318	69,860	72,382
	Demand totals	62,188	64,504	67,318	69,860	72,382
	Difference	0	0	0	0	0
Third year	Supply totals	62,188	64,504	67,318	69,860	72,382
	Demand totals	62,188	64,504	67,318	69,860	72,382
	Difference	0	0	0	0	0
Fourth year	Supply totals	62,188	64,504	67,318	69,860	72,382
	Demand totals	62,188	64,504	67,318	69,860	72,382
	Difference	0	0	0	0	0
Fifth year	Supply totals	62,188	64,504	67,318	69,860	72,382
	Demand totals	62,188	64,504	67,318	69,860	72,382
	Difference	0	0	0	0	0
NOTES:						
(a) Volumes are in units of AF.						
(b) The Kern County Subbasin is not adjudicated, and this projected supply volumes, which include groundwater, do not comprise a determination of water rights or maximum allowable pumping.						

7.4 Water Supply Management Tools and Options

☒ CWC § 10620 (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.

Cal Water coordinates on an ongoing basis with all relevant agencies in the region to optimize the use of regional water supplies. This includes City of Bakersfield, the relevant GSAs, ID-4, and other public and private entities with which Cal Water can collaborate to protect and enhance local groundwater and surface water resources.

Cal Water is currently in the process of developing multiple regional water supply reliability studies using integrated resource planning practices to create a long-term supply reliability strategy through 2050 for Cal Water districts throughout California. The studies will create long-term strategies to address a wide range of water supply challenges including climate change, new regulatory requirements (e.g., SGMA), and potential growth in demands due to new development. These water supply reliability studies will be completed on a rolling basis over the next several years, with all studies anticipated to be complete by 2024. The Bakersfield District will be included in the Central Valley Water Reliability Study.

Cal Water also has its own aggressive and comprehensive water conservation program that has and will continue to reduce per-capita usage and therefore demands on critical water sources. Cal Water is committed to helping its customers use water efficiently and has developed a range of water conservation programs to support this goal. To ensure that it is providing the right mix of programs in the most cost-effective manner possible, Cal Water routinely conducts comprehensive conservation program analysis and planning. This is done on a five-year cycle in tandem with the UWMP. Cal Water's Conservation Master Plan provides the basis for the information on the implementation of and expected water savings from Demand Management Measures (DMMs) presented in Chapter 9.

Cal Water also monitors and supports the goals of the Kern Integrated Regional Water Management Plan (IRWMP).

7.5 Drought Risk Assessment

☑ **CWC § 10635(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.

7.5.1 Data, Methods, and Basis for Water Shortage Condition

This drought risk assessment considers the effects on available water supply sources of a five-year drought commencing the year after the assessment is completed, i.e., from 2021 through 2025. This evaluation considers historical drought hydrology and plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria. In the Bakersfield District, the supply source is a combination of purchased water and groundwater. As such, the same data, methodology, and basis for the conclusions of the above water supply sufficiency analysis for multiple dry year periods through 2045 holds true for purposes of this drought risk assessment (i.e., supply availability through 2025). Accordingly, as shown in Table 7-5 of the Plan, the purchased water and groundwater supply is expected to be able to meet the projected demands through 2025, even if there is a five-year drought.

7.5.2 Drought Risk Assessment Water Source Reliability

As described in Chapter 6, purchased water and groundwater are the sources of water supply for the Bakersfield District. Based on discussion in Section 7.1.1, the Bakersfield District purchased water and groundwater supplies are expected to be sufficient to meet demands in all hydrologic conditions, including an extended five-year drought period.

As described in Sections 4.3 and 6.10.1 of this Plan, the impacts on climate change have already been factored into the District's demand projections and the analysis of the near- and longer-term reliability of the groundwater supply source available to the District.

Regulatory conditions that could affect future water supply availability and project development (e.g., related to the Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary [Bay-Delta Plan]) are discussed in Section 6.10.3 of the Plan. However, the District does not currently have plans for projects to develop additional supply sources, and so these regulatory conditions will be assessed in future UWMP updates if or when the District moves forward with any plans to develop supply projects.

Implementation of SGMA in the Kern County Subbasin is a locally applicable consideration for the Bakersfield District. As discussed in Section 6.2.3 of this Plan, the long-term impacts of SGMA implementation in the Kern County Subbasin are still uncertain. However, it is the intent of the projects and management actions planned by the within the Basin to stabilize water levels and provide for sustainable management of the groundwater resource. It is anticipated that should pumping fees or similar restrictions (i.e., allocations) be required to address future shortfalls, such actions will be focused on management of agricultural water use, as opposed to M&I pumping. As such actions are implemented, Cal Water will consider them as a part of its future supply planning efforts.

Cal Water holds certain water rights to groundwater it has pumped and used as an overlying owner and appropriator. Cal Water's water rights have been dedicated to a public use, and Cal Water is required by the CPUC to provide water to all customers within its designated service area under reasonable rules and regulations. Further, under California law municipal water rights and uses have a higher priority and are entitled to more protection than other uses of water, including in connection with SGMA. Use of water for domestic purposes is recognized as the "highest use" of water in the State of California pursuant to CWC §106, and the rights of urban water purveyors should be protected to the fullest extent necessary for existing and future uses, pursuant to CWC §106.5.

SGMA was intended to preserve the security of water rights in the state to the greatest extent possible, and was not intended to determine, modify or alter any surface water or groundwater rights or priorities. (CWC §10720.1(b), 10720.5(a) and (b).) SGMA should therefore not reduce, adversely impact or limit Cal Water's present or future exercise of its domestic water rights or its obligation to serve its municipal customers, and Cal Water's rights should be subject to less restrictions and limitations than any other types of water rights or uses.

Table 7-5 provides a comparison of the water supply sources available to the Bakersfield District with the total projected water use for an assumed drought period of 2021 through 2025. This includes current climate change conditions. It should be noted that the supply values shown in the table do not represent the total supply available to the District in a given year, but rather

reflect the fact that the available purchased water and groundwater supplies are sufficient to meet the demands as needed. It should also be noted that the Kern County Subbasin is not adjudicated, and the projected groundwater supply volumes are not intended to and do not determine, limit or represent Cal Water's water rights or maximum pumping volumes. Any determination of Cal Water's water rights, as an overlying owner, appropriator, municipal water purveyor or otherwise, is beyond the scope of this report and the UWMP statutes and regulations.

In general, the District has sufficient supplies to meet demands in all year types. However, Cal Water has developed a WSCP (Appendix G) to address potential water shortage conditions resulting from any cause (e.g., droughts, impacted distribution system infrastructure, regulatory-imposed shortage restrictions, etc.). The WSCP, included as Appendix G, identifies a variety of actions that Cal Water will implement to reduce demands and further ensure supply reliability at various levels of water shortage.

Table 7-5. Five-Year Drought Risk Assessment Tables (DWR Table 7-5)

2021	Total
Total Water Use	60,965
Total Supplies	60,965
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	

2022	Total
Total Water Use	61,217
Total Supplies	61,217
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	

Table 7-5. Five-Year Drought Risk Assessment Tables (DWR Table 7-5)

2023	Total
Total Water Use	61,503
Total Supplies	61,503
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	

2024	Total
Total Water Use	61,809
Total Supplies	61,809
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	

2025	Total
Total Water Use	62,188
Total Supplies	62,188
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	
Resulting % Use Reduction from WSCP action	
NOTES: (a) Volumes are in units of AF. (b) In general, the District has sufficient supplies to meet demands in all year types and it is not anticipated that WSCP actions will be required in the District during the drought period. However, during state, regional, or extreme circumstances, the WSCP would be implemented to reduce demand.	

Chapter 8

Water Shortage Contingency Planning

☒ CWC § 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.

The Water Shortage Contingency Plan (WSCP) for the Bakersfield District (also referred to herein as “District”) is included in this Urban Water Management Plan (UWMP) as Appendix G. The WSCP serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. The primary objective of the WSCP is to ensure that the District has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions. Consistent with CWC §10632, the WSCP includes six levels to address shortage conditions ranging from up to 10 percent to greater than 50 percent shortage, identifies a suite of demand mitigation measures for the District to implement at each level, and identifies procedures for the District to annually assess whether or not a water shortage is likely to occur in the coming year, among other things.

A summary of the key elements of the WSCP including water shortage levels and demand-reduction actions is shown in Table 8-1, Table 8-2, and Table 8-3. Additional details are provided in Appendix G.

Table 8-1. Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
1	Up to 10%	Demand reduction (See Table 8-2)
2	Up to 20%	Demand reduction (See Table 8-2)
3	Up to 30%	Demand reduction (See Table 8-2)
4	Up to 40%	Demand reduction (See Table 8-2)
5	Up to 50%	Demand reduction (See Table 8-2)
6	>50%	Demand reduction (See Table 8-2)
NOTES:		

Table 8-2. Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference (optional)	Penalty, Charge, or Other Enforcement?
1	Other	8%	1. Limit landscape irrigation to specific times 2. Customers must repair leaks, breaks, and malfunctions in a timely manner 3. Restrict or prohibit runoff from landscape irrigation 4. Prohibit application of potable water to outdoor landscapes within 48 hours of measurable rainfall 5. Prohibit use of potable water for washing hard surfaces 6. Lodging establishments must offer opt out of linen service 7. Require shut-off nozzles on hoses for vehicle washing with potable water 8. Restaurants may only serve water upon request 9. No watering of landscape of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission, and the Department of Housing and Community	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference (optional)	Penalty, Charge, or Other Enforcement?
			Development, or other state agency 10. Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	
1	Other	--	1. Expand Public Information/Media Campaign 2. Water Bill Inserts 3. Promote online water waste reporting 4. Expand Rebates or Giveaways of Plumbing Fixtures and Devices 5. Expand Rebates for Landscape Irrigation Efficiency 6. Expand CII Water Use Surveys 7. Expand Res Water Use Surveys	No
2	Other	14%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent actions. 2. Prohibit the use of non-recirculating systems in all new conveyer car wash and commercial laundry systems 3. Prohibit the use of single pass cooling systems in new connections 4. No watering of landscape of newly constructed homes and buildings in a	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference (optional)	Penalty, Charge, or Other Enforcement?
			manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development 5. Landscape - Limit landscape irrigation to 1-3 days/week	
2	Other	--	1. Continue with Stage 1 actions except where superseded by more stringent actions. 2. Water Efficiency Workshops, Public Events 3. Offer Water Use Surveys 4. Provide Rebates or Giveaways of Plumbing Fixtures and Devices 5. Provide Rebates for Landscape Irrigation Efficiency	No
3	Other	28%	1. Continue with Stage 2 restrictions and prohibitions except where superseded by more stringent actions. 2. Landscape - Prohibit irrigation of ornamental turf on public street medians with potable water 3. Prohibit Filling Ornamental Lakes or Ponds 4. Prohibit use of potable water for	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference (optional)	Penalty, Charge, or Other Enforcement?
			construction and dust control 5. Prohibit use of potable water for street washing	
3	Other	--	1. Continue with Stage 2 actions except where superseded by more stringent actions. 2. Home or Mobile Water Use Reports 3. Decrease Frequency and Length of Line Flushing 4. Reduce System Water Loss 5. Increase Water Waste Patrols/Enforcement 6. Implement Drought Rate Structure and Customer Water Budgets (Res) 7. Implement Drought Rate Structure and Customer Water Budgets (CII)	No
4	Other	37%	1. Continue with Stage 3 restrictions and prohibitions except where superseded by more stringent actions. 2. Prohibit vehicle washing except with recirculated water or low-volume systems 3. Prohibit use of water for recreational purposes such as water parks and the filling of pools	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference (optional)	Penalty, Charge, or Other Enforcement?
4	Other	--	1. Continue with Stage 3 actions except where superseded by more stringent actions. 2. Promote / Expand Use of Recycled Water	No
5	Other	47%	1. Continue with Stage 4 restrictions and prohibitions except where superseded by more stringent actions. 2. Require net zero demand Increase on new water service connections 3. Prohibit single-pass cooling systems	Yes
5	Other	--	1. Continue with Stage 4 actions except where superseded by more stringent actions. 2. Require Pool Covers	No
6	Other	56%	1. Continue with Stage 5 restrictions and prohibitions except where superseded by more stringent actions. 2. Moratorium on new water service connections 3. Prohibit all landscape irrigation	Yes
NOTES:				

Table 8-3. Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference <i>(optional)</i>
NOTES:			

Chapter 9

Demand Management Measures

☒ **CWC § 10631 (e)**

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.

This chapter presents a summary of past and planned demand management measure (DMM) implementation in the Bakersfield District (also referred to as the "District"), as well as an overview of the expected water savings.

This chapter has the following sections:

9.1 Demand Management Measures for Wholesale Agencies

9.2 Demand Management Measures for Retail Suppliers

9.3 Implementation over the Past Five Years

9.4 Implementation to Achieve Water Use Targets

9.5 Water Use Objectives (Future Requirements)

9.1 Demand Management Measures for Wholesale Agencies

Because the District is a retail water supplier, this section does not apply.

9.2 Demand Management Measures for Retail Suppliers

California Water Service Company (Cal Water) centrally administers its conservation programs for all the districts it operates. For purposes of this section, these programs have been grouped in accordance with the DMM categories in CWC §10631(e). These categories are:

- (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, and
- (vii) Other demand management measures

Following are descriptions of the conservation programs Cal Water operates within each of these DMM categories. The District's Conservation Master Plan, provided in Appendix H, contains additional information on Cal Water's conservation programs.

9.2.1 Water Waste Prevention Ordinances

Cal Water's enforcement of water waste prevention and water use restrictions is authorized and overseen by the California Public Utilities Commission via Rule 14.1 or Schedule 14.1. Local government in districts operated by Cal Water may also adopt ordinances regulating water use. Cal Water coordinates its efforts to prevent water waste with the appropriate local governmental entities. For the Bakersfield District, this includes the City of Bakersfield and Kern County.

Rule 14.1 defines the District's Water Shortage Contingency Plan (WSCP, Appendix H), including its prohibitions on water waste and restrictions on water use. Prohibitions include:

- Use of potable water through a broken or defective plumbing fixture or irrigation system when Cal Water has notified the customer in writing to repair the broken or defective plumbing fixture or irrigation system, and the customer has failed to effect such repairs within seven (7) business days of receipt of such notice.
- The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures.
- The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is

fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

Restrictions on water use during shortages include, but are not necessarily limited to:

- Outdoor irrigation restrictions in terms of time of day and weekly frequency.
- Obligations to fix leaks, breaks, or malfunctions within five (5) business days of written notification by Cal Water.
- Application of potable water to driveways and sidewalks.
- The use of potable water in a water feature, except where the water is part of a recirculating system.
- The application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall.
- The serving of drinking water other than upon request in eating or drinking establishments.
- Irrigation of ornamental landscape on public street medians.
- Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.
- Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.
- Limits on filling ornamental lakes or ponds.
- Use of potable water for street cleaning with trucks, except for initial wash-down for construction purposes.
- Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.

9.2.2 Metering

☒ **CWC § 526 (a)**

Notwithstanding any other provision of law, an urban water supplier that, on or after January 1, 2004, receives water from the federal Central Valley Project under a water service contract or subcontract ... shall do both of the following:

(1) On or before January 1, 2013, install water meters on all service connections to residential and nonagricultural commercial buildings constructed prior to January 1, 1992, located within its service area.

(2) On and after March 1, 2013, or according to the terms of the Central Valley Project water contract in operation, charge customers for water based on the actual volume of deliveries, as measured by a water meter.

☒ **CWC § 527 (a)**

(a) An urban water supplier that is not subject to Section 526 shall do both of the following:

(1) Install water meters on all municipal and industrial service connections located within its service area on or before January 1, 2025.

All non-residential services in the District are metered. The District is in the process of converting all residential services to meters. As of 2020, there were 6,929 residential services that had yet to be converted. These services are scheduled for conversion by the end of 2024. All service connections within the District will be metered by January 1, 2025. Meters are read monthly and routinely maintained and calibrated. Customers are billed monthly based on their metered water use.

Cal Water is also piloting automatic meter reading (AMR) and advanced metering infrastructure (AMI) in several of its districts. AMI may be used by Cal Water in the future to detect and alert households of leaks and other possible problems as well as to provide customers with tailored water use information to help them use water more efficiently.

9.2.3 Conservation Pricing

The CPUC reviews and authorizes District water rates in a General Rate Case every three years. Currently, the District uses a three-tier increasing block rate design for residential water use and a single-tier uniform rate design for non-residential use. The District provides rate assistance to lower income households through its Customer Assistance Program (CAP).

9.2.4 Public Education and Outreach

The District's public outreach program is divided into four components, as follows:

Residential Customer Assistance – This category provides tailored assistance to residential customers through home water surveys and monthly water use reports. It provides assistance to residential customers wanting to reduce their indoor and outdoor water uses. While available to all residential customers, marketing of home water surveys is generally focused on high use residential customers.

Non-Residential Customer Assistance – This category provides tailored assistance to commercial customers through commercial water surveys, monthly landscape reports to large landscape customers, and large landscape water use surveys. It provides assistance to commercial customers wanting to reduce their use of water for sanitation, hygiene, process, and landscape purposes.

Public Information and School Education – Cal Water’s public information program provides general information on the need for and value and methods of water conservation through multiple media outlets, including its website, direct mail, and external print media. Cal Water’s school education program includes the Cal Water H2O Challenge (a project-based learning competition for grades 4-6), Cal Water Town (an interactive online learning tool), and general information and learning materials for students and teachers.

Rebate Program Information and Marketing – Through its website, bill inserts, newsletters, and print media, Cal Water advertises and markets a variety of conservation rebate programs, including rebate programs for high-efficiency toilets, urinals, and clothes washers, and irrigation equipment and landscape efficiency improvements.

9.2.5 Programs to Assess and Manage Distribution System Real Loss

Cal Water took part in the California Water Loss Technical Assistance Program (TAP) in 2016 and 2017. Cal Water conducts regular distribution system audits using the American Water Works Association (AWWA) Free Water Audit Software. Cal Water is developing a Water Loss Control Optimization Plan and Water Loss Control Policy to guide future water loss management and has solicited technical support with respect to:

- Satisfying current and future CPUC and state water loss standards and regulations
- Improving audit data and validity scores
- Implementing cost-effective water loss control actions

Recently, Cal Water has created a Water Loss Program Analyst position to coordinate and oversee these activities.

9.2.6 Water Conservation Program Coordination and Staffing Support

Cal Water's conservation programs are centrally administered by a team of conservation professionals. Conservation staffing levels and positions are reviewed and authorized by the California Public Utilities Commission in General Rate Cases every three years. The currently authorized conservation program staffing consists of nine full-time positions, which include:

- Director of Water Resource Sustainability,
- Conservation Program Manager,
- Research, Analytics and Reporting Manager,
- Water Resource Sustainability Analyst,
- Water Loss Program Analyst,
- Three Conservation Program Coordinators, and
- Conservation Assistant.

These staff positions manage all aspects of Cal Water's conservation programs deployed across 24 separate districts serving a combined population of 1.8 million people through half a million service connections.

9.2.7 Other Demand Management Measures

In addition to the DMM programs described above, Cal Water operates rebate, give-away, and direct installation programs aimed at plumbing fixture replacement and irrigation equipment and landscape efficiency improvements. Following are brief descriptions of each of these DMMs.

MaP Premium and Non-Premium Toilet Replacement – This program replaces old toilets with MaP certified high-efficiency toilets. Financial rebates, direct installation, and direct distribution are used to deliver toilets to customers. For residential customers, MaP premium certified toilets, which have greater water savings potential, are eligible for a rebate up to \$50. For commercial customers, a rebate up to \$100 is available for valve-type toilets flushing 1.28 gallons or less and EPA WaterSense labeled tank-type toilets. Cal Water centrally administers the program. This program is available to all residential and non-residential customers. Cal Water markets the program through direct mail, print media, bill stuffers, and its website. Where advantageous, Cal Water partners with local or regional agencies and community organizations to offer the program.

Urinal Valve and Bowl Replacement – This program replaces old urinals with high-efficiency urinals meeting the 0.125 gallon per flush water use standard adopted by the California Energy Commission in April 2015. Rebates up to \$150 are available to customers. The program targets offices and public buildings receiving significant foot traffic. Cal Water centrally administers the program. While this program is available to all non-residential customers, marketing focuses on

prime targets, such as restaurants and high-density office buildings. Cal Water markets the program through direct mail, print media, bill stuffers, and its website.

Clothes Washer Replacement – This program provides customer rebates up to \$150 for residential high-efficiency clothes washers. The program targets single-family households, multi-family units, and multi-family common laundry areas. Cal Water centrally administers the program, and markets the program through direct mail, print media, bill stuffers, and its website. This program is available to all residential customers. Where advantageous, Cal Water partners with local or regional agencies to offer the program.

Residential Conservation Kit Distribution – This program offers Cal Water residential customers conservation kits featuring a range of water-saving plumbing retrofit fixtures. Kits are available at no charge to customers, who can request them via Cal Water’s website, via mail, or by contacting or visiting their district offices. Each kit includes the following items: high-efficiency showerheads, kitchen faucet aerator, bathroom faucet aerators, full-stop hose nozzle, and toilet leak detection tablets. Cal Water centrally administers this program as part of a company-wide program operated in each of its districts. This program is available to all residential customers. Cal Water markets the program through direct mail, print media, bill stuffers, and through its website.

Smart Controllers Rebates/Vouchers – This program targets residential and non-residential customers with high landscape water use. The program offers financial incentives up to \$125 for residential controllers and up to \$25 per station for commercial-grade controllers to either the customer or contractor for proper installation of the Smart Controller at customer sites. The landscape contractor has the direct relationship with customers and is typically the entity customers listen to when making landscape and irrigation decisions. The program educates contractors about the customer benefits of Smart Controllers along with proper installation of the devices. This program is offered to all residential and non-residential customers. Cal Water markets the program through direct mail, print media, bill stuffers, and its website.

High Efficiency Irrigation Nozzle Web Vouchers/Rebates – Water efficient sprinkler nozzles (popup and rotating) and integrated pressure-regulated spray bodies use significantly less water than a standard sprinkler head by distributing water more slowly and uniformly to the landscape. In addition to reducing water use, water directed from these nozzles reduces run-off onto streets and sidewalks with a more directed flow. Customers are able to obtain the nozzles and spray bodies either directly through Cal Water or via a web-voucher program. Restrictions on the number of nozzles individual customers may receive vary by customer class and/or landscape size. Cal Water centrally administers this program as part of a company-wide program operated in most of its districts.

Turf Buy-Back – This program offers customers a \$1 per square foot rebate to replace turf with qualified drought-tolerant landscaping. Customer applications are screened to ensure program

requirements are met, including before and after photos of the retrofitted landscape area. Turf replacement rebates were offered in a subset of Cal Water districts starting in 2014 and offered across all districts starting in 2015 as a drought response measure. Implementation of this DMM was authorized by the California Public Utilities Commission to resume in 2021.

Table 9-1 summarizes the DMMs available to District customers at the time this Urban Water Management Plan (UWMP or Plan) was prepared.

Table 9-1. Cal Water DMMs Available to District Customers

DMM Measures (Rebate, Direct Install, and Free Distribution Programs)	Use Type Eligibility		
	Single-Family Residential	Multi-Family Residential	Commercial
Indoor Programs			
MaP Premium Toilet	✓	✓	✓
Urinal Bowl & Valve (< 0.125 gal)			✓
Clothes Washer (In Unit)	✓	✓	
Conservation Kits (showerheads, aerators)	✓		✓
Outdoor Programs			
Smart Irrigation Controller	✓	✓	✓
High Efficiency Irrigation Pop-up Nozzle	✓	✓	✓
High Efficiency Irrigation Rotating Nozzle	✓	✓	✓
High Efficiency Irrigation Spray Body		✓	✓
Turf Buy-Back	✓	✓	✓
Residential Assistance Programs			
Residential Water Survey	✓	✓	
Non-Residential Assistance Programs			
Commercial Water Use Surveys			✓
Monthly Water Use Report			✓
Large Landscape Water Use Survey			✓

9.3 Implementation over the Past Five Years

Table 9-2 summarizes program implementation for the previous five years. Estimated water savings do not include savings from water waste prevention ordinances, conservation pricing, public information, or distribution system water loss management. Cal Water uses the Alliance for Water Efficiency's Water Conservation Tracking Tool to estimate water savings.

Table 9-2. Implementation of Customer DMMs: 2016-2020

Indoor Programs	2016 – 2020 Total	Average Annual
Toilets & Urinals (number distributed)	3,616	723
Clothes Washers (number distributed)	434	87
Conservation Kits (number distributed)	1,506	301
Outdoor Programs		
Smart Controllers (number distributed)	617	123
Nozzles & Spray Bodies (number distributed)	14,703	2,941
Turf Buy-Back (sq ft removed)	29,316	5,863
Residential Assistance Programs		
Surveys/Audits (homes receiving)	141	28
Non-Residential Assistance Programs		
Surveys/Audits (sites receiving)	15	3
Large Landscape Reports (sites receiving)	179	36
Estimated Water Savings (AF)	1,105	221
NOTES: Estimated water savings for 2016-2020. DMMs will continue to generate savings after 2020 for their useful life.		

9.4 Implementation to Achieve Water Use Targets

All the DMMs described above contributed to the District's compliance with its SB X7-7 2020 target GPCD.

9.5 Water Use Objectives (Future Requirements)

CWC §10609 requires that urban retail water suppliers develop new water use objectives that are based on specific standards for certain water use sectors. These water use objectives will not be developed until 2023. Suppliers are encouraged in this UWMP cycle to consider how they will align their conservation management actions in order to meet these future obligations.

As noted above, Cal Water's conservation programs are subject to review and approval by the CPUC through a General Rate Case every three years. In making conservation program recommendations to the CPUC, Cal Water carefully considers how they will advance multiple objectives, including compliance with the pending water use objectives. Specific objectives identified in Cal Water's most recent General Rate Case included:

- Maintaining continuity with and furthering implementation of conservation programs authorized by the previous General Rate Case.

- Preserving gains in water conservation achieved during the 2013-2017 drought.
- Ensuring Cal Water districts are well-positioned to comply with state regulations and policies pertaining to water conservation, water loss management, and groundwater management, including Executive Order B-37-16, SB 555, and the Sustainable Groundwater Management Act (SGMA).
- Advancing cost-effective water use efficiency alternatives in districts with high water supply costs.

Cal Water developed a scoring methodology to adjust conservation programs and budgets to further these objectives. The methodology specifically considers five distinct conservation policy drivers:

1. State Conservation Standards and Water Use Objectives
2. SGMA Compliance
3. SB 555 Water Loss Management Requirements
4. Commercial, Institutional, and Industrial (CII) Water Management
5. Avoided Water Cost and Affordability

The methodology assigns greater weight to the State Conservation Standards and Water Use Objectives and SGMA Compliance policy drivers, reflecting their importance in terms of overall water resources management.

Scoring for the SGMA Compliance policy driver is based on groundwater basin priority, district dependence on groundwater supply, and basin adjudication status. The highest scores are assigned to districts in unadjudicated and critically overdrafted or high priority basins where groundwater comprises more than 45 percent of the water supply. The Bakersfield District ranked in the top third of Cal Water's districts for this policy driver.

Scoring for the State Conservation Standards and Water Use Objectives policy driver is based on four metrics that are used to gauge which districts are most likely to require adjustments to their conservation program mix or level of implementation to comply with the new standards. These metrics are:

1. Residential per capita landscape area
2. Residential per capita turf area
3. Size and number of large residential landscapes
4. Difference between a simulated water use budget and average water use for 2011-15

The Bakersfield District ranked in the middle third of Cal Water's districts for this policy driver.

Scoring for the SB 555 Water Loss Management Requirements policy driver is based on the district's infrastructure leakage index (ILI) from its most recent validated water loss audit. The ILI

is a performance indicator of real (physical) water loss from the water distribution system. A high ILI indicates possible distribution system inefficiencies and may also indicate significant water system leakage. Proposed adjustments to funding for water loss management are based on the ILI scoring criteria. The Bakersfield District ranked in the middle third of Cal Water's districts for this policy driver.

Scoring for the CII Water Management policy driver is based on the ratio of CII water uses to total water uses in a district. The Bakersfield District ranked in the top third of Cal Water's districts for this policy driver.

Scoring for the Avoided Water Cost and Affordability policy driver is based on the District's avoided cost of water supply, as estimated by the California Urban Water Conservation Council (CUWCC)/Water Research Foundation Avoided Cost Model. The Bakersfield District ranked in the bottom third of Cal Water's districts for this policy driver.

The combination of scores on each policy driver were used by Cal Water to recommend to the CPUC in its most recent General Rate Case adjustments to the conservation budgets of its districts. The purpose of the adjustments is to increase Cal Water's capacity to deploy conservation programs in districts expected to face the most significant regulatory and water management challenges in coming years. Recommended adjustments ranged from a low of 5 percent to a high of 25 percent. The recommended adjustment for the Bakersfield District was 22.5 percent.

Chapter 10

Plan Adoption, Submittal, and Implementation

☒ **CWC § 10621 (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.

This chapter provides information on a public hearing, the adoption process for the Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP), the adopted UWMP and WSCP submittal process, plan implementation, and the process for amending the adopted UWMP or WSCP. This chapter includes the following sections:

- 10.1 Inclusion of All 2020 Data
- 10.2 Notice of Public Hearing
- 10.3 Public Hearing and Adoption
- 10.4 Plan Submittal
- 10.5 Public Availability
- 10.6 Notification of Public Utilities Commission
- 10.7 Amending an Adopted UWMP or Water Shortage Contingency Plan

10.1 Inclusion of All 2020 Data

This UWMP includes the water use and planning data for the entire calendar year of 2020, per the UWMP Guidebook 2020.

10.2 Notice of Public Hearing

☒ **CWC § 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.

Prior to adopting the Plan, California Water Service Company (Cal Water) held a virtual public hearing to present information on its Bakersfield District (also referred to herein as the “District”) 2020 UWMP and WSCP on June 1, 2021, 7:00 PM.⁵⁸

Relevant entities were notified of the UWMP and WSCP review at least 60 days prior to the public hearing, including: (1) cities, counties, and Groundwater Sustainability Agencies (GSAs), and (2) the public. These entities were noticed again with the specific date, time and location of the hearing at least two weeks prior to the public hearing. The notice to the public, as specified in Government Code 6066, and letters to relevant agencies can be found in Appendix B and Appendix C, respectively.

10.2.1 Notice to Cities and Counties

☒ **CWC § 10631 (a)** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

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.

Table 10-1 lists the cities and counties that were notified. Copies of these letters are provided in Appendix B.

⁵⁸ Restrictions related to the COVID-19 pandemic prevented the District from holding an in-person public hearing as previously planned.

Table 10-1. Notification to Cities and Counties (DWR Table 10-1)

City Name	60 Day Notice	Notice of Public Hearing
City of Bakersfield	X	X
County Name	60 Day Notice	Notice of Public Hearing
Kern County	X	X
Other Agency Name	60 Day Notice	Notice of Public Hearing
Kern County Water Agency	X	X
Kern Delta Water District	X	X
Kern River Groundwater Sustainability Agency	X	X
NOTES:		

10.2.2 Notice to the Public

Notification to the public and to cities and counties also provided instructions on how to view the 2020 UWMP and WSCP prior to the hearing, the revision schedule, and contact information of the UWMP and WSCP preparer. A copy of this notice is included in Appendix C.

10.3 Public Hearing and Adoption

☒ CWC § 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.*

☒ CWC § 10621 (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.

The deadline for public comments on the UWMP and WSCP was June 1, 2021, the day of the public hearing. The final Plan was formally adopted by Cal Water's Vice President of Engineering June 20, 2021, and was submitted to California Department of Water Resources (DWR) within 30 days of approval. Appendix I presents a copy of the signed Resolution of Plan Adoption. Appendix B contains the following:

- Letters sent to and received from various agencies regarding this plan, and
- Correspondence between Cal Water and participating agencies.

10.4 Plan Submittal

☒ CWC § 10621 (f)

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

☒ CWC § 10635 (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.

☒ CWC § 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.

This UWMP and WSCP were submitted to DWR within 30 days of adoption and by the July 1, 2021 deadline. The submittal was done electronically through Water Use Efficiency Data Portal, an online submittal tool. The adopted UWMP and WSCP was also sent to the California State Library and to the cities and counties listed in Table 10-1 no later than 30 days after adoption.

10.5 Public Availability

☒ CWC § 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.

On or about May 3, 2021, an electronic version of the draft 2020 UWMP and WSCP were made available for review by visiting Cal Water's website: <https://www.calwater.com/conservation/uwmp-review/>.⁵⁹

10.6 Notification of Public Utilities Commission

☒ CWC § 10621 (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.

Cal Water is an urban water supplier regulated by the California Public Utilities Commission. Cal Water included the District's 2020 UWMP and WSCP as part of its general rate case filings.

10.7 Amending an Adopted UWMP or Water Shortage Contingency Plan

☒ CWC § 10644 (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.

If the 2020 UWMP or WSCP is amended, each of the steps for notification, public hearing, adoption and submittal will also be followed for the amended document.

⁵⁹ Restrictions related to the COVID-19 pandemic prevented the District from making a printed hard-copy available for public review as previously planned.

Appendix A: UWMP Act Checklist

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	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	Chapter 1
x	x	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.	Summary	Section 1.6
x	x	Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.4 and Table 2-1
x	x	Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5 and Table 2-4
x	x	Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 2.5
x		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Section 2.5.1
	x	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	N/A
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Chapter 3
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.4 and Table 3-1

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.4 and Table 3-2
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Section 3.4 and Table 3-2
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3.5
x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2 and Tables 4-1 to 4-3
x	x	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.2.3
x	x	Section 4.2.6	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	Section 4.2.4 and Tables 4-5 and 4-6
x	x	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.2.4
x	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 4.2.3 and Table 4-4
x	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.2.5 and Table 4-7
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 7.5.1
x		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.5 and Table 5-2
	x	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	N/A

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.4
x		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5-year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.4
x		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Section 5.5
x	x	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.	System Supplies	Chapter 7
x	x	Sections 6.1	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, <i>including changes in supply due to climate change</i> .	System Supplies	Section 7.2
x	x	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	Section 6.9 and Table 6-9
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.8
x	x	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.9
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2
x	x	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2.1
x	x	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	Section 6.2
x	x	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2
x	x	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years.	System Supplies	Section 6.2.5 and Table 6-1
x	x	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	Section 6.9
x	x	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	Section 6.7
x	x	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)	Section 6.5.2 and Tables 6-4 and 6-5
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and Table 6-5
x	x	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)	Section 6.5.3
x	x	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 a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.3 and Table 6-4
x	x	Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.3

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	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)	Section 6.5.3 and Table 6-6
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6
x	x	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)	Section 6.5.2 and Table 6-3
x	x	Section 6.2.8, Section 6.3.7	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 5 consecutive water years.	System Supplies	Section 6.8 and Table 6-7
x	x	Section 6.4 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	Section 6.11 and Table 6-10
x	x	Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability.	Water Supply Reliability Assessment	Section 7.1.2
x	x	Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4
x	x	Section 7.3	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 water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.2 and Tables 7-2 to 7-4
x	x	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	Section 7.5
x	x	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 5 consecutive years.	Water Supply Reliability Assessment	Section 7.5
x	x	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	Section 7.5

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.5 and Table 7-5
x	x	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	Section 7.5
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Appendix G
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Appendix G
x	x	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	Appendix G
x	x	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	Appendix G
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent 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	Appendix G
x	x	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Appendix G

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Appendix G
x	x	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	Appendix G
x	x	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	Appendix G
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Appendix G
x	x	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	Appendix G
x	x	Section 8.5 and 8.6	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	Appendix G
x		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	Appendix G
x	x	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Appendix G
x	x	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Appendix G
x	x	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	Appendix G
x	x	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	Appendix G
x	x	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	Appendix G

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought.	Water Shortage Contingency Planning	Appendix G
x		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Appendix G
x		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	Appendix G
x	x	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Section 10.4
	x	Sections 9.1 and 9.3	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
x		Sections 9.2 and 9.3	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	Chapter 9
x		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	Section 10.3
x	x	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 urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Section 10.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Chapter 10
x	x	Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.2.1
x	x	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	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	Section 10.6
x	x	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	Section 10.7

Appendix B: Correspondence

- UWMP Notice of Preparation
- District Mailing List
- Growth Projection and Land Use Letter
- UWMP and WSCP Public Draft Comments

Note: There were no public comments received on the UWMP or WSCP Public Draft.

**Notice of Preparation of Urban Water Management Plan and
Water Shortage Contingency Plan - 2020 Update**

The Urban Water Management Planning Act (California Water Code §10608–10656) requires that California Water Service (Cal Water) update its Urban Water Management Plan (UWMP) and associated Water Shortage Contingency Plan (WSCP) every 5 years.

Cal Water is currently reviewing its existing UWMP and associated WSCP, which were updated in 2016, and considering revisions for each plan. Coordination with other water suppliers, cities, counties, and community organizations in the region is an important part of the preparation of Cal Water's UWMP and WSCP. We are available to discuss the assumptions used in the development of the plans including available water supply, water demands, land use, as well as other aspects of the plans.

A draft of the 2020 UWMP and WSCP will be made available for public review and a public hearing will be scheduled in Spring 2021. We will notify you when the draft is available for review, how to access it, and details regarding the public hearing.

The updated UWMP and WSCP are due by July 1, 2021. If you would like more information regarding our 2015 UWMP and WSCP and the schedule for updating these documents, or if you would like to participate in the preparation of the 2020 UWMP and WSCP, please contact:

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Senior Engineer
California Water Service
Phone: (408) 367-8338
Email: PlanningInfo@calwater.com

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Council Member
City of Bakersfield
city_council@bakersfieldcity.us

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Lorelei Oviatt
Planning Director
Kern County, Planning Department
LoreleiO@co.kern.ca.us

Bolzowski, Michael R.

From: Storms, Maximilian (Max)
Sent: Wednesday, May 19, 2021 11:25 AM
To: nfidler@bakersfieldcity.us; pjohanson@bakersfieldcity.us; achianel@bakersfieldcity.us
Cc: McCusker, Kevin; Johnson, Tamara; PlanningInfo
Subject: California Water Service 2020 Bakersfield UWMP - Public Draft
Attachments: Bakersfield (CBK) - Cal Water UWMP_Land Use Coordination.pdf

To Whom It May Concern:

California Water Service (Cal Water) is currently updating its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to reflect water service conditions in the Bakersfield District. The Bakersfield District serves portions of the City of Bakersfield and segments of unincorporated Kern County.

The State requires all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an UWMP and WSCP at least once every five years. These documents support Cal Water's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions.

Cal Water's estimates of future water demands are based on demographic projections and current and projected land use forecasts. For the Bakersfield District, Cal Water's water demand forecast is tied to Census Block population counts from decadal Census data. The decadal Census estimates are converted to average population per single- and multi-family service, which are applied to service counts for years between the decadal Censuses. Projected population is based on population and employment forecasts for Kern County generated by the California Department of Transportation's (Caltrans) long-term socio-economic forecast model.

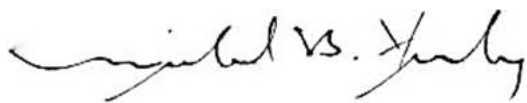
The UWMP also incorporates water supply assessments (WSA) for projects in or near the Bakersfield District into the demand forecast. As additional large-scale projects and/or specified land use planning processes arise (e.g., general plans, specific plans), additional WSAs will be developed to consider their impacts on available supplies.

We have attached the current public review draft of the UWMP, and incorporated WSCP for your review. Please share this with others in your organization that may be interested in the information.

Cal Water is available to discuss the assumptions used in the development of the UWMP for the Bakersfield District, including available supply, water demands, land use, as well as any other aspects of the plan.

Should you have any questions or comments, please contact Michael Bolzowski at mbolzowski@calwater.com.

Sincerely,



Michael B. Hurley
Water Resources Manager

Bolzowski, Michael R.

From: Storms, Maximilian (Max)
Sent: Wednesday, May 19, 2021 11:25 AM
To: LoreleiO@co.kern.ca.us
Cc: McCusker, Kevin; Johnson, Tamara; PlanningInfo
Subject: California Water Service 2020 Bakersfield UWMP - Public Draft
Attachments: Bakersfield (Kern Co) - Cal Water UWMP_Land Use Coordination.pdf

Ms. Oviatt,

California Water Service (Cal Water) is currently updating its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to reflect water service conditions in the Bakersfield District. The Bakersfield District serves portions of the City of Bakersfield and segments of unincorporated Kern County.

The State requires all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an UWMP and WSCP at least once every five years. These documents support Cal Water's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions.

Cal Water's estimates of future water demands are based on demographic projections and current and projected land use forecasts. For the Bakersfield District, Cal Water's water demand forecast is tied to Census Block population counts from decadal Census data. The decadal Census estimates are converted to average population per single- and multi-family service, which are applied to service counts for years between the decadal Censuses. Projected population is based on population and employment forecasts for Kern County generated by the California Department of Transportation's (Caltrans) long-term socio-economic forecast model.

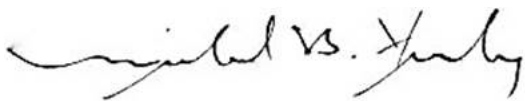
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We have attached the current public review draft of the UWMP, and incorporated WSCP for your review. Please share this with others in your organization that may be interested in the information.

Cal Water is available to discuss the assumptions used in the development of the UWMP for the Bakersfield District, including available supply, water demands, land use, as well as any other aspects of the plan.

Should you have any questions or comments, please contact Michael Bolzowski at mbolzowski@calwater.com.

Sincerely,



Michael B. Hurley
Water Resources Manager

Appendix C: Public Meeting Notice

- Public Meeting Notice of Intent
- Proof of Publication
- Public Meeting Presentation

Good afternoon!

We hope that this note finds you well.

We wanted to provide you with an update on the preparation of our updated Urban Water Management Plans and Water Shortage Contingency Plans.

These plans are a critical component of the steps we take to ensure there are sufficient water supplies to meet the current and future water needs of our customers, and we look forward to working with you on this important project.

Please let us know if you have any questions or need any additional information.

Cal Water Community Affairs



California Water Service
Quality. Service. Value.™



Urban Water Management Plan and Water Shortage Contingency Plan - 2020 Update

As a defined urban water supplier, California Water Service (Cal Water) is preparing an update to its Urban Water Management Plans (UWMP) and Water Shortage Contingency Plans (WSCP) that will address the water service conditions in our service areas. These documents support a water supplier's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions. It is Cal Water's intent to adopt the UWMPs, and the incorporated WSCPs, and file the plans as required with the Department of Water Resources, the California State Library, and any city or county within which Cal Water provides service no later than 30 days after adoption.

Schedule of upcoming actions:

After a public review period, a public meeting to receive comments on the Draft UWMP and WSCP will be held. As the information becomes available for each service area, the electronic copy of the UWMP, WSCP, and information on the public meeting, including a link to participate, will be available at the following internet address:

<https://www.calwater.com/conservation/uwmp-review/>

If you are unable to attend the scheduled public meeting but want to provide comments regarding the proposed UWMP or WSCP, you may send your comments via email to PlanningInfo@calwater.com.

Reliability Runs **Deep**



California Water Service
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CALIFORNIA WATER SERVICE CO/PLANNING DEPT.
1720 NORTH FIRST ST.
SAN JOSE, CA 95112

COPY OF NOTICE

Notice Type: GPN GOVT PUBLIC NOTICE
Ad Description: -CALIFORNIA WATER SERVICE - BAKERSFIELD DISTRICT

To the right is a copy of the notice you sent to us for publication in the THE BAKERSFIELD CALIFORNIAN. Please read this notice carefully and call us with any corrections. The Proof of Publication will be filed with the County Clerk, if required, and mailed to you after the last date below. Publication date(s) for this notice is (are):

05/13/2021 , 05/20/2021

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CNS 3468416

NOTICE OF INTENT TO ADOPT AN URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN AND HOLD A PUBLIC MEETING TO RECEIVE COMMENTS ON THE PROPOSED PLANS CALIFORNIA WATER SERVICE - BAKERSFIELD DISTRICT

California Water Code (CWC) sections 10610 through 10656, known as the "Urban Water Management Planning Act" (Act), require all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an Urban Water Management Plan (UWMP) at least once every five years.

UWMPs support a water supplier's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions. The UWMP must 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 UWMP must also address measures for residential, commercial, governmental, and industrial water demand management.

Further, Section 10632 of the CWC requires that every urban water supplier shall prepare and adopt a Water Shortage Contingency Plan (WSCP) as part of its plan (UWMP). Section 10632.2 provides that, "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, 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." The WSCP will be incorporated as an appendix of the UWMP.

One of Cal Water's service areas is the Bakersfield District, which is located in Kern County. The Bakersfield District serves portions of the City of Bakersfield and segments of unincorporated Kern County lands. As a defined urban water supplier, Cal Water is preparing an update to its UWMP that will address the water service conditions in the Bakersfield District. It is Cal Water's intent to adopt that UWMP and the incorporated WSCP, and file that plan as required with the Department of Water Resources, the California State Library, and any city or county within which Cal Water provides service no later than 30 days after adoption.

Schedule of upcoming actions:
On or about May 3, 2021, an electronic copy of the Draft 2020 UWMP and WSCP will be available for review. After a public review period, a public meeting to receive comments on the Draft UWMP and WSCP Plan for the Bakersfield District will be held online on June 1, 2021, at 7:00 p.m. The electronic copy of the

UWMP, WSCP, and additional information on the public meeting, including a link to participate, is available at the following internet address: <https://www.calwater.com/conservation/uwmp-review/>

If you are unable to attend the scheduled public meeting but want to provide comments regarding the proposed UWMP or WSCP, you may send your comments via email to PlanningInfo@calwater.com. Cal Water will receive comments on the Draft 2021 UWMP and WSCP from May 3 through June 1, 2021.

Please share this notice with others that may have interest in this matter.

5/13, 5/20/21

CNS-3468416#

THE BAKERSFIELD CALIFORNIAN





California Water Service

June 1, 2021

Quality. Service. Value.

Bakersfield District

**2020 Urban Water Management Plan
2020 Water Shortage Contingency Plan**

Meeting Agenda

- Purpose and objectives
- Introduce California Water Service (CWS) staff and consultants
- Presentation of the 2020 Urban Water Management Plan (UWMP)
- Presentation of 2020 Water Shortage Contingency Plan (WSCP)
- Drought update
- Public comments and questions



2020 UWMP Update: Public Outreach

- Preliminary information sent to relevant entities in February 2021
- Second notice sent to relevant entities in May 2021
- Two notices posted in local newspaper
- Draft 2020 UWMP and WSCP available for review at <https://www.calwater.com/conservation/uwmp-review/>
- Public hearing



Urban Water Management Planning Act

- Supports long-term water resource planning to ensure adequate supplies
- California Water Code - Sections 10610-10656
- Threshold: Utilities with 3,000+ services or 3,000+ acre-feet per year (AFY) water sales
- At least a 20-year planning horizon, Cal Water's plan covers 25 years
- Must be updated every 5 years and submitted by July 1, 2021
- Basis for SB-610 Water Supply Assessments and SB-221 Water Supply Verifications



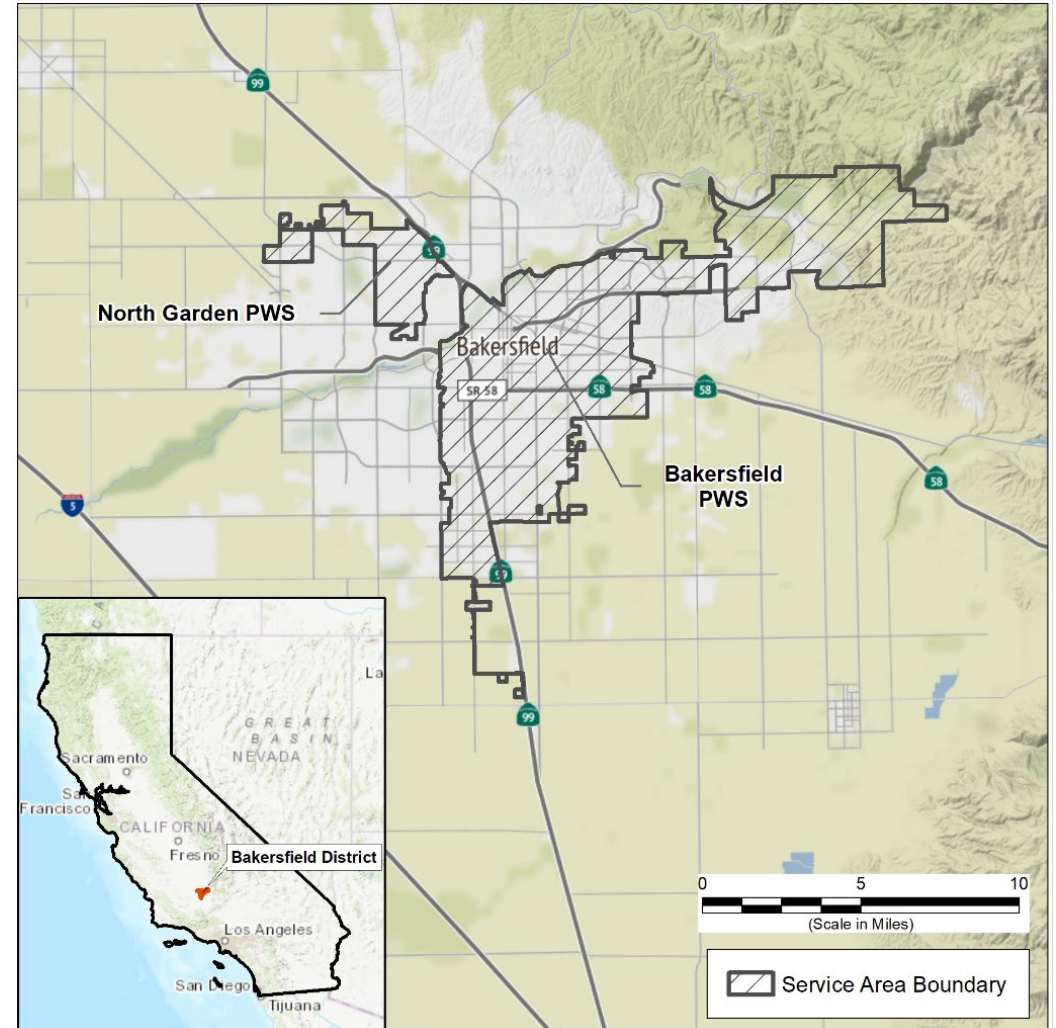
UWMP Elements

- Service area description
- Population forecast
- Supply and demand projections through 2045 in normal, single dry and multiple dry years
- Water supply reliability
- Conservation/Demand Management Measures
- Climate change
- WSCP



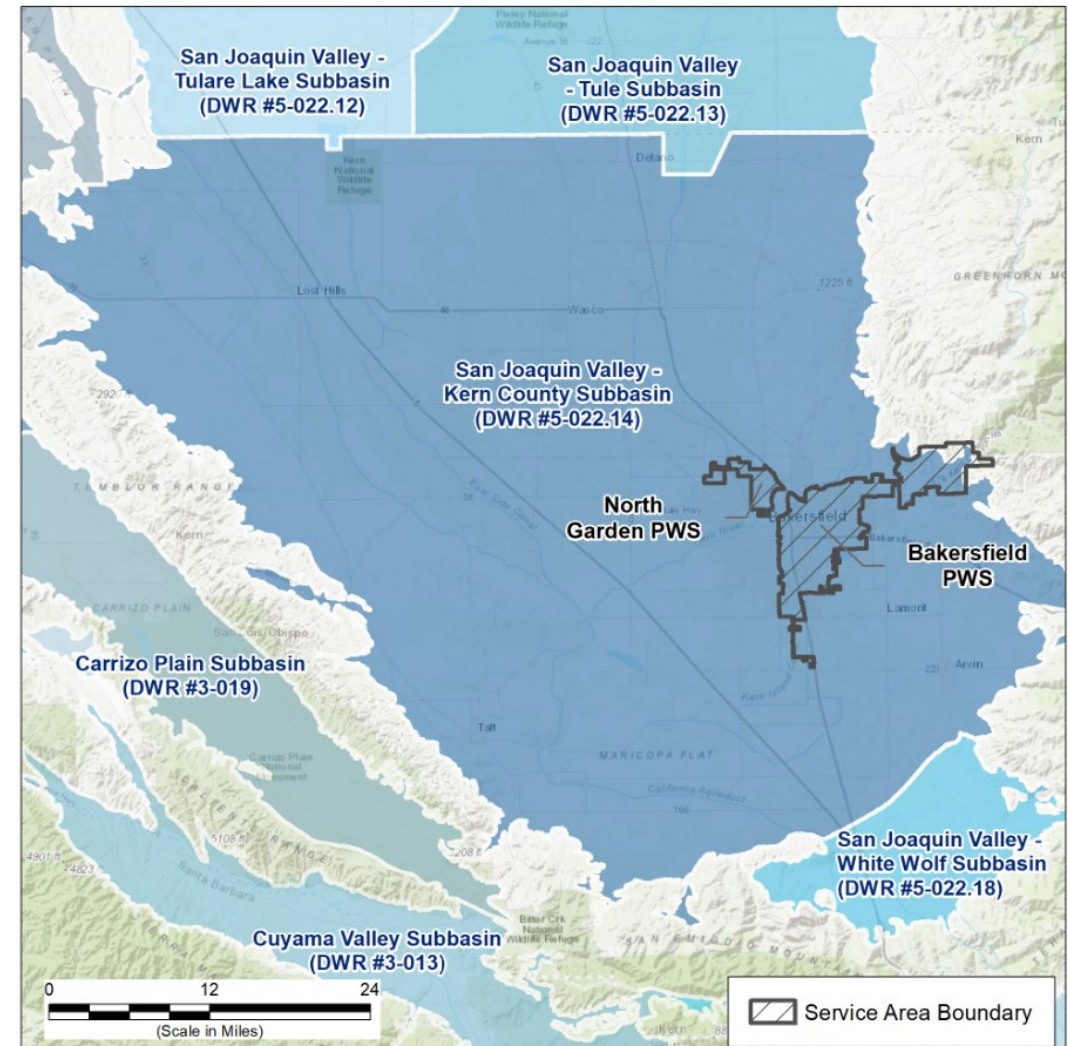
District Overview

- Serving Bakersfield District since 1926
- Two Public Water Systems
- Uses groundwater and purchased water from City of Bakersfield and Kern County Water Agency (KCWA)
- Improvement District 4 (ID-4)
- Distribution system includes 130 wells and 56 surface storage structures



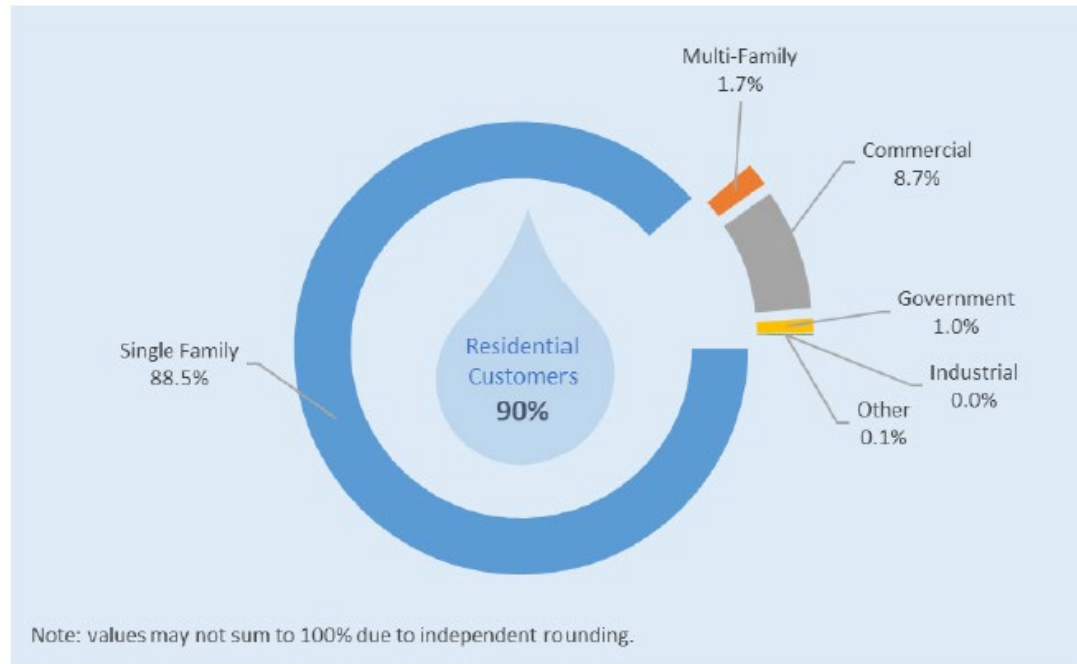
Water Supply Sources

- Groundwater pumped from the Kern County Subbasin
- Untreated local surface water purchased from City of Bakersfield
- Treated local surface and imported water purchased from KCWA ID-4
- Cal Water continues to investigate additional supply sources, however there is no current or projected use of recycled water or other supply sources

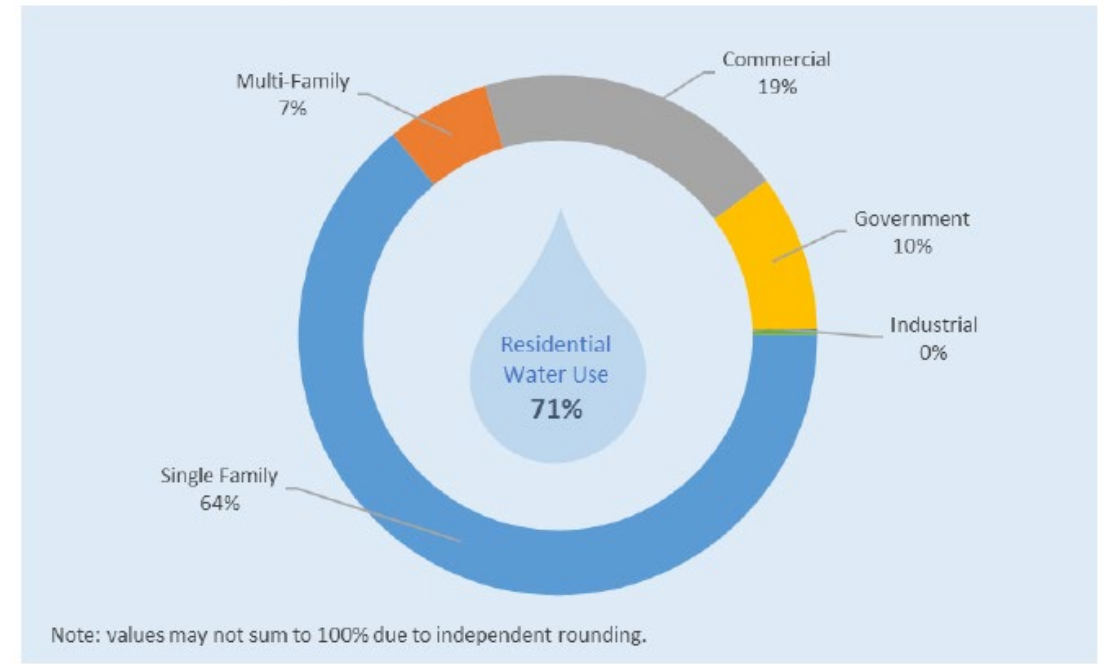


Distribution of Services/Demand

Types of Customers



Demand



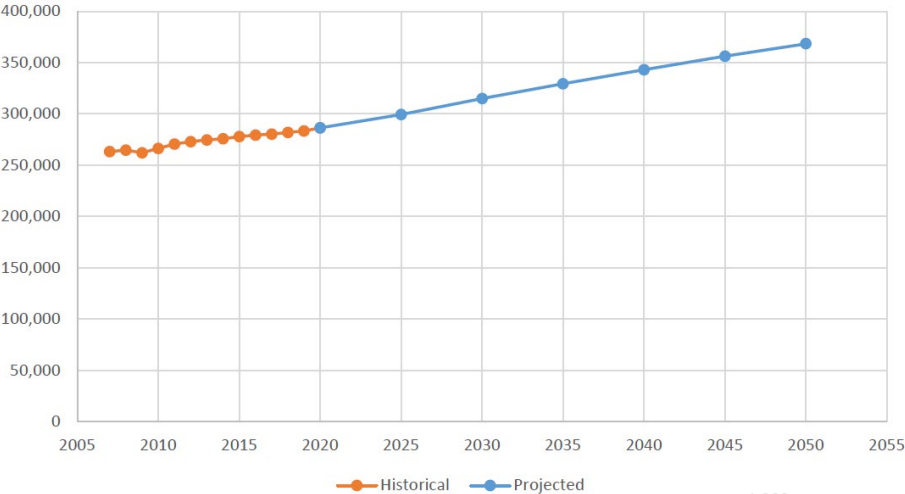
Demand Projection Methodology

- Forecast horizon is beyond 20 years required by UWMP
- Generates normal-, wet-, and dry-year demand forecasts
- Directly considers impacts of climate change
- Demand model uses historical data on services, sales, production, population, and proposed conservation measures
- Regional Growth Forecast: housing and employment growth forecasts based on county-level forecasts prepared by Caltrans

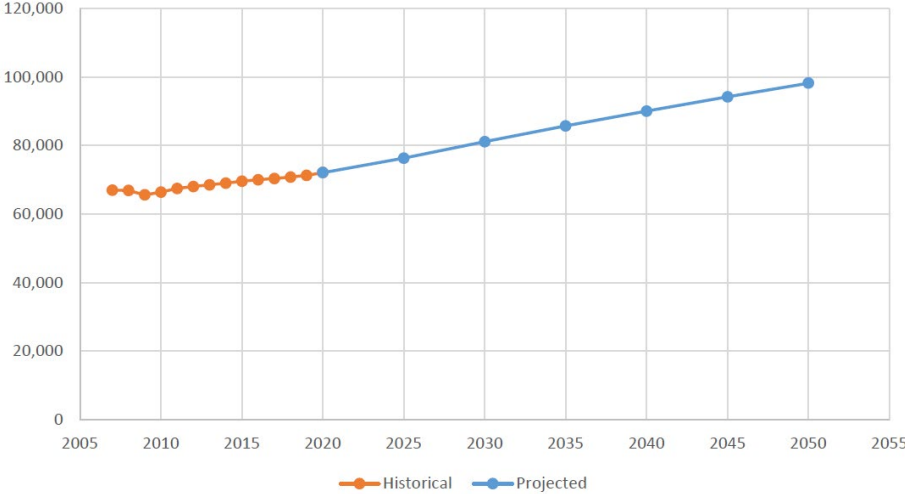


Population & Account Projections

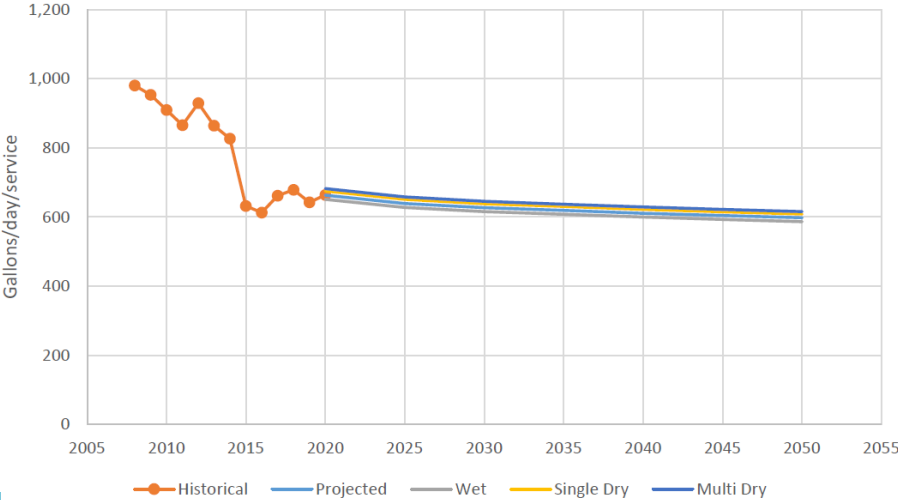
Historical and Projected Population



Historical and Projected Services

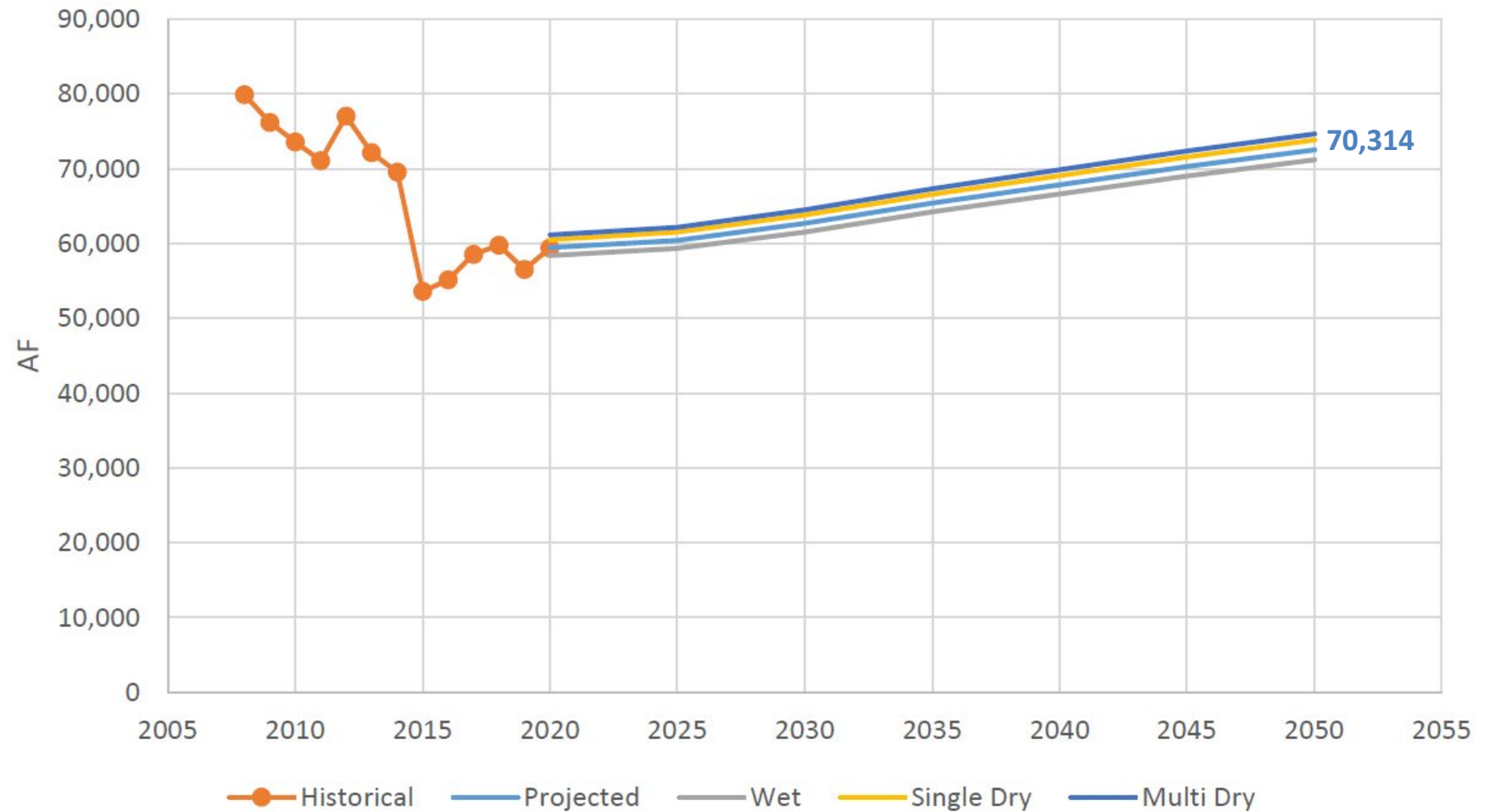


Average Demand Per Service



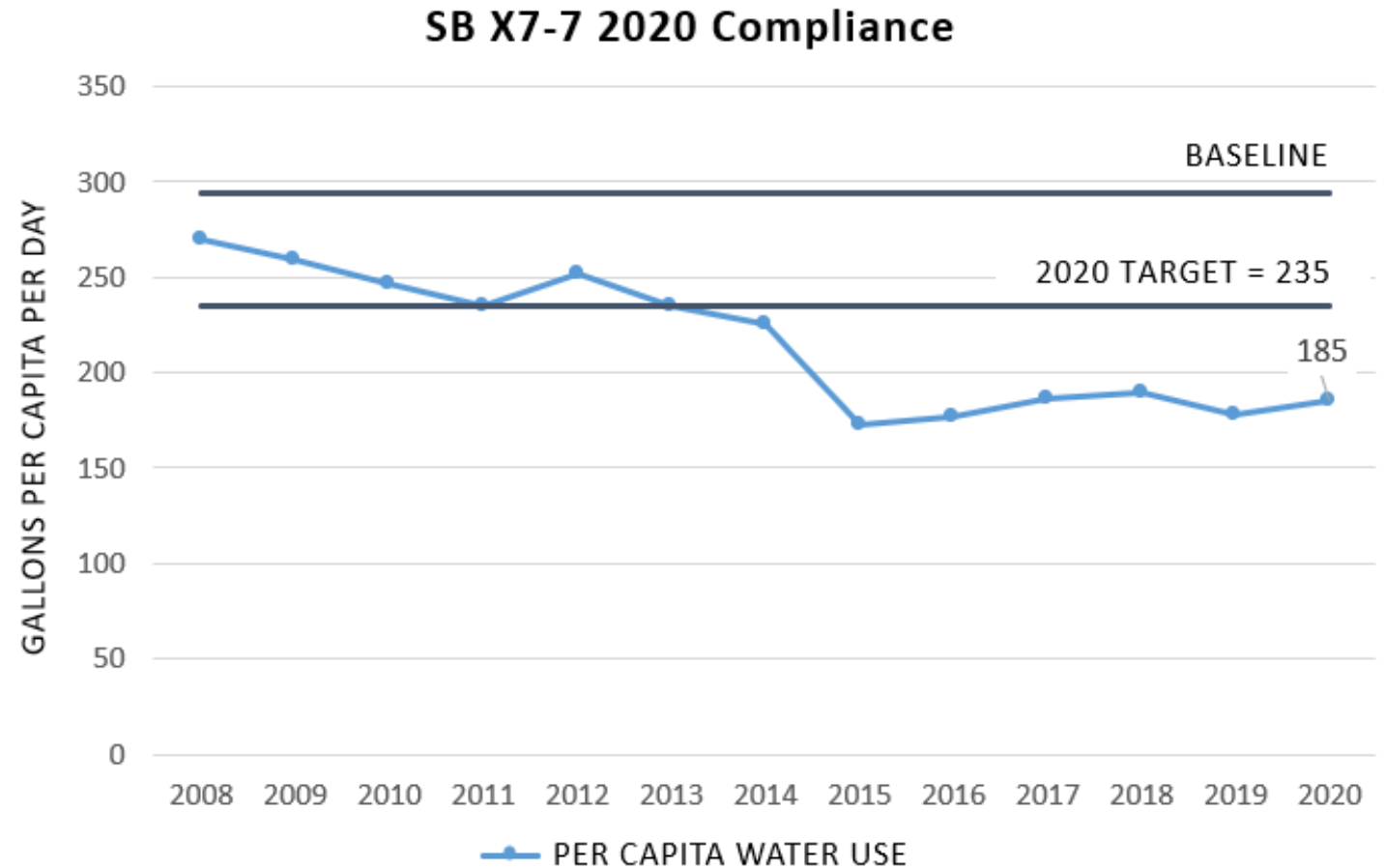
Demands for Potable Water - Projected

- 2045 demand projected to be 70,314 acre-feet per year
- 18% increase relative to 2020 demands



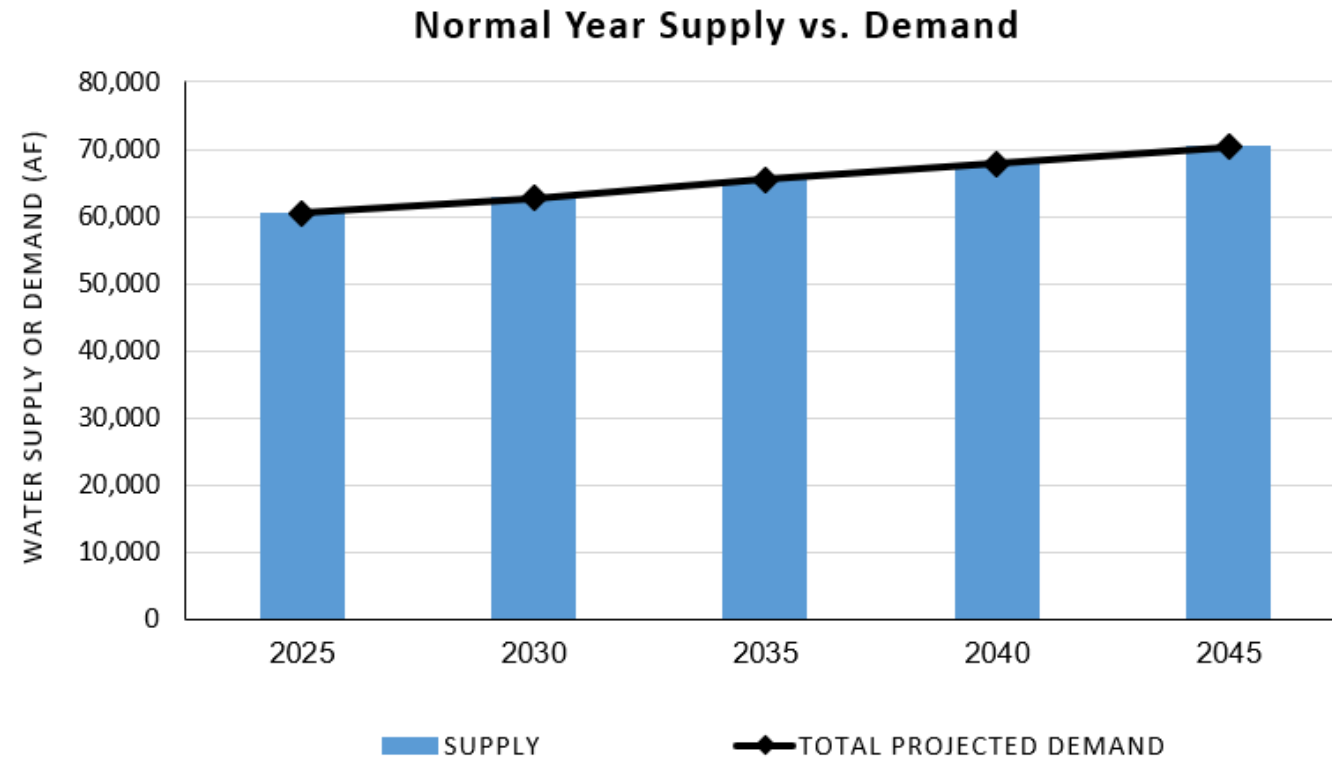
SB X7-7 (20% by 2020)

- Goal is to reduce per capita urban water use below baseline by:
 - 10% by Dec. 31, 2015
 - 20% by Dec. 31, 2020
- Bakersfield District met its 2020 Target



Supply Sufficiency

- Supply sufficiency analysis is based on the following factors:
 - Bakersfield District has always been able to meet historical demands; due to successful conservation, projected future demands are less than historical
 - Long-term supply agreements with wholesalers provide reliable surface water source
 - Municipal & Industrial (M&I) demands for groundwater are relatively minor within the Kern County Subbasin and are subject to certain legal protections
- Supply is projected to be sufficient to meet projected demand under normal, single dry, and multiple dry year conditions
- Any unexpected shortages will be addressed by the WSCP



Local Topics – Bakersfield District

- Implementation of Sustainable Groundwater Management Act (SGMA) is in early stages and may impact future supply reliability
 - The Kern County Subbasin is determined by DWR to be in a condition of “critical overdraft”
 - The final Groundwater Sustainability Plans (GSPs) for the Kern County Subbasin are available on the DWR SGMA Portal website
- Cal Water is actively engaging in SGMA implementation and will incorporate any impacts into ongoing supply planning



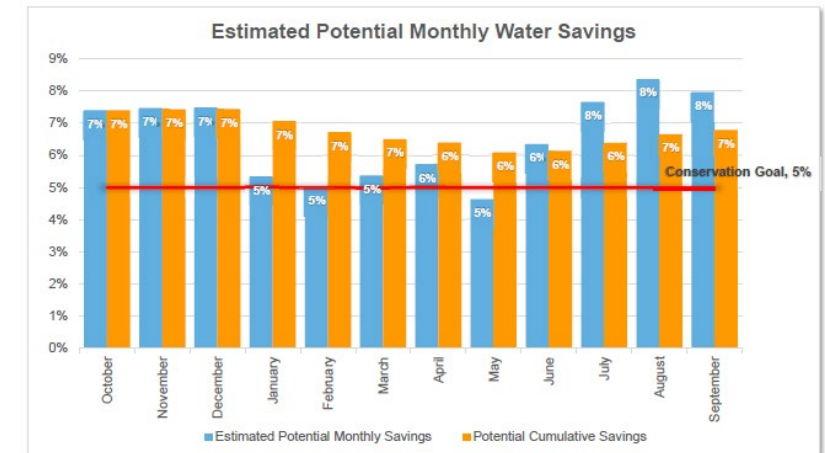
Water Shortage Contingency Plan Elements

- Comprehensive drought response plan
 - Annual assessment of water supply reliability
 - Six standard shortage stages (10% to >50%)
 - Shortage response actions
 - Communication protocols
 - Monitoring, enforcement, and reporting
- Quantitatively assessed using Drought Response Tool



1 - Home
Bakersfield District

Enter Agency Information	
Agency Name	Bakersfield
Total Population Served	285,590
Conservation Goal (%)	5%
Drought Stage	Stage 1
Number of Residential Accounts	56,795
Number of Commercial, Industrial, and Institutional (CII) Accounts	15,141
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	73%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	63%
Comments	BK



Drought Update

- Governor has issued drought emergencies in the majority of counties in California
- Cal Water is monitoring drought conditions in all of its service territories
 - Established a Drought Response Committee
 - Proactively developing conservation messaging
- Cal Water is closely coordinating its drought response with other water agencies and regulatory bodies
- Cal Water will follow protocols outlined in the WSCP as needed
 - Based on local conditions or state mandates



Questions or Comments

- Draft 2020 UWMP and 2020 WSCP available at <https://www.calwater.com/conservation/uwmp-review/>
- Comments on any parts of the UWMP will be accepted through June 1, 2021
- Send 2020 UWMP and WSCP comments to: planninginfo@calwater.com



Appendix D: Summary of Demand Projection Methodology and Assumptions

Cal Water Long-Term Demand Forecast Model Overview

Forecast Domain

The forecast model generates separate forecasts for each customer class and distribution system. Table 1 lists Cal Water districts and distribution systems. Table 2 lists customer classes.

Forecast Horizon and Time Step

The forecast horizon is 30 years. The forecast has an annual time-step.

Normal, Wet, and Dry Year Forecasts

The forecast model generates normal-, wet-, and dry-year demand forecasts. The normal-year forecast is the default forecast. The wet- and dry-year forecasts can be substituted for the default forecast as necessary for system planning purposes. The model produces two different dry year forecasts: the single dry year forecast and the multiple dry year forecast. The latter represents the expected effect of prolonged drought conditions on unconstrained water demand.¹

Relationship to GRC Sales Forecast

The first year of the forecast can be set to the current GRC sales forecast or actual consumption.

Relationship to PAWS

The demand model uses historical data on services, sales, production, and population from Cal Water's Production Analysis Worksheets (PAWS).

Accounting Rules

The model uses the following accounting rules to ensure forecast consistency:

- Population and conservation savings forecasts are functions of the service forecast.
- The sales forecast for a distribution system is the sum of the class-level sales forecasts for the distribution system. The production forecast for a distribution system is the sum of the sales and non-revenue water (NRW) forecasts for the distribution system.
- The sales and production forecasts for a district are the sum of the sales and production forecasts for its distribution systems.

Volume Units

Sales and production forecasts are in acre-feet (AF). Average sales and per capita forecasts are in gallons per day.

Per Capita Water Use

The model generates per capita forecasts for water use by single-family customers, water use by multi-family customers, water use by all residential customers, and water use by all district customers.

¹ Unconstrained demand is what demand would be in the absence of water use restrictions or policies intended to curtail water use.

Service Forecast

The forecast model generates three alternative service forecasts:

- Average Y-Y Change in Services. The model bases the forecast on the historical year-to-year (y-y) change in the number of services. This forecast assumes additive growth.
- Average Y-Y % Change in Services. The model bases the forecast on the historical y-y percentage change in services. This forecast assumes exponential growth.
- Regional Growth Forecast. The model uses regional housing and employment growth forecasts to project future services. Districts in the Bay Area use census-tract level growth forecasts prepared by the Association of Bay Area Governments (ABAG). Districts in Southern California use census-tract-level growth forecasts prepared by the Southern California Association of Governments (SCAG). The remaining districts use county-level forecasts prepared by Caltrans.

Regional Forecasts

Table 3 lists the regional forecasts in the model. Table 4 summarizes how the model uses the regional forecasts to project future services.

Service Floors and Ceilings

The forecast can include floors and ceilings on the service growth. The floor (ceiling) is the minimum (maximum) number of services allowed in the forecast.

User-Specified Growth Rates

The model allows user-specified growth rates.

Water Supply Assessments

The user can add to the forecast projected services and water use from Water Supply Assessments prepared for proposed development projects. The user can specify how much of this projected growth in services and water use the model should treat as additive to the baseline forecast.

Population Forecasts

The population projection is a function of the residential service projections to ensure internal consistency. Population in year t is:

$$Population_t = \left[\frac{persons}{service} \right]_{SFR} \cdot SFRservices_t + \left[\frac{persons}{service} \right]_{MFR} \cdot MFRservices_t$$

For multi-family services, the calculation of average persons per service uses the equation below. The model uses county assessor data linked to Cal Water customer data to estimate average dwelling units per parcel and average parcels per service. It uses census data to estimate average persons per dwelling unit.

$$\left[\frac{persons}{service} \right]_{MFR} = \frac{Avg \text{ Dwelling Units}}{Parcel} \cdot \frac{Avg \text{ Parcels}}{Service} \cdot \frac{Avg \text{ Persons}}{Dwelling \text{ Unit}}$$

Sales/Service Forecast

The model generates separate forecasts of sales/service for each customer class and distribution system.

Sales/Service Initialization

The model user sets sales/service for first year of the forecast to either current year water use or the most recent General Rate Case sales forecast. The 2020 UWMP projections start with 2020 actual sales/service.

Sales/Service Adjustments

In each forecast year, the model adjusts the previous year's sales/service estimate for:

1. Rebound from the 2012-16 drought
2. Passive water savings from plumbing codes and appliance standards
3. Active water savings from Cal Water conservation programs
4. Real changes in the marginal cost of water service
5. Real changes in per capita income

The user can select which adjustments to apply. The 2020 UWMP projections include all the adjustments except the drought rebound adjustment. The 2020 UWMP projections exclude the drought rebound adjustment because analysis of recent consumption trends showed that further rebound from the 2012-2016 drought was unlikely.

A description of each adjustment follows.

Drought Rebound

The model adjusts the sales/service forecast for demand recovery following the 2012-2016 drought. The model makes this adjustment using data on the growth in sales/service between 2016 and 2017. The model assumes some of the savings achieved during the drought will be permanent. The user can set the level of permanent drought savings. The default setting is 20%.

Passive Water Savings

The model uses DWR projections of water savings from plumbing/building codes to forecast passive water savings.² The model extends the DWR projections, which run through 2040, to 2050.

Active Water Savings

The model uses conservation program savings projections from Cal Water's 2015 Conservation Master Plans to forecast active water savings.

Price and Income Adjustments

The model adjusts average sales for expected changes in real income and cost of water service. The adjustment equation is:³

² M.Cubed. 2016. Projected Statewide and County-Level Effects of Plumbing Codes and Appliance Standards on Indoor GPCD. Technical Memorandum prepared by David Mitchell for the California Department of Water Resources. August 30, 2016.

³ The model uses a constant-elasticity-of-demand specification: $Q_t = AP_t^\epsilon I_t^\delta$

$$\Delta Q_t = Q_0 \left(1 - \left(\frac{P_t}{P_0} \right)^\varepsilon \left(\frac{I_t}{I_0} \right)^\delta \right)$$

where Q_0 is sales/service in the base year of the forecast, $\left(\frac{P_t}{P_0} \right)$ and $\left(\frac{I_t}{I_0} \right)$ are the price of water and income relative to the base year of the forecast, and ε and δ are empirically derived estimates of price and income elasticity.

Sales Forecast

The sales forecast is the product of the service and average use per service forecasts.

Non-Revenue Water Forecast

The non-revenue water forecast is a function of the services forecast. The forecast starts with an initial estimate of non-revenue water, expressed in gallons/connection/day. The model decomposes this estimate into real and apparent loss. The model assumes future apparent loss is equal to the average apparent loss for the five year before the start of the forecast. In the case of real loss, the model assumes Cal Water's loss management program will reduce real losses over time. The amount of reduction depends on the starting estimate of real loss. If this estimate is 10 gallons/connection/day or less, the model assumes no further reduction. Otherwise, the model assumes real losses (in gallons/connection/day) will decrease until they are equal to 75% of the average real loss for the five years before the start of the forecast or the State Water Board draft real water loss standard for the distribution system, whichever is greater.⁴ The model assumes the reduction in real loss will occur between 2020 and 2030.

Production Forecast

The production forecast is the sum of the sales and NRW forecasts.

Normal, Wet, Single Dry, and Multiple Dry Year Projections

The model generates normal, wet, single dry, and multiple dry year forecasts of sales and production. The model bases these forecasts on empirically derived relationships between monthly water sales, rainfall, and air temperature estimated for each Cal Water district.⁵

- Wet year – minus one standard deviation weather effect on sales and production
- Single dry year – plus one standard deviation weather effect on sales and production
- Multiple dry year – plus 1.6 standard deviations weather effect on sales and production

In the case of the dry year forecasts, the model is forecasting demand in the absence of drought water use restrictions or other policies that would limit water use in dry years.

⁴ The State Water Board did not develop a draft water loss standard for every Cal Water distribution system. For those without a draft standard, the model assumes real losses will decrease until they are equal to 75% of the average real loss for the five year before the start of the forecast.

⁵ A&N Technical Services, Cal Water Long Term Water Demand Forecast Model, December 2014.

Table 1. Long-Term Demand Model Districts and Systems

Label	District-System	Notes
AV	Antelope Valley District	
AV-FMT	Fremont System	
AV-LAN	Lancaster System	
AV-LKH	Lake Hughes System	
AV-LVY	Leona Valley System	
BG	Bear Gulch District	No sub-systems in district
BK	Bakersfield District	
BK-BK	Bakersfield System	
BK-NG	North Garden System	
CH	Chico District	
CH-CH	Chico System	
CH-HAM	Hamilton City System	
DIX	Dixon District	No sub-systems in district
DOM	Dominguez District	No sub-systems in district
ELA	East Los Angeles District	No sub-systems in district
HAW	Hawthorne District	No sub-systems in district
HR	Hermosa-Redondo District	No sub-systems in district
KC	King City District	No sub-systems in district
KRV	Kern River Valley District	
KRV-BDFLO	Lower Bodfish System	
KRV-BDFUP	Upper Bodfish System	
KRV-KNVARD	Kernville & Arden System	Includes KNV, KRVArdenWaterCo, COUN, MSH, POND
KRV-LKL	Lakeland System	
KRV-ONX	Onyx System	
KRV-SLK	South Lake System	Includes SQM
KRV-SPM	Split Mountain System	
LAS	Los Altos District	No sub-systems in district
LIV	Livermore District	No sub-systems in district

Cal Water Long-Term Demand Forecast Model Overview

Label	District-System	Notes
MPS	Mid-Peninsula District	
MPS-SM	San Mateo System	
MPS-SC	San Carlos System	
MRL	Marysville District	No sub-systems in district
ORO	Oroville District	No sub-systems in district
PV	Palos Verdes District	No sub-systems in district
RDV	Redwood Valley District	
RDV-ARM	Armstrong System	
RDV-CSP	Coast Springs System	
RDV-HKN	Hawkins Water System	
RDV-LUC	Lucerne System	
RDV-NOH	Noel Heights System	
RDV-RPD	Rancho del Paradiso System	
SEL	Selma District	No sub-systems in district
SLN	Salinas District	
SLN-SLN	Salinas System	Includes Bolsa Knolls, Country Meadows
SLN-SLNH	Salinas Hills System	Includes Buena Vista, Indian Springs
SLN-OH	Oak Hill System	
SLN-LL	Las Lomas System	
SSF	South San Francisco District	No sub-systems in district
STK	Stockton District	No sub-systems in district
VIS	Visalia District	No sub-systems in district
WIL	Willows District	No sub-systems in district
WLK	Westlake District	No sub-systems in district

Table 2. Long-Term Demand Model Customer Classes

Label	Description	Revenue Class #
SFR	Single-Family Residential	1
FLT	Single-Family Flat Rate	4
RES	SFR + FLT	1, 4
MFR	Multi-Family	15
COM	Commercial/Business	2
GOV	Government/Public Authority	11
IND	Industrial	3
OTH	Other/miscellaneous	8,13
IRR	Dedicated irrigation customers	7

Table 3. Regional Forecasts used in First Generation Long-term Demand Model Forecasts

Regional Forecast	Version	Range
ABAG	Plan Bay Area 2040, GEOID10-level summary	2010 to 2040
SCAG	RTP07 GEOID10-level	2010 to 2035
Caltrans	2017 County Forecasts	2010 to 2050

Table 4. Regional Growth Rates used in the Service Growth Forecasts

Service Class	ABAG	SCAG	Caltrans
SFR	y-y % change in single-family dwelling units	y-y % change in all residential dwelling units	y-y % change in single-family dwelling units
MFR	y-y % change in multi-family dwelling units	y-y % change in all residential dwelling units	y-y % change in multi-family dwelling units
COM	y-y % change in total number of jobs	y-y % change in total number of jobs	y-y % change in county employment in retail, wholesale, information, financial, professional, and leisure sectors
GOV	y-y % change in gov't, information, and construction jobs	y-y % change in total number of jobs	y-y % change in county employment in federal, state, local government and education and healthcare sectors
IND	y-y % change in manufacturing jobs	y-y % change in total number of jobs	y-y % change in county employment in manufacturing sectors

Historical and Projected Services, Water Sales, and Total Production

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General Rate Case Sales Baseline 2020

Historical Data Range
First Year 2007
Last Year 2020

Forecast Range
First Year 2020
Last Year 2050

Service Growth Basis Caltrans Growth Forecasts

Service Growth Rates					
Class	Caltrans Projected	Historical %Y-Y ¹			
		5-Yr	10-Yr	15-Yr	20-Yr
RES ²	1.0%	0.8%	0.9%		
MFR	0.4%	0.1%	1.0%		
COM	0.8%	-0.1%	0.1%		
GOV	0.8%	0.5%	1.0%		
IND	0.4%	0.8%	0.0%		
TOT		0.7%	0.8%		

Water Supply Assessments	WSA Name	Completion	Incorporated
		Date	into Forecast (Y/N)
1			
2			
3			
4			
5			

Sales Forecast Adjustments	Drought Rebound	OFF
	Plumbing Code	ON
	Active Conservation	ON
	Price Response	ON
	Income Response	ON

Non-Revenue Water (NRW) Basis

Real loss (gal/con/day):
2016-2020 average if <= 10 gal/con/day
Draft Water Board standard or 75% of 2016-2020 average,
whichever is greater, by 2030.

Apparent loss (gal/con/day): 2016-2020 average.

1. Account reclassifications can impact historical %Y-Y growth rates for individual customer classes.
2. RES = Metered and unmetered single-family residential customers.

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Bakersfield**

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Historical Service Counts

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2000								
2001								
2002								
2003								
2004								
2005								
2006								
2007	59,068	931	6,243	579	35	135	0	66,991
2008	58,924	998	6,269	594	33	103	0	66,920
2009	57,590	1,035	6,245	653	32	69	0	65,624
2010	58,357	1,089	6,229	661	32	56	0	66,424
2011	59,270	1,185	6,249	670	32	55	0	67,462
2012	59,852	1,194	6,262	685	32	51	0	68,076
2013	60,338	1,194	6,260	693	31	53	0	68,568
2014	60,825	1,190	6,273	696	30	69	0	69,083
2015	61,294	1,199	6,305	712	30	76	0	69,616
2016	61,670	1,200	6,310	728	31	72	0	70,011
2017	62,068	1,194	6,284	724	31	78	0	70,378
2018	62,535	1,200	6,284	732	31	73	0	70,854
2019	63,017	1,197	6,269	730	31	75	0	71,319
2020	63,838	1,202	6,264	731	32	77	0	72,144
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								
2030								

CAGR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
5-Year	0.8%	0.1%	-0.1%	0.5%	0.8%	0.2%		0.7%
10-Year	0.9%	1.0%	0.1%	1.0%	0.0%	3.2%		0.8%
15-Year								
20-Year								

CAGR = Compound Annual Growth Rate

**District Demand Projection Report
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Historical Sales (AF)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2000								
2001								
2002								
2003								
2004								
2005								
2006								
2007								
2008	50,344	3,673	13,172	5,926	66	344	0	73,525
2009	47,800	3,718	12,822	5,534	53	152	0	70,079
2010	46,612	3,520	11,932	5,443	45	131	0	67,683
2011	43,886	3,757	12,013	5,598	56	95	0	65,406
2012	47,680	3,919	12,389	6,724	56	134	0	70,902
2013	43,261	3,874	12,403	6,674	51	144	0	66,407
2014	41,398	3,733	12,326	6,134	51	356	0	63,997
2015	31,407	3,386	10,121	4,142	58	200	0	49,314
2016	30,449	3,243	9,577	4,597	38	174	0	48,078
2017	33,149	3,317	10,123	5,380	46	148	0	52,163
2018	34,491	3,366	10,412	5,412	39	188	0	53,907
2019	32,852	3,323	10,146	4,785	40	212	0	51,359
2020	35,018	3,400	10,018	4,976	42	182	0	53,635
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								
2030								

CAGR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
5-Year	2.2%	0.1%	-0.2%	3.7%	-6.4%	-1.9%		1.7%
10-Year	-2.8%	-0.3%	-1.7%	-0.9%	-0.7%	3.4%		-2.3%
15-Year								
20-Year								

CAGR = Compound Annual Growth Rate

**District Demand Projection Report
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Historical Sales/Service (GPD)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2000								
2001								
2002								
2003								
2004								
2005								
2006								
2007								
2008	763	3,286	1,876	8,912	1,781	2,993		981
2009	741	3,205	1,833	7,565	1,454	1,977		953
2010	713	2,887	1,710	7,350	1,265	2,083		910
2011	661	2,831	1,716	7,460	1,573	1,536		866
2012	711	2,930	1,766	8,758	1,551	2,375		930
2013	640	2,895	1,769	8,599	1,477	2,405		865
2014	608	2,801	1,754	7,871	1,515	4,593		827
2015	457	2,521	1,433	5,197	1,701	2,358		632
2016	441	2,412	1,355	5,640	1,100	2,149		613
2017	477	2,479	1,438	6,638	1,355	1,694		662
2018	492	2,505	1,479	6,599	1,110	2,310		679
2019	465	2,478	1,445	5,856	1,157	2,527		643
2020	490	2,525	1,428	6,077	1,173	2,122		664
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								
2030								

CAGR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
5-Year	1.4%	0.0%	-0.1%	3.2%	-7.2%	-2.1%		1.0%
10-Year	-3.7%	-1.3%	-1.8%	-1.9%	-0.7%	0.2%		-3.1%
15-Year								
20-Year								

CAGR = Compound Annual Growth Rate

**District Demand Projection Report
Bakersfield**

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Historical Production (AF)

YEAR	SALES	NRW	PROD
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008	73,525	6,393	79,918
2009	70,079	6,094	76,173
2010	67,683	5,885	73,568
2011	65,406	5,687	71,094
2012	70,902	6,165	77,067
2013	66,407	5,774	72,181
2014	63,997	5,565	69,562
2015	49,314	4,288	53,602
2016	48,078	7,094	55,171
2017	52,163	6,409	58,572
2018	53,907	5,866	59,773
2019	51,359	5,166	56,525
2020	53,635	5,783	59,418
2021			
2022			
2023			
2024			
2025			
2026			
2027			
2028			
2029			
2030			

NRW %	NRW GPD/Svc
8.0%	85
8.0%	83
8.0%	79
8.0%	75
8.0%	81
8.0%	75
8.0%	72
8.0%	55
12.9%	90
10.9%	81
9.8%	74
9.1%	65
9.7%	72

CAGR	SALES	NRW	PROD
5-Year	1.7%	6.2%	2.1%
10-Year	-2.3%	-0.2%	-2.1%
15-Year			
20-Year			

	NRW GPD/Svc
	5.4%
	-1.0%

CAGR = Compound Annual Growth Rate

**District Demand Projection Report
Bakersfield**

6/4/2021

Historical GPCD

YEAR	POPULATION	GPCD	
		RESIDENTIAL	TOTAL
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007	263,288		
2008	264,626	182	270
2009	262,094	175	259
2010	266,331	168	247
2011	270,421	157	235
2012	272,901	169	252
2013	274,500	153	235
2014	275,768	146	225
2015	277,889	112	172
2016	279,181	108	176
2017	280,074	116	187
2018	281,942	120	189
2019	283,321	114	178
2020	286,310	120	185
2021			
2022			
2023			
2024			
2025			
2026			
2027			
2028			
2029			
2030			

CAGR	POPULATION	RESIDENTIAL GPCD	TOTAL GPCD
5-Year	0.6%	1.4%	1.5%
10-Year	0.7%	-3.3%	-2.8%
15-Year			
20-Year			

CAGR = Compound Annual Growth Rate

**District Demand Projection Report
Bakersfield**

6/4/2021

Projected Services

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2020	63,838	1,202	6,264	731	32	77	0	72,144
2021	64,540	1,208	6,334	738	32	73	0	72,925
2022	65,270	1,214	6,408	746	32	72	0	73,741
2023	66,010	1,220	6,484	754	32	72	0	74,572
2024	66,790	1,226	6,549	762	32	72	0	75,431
2025	67,638	1,231	6,611	772	32	72	0	76,357
2026	68,511	1,238	6,662	781	33	72	0	77,296
2027	69,367	1,245	6,717	789	33	72	0	78,222
2028	70,264	1,252	6,776	796	33	72	0	79,192
2029	71,181	1,260	6,837	803	33	72	0	80,186
2030	72,097	1,268	6,902	810	33	72	0	81,182
2031	72,984	1,276	6,965	817	33	72	0	82,147
2032	73,840	1,283	7,026	825	33	72	0	83,079
2033	74,679	1,290	7,085	832	33	72	0	83,991
2034	75,489	1,296	7,142	839	34	72	0	84,872
2035	76,281	1,303	7,198	846	34	72	0	85,734
2036	77,086	1,309	7,251	854	34	72	0	86,605
2037	77,880	1,314	7,301	861	34	72	0	87,463
2038	78,674	1,320	7,352	868	34	72	0	88,320
2039	79,484	1,325	7,402	875	34	72	0	89,193
2040	80,285	1,330	7,452	882	34	72	0	90,057
2041	81,078	1,335	7,503	889	35	72	0	90,912
2042	81,876	1,340	7,555	896	35	72	0	91,773
2043	82,642	1,344	7,607	903	35	72	0	92,603
2044	83,402	1,349	7,659	910	35	72	0	93,427
2045	84,171	1,353	7,711	917	35	72	0	94,259
2046	84,921	1,357	7,763	924	35	72	0	95,071
2047	85,674	1,361	7,815	930	35	72	0	95,888
2048	86,395	1,365	7,867	937	36	72	0	96,672
2049	87,115	1,368	7,921	944	36	72	0	97,455
2050	87,844	1,372	7,974	951	36	72	0	98,249

**District Demand Projection Report
Bakersfield**

6/4/2021

Projected Sales (AF)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2020	35,018	3,400	10,018	4,976	42	182	0	53,635
2021	34,811	3,364	10,044	4,992	42	175	0	53,428
2022	35,003	3,370	10,089	5,019	42	171	0	53,694
2023	35,212	3,377	10,141	5,049	42	171	0	53,992
2024	35,456	3,385	10,177	5,076	42	171	0	54,307
2025	35,756	3,394	10,209	5,122	43	171	0	54,694
2026	36,187	3,404	10,225	5,157	43	171	0	55,187
2027	36,561	3,415	10,248	5,180	43	171	0	55,618
2028	36,947	3,425	10,279	5,203	43	171	0	56,068
2029	37,360	3,441	10,316	5,226	43	171	0	56,558
2030	37,777	3,457	10,358	5,249	44	171	0	57,056
2031	38,185	3,473	10,406	5,274	44	171	0	57,552
2032	38,563	3,488	10,450	5,302	44	171	0	58,017
2033	38,973	3,503	10,491	5,329	44	171	0	58,511
2034	39,379	3,519	10,530	5,356	44	171	0	58,999
2035	39,779	3,533	10,567	5,382	44	171	0	59,478
2036	40,153	3,547	10,601	5,409	44	171	0	59,925
2037	40,508	3,560	10,632	5,434	45	171	0	60,349
2038	40,880	3,572	10,663	5,459	45	171	0	60,791
2039	41,244	3,584	10,694	5,484	45	171	0	61,222
2040	41,601	3,596	10,725	5,508	45	171	0	61,646
2041	41,961	3,608	10,757	5,531	45	171	0	62,073
2042	42,331	3,619	10,790	5,555	46	171	0	62,511
2043	42,692	3,630	10,824	5,578	46	171	0	62,939
2044	43,065	3,641	10,857	5,600	46	171	0	63,381
2045	43,423	3,651	10,890	5,622	46	171	0	63,804
2046	43,771	3,661	10,923	5,644	46	171	0	64,217
2047	44,116	3,671	10,957	5,666	46	171	0	64,628
2048	44,446	3,680	10,990	5,687	47	171	0	65,021
2049	44,782	3,689	11,024	5,709	47	171	0	65,422
2050	45,129	3,698	11,059	5,730	47	171	0	65,833

**District Demand Projection Report
Bakersfield**

6/4/2021

Projected Sales/Service (GPD)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2020	490	2,525	1,428	6,077	1,173	2,122	0	664
2021	482	2,486	1,416	6,039	1,173	2,122	0	654
2022	479	2,478	1,406	6,007	1,173	2,122	0	650
2023	476	2,472	1,396	5,978	1,173	2,122	0	646
2024	474	2,466	1,387	5,948	1,173	2,122	0	643
2025	472	2,461	1,379	5,920	1,173	2,122	0	639
2026	472	2,455	1,370	5,891	1,173	2,122	0	637
2027	471	2,449	1,362	5,863	1,173	2,122	0	635
2028	469	2,443	1,354	5,836	1,173	2,122	0	632
2029	469	2,439	1,347	5,810	1,173	2,122	0	630
2030	468	2,435	1,340	5,784	1,173	2,122	0	627
2031	467	2,431	1,334	5,762	1,173	2,122	0	625
2032	466	2,427	1,328	5,740	1,173	2,122	0	623
2033	466	2,425	1,322	5,719	1,173	2,122	0	622
2034	466	2,423	1,316	5,698	1,173	2,122	0	621
2035	466	2,421	1,311	5,677	1,173	2,122	0	619
2036	465	2,419	1,305	5,656	1,173	2,122	0	618
2037	464	2,418	1,300	5,635	1,173	2,122	0	616
2038	464	2,416	1,295	5,615	1,173	2,122	0	614
2039	463	2,415	1,290	5,594	1,173	2,122	0	613
2040	463	2,413	1,285	5,574	1,173	2,122	0	611
2041	462	2,412	1,280	5,554	1,173	2,122	0	610
2042	462	2,411	1,275	5,534	1,173	2,122	0	608
2043	461	2,410	1,270	5,515	1,173	2,122	0	607
2044	461	2,410	1,266	5,495	1,173	2,122	0	606
2045	461	2,409	1,261	5,475	1,173	2,122	0	604
2046	460	2,408	1,256	5,456	1,173	2,122	0	603
2047	460	2,408	1,252	5,437	1,173	2,122	0	602
2048	459	2,407	1,247	5,418	1,173	2,122	0	600
2049	459	2,407	1,243	5,399	1,173	2,122	0	599
2050	459	2,406	1,238	5,380	1,173	2,122	0	598

**District Demand Projection Report
Bakersfield**

6/4/2021

Projected Production (AF)

YEAR	SALES	NRW	PROD
2020	53,635	5,846	59,481
2021	53,428	5,825	59,253
2022	53,694	5,803	59,497
2023	53,992	5,782	59,774
2024	54,307	5,764	60,071
2025	54,694	5,745	60,439
2026	55,187	5,722	60,909
2027	55,618	5,700	61,318
2028	56,068	5,678	61,747
2029	56,558	5,654	62,212
2030	57,056	5,625	62,681
2031	57,552	5,689	63,241
2032	58,017	5,751	63,768
2033	58,511	5,812	64,322
2034	58,999	5,871	64,870
2035	59,478	5,931	65,408
2036	59,925	5,989	65,915
2037	60,349	6,048	66,397
2038	60,791	6,108	66,899
2039	61,222	6,167	67,389
2040	61,646	6,226	67,871
2041	62,073	6,285	68,358
2042	62,511	6,341	68,852
2043	62,939	6,398	69,337
2044	63,381	6,455	69,835
2045	63,804	6,511	70,314
2046	64,217	6,567	70,784
2047	64,628	6,620	71,248
2048	65,021	6,674	71,695
2049	65,422	6,728	72,150
2050	65,833	6,728	72,561

	NRW GPD/Svc
9.8%	72
9.8%	71
9.8%	70
9.7%	69
9.6%	68
9.5%	67
9.4%	66
9.3%	65
9.2%	64
9.1%	63
9.0%	62
9.0%	62
9.0%	62
9.1%	62
9.1%	62
9.1%	62
9.1%	62
9.1%	62
9.2%	62
9.2%	62
9.2%	62
9.2%	62
9.2%	62
9.3%	62
9.3%	62
9.3%	62
9.3%	62
9.3%	62
9.3%	61

**District Demand Projection Report
Bakersfield**

6/4/2021

Projected GPCD

YEAR	POPULATION	GPCD	
		RESIDENTIAL	TOTAL
2020	286,310	144	185
2021	288,735	141	183
2022	291,254	141	182
2023	293,806	140	182
2024	296,476	139	181
2025	299,366	139	180
2026	302,365	139	180
2027	305,317	138	179
2028	308,396	138	179
2029	311,575	138	178
2030	314,753	138	178
2031	317,828	138	178
2032	320,788	137	177
2033	323,685	137	177
2034	326,478	137	177
2035	329,207	137	177
2036	331,967	137	177
2037	334,685	137	177
2038	337,396	137	177
2039	340,155	137	177
2040	342,878	137	177
2041	345,567	137	177
2042	348,272	136	176
2043	350,869	136	176
2044	353,441	136	176
2045	356,039	136	176
2046	358,570	136	176
2047	361,106	136	176
2048	363,535	136	176
2049	365,954	136	176
2050	368,400	136	176

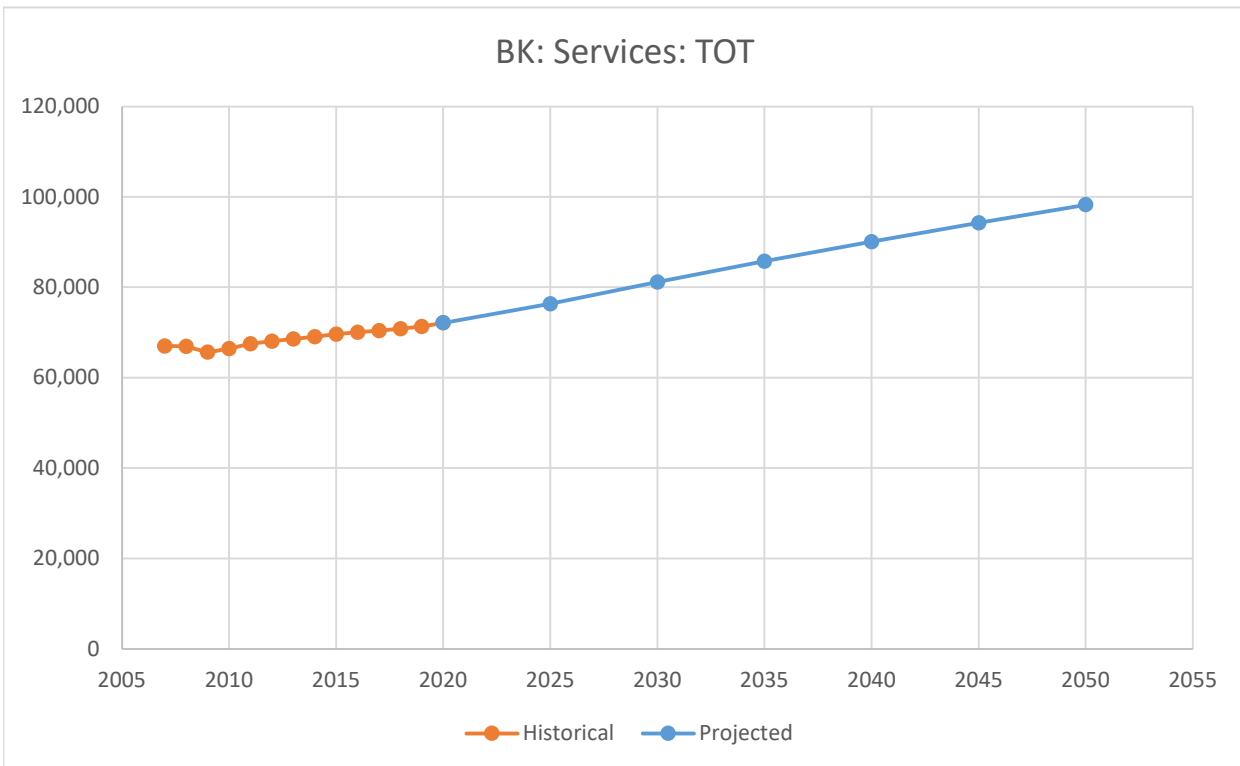
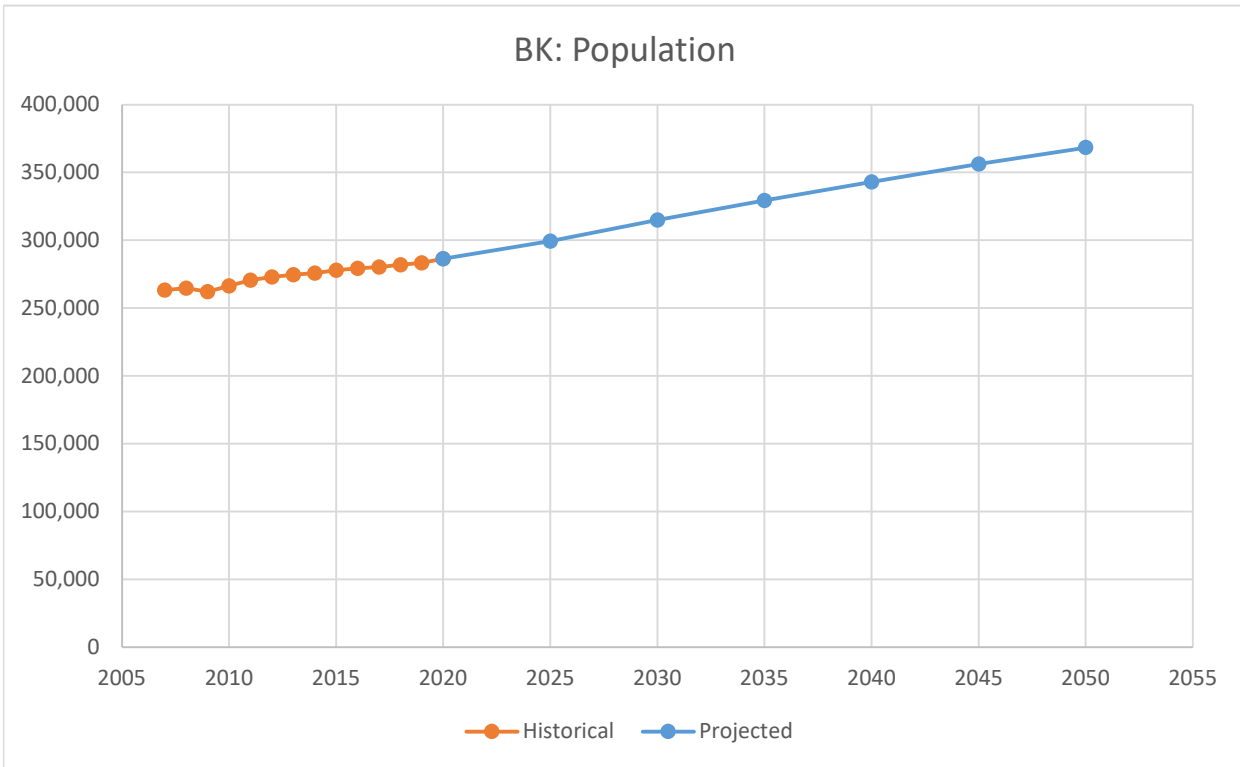
**District Demand Projection Report
Bakersfield**

6/4/2021

Normal, Single-Year, and Multi-Year Dry Year Demand

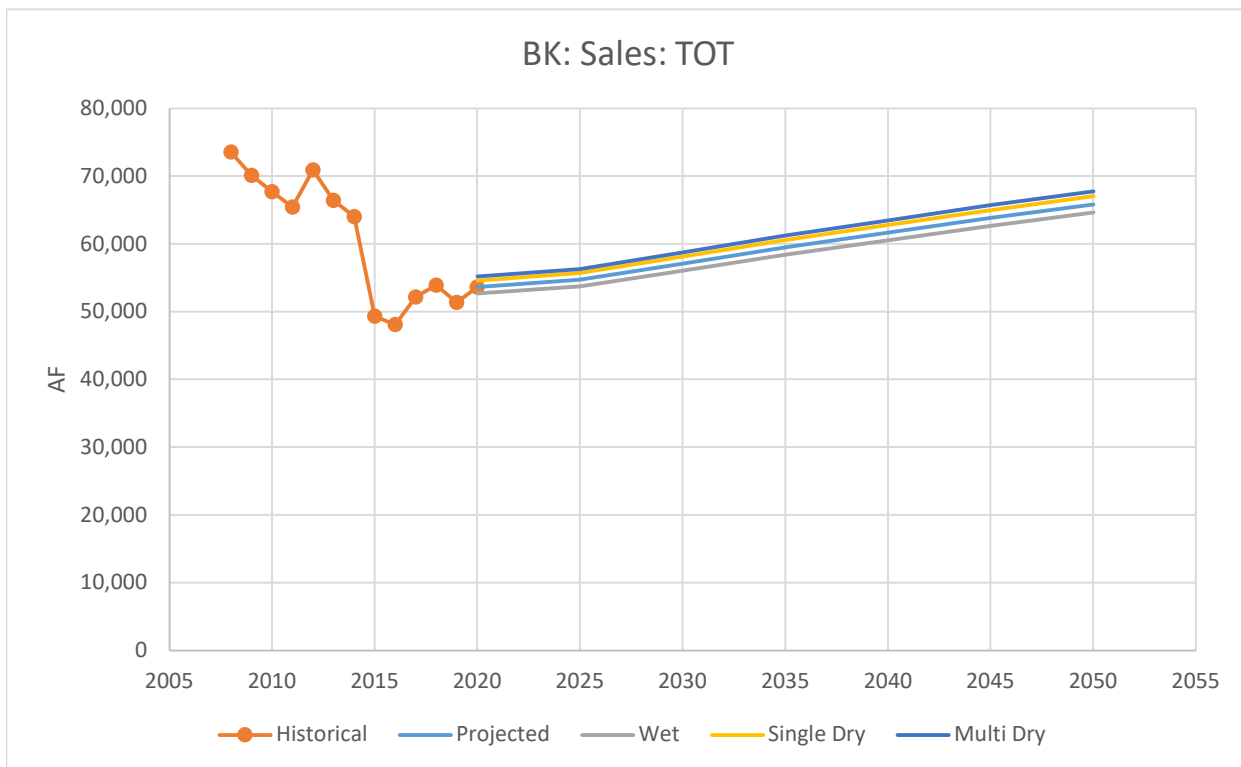
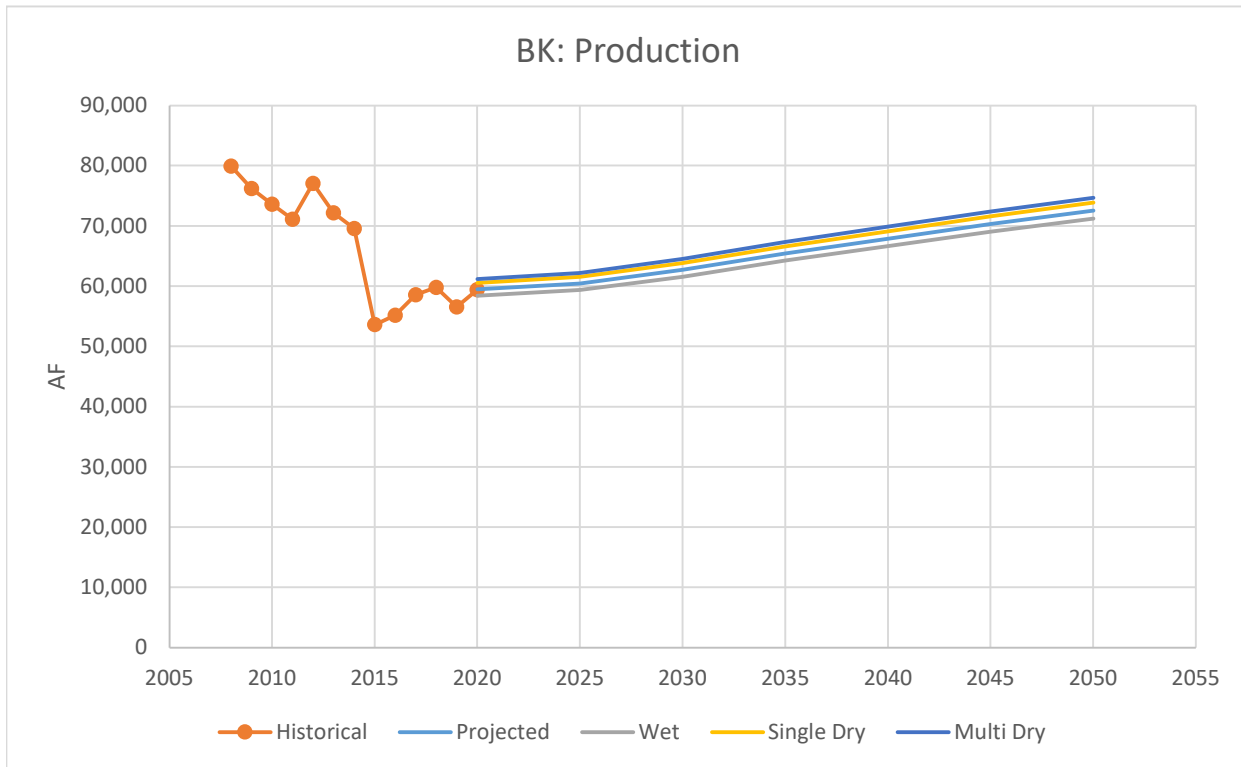
YEAR		NORMAL		SINGLE DRY YEAR	% OF NORMAL		MULTI DRY YEAR	% OF NORMAL
2020		59,481		60,543	102%		61,200	103%
2021		59,253		60,311	102%		60,965	103%
2022		59,497		60,560	102%		61,217	103%
2023		59,774		60,842	102%		61,503	103%
2024		60,071		61,144	102%		61,809	103%
2025		60,439		61,520	102%		62,188	103%
2026		60,909		61,999	102%		62,674	103%
2027		61,318		62,417	102%		63,097	103%
2028		61,747		62,854	102%		63,539	103%
2029		62,212		63,329	102%		64,020	103%
2030		62,681		63,807	102%		64,504	103%
2031		63,241		64,378	102%		65,082	103%
2032		63,768		64,916	102%		65,626	103%
2033		64,322		65,481	102%		66,198	103%
2034		64,870		66,039	102%		66,763	103%
2035		65,408		66,588	102%		67,318	103%
2036		65,915		67,104	102%		67,841	103%
2037		66,397		67,596	102%		68,339	103%
2038		66,899		68,108	102%		68,856	103%
2039		67,389		68,608	102%		69,362	103%
2040		67,871		69,100	102%		69,860	103%
2041		68,358		69,596	102%		70,362	103%
2042		68,852		70,101	102%		70,873	103%
2043		69,337		70,595	102%		71,373	103%
2044		69,835		71,103	102%		71,888	103%
2045		70,314		71,592	102%		72,382	103%
2046		70,784		72,070	102%		72,866	103%
2047		71,248		72,544	102%		73,346	103%
2048		71,695		73,000	102%		73,807	103%
2049		72,150		73,464	102%		74,277	103%
2050		72,561		73,883	102%		74,701	103%

Charts



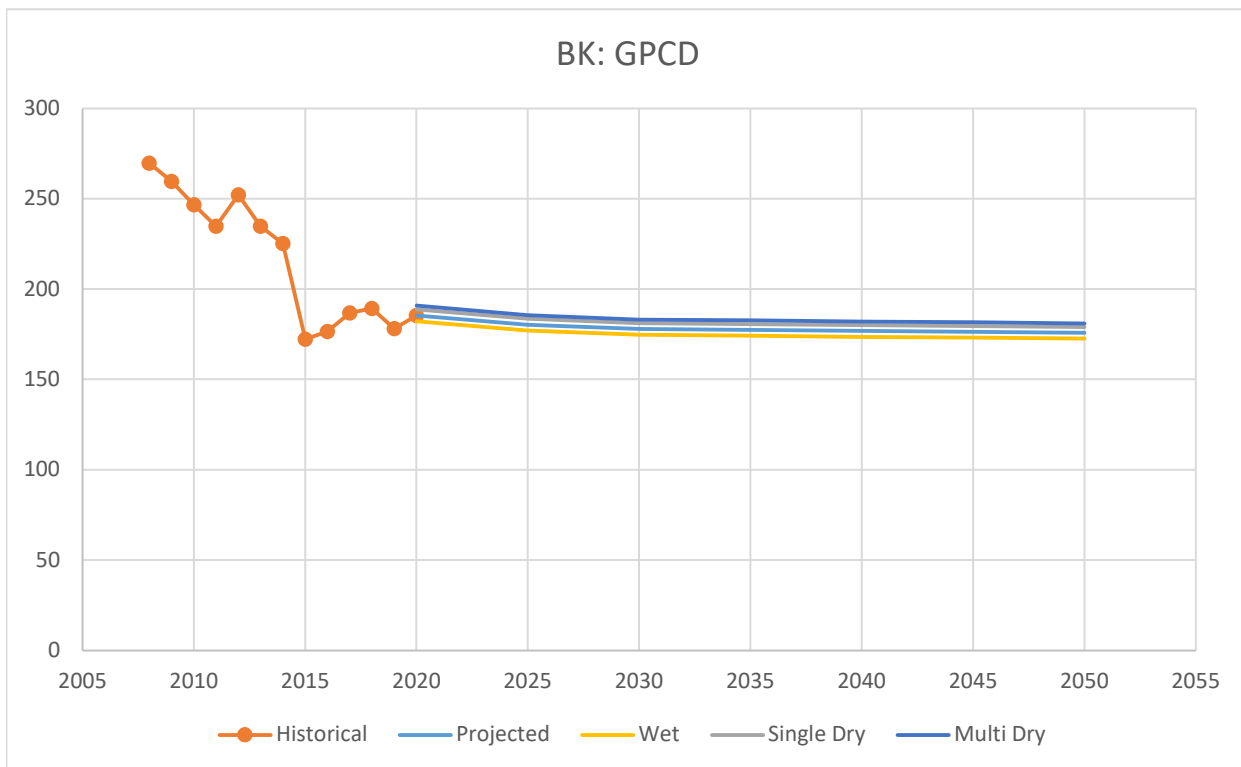
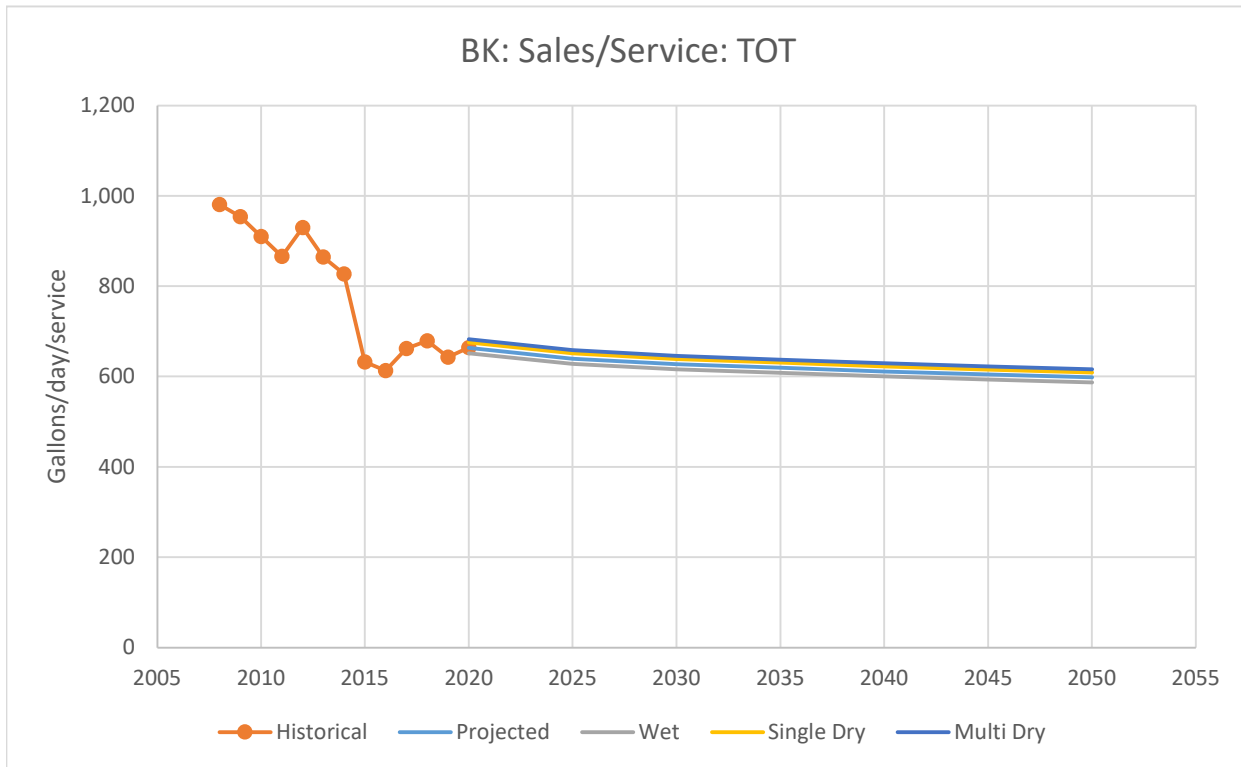
District Demand Projection Report
Bakersfield

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**District Demand Projection Report
Bakersfield**

6/4/2021



Appendix E: DWR SB X7-7 Verification Forms

**Water Conservation Act of 2009
SB X7-7
Updated Verification Forms**

Bakersfield District

**2020 Urban Water Management Plan
Appendix E**



SB X7-7 Table-1: Baseline Period Ranges			
Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	79,918	Acre Feet
	2008 total volume of delivered recycled water	-	Acre Feet
	2008 recycled water as a percent of total deliveries	0.00%	Percent
	Number of years in baseline period ^{1, 2}	10	Years
	Year beginning baseline period range	1995	
	Year ending baseline period range ³	2004	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range ⁴	2007	
¹ If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. ² The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.			
³ The ending year must be between December 31, 2004 and December 31, 2010.			
⁴ The ending year must be between December 31, 2007 and December 31, 2010.			

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
<input type="checkbox"/>	1. Department of Finance (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
<input type="checkbox"/>	2. Persons-per-Connection Method
<input type="checkbox"/>	3. DWR Population Tool
<input checked="" type="checkbox"/>	4. Other DWR recommends pre-review
<p>NOTES: Cal Water uses a population estimation methodology based on overlaying Census Block data from the 2000 and 2010 Censuses with the District's service area. LandView 5 and MARPLOT software are used with these data to estimate population per dwelling unit for 2000 and 2010. The per dwelling unit population estimates are then combined with Cal Water data on number of dwelling units served to estimate service area population for non-Census years. Cal Water also estimated service area population using DWR's Population Tool. The estimates prepared using Cal Water's methodology and DWR's Population Tool differed by less than one percent. Cal Water is electing to use the population estimates produced by its methodology in order to maintain consistency with population projections it has prepared in other planning documents and reports.</p>	

SB X7-7 Table 3: Service Area Population		
Year		Population
10 to 15 Year Baseline Population		
Year 1	1995	214,863
Year 2	1996	213,683
Year 3	1997	215,318
Year 4	1998	216,301
Year 5	1999	217,530
Year 6	2000	220,851
Year 7	2001	224,924
Year 8	2002	229,212
Year 9	2003	233,630
Year 10	2004	240,029
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2003	233,630
Year 2	2004	240,029
Year 3	2005	246,177
Year 4	2006	251,898
Year 5	2007	256,127
2015 Compliance Year Population		
2015		278,488

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					Annual Gross Water Use
			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>	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1995	69,164			-		-	69,164
Year 2	1996	73,246			-		-	73,246
Year 3	1997	73,501			-		-	73,501
Year 4	1998	62,863			-		-	62,863
Year 5	1999	72,220			-		-	72,220
Year 6	2000	74,906			-		-	74,906
Year 7	2001	73,619			-		-	73,619
Year 8	2002	76,872			-		-	76,872
Year 9	2003	79,395			-		-	79,395
Year 10	2004	78,031			-		-	78,031
<i>Year 11</i>	0	-			-		-	-
<i>Year 12</i>	0	-			-		-	-
<i>Year 13</i>	0	-			-		-	-
<i>Year 14</i>	0	-			-		-	-
<i>Year 15</i>	0	-			-		-	-
10 - 15 year baseline average gross water use								73,382
5 Year Baseline - Gross Water Use								
Year 1	2003	79,395			-		-	79,395
Year 2	2004	78,031			-		-	78,031
Year 3	2005	75,679			-		-	75,679
Year 4	2006	80,709			-		-	80,709
Year 5	2007	80,633			-		-	80,633
5 year baseline average gross water use								78,890
2015 Compliance Year - Gross Water Use								
2015		53,602	-		-		-	53,602
* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3								

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source	Wells			
This water source is:				
<input checked="" type="checkbox"/>	The supplier's own water source			
<input type="checkbox"/>	A purchased or imported source			
Baseline Year <i>Fm SB X7-7 Table 3</i>	Volume Entering Distribution System	Meter Error Adjustment* <i>Optional (+/-)</i>	Corrected Volume Entering Distribution System	
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1995	53,524		53,524
Year 2	1996	60,044		60,044
Year 3	1997	59,507		59,507
Year 4	1998	50,194		50,194
Year 5	1999	59,704		59,704
Year 6	2000	61,961		61,961
Year 7	2001	61,566		61,566
Year 8	2002	65,645		65,645
Year 9	2003	58,278		58,278
Year 10	2004	51,586		51,586
Year 11	0			-
Year 12	0			-
Year 13	0			-
Year 14	0			-
Year 15	0			-
5 Year Baseline - Water into Distribution System				
Year 1	2003	58,278		58,278
Year 2	2004	51,586		51,586
Year 3	2005	49,856		49,856
Year 4	2006	52,499		52,499
Year 5	2007	53,889		53,889
2015 Compliance Year - Water into Distribution System				
2015		33,388		33,388
* Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document				
NOTES:				

SB X7-7 Table 4-A: Volume Entering the Distribution				
Name of Source		KCWRA & City of Bakersfield		
This water source is:				
<input type="checkbox"/>	The supplier's own water source			
<input checked="" type="checkbox"/>	A purchased or imported source			
Baseline Year <i>Fm SB X7-7 Table 3</i>		Volume Entering Distribution System	Meter Error Adjustment* <i>Optional (+/-)</i>	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1,995	15640.3755		15,640
Year 2	1,996	13201.8254		13,202
Year 3	1,997	13993.9942		13,994
Year 4	1,998	12669.6036		12,670
Year 5	1,999	12515.5946		12,516
Year 6	2,000	12945.1099		12,945
Year 7	2,001	12052.5271		12,053
Year 8	2,002	11226.4041		11,226
Year 9	2,003	21116.8874		21,117
Year 10	2,004	26445.047		26,445
Year 11	-			0
Year 12	-			0
Year 13	-			0
Year 14	-			0
Year 15	-			0
5 Year Baseline - Water into Distribution System				
Year 1	2,003	21116.8874		21,117
Year 2	2,004	26445.047		26,445
Year 3	2,005	25823.3978		25,823
Year 4	2,006	28210.0838		28,210
Year 5	2,007	26744.8068		26,745
2015 Compliance Year - Water into Distribution System				
2015		20,214		20,214
* Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document				

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year <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	1995	214,863	69,164	287
Year 2	1996	213,683	73,246	306
Year 3	1997	215,318	73,501	305
Year 4	1998	216,301	62,863	259
Year 5	1999	217,530	72,220	296
Year 6	2000	220,851	74,906	303
Year 7	2001	224,924	73,619	292
Year 8	2002	229,212	76,872	299
Year 9	2003	233,630	79,395	303
Year 10	2004	240,029	78,031	290
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				294
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	2003	233,630	79,395	303
Year 2	2004	240,029	78,031	290
Year 3	2005	246,177	75,679	274
Year 4	2006	251,898	80,709	286
Year 5	2007	256,127	80,633	281
5 Year Average Baseline GPCD				287
2015 Compliance Year GPCD				
2015		278,488	53,602	172

SB X7-7 Table 6: Gallons per Capita per Day
Summary From Table SB X7-7 Table 5

10-15 Year Baseline GPCD	294
5 Year Baseline GPCD	287
2015 Compliance Year GPCD	172

SB X7-7 Table 7: 2020 Target Method*Select Only One*

Target Method		Supporting Documentation
<input checked="" type="checkbox"/>	Method 1	SB X7-7 Table 7A
<input type="checkbox"/>	Method 2	SB X7-7 Tables 7B, 7C, and 7D <i>Contact DWR for these tables</i>
<input type="checkbox"/>	Method 3	SB X7-7 Table 7-E
<input type="checkbox"/>	Method 4	Method 4 Calculator

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	2020 Target GPCD
294	235

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
287	273	235	235
¹ Maximum 2020 Target is 95% of the 5 Year Baseline GPCD Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target. ² 2020			

SB X7-7 RA1 - Weighted Baseline				
Participating Member Agency Name <i>Add rows as needed</i>	10-15 year Baseline GPCD*	Average Population During 10-15 Year Baseline Period	(Baseline GPCD) X (Population)	Regional Alliance Weighted Average 10-15 Year Baseline GPCD
Cal Water - Bakersfield District	294	222,634	65,454,468	
Cal Water - Kern River Valley District	205	6,155	1,261,737	
Cal Water - Selma District	273	21,972	5,998,394	
Cal Water - Visalia District	247	111,268	27,483,268	
Regional Alliance Total	1,019	362,029	100,197,867	277
<p><i>*All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6, Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable. These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.</i></p>				
NOTES				

SB X7-7 RA1 - Weighted 2020 Target				
Participating Member Name	Agency <i>Add rows as needed</i>	2020 Target GPCD*	2020 Population	(2020 Target) X (Population)
Cal Water - Bakersfield District		235	286,310	67,282,908
Cal Water - Kern River Valley District		179	5,501	984,679
Cal Water - Selma District		218	26,157	5,702,299
Cal Water - Visalia District		198	147,032	29,112,298
Regional Alliance Total		830	465,000	103,082,184
222				
<i>*All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6 , Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable. These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.</i>				
NOTES				

Appendix F: Climate Change Studies – Executive Summaries

- Climate Change – Water Resource Monitoring and Adaptation Plan – Phase 1
- Potential Climate Change Impacts on the Water Supplies of California Water Service



Climate Change- Water Resource Monitoring and Adaptation Plan – Phase 1

December 17, 2020

California Water Service
1720 North First Street
San Jose, CA 95112

Submitted by:
ICF
555 W 5th St
Suite 3100
Los Angeles, CA 90013

Executive Summary

Shifts in the frequency and severity of natural hazards resulting from climate change, often referred to as climate hazards, increasingly threaten water resources in California. These relevant climate hazards include reductions to snowpack, greater concentrations of precipitation in both a shorter rain season and isolated atmospheric river events, and more volatility between wet and dry water years.

To identify and prepare for impacts from these hazards, California Water Service (Cal Water) is seeking to identify climate change vulnerabilities to water supplies, operations and facilities, and to develop adaptation strategies to address those vulnerabilities through a Climate Change Water Resources Monitoring and Adaptation Plan. This body of work is intended to provide Cal Water with information to inform decisions on water system/asset management and resource planning to better prepare for and respond to current and projected changes to climate. This work represents a forward-looking approach in addressing climate risks for California utilities, as the large majority of water wholesaler and utilities have not completed climate vulnerability and adaptation plans.

In the first phase of this effort, the ICF team collaborated with Cal Water to conduct a literature and tools review as the foundation for subsequent phases of work. In Phase 2 of this project, the ICF team and Cal Water will undertake a vulnerability assessment of Cal Water's facilities and operations by developing an assessment approach that evaluates climate impacts to Cal Water, identifies asset vulnerabilities, and prioritizes climate risks. Phase 3 will focus on an assessment of climate-driven impacts to water supply resources and demand. This first phase of research and assessment will provide Cal Water with a clear "lay of the land" in understanding available methodologies and lessons learned in conducting vulnerability assessments and developing adaptation plans in the water sector. This work can provide key insights for Cal Water, industry practitioners, and Cal Water customers on best practices and needs in climate vulnerability and adaptation efforts.

This first phase will also act as a foundation for Cal Water to build on in subsequent phases of work. ICF and Cal Water will build on research and findings developed in Phase 1 to define the scope of Phases 2 and 3.

In Phase 1, the ICF team undertook three areas of review:

- 1) Literature and tools related to adaptation planning by water suppliers and other relevant organizations
- 2) Methods and data in Cal Water's 2016 Vulnerability Study "Potential Climate Change Impacts on the Water Supplies of California Water Service"
- 3) Climate change impact assessments and adaptation plans beyond Cal Water (wholesalers, state agencies) that could affect Cal Water's vulnerability or adaptive capacity

In the first part of our assessment, the studies we reviewed conclude that there is high certainty of climate-driven reductions to snowpack, wetter winter months, and more volatility between wet and dry water years. While California water systems are designed to operate under a wide

range of hydrologic conditions, they are not designed to absorb and adapt to the projected levels of change, which could have impacts on historical supplies from reservoir systems and groundwater systems. These studies also revealed a suite of potential approaches to vulnerability assessment and risk assessment that are applicable to Phases 2 and 3.

Key studies that the ICF team referenced include Brown and Caldwell's "Impacts of Climate Change on Honolulu Water Supplies and Planning Strategies for Mitigation", the Water Research Foundation's (WRF)'s "Mapping Climate Exposure and Climate Information Needs to Water Utility Business Functions", the Metropolitan Water District's (MWD)'s "2015 Integrated Water Resources Plan" and "2015 Urban Water Management Plan", and the U.S. Environmental Protection Agency's (EPA's) Climate Resilience Evaluation and Awareness Toolkit (CREAT).

In the second part of our review, we found that Cal Water's 2016 Climate Change Vulnerability Study undertook a high-level investigation of impacts of climate change on water supply, including surface water, groundwater, and imported water throughout Cal Water service areas. However, the study did not use uniform metrics across water suppliers, was unable to apply the currently available downscaled climate projections, and did not consider the full suite of potential climate impacts to Cal Water's systems, including impacts of compounding climate hazards and impacts on Cal Water facilities and operations.

In the third part of this work, the ICF team researched and assessed existing climate vulnerability assessments and adaptation efforts that have an impact on Cal Water's ability to mitigate impacts from climate change. This included efforts by water supply wholesalers connected to Cal Water's system, and state agencies that regulate Cal Water's supplies, operations, and planning efforts. This will allow Cal Water to build on existing actions and avoid recreating adaptation efforts that are planned or have been implemented.

Cal Water has undertaken key steps toward adaptation planning since the 2016 Vulnerability Study, such as this work to provide additional vulnerability analysis, working locally to identify and prepare to meet Sustainable Groundwater Management Act (SGMA) requirements, and coordinating with wholesalers on their identified climate-driven vulnerabilities. Phases 2 and 3 of this work will further frame system vulnerabilities within an adaptation planning context for a flexible and anticipatory response.

The ICF team's literature review focused on identifying approaches for assessing water utility vulnerabilities of assets and water resources, and adaptation planning needs (summarized in Table 1). To identify these priority approaches, the team reviewed a list of publications with input from Cal Water on key sources. We reviewed and analyzed the relevant literature for applicability to Cal Water, the advantages and fit within a robust plan for assessment, and the potential disadvantages. We highlighted those approaches in the sections on key takeaways and the applicability of approaches to Cal Water. Table 1 provides important considerations raised by the ICF team during this process.

Table 1: Advantages and disadvantages of identified approaches

Identified Approach	Advantages	Disadvantages
Integrated resource-level (i.e., top-down) and asset-level (i.e., bottom-up) approaches to vulnerability assessment	<ul style="list-style-type: none"> Allows for matching available information with appropriate methodologies Supports evaluation of vulnerabilities in both water supply resources and physical systems: an integrated approach can help to address gaps in either area 	<ul style="list-style-type: none"> Bottom-up approaches can require extensive historical data and asset-level data Integration of climate projections into hydrological models can be challenging. For example, data inputs for hydrological models and the outputs from climate projections may be incompatible or require additional data processing
Robust Decision-Making	<ul style="list-style-type: none"> Supports identification of decisions for response under a range of potential climate futures Supports alignment between climate impacts and operating units/business functions Ensures the scope focuses on critical services, assets, and resources Supports the development of adaptation pathways and measures Provides a framework for information that can signal the need for critical decisions on adaptation 	<ul style="list-style-type: none"> Involves significant investment of time to identify performance metrics, business functions, and key variables Even with significant time invested on the front end, scope can change and require rescoping later in the effort Requires a strong understanding of utility decision-making
Applying climate projections to hydrologic modeling, future demand and planning scenarios	<ul style="list-style-type: none"> Generates better understanding of impacts of extreme scenarios, snowpack loss, drought, increased temperatures, precipitation whiplash, and other hydrologic changes in water supply resources and downstream demands Allows for modeling of a range of climate scenarios to better account for uncertainties in resource management and climate outcomes Integrates climate projections with scaled historical time series data 	<ul style="list-style-type: none"> Can require substantial data, and may introduce bias (due to selected climate scenarios) It is necessary to identify performance metrics and thresholds related to available climate variables; these can be difficult to identify and thresholds may not exist Relies on necessary simplifying assumptions to model complex hydrologic systems
Stress testing and scenarios	<ul style="list-style-type: none"> Supports management of uncertainty, especially in the absence of data Allows for understanding of climate impacts on system performance within a risk framework 	<ul style="list-style-type: none"> Can require refined climate information (e.g. hydrological variables) and detailed asset information Can require the integration of climate information into hydrological models, which may require

Identified Approach	Advantages	Disadvantages
	<ul style="list-style-type: none"> • Supports identification of major performance metrics and their potential for failure • Helps in understanding how the severity of impacts varies for facilities, operations, and water supplies under different climate change conditions. 	<p>significant data processing to be compatible with one another</p> <ul style="list-style-type: none"> • Can result in qualitative or directional findings that don't provide straightforward adaptation responses
Engaging staff in climate change vulnerability assessments and adaptation plans	<ul style="list-style-type: none"> • Provides perspective for setting study parameters • Provides targeted input and data into assessment • Identifies existing data gaps and actions to address gaps • Supports development of institutional capacity for monitoring impacts, adaptation planning, and implementation 	<ul style="list-style-type: none"> • Can be time-consuming for team members attending workshops and interviews; requires a targeted approach to ensure efficiency and that the right data is captured • Requires cross-team coordination that may be outside of "normal" communication pathways, e.g. between engineers and policy specialists
Evaluating costs of inaction	<ul style="list-style-type: none"> • Helps to prioritize adaptation planning needs • Creates a better understanding of the risks to Cal Water 	<ul style="list-style-type: none"> • Requires scaling information on past costs without clear data on future impacts, creating uncertainties in estimates
Use of Flexible Adaptation Pathways	<ul style="list-style-type: none"> • Helps to select appropriate timing (including lead time from planning to implementation) and application of adaptation measures • Considers and compares multiple strategies in adaptation planning • Includes triggers that signal when decision-makers should decide on switching to another pathway • Allows for adaptive decisions under uncertainty by integrating points for re-assessing pathway and actions • Considers alternative external developments over time 	<ul style="list-style-type: none"> • Does not provide a fixed timeline for actions • This approach is relatively new and may require coordination with budget cycles and external policy updates, since actions evolve over time • May push decision burden onto future decision-makers who did not develop original pathway

Our team synthesized these identified methodologies, findings, and insights into an overarching approach for characterizing climate vulnerabilities and planning for adaptation at both an asset level and water supply planning level to suit Cal Water's needs in addressing climate change impacts, shown in Figure 1.

Figure 1: Climate Assessment Framework

1 Set Objectives and Define Scope

Ask key questions, set objectives, scope and organize, select and characterize relevant assets, operations, and resources.

2 Compile Data

Identify appropriate climate projections for assessment and collect data on potentially impacted facilities, assets and operations, water supply resources, and water demand.

3 Assess Vulnerability

Understand and define system vulnerabilities, based on exposure, sensitivity and adaptive capacity of the system.

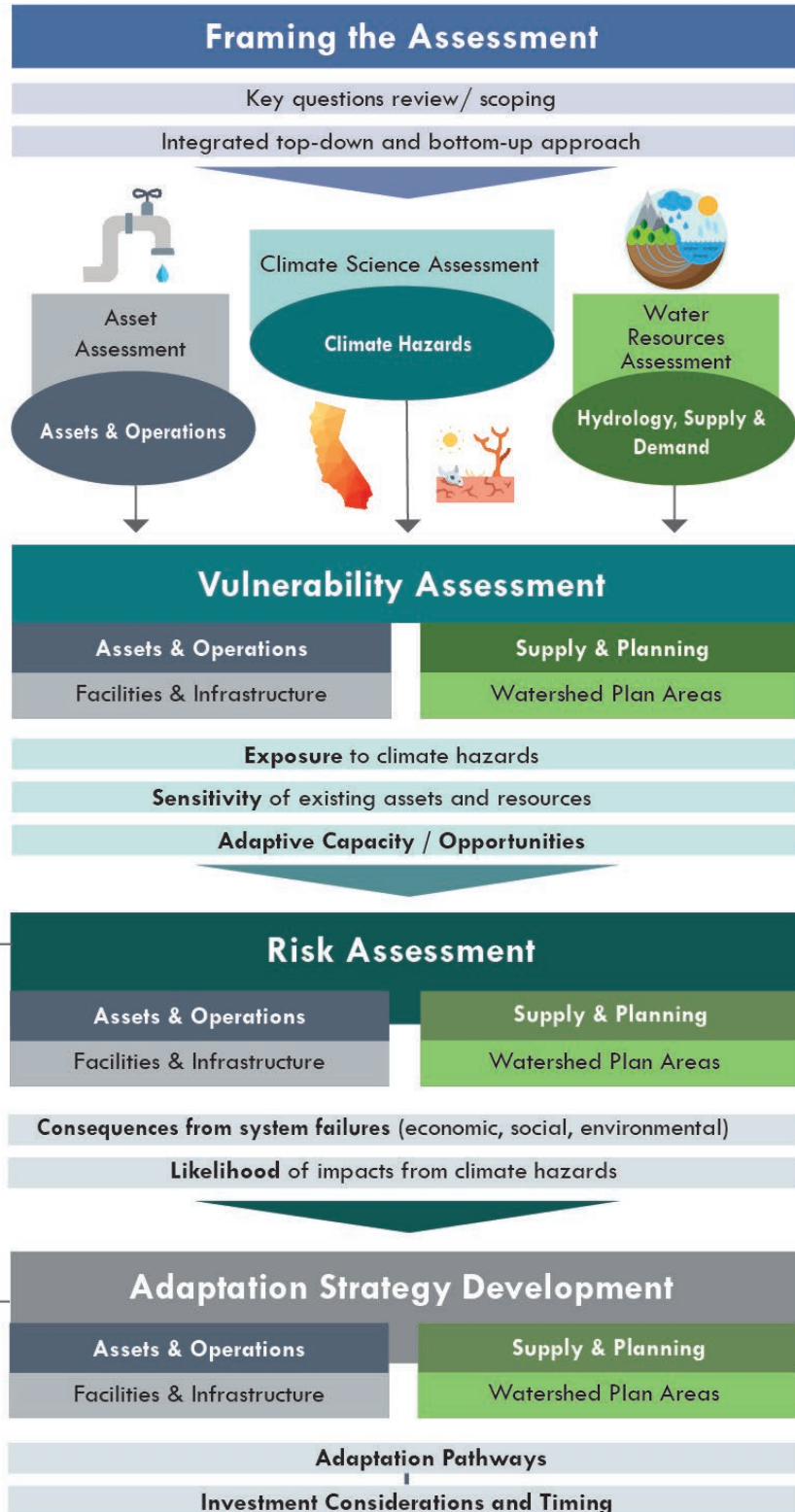
4 Assess Risks

Understand and define risks - consequences from system failures and uncertainty, i.e. likelihood.

Prioritization
based on consequences
and likelihood.

5 Develop Adaptation Strategies

Develop and plan adaptation strategies, prioritizing strategies based on adaptation pathways and investment considerations.



Source: Silvestrum Climate Associates, October 2020

Based on this review, the ICF team is making the following key recommendations for guiding Cal Water's efforts in identifying climate vulnerabilities and planning for adaptation:

- **Apply a standard conceptual framework to vulnerability assessment which integrates both top-down analysis and bottom-up analysis (see Figure 1).** The standard conceptual framework for assessing climate vulnerabilities and risks includes understanding exposure, sensitivity, and adaptive capacity, and potential impacts as components of vulnerability, and consequence and likelihood as components of risk. Top-down analysis would begin by applying downscaled Global Climate Model (GCM) projections to assess impacts on water supply resources and the bottom-up analysis would begin by identifying system sensitivities to climate hazards. These analyses are complementary.
- **Use a robust decision making (RDM) framework for vulnerability assessment and adaptation planning** by seeking to identify decisions for response under a range of potential climate futures, mapping impacts on operating units/business functions, and ensuring that the scope focuses on critical services, assets, and resources. A robust decision-making framing will support the development of adaptation pathways and measures by monitoring information that signals the need for critical decisions on adaptation.
- **Engage staff and key stakeholders in the planning process** to gain a holistic planning perspective for setting study parameters, providing targeted input into assessment and plan development, and supporting institutional capacity for adaptation.
- **Build off of the 2016 Cal Water Climate Change Impact study by applying updated climate models and projections for additional hydrologic variables** to hydrologic modeling, future demand and planning scenarios, and scaled historical time series data to better understand impacts of extremes, precipitation whiplash, and other hydrologic changes in water supply resources. We recommend presentation of this with uniform metrics for more actionable findings.
- **Assess climate impact consequence by stress-testing key water system performance metrics.** This includes developing a range of impact scenarios to understand how the severity of impacts varies for facilities, operations, and water supplies under different climate change conditions.
- **Evaluating the order of magnitude cost of inaction.** We recommend communicating consequences in terms of direct costs to Cal Water and customers without adaptation actions to prioritize adaptation response.
- **Follow a step-by-step, iterative process to adaptive management which fully aligns with potential exposure to climate hazards and vulnerabilities,** including:
 - Utilizing Flexible Adaptation Pathways in planning for selecting appropriate timing and application of adaptation measures
 - Planning for monitoring and evaluation
 - Evaluating adaptation investment decisions

During Phases 2 and 3 in which Cal Water and the ICF team will further assess vulnerability, we will frame the study outputs within a decision-making context for compatibility with adaptation planning concepts and eventual investment in adaptation measures.

Potential Climate Change Impacts on the Water Supplies of California Water Service

Prepared by

Gary Fiske and Associates, Inc.
Balance Hydrologics, Inc.

January 2016



Executive Summary

Introduction

California Water Service Company (Cal Water) provides water service to roughly 478,000 customers – about 1.7 million people – located in 83 state-wide communities in 24 service districts. Cal Water's districts rely on a variety of supply sources, including local groundwater, local surface water, and imported supplies. It is critical for Cal Water to gain a better understanding of the potential impacts of climate change on the availability of those supplies. Impacts are inherently uncertain, but Cal Water believes that the only responsible course is to carefully incorporate climate change into its ongoing water supply planning.

The present project and report represent a first step in that path. In order for Cal Water to determine how its long-term water supply planning should reflect climate change impacts, it must first have an understanding of what the impacts of climate change on its supply sources might be. That is the purpose of this study.

The work reported on here focuses on the sample of Cal Water districts highlighted in Figure ES-1. These districts account for 85% of Cal Water's total 2014 production and reflect the diversity of all Cal Water districts, including geographic, hydrologic, and climatic conditions and primary and secondary supply sources.

Changes in climate can affect the availability of local groundwater and surface water supplies, as well as purchased imported supplies. This study separately addresses the impacts on each of these for each sample district. It relies on the best available projections of changes in climate (temperature and precipitation) through the end of the century. It then uses the climate projections to examine how surface water flows and groundwater recharge rates may change.

For imported supplies, this study relies on studies already completed by wholesale providers where possible. Where no such studies have been done or where the data from such studies was unavailable, other approaches were developed to estimate climate change impacts on these supplies.

The results reported here provide an integrated view of how projected climate changes may affect water supply availability for Cal Water's service districts. The results also represent a first step in integrating potential future climate change impacts into Cal Water's ongoing supply planning. Because of the inherent uncertainties, a nuanced risk assessment may be needed to guide the incorporation of these results into long-range planning. Beyond the Company's supply/infrastructure planning, the results also can affect the Company's triennial General Rate Cases; they may also have potential operational implications.

Figure ES- 1. Cal Water Service Districts with Sample Districts Highlighted



Estimating Changes in Climate

Climate change is primarily driven by increased concentrations of greenhouse gases (GHGs) in the atmosphere. The trajectory of future climate change is a function of the rate at which those concentrations are projected to increase and the manner in which the atmosphere and oceans respond to increased concentrations. Both are difficult to model. Thus, while the scientific community overwhelmingly agrees that climate change will occur (and indeed may already have begun), the trajectory of those changes is very uncertain.

The projections of temperature and precipitation that underlie this study are based on 40 of the latest Global Circulation Models (GCMs) run as part of the Coupled Model Intercomparison Project Phase 5 (CMIP5). Generally speaking, this type of approach is termed an ensemble analysis, for which the downscaled climate projections for any particular Cal Water Service District were based on the median of the 40 downscaled GCM datasets. The GCMs used by the analysis are driven by two GHG emission pathways that bound the possible trajectories of GHG concentrations.

Impacts of Climate Change on Water Supplies

The supplies for each district consist of a mix of local surface water, local groundwater, and/or purchased imports. Climate change impacts were estimated for each of these components. The approaches used for each are described below. Based on the breakdown of district production among the supply sources, Table ES-1 shows the ranges of projected overall climate change impacts on available supply, relative to the historic average.¹ Table ES-2 groups this vulnerability into 4 categories of expected change, and Figure ES-2 maps the end-of-century vulnerability.

¹ The historical averages used here, and elsewhere in this report, are based on the entire range of historical data available for the district-specific analyses. These ranges vary across districts, and are specified within the district-specific technical memoranda.

Table ES- 1. Projected Changes in Available Supply due to Climate Change

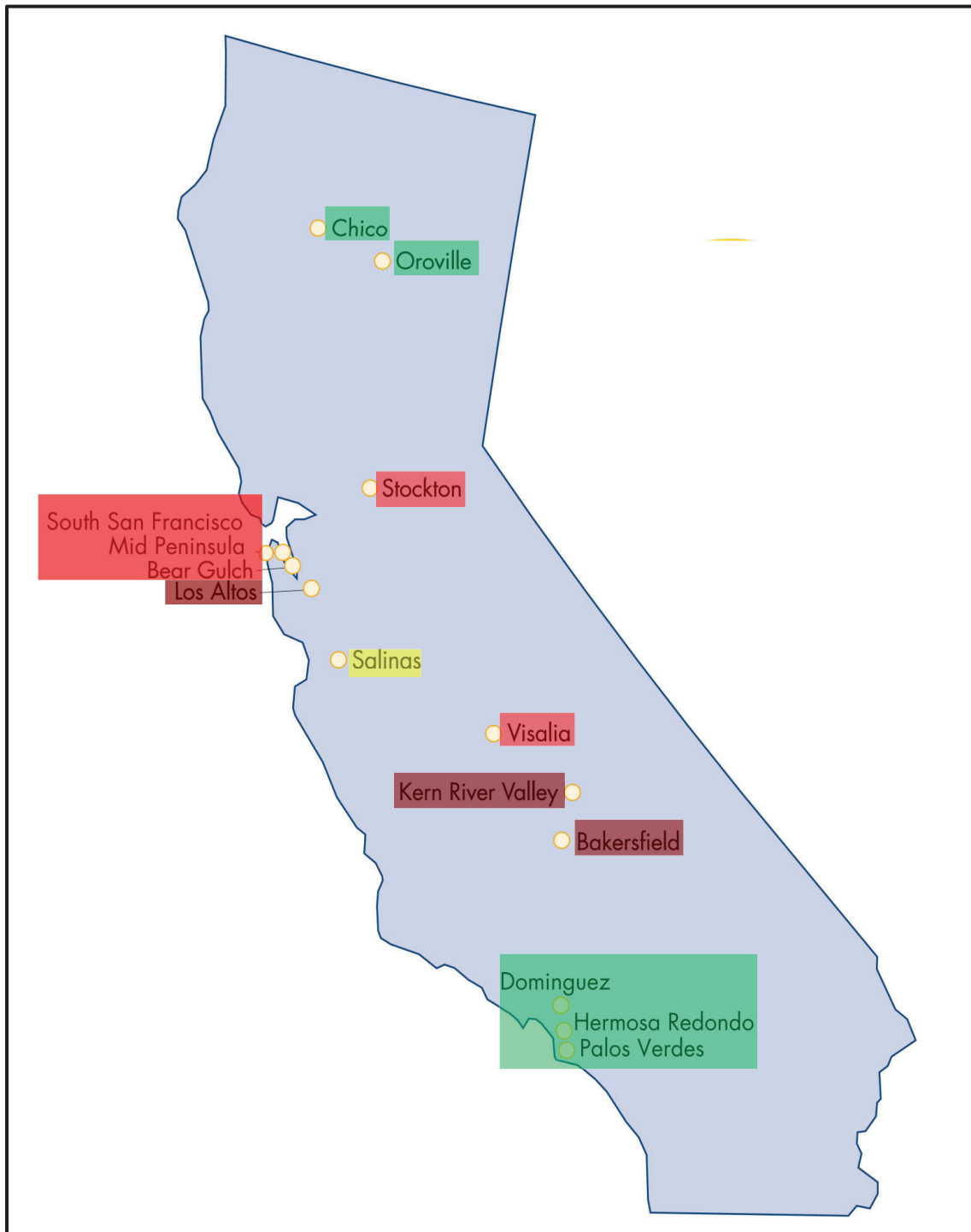
District		Percentage Change in Supply		
		2020	2050	2100
BK	Minimum	-10%	-10%	-12%
	Maximum	-12%	-16%	-20%
VIS	Minimum	-7%	-8%	-8%
	Maximum	-9%	-10%	-14%
KRV	Minimum	-13%	-16%	-19%
	Maximum	-16%	-21%	-31%
MPS/SSF/BG	Minimum	0%	-2%	-6%
	Maximum	0%	-7%	-15%
LAS	Minimum	-3%	-3%	-10%
	Maximum	-4%	-18%	-28%
CH	Minimum	2%	2%	0%
	Maximum	3%	1%	-3%
ORO	Minimum	0%	8%	5%
	Maximum	0%	-8%	-7%
DOM/HR/PV	Minimum	0%	0%	-1%
	Maximum	0%	-2%	-3%
STK	Minimum	0%	0%	-8%
	Maximum	0%	-14%	-17%
SLN	Minimum	-6%	-6%	-6%
	Maximum	-7%	-7%	-7%

Table ES- 2. Categories of Projected Supply Vulnerability

District	Supply Vulnerability		
	2020	2050	2100
KRV	3	4	4
BK	3	3	4
LAS	1	3	4
VIS	2	2	3
STK	1	2	3
SLN	2	2	2
MPS/SSF/BG	1	1	3
DOM/HR/PV	1	1	1
ORO	1	1	1
CH	1	1	1

Districts in Category 1 expect <5% reduction in supply. Category 2 indicates a reduction of 5-10%. Category 3 indicates an expected reduction of 10-15%. Category 4 reductions exceed 15%.

Figure ES- 2. Cal Water 2100 Vulnerability to Climate Change



Vulnerability levels:
Green = Low
Yellow = Moderate
Light Red = High
Dark Red = Very High

Estimating Climate Change Impacts on Local Surface Supplies

For those Cal Water districts that obtain a portion of their water supplies from local surface water, projected average annual precipitation in each of three forecast years (2020, 2050, 2100) were compared to historical precipitation to estimate the projected average annual discharge for that forecast year. Table ES-3 shows the estimated percent changes in surface water availability compared to historical averages.

Table ES- 3. Estimated Impacts on Local Surface Supply Availability

District		Percent Change in Runoff		
		2020	2050	2100
BK	Minimum Impact	-17%	-18%	-19%
	Maximum Impact	-18%	-19%	-23%
KRV	Minimum Impact	-17%	-18%	-19%
	Maximum Impact	-18%	-19%	-23%
MPS/SSF/BG	Minimum Impact	+3%	+6%	+12%
	Maximum Impact	+3%	+5%	+6%

Of the three districts, the two in the southern San Joaquin Valley are projected to experience significant reductions in their local surface supplies. In contrast, the Bear Gulch district surface supply is forecast to increase.

Estimating Climate Change Impacts on Local Groundwater Supplies

Climate change impacts on Cal Water's local groundwater supplies result from changes in projected groundwater recharge. The three groundwater recharge components include:

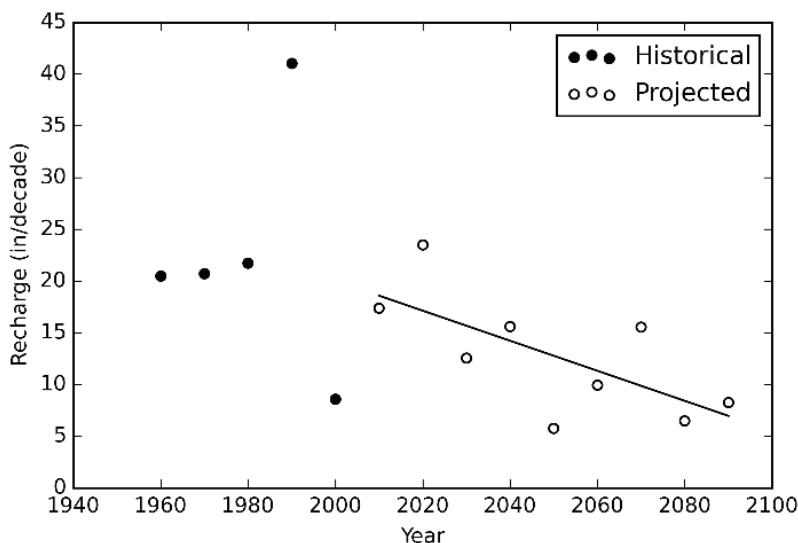
- Local river sources;
- Direct recharge from precipitation on the groundwater basin; and
- Recharge from agricultural and urban deep percolation.

The analysis first estimated the split of local recharge among these three components using geographic and geologic data, geochemical markers, and previously published reports and other supporting information. The climate change impacts on each component were then estimated, consolidated into overall projections of recharge impacts, and compared to estimated historical recharge rates.

Estimates of impacts on river recharge used the methodology for local surface supply described above. For the purposes of this phase of work, it was assumed that the change in recharge from the river is proportional to the change in total annual discharge. The estimated amount of water that will recharge directly into a groundwater basin from rain (or snow) is based on a balance of evapotranspiration (ET), precipitation rates, and soil

water capacity. Recharge is estimated using both historical and projected precipitation and temperature data. Decadal averages in projected recharge are then used to calculate long-term trends. This is illustrated in Figure ES-3 for Kern River Valley.

Figure ES- 3. Historic and Projected Decadal Direct-Precipitation Recharge for Kern River Valley



A quantitative projection of recharge from deep percolation beneath irrigated fields and urban areas is beyond the scope of this phase. Instead, districts for which a significant proportion of recharge is from agricultural and urban water are identified and expected trends under climate change of this water source for those districts are estimated. At-risk service areas with decreasing agricultural and urban water sources can be explored further in future work.

The estimated percentage impacts on each of the recharge components are multiplied by the expected fractions that each component is of total recharge to calculate the range of expected recharge reductions. Table ES-4 shows those results for each district, excluding the impacts of urban/agricultural applied water percolation.

Actual impacts on Cal Water's ability to pump groundwater may be less than these recharge reductions because the storage volumes in different basins have differing degrees of responsiveness to changes in recharge. The degree to which changes in recharge volumes translate into available groundwater supply is a function of the hydrogeologic attributes of the basin. A detailed understanding of those characteristics would require a level of modeling that is well beyond the scope of this phase of work. Instead, the estimates of basin responsiveness were based on the historical record of how the basin's water level has varied with recent climate variability. For some districts, the basin appears to be highly responsive, while for others changes in climate do not have much impact.

Table ES- 4. Projected Changes in Average Annual Groundwater Recharge

District		Percentage Change in Recharge		
		2020	2050	2100
BK	Minimum	-14%	-15%	-15%
	Maximum	-14%	-15%	-18%
VIS	Minimum	-9%	-10%	-11%
	Maximum	-9%	-10%	-14%
KRV	Minimum	-13.4%	-19%	-23%
	Maximum	-15%	-22%	-35%
MPS/SSF/BG	Minimum	-2%	-4%	-6%
	Maximum	-2%	-6%	-12%
LAS	Minimum	-7%	-8%	-13%
	Maximum	-8%	-18%	-25%
CH	Minimum	6%	4%	1%
	Maximum	6%	2%	-4%
ORO	Minimum	0%	0%	0%
	Maximum	0%	0%	0%
DOM/HR/PV	Minimum	0%	0%	0%
	Maximum	0%	0%	0%
STK	Minimum	-2%	-3%	-6%
	Maximum	-2%	-4%	-7%
SLN	Minimum	-7%	-7%	-7%
	Maximum	-7%	-7%	-7%

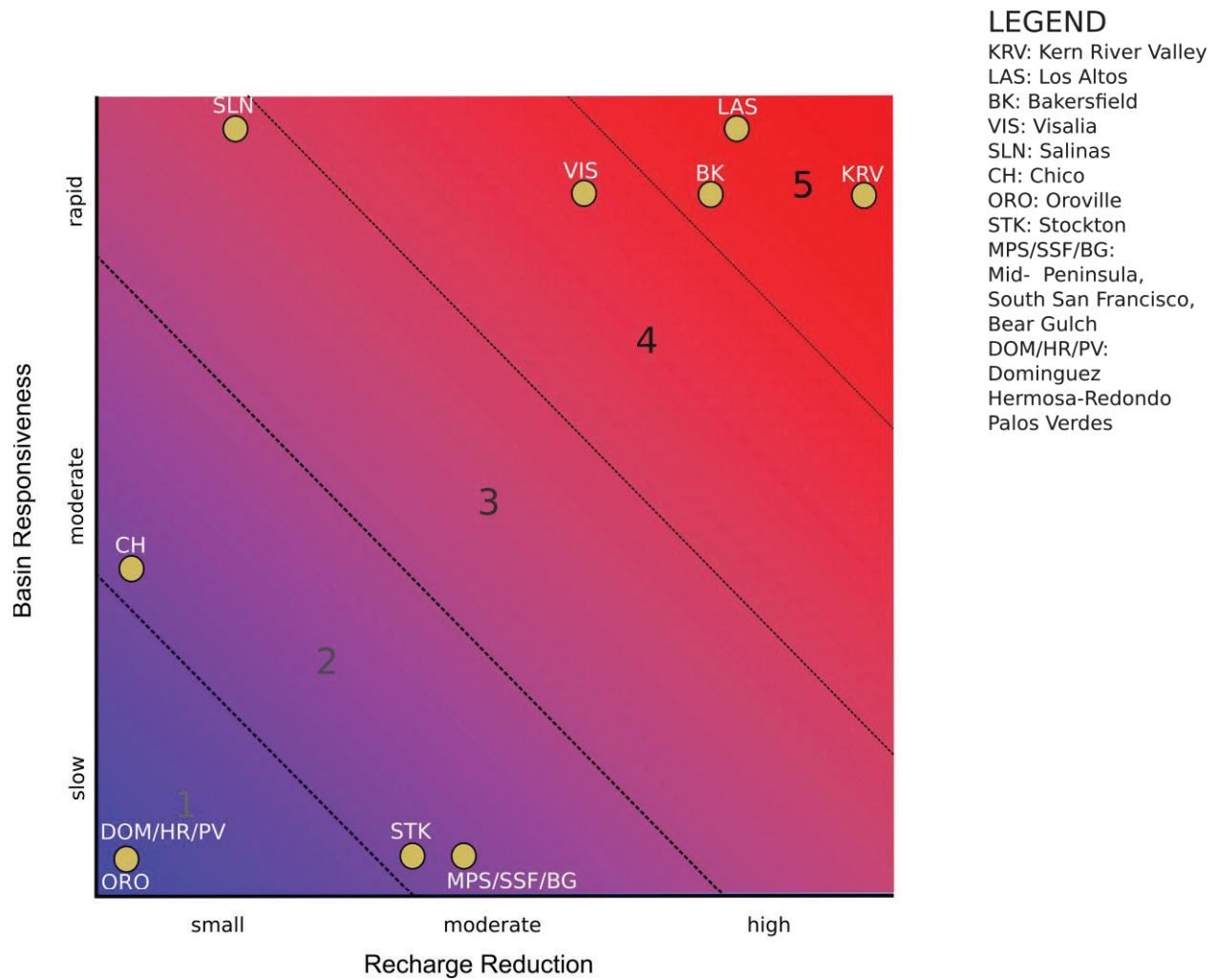
The overall risk to Cal Water’s groundwater supplies for each district is based on the expected recharge reductions and the expected responsiveness of basin water level to those reductions. Table ES-5 rates each district’s groundwater supply risk on a 1-5 scale, with 1 indicating little or no risk and 5 indicating high risk. Figure ES-4 is a visual depiction of these ratings.

Generally speaking, the groundwater supply impacts are large for the districts in the southern San Joaquin Valley. The Los Altos District also shows a high impact, largely because a significant portion of its recharge is from imported supplies, which are forecast to decrease significantly. Further north in the Central Valley, groundwater supplies are less affected. The Bay Area and Los Angeles Basin districts also show relatively smaller impacts.

Table ES- 5. District Groundwater Risk Ratings

District	Rating
BK	5
KRV	5
LAS	5
VIS	4
SLN	3
CH	2
MPS/SSF/BG	2
STK	2
ORO	1
DOM/HR/PV	1

Figure ES- 4. Groundwater Risk Ratings



Impacts of Climate Change on Imported Water Supplies

About half of Cal Water's supply is imported water that is purchased from wholesale suppliers. The supply and delivery systems of these suppliers are generally very complex and it is impossible within the confines of this project to independently model the impacts of climate change on those systems. The analysis therefore relied on available data, including the results of any climate change modeling that these suppliers themselves have done and other indicators of climate change impacts.

As a result, the climate change scenarios on which the estimates of impacts on different wholesale supplies are based will differ from one another and from the approach described above for the analysis of local supply impacts. The time frames of the results also differ. However, despite those limitations, important information about potential future climate change impacts on wholesale water supply availability was developed. Table ES-6 compares summary measures of central tendency for the potential district-specific climate change impacts on the availability of imported supplies.

Table ES- 6. Projected Climate Change Impacts on Imported Supplies

District	Source	Mid-Century	Late-Century
BK	SWP	-7%	-17%
LAS	SWP, CVP	-9%	-21%
ORO	SWP	-1%	-3%
MPS/SSF/BG	SFPUC	-10%	-20%
DOM/HR/PV	MWD	-1% to -2%	-2% to -5%
STK	USBR	-5%	-10%

Conclusions and Next Steps

The study results indicate significant risks for some districts. This points to the need for Cal Water to account for these risks in its future water supply planning if it is to minimize the adverse effects on its customers. The sole focus of this effort was to assess the potential climate change impacts on Cal Water's supplies. That is an important first step in integrating climate change into supply planning, but this study was not designed to:

- Analyze the impacts of these future supply limitations on Cal Water's ability to serve future customer demands. This is a function of such factors as water rights and contractual arrangements, how future demands are forecast to grow, how water conservation programming will affect those demands, and how Cal Water might modify the manner in which it operates its system.

- Develop mitigation plan to evaluate how potential supply and infrastructure investments and/or acquisition of new supplies might address any adverse impacts on water supply reliability.
- Formally assess alternative approaches to incorporating climate change in Cal Water's supply planning.

Possible next steps for Cal Water include:

- Methodological enhancements to reduce some of the uncertainties in the results reported herein;
- Development and acquisition of better and more complete data;
- Extending this study to other Cal Water districts;
- Developing a plan to mitigate anticipated climate change impacts on supply; and
- Integrating climate change into the Company's ongoing water supply planning.

Despite the study's limitations and uncertainties, three critical messages emerge:

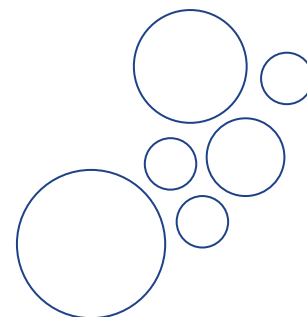
- Cal Water supplies in the 21st century are likely to be adversely affected by climate change.
- These impacts will vary considerably across districts, depending on geography and source mix. For some districts, the impacts can be significant; for others, little or no impacts are projected.
- The impacts will generally increase over time. Anticipated late-century impacts are forecast to be significantly higher in some districts than impacts at mid-century. Moreover, during the period that climate change is forecast to increasingly constrain supplies, demands are also generally forecast to increase, further exacerbating the adverse impacts on water supply reliability.

Appendix G: Water Shortage Contingency Plan



Water Shortage Contingency Plan 2020 Update

Bakersfield District
June 2021



Chapter 1

Introduction

☒ CWC § 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.

☒ CWC § 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.

This document describes the water shortage contingency plan (WSCP) for the Bakersfield District (also referred to herein as the “District”). The WSCP includes the stages of response to a water shortage caused by drought or by supply interruptions caused by infrastructure failure, regulatory mandate, or catastrophic human-caused or natural events. The primary objective of the WSCP is to ensure that the District has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions.

Specifically, this Plan includes the following chapters:

Chapter 1 - Introduction

Chapter 2 - Water Supply Reliability Analysis

Chapter 3 - Annual Water Supply and Demand Assessment Procedures

Chapter 4 - Water Shortage Levels

Chapter 5 - Shortage Response Actions

Chapter 6 - Communication Protocols

Chapter 7 - Compliance and Enforcement

Chapter 8 - Legal Authorities

Chapter 9 - Financial Consequences of WSCP

Chapter 10 - Monitoring and Reporting

Chapter 11 - WSCP Refinement Procedures

Chapter 12 - Plan Adoption, Submittal, and Availability

Chapter 2

Water Supply Reliability Analysis

☑ **CWC § 10632 (a) (1)** *The analysis of water supply reliability conducted pursuant to Section 10635.*

As described in Chapter 6 of the District Urban Water Management Plan (UWMP), the District currently purchases water from two sources: (1) untreated Kern River water purchased from the City of Bakersfield (City), and (2) treated Kern River water and imported water purchased from Kern County Water Agency-Improvement District 4 (ID-4). In addition, the District overlies the Kern County Subbasin of the San Joaquin Valley Groundwater Basin (California Department of Water Resources [DWR] Basin No. 5-022.14) and pumps water from that subbasin. The subbasin is not adjudicated; however, in its recent evaluation of California's groundwater basins, DWR determined that it is in a condition of critical overdraft.¹

Chapter 7 of the District UWMP demonstrates that the supplies available to the District are considered highly reliable in extended drought conditions, and are expected to continue to be sufficient to meet projected District demands in all hydrologic conditions evaluated, including an extended five-year drought period. Although water shortage conditions are not expected to arise due to drought, this WSCP addresses potential water shortage conditions resulting from any cause (e.g., droughts, impacted distribution system infrastructure, regulatory-imposed shortage restrictions, catastrophic events, etc.).

Under the Sustainable Groundwater Management Act (SGMA), GSAs have the authority to implement projects and management actions that help basins reach their sustainability goal. As described in Chapter 6 of the District UWMP, the Bakersfield District falls within the jurisdiction of several Groundwater Sustainability Agencies (GSAs), the GSPs of which include various projects and management actions. These projects and management actions do not include any immediately planned groundwater pumping allocations, pumping fees, or other provisions which would be expected to impact the availability of groundwater supply to the District. If such actions are adopted in the future, Cal Water will consider them as a part of its future supply planning efforts.

¹ DWR, 2019. Sustainable Groundwater Management Act 2018 Basin Prioritization, State of California, dated January 2019.

Chapter 3

Annual Water Supply and Demand Assessment Procedures

☒ **CWC § 10632 (a) (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.

☒ **CWC § 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.

☒ **CWC § 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.

On an annual basis, the District will conduct a Supply-Demand Assessment (SDA) to identify whether there is likely to be a water shortage condition in the coming year. This assessment will assume that the following year will experience a shortfall of 20%, corresponding to Water Shortage Level 3. Each element of the annual SDA is described below.

1. Evaluation Criteria

The evaluation criteria that will be used to identify whether the District is likely to experience a water shortage in the coming year include:

- a. **Supply Well Operational Constraints** - A comparison of groundwater level elevations to well operational depths to identify the need to (1) lower pump depths, (2) deepen existing wells, or (3) site and drill additional supply wells.
- b. **Treatment and Distribution System Constraints** - An assessment of the probabilities of facility and infrastructure outages and the degree to which they could limit Cal Water's ability to access, convey, or treat adequate supplies, including any planned maintenance or capital improvements over the next year that could affect its ability to provide sufficient supply to meet demands.
- c. **Local Regulatory Conditions** - Evaluation of (1) any new GSA policies (e.g., pumping allocations) or sustainability criteria that could trigger a change in groundwater volume available for pumping, and (2) any new limitations on well permitting that could limit the ability to deepen existing supply wells or drill new supply wells.
- d. **State Regulatory Conditions** - Evaluation of any state-mandated drought or water use restrictions.

These criteria will be assessed by Cal Water staff, including District staff with detailed knowledge of District operations, well conditions, and local GSA activities. The data used to support these assessments may include, but is not limited to, supply capacity, supply and pump capacity, firm capacities, tank storage capacity, groundwater level measurements, system demand, and zone demand.

2. Water Supply

The District obtains its supplies from purchases and from the Kern County Subbasin of the San Joaquin Valley Groundwater Basin (California Department of Water Resources [DWR] Basin No. 5-022.14). As discussed in Chapter 7 of the District UWMP, these supplies are projected to be sufficient to serve future demands. The only identified potential constraints on water supply are the operational limitations and potential local regulatory conditions identified as evaluation criteria above.

3. Unconstrained Customer Demand

The demand forecast described in Chapter 4 of the District UWMP yields the anticipated unconstrained water demand, i.e. the expected water use in the absence of shortage-

caused reductions in water use. During a drought cycle, unconstrained demand typically increases due to higher than normal air temperatures and lower than normal precipitation. The supply reliability analysis and Drought Risk Assessment presented in Chapter 7 of the District UWMP accounts for this anticipated shift in unconstrained water demand, and as discussed above, even with these increases in demand the available groundwater supply is expected to be sufficient to meet these demands.

The model underlying the demand forecast described in Chapter 4 of the District UWMP has an annual time step. Cal Water has begun developing a short-term demand model with a monthly time step that will be more appropriate for the annual supply-demand assessments.

4. Planned Water Use for Current Year Considering Dry Subsequent Year

Cal Water will evaluate the anticipated supplies for the current year, assuming that the following year will be dry, as defined above, using the Evaluation Criteria identified above. Barring changes in supply availability per the Evaluation Criteria, the assumed dry subsequent year is not expected to affect the manner in which Cal Water will draw water from the basin in the current year, and the planned water use for the current year will equal the unconstrained demand.

5. Infrastructure Considerations

As part of its triennial General Rate Case applications to the California Public Utilities Commission (CPUC), Cal Water prepares a Supply-Demand Analysis (CPUC SD Analysis) for each of its Districts. The CPUC SD Analysis is an inventory of water production and pump assets that provide direct and indirect sources of supply to meet customer demands in accordance with CPUC General Order 103-A and California Code of Regulations (CCR) Title 22 Waterworks Standards. This CPUC SD Analysis is based on a combination of regulatory requirements, professional consultant recommendations, and industry standard practices, including those from the American Water Works Association (AWWA) and American Society of Civil Engineers (ASCE). It identifies specific vulnerabilities in different pressure zones within the system and evaluates the system against performance criteria that meet regulatory requirements and ensure operationally adequate levels of service.

Cal Water plans to extend the District CPUC SD Analysis to perform this analysis on an annual basis. This analysis will guide Cal Water's annual evaluation of operational treatment/distribution constraints that could potentially limit the availability of supplies. This evaluation of supply well operational constraints and treatment and distribution constraints will be completed by March 31 of each year and will assess potential impacts on supply availability. If such constraints are identified, Cal Water will

develop a plan to address these constraints, mitigate potential effects, and implement the appropriate water shortage stage of action per Chapter 5, below.

6. Other Factors

As identified under the Evaluation Criteria above, local regulatory conditions could potentially limit the availability of supplies. Therefore, Cal Water will evaluate the development of new regulatory constraints by March 31 of each year and assess their potential impacts on supply availability. If such constraints are identified, Cal Water will develop a plan to address these constraints and mitigate potential effects and implement the appropriate water shortage stage of action per Chapter 5 below.

Consistent with California Water Code (CWC) § 10632.1, Cal Water will perform and submit an SDA to DWR by July 1st of each year beginning in 2022.

Chapter 4

Water Shortage Levels

☒ CWC § 10632 (a) (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.

Consistent with the requirements of CWC § 10632(a)(3), this WSCP is based on the six water shortage levels (also referred to as "stages") shown in Table 4-1 for the water year ending September 2020. These shortage stages are intended to address shortage caused by any condition, including the catastrophic interruption of water supplies.

Table 4-1. Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
1	Up to 10%	Demand reduction (See Table 5-1)
2	Up to 20%	Demand reduction (See Table 5-1)
3	Up to 30%	Demand reduction (See Table 5-1)
4	Up to 40%	Demand reduction (See Table 5-1)
5	Up to 50%	Demand reduction (See Table 5-1)
6	>50%	Demand reduction (See Table 5-1)
NOTES:		

Shortage response actions for each of these stages are identified and discussed in Chapter 5.

Chapter 5

Shortage Response Actions

☒ CWC § 10632 (a) (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.

☒ CWC § 10632 (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.

This chapter describes the response actions Cal Water will take to deal with the shortages associated with each of the six stages enumerated in Chapter 4. As discussed above, the existing groundwater supply of the District is expected to be able to serve 100% of future demands under all conditions of precipitation and hydrology. However, inasmuch as Cal Water may have to implement shortage response actions to comply with state mandates, local regulatory changes, or respond to catastrophic events, it is important to carefully identify and describe the anticipated necessary actions.

5.1 Demand Reduction

The combinations of demand-reduction actions required to resolve the shortages associated with each of the six drought stages are based on Cal Water's experiences in dealing with past drought-related shortages and also include other actions deemed appropriate to achieve the required demand reductions. In order to evaluate and ensure that the right actions would be implemented with the proper level of intensity, Cal Water employed the Drought Response Tool (DRT), an Excel spreadsheet model developed by EKI Environment and Water, Inc.

The DRT provides a quantitative framework that allows Cal Water to systematically estimate the monthly and cumulative annual demand reductions expected to result from particular combinations of drought response actions and associated implementation rates. Data inputs to

the DRT include total production, class-specific water use, population, and assumptions regarding the split between indoor and outdoor water use for each customer class.

For each drought response action, the user specifies:

- The customer class(es) and end use(s) that are affected;
- The percent savings for those end use(s) for each account that implements the action. These are based on evaluations reported in the literature, or where such studies are not available, on best estimates based on Cal Water experience; and
- The percentage of accounts assumed to implement the action, which is presumed to be the result of the intensity level of Cal Water program implementation, including but not limited to marketing and enforcement activities.

Based on the foregoing inputs, the DRT model calculates the resulting monthly savings. Cal Water adjusted the combination of actions and implementation levels to achieve the targeted savings levels at each of the six shortage stages.

In order to evaluate the robustness of the DRT model, Cal Water modeled the actions implemented during the height of the last drought for a subset of its Districts, and found that the modeled water shortage reductions were generally consistent with the responses observed in its Districts. In short, the DRT is a robust, transparent tool to tie a particular set of shortage-response actions to an expected reduction in demand.

For each of the six water shortage stages, the modeling targeted the mid-range of the required demand reduction range, ergo:

- 5% for Stage 1,
- 15% for Stage 2,
- 25% for Stage 3,
- 35% for Stage 4,
- 45% for Stage 5, and
- 55% for Stage 6.

The key DRT inputs and outputs for each of the six water shortage stages are reproduced in Attachment A.

Table 5-1 shows the water shortage reduction actions, savings assumptions, and implementation rates that are required for the District to achieve the targeted annual demand reductions for each of the six shortage stages. At each stage, there are two types of demand-reduction actions identified:

- Restrictions on customer water usage; and
- Consumption reduction actions by Cal Water to encourage decreased water usage.

The total demand reductions are governed by a set of user-specified constraints to ensure that usage levels do not endanger health and safety or result in unacceptable economic impacts. The DRT will not permit estimated usage reductions to violate these constraints,

regardless of the demand reduction actions selected. For most Cal Water districts, including Bakersfield, the following default constraints are used:

- A minimum residential indoor per capita daily usage of 25 gallons,
- A maximum residential outdoor usage reduction of 100%,
- A maximum Commercial, industrial, and institutional (CII) indoor usage reduction of 30%, and
- A maximum CII outdoor usage reduction of 100%.

Many actions are implemented across a number of stages, some at increasing implementation levels. Therefore the actions are listed as a row under the first stage at which they are implemented, and the implementation rate is shown under each stage column heading at the right. The unit savings represent a percentage savings of the end uses indicated in the table.

Because of the DRT logic described above, the format of Table 5-1 differs from that of the default DWR table.

Table 5-1. Demand Reduction Actions to Achieve Required Savings (DWR Table 8-2)

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Stage 1: Minimal Shortage									
Restrictions									
Landscape - Limit landscape irrigation to specific times	Irrigation	10%	75%	N/A	N/A	N/A	N/A	N/A	Yes
Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks	100%	15%	30%	35%	50%	50%	50%	Yes
Landscape - Restrict or prohibit runoff from landscape irrigation	Irrigation	3%	15%	40%	50%	75%	75%	75%	Yes
Landscape - Prohibit application of potable water to outdoor landscapes within 48 hours of measurable rainfall	Irrigation	20%	15%	40%	50%	50%	100%	N/A	Yes
Other - Prohibit use of potable water for washing hard surfaces	Misc. Outdoor	17%	15%	40%	50%	75%	75%	75%	Yes
Other - Require shut-off nozzles on hoses for vehicle washing with potable water	Misc. Outdoor	17%	50%	50%	50%	75%	75%	75%	
CII - Lodging establishments must offer opt out of linen service	Fixtures & Appliances	1%	50%	75%	75%	75%	75%	75%	Yes
CII - Restaurants may only serve water upon request	Fixtures & Appliances	1%	75%	75%	75%	75%	75%	75%	Yes

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
No watering of landscape of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission, the Department of Housing and Community Development, or other state agency	Irrigation	50%	1.11%	1.11%	1.11%	1.11%	1.11%	N/A	Yes
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	50%	50%	75%	75%	75%	75%	75%	Yes
Consumption Reduction									
Expand Public Information/Media Campaign	All	0.5%	50%	50%	50%	50%	75%	75%	No
Water Bill Inserts	All	1%	100%	100%	100%	100%	100%	100%	No
Promote online water waste reporting	All	10%	0%	0%	0%	0%	1%	1%	No
Expand Rebates or Giveaways of Plumbing Fixtures and Devices	All	10%	1%	1%	2%	3%	5%	5%	No
Expand Rebates for Landscape Irrigation Efficiency	All	10%	1%	1%	2%	3%	5%	5%	No
Expand CII Water Use Surveys	All CII uses	5%	1%	1%	1%	2%	2%	4%	No
Expand Res Water Use Surveys	All Residential Uses	5%	1%	1%	1%	2%	2%	4%	No
Stage 2: Moderate Shortage									
Restrictions									

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Landscape - Limit landscape irrigation to 1-3 days/week	Irrigation	15%-79% 1		75%	25%	25%	75%	N/A	Yes
Prohibit the use of non-recirculating systems in all new conveyer car wash and commercial laundry systems	Fixtures & Appliances	50%		0%	0%	0%	0%	0%	Yes
Prohibit the use of single pass cooling systems in new connections	Cooling	50%		0%	0%	0%	20%	20%	Yes
Consumption Reduction									
Water Efficiency Workshops, Public Events	All Residential Uses	5%		25%	25%	50%	50%	75%	No
Offer Water Use Surveys	All	1%		1%	1%	2%	2%	4%	No
Provide Rebates or Giveaways of Plumbing Fixtures and Devices	All	10%		1%	2%	3%	5%	5%	No
Provide Rebates for Landscape Irrigation Efficiency	All	10%		1%	2%	3%	5%	5%	No
Stage 3: Severe Shortage									
Restrictions									
Other - Prohibit use of potable water for construction and dust control	Misc. Outdoor	100%			1%	1%	1%	1%	Yes
Prohibit use of potable water for street washing	Misc. Outdoor	100%			1%	1%	1%	1%	Yes

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Landscape - Prohibit irrigation of ornamental turf on public street medians with potable water	Irrigation	100%			20%	20%	25%	N/A	Yes
Prohibit Filling Ornamental Lakes or Ponds	Misc. Outdoor	100%			1%	1%	1%	1%	Yes
Consumption Reduction									
Home or Mobile Water Use Reports	All	5%			15%	50%	50%	50%	No
Decrease Frequency and Length of Line Flushing	Non Revenue Water	25%			50%	50%	50%	50%	No
Reduce System Water Loss	Non Revenue Water	100%			10%	10%	10%	20%	No
Increase Water Waste Patrols/Enforcement	All	10%			1%	2%	4%	5%	No
Implement Drought Rate Structure and Customer Water Budgets (Res)	All Residential Uses	30%-60% ₂			40%	25%	30%	40%	Yes
Implement Drought Rate Structure and Customer Water Budgets (CII)	All CII uses	10%-30% ₃			40%	25%	30%	50%	Yes
Stage 4: Critical Shortage									
Water Use Restrictions									
Prohibit vehicle washing except with recirculated water or low-volume systems	Misc. Outdoor	10%				50%	50%	50%	Yes
Prohibit use of water for recreational purposes such as water parks and the filling of pools	Misc. Outdoor	100%				1%	1%	1%	Yes
Consumption Reduction Actions									
Promote / Expand Use of Recycled Water	Irrigation	100%				0%	0%	0%	No

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Stage 5: Emergency Shortage									
Water Use Restrictions									
Require net zero demand Increase on new water service connections	All	100%					1.08%	1.08%	Yes
Prohibit single-pass cooling systems	Cooling	50%					20%	20%	Yes
Consumption Reduction Actions									
Require Pool Covers	Misc. Outdoor	28%					10%	10%	Yes
Stage 6: Extreme Shortage									
Water Use Restrictions									
Moratorium on new water service connections	All	100%					1.08%		Yes
Landscape - Prohibit all landscape irrigation	Irrigation	100%					50%		Yes
Cumulative Annual Savings			8%	14%	28%	37%	47%	56%	
NOTES:									
1. Watering restricted to no more than 3 days/wk in Stage 2 and Stage 3; no more than 2 days/wk in Stage 4; no more than 1 day/wk in Stage 5.									
2. Residential water budgets of up to 30% for Stage 3, up to 40% for Stage 4; 50% for Stage 5, up to 60% for Stage 6.									
3. CII water budgets of up to 10% for Stage 3, up to 20% for Stage 4, up to 30% for Stages 5 and 6.									

5.2 Supply Augmentation

As indicated in Table 5-2, Cal Water has not identified any supply augmentation actions to assist in resolving future District water shortages. As identified in Chapter 3, Cal Water may consider deepening or drilling new wells if necessary due to declining groundwater levels. However, Cal Water considers these actions to be operational changes (described in Section 5.3), rather than accessing a new supply source.

Table 5-2. Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference <i>(optional)</i>
NOTES:			

5.3 Operational Changes

As discussed above in Chapter 3, the primary operational change that Cal Water will consider in the District is extracting groundwater from a lower elevation, utilizing the deeper wells that are drilled following identification of this need as part of the annual SDA. As identified in Table 5-1, the District will also decrease the frequency and length of line flushing under Stage 3 and beyond. The District will also evaluate the potential benefits of altering other maintenance cycles and expediting infrastructure repairs to improve system efficiency, to the extent feasible.

In addition, Cal Water is actively participating in the GSP development process, and will make whatever operational changes are necessary to conform to the results of that process.

5.4 Mandatory Restrictions

The water shortage response actions included in Table 5-1 include a variety of mandatory customer water use restrictions that will be necessary to achieve the targeted demand reductions for the different shortage stages. The types of restrictions and the manner and degree of enforcement for these restrictions vary by stage, and are discussed in Chapter 7.

5.5 Emergency Response Plan

Cal Water has an Emergency Response Plan (ERP) in place that coordinates the overall response to a disaster.

The ERP addresses the Company's responsibilities in emergencies associated with natural disaster, human-caused emergencies, and technological incidents. It provides a framework for coordination of response and recovery efforts within the Company in cooperation with local, State, and Federal agencies, as well as other public and private organizations. The ERP establishes an emergency organization to direct and control operations during a period of emergency by assigning responsibilities to specific personnel.

The ERP does the following:

- It conforms to the State mandated Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS), and it effectively structures emergency response at all levels in compliance with the Incident Command System (ICS).
- It establishes response policies and procedures, while providing the Company clear guidance related to emergency planning.
- It describes and details procedural steps necessary to protect lives and property.
- It outlines coordination requirements.
- It provides a basis for unified training and response exercises to ensure compliance.

The Bakersfield District has installed backup power generators at some of its well sites, booster sites, and pump storage sites that can be operated in the event of a system wide power outage. A complete loss of power has never been experienced, but the generators have been used in the past to overcome localized outages.

The District currently has interties with ID-4.

5.6 Seismic Risk Assessment and Mitigation Plan

☒ CWC § 10632.5

(a) In addition to the requirements of paragraph (3) of subdivision (a) 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.

Cal Water's ERP includes information on various hazards and a related fault map overlying the District. The Kern County Emergency Operations Plan, which include additional discussion of area earthquake risk and mitigation, can be found at:

<https://www.kerncountyfire.org/en/operations/divisions/office-of-emergency-services/emergency-plans/emergency-operations-plan.html>.

5.7 Shortage Response Action Effectiveness

Table 5-1 above shows the effectiveness of the specific demand-reduction actions and implementation levels necessary for the District to achieve the targeted savings for each water shortage stage. The bottom row indicates the total annual cumulative savings expected to be reached at each water shortage stage level. Additional details, including anticipated savings on a month-by-month basis are provided in the DRT model inputs and outputs included in Attachment A.

Chapter 6

Communication Protocols

☒ **CWC § 10632 (a) (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.

Cal Water intends to escalate communication to customers and stakeholders, as needed, throughout any water shortage situation to help ensure they are aware of current conditions, any water use restrictions that are in effect, and the many ways Cal Water can help them reduce their water use. Cal Water's outreach efforts include multiple channels, including bill messages, bill inserts, direct mail, email, letters, social media, print, radio, music streaming services, TV, over-the-top media, movie theatre advertising, and group presentations.

These efforts will expand on current Cal Water outreach efforts and will be customized to the needs at the time of the shortage to ensure a proper channel mix so that the maximum audience is reached as efficiently as possible.

Chapter 7

Compliance and Enforcement

☑ **CWC § 10632 (a) (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.*

7.1 Water Use Restrictions

In accordance with Rule 14.1, Cal Water is currently authorized to take the following actions to enforce the water use restrictions:

First Violation: Cal Water shall provide the customer with a written notice of violation.

Second Violation: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation and is authorized to install a flow-restricting device on the customer's service line.

Cal Water has submitted to the California Public Utilities Commission (CPUC) an update to Rule 14.1 and Schedule 14.1, for approval, to align with the restrictions identified in this WSCP. Rule 14.1 and Schedule 14.1 are discussed in more detail in Chapter 8. The current versions of Rule 14.1 and Schedule 14.1 can be found on the Cal Water website.

7.2 Non-Essential, Wasteful Uses

In the event that more stringent measures are needed, implementation of Schedule 14.1 would be requested from the CPUC. If implemented, Cal Water is currently authorized to take the following actions when its personnel verify a customer is using potable water for non-essential, wasteful uses.

First Violation: Cal Water shall provide the customer with a written notice of violation. In addition, Cal Water is authorized to take the following actions:

- A. If the customer currently receives service through a metered connection, install a real-time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service.
- B. If the customer does not currently receive service through a metered connection, install a water meter on the customer's service line, charge the

customer for water use pursuant to Cal Water's metered service tariffs and rules, and install a real-time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service.

Second Violation: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation. In addition to the actions prescribed under the first violation above, Cal Water is authorized to take the following actions:

- A. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.
 - i. If Stage 1 is in effect, \$25
 - ii. If Stage 2 is in effect, \$50
 - iii. If Stage 3 is in effect, \$100
 - iv. If Stage 4 is in effect, \$200
- B. At its sole discretion, waive the waste of water penalty if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high-efficiency sprinkler system, or properly programmed smart irrigation controller has been installed, after a notice of violation was delivered, and is in use at the customer's service address.

Third Violation: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the second violation, Cal Water shall provide the first and second violations above, Cal Water is authorized to take the following actions:

- A. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.
 - i. If Stage 1 is in effect, \$50
 - ii. If Stage 2 is in effect, \$100
 - iii. If Stage 3 is in effect, \$200
 - iv. If Stage 4 is in effect, \$400

- B. At its sole discretion, waive the waste of water surcharge if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high- efficiency sprinkler system, or properly programmed smart irrigation controller has been installed, after notice of violations have been delivered, and is in use at the customer's service address.

Fourth Violation: If Cal Water verifies that the customer has used potable water for non- essential, wasteful uses after having been notified of the third violation, Cal Water shall provide the customer with a fourth written notice of violation. In addition to actions set forth in previous violations prescribed above, Cal Water is authorized to install a flow- restricting device on the customer's service line.

Egregious Violations: Notwithstanding the foregoing framework for penalties, customers who Cal Water has verified are egregiously using potable water for non-essential, wasteful uses are subject to having a flow- restricting device installed on their service line. After providing the customer with one notice of egregious violation, either by direct mail or door hanger, which documents the egregious use of potable water for non-essential, wasteful uses and explains that failure to correct the violation may result in the installation of a flow-restricting device on the customer's service line, Cal Water is authorized to install a flow-restricting device on the customer's service line.

Cal Water plans to submit to the CPUC an update to Schedule 14.1 to align with this WSCP including, but not limited to, consistency with the new six stage shortage level structure.

7.3 Drought Surcharges

Water budgets and associated drought surcharges are included as actions in Table 5-1. Cal Water will implement such actions through the implementation of Schedule 14.1.

Chapter 8

Legal Authorities

☒ CWC § 10632 (a) (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.

Cal Water is an investor-owned water utility that is regulated by the CPUC. As such, it does not have the authority to adopt resolutions or ordinances. Rule 14.1, as filed with the CPUC, serves as Cal Water's restrictions on non-essential, wasteful uses of potable water. In the event that more stringent measures are required, Cal Water may request the addition of Schedule 14.1 which serves as Cal Water's WSCP and includes staged mandatory reductions and drought surcharges. Cal Water 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 and to ensure consistency with local resolutions and ordinances.

On April 1, 2016, Cal Water filed its current Schedule 14.1 with the CPUC.² The Schedule lays out the staged mandatory reductions and drought surcharges associated with Cal Water's WSCP. This filing is consistent with Resolution W-5034, adopted by the Commission on April 9, 2015, ordering compliance with requirements of the State Water Resources Control Board (SWRCB).

Schedule 14.1 is an extension of Rule 14.1. The compliance and enforcement information presented in Chapter 7 is based on the current versions of both Rule 14.1 and Schedule 14.1, which are based, in part, on the specific SWRCB requirements associated with the Governor's Executive Order B-29-15, which required statewide cutbacks to address the unprecedented 2011-2017 drought, as well as the additional information required pursuant to the CWC.

Cal Water has submitted an update to Rule 14.1 and Schedule 14.1 to the CPUC, for approval, to align with this WSCP.

² For reference, the current versions of Rule 14.1 and Schedule 14.1 are included as Attachment B.

In the event of a determination of a water shortage Cal Water shall declare a water shortage emergency in accordance with the Water Code Chapter 3 (commencing with Section 350) of Division 1 and implement the Water Shortage Contingency Plan at the appropriate Stage.

Chapter 9

Financial Consequences of WSCP

☒ **CWC § 10632 (a) (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.

In 2008, the CPUC approved the creation of a Water Revenue Adjustment Mechanism (WRAM) and Modified Cost Balancing Accounts (MCBA). The goals of the WRAM and MCBA are to sever the relationship between sales and revenue to remove the disincentive to reduce water use. The WRAM and MCBA are designed to be revenue neutral in order to ensure that both the utility and ratepayers are neither harmed nor benefitted.

In 2020, the CPUC ordered that regulated water utilities may not include the continuation of the WRAM and MCBA in their next general rate case filing but may propose the use of a Monterey-Style Revenue Adjustment Mechanism and Incremental Cost Balancing Account. As such, the WRAM and MCBA will no longer be in place for Cal Water beginning in 2023.

During a water shortage, Cal Water will file for a Drought Memorandum Account, or similar, to track incremental shortage-related expenses to be reviewed by the CPUC for future recovery in rates. Cal Water will also file for a Drought Lost Revenue Memorandum Account, or similar, to track reduced sales to be reviewed by the CPUC for future recovery in rates.

Both the Drought Memorandum Account and Drought Lost Revenue Memorandum Account are mechanisms that have been approved by the CPUC in previous droughts.

Chapter 10

Monitoring and Reporting

☒ **CWC § 10632 (a) (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.*

During the period 2014-16, in order to effectively respond to the drought, Cal Water realigned its organizational structure to ensure sufficient resources were available to implement its WSCP. The day-to-day implementation was overseen by the Director of Drought Management & Conservation, with the assistance of the Drought Response Project Manager. The Director of Drought Management & Conservation reported to a team of Cal Water's Officers (Steering Committee), including the President & CEO, the Vice President of Corporate Communications & Community Affairs, the Vice President of Customer Service & Information Technology, the Vice President of Operations, and the Vice President of Continuous Improvement.

Reporting to the Director of Drought Management & Conservation was a team of functional leads, each responsible for managing individual portions of Cal Water's Plan. This team included the Director of Customer Service, the Water Conservation Manager, the Manager of Corporate Communications, the Water Supply Manager, and the Government & Community Relations Manager.

Cal Water would implement a similar structure to effectively manage future water shortages.

This structure includes regular meetings with reporting on items such as:

- Aggregate customer demands,
- Customer compliance with water use restrictions,
- Current and projected water supply conditions,
- Customer outreach activities,
- Customer service inquiries, and
- Operations activities (e.g., water flushing activities, leak repairs, etc.).

Chapter 11

WSCP Refinement Procedures

☒ **CWC § 10632 (a) (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.*

Cal Water's Drought Steering Committee utilizes an adaptive management process to regularly assess and determine adjustments and changes to the implementation of the WSCP. These refinements are implemented by the Director of Drought Management & Conservation (or equivalent) through the team of functional leads.

Chapter 12

Plan Adoption, Submittal, and Availability

☒ **CWC § 10632 (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.*

The deadline for public comments on the WSCP was June 1, 2021, one week after the public hearing. The final WSCP was formally adopted by Cal Water's Vice President of Customer Service & Chief Citizenship Officer on June 20, 2021. The District UWMP includes a copy of the signed Resolution of Plan Adoption and contains the following:

- Letters sent to and received from various agencies regarding the UWMP and WSCP, and
- Correspondence between Cal Water and participating agencies.

This UWMP and WSCP were submitted to DWR within 30 days of adoption and by the July 1, 2021 deadline. The submittal was done electronically through Water Use Efficiency Data Portal, an online submittal tool. The adopted WSCP was also sent to the California State Library and to the cities and counties listed in Table 10-1 of the District UWMP.

On or about May 3, 2021, an electronic version of the draft 2020 WSCP was made available for review by visiting Cal Water's website:

<https://www.calwater.com/conservation/uwmp-review/>.

Attachment A
Key Drought Response Tool Tables and Charts



Drought Response Tool

[Home](#)[Input Baseline
Year Water Use](#)[Baseline Year
Water Use
Profile](#)[Drought
Response
Actions](#)[Estimated
Water Savings](#)[Drought
Response
Tracking](#)

1 - Home Bakersfield

Enter Agency Information	
Agency Name	Bakersfield
Total Population Served	285,590
Conservation Goal (%)	5%
Drought Stage	Stage 1
Number of Residential Accounts	56,795
Number of Commercial, Industrial, and Institutional (CII) Accounts	15,141
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	73%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	63%
Comments	BK

Home

Input Baseline
Year Water UseBaseline Year
Water Use
ProfileDrought
Response
ActionsEstimated
Water SavingsDrought
Response
Tracking**1 - Home**
Bakersfield

Navigation	
USER'S GUIDE	Download and read the guide before using this Tool
1 - HOME	Enter agency information
2 - INPUT BASELINE YEAR WATER USE	Enter Baseline Year production and use
3 - BASELINE YEAR WATER USE PROFILE	Review and confirm entered information
4 - DROUGHT RESPONSE ACTIONS	Select Drought Response Actions and input estimated water savings and implementation rates.
5 - ESTIMATED WATER SAVINGS	Review estimated water production and compare estimated savings to conservation target.
6 - DROUGHT RESPONSE TRACKING	Track production and water savings against the conservation target.



Drought Response Tool

Home

Input Baseline
Year Water Use

Baseline Year
Water Use
Profile

Drought
Response
Actions

Estimated
Water Savings

Drought
Response
Tracking

1 - Home Bakersfield

For questions about this tool or for additional information, contact:

Anona Dutton, P.G., C.Hg.
adutton@ekiconsult.com
(650) 292-9100



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2 - Input Baseline Year (2020) Water Use

Bakersfield

Input Baseline Year (2020) Production and Water Use

Units: (mg)



Select the units to input monthly production and use data. Enter the total monthly potable water production for the Baseline Year. Next, enter monthly water use data by sector for the Baseline Year. If you bill on a bi-monthly basis, divide your billing data between the months that the billing cycle includes. If your single-family and multi-family accounts are tracked separately, enter the combined water use for both sectors in the Residential Water Use column. If your commercial, industrial, and institutional (CII) accounts are tracked separately, enter the combined water use for each sector in the CII Water Use column. Your non-revenue water use is calculated by subtracting your monthly residential, CII, and dedicated irrigation water uses from your monthly production. Your monthly residential gallons per capita per day (R-GPCD) is calculated by dividing your monthly residential water use by your population entered in Worksheet 1 - Home.

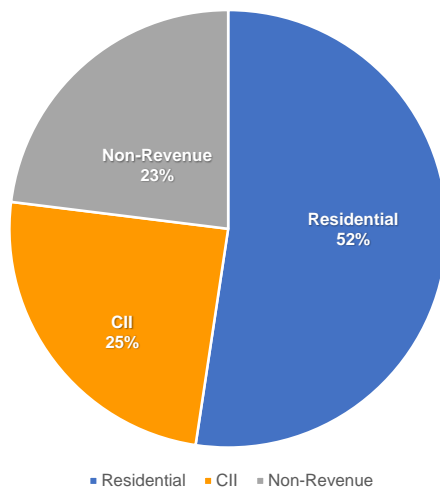
Date	Total Production (mg)	Residential Water Use (mg)	COM-GOV Water Use (mg)	Industrial Water Use (mg)	Non-Revenue Water Use (mg)	Total R-GPCD	Comments
October	1,874	995	501	9	369	112	
November	1,497	856	409	8	223	100	
December	1,047	673	330	7	38	76	
January	964	529	254	5	176	60	
February	1,105	536	246	4	319	67	
March	1,222	612	288	6	316	69	
April	1,220	634	289	4	293	74	
May	1,885	785	300	7	793	89	
June	2,432	1,144	477	2	807	134	
July	2,589	1,357	633	6	593	153	
August	2,426	1,366	660	10	390	154	
September	2,135	1,196	549	9	380	140	

3 - Baseline Year (2020) Water Use Profile

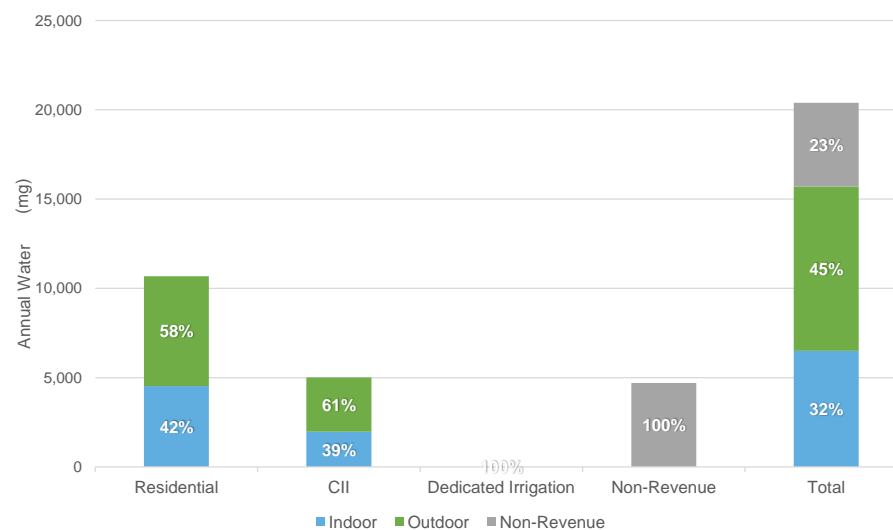
Bakersfield

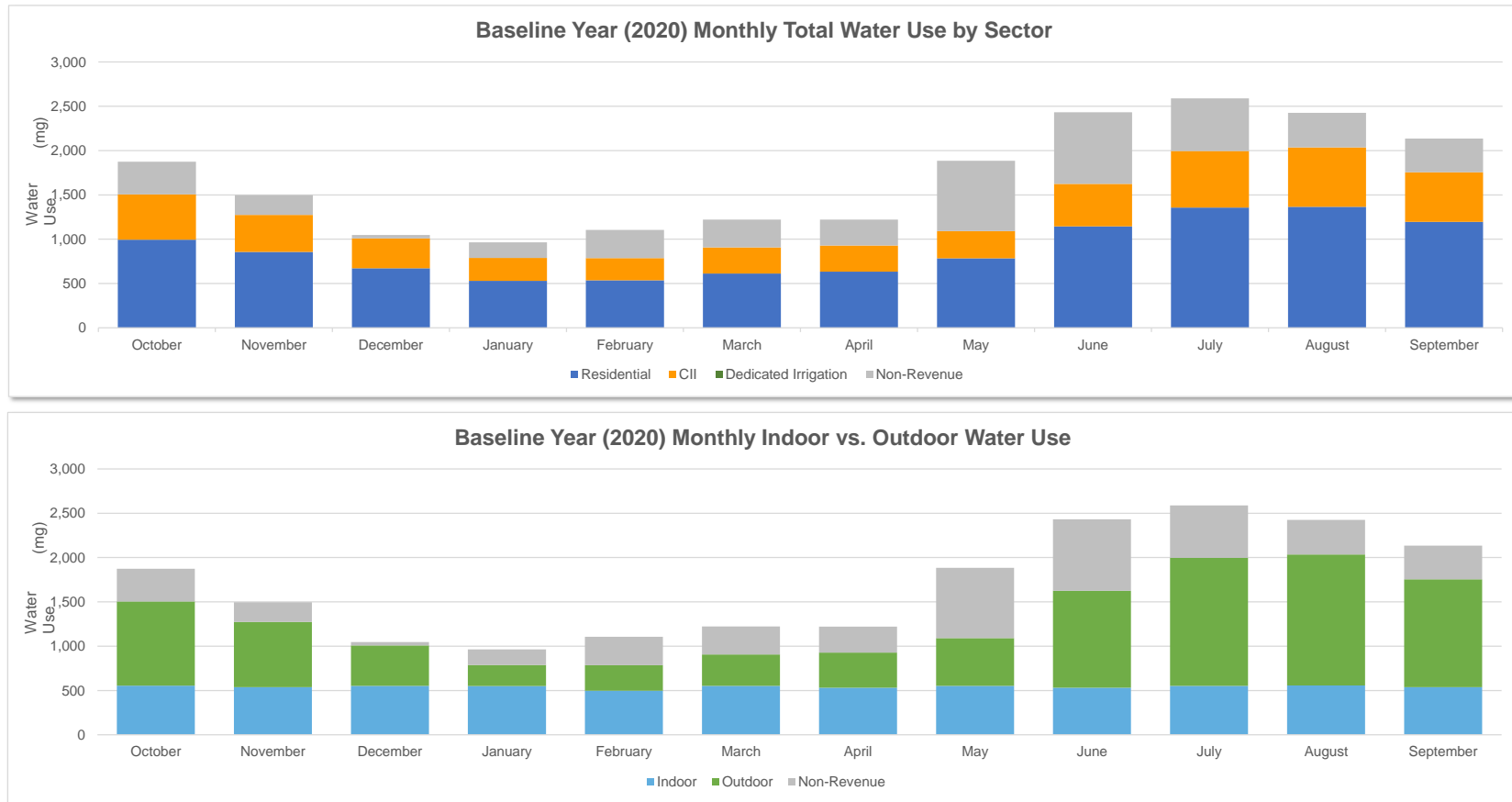
Baseline Year (2020) Annual Water Use Summary						
Units: <input type="text" value="(mg)"/>						
A summary of your Baseline Year water use by sector and major end use category is shown below. Select the units in which your production and use data are displayed.						
Water Use	Total Production (mg)	Water Use (mg)				Comments
		Residential	CII	Dedicated Irrigation	Non-Revenue	
Total	20,395	10,683	5,014	0	4,698	
Total Indoor	6,503	4,532	1,971	--	--	
Total Outdoor	9,194	6,152	3,042	0	--	
Total Non-Revenue	4,698	--	--	--	4,698	
Total Indoor %	32%	42%	39%	0%	--	
Total Outdoor %	45%	58%	61%	100%	--	
Total Non-Revenue %	23%	--	--	--	100%	

Baseline Year (2020) Percent Annual Water Use by Sector



Baseline Year (2020) Annual Water Use by Sector and End Use



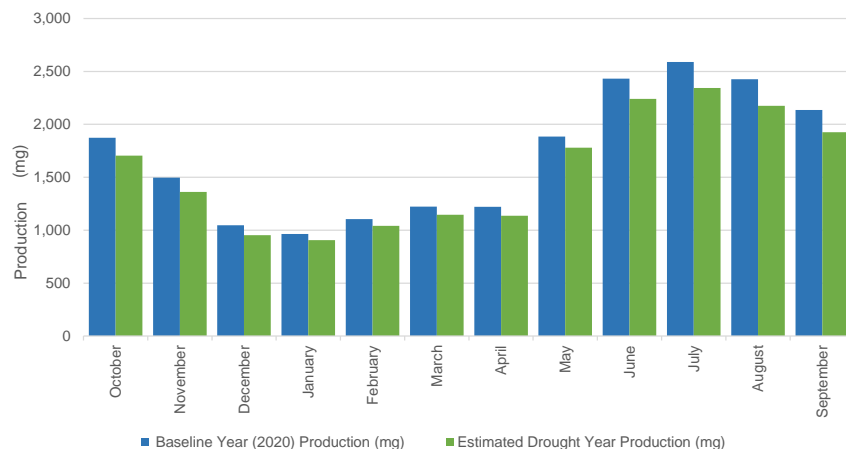
3 - Baseline Year (2020) Water Use Profile
Bakersfield

5 - Estimated Water Savings - Stage 1

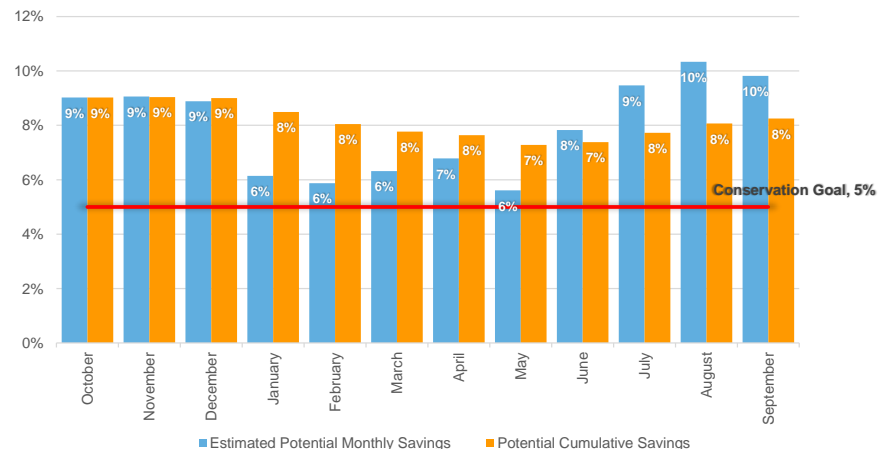
Bakersfield

Estimated Monthly Water Use and Savings Summary						
Units: <div>(mg)</div>		<div><div></div><div>This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.</div></div>				
Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	1,874	1,705	9%	9%	5%	
November	1,497	1,361	9%	9%	5%	
December	1,047	954	9%	9%	5%	
January	964	905	6%	8%	5%	
February	1,105	1,040	6%	8%	5%	
March	1,222	1,145	6%	8%	5%	
April	1,220	1,137	7%	8%	5%	
May	1,885	1,779	6%	7%	5%	
June	2,432	2,241	8%	7%	5%	
July	2,589	2,344	9%	8%	5%	
August	2,426	2,175	10%	8%	5%	
September	2,135	1,925	10%	8%	5%	

Baseline Year(s) Production vs. Estimated Production



Estimated Potential Monthly Water Savings





Drought Response Tool


[Home](#)[Input Baseline
Year Water Use](#)[Baseline Year
Water Use
Profile](#)[Drought
Response
Actions](#)[Estimated
Water Savings](#)[Drought
Response
Tracking](#)

1 - Home Bakersfield

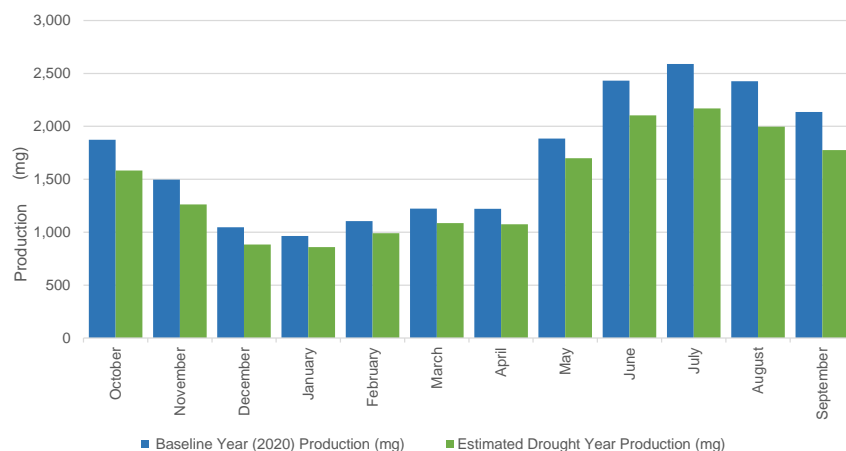
Enter Agency Information	
Agency Name	Bakersfield
Total Population Served	285,590
Conservation Goal (%)	15%
Drought Stage	Stage 2
Number of Residential Accounts	56,795
Number of Commercial, Industrial, and Institutional (CII) Accounts	15,141
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	73%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	63%
Comments	BK

5 - Estimated Water Savings - Stage 2

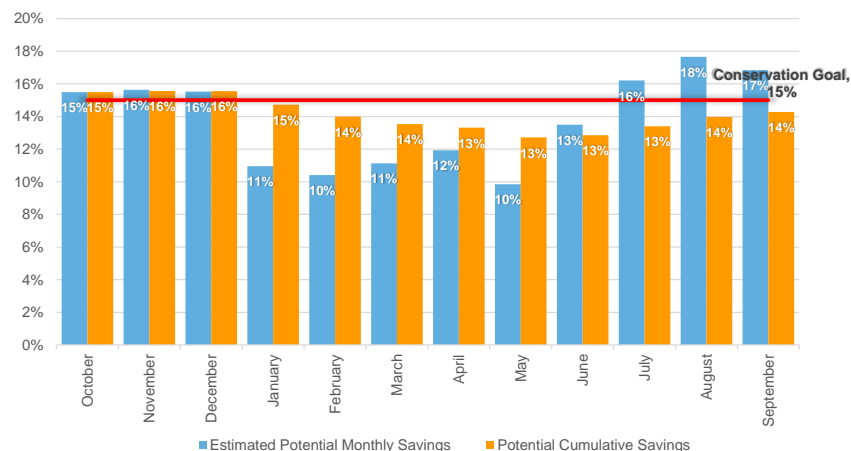
Bakersfield

Estimated Monthly Water Use and Savings Summary						
Units: <div>(mg)</div>						
	This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.					
Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	1,874	1,584	15%	15%	15%	
November	1,497	1,262	16%	16%	15%	
December	1,047	884	16%	16%	15%	
January	964	859	11%	15%	15%	
February	1,105	990	10%	14%	15%	
March	1,222	1,086	11%	14%	15%	
April	1,220	1,075	12%	13%	15%	
May	1,885	1,699	10%	13%	15%	
June	2,432	2,104	13%	13%	15%	
July	2,589	2,170	16%	13%	15%	
August	2,426	1,998	18%	14%	15%	
September	2,135	1,775	17%	14%	15%	

Baseline Year(s) Production vs. Estimated Production



Estimated Potential Monthly Water Savings





Drought Response Tool

[Home](#)[Input Baseline
Year Water Use](#)[Baseline Year
Water Use
Profile](#)[Drought
Response
Actions](#)[Estimated
Water Savings](#)[Drought
Response
Tracking](#)

1 - Home Bakersfield

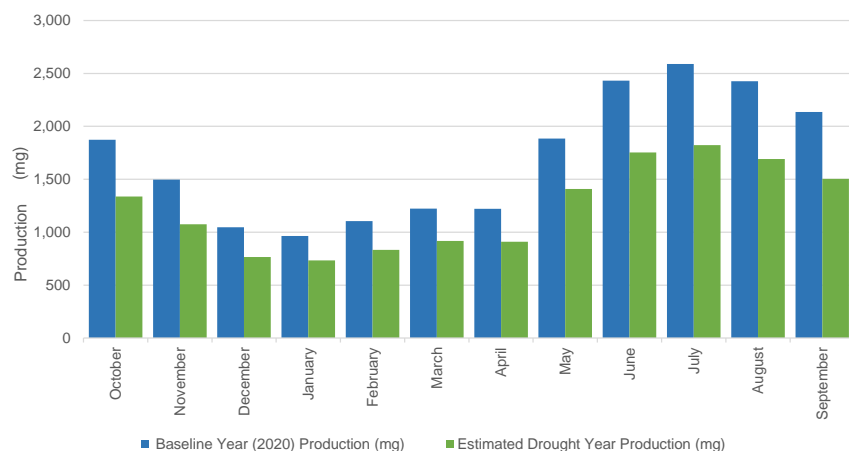
Enter Agency Information	
Agency Name	Bakersfield
Total Population Served	285,590
Conservation Goal (%)	25%
Drought Stage	Stage 3
Number of Residential Accounts	56,795
Number of Commercial, Industrial, and Institutional (CII) Accounts	15,141
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	73%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	63%
Comments	BK

5 - Estimated Water Savings - Stage 3

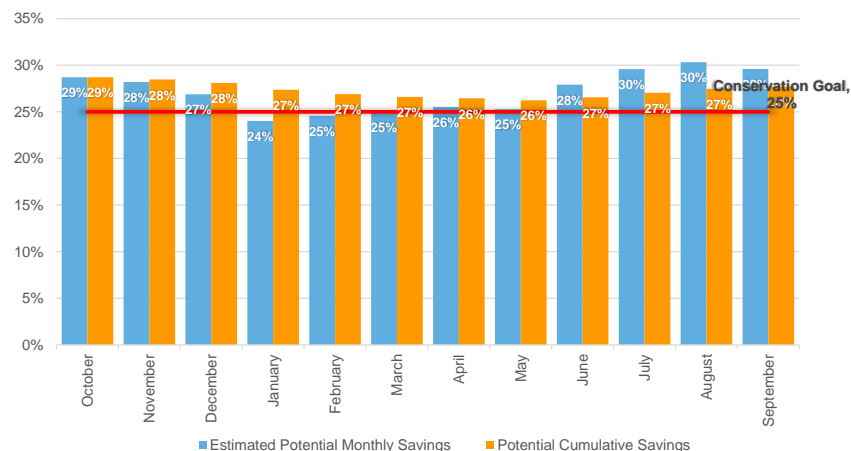
Bakersfield

Estimated Monthly Water Use and Savings Summary						
Units: <div>(mg)</div>		<div><div></div><div>This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.</div></div>				
Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	1,874	1,336	29%	29%	25%	
November	1,497	1,075	28%	28%	25%	
December	1,047	765	27%	28%	25%	
January	964	733	24%	27%	25%	
February	1,105	833	25%	27%	25%	
March	1,222	917	25%	27%	25%	
April	1,220	909	26%	26%	25%	
May	1,885	1,408	25%	26%	25%	
June	2,432	1,753	28%	27%	25%	
July	2,589	1,823	30%	27%	25%	
August	2,426	1,691	30%	27%	25%	
September	2,135	1,503	30%	28%	25%	

Baseline Year(s) Production vs. Estimated Production



Estimated Potential Monthly Water Savings





Drought Response Tool


[Home](#)[Input Baseline
Year Water Use](#)[Baseline Year
Water Use
Profile](#)[Drought
Response
Actions](#)[Estimated
Water Savings](#)[Drought
Response
Tracking](#)

1 - Home Bakersfield

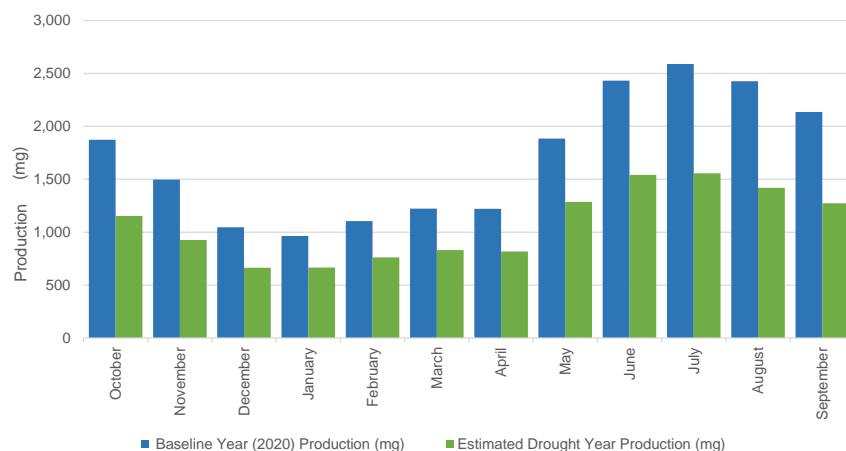
Enter Agency Information	
Agency Name	Bakersfield
Total Population Served	285,590
Conservation Goal (%)	35%
Drought Stage	Stage 4
Number of Residential Accounts	56,795
Number of Commercial, Industrial, and Institutional (CII) Accounts	15,141
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	73%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	63%
Comments	BK

5 - Estimated Water Savings - Stage 4

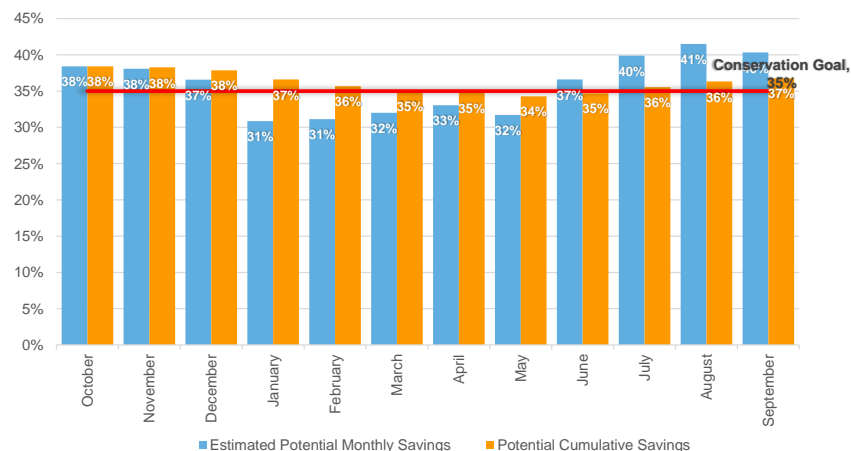
Bakersfield

Estimated Monthly Water Use and Savings Summary						
Units: <div>(mg)</div>						
	This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.					
Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	1,874	1,154	38%	38%	35%	
November	1,497	927	38%	38%	35%	
December	1,047	664	37%	38%	35%	
January	964	667	31%	37%	35%	
February	1,105	761	31%	36%	35%	
March	1,222	831	32%	35%	35%	
April	1,220	817	33%	35%	35%	
May	1,885	1,287	32%	34%	35%	
June	2,432	1,542	37%	35%	35%	
July	2,589	1,557	40%	36%	35%	
August	2,426	1,419	41%	36%	35%	
September	2,135	1,274	40%	37%	35%	

Baseline Year(s) Production vs. Estimated Production



Estimated Potential Monthly Water Savings





Drought Response Tool

[Home](#)[Input Baseline
Year Water Use](#)[Baseline Year
Water Use
Profile](#)[Drought
Response
Actions](#)[Estimated
Water Savings](#)[Drought
Response
Tracking](#)

1 - Home Bakersfield

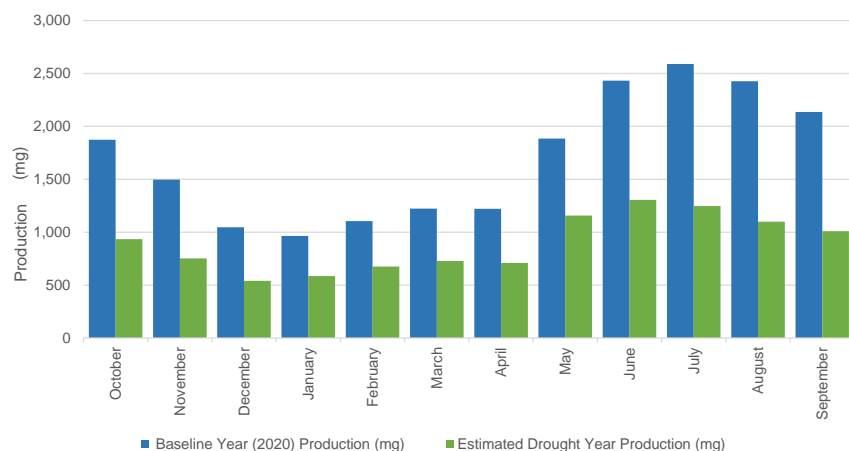
Enter Agency Information	
Agency Name	Bakersfield
Total Population Served	285,590
Conservation Goal (%)	45%
Drought Stage	Stage 5
Number of Residential Accounts	56,795
Number of Commercial, Industrial, and Institutional (CII) Accounts	15,141
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	73%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	63%
Comments	BK

5 - Estimated Water Savings - Stage 5

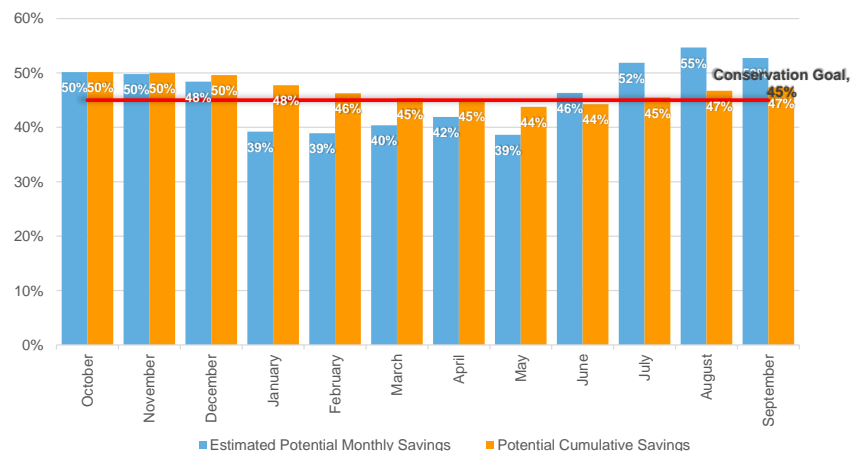
Bakersfield

Estimated Monthly Water Use and Savings Summary						
Units: <div>(mg)</div>						
<div><div></div><div>This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.</div></div>						
Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	1,874	934	50%	50%	45%	
November	1,497	751	50%	50%	45%	
December	1,047	540	48%	50%	45%	
January	964	586	39%	48%	45%	
February	1,105	675	39%	46%	45%	
March	1,222	728	40%	45%	45%	
April	1,220	709	42%	45%	45%	
May	1,885	1,157	39%	44%	45%	
June	2,432	1,305	46%	44%	45%	
July	2,589	1,246	52%	45%	45%	
August	2,426	1,099	55%	47%	45%	
September	2,135	1,009	53%	47%	45%	

Baseline Year(s) Production vs. Estimated Production



Estimated Potential Monthly Water Savings





Drought Response Tool

[Home](#)[Input Baseline
Year Water Use](#)[Baseline Year
Water Use
Profile](#)[Drought
Response
Actions](#)[Estimated
Water Savings](#)[Drought
Response
Tracking](#)

1 - Home Bakersfield

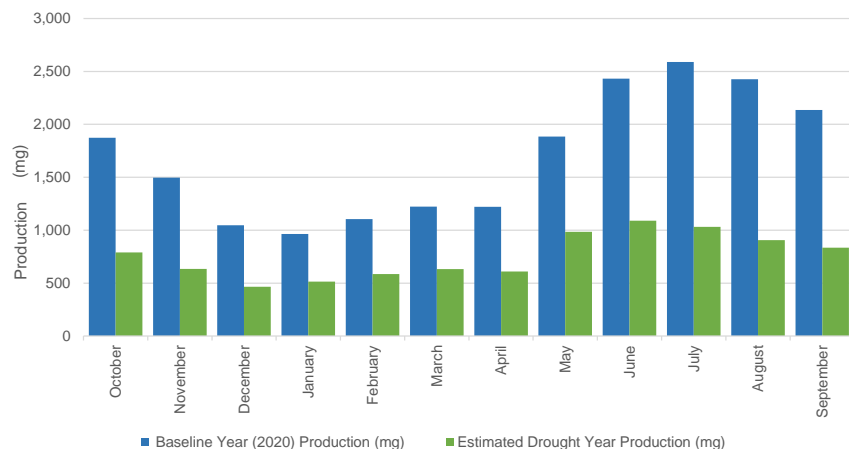
Enter Agency Information	
Agency Name	Bakersfield
Total Population Served	285,590
Conservation Goal (%)	55%
Drought Stage	Stage 6
Number of Residential Accounts	56,795
Number of Commercial, Industrial, and Institutional (CII) Accounts	15,141
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	73%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	63%
Comments	BK

5 - Estimated Water Savings - Stage 6

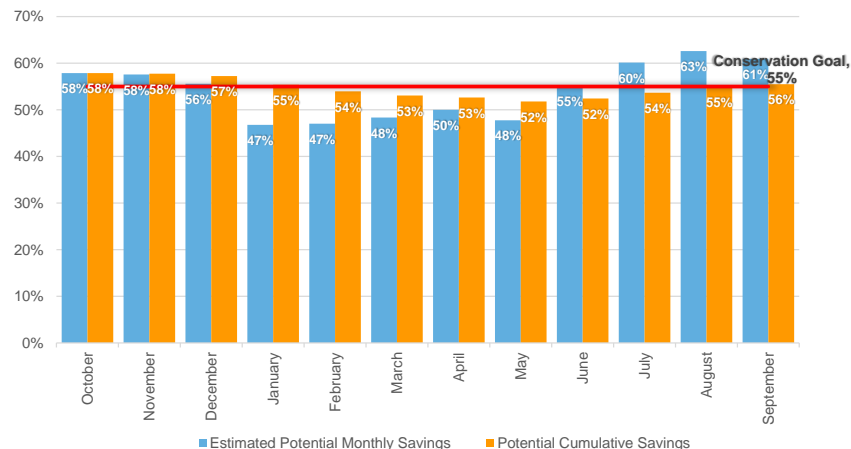
Bakersfield

Estimated Monthly Water Use and Savings Summary						
Units: <input type="text" value="(mg)"/>						
<i>This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.</i>						
Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	1,874	789	58%	58%	55%	
November	1,497	635	58%	58%	55%	
December	1,047	465	56%	57%	55%	
January	964	513	47%	55%	55%	
February	1,105	585	47%	54%	55%	
March	1,222	631	48%	53%	55%	
April	1,220	610	50%	53%	55%	
May	1,885	985	48%	52%	55%	
June	2,432	1,090	55%	52%	55%	
July	2,589	1,032	60%	54%	55%	
August	2,426	907	63%	55%	55%	
September	2,135	834	61%	56%	55%	

Baseline Year(s) Production vs. Estimated Production



Estimated Potential Monthly Water Savings



Attachment B
CPUC Rule and Schedule 14.1

Rule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 1)

(T)

A. APPLICABILITY

(N)

1. This schedule applies to all of California Water Service's regulated ratemaking areas in California, as well as Grand Oaks Water.

B. GENERAL INFORMATION

1. All expenses incurred by utility to implement Rule 14.1, and Schedule 14.1, and requirements of the California State Water Resources Control Board ("Water Board") that have not been considered in a General Rate Case or other proceeding shall be accumulated by Cal Water in a separate memorandum account, authorized in Resolution W-4976, for disposition as directed or authorized from time to time by the Commission.
2. To the extent that a Stage of Mandatory Water Use Restrictions in Schedule 14.1 has been activated, and a provision in this Rule is inconsistent with the activated Stage in Schedule 14.1, the provisions of Schedule 14.1 apply.

C. DEFINITIONS

For the purposes of this Rule, the following terms have the meanings set forth in this section.

1. "Commercial nursery" means the use of land, buildings or structures for the growing and/or storing of flowers, fruit trees, ornamental trees, vegetable plants, shrubs, trees and similar vegetation for the purpose of transplanting, for use as stock or grafting, and includes the retail sale or wholesale distribution of such items directly from the premises/lot.
2. "Drip irrigation system" means a non-spray, low-pressure, and low volume irrigation system utilizing emission devices with a precipitation or flow rate measured in gallons per hour (GPH), designed to slowly apply small volumes of water at or near the root zone of plants or other landscaping.
3. "Flow rate" means the rate at which water flows through pipes, valves, and emission devices, measured in gallons per minute (GPM), gallons per hour (GPH), inches per hour (IPH), hundred cubic feet (Ccf), or cubic feet per second (CFS).
4. "Flow-restricting device" means valves, orifices, or other devices that reduce the flow of potable water through a service line, which are capable of passing a minimum of 3 Ccf per person, per month, based upon the U.S. Census calculation of the average number of people in a household in the area.
5. "High-efficiency sprinkler systems" means an irrigation system with emission devices, such as sprinkler heads or nozzles, with a precipitation or flow rate no greater than one IPH.
6. "Irrigation" means the application of potable water by artificial means to landscape.
7. "Irrigation system" means the components of a system meant to apply water to an area for the purpose of irrigation, including, but not limited to, piping, fittings, sprinkler heads or nozzles, drip tubing, valves, and control wiring.
8. "Landscape" means all of the outdoor planting areas, turf areas, and water features at a particular location.
9. "Measureable rainfall" means any amount of precipitation of more than one-tenth of an inch (0.1").
10. "Micro spray irrigation system" means a low-pressure, low-volume irrigation system utilizing emission devices that spray, mist, sprinkle, or drip with a precipitation or flow rate measured in GPH, designed to slowly apply small volumes of water to a specific area.

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(To be inserted by Cal. P.U.C.)

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Vice President

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WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 2)

C. DEFINITIONS (Continued)

11. "Ornamental landscape" means shrubs, bushes, flowers, ground cover, turf, lawns, and grass planted for the purpose of improving the aesthetic appearance of property, but does not include crops or other agricultural products or special landscape areas.
12. "Ornamental turf" means a ground cover surface of grass that can be mowed and is planted for the purpose of improving the aesthetic appearance of the property, but does not include crops or other agricultural products or special landscape areas.
13. "Plumbing fixture" means a receptacle or device that is connected to a water supply system, including, but not limited to, pipes, toilets, urinals, showerheads, faucets, washing machines, water heaters, tubs, and dishwashers.
14. "Potable water" means water supplied by Cal Water which conforms to the federal and state standards for human consumption.
15. "Properly programmed" means a smart irrigation controller that has been programmed according to the manufacturer's instructions and site-specific conditions.
16. "Real-time water measurement device" means a device or system that provides regularly updated electronic information regarding the customer's water use.
17. "Runoff" means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape onto other areas.
18. "Smart irrigation controller" means an automatic device used to remotely control valves that operate an irrigation system that has been tested by an American National Standards Institute accredited third-party certifying body or laboratory in accordance with the Environmental Protection Agency's WaterSense program (or an analogous successor program), and certified by such body or laboratory as meeting the performance and efficiency requirements of such program, or the more stringent performance and efficiency requirements of another similar program.
19. "Special landscape area" means an area of the landscape dedicated solely to edible plants and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.
20. "Turf" means a ground cover surface of grass that can be mowed.
21. "Water feature" means a design element where open, artificially supplied water performs an aesthetic or recreation feature, including, but not limited to, ponds, lakes, waterfalls, fountains, and streams.
22. "Water use evaluation" means an evaluation of the efficiency of indoor water-using devices, including, but not limited to, measurement of flow rates for all existing showerheads, faucets, and toilets, inspection for leaks, and providing written recommendations to improve the efficiency of the indoor water-using fixtures and devices and/or an evaluation of the performance of an irrigation system, including, but not limited to, inspection for leaks, reporting of overspray or runoff, and providing written recommendations to improve the performance of the irrigation system.

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WATER SHORTAGE CONTINGENCY PLAN (continued)

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D. ENFORCEMENT

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Each Stage of this Rule establishes certain restrictions on the use of potable water. Violating the restrictions set forth in a particular Stage while it is in effect is declared a non-essential, wasteful use of potable water. Subject to the schedule and conditions outlined below, Cal Water is authorized to install a flow-restricting device on the service line of any customer when its personnel verify a customer is using potable water for non-essential, wasteful uses. No person shall have any right or claim in law or in equity, against Cal Water because of, or as a result of, any matter or thing done or threatened to be done pursuant to the restrictions on using potable water for non-essential, wasteful uses.

1. FIRST VIOLATION: Cal Water shall provide the customer with a written notice of violation.
2. SECOND VIOLATION: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation and is authorized to install a flow-restricting device on the customer's service line. Cal Water shall not be held liable for any injuries, damages, and/or consequences arising from the installation of a flow restricting device.
3. NOTICES OF VIOLATION:
 - A. Written notices of violation provided to customers pursuant to this Rule shall document the verified violation and alert the customer to the fact that future violations of the restricted uses of potable water may result in the installation of a flow-restricting device on the customer's service line or the discontinuation of the customer's service.
 - B. If Cal Water elects to install a flow-restricting device on a customer's service line, the written notice of violation shall explain that a flow-restricting device has or will be installed on the customer's service line, document the steps the customer must take in order for the flow-restricting device to be removed, and explain that after the flow-restricting device is removed, it may be reinstalled, without further notice, if the customer is again verified by Cal Water's personnel to be using potable water for non-essential, wasteful uses.
4. FLOW RESTRICTING DEVICE CONDITIONS: The installation of a flow-restricting device on a customer's service line is subject to the following conditions:
 - a. The device shall be capable of providing the premise with a minimum of 3 Ccf per person, per month, based upon the U.S. Census calculation of the average number of people in a household in the area.
 - b. The device may only be removed by Cal Water, and only after a minimum three-day period has elapsed.
 - c. Any tampering with the device may result in the discontinuation of the customer's water service and the customer being charged for any damage to Cal Water's equipment or facilities and any required service visits.

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WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 4)

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D. ENFORCEMENT (Continued)

(N)

d. After the removal of the device, if Cal Water verifies that the customer is using potable water for non-essential, wasteful uses, Cal Water may install another flow-restricting device without prior notice. This device may remain in place until water supply conditions warrant its removal. If, despite the installation of the device, Cal Water verifies that the customer is using potable water for non-essential and, unauthorized wasteful uses, then Cal Water may discontinue the customer's water service, as provided in its Rule No. 11.

5. **FLOW-RESTRICTING DEVICE REMOVAL CHARGES:** The charge to customers for removal of a flow-restricting device installed pursuant to this Rule is \$100 during normal business hours, and \$150 for the device to be removed outside of normal business hours.

E. WASTEFUL USES OF WATER

Except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency, customers are prohibited, at all times, from using potable water for the following actions, as each is declared a non-essential, wasteful use of water:

1. Use of potable water through a broken or defective plumbing fixture or irrigation system when Cal Water has notified the customer in writing to repair the broken or defective plumbing fixture or irrigation system, and the customer has failed to effect such repairs within seven (7) business days of receipt of such notice;
2. The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;
3. The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

F. MANDATORY STAGED RESTRICTIONS OF WATER USE

1. **ADOPTION OF STAGED MANDATORY RESTRICTIONS:** Cal Water may implement the following staged mandatory restrictions of water use, after notifying the Director of the Commission's Division of Water and Audits (DWA), by a Tier 1 advice letter in both hard-copy and emailed formats, of Cal Water's intent to implement a particular stage, if:
 - a. Water supplies are projected to be insufficient to meet normal customer demand by Cal Water; or
 - b. A water supply shortage or threatened shortage exists; or
 - c. Water supplies are curtailed by a wholesale water supplier; or
 - d. Directed to do so under a duly adopted emergency regulation by the Commission or other authorized government agencies.

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WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 5)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

2. **PUBLIC NOTICE:** Thirty (30) days prior to implementing a mandatory staged reduction in water use in this Rule, Cal Water shall notify its customer of the requirements of the particular stage implemented by Cal Water by bill insert, direct mailing, email, or bill message directing the customer to additional information on Cal Water's website.
3. **STAGE 1 WATER SHORTAGE:** A Stage 1 Water Shortage occurs when Cal Water, the Commission, a wholesale water supplier, or other authorized government agency determines that measures are needed to reduce water consumption by customers served by public water suppliers. In addition to the prohibitions outlined in **Section E**, the following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency:
 - a. Outdoor Irrigation Restrictions (Stage 1)
 - i. Irrigating ornamental landscapes with potable water is limited to no more than **three (3) days** per week, on a schedule established and posted by Cal Water on its website or otherwise provided to customers by bill message, bill insert, direct mail, or email, or as follows:
 1. Customers with even-numbered addresses may irrigate on Saturdays, Tuesdays, and Thursdays.
 2. Customers with odd-numbered addresses may irrigate on Sundays, Wednesdays, and Fridays.
 3. Customers without a street address may irrigate on Saturdays, Tuesdays, and Thursdays.
 4. Notwithstanding the foregoing restrictions, irrigation of special landscape areas or commercial nurseries may occur as needed, provided that the customer who wishes to irrigate a special landscape area or commercial nursery presents Cal Water with a plan to achieve water use reductions commensurate with those that would be achieved by complying with foregoing restrictions.
 5. Notwithstanding the foregoing restrictions, when a city, county, or other local public agency in one of Cal Water's service areas duly adopts restrictions on the number of days or hours of the day that customers may irrigate which are different than those adopted by Cal Water, Cal Water may enforce the city, county, or other local public agency's restrictions.
 - ii. Irrigating ornamental landscape with potable water is prohibited during the hours between **8:00 a.m. and 6:00 p.m.**
 - iii. The foregoing restrictions do **not** apply to:
 1. Landscape irrigation zones that exclusively use drip irrigation systems and/or micro spray irrigation system;

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WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 6)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 1 (cont.)]

2. Irrigating ornamental landscapes with the use of a hand-held bucket or similar container, with a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored, or for the express purpose of adjusting or repairing an irrigation system.
- b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixture(s) or irrigation system(s) must be repaired within **five (5) business days** of written notification by Cal Water, unless other arrangements are made with Cal Water.
- c. **Prohibited** Uses of Water: Customers are prohibited from using potable water for the following actions:
 - i. The application of potable water to driveways and sidewalks;
 - ii. The use of potable water in a water feature, except where the water is part of a recirculating system;
 - iii. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall.
- d. Other duly adopted restrictions on the use potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.
4. **STAGE 2 WATER SHORTAGE:** A Stage 2 Water Shortage occurs when the Stage 1 Water Shortage restrictions are deemed insufficient to achieve identified water use goals established by Cal Water, the Commission, a wholesale water supplier, or other authorized government agency. In addition to the prohibited wasteful water use practices listed in Section D, the following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency. Differences from or additions to the previous Stage are underlined.
 - a. Outdoor Irrigation Restrictions (Stage 2)
 - i. Irrigating ornamental landscapes with potable water is limited to no more than **three (3) days** per week, on a schedule established and posted by Cal Water on its website or otherwise provided to customers by bill message, bill insert, direct mail, or email, or as follows:
 1. Customers with even-numbered addresses may irrigate on Saturdays, Tuesdays, and Thursdays.
 2. Customers with odd-numbered addresses may irrigate on Sundays, Wednesdays, and Fridays.

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WATER SHORTAGE CONTINGENCY PLAN (continued)

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F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 2 (cont.)]

3. Customers without a street address may irrigate on Saturdays, Tuesdays, and Thursdays.
 4. Notwithstanding the foregoing restrictions, irrigation of special landscape areas or commercial nurseries may occur as needed, provided that the customer who wishes to irrigate a special landscape area or commercial nursery presents Cal Water with a plan to achieve water use reductions commensurate with those that would be achieved by complying with foregoing restrictions.
 5. Notwithstanding the foregoing restrictions, when a city, county, or other public agency in one of Cal Water's service areas duly adopts restrictions on the number of days or hours of the day that customers may irrigate which are different than those adopted by Cal Water, Cal Water may enforce the city, county, or other local public agency's restrictions.
- ii. Irrigating ornamental landscape with potable water is prohibited during the hours between **8:00 a.m. and 6:00 p.m.**
 - iii. The foregoing restrictions do **not** apply to:
 1. Landscape irrigation zones that exclusively use drip irrigation systems and/or micro spray irrigation system;
 2. Irrigating ornamental landscapes with the use of a hand-held bucket or similar container, a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored, or for the express purpose of adjusting or repairing an irrigation system.
 - b. **Obligation to Fix Leaks, Breaks or Malfunctions:** All leaks, breaks, or other malfunctions in the customer's plumbing fixture(s) or irrigation system(s) must be repaired within **three (3) business days** of written notification by Cal Water, unless other arrangements are made with Cal Water.
 - c. **Prohibited Uses of Water:** Customers are prohibited from using potable water for the following actions:
 - i. The application of potable water to driveways and sidewalks;
 - ii. The use of potable water in a water feature, except where the water is part of a recirculating system;
 - iii. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall;
 - iv. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;

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WATER SHORTAGE CONTINGENCY PLAN (continued)

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F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 2 (cont.)]

- v. Irrigation of ornamental landscape on public street medians;
 - vi. Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.
 - d. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.
 - e. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Rule.
 - f. Other duly adopted restrictions on the use of potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.
5. STAGE 3 WATER SHORTAGE: A Stage 3 Water Shortage occurs when the Stage 2 Water Shortage restrictions are deemed insufficient to achieve identified water use goals established by Cal Water, the Commission, a wholesale water supplier, or other authorized government agency. In addition to the prohibited wasteful water use practices listed in Section D, the following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency. Differences from or additions to the previous Stages are underlined.

a. Outdoor Irrigation Restrictions

- i. Irrigating ornamental landscapes with potable water is limited to no more than **two (2) days** per week, on a schedule established and posted by Cal Water on its website or otherwise provided to customers by bill message, bill insert, direct mail, or email, or as follows:
 - 1. Customers with even-numbered addresses may irrigate on Saturdays and Tuesdays (previous Stages allowed Thursdays as well).
 - 2. Customers with odd-numbered addresses may irrigate on Sundays and Wednesdays (previous Stages allowed Fridays as well).
 - 3. Customers without a street address may irrigate on Saturdays and Tuesdays (previous Stages allowed Thursdays as well).

(N)

(continued)

(To be inserted by utility)

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Advice Letter No. 2167-A

PAUL G. TOWNSLEY

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Vice President

Effective _____

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Rule No. 14.1

(N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 9)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 3 (cont.)]

4. Notwithstanding the foregoing restrictions, irrigation of special landscape areas or commercial nurseries may occur as needed, provided that the customer who wishes to irrigate a special landscape area or commercial nursery presents Cal Water with a plan to achieve water use reductions commensurate with those that would be achieved by complying with foregoing restrictions.
5. Notwithstanding the foregoing restrictions, when a city, county, or other local public agency in one of Cal Water's service areas duly adopts restrictions on the number of days or hours of the day that customers may irrigate which are different than those adopted by Cal Water, Cal Water may enforce the city, county, or other local public agency's restrictions.
- ii. Irrigating ornamental landscape with potable water is prohibited during the hours between **8:00 a.m. and 6:00 p.m.**
- iii. The foregoing restrictions do **not** apply to:
 1. Landscape irrigation zones that exclusively use drip irrigation systems and/or micro spray irrigation system;
 2. Irrigating ornamental landscapes with the use of a hand-held bucket or similar container, a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored, or for the express purpose of adjusting or repairing an irrigation system.
- b. **Obligation to Fix Leaks, Breaks or Malfunctions:** All leaks, breaks, or other malfunctions in the customer's plumbing fixtures and/or irrigation system must be repaired within **two (2) business days** of written notification by Cal Water, unless other arrangements are made with Cal Water.
- c. **Prohibited Uses of Water:** Customers are prohibited from using potable water for the following actions:
 - i. The application of potable water to driveways and sidewalks;
 - ii. The use of potable water in a water feature, except where the water is part of a recirculating system;
 - iii. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall;
 - iv. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;
 - v. Irrigation of ornamental turf on public street medians;
 - vi. Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.
 - vii. Use of potable water for street cleaning with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible);

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WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 10)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 3 (cont.)]

- viii. Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.
- d. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.
- e. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Rule.
- f. Other duly adopted restrictions on the use of potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.
6. STAGE 4 WATER SHORTAGE: A Stage 4 Water Shortage occurs when the Stage 3 Water Shortage restrictions are deemed insufficient to achieve identified water use goals established by Cal Water, the Commission, a wholesale water supplier, or other authorized government agency. In addition to the prohibited wasteful water use practices listed in Section D, the following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency. Differences from or additions to the previous Stage are underlined.
- a. Irrigating ornamental landscape with potable water is prohibited, except when a hand-held bucket or a similar container, or a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored is used to maintain vegetation, including trees and shrubs.
- b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixtures or irrigation system must be repaired within **one (1) business day** of written notification by Cal Water, unless other arrangements are made with Cal Water.

Prohibited Uses of Water: Customers are prohibited from using potable water for the following actions:

- i. The application of potable water to driveways and sidewalks;
- ii. The use of potable water in a water feature, except where the water is part of a recirculating system;
- iii. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall;

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WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 11)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 4 (cont.)]

- iv. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;

[Note that items previously identified as (v) and (vi) in Stage 3 have been eliminated.]

- v. Use of potable water for street cleaning with trucks (the previous Stage allowed certain exceptions);

- vi. Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses (the previous Stage allowed certain exceptions).

- c. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.

- d. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Rule.

- f. Other duly adopted restrictions on the use of utility-supplied potable water as prescribed from time to time by the Commission or other authorized government agencies, commissions, or officials are incorporated herein by reference.

G. ADOPTION OF STAGED MANDATORY WATER USE REDUCTIONS (for Schedule 14.1)

1. ADDITION OF SCHEDULE 14.1: If, in the opinion of Cal Water, more stringent water conservation measures are required due to supply conditions or government directive, Cal Water may request the addition of a Schedule No. 14.1 – Staged Mandatory Water Use Reductions, via a Tier 2 advice letter.

- A. Cal Water may not activate Schedule No. 14.1 until it has been authorized to do so by the California Public Utilities Commission, as delegated to its Division of Water and Audits.

- B. A Schedule No. 14.1 that has been authorized by the California Public Utilities Commission shall remain dormant until triggered by specific conditions detailed in the Schedule 14.1 tariff and Cal Water has requested and received authorization for activating a stage by the California Public Utilities Commission.

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Rule No. 14.1

(N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 12)

G. ADOPTION OF STAGED MANDATORY WATER USE REDUCTIONS (for Schedule 14.1) (continued)

- c. Notice of the Tier 2 advice letter and associated public participation hearing, if required, shall be provided to customers through a bill insert or a direct mailing, as set forth in Subsection 5 (Public Notice) below.
 - d. Cal Water shall comply with all requirements of Sections 350-358 of the California Water Code.
 - e. The Tier 2 advice letter requesting the addition of a Schedule No. 14.1 shall include, but not be limited to:
 - i. A proposed Schedule No. 14.1 tariff, which shall include but not be limited to:
 - 1. Applicability,
 - 2. Territory applicable to,
 - 3. A detailed description of each stage of water budgets (the number of stages requested for a ratemaking area may vary depending on the specifics of the water shortage event),
 - 4. A detailed description of the trigger(s) that activates each stage of water budgets,
 - 5. A detailed description of each water use restriction for each stage of water budgets,
 - 6. Water use violation levels, written warning levels, associated fines, if applicable, and exception procedures,
 - 7. Conditions for installation of a flow restrictor,
 - 8. Charges for removal of flow restrictors, and
 - 9. Special conditions
 - ii. Justification for, and documentation and calculations in support of the water budgets.
2. Conditions for Activating Schedule No. 14.1: Cal Water may file a Tier 1 advice letter to request activation of a particular stage of its Schedule No. 14.1 tariff if:
- a. Cal Water, the California Public Utilities Commission, wholesale water supplier, or other government agency declares an emergency requiring mandatory water budgets, mandatory water rationing, or mandatory water allocations; or
 - b. A government agency declares a state of emergency in response to severe drought conditions, earthquake or other catastrophic event that severely reduces Cal Water's water supply; or
 - c. Cal Water is unable to achieve water conservation targets set by itself; or
 - d. Water conservation targets set by itself or a governing agency are insufficient; or
 - e. Cal Water chooses to subsequently activate a different stage of its Schedule No. 14.1 tariff.

(continued)

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Rule No. 14.1

(N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 13)

G. ADOPTION OF STAGED MANDATORY WATER USE REDUCTIONS (for Schedule 14.1) (continued)

- a. Include, but not be limited to, a justification for activating the particular stage of mandatory water use reductions, as well as the period during which the particular stage will be in effect.
 - b. Be accompanied by the customer notification measures detailed in sub-section 5 (Public Notice) below.
4. De-Activating Schedule No. 14.1: When Schedule No. 14.1 is activated and Cal Water determines that water supplies are again sufficient to meet normal demands, and mandatory water use reductions are no longer necessary, Cal Water shall seek the approval of the California Public Utilities Commission, via a Tier 1 advice letter, to deactivate the particular stage of mandatory water use reductions that had been authorized.
5. Public Notice
- a. When Cal Water requests the addition of a Schedule 14.1 – Staged Mandatory Water Use Reductions Tariff, via a Tier 2 advice letter, it shall provide notice of the Tier 2 advice letter and associated public hearing provided to customers through bill inserts or direct mailing, and it shall comply with all requirements of Sections 350-358 of the California Water Code (CWC), including but not limited to the following:
 - i. In order to be in compliance with both the General Order 96-B and CWC, notice shall be provided via both newspaper and bill insert/direct mailing.
 - ii. One notice shall be provided for each advice letter filed, that includes both notice of the filing of the Tier 2 advice letter as well as the details of the public hearing (date, time, place, etc.).
 - iii. The public meeting shall be held after the Tier 2 advice letter is filed, and before the Commission authorizes the addition of Schedule 14.1 to the tariff except in cases of emergency water shortages approved by DWA.
 - iv. Cal Water shall consult with Division of Water and Audits staff prior to filing advice letter, in order to determine details of public meeting.
 - b. In the event that Schedule No. 14.1- Staged Mandatory Water Use Reductions Tariff is triggered, and Cal Water requests activation through the filing of a Tier 1 advice letter, Cal Water shall notify its customers and provide each customer with a summary of Schedule No. 14.1 by means of bill insert or direct mailing. Notification shall take place prior to imposing any penalties associated with this plan. If activation of Schedule No. 14.1 occurs one year or more since the public hearing associated with adding Schedule 14.1 to its tariffs, then Cal Water shall conduct a public hearing pursuant to California Water Code Section 351 prior to activating a stage of its Mandatory Water Use Reduction Tariff.
 - c. During the period that a stage of Schedule No. 14.1 is activated, Cal Water shall provide customers with updates in at least every other bill, regarding its water supply status and the results of customers' conservation efforts.

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(To be inserted by utility)

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Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES

Page 1

A. APPLICABILITY

1. This schedule applies to all of California Water Service's regulated ratemaking areas in California, as well as Grand Oaks Water.

B. GENERAL INFORMATION

1. All expenses incurred by California Water Service to implement Rule 14.1, and Schedule 14.1, and requirements of the California State Water Resources Control Board ("Water Board") that have not been considered in a General Rate Case or other proceeding shall be accumulated by Cal Water in a separate memorandum account, authorized in Resolution W-4976, for disposition as directed or authorized from time to time by the Commission.
2. All monies collected by Cal Water through waste of water penalties established in this schedule shall be recorded in the appropriate memorandum account and used to offset the expenses described in Section 1 above.
3. Except in the case of Grand Oaks, all monies collected by Cal Water through drought surcharges, as established by the Mandatory Water Budgets found in Schedule 14.1, shall be recorded in the appropriate Water Revenue Adjustment Mechanism ("WRAM") account and used to offset under-collected revenues.
4. To the extent that any provision in this Schedule is inconsistent with Rule 14.1, the provisions of this Schedule apply.

5. On April 1, 2015, the Governor of the State of California issued Executive Order B-29-15 due to severe drought conditions. The Executive Order, among other requirements, directs the State Water Resources Control Board ("Water Board") to impose restrictions on urban water suppliers like Cal Water to achieve a statewide 25% reduction in potable urban usage, as compared with the amount used in 2013, through February 2016.

Urban water suppliers must develop rate structures and other pricing mechanisms, such as surcharges and penalties, to achieve 25% water conservation.

6. On May 5, 2015, the Water Board issued an Emergency Regulation by Resolution No. 2015-0032 due to continuing drought conditions with specific water use reductions, by service area, and prohibitions on how end-use customers can use potable water. On May 7, 2015, the California Public Utilities Commission ("Commission") issued Resolution W-5041 ordering compliance with the mandates of the Governor and the Water Board.
7. On November 13, 2015, the Governor of the State of California issued Executive Order B-36-15 that directed the Water Board to, if drought conditions persist through January 2016, extend until October 31, 2016 restrictions to achieve a statewide reduction in potable usage.
8. On February 2, 2016, the Water Board adopted an extended and revised Emergency Regulation due to continuing drought conditions. On February 11, 2016, the Commission issued Resolution W-5082 ordering compliance with the mandates of the Governor and the Water Board.

C. DEFINITIONS

For the purposes of this Schedule, the following terms have the meanings set forth in this section.
(These are the same as in Rule 14.1, unless otherwise specified.)

1. "Commercial nursery" means the use of land, buildings or structures for the growing and/or storing of flowers, fruit trees, ornamental trees, vegetable plants, shrubs, trees and similar vegetation for the purpose of transplanting, for use as stock or grafting, and includes the retail sale or wholesale distribution of such items directly from the premises/lot.

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WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES

Page 2

C. DEFINITIONS (Continued)

2. "Drip irrigation system" means a non-spray, low-pressure, and low volume irrigation system utilizing emission devices with a precipitation or flow rate measured in gallons per hour (GPH), designed to slowly apply small volumes of water at or near the root zone of plants or other landscaping.
3. "Flow rate" means the rate at which water flows through pipes, valves, and emission devices, measured in gallons per minute (GPM), gallons per hour (GPH), inches per hour (IPH), hundred cubic feet (Ccf), or cubic feet per second (CFS).
4. "Flow-restricting device" means valves, orifices, or other devices that reduce the flow of potable water through a service line, which are capable of passing a minimum of 3 Ccf per person, per month, based upon the U.S. Census calculation of the average number of people in a household in the area.
5. "High-efficiency sprinkler systems" means an irrigation system with emission devices, such as sprinkler heads or nozzles, with a precipitation or flow rate no greater than one IPH.
6. "Irrigation" means the application of potable water by artificial means to landscape.
7. "Irrigation system" means the components of a system meant to apply water to an area for the purpose of irrigation, including, but not limited to, piping, fittings, sprinkler heads or nozzles, drip tubing, valves, and control wiring.
8. "Landscape" means all of the outdoor planting areas, turf areas, and water features at a particular location.
9. "Measureable rainfall" means any amount of precipitation of more than one-tenth of an inch (0.1").
10. "Micro spray irrigation system" means a low-pressure, low-volume irrigation system utilizing emission devices that spray, mist, sprinkle, or drip with a precipitation or flow rate measured in GPH, designed to slowly apply small volumes of water to a specific area.
11. "Ornamental landscape" means shrubs, bushes, flowers, ground cover, turf, lawns, and grass planted for the purpose of improving the aesthetic appearance of property, but does not include crops or other agricultural products or special landscape areas.
12. "Ornamental turf" means a ground cover surface of grass that can be mowed and is planted for the purpose of improving the aesthetic appearance of the property, but does not include crops or other agricultural products or special landscape areas.
13. "Plumbing fixture" means a receptacle or device that is connected to a water supply system, including, but not limited to, pipes, toilets, urinals, showerheads, faucets, washing machines, water heaters, tubs, and dishwashers.
14. "Potable water" means water supplied by Cal Water which conforms to the federal and state standards for human consumption.
15. "Properly programmed" means a smart irrigation controller that has been programmed according to the manufacturer's instructions and site-specific conditions.
16. "Real-time water measurement device" means a device or system that provides regularly updated electronic information regarding the customer's water use.
17. "Runoff" means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape onto other areas.
18. "Smart irrigation controller" means an automatic device used to remotely control valves that operate an irrigation system that has been tested by an American National Standards Institute accredited third-party certifying body or

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WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

Page 3

C. DEFINITIONS (Continued)

laboratory in accordance with the Environmental Protection Agency's WaterSense program (or an analogous successor program), and certified by such body or laboratory as meeting the performance and efficiency requirements of such program, or the more stringent performance and efficiency requirements of another similar program.

19. "Special landscape area" means an area of the landscape dedicated solely to edible plants and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.
20. "Turf" means a ground cover surface of grass that can be mowed.
21. "Water feature" means a design element where open, artificially supplied water performs an aesthetic or recreation feature, including, but not limited to, ponds, lakes, waterfalls, fountains, and streams.
22. "Water use evaluation" means an evaluation of the efficiency of indoor water-using devices, including, but not limited to, measurement of flow rates for all existing showerheads, faucets, and toilets, inspection for leaks, and providing written recommendations to improve the efficiency of the indoor water-using fixtures and devices and/or an evaluation of the performance of an irrigation system, including, but not limited to, inspection for leaks, reporting of overspray or runoff, and providing written recommendations to improve the performance of the irrigation system.

D. WASTE OF WATER PENALTIES

Each Stage of this Schedule establishes certain restrictions on the use of potable water. Violating the restrictions set forth in a particular Stage while it is in effect is declared a non-essential, wasteful use of potable water. Cal Water is authorized to take the following actions when its personnel verify a customer is using potable water for non-essential, wasteful uses. No person shall have any right or claim in law or in equity, against Cal Water because of, or as a result of, any matter or thing done or threatened to be done pursuant to the restrictions on using potable water for non-essential, wasteful uses.

Note: When a Stage in this Schedule has been activated, Section D in this Schedule supersedes Section D (Enforcement) in Rule 14.1.

- 1. FIRST VIOLATION:** Cal Water shall provide the customer with a written notice of violation. In addition, Cal Water is authorized to take the following actions:

- a. If the customer currently receives service through a metered connection, install a real-time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service. (C)
- b. If the customer does not currently receive service through a metered connection, install a water meter on the customer's service line, charge the customer for water use pursuant to Cal Water's metered service tariffs and rules, and install a real-time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service. (C)

- 2. SECOND VIOLATION:** If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation. In addition to the actions prescribed under the first violation above, Cal Water is authorized to take the following actions:

- a. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.
 - i. If Stage 1 is in effect, \$25 (Stage 1 is detailed below in Section E).
 - ii. If Stage 2 is in effect, \$50 (Stage 2 is detailed below in Section F).

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WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

Page 4

D. WASTE OF WATER PENALTIES (Continued)

iii. If Stage 3 is in effect, \$100 (Stage 3 is detailed below in Section G).

iv. If Stage 4 is in effect, \$200 (Stage 4 is detailed below in Section H).

b. At its sole discretion, waive the waste of water penalty if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high-efficiency sprinkler system, or properly programmed smart irrigation controller has been installed, after a notice of violation was delivered, and is in use at the customer's service address.

3. THIRD VIOLATION: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the second violation, Cal Water shall provide the customer with a third written notice of violation. In addition to the actions prescribed under the first and second violation above, Cal Water is authorized to take the following actions:

a. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.

i. If Stage 1 is in effect, \$50 (Stage 1 is detailed below in Section E).

ii. If Stage 2 is in effect, \$100 (Stage 2 is detailed below in Section F).

iii. If Stage 3 is in effect, \$200 (Stage 3 is detailed below in Section G).

iv. If Stage 4 is in effect, \$400 (Stage 4 is detailed below in Section H).

b. At its sole discretion, waive the waste of water surcharge if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high-efficiency sprinkler system, or properly programmed smart irrigation controller has been installed, after notice of violations have been delivered, and is in use at the customer's service address.

4. FOURTH VIOLATION: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the third violation, Cal Water shall provide the customer with a fourth written notice of violation. In addition to actions set forth in previous violations prescribed above, Cal Water is authorized to install a flow-restricting device on the customer's service line. Cal Water shall not be held liable for any injuries, damages, and/or consequences arising from the installation of a flow restricting device.

5. EGREGIOUS VIOLATIONS: Notwithstanding the foregoing framework for penalties, customers who Cal Water has verified are egregiously using potable water for non-essential, wasteful uses are subject to having a flow-restricting device installed on their service line. After providing the customer with one notice of egregious violation, either by direct mail or door hanger, which documents the egregious use of potable water for non-essential, wasteful uses and explains that failure to correct the violation may result in the installation of a flow-restricting device on the customer's service line, Cal Water is authorized to install a flow-restricting device on the customer's service line. Cal Water shall not be held liable for any injuries, damages, and/or consequences arising from the installation of a flow restricting device.

6. NOTICES OF VIOLATION:

a. Unless otherwise specified, written notices of violation provided to customers pursuant to this Schedule shall document the verified violation and alert the customer to the fact that future violations of the restricted uses of potable water may result in a real-time water measurement device being installed on the customer's service line at the customers expense, waste of water surcharges being applied to the customer's bill, the installation of a flow-restricting device on the customer's service line, or the discontinuation of the customer's service.

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WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

Page 5

D. WASTE OF WATER PENALTIES (Continued)

b. If Cal Water elects to install a flow-restricting device on a customer's service line, the written notice shall document the steps the customer must take in order for the flow-restricting device to be removed, and shall explain that after the flow-restricting device is removed, it may be reinstalled, without further notice, if the customer is again verified by Cal Water to be using potable water for non-essential, wasteful uses.

7. FLOW RESTRICTING DEVICE CONDITIONS: The installation of a flow-restricting device on a customer's service line is subject to the following conditions:

- a. The device shall be capable of providing the premise with a minimum of 3 Ccf per person, per month, based upon the U.S. Census calculation of the average number of people in a household in the area.
- b. The device may only be removed by Cal Water, and only after a minimum three-day period has elapsed.
- c. Any tampering with the device may result in the discontinuation of the customer's water service and the customer being charged for any damage to Cal Water's equipment or facilities and any required service visits.
- d. After the removal of the device, if Cal Water's personnel verify that the customer is using potable water for non-essential, wasteful uses, Cal Water may install another flow-restricting device without prior notice. This device shall remain in place until water supply conditions warrant its removal. If, despite the installation of the device, Cal Water's personnel verifies that the customer is using potable water for non-essential, wasteful uses, then Cal Water may discontinue the customer's water service, as provided in its Rule No. 11.

8. FLOW-RESTRICTING DEVICE REMOVAL CHARGES: The charge to customers for removal of a flow-restricting device installed pursuant to this Schedule is \$100 during normal business hours, and \$150 for the device to be removed outside of normal business hours.

E. STAGE ONE WATER USE RESTRICTIONS

1. WASTEFUL USES OF WATER (STAGE 1)

The following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need, or to comply with a term or condition in a permit issued by a state or federal agency:

- a. Outdoor Irrigation Restrictions (Stage 1)
 - i. Irrigating ornamental landscapes with potable water is limited to no more than **three (3) days per week**, on a schedule established and posted by Cal Water on its website or otherwise provided to customers by bill message, bill insert, direct mail, or email, or as follows:
 1. Customers with even-numbered addresses may irrigate on Saturdays, Tuesdays, and Thursdays.
 2. Customers with odd-numbered addresses may irrigate on Sundays, Wednesdays, and Fridays.
 3. Customers without a street address may irrigate on Saturdays, Tuesdays, and Thursdays.

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WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

Page 6

E. STAGE ONE WATER USE RESTRICTIONS (Continued)

4. Notwithstanding the foregoing restrictions, irrigation of special landscape areas or commercial nurseries may occur as needed, provided that the customer who wishes to irrigate a special landscape area or commercial nursery presents Cal Water with a plan to achieve water use reductions commensurate with those that would be achieved by complying with foregoing restrictions.
5. Notwithstanding the foregoing restrictions, when a city, county, or other local public agency in one of Cal Water's service areas duly adopts restrictions on the number of days or hours of the day that customers may irrigate that are different than those adopted by Cal Water, Cal Water may enforce the city, county, or other local public agency's restrictions.
- ii. Irrigating ornamental landscape with potable water is prohibited during the hours between **8:00 a.m. and 6:00 p.m.**
- iii. The foregoing restrictions do **not** apply to:
 1. Landscape irrigation zones that exclusively use drip irrigation systems and/or micro spray irrigation system;
 2. Irrigating ornamental landscapes with the use of a hand-held bucket or similar container, with a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored, or for the express purpose of adjusting or repairing an irrigation system.
- b. **Obligation to Fix Leaks, Breaks or Malfunctions:** All leaks, breaks, or other malfunctions in the customer's plumbing fixtures and/or irrigation system must be repaired within **five (5) business days** of written notification by Cal Water, unless other arrangements are made with Cal Water.
- c. **Prohibited Uses of Water:** Customers are prohibited from using potable water for the following actions:
 - i. The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;
 - ii. The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.
 - iii. The application of potable water to driveways and sidewalks;
 - iv. The use of potable water in a water feature, except where the water is part of a recirculating system;
 - v. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall (see Definitions);
 - vi. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;
 - vii. Irrigation of ornamental turf on public street medians with potable water;
 - viii. Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.
- d. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.

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WATER SHORTAGE CONTINGENCY PLAN
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E. STAGE ONE WATER USE RESTRICTIONS (Continued)

[Stage 1 (cont.)]

- e. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Schedule.
- f. Other duly adopted restrictions on the use of potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.

F. STAGE TWO WATER USE RESTRICTIONS

1. MANDATORY WATER BUDGETS AND BANKING (STAGE 2)

As described in greater detail below, the Water Board has mandated reductions in potable urban usage, as compared with the amount used in 2013, in each of Cal Water's service areas. Water suppliers must develop rate structures and other pricing mechanisms, such as surcharges and penalties, to achieve these mandated reductions

- a. **Mandatory Reduction Percentages:** The Water Board has established increasing levels of required water reduction for each service areas based upon the residential per capita per day use (R-GPCD) in that service area for the three summer months of July through September 2014. The Water Board's approach considers the relative per capita water usage in each service area and requires that those areas with high per-capita use achieve proportionally greater reductions than those with low use. The Water Board has also allowed for adjustments to these required water reductions based on specific criteria.

Each month, the Water Board determines whether a service area has met its mandatory reduction percentage by calculating cumulative savings in the service area since June 2015, and comparing those with the amount of water used during the same months in 2013.

- b. **Customer Water Budgets:** Each customer with metered potable water service (residential and non-residential customers) will receive an individualized "Water Budget" for each billing period.

- i. The Water Budget will be based on the units of water (CCF) that customer used in the same billing period in 2013, minus the Mandatory Reduction Percentage established by the Water Board for that customer's service area. A customer's Water Budget will vary according to their monthly water usage in 2013. Cal Water shall notify its customers of any changes to the Mandatory Reduction Percentage by the Water Board through bill inserts or direct mailings prior to applying the changed percentage in the requirements in this Schedule, consistent with the "Update" process described in Section F.I.d.(iv) of this Schedule. Cal Water shall also include the current Mandatory Reduction Percentage in effect for each service area on its website.

- ii. If a customer was not in his or her current location in 2013, the average monthly consumption will be used as a starting budget. If customers have a unique situation and the average budget is not appropriate, they can file an appeal to have their Water Budget increased. Cal Water may also modify the starting budget to reflect suitable use.

- iii. The Water Budget for the following billing period will appear on each customer's water bill. Customers will also be able to find their Water Budgets, and their individual water use history dating back to 2013, by going to usage.calwater.com (do not include "www"), and entering their account number, street (or house) number, and ZIP code.

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**WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)**

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F. STAGE TWO WATER USE RESTRICTIONS (continued)

(T)

1. MANDATORY WATER BUDGETS AND BANKING (STAGE 2) (continued)

(T)

c. **Minimum Water Budgets:** A minimum monthly amount of water that protects the health and safety of customers will be established for each service area as a Minimum Water Budget for single-family residential customers.

- i. No single-family residential customer will have a water budget that is below the threshold of the monthly Minimum Water Budget, even if applying the Mandatory Reduction Percentage to that customer's 2013 usage would result in a lower amount.
- ii. The Minimum Water Budget for each service area is identified in **Appendix A**. (For areas with bi-monthly billing and bi-monthly water budgets, the Minimum Water Budget in Appendix A should be doubled for the billing period.)

d. **Drought Surcharges:** If a customer uses more units of potable water (CCF) than their Water Budget in a billing period, that customer's water bill may reflect an additional "Drought Surcharge" for each unit of water over the Water Budget, depending on the amount of excess usage (according to usage tiers described below).

(T)

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- i. **Tier A and Tier B Excess Water Usage:** Excess water usage above a customer's Water Budget may fall into one or both of two tiers – Tier A and Tier B. The amount of usage in Tiers A and B varies by service area, and depends upon whether an area has met its Mandatory Reduction Percentage on a cumulative basis.

For the purposes of Drought Surcharges, each service area will fall into one of two categories – those in compliance with the Mandatory Reduction Percentage, and those not in compliance. There are two sample tables in the last section of this Schedule (**Section I**). The first sample table identifies the Tier A and B usage amounts for those service areas that are in compliance with their Mandatory Reduction Percentage, as of the date specified in **Appendix A**. The second sample table identifies the Tier A and B usage amounts for those service areas that are not in compliance with their Mandatory Reduction Percentage, as of the date specified in **Appendix A**.

(C)

- ii. **Current Surcharges and Tiers:** **Appendix A** to this schedule provides the Drought Surcharge rate per unit of water and the excess water usage in Tiers A and B that are currently in effect for each service area.

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At this time, Drought Surcharges only apply to excess water usage that falls within "Tier B." Excess water usage in Tier A constitutes a "courtesy" tier to which Drought Surcharges are not applied. As stated below under Water Banking, however, all excess water usage will be applied against a customer's "banked" water amounts, regardless of whether the usage falls within Tier A or Tier B.

(C)

Customers will continue to pay the normal tariffed rates for potable water, in addition to any applicable Drought Surcharges. Cal Water retains the right to increase the surcharges if there are changes to the rates in the future.

(T)

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- iii. **Current Compliance Status of Service Area:** **Appendix B** to this schedule provides the Mandatory Reduction Percentage adopted by the Water Board for each area, and the actual cumulative savings for each area, **as of the date specified in Appendix A. Drought Surcharges will be applied based on Tier A and B excess water usage beginning with the first day of each billing period that starts on or after March 31, 2016.**

(C)

- iv. **Updates:** An increase in the excess usage designated in Tier A, an increase in Customer Water Budgets, or a decrease in Drought Surcharge rates, are "less restrictive" tariff changes that may be implemented via a Tier 1 advice letter. A decrease in the excess usage designated in Tier A, a decrease in Customer Water Budgets, or an increase in Drought Surcharge rates are "more restrictive" tariff changes that shall be implemented by filing a Tier 2 advice letter. Cal Water shall notify its customers, and provide each customer with a summary of the changes by means of a bill insert or direct mailing, prior to the effective date of a more restrictive tariff change. A service area's compliance status, which determines the amount of excess usage designated for Tiers A and B, shall be updated no more than once every 90 days, or to implement different requirements of the Water Board as needed.

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WATER SHORTAGE CONTINGENCY PLAN

WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

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(T)

F. STAGE TWO WATER USE RESTRICTIONS (continued)

|

1. MANDATORY WATER BUDGETS AND BANKING (STAGE 2) (continued)

(T)

e. **Water Banking:** Customers will be able to “bank” unused units of water from their water budget for use in future billing periods.

(L)

i. Should a customer exceed his or her monthly budget, any banked units of water will be applied to the overage before drought surcharges are imposed.

ii. Banked water units can only offset future usage that exceeds a water budget.

f. **Water Budget Appeals:** If specified criteria are met, a customer can file an appeal to have his or her water budget increased.

i. The reasons appeals may be considered include: water use necessary for health and safety; business or economic needs, including process-water requirements; significant long-term savings achieved since 2011; average monthly water use in 2014 that is at least 50% lower than district average; and large animal care (e.g. horse).

ii. All appeals must be submitted online at www.calwater.com/appeal or via a written application form (available at www.calwater.com/appeal or from our local Customer Center).

iii. Surcharges incurred during the appeal review period may be waived if the review takes an extended period of time.

2. WASTEFUL USES OF WATER (STAGE 2)

Cal Water may continue to impose the restrictions on the wasteful use of water as outlined in Stage One, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency.

G. STAGE THREE WATER USE RESTRICTIONS

1. MANDATORY WATER BUDGETS AND BANKING (STAGE 3)

Water budgets will be based on a customer’s consumption during a historical base period and will include a percentage reduction designed to meet necessary water-use reductions. Cal Water may include provisions such as minimum water budgets to protect the health and safety of customers, and water banking allowing customers additional flexibility with regard to their required reductions.

In addition to the normal rate paid for the unit of water, a drought surcharge will be charged to a customer for each unit of water used over the established water budget for the billing period. Cal Water may implement surcharges up to three (3) times those charged in Stage 2. Cal Water will establish an appeals process for customers that will allow for requests for increased water budgets.

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G. STAGE THREE WATER USE RESTRICTIONS (Continued)

[Stage 3 (cont.)]

2. WASTEFUL USES OF WATER (STAGE 3)

The following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency.

Differences from or additions to previous Stages are underlined. (The following restrictions are the same as those provided in Stage 3 of Rule 14.1.)

a. Outdoor Irrigation Restrictions (Stage 3)

- i. Irrigating ornamental landscapes with potable water is limited to no more than **two (2) days per week**, on a schedule established and posted by Cal Water on its website or otherwise provided to customers by bill message, bill insert, direct mail, or email, or as follows:

1. Customers with even-numbered addresses may irrigate on Saturdays and Tuesdays (previous Stages allowed Thursdays as well).
2. Customers with odd-numbered addresses may irrigate on Sundays and Wednesdays (previous Stages allowed Fridays as well).
3. Customers without a street address may irrigate on Saturdays and Tuesdays (previous Stages allowed Thursdays as well).
4. Notwithstanding the foregoing restrictions, irrigation of special landscape areas or commercial nurseries may occur as needed, provided that the customer who wishes to irrigate a special landscape area or commercial nursery presents Cal Water with a plan to achieve water use reductions commensurate with those that would be achieved by complying with foregoing restrictions.
5. Notwithstanding the foregoing restrictions, when a city, county, or other local public agency in one of Cal Water's service areas duly adopts restrictions on the number of days or hours of the day that customers may irrigate which are different than those adopted by Cal Water, Cal Water may enforce the city, county, or other local public agency's restrictions.

- ii. Irrigating ornamental landscape with potable water is prohibited during the hours between **8:00 a.m. and 6:00 p.m.**

- iii. The foregoing restrictions do **not** apply to:

1. Landscape irrigation zones that exclusively use drip irrigation systems and/or micro spray irrigation system;
2. Irrigating ornamental landscapes with the use of a hand-held bucket or similar container, a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored, or for the express purpose of adjusting or repairing an irrigation system.

- b. **Obligation to Fix Leaks, Breaks or Malfunctions:** All leaks, breaks, or other malfunctions in the customer's plumbing fixtures and/or irrigation system must be repaired within **two (2) business days** of written notification by Cal Water, unless other arrangements are made with Cal Water.

- c. **Prohibited Uses of Water:** Customers are prohibited from using potable water for the following actions:

- i. The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures (note: this provision appears under Section E in Rule 14.1);

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G. STAGE THREE WATER USE RESTRICTIONS (Continued)

[Stage 3 (cont.)]

- ii. The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use (note: this provision appears under Section E in Rule 14.1).
- iii. The application of potable water to driveways and sidewalks;
- iv. The use of potable water in a water feature, except where the water is part of a recirculating system;
- v. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall;
- vi. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;
- vii. Irrigation of ornamental turf on public street medians with potable water;
- viii. Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.
- ix. Use of potable water for street cleaning with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible);
- x. Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.
- d. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.
- e. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Schedule.
- f. Other duly adopted restrictions on the use of potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.

H. STAGE FOUR WATER USE RESTRICTIONS

1. MANDATORY WATER BUDGETS AND BANKING (STAGE 4)

Water budgets will be based on a customer's consumption during a historical base period and will include a percentage reduction designed to meet necessary water-use reductions. Cal Water may include provisions such as minimum water budgets to protect the health and safety of customers, and water banking allowing customers additional flexibility with regard to their required reductions.

In addition to the normal rate paid for the unit of water, a drought surcharge will be charged to a customer for each unit of water used over the established water budget for the billing period. For Stage 4, Cal Water may implement surcharges up to three (3) times those charged in Stage 2. Cal Water may require customer consumption reductions of up to 50%.

Cal Water will establish an appeals process for customers that will allow for requests for increased water budgets.

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H. STAGE FOUR WATER USE RESTRICTIONS (Continued)

[Stage 4 (cont.)]

2. WASTEFUL USES OF WATER (STAGE 4)

The following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency. Differences from or additions to previous Stages are underlined. (The following restrictions are the same as those provided in Stage 4 of Rule 14.1.)

- a. Irrigating ornamental landscape with potable water is prohibited, except when a hand-held bucket or a similar container, or a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored is used to maintain vegetation, including trees and shrubs.
- b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixtures or irrigation system must be repaired within **one (1) business day** of written notification by Cal Water, unless other arrangements are made with Cal Water.
- c. Prohibited Uses of Water: Customers are prohibited from using potable water for the following actions:
 - i. The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;
 - ii. The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.
 - iii. The application of potable water to driveways and sidewalks;
 - iv. The use of potable water in a water feature, except where the water is part of a recirculating system;
 - v. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall;
 - vi. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;
[Note that items previously identified as (ix) and (x) in Stage 3 have been eliminated.]
 - vii. Use of potable water for street cleaning with trucks (previous Stage allowed certain exceptions);
 - viii. Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses (previous Stages allowed certain exceptions).
- d. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.
- e. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Schedule.
- f. Other duly adopted restrictions on the use of potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.

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I. SAMPLE TABLES WITH TIER A AND TIER B EXCESS USAGE AMOUNTS

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1. FOR DISTRICTS IN COMPLIANCE WITH MANDATORY REDUCTIONS

For the purposes of applying Drought Surcharges, the sample table below identifies the number of units over a customer's Water Budget (the excess usage) that falls within Tiers A and B in a district whose cumulative savings meet the Water Board's Mandatory Reduction Percentage as of the date identified in **Appendix A**.

For Districts in Compliance with Mandatory Water Reduction Targets							
District	Service Area	Tier A - No Surcharges	Tier B - Drought Surcharges Applied			Minimum Water Budget (Ccf per month)	Rate Support Fund Area (RSF)
		Units Over Water Budget	Units Over Water Budget	Surcharge per unit (Non-LIRA Customers)	Surcharge per unit (LIRA Customers)		
Antelope Valley	Fremont Valley & Lake Hughes	1-6	7+	\$4.5200	\$2.2600	5	RSF Area
	Lancaster	1-5	6+	\$7.1180	\$3.5590	5	
	Leona Valley	1-4	5+	\$4.5200	\$2.2600	5	RSF Area
Bakersfield		1-6	7+	\$4.1868	\$2.0934	7	
Bayshore	Mid-Peninsula	1-3	4+	\$10.0000	\$5.0000	6	
	South San Francisco	1-3	4+	\$5.6492	\$2.8246	6	
Bear Gulch		1-5	6+	\$10.0000	\$5.0000	6	
Chico		1-6	7+	\$3.1314	\$1.5657	6	
Dixon		1-3	4+	\$7.9402	\$3.9701	7	
Dominguez		1-3	4+	\$6.9934	\$3.4967	7	
East Los Angeles		1-4	5+	\$3.7605	\$1.8803	9	
Grand Oaks		1-6	7+	\$2.1236	\$1.0618	5	
Hermosa Redondo		1-3	4+	\$9.1586	\$4.5793	5	
Kern River Valley		1-3	4+	\$4.5200	\$2.2600	4	RSF Area
King City		1-4	5+	\$6.7536	\$3.3768	9	
Livermore		1-4	5+	\$7.6194	\$3.8097	6	
Los Altos		1-5	6+	\$8.1608	\$4.0804	6	
Marysville		1-4	5+	\$5.1470	\$2.5735	6	
Oroville		1-5	6+	\$6.1840	\$3.0920	6	
Palos Verdes		1-6	7+	\$9.5358	\$4.7679	6	
Redwood Valley		1-4	5+	\$4.5200	\$2.2600	4	RSF Area
Salinas		1-3	4+	\$5.7776	\$2.8888	7	
Selma		1-5	6+	\$3.0122	\$1.5061	8	
Stockton		1-4	5+	\$5.5506	\$2.7753	7	
Visalia		1-5	6+	\$2.9796	\$1.4898	7	
Westlake		1-6	7+	\$9.2378	\$4.6189	6	
Willows		1-5	6+	\$4.1356	\$2.0678	6	

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WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

Page 14

(T)

I. SAMPLE TABLES WITH TIER A AND TIER B EXCESS USAGE AMOUNTS

(N)

2. FOR DISTRICTS NOT IN COMPLIANCE WITH MANDATORY REDUCTIONS

For the purposes of applying Drought Surcharges, the sample table below identifies the number of units over a customer's Water Budget (the excess usage) that falls within Tiers A and B in a district whose cumulative savings do NOT meet the Water Board's Mandatory Reduction Percentage as of the date identified in **Appendix A**.

For Districts <u>not</u> in Compliance with Mandatory Water Reduction Targets							
District	Service Area	Tier A - No Surcharges	Tier B - Drought Surcharges Applied			Minimum Water Budget (CCF per month)	Rate Support Fund Area (RSF)
		Units Over Water Budget	Units Over Water Budget	Surcharge per unit (Non-LIRA Customers)	Surcharge per unit (LIRA Customers)		
Antelope Valley	Fremont Valley & Lake Hughes	1	2+	\$4.5200	\$2.2600	5	RSF Area
	Lancaster	1	2+	\$7.1180	\$3.5590	5	
	Leona Valley	1	2+	\$4.5200	\$2.2600	5	RSF Area
Bakersfield		1	2+	\$4.1868	\$2.0934	7	
Bayshore	Mid-Peninsula	1	2+	\$10.0000	\$5.0000	6	
	South San Francisco	1	2+	\$5.6492	\$2.8246	6	
Bear Gulch		1	2+	\$10.0000	\$5.0000	6	
Chico		1	2+	\$3.1314	\$1.5657	6	
Dixon		1	2+	\$7.9402	\$3.9701	7	
Dominguez		1	2+	\$6.9934	\$3.4967	7	
East Los Angeles		1	2+	\$3.7605	\$1.8803	9	
Grand Oaks		1	2+	\$2.1236	\$1.0618	5	
Hermosa Redondo		1	2+	\$9.1586	\$4.5793	5	
Kern River Valley		1	2+	\$4.5200	\$2.2600	4	RSF Area
King City		1	2+	\$6.7536	\$3.3768	9	
Livermore		1	2+	\$7.6194	\$3.8097	6	
Los Altos		1	2+	\$8.1608	\$4.0804	6	
Marysville		1	2+	\$5.1470	\$2.5735	6	
Oroville		1	2+	\$6.1840	\$3.0920	6	
Palos Verdes		1	2+	\$9.5358	\$4.7679	6	
Redwood Valley		1	2+	\$4.5200	\$2.2600	4	RSF Area
Salinas		1	2+	\$5.7776	\$2.8888	7	
Selma		1	2+	\$3.0122	\$1.5061	8	
Stockton		1	2+	\$5.5506	\$2.7753	7	
Visalia		1	2+	\$2.9796	\$1.4898	7	
Westlake		1	2+	\$9.2378	\$4.6189	6	
Willows		1	2+	\$4.1356	\$2.0678	6	

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WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

Page 15

APPENDIX A to Schedule 14.1 - NOT IN EFFECT

(C)

Drought Surcharge Tiers (applies to all metered customers of potable water)

(C)

District	Service Area	In Compliance with Mandatory Reduction? As of 2/1/16	Tier A - No Surcharges	Tier B - Drought Surcharges Applied			Minimum Water Budget (CCF per month)	Rate Support Fund Area (RSF)
			Units Over Water Budget	Units Over Water Budget	Surcharge per unit (Non-LIRA Customers)	Surcharge per unit (LIRA Customers)		
Antelope Valley	Fremont Val. /Lake Hughes		1-6	7+	\$4.5200	\$2.2600	5	RSF Area
	Lancaster		1-5	6+	\$7.1180	\$3.5590	5	
	Leona Valley		1-4	5+	\$4.5200	\$2.2600	5	RSF Area
Bakersfield			1-6	7+	\$4.1868	\$2.0934	7	
Bayshore	Mid-Peninsula		1-3	4+	\$10.0000	\$5.0000	6	
	South San Francisco		1-3	4+	\$5.6492	\$2.8246	6	
Bear Gulch			1-5	6+	\$10.0000	\$5.0000	6	
Chico			1-6	7+	\$3.1314	\$1.5657	6	
Dixon			1-3	4+	\$7.9402	\$3.9701	7	
Dominguez			1-3	4+	\$6.9934	\$3.4967	7	
East Los Angeles			1-4	5+	\$3.7605	\$1.8803	9	
Grand Oaks			1-6	7+	\$2.1236	\$1.0618	5	
Hermosa Redondo		No	1	2+	\$9.1586	\$4.5793	5	
Kern River Valley		No	1	2+	\$4.5200	\$2.2600	4	RSF Area
King City			1-4	5+	\$6.7536	\$3.3768	9	
Livermore			1-4	5+	\$7.6194	\$3.8097	6	
Los Altos			1-5	6+	\$8.1608	\$4.0804	6	
Marysville			1-4	5+	\$5.1470	\$2.5735	6	
Oroville			1-5	6+	\$6.1840	\$3.0920	6	
Palos Verdes		No	1	2+	\$9.5358	\$4.7679	6	
Redwood Valley (all)			1-4	5+	\$4.5200	\$2.2600	4	RSF Area
Salinas			1-3	4+	\$5.7776	\$2.8888	7	
Selma			1-5	6+	\$3.0122	\$1.5061	8	
Stockton			1-4	5+	\$5.5506	\$2.7753	7	
Visalia		No	1	2+	\$2.9796	\$1.4898	7	
Westlake		No	1	2+	\$9.2378	\$4.6189	6	
Willows			1-5	6+	\$4.1356	\$2.0678	6	

- (a) The Drought Surcharge is equal to two (2) times the highest residential tier rate with a \$10.00 maximum EXCEPT:
The Drought Surcharge in Rate Support Fund (RSF) areas is equal to \$4.52.
The Drought Surcharge for districts with a 10% or less water reduction requirement is equal to the highest residential tier rate.
- (b) The Drought Surcharge for LIRA customers is 50% of the Drought Surcharge for Non-LIRA customers.
- (c) The Minimum Water Budget is set at 55 gpcd (gallons per capita per day) multiplied by the number of people per household for the area according to the U.S. Census.
- (d) A district is determined to be in compliance if it has met or is within one percent of its Mandatory Reduction requirement.

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WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

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APPENDIX B to Schedule 14.1

CUMULATIVE WATER SAVED COMPARED TO MANDATORY REDUCTIONS

Urban Water Supplier	Cumulative Percentage Saved	Water Board's Target Percentage	In Compliance?
	Jun. 2015 to Jan. 2016 (as compared to 2013) *	Mandatory Reduction *	As of Feb. 1, 2016 **
California Water Service Company Antelope Valley	47.8%	36%	
California Water Service Company Bakersfield	31.1%	32%	
California Water Service Company Bear Gulch	35.0%	36%	
California Water Service Company Chico District	38.3%	32%	
California Water Service Company Dixon, City of	30.2%	28%	
California Water Service Company Dominguez	16.8%	16%	
California Water Service Company East Los Angeles	15.5%	8%	
California Water Service Company Hermosa Redondo	18.3%	20%	No
California Water Service Company Kern River Valley	20.1%	28%	No
California Water Service Company King City	21.8%	12%	
California Water Service Company Livermore	39.9%	24%	
California Water Service Company Los Altos/Suburban	38.1%	32%	
California Water Service Company Marysville	26.2%	24%	
California Water Service Company Mid Peninsula	26.6%	16%	
California Water Service Company Oroville	28.5%	28%	
California Water Service Company Palos Verdes	28.9%	36%	No
California Water Service Company Redwood Valley	31.7%	16%	
California Water Service Company Salinas District	24.9%	16%	
California Water Service Company Selma	39.0%	32%	
California Water Service Company South San Francisco	20.8%	8%	
California Water Service Company Stockton	22.6%	20%	
California Water Service Company Visalia	25.6%	32%	No
California Water Service Company Westlake	33.5%	36%	No
California Water Service Company Willows	30.1%	28%	

* The figures in Appendix B are from the State Water Resources Control Board's website at:

http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/docs/2016feb/suppliercompliance_022516.pdf

** A district is determined to be in compliance if it has met or is within one percent of its Mandatory Reduction requirement.

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Appendix H: Conservation Master Plan

CONSERVATION MASTER PLAN 2021 – 2025



April 2021

Bakersfield District

California Water Service
Prepared by M.Cubed



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Bakersfield District Conservation Master Plan: 2021-2025

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List of Acronyms

AB	Assembly Bill
AF	Acre-feet (one AF equals 325,851 gallons)
AMI	Advanced metering infrastructure
AMR	Automatic meter reading
AWE	Alliance for Water Efficiency
BCR	Benefit Cost Ratio
BMP	Best Management Practice
CalWEP	California Water Efficiency Partnership
CII	Commercial, industrial, and institutional
CPUC	California Public Utilities Commission
CUWCC	California Urban Water Conservation Council
EO	Executive Order
GPCD	Gallons per capita per day
GPF	Gallons per flush
GPM	Gallons per minute
GRC	General Rate Case
HET	High efficiency toilet
HEU	High efficiency urinal
HEW	High efficiency clothes washer
IOU	Investor-owned utility
MaP	Maximum performance toilet testing program
MGD	Million gallons per day
MOU	Memorandum of Understanding Regarding Urban Water Conservation in California
SB	Senate Bill
SB X7-7	Senate Bill X7-7 Water Conservation Act of 2009
ULFT	Ultra low flow toilet
UWMP	Urban Water Management Plan
WF	Water Factor
WSCP	Water Shortage Contingency Plan

1 Introduction

1.1 Master Plan Scope and Objectives

Cal Water is committed to helping its customers use water efficiently and has developed a range of water conservation programs to support this goal. To ensure that it is providing the right mix of programs in a cost-effective manner, Cal Water routinely conducts comprehensive conservation program analysis and planning. This is done on a five-year cycle in tandem with the Urban Water Management Plan (UWMP). The results of this planning for the Bakersfield District are summarized in this report, which covers the period 2021 to 2025.

The main purposes of this Conservation Master Plan are to:

- Serve as a broad guidance document that helps inform annual conservation activities, such as program levels, staffing, and budget needs both internally and for stakeholders.
- Summarize the mix of conservation measures that Cal Water plans to implement going forward, including the estimated water savings, costs, and effects on water demand.
- Explain the evaluation process and factors considered in selecting conservation measures.
- Provide an update to the 2016-20 Conservation Master Plan as part of a five-year review cycle to assess program performance and identify the need for any adjustments; and
- Ensure Cal Water districts are positioned to comply with the state's Making Water Conservation a California Way of Life regulations.

1.2 Relationship to GRC and UWMP

Cal Water's operations are regulated by the California Public Utilities Commission (CPUC), which approves the budgets and rates for each Cal Water district every three years in a General Rate Case (GRC) proceeding. The district's conservation programs and expenditures are part of the GRC proceeding. The last GRC covered the three-year period 2020-22 and a new GRC covering the period 2023-25 is presently underway. The conservation programs and budgets for 2021 in this plan reflect those authorized in the last GRC while those recommended for 2023-25 reflect programs and budgets being proposed by Cal Water in the current GRC.

This plan is an update to the Conservation Master Plan Cal Water completed in 2016 covering the period 2016-20. It constitutes the primary source of information on historical and proposed implementation of conservation programs reported in the Bakersfield District's 2020 UWMP. A copy of this plan is provided as an appendix to the UWMP.

1.3 Relationship to Water Shortage Contingency Plan

The Water Conservation Master Plan is distinct from Cal Water's Water Shortage Contingency Plan (WSCP), which is also part of each district's UWMP. While the main purpose of the WSCP is to provide a blue-print for responding to water shortage emergencies caused by drought or other events resulting in temporary disruption to water supplies, the goal of the Water Conservation Master Plan is to provide a blue-print for providing education, assistance, and incentives to help customers use water efficiently all the time. Regardless of drought, water in California is an increasingly scarce resource. Investing in water use efficiency has repeatedly been shown to be a cost-effective way to ensure adequate supply of water for the future. While the conservation programs Cal Water implements are critically important during periods of water shortage, their primary purpose is to help make sure Cal Water can reliably serve customer water needs far into the future.

1.4 Report Organization

The remainder of this report is organized as follows:

- Section 2 provides a brief overview of the District, including the communities it serves, its sources of water supply, and its customer water demands.
- Section 3 discusses Cal Water's conservation goals and accomplishments, in particular with respect to the Water Conservation Act of 2009, CPUC conservation requirements, and the state's pending Making Water Conservation a California Way of Life regulations.
- Section 4 describes the conservation programs Cal Water currently offers to its customers and discusses new programs Cal Water intends to offer.
- Section 5 presents the water savings, costs, and benefits expected from the recommended conservation programs.
- Section 6 discusses metrics used to assess program performance.
- Section 7 addresses program monitoring and future updates to the Conservation Master Plan.

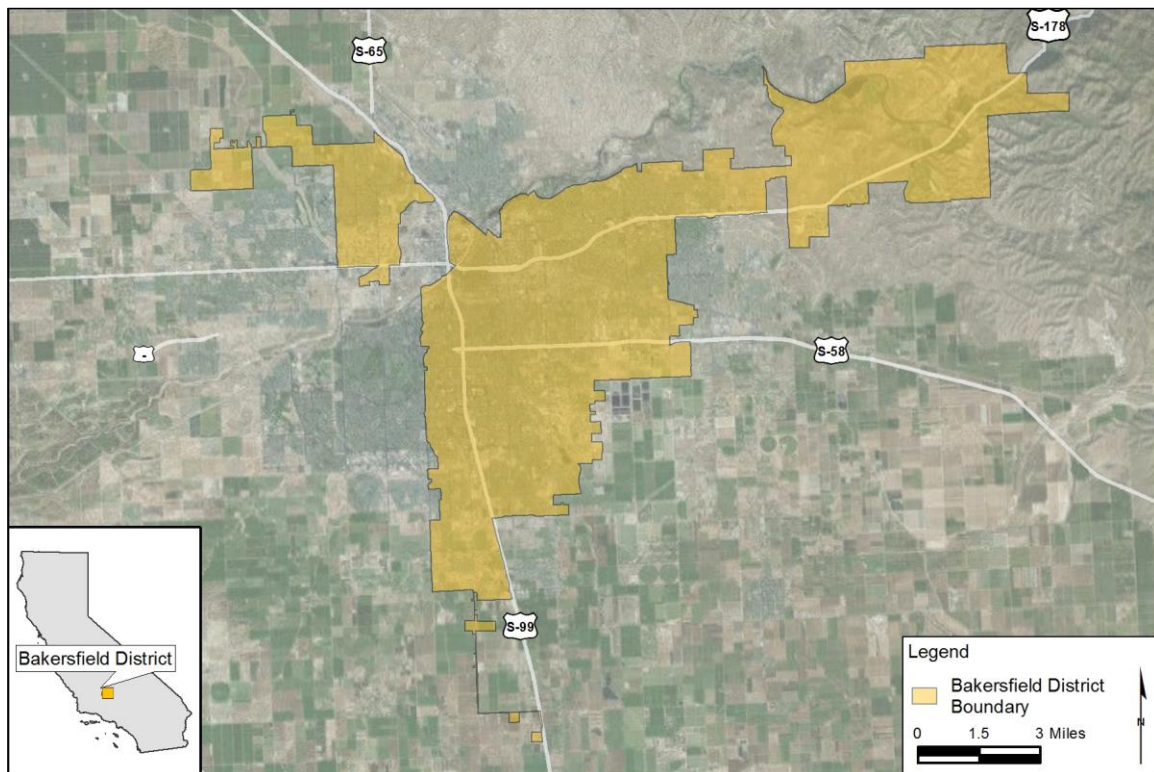
2 District Overview

District Quick Facts:

- Communities Served: Portions of the City of Bakersfield and adjacent unincorporated areas
- Population served in 2020: 286,310
- Residential Customers: 90% of total services and 71% of total use
- Sources of Supply: 48% purchased surface water, 52% groundwater
- Average Annual Water Deliveries Last Five Years: 57,900 AF
- Average Per Capita Water Use Last Five Years: 183 GPCD

The Bakersfield District serves portions of the City of Bakersfield and segments of adjacent unincorporated Kern County. The District was formed in 1926 with the purchase of Bakersfield Water Works. Later, the unincorporated communities of Olcese, and North Garden were incorporated into the District. Cal Water also operates the City of Bakersfield water system through an operations and maintenance contract. A map of the service area boundaries is shown in Figure 1.

Figure 1. Bakersfield District Service Area Boundaries



Cal Water estimates the service area population was 286,310 in 2020. Service area population has been growing at an annual rate of less than one percent for the past

10 years. Between 2016 and 2020, the District's population grew at an average rate of 0.6 percent per year.

Groundwater is the District's sole source of water supply. The District delivers water to residential, commercial, industrial, and governmental customers. Residential customers account for 90 percent of water services in the District. The share of services in 2020 by customer category is shown in Figure 2. The share of total water sales by customer category over the period 2016-2020 is shown in Figure 3. Residential customers accounted for 71 percent of water use over this period.

Annual demand has averaged 57,900 acre-feet (AF) over the five-year period 2016-2020. Total annual demands since 1980 are shown in Figure 4.

Figure 2. Share of Services in 2020 by Customer Category

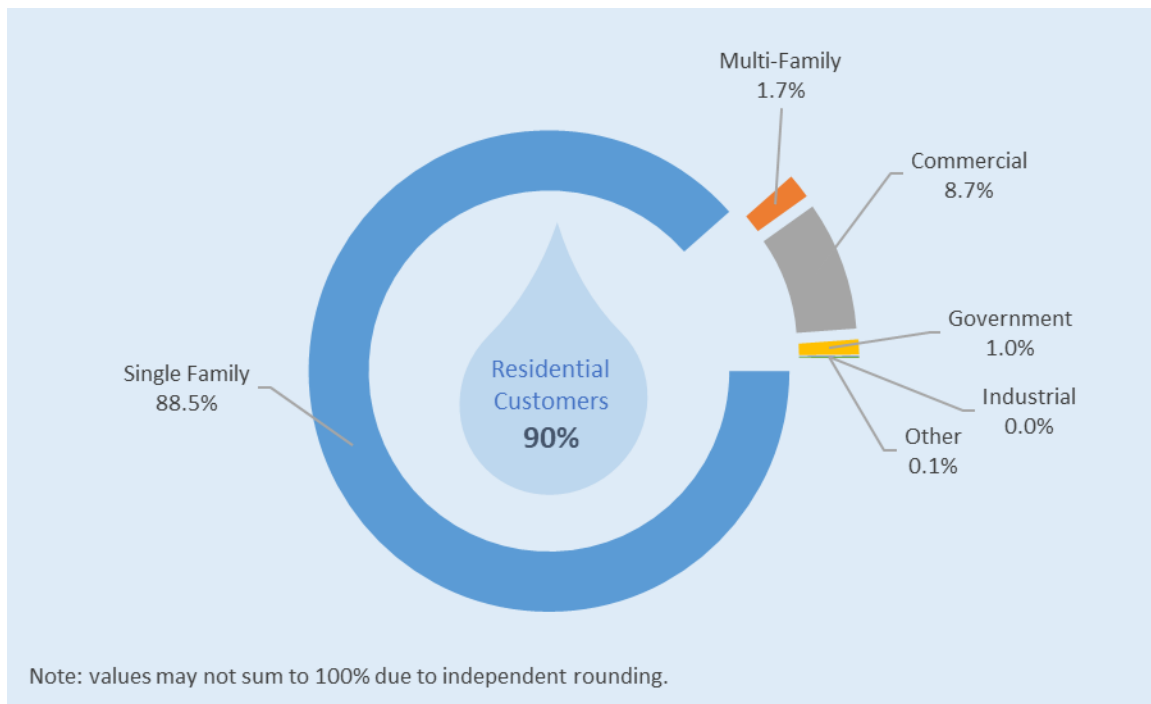


Figure 3. Share of Water Sales by Customer Category: 2016-2020

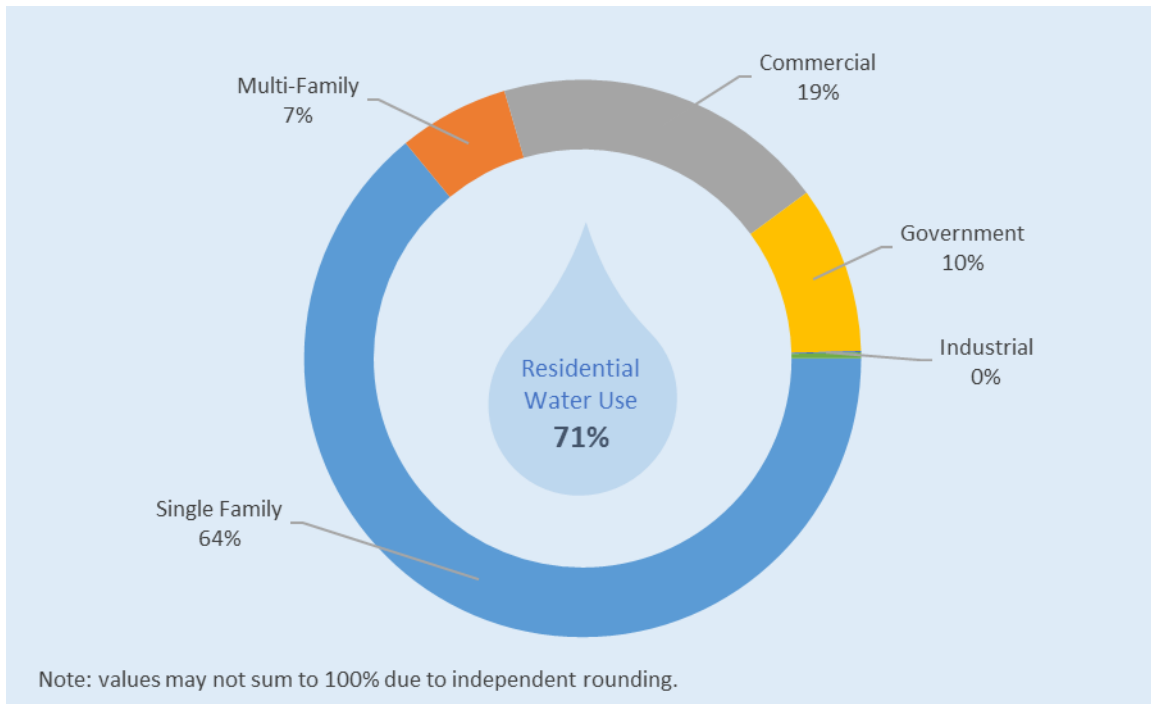
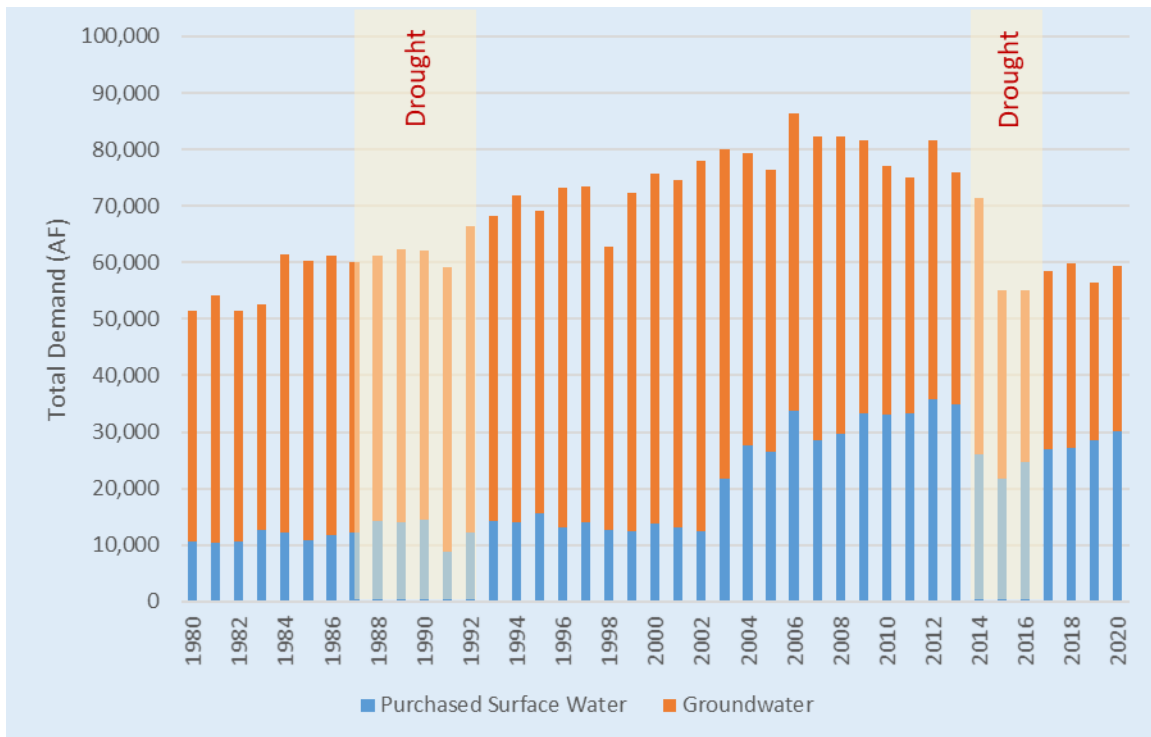


Figure 4. Total Demand and Sources of Supply: 1980 - 2020



3 Conservation Goals and Progress

In this section, conservation goals and progress for the Bakersfield District are presented.

3.1 Conservation Program Activity and Water Savings

Cal Water uses the Alliance for Water Efficiency's Water Conservation Tracking Tool to track program activity and estimate water savings. Conservation program activity for 2016-20 is shown in Table 1. This activity is expected to generate water savings of 221 AF/year and cumulative lifetime savings of 3,315 AF.

Table 1. Conservation Program Activity and Water Savings: 2016-20

1. Plumbing Fixture Replacement	2016 – 2020 Total Activity
Toilets & Urinals (number distributed)	3,616
Clothes Washers (number distributed)	434
Consv. Kits (number distributed)	1,506
2. Irrigation Equip./Landscape Upgrades	
Smart Controllers (number distributed)	617
Nozzles & Spray Bodies (number distributed)	14,703
Turf Replacement (sq ft removed)	29,316
3. Residential Customer Assistance	
Surveys/Audits (homes receiving)	141
4. Non-Residential Customer Assistance	
Surveys/Audits (sites receiving)	15
Large Landscape Reports (sites receiving)	179
Average Annual Water Savings (AF)	221
Cumulative Lifetime Water Savings (AF)	3,315

3.2 Plumbing Codes and Water Use Efficiency Standards

Cal Water's conservation programs are operated within the context of existing plumbing codes and water use efficiency standards that are designed to improve the future water use efficiency of major water using appliances and fixtures, such as toilets and clothes washers, as well as water used outdoor for landscaping. Cal Water estimates that plumbing codes and water use efficiency standards will cumulatively save more than 33,900 AF in the District over the next 25 years. The primary drivers for the expected water savings are as follows:

- AB 715, enacted in 2007, requires that any toilet or urinal sold or installed in California on or after January 1, 2014 cannot have a flush rating exceeding 1.28 and 0.5 gallons per flush, respectively. AB 715 superseded the state's previous standards for toilet and urinal water use set in 1991 of 1.6 and 1.0 gallons per flush, respectively. On April 8, 2015, in response to the Governor's Emergency Drought Response Executive Order (EO B-29-15), the California Energy Commission approved new standards for urinals requiring that they not use more than 0.125 gallons per flush, 75% less than the standard set by AB 715.
- Water use standards for residential and commercial clothes washers and dishwashers are established by the U.S. Department of Energy through its authority under the federal Energy Policy and Conservation Act. Water use efficiency is summarized by the water factor for the appliance which measures the gallons of water used per cycle per cubic foot of capacity. A typical top-loading residential clothes washer manufactured in the 1990s had a water factor of around 12. In 2015, the allowable water factor for top- and front-loading residential clothes was reduced to 8.4 and 4.7, respectively. In 2018, the water factor standard for top-loading residential clothes washers was reduced to 6.5. In 2010 the allowable water factor for top- and front-loading commercial clothes washers was reduced to 8.5 and 5.5, respectively. The maximum water factor for Energy Star compliant top- and front-loading washers is 3.7 and 4.3, respectively. An Energy Star compliant washer uses about two-thirds less water per cycle than washers manufactured in the 1990s. There also are federal dishwasher efficiency standards. The maximum water use for standard and compact sized dishwashers is 5.0 and 3.5 gallons per cycle, respectively.
- New construction and renovations in California are subject to CalGreen Code requirements. CalGreen includes prescriptive indoor provisions for maximum water consumption of plumbing fixtures and fittings in new and renovated properties. CalGreen also allows for an optional performance path to compliance, which requires an overall aggregate 20% reduction in indoor water use from a calculated baseline using a set of worksheets provided with the CalGreen guidelines.
- SB 407, enacted in 2009, mandates that existing buildings in California come up to current state plumbing fixture standards. This law establishes requirements that residential and commercial property built and available for use on or before January 1, 1994 replace plumbing fixtures that are not water conserving, defined as "noncompliant plumbing fixtures" as follows:
 - any toilet manufactured to use more than 1.6 gallons of water per flush;
 - any urinal manufactured to use more than one gallon of water per flush;

- any showerhead manufactured to have a flow capacity of more than 2.5 gallons of water per minute; and
 - any interior faucet that emits more than 2.2 gallons of water per minute.
- For single-family residential property, the SB 407 compliance date was January 1, 2017. For multi-family and commercial property, it was January 1, 2019.
- The law does not include enforcement mechanisms ensuring conversion by these dates. However, it does require retrofit upon resale of property. SB 837, passed in 2011, reinforced this requirement by requiring the transfer disclosure statement include disclosure of compliance with SB 407.

California also has adopted regulations governing future use of water for landscape.

- The California Water Commission approved the State's updated Model Water Efficient Landscape Ordinance (MWELo) in 2015. MWELo or a locally adopted equivalent ordinance limits how much water new and rehabilitated residential and commercial landscapes can use. For residential landscapes, the maximum allowed water allowance (MAWA) is 55% of the amount of water that healthy cool season turf grass would require given the local climate. For commercial landscapes, it is 45%. Variances are allowed for special landscaping, such as play fields and parks, or landscaping irrigated with recycled water.
- CalGreen requires that automatic irrigation controllers for new landscaping installed by a builder be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plant water needs as weather or soil conditions change.
- Starting October 1, 2020, spray sprinkler bodies sold or offered for sale in California are required to use the WaterSense test procedure (Version 1.0, September 21, 2017) and must meet state standards (California Code of Regulations, Title 20, section 1605.3(x)(1)(A)). The new standards establish limits on maximum and average flow rate and minimum outlet pressure. Statewide, the new standards are estimated to save 15 billion gallons of water in the first year the standard is in effect and 152 billion gallons per year at full stock turnover. Consumers are expected to save about \$22 per spray sprinkler body over the life of the device through reduced water use.

3.3 Compliance with State Urban Water Use Target

The Water Conservation Act of 2009, also known as SB X7-7, mandated a 20% reduction in per capita water use by 2020. Every urban retail water supplier was

required to establish a 2020 per capita water use target based on their historical water use. Water suppliers could also form a Regional Alliance with other retail water suppliers and meet the requirement jointly. The District formed a Regional Alliance with other Cal Water districts in the Tulare Lake Hydrologic Region. As long as either the District's or the Regional Alliance's 2020 per capita water use is below target, the District will have met the act's requirements.

Figure 5 demonstrates the District's compliance with the Water Conservation Act of 2009. Both the District's and the Regional Alliance's 2020 water use were below their respective targets. Through the concerted efforts of Cal Water and its customers, District per capita water use is now 31% below its peak reached in the mid-2000s (see Figure 6).

Figure 5. 2020 Target and Actual Per Capita Water Use

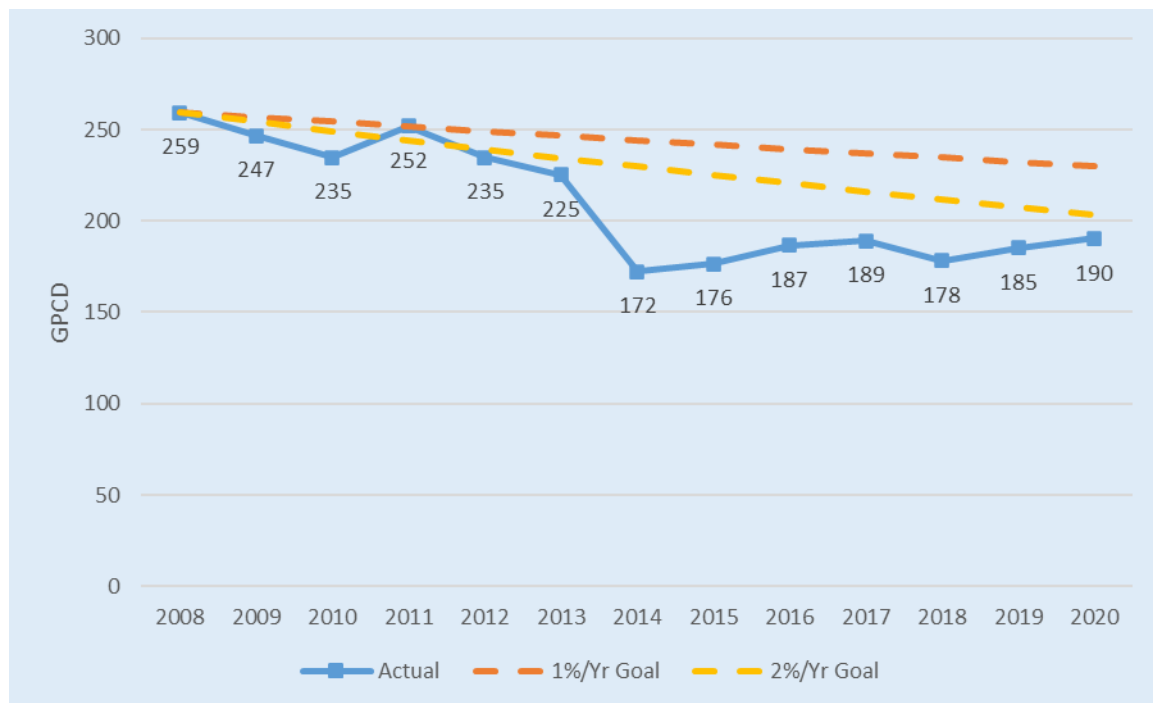


3.4 Compliance with CPUC Conservation Goals

In 2008, the California Public Utilities Commission (CPUC) established water conservation goals of 1-2% per year for Class A utilities, which includes California Water Service Company.¹ As shown in Figure 6, the District has consistently met or exceeded these goals since their adoption.

¹ CPUC Decision 08-02-036, dated February 29, 2008.

Figure 6. District Per Capita Water Use Relative to CPUC Conservation Goals



3.5 Making Water Conservation a California Way of Life

The state adopted legislation in 2018 establishing a new framework for setting urban water conservation standards and objectives.² This legislation built upon the April 2017 report entitled *Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16*, prepared by state agencies, including the CPUC. The legislation directs the state to establish water use efficiency standards for:

- Residential Indoor Water Use
- Residential Outdoor Water Use
- Dedicated Landscape Meter Water Use
- Utility Distribution System Water Losses

Once adopted, these standards will provide the basis for a new urban water use target, or in the vernacular of the legislation, an aggregate urban water use objective. In one way, the Making Water Conservation a California Way of Life legislation carries on where the Water Conservation Act of 2009 left off – it will establish a new set of water use objectives for retail urban water suppliers. However, there are important

² Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman).

differences. First, whereas the 2009 legislation established a long-term reduction target, under the new regulations, urban water suppliers will report water use relative to the new target annually starting in 2023 and will need to achieve the new target by January 1, 2027. Second, while the 2009 legislation applied to all urban water uses, the new legislation excludes non-residential uses other than water served by dedicated landscape meters from the target setting process. Instead, it requires DWR and the State Water Board to propose best management practices, including water audits and water management plans for non-residential customers above a certain size or volume of use, by October 1, 2021. Third, whereas the 2009 legislation set the same objective for all urban water suppliers (reduce water use by 20%), the new legislation varies the objective based on local conditions and existing levels of water use.³

Figure 7 shows the components of an urban water supplier's water use objective. The first four components will be based on the efficiency standards the state sets for indoor and outdoor residential water use, dedicated landscape meter water use, and utility distribution system losses. The fifth component allows for special circumstances, such as a large seasonal population or significant water use for fire protection, while the sixth component provides credit for water recycling. Added together, the six components establish the water suppliers water use objective.

For water suppliers failing to meet their water use objective, the legislation specifies progressive enforcement, as follows:

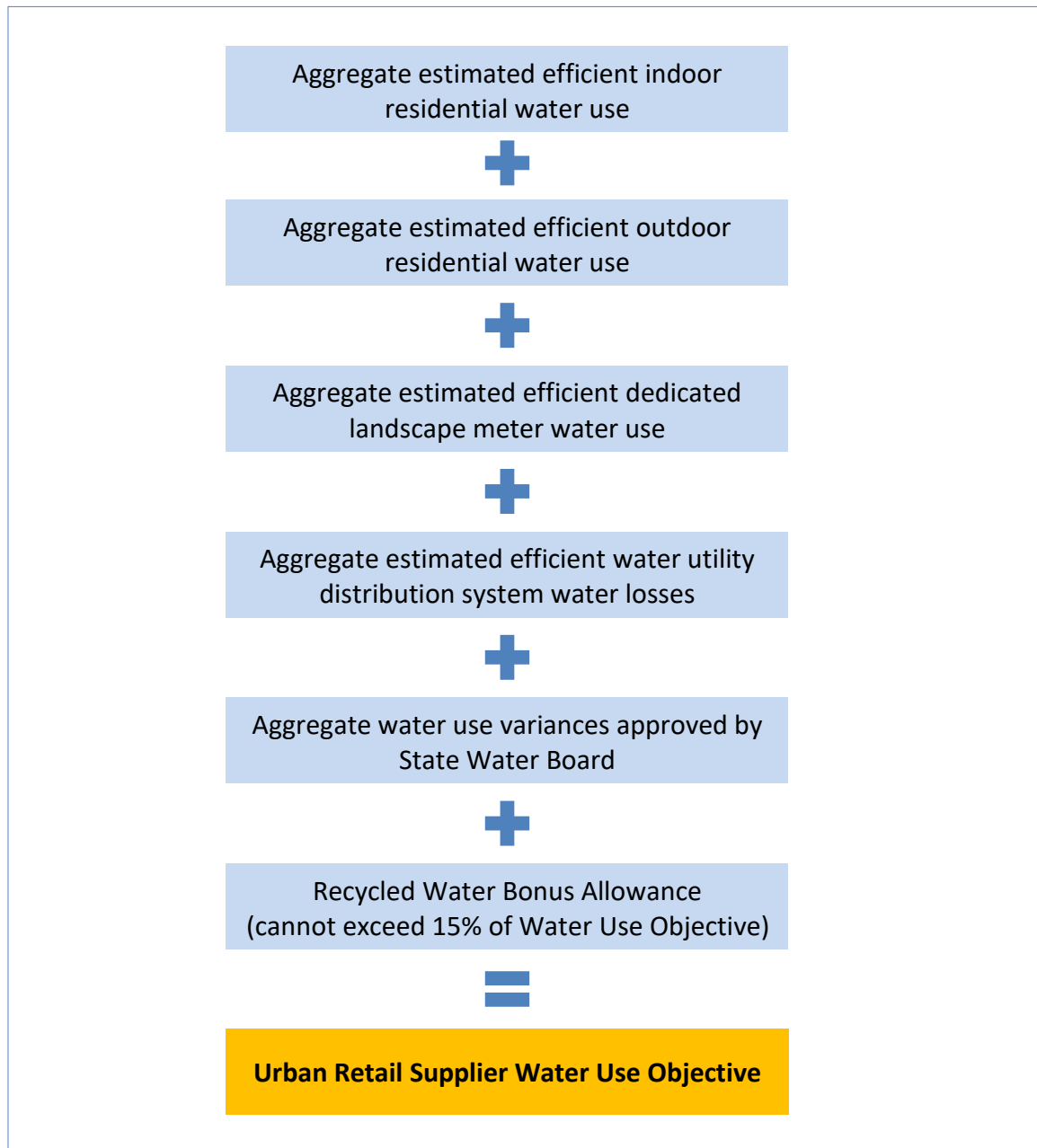
- Starting November 1, 2023, the State Water Board may issue information orders to obtain information to determine technical assistance needs for compliance (CWC 10609.26(a))
- Starting November 1, 2024, the State Water Board may issue written notices to warn suppliers of violation and request corrective actions by the next annual reporting (CWC 10609.26(b))
- Starting November 1, 2025, the State Water Board may issue conservation orders that may include referral to DWR for technical assistance and other local enforcement actions, including imposition of civil liability (CWC 10609.26(c))

Cal Water conducted a risk assessment to determine which of its districts may require additional resources to meet the new conservation regulations. The risk assessment considered current and projected level of overall water use, level of indoor residential water use, extent of residential and non-residential landscape area and water use, and

³ For additional information, see [Making Water Conservation a California Way of Life: Primer of 2018 Legislation on Water Conservation and Drought Planning Senate Bill 606 \(Hertzberg\) and Assembly Bill 1668 \(Friedman\)](#).

condition of distribution system and level of water loss. Using a scoring system, the assessment ranked each district in terms of its risk of non-compliance with the individual components of the water use objective as well as the aggregate objective. The results of this assessment provided the basis for the conservation program budgets put forward in Cal Water's 2018 and 2021 general rate cases.

Figure 7. Making Water Conservation a California Way of Life Water Use Objective



4 Water Conservation Program

Cal Water centrally administers the conservation programs for its service districts. This creates both constraints and opportunities in terms of program design and implementation. The key constraint is the need to have consistent program offerings across districts. Except under unique circumstances, it is generally not logistically feasible or cost-effective to customize programs for individual districts. Also, if Cal Water offers a program in one district, customers in other districts generally expect it to also be available in their district. This puts a premium on offering a relatively small set of programs that can benefit all Cal Water customers. The advantage of central administration, however, is that it gives Cal Water scale economies and purchasing power that helps it keep program costs down, thereby improving cost-effectiveness.

4.1 Conservation Program Drivers

While Cal Water strives to develop programs that can be deployed in any of its districts, it tailors marketing, customer targeting, and implementation focus based on the needs of each district. In the Bakersfield District, the main drivers shaping the conservation program are summarized in Table 2.

Table 2. Main Conservation Program Drivers in Bakersfield District

Driver	Explanation
Groundwater Management	Groundwater is an important source of water supply for the District. The groundwater basin from which the District pumps is designated as critically overdrafted by the state and subject to the requirements of the Ground Water Sustainability Act of 2014.
Residential Water Use	The state's Making Conservation a California Way of Life water use regulations are focused on reducing indoor and outdoor residential water use.
Landscape Water Use	The state's Making Conservation a California Way of Life water use efficiency regulations may require the District to start serving some non-residential landscapes through dedicated landscape meters and annually report water use relative to new landscape water use efficiency standards.

4.2 Customer Conservation Programs

Cal Water's conservation programs are grouped into four categories:

- Plumbing Fixture Replacement
- Irrigation Equipment/Landscape Upgrades
- Residential Customer Assistance
- Non-Residential Customer Assistance

A description of current programs in each of these categories follows. Where rebate amounts are listed, these are current rebate levels. Readers should note that rebate amounts may be adjusted in the future in response to CPUC requirements or changes to program design.

4.2.1 Plumbing Fixture Replacement

High-Efficiency Toilet Replacement – This program replaces old toilets with MaP certified high-efficiency toilets via financial rebates, direct installation, or direct distribution.⁴ Current rebate amounts are up to \$50/toilet for residential toilet replacement and up to \$100/toilet for commercial toilet replacement.

High-Efficiency Urinal Replacement – This program replaces old urinals with high-efficiency urinals meeting the state’s 0.125 gallon per flush water use standard via financial rebates and direct installation. While available to all non-residential customers, the program targets sites with higher-than-average bathroom utilization, such as restaurants and office buildings. The current rebate amount is up to \$150/urinal.

Clothes Washer Replacement – This program provides a financial rebate to replace an old inefficient clothes washer with a new high-efficiency washer. The program is available to all residential and multi-family customers. The current rebate amount is up to \$150/washer.

Residential Conservation Kit Distribution – This program offers residential customers conservation kits featuring a range of water-saving plumbing retrofit devices. The kits are available at no charge and include two high-efficiency showerheads (1.5 gpm), two bathroom faucet aerators (1.0 gpm), one kitchen faucet aerator (1.5 gpd), toilet leak tablets, and an outside multi-function, full-stop hose nozzle.

4.2.2 Irrigation Equipment/Landscape Upgrades

Smart Irrigation Controller Installation – This program provides a financial rebate for the installation of a smart irrigation controller that automatically adjusts watering

⁴ For information on MaP certified toilets, see: <https://www.map-testing.com/>

schedule in response to changing weather conditions. The current rebate amount is \$125/controller for residential customers and \$25/station for commercial customers.

High-Efficiency Sprinkler Nozzle Rebate – This program provides a financial rebate for the installation of high-efficiency sprinkler nozzles. This program is available to all Cal Water customers. The current rebate amount is \$5/nozzle.

Large Rotary Nozzle Rebate – This program provides a financial rebate for the installation of high-efficiency large rotary nozzles. This program is available to all Cal Water customers. The current rebate amount is up to \$30/nozzle toward the nozzle purchase cost and up to \$8/spray body toward installation cost, if installed by a C-27 licensed landscape contractor.

Spray Body with Integrated Pressure Regulation and Check Valve Rebate – This program provides a financial rebate for the installation of high-efficiency spray bodies with integrated pressure regulation. This program is available to all Cal Water customers. The current rebate amount is up to \$10/body toward the spray body purchase cost and up to \$8/spray body toward installation cost, if installed by a C-27 licensed landscape contractor.

Turf Replacement Rebate – This program provides a financial rebate for replacement of turf with approved drought-tolerant landscaping. Cal Water operated this program in 2015/16 as a drought response measure. The program will be re-started as part of Cal Water's irrigation equipment/landscape upgrade program offerings.

4.2.3 Customer Assistance

Smart Landscape Tune-Up Program – This program provides customers with an irrigation system evaluation and installation of approved efficient irrigation system equipment, such as a smart irrigation controller and high-efficiency sprinkler nozzles. The program also includes irrigation system adjustments and detection and repair of irrigation system leaks. This program is available to all Cal Water customers at no charge.

Residential Customer Portal – Through its residential customer portal, Cal Water provides tailored assistance to each residential customer via customized water-efficiency targets, water savings calculators, and customer-specific recommendations for programs and water-saving tips.

Non-Residential Customer Assistance – Cal Water provides tailored assistance to commercial customers through customized incentives, commercial water surveys, and large landscape water use surveys. The non-residential assistance program helps commercial customers efficiently use water for sanitation/cleaning, heating/cooling, process, and landscape purposes.

4.2.4 Summary of Customer Programs

The customer conservation programs offered to customers in Bakersfield District are summarized in Table 3 by customer class.

Table 3. Cal Water Conservation Programs Available to Bakersfield District Customers

Programs (Rebate, Direct Install, and Free Distribution Programs)	Customer Eligibility		
	Single-Family	Multi-Family	Commercial
Plumbing Fixture Replacement			
High-Efficiency Toilet Replacement	✓	✓	✓
High-Efficiency Urinal Replacement			✓
High-Efficiency Clothes Washer Rebate	✓	✓	
Conservation Kits	✓	✓	
Irrigation Equipment/Landscape Upgrades			
Smart Irrigation Controller Rebate	✓	✓	✓
High-Efficiency Sprinkler Nozzle Rebate	✓	✓	✓
Large Rotary Nozzle Rebate		✓	✓
Spray Body Rebate		✓	✓
Turf Replacement Rebate	✓	✓	✓
Customer Assistance			
Smart Landscape Tune-Up Program	✓	✓	✓
Residential Customer Portal	✓		
Non-Residential Customer Assistance		✓	✓

4.3 School Education and Public Information Programs

Public Information Program – Cal Water operates an extensive public information program to provide information to customers on ways to use water efficiently and to market its conservation programs through multiple media outlets, including the Cal Water website, direct mail and bills, digital media, social media, and email.

School Education Program - Cal Water's school education program includes the Cal Water H2O Challenge, a project-based learning competition for grades 4-6, individual student competitions for grades K-12 and general information and learning materials for students and teachers. Cal Water deploys its school education program in all its districts. Cal Water H2O Challenge is a project-based competition for classrooms, grades 4-6. The program is offered in partnership with DoGoodery, the California Association of Science Educators (CASE), and the WestEd K-12 Alliance. The program aligns with the Common Core State Standards and the Next Generation Science

Standards. The Cal Water H2O Challenge offers a unique opportunity for upper elementary teachers to facilitate their students' learning of standards-based content, while developing the core understanding of environmental principles necessary to becoming science-literate citizens.

4.4 Water System Efficiency

4.4.1 System Water Loss Management

As discussed above, reducing distribution system losses is one of the main focuses of the new Making Water Conservation a California Way of Life regulations. In preparation for these new requirements, Cal Water took part in the California Water Loss Technical Assistance Program (TAP) in both 2016 and 2017. Cal Water annually conducts distribution system audits using the American Water Works Association (AWWA) Free Water Audit Software. It has also developed a Water Loss Control Plan and Water Loss Control Policy to guide future water loss management with respect to:

- Meeting CPUC and state water loss standards and regulations
- Improving audit data and validity scores
- Implementing cost-effective water loss control actions

To coordinate and oversee water loss management actions across its multiple districts, Cal Water has added a Water Loss Program Analyst position to its conservation staff.

4.4.2 Metering and Pricing

Cal Water has deployed conservation-oriented rate designs in all its districts since 2008. The CPUC reviews these rate designs every three years as part of a general rate case. Cal Water is continuously seeking ways to improve the efficiency and equity of the rates and charges paid by customers. One example is Cal Water's Customer Assistance Program (CAP), which provides bill discounts to qualifying lower income households.

All non-residential services in the District are metered. The District is in the process of converting all residential services to meters. As of 2020, there were 6,929 residential services that had yet to be converted. These services are scheduled for conversion by the end of 2024. All service connections within the District will be metered by January 1, 2025. In addition to its use for billing, Cal Water uses meter data in the management of its conservation programs, including using it to analyze water use trends and identify customers that may benefit from Cal Water conservation programs. Cal Water is also piloting automatic meter reading (AMR) and advanced metering infrastructure (AMI) in several of its districts. Broad adoption

of AMI would allow Cal Water in the future to detect and alert households of leaks and other possible problems as well as provide customers with tailored water use information to help them use water more efficiently.

4.5 Conservation Partnerships

Cal Water collaborates with organizations at the local, state, and national level to promote and advance water use efficiency, including as a member of the following organizations and initiatives.

California Water Efficiency Partnership (CalWEP) – CalWEP’s mission is to maximize urban water efficiency and conservation throughout California by supporting and integrating innovative technologies and practices; encouraging effective public policies; advancing research, training, and public education; and building collaborative approaches and partnerships. In addition to being a CalWEP member, Cal Water serves on the organization’s board of directors.

Alliance for Water Efficiency - The Alliance for Water Efficiency (AWE) is a national non-profit organization dedicated to efficient and sustainable use of water. In addition to being an AWE member, Cal Water uses the AWE Water Conservation Tracking Tool to evaluate conservation programs and track water savings.

EPA WaterSense - As an EPA WaterSense partner, Cal Water has committed to educating its customers about the value of water, water efficiency, and the WaterSense brand. Products and services earning the WaterSense label have been certified to be at least 20 percent more efficient without sacrificing performance.

5 Conservation Budget

The District’s recommended conservation budget for the period 2021-2025 is presented in Figure 8.⁵ Cal Water used the three-step process shown in Figure 9 to develop the conservation budget. In the first step, a wide range of possible conservation programs are qualitatively screened in terms of their potential savings, implementation feasibility, customer receptivity, and cost. The program screening filters used in this step are listed in Table 4. In the second step, the programs passing through the screen are quantitatively analyzed using the AWE’s Water Conservation Tracking Tool. In the third step, a portfolio of programs is developed based on the results of the second step. As discussed earlier, in its two most recent general rate

⁵ This is a composite of the conservation budget the CPUC approved in Cal Water’s 2018 general rate case, which covers the period 2020-2022, and the budget Cal Water is proposing in its 2021 general rate case, which covers the period 2023-2025. Depending on the outcome of the general rate case, the adopted 2023-2025 budget may differ from Cal Water’s recommended budget.

Bakersfield District Conservation Master Plan: 2021-2025

cases Cal Water has further refined the conservation budget based on the results of a risk assessment used to determine which districts may require additional resources to meet the state's new conservation regulations.

Figure 8. Recommend Conservation Budget and Allocation: 2021-2025

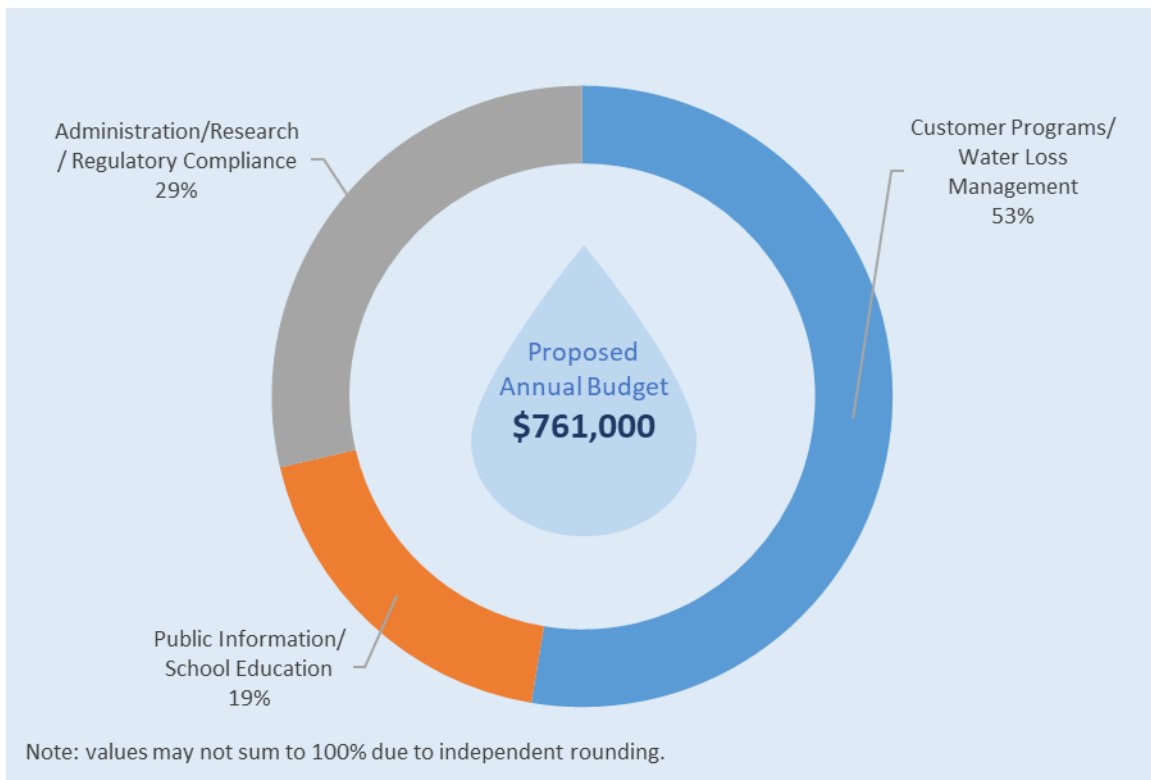
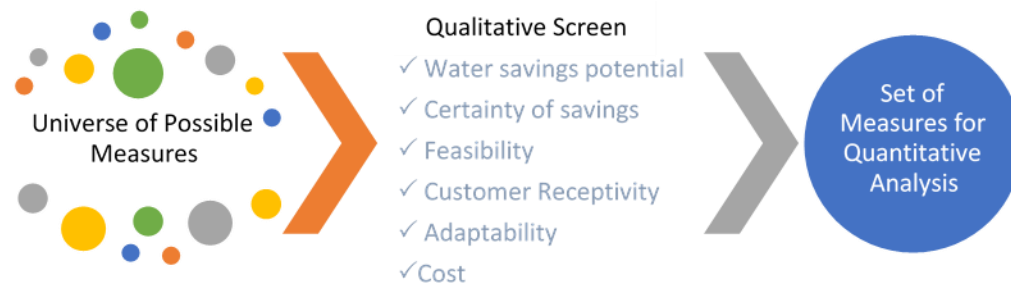
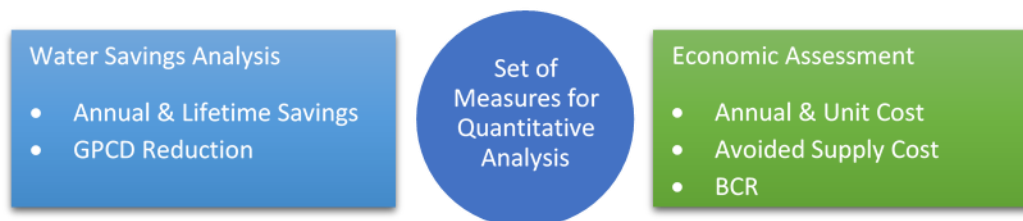


Figure 9. Conservation Program Assessment Method

Step 1: Qualitative Assessment of Possible Programs



Step 2: Quantitative Analysis of Screened Measures



Step 3: Portfolio Development & Budgets



Table 4. Conservation Measure Qualitative Screening Filters

Filter	Description
Water Savings Potential	The amount of water a measure can potentially save over its lifespan or over a certain period after an action that encourages behavioral change (such as receipt of a home water survey). This filter screens out measures where potential savings are too low to make it worthwhile.
Certainty of Water Savings	The certainty of the water savings estimated in Water Savings Potential. Some measures have high potential but low certainty because they are new and untested or because they rely on uncertain behavioral actions of participants. Other measures have low potential but high certainty. This filter screens out measures that have low expected savings (i.e., measures with high certainty but low potential or measures with high potential but low certainty) or flags these measures as candidates for pilot programs.
Implementation Feasibility	The ease with which a measure can be implemented, such as adequate budget and staff resources to handle outreach and ongoing administrative needs. This filter screens out measures than are considered infeasible to implement.
Customer Receptivity	The degree to which customers are receptive to a measure, such as how easy or difficult it is for a customer to apply for a certain rebate or arrange for a water survey. This filter screens out measures that are unlikely to be favored by customers.
Adaptability	The ease with which a measure can be scaled to react to a changing market (e.g., increasing or decreasing a toilet rebate to ramp up/down the participation rate), or adjusted to accommodate a different market sector (e.g., redesigning the incentives or other parameters of a single-family landscape turf replacement program to target the multi-family or commercial sectors). This filter screens out measures that cannot be readily adapted to changing circumstances of the market.
Cost	The expected cost-effectiveness of the measure relative to other measures. This filter screens out measures that are unlikely to be cost-effective or would crowd out other desirable measures because of its expense.

6 Performance Metrics

Cal Water periodically evaluates program savings potential and cost-effectiveness using the AWE Water Conservation Tracking Tool. Based on the most recent evaluation, the expected water savings and cost-effectiveness of Bakersfield's conservation program are as follows:

- **Water Savings** – Up to 1,120 AF/year and cumulatively up to 16,800 AF over the useful life of the measures. Program water savings will help the District comply with new state water conservation and groundwater management regulations.
- **Unit Cost** – \$400/AF (rounded to nearest \$100), which is cost competitive with alternative sources of water supply.

7 Program Monitoring and Reporting

Cal Water regularly reviews its conservation programs to ensure they are performing as expected. This includes the following:

Program Tracking - Cal Water uses the AWE Water Conservation Tracking tool to track program participation, cost, and water savings. This data helps Cal Water monitor program performance, analyze water use trends, and forecast future water demand.

Research and Evaluation – Cal Water regularly evaluates program performance and undertakes pilot projects to assess the effectiveness of its programs. Examples include:

- Comprehensive statistical evaluations of bathroom retrofit programs operated between 2013 and 2018
- Statistical evaluations of water savings associated with high-efficiency irrigation nozzle replacement, smart irrigation controller installation, and turf replacement programs.
- Development of statistical models of customer program participation that help Cal Water target programs based on household and neighborhood attributes.
- AMR and AMI pilot projects.

Annual Conservation Report – Cal Water annually reports on the conservation program's progress and accomplishments, and posts public reports for each of its

Bakersfield District Conservation Master Plan: 2021-2025

districts on its public website (<https://www.calwater.com/conservation/water-conservation-reports/>).

CPUC Reporting – Cal Water reports to the CPUC annually on the implementation, cost, and performance of its conservation programs.

State Reporting – Starting in 2023, Cal Water will annually report District water use relative to its water use objective as part of the new Making Water Conservation a California Way of Life regulations.

Appendix I: Resolution to Adopt UWMP



CALIFORNIA WATER SERVICE

1720 North First Street
San Jose, CA 95112-4598 Tel: (408) 367-8200

June 20, 2021

Julia Ekstrom, PhD
Supervisor, Urban Unit
California Department of Water Resources
Water Use Efficiency Section
P.O. Box 942836
Sacramento, CA 94236-0001

**Re: Adoption of the 2020 Urban Water Management Plan and
Water Shortage Contingency Plan
California Water Service – Bakersfield District**

Ms. Ekstrom:

This letter serves as notice that California Water Service Company (Cal Water) has formally adopted this 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) for our Bakersfield District.

The attached resolution from Cal Water's Board of Directors on September 28, 2005 delegated authority for this approval to, among others, any Vice President. I have approved the attached UWMP and WSCP, which was developed by staff under my supervision in accordance with the Urban Water Management Planning Act contained in the California Water Code, Division 6, Part 2.6.

If you have any questions regarding this UWMP or WSCP, please contact Michael Bolzowski at the above mailing address, by telephone at (408) 367-8338, or by email at mbolzowski@calwater.com.

Sincerely,

Shannon Dean
Vice President, Customer Service and Chief Citizenship Officer

Attachments

cc: Ken Jenkins - Director, Water Resource Sustainability
Tamara Johnson - District Manager, Bakersfield District



CALIFORNIA WATER SERVICE

1720 North First Street
San Jose, CA 95112-4598 Tel: (408) 367-8200

CALIFORNIA WATER SERVICE COMPANY

RESOLVED, that this Board of Directors delegates its authority to approve Urban Water Management Plans as required under the Urban Water Management Planning Act contained in California Water Code 6, Part 2.6 to the President and Chief Executive Officer, any Vice President, the Corporate Secretary and any Assistant Secretary of California Water Service Company.

--oOo--

I, DAN L. STOCKTON, Corporate Secretary of California Water Service Company, a California corporation, do hereby certify that the foregoing is a full, true and correct copy of certain resolution adopted by the Board of Directors of said corporation at a regular meeting of said Board duly called and held September 28, 2005, at which a quorum was present, that all Directors present voted in favor of said resolution, and that said resolution has never been annulled or revoked but is still in full force and effect.

IN WITNESS WHEREOF, I have hereunto signed my name this 7th day of September, 2005.

Dan L. Stockton
Corporate Secretary