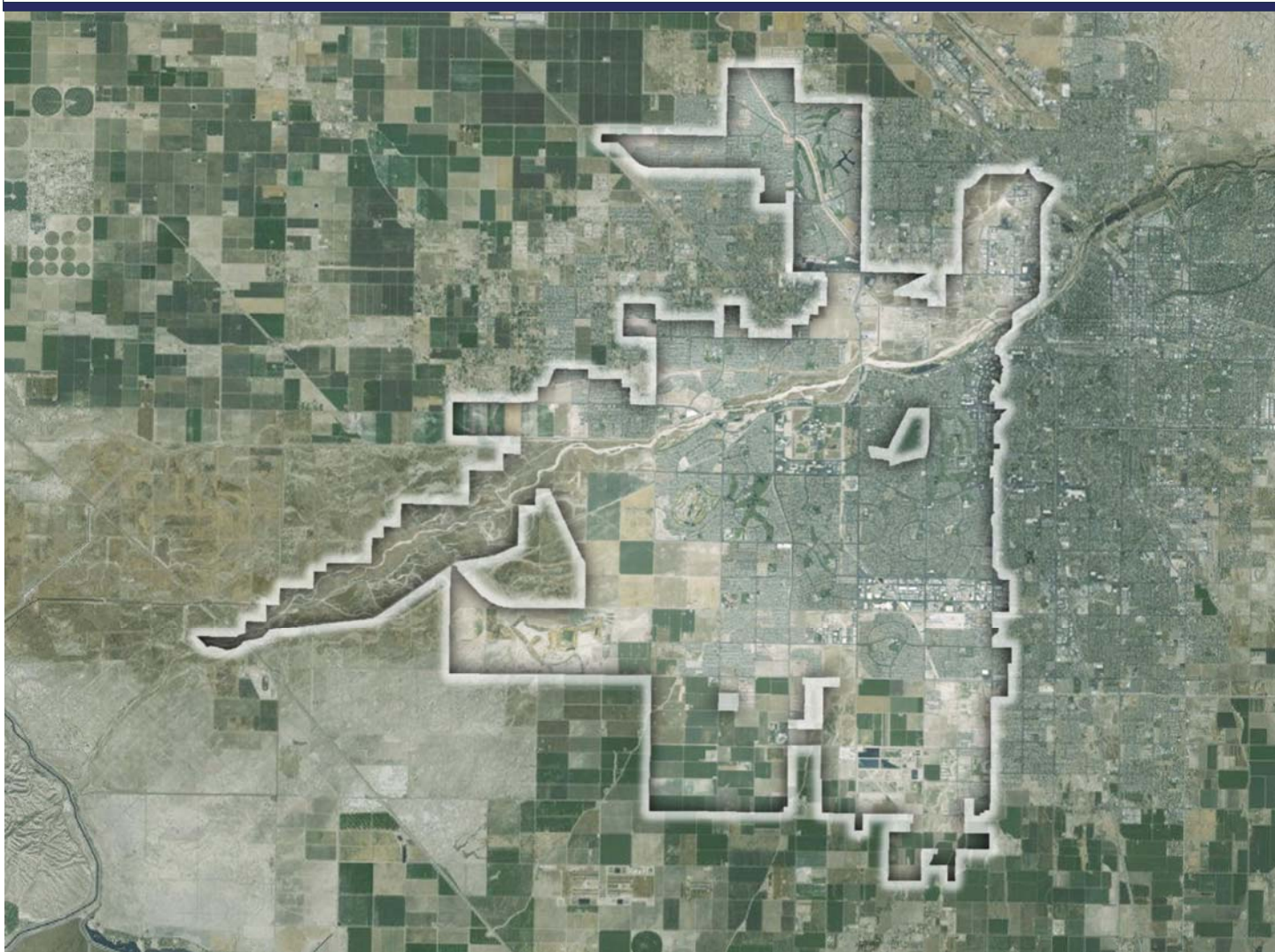


# City of Bakersfield

## 2015 Urban Water Management Plan

June 2017



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### ABBREVIATIONS AND ACRONYMS

|           |   |
|-----------|---|
| AB        | Assembly Bill   |
| AF        | acre-feet   |
| AFY       | acre-feet per year  |
| AWWA      | American Water Association  |
| BMPs      | Best Management Practices   |
| Cal Water | California Water Service Company  |
| CASGEM    | California Statewide Groundwater Elevation Monitoring                         |
| CGC       | California Green Code   |
| CII       | commercial, industrial and institutional                                      |
| CIMIS     | California Irrigation Management Information System                           |
| City      | City of Bakersfield   |
| CPUC      | California Public Utility Commission  |
| CUWCC     | California Urban Water Conservation Council                                   |
| CWC       | California Water Code   |
| DMM       | demand management measures  |
| DOF       | Department of Finance   |
| DWR       | Department of Water Resources   |
| ETo       | evapotranspiration  |
| °F        | degrees Fahrenheit  |
| FAS       | Fully Appropriated Status   |
| Final EIR | Kern River Flow and Municipal Water Program Final Environmental Impact Report |
| GIS       | Geographical Information Systems  |
| GPCD      | gallons of water used per person per day                                      |
| ID4       | Improvement District No. 4  |
| IRWMP     | Integrated Regional Water Management Plan                                     |
| KCWA      | Kern County Water Agency  |
| mg/l      | milligrams per liter  |
| MGD       | million gallons per day   |
| NAICS     | North American Industry Classification System                                 |
| Plan      | Urban Water Management Plan   |
| PWS       | Public Water System   |
| SB X7-7   | Water Conservation Act of 2009  |
| SCAG      | Southern California Association of Governments                                |
| SGMA      | Sustainable Groundwater Management Act  |
| SWP       | State Water Project   |
| SWRCB     | State Water Resources Control Board   |
| SWRCB-DDW | State Water Resources Control Board - Division of Drinking Water              |
| TCP       | Trichloropropane  |
| TDS       | Total Dissolved Solids  |
| Tenneco   | Tenneco West  |
| UWMP Act  | California Urban Water Management Planning Act                                |
| WRCC      | Western Regional Climate Center   |
| WUE       | Water Use Efficiency  |
| WWTP      | Wastewater Treatment Plant  |



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# CHAPTER 1

## INTRODUCTION AND OVERVIEW

### 1.1 BACKGROUND AND PURPOSE

The City of Bakersfield (City) is a retail water supplier and wholesale water supplier and is required to prepare an Urban Water Management Plan (Plan) in accordance with the California Urban Water Management Planning Act (UWMP Act) which was established in 1983. The Act requires every “urban water supplier” to prepare and adopt a Plan, periodically review its Plan at least once every five years in years ending in five and zero and make any amendments or changes which are indicated by the review. Pursuant to California Water Code Section 10617, an “Urban Water Supplier” is defined as 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. The primary objective of the UWMP Act is to direct urban water suppliers to evaluate their existing water conservation efforts and, to the extent practicable, review and implement alternative and supplemental water conservation measures. The UWMP Act is directed primarily at retail water purveyors where programs can be immediately applied to the consumer. The Act also applies to wholesalers, in that water may be provided indirectly for ultimate municipal use. **This Plan includes both the City of Bakersfield’s Domestic Water System (retail) and Wholesale Water System (wholesale), as briefly described in Section 2.1.1.** The UWMP Act, originally known as Assembly Bill (AB) 797, is included in Appendix A.

Section 10621(a) of the California Water Code states, “Each water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.” However, due to recent changes in Urban Water Management

Plan requirements, California State law has extended the deadline for the 2015 Plans to July 1, 2016. The City's 2015 Plan is an update to the City's 2010 Plan.

## **1.2 URBAN WATER MANAGEMENT PLANNING AND THE CALIFORNIA WATER CODE**

### **1.2.1 URBAN WATER MANAGEMENT PLANNING ACT OF 1983**

The City of Bakersfield is a retail and wholesale water supplier and is required to prepare a Plan in accordance with the UWMP Act established in 1983. The UWMP Act is included in the California Water Code (CWC) under Sections 10610 through 10656. A copy of the UWMP Act is provided in Appendix A. The UWMP Act requires water agencies develop UWMPs to provide a framework for long-term water planning as well as information regarding long-term resource planning to ensure sufficient water supplies are available to meet existing and future demands. Urban water suppliers are required to report, describe, and evaluate water deliveries and uses, water supply sources, efficient water uses, demand management measures, and water shortage contingency planning.

### **1.2.2 APPLICABLE CHANGES TO THE WATER CODE SINCE 2010**

In compliance with the UWMP Act, the City last prepared a 2010 Urban Water Management Plan Update for its Domestic Water System and Wholesale Water System. There have been new amendments added and some reorganization of the California Water Code sections since the City's last update. The following tabulation is a summary of the new requirements which were incorporated in the City's 2015 Plan, as applicable:

| Change Number | Topic                                   | CWC Section                               | Legislative Bill | Summary  | Guidebook Section   |
|---------------|---|---|------------------|--|---------------------|
| 1             | Demand Management Measures              | 10631 (f)(1) and (2)                      | AB 2067, 2014    | Requires water suppliers to provide narratives describing their water demand management measures, as provided. Requires retail water suppliers to address the nature and extent of each water demand management measure implemented over the past 5 years and describe the water demand management measures that the supplier plans to implement to achieve its water use targets. | Chapter 9           |
| 2             | Submittal Date                          | 10621 (d)                                 | AB 2067, 2014    | Requires each urban water supplier to submit its 2015 plan to the Department of Water Resources by July 1, 2016.   | Chapter 10          |
| 3             | Electronic Submittal                    | 10644 (a) (2)                             | SB 1420, 2014    | Requires the plan, or amendments to the plan, to be submitted electronically to the department.  | Chapter 10          |
| 4             | Standardized Forms                      | 10644 (a) (2)                             | SB 1420, 2014    | Requires the plan, or amendments to the plan, to include any standardized forms, tables, or displays specified by the department.  | CH 1, Section 1.4   |
| 5             | Water Loss                              | 10631 (e) (1) (J) and (e) (3) (A) and (B) | SB 1420, 2014    | Requires a plan to quantify and report on distribution system water loss.  | Appendix L          |
| 6             | Estimating Future Water Savings         | 10631 (e) (4)                             | SB 1420, 2014    | Provides for water use projections to display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans, when that information is available and applicable to an urban water supplier.   | Appendix K          |
| 7             | Voluntary Reporting of Energy Intensity | 10631.2 (a) and (b)                       | SB 1036, 2014    | Provides for an urban water supplier to include certain energy-related information, including, but not limited to, an estimate of the amount of energy used to extract or divert water supplies.   | Appendix O          |
| 8             | Defining Water Features                 | 10632                                     | AB 2409, 2010    | Requires urban water suppliers to analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.   | CH 8, Section 8.2.4 |

Source: Department of Water Resources' Final "Guidebook for Urban Water Suppliers," March 2016

### 1.2.3 WATER CONSERVATION ACT OF 2009 (SB X7-7)

The Water Conservation Act of 2009 (SB X7-7) required retail urban water suppliers to report the following conservation goals in their 2010 UWMPs:

- Base Daily per Capita Water Use;
- 2015 Interim Urban Water Use Target;
- 2020 Urban Water Use Target; and
- Compliance Daily per Capita Water Use

A discussion addressing the requirements of the Water Conservation Act is found in Chapter 5 of the City's 2015 Plan.

### **1.3 URBAN WATER MANAGEMENT PLANNING IN RELATION TO OTHER PLANNING EFFORTS**

The City has coordinated the preparation of the Plan with the City of Bakersfield City Clerk, the County of Kern, California Water Service Company (Cal Water), Casa Loma Water Company, East Niles Community Services District, Greenfield County Water District, North of the River Municipal Water District, Oildale Mutual Water Company, Vaughn Water Company, Rosedale Rio Bravo Water Storage District, and Kern County Water Agency (KCWA) Improvement District No. 4 (ID4). The City has requested copies of draft 2015 Plans from these agencies and provided a draft of the City's 2015 Plan to these agencies.

### **1.4 UWMP ORGANIZATION**

The City's 2015 Plan was prepared consistent with the recommended organization provided in the Department of Water Resources' (DWR) Final "Guidebook for Urban Water Suppliers", dated March 2016. The City's 2015 Plan consists of the following Chapters:

- Chapter 1 - Introduction and Overview
- Chapter 2 - Plan Preparation
- Chapter 3 - System Description
- Chapter 4 - System Water Use
- Chapter 5 - Baselines and Targets
- Chapter 6 - System Supplies
- Chapter 7 - Water Supply Reliability
- Chapter 8 - Water Shortage Contingency Planning

## Chapter 9 - Demand Management Measures

## Chapter 10 - Plan Adoption, Submittal, and Implementation

Pursuant to California Water Code requirements, the City's 2015 Plan incorporates DWR's standardized tables for the reporting and submittal of UWMP data. The City of Bakersfield is a retail and wholesale water supplier. The standardized tables are provided following the text and are separated by retail and wholesale sections. The City also submitted the UWMP data (standardized tables) electronically to DWR.

The City's 2015 Plan also provides supporting documents (appendices) including notification letters of the UWMP update, public notice of the UWMP hearing, adoption resolution from the City's governing body, and the City's Water Shortage Contingency Plan, which is discussed in Chapter 8. Further discussions regarding these supporting documents are provided within the individual chapters of the City's 2015 Plan.

### **1.5 UWMP AND GRANT OR LOAN ELIGIBILITY**

Pursuant to DWR's Final "Guidebook for Urban Water Suppliers," "in order for an urban water supplier to be eligible for any water management grant or loan administered by DWR, the agency must have a current UWMP on file that has been determined by DWR to address the requirements of the CWC. A current UWMP must also be maintained by the water supplier throughout the term of any grant or loan administered by DWR...An UWMP may also be required in order to be eligible for other State funding, depending on the conditions that are specified in the funding guidelines." The City's 2015 Plan has been prepared in order to meet eligibility requirements for grants and loans administered by the State and/or DWR.



## **1.6 UWMP CHECKLIST**

The City's 2015 Plan is considered an update to the City's 2010 Plan. However, the 2015 Plan is considered a stand-alone document. A checklist of specific UWMP requirements is included in Appendix B. The checklist includes the page number where the required elements are addressed to assist in DWR's review of the submitted Plan.

## CHAPTER 2

### PLAN PREPARATION

#### 2.1 BASIS FOR PREPARING THIS PLAN

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##### 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.*

##### CWC 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.*

##### CWC 10621.

*(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero, except as provided in subdivision (d).*

*(d) Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.*

---

This Plan was prepared in accordance with the UWMP Act which was established in 1983. The UWMP Act requires every "urban water supplier" to prepare and adopt a Plan, to periodically review its Plan at least once every five years and make any amendments or changes which are indicated by the review. An "Urban Water Supplier" is defined as 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 (AF) of water annually. The primary objective of the UWMP Act is to direct urban water suppliers to prepare a plan that describes and

evaluates sources of supply, reasonable and practical efficient uses, reclamation, and demand management activities. **The UWMP Act is directed primarily at retail water purveyors where programs can be immediately applied to the consumers. The Act also applies to wholesalers, in that water may be provided indirectly for ultimate municipal use. This Plan includes both the City of Bakersfield Domestic and Wholesale Water Systems, as briefly described in Section 2.1.1.** Sections 10610 through 10656 of the California Water Code, Urban Water Management Planning Act, were enacted in 1983. The UWMP Act, originally known as AB 797, is included in Appendix A.

Section 10621(a) of the California Water Code states, “Each water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.” However, because of recent changes in Urban Water Management Plan requirements, California State law has extended the deadline for the 2015 Plans to July 1, 2016.

The City’s Domestic Water System is operated under a service contract with Cal Water, a California Public Utility Commission (CPUC) regulated company and is managed by the City’s Water Resources Department. The Domestic Water System serves retail customers within its service area boundaries, within a portion of the City of Bakersfield. Other water purveyors serve the retail customers within the remaining City limits. The Domestic Water System is supplied by groundwater wells (owned by the City) and by surface water treatment plants (owned by Cal Water and owned by KCWA’s ID4). The Domestic Water System indirectly receives water from the City’s Wholesale Water System through groundwater replenishment activities and through surface water deliveries to Cal Water’s North Garden Water Treatment Plant and to KCWA ID4’s Henry C. Garnett Water Purification Plant. The City’s Domestic Water System is an “urban water supplier” pursuant to Section 10617 of the California Water Code and directly serves potable water to more than 3,000 customers and supplies more than 3,000 acre-feet per year (AFY) at retail for municipal purposes.

The City's Wholesale Water System consists of the Kern River surface water rights and water supply. The Wholesale Water System is operated by the City's Water Resources Department. The Wholesale Water System provides raw Kern River water for groundwater replenishment, to Cal Water for its surface water treatment plants, to local farmers within the Kern River Canal & Irrigation Company service area, and to other local customers pursuant to pre-existing obligations. The City's Wholesale Water System is an "urban water supplier" pursuant to Section 10617 of the California Water Code and supplies more than 3,000 AFY at retail for municipal purposes.

### 2.1.1 PUBLIC WATER SYSTEMS

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#### CWC 10644.

*(a)(2) The plan, or amendments to the plan, submitted to the department ... shall include any standardized forms, tables, or displays specified by the department.*

#### CWC 10608.52.

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

#### California Health and Safety Code 116275.

*(h) "Public water system" means a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.*

---

Pursuant to California Water Code requirements, the City's 2015 Plan incorporates DWR's standardized tables for the reporting and submittal of UWMP data. The standardized tables are provided in line with the text and are separated by retail and wholesale sections. The City also submitted the UWMP data (standardized tables) electronically through DWR's Online Submittal Tool. In addition, the City's Domestic Water System is a Public Water System (PWS) and is regulated by the State Water Resources Control Board - Division of Drinking Water (SWRCB-DDW). The SWRCB-DDW requires that water agencies report provide the number of connections, water usage, and other information annually. The information provided to SWRCB-DDW indicates the City's Domestic Water System serves potable water to more than 3,000 customers and supplies more than 3,000 AFY.

#### **2.1.2 AGENCIES SERVING MULTIPLE SERVICE AREAS / PUBLIC WATER SYSTEMS**

The City's Domestic Water System serves only a single Public Water System. The City's Domestic Water System operates under the PWS Identification Number CA1510031, as shown in Table 2-1R. The City's Wholesale Water System is not a PWS and does not have a PWS Identification Number.

| Table 2-1 Retail Only: Public Water Systems |                          |                                      |                               |
|---|--------------------------|--------------------------------------|-------------------------------|
| Public Water System Number                  | Public Water System Name | Number of Municipal Connections 2015 | Volume of Water Supplied 2015 |
| CA1510031                                   | City of Bakersfield      | 43,789                               | 35,954                        |
|   |                          |                                      |                               |
|   |                          |                                      |                               |
| <b>TOTAL</b>                                |                          | <b>43,789</b>                        | <b>35,954</b>                 |
| NOTES:                                      |                          |                                      |                               |

Table 2-1R Public Water Systems

## 2.2 REGIONAL PLANNING

The City's Domestic Water System and Wholesale Water System have developed its 2015 Plan reporting solely on its service area to address all requirements of the California Water Code. The City's 2015 Plan was not developed as a Regional Plan.

## 2.3 INDIVIDUAL OR REGIONAL PLANNING AND COMPLIANCE

As shown in Table 2-2, the City's Domestic Water System and Wholesale Water System 2015 Plan is an "Individual UWMP". The City has developed its 2015 Plan reporting solely on its domestic (retail) and wholesale water service areas to address all requirements of the California Water Code. The City notified and coordinated with appropriate regional agencies and constituents (See Section 2.5 of this plan).

| Table 2-2: Plan Identification      |   |  |
|-------------------------------------|---|--|
| Select Only One                     | Type of Plan  | Name of RUWMP or Regional Alliance<br><i>if applicable</i> |
| <input checked="" type="checkbox"/> | Individual UWMP   |  |
|                                     | <input type="checkbox"/> Water Supplier is also a member of a RUWMP             |  |
|                                     | <input type="checkbox"/> Water Supplier is also a member of a Regional Alliance |  |
| <input type="checkbox"/>            | Regional Urban Water Management Plan (RUWMP)                                    |  |
| NOTES:                              |   |  |

Table 2-2 Plan Identification

### 2.3.1 REGIONAL UWMP

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*CWC 10620.*

*(d)(1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.*

---

As indicated in Table 2-2, the City's 2015 Plan was developed as an "Individual UWMP" and not part of a Regional Plan.

### 2.3.2 REGIONAL ALLIANCE

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*CWC 10608.20.*

*(a)(1) ...Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28...*



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.*

---

As indicated in Table 2-2, the City's 2015 Plan was developed as an "Individual UWMP" and not part of a Regional Alliance.

## **2.4 FISCAL OR CALENDAR YEAR AND UNITS OF MEASURE**

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CWC 10608.20.

*(a)(1) Urban retail water suppliers...may determine the targets on a fiscal year or calendar year basis.*

---

### **2.4.1 FISCAL OR CALENDAR YEAR**

The data provided in the City's 2015 Plan is reported on a calendar year basis, unless noted otherwise, as shown in Table 2-3.

| Table 2-3: Agency Identification   |                                   |
|--|-----------------------------------|
| Type of Agency (select one or both)  |                                   |
| <input checked="" type="checkbox"/>  | Agency is a wholesaler            |
| <input checked="" type="checkbox"/>  | Agency is a retailer              |
| Fiscal or Calendar Year (select one)   |                                   |
| <input checked="" type="checkbox"/>  | UWMP Tables Are in Calendar Years |
| <input type="checkbox"/>   | 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:   |                                   |

**Table 2-3      Agency Identification**

## 2.4.2 REPORTING COMPLETE 2015 DATA

The data provided in the City's 2015 Plan is provided on a calendar year basis through December 31, 2015.

## 2.4.3 UNITS OF MEASURE

As shown in Table 2-3, the data provided in the City's 2015 Plan is reported in units of acre-feet, unless noted otherwise.

## 2.5 COORDINATION AND OUTREACH

---

### CWC 10631.

*(j) 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 (c). 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 (c).*

---

### 2.5.1 WHOLESALE AND RETAIL COORDINATION

The City of Bakersfield is a retailer and wholesaler. The City's Domestic Water System receives a portion of its water from wholesale treated surface water from Cal Water's North Garden Water Treatment Plant and KCWA ID4's Henry C. Garnett Water Purification Plant. The City's Wholesale Water System provides Kern River water to two (2) Cal Water treatment plants: the North Garden Water Treatment Plant and Northeast Treatment Plant and provides for various water demands within City limits. Consequently, the City provided its 2015 Plan to Cal Water, KCWA, and other users as applicable. As indicated in Tables 2-4R and 2-4W, the 2015 Plan includes the City's water use projections in five-year increments for normal, single dry, and multiple dry year conditions over the next 20 years, which was provided to Cal Water, KCWA, and other users.

| Table 2-4 Retail: Water Supplier Information Exchange   |  |
|---|--|
| The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631. |  |
| Wholesale Water Supplier Name   |  |
| California Water Company  |  |
| Kern County Water Agency  |  |
|   |  |
| NOTES:  |  |

Table 2-4R Retail Water Supplier Information Exchange

| Table 2-4 Wholesale: Water Supplier Information Exchange (select one) |  |
|---|--|
| <input type="checkbox"/>  | Supplier has informed more than 10 other water suppliers of water supplies available in accordance with CWC 10631. Completion of the table below is optional. If not completed include a list of the water suppliers that were informed. |
|   | <b>Provide page number for location of the list.</b>   |
| <input checked="" type="checkbox"/>                                   | Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with CWC 10631.<br><b>Complete the table below.</b>  |
| Water Supplier Name   |  |
| California Water Service  |  |
|   |  |
| NOTES:  |  |

Table 2-4W Wholesale Water Supplier Information Exchange

## 2.5.2 COORDINATION WITH OTHER AGENCIES AND THE COMMUNITY

---

### CWC 10620.

*(d)(2) 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 the plan.*

---

The City is required to coordinate the preparation of the Plan with appropriate agencies in the area, including appropriate water suppliers that share a common source. Therefore, the City's Domestic Water System and Wholesale Water System coordinated the preparation of the Urban Water Management Plan with the City of Bakersfield City Clerk, the County of Kern, Cal Water, Casa Loma Water Company, East Niles Community Services District, Greenfield County Water District, North of the River Municipal Water District, Oildale Mutual Water Company, Vaughn Water Company, Rosedale Rio Bravo Water Storage District, and KCWA ID4, as shown in Appendix C. As discussed in Section 10.2, the City notified these agencies, at least sixty (60) days prior to the public hearing of the preparation of the 2015 Plan and invited them to participate in the development of the Plan. A copy of the notification letters sent to these agencies is provided in Appendix C.

### 2.5.3 NOTICE TO CITIES AND COUNTIES

---

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.*

---

As discussed in Section 10.2, notification was provided to the Bakersfield City Clerk and County of Kern that the City was reviewing and considering amendments (updates) to the 2010 Plan, and as a result prepared the 2015 Plan Update. Notification was provided at least 60 days prior to the public hearing (see Appendix C).

## CHAPTER 3

### SYSTEM DESCRIPTION

#### 3.1 GENERAL DESCRIPTION

---

CWC 10631.

*(a) Describe the service area of the supplier.*

---

The City of Bakersfield is located in the southern San Joaquin Valley in Kern County. The City of Bakersfield is approximately 100 miles north of the City of Los Angeles, 271 miles south of the City of Sacramento, the capital of California, 286 miles south of San Francisco, 282 miles west of Las Vegas and about 140 miles east of the Pacific Coast. The City of Bakersfield is partially surrounded by a rim of mountains. The Sierra Nevadas are located northeast of the City of Bakersfield and the southern boundary is formed by the Tehachapi Mountains.

The City of Bakersfield is the county seat and the principle metropolitan city of Kern County. The City of Bakersfield operates under a council-manager form of government, with the Water Board of the City of Bakersfield recommending, administering and implementing domestic water and Kern River water policies set by the City Council. The Domestic Water System and the Wholesale Water System are municipally-owned systems, acquired by the City of Bakersfield on December 22, 1976.

The City of Bakersfield is both a wholesaler and retailer of water in the City of Bakersfield area. The City of Bakersfield purchased Kern River water rights, land and the physical water distribution systems for the Ashe Domestic Water Service Area, which has grown to become the City's Domestic Water Service Area, from Tenneco



West (Tenneco). Cal Water is under contract to operate and maintain the City's Domestic Water Service System. The City wholesales a portion of its Kern River water to two Cal Water treatment facilities, and other various water entities. The City's Water Resources Department manages both the domestic retail water operation (City's Domestic Water System) and the wholesale water operation (City's Wholesale Water System).

A portion of the urban water demand within the City limits is satisfied through the City's Kern River deliveries to water treatment plants owned and operated by Cal Water. Cal Water serves portions of the City and unincorporated areas in Kern County, and provides water primarily to single-family residences. Cal Water owns and operates the North Garden Treatment Plant and Northeast Treatment Plant, as show in Plate 1. At these treatment plants, Kern River surface water from the City's Wholesale Water System is treated and prepared for distribution to City and County residents.

The City's Domestic Water System is a local water purveyor that serves retail customers within its service area. The City's water system is currently operated and maintained by Cal Water, as shown in Plate 1. The location of the City's Domestic Water System's service area is shown on Plate 2. In addition, the City of Bakersfield service area boundary within the City of Bakersfield municipal boundary are shown on Plate 3. The City's Domestic Water System provides water primarily for residential uses and also for business, commercial, industrial, and public customers in, and adjacent to, the westerly portion of the City of Bakersfield area. In addition, the City Water Resources Department operates the Kern River channel and several weirs, headgates, turnouts and canals through the City of Bakersfield, as well as 1,470 acres of groundwater recharge ponds (referred to as the City's 2,800 Acre Recharge Facility) along the Kern River.

# City of Bakersfield Water Purveyors

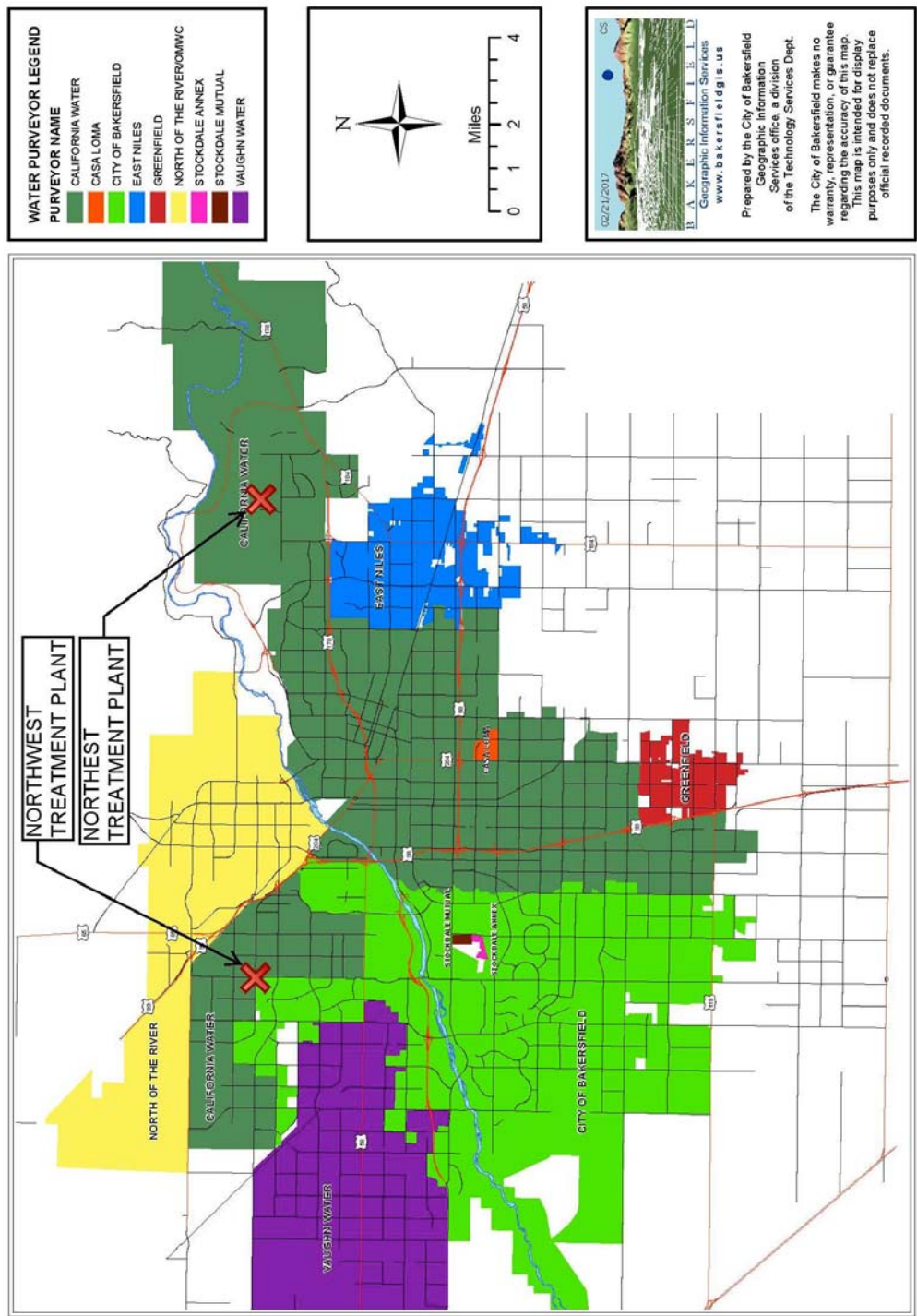
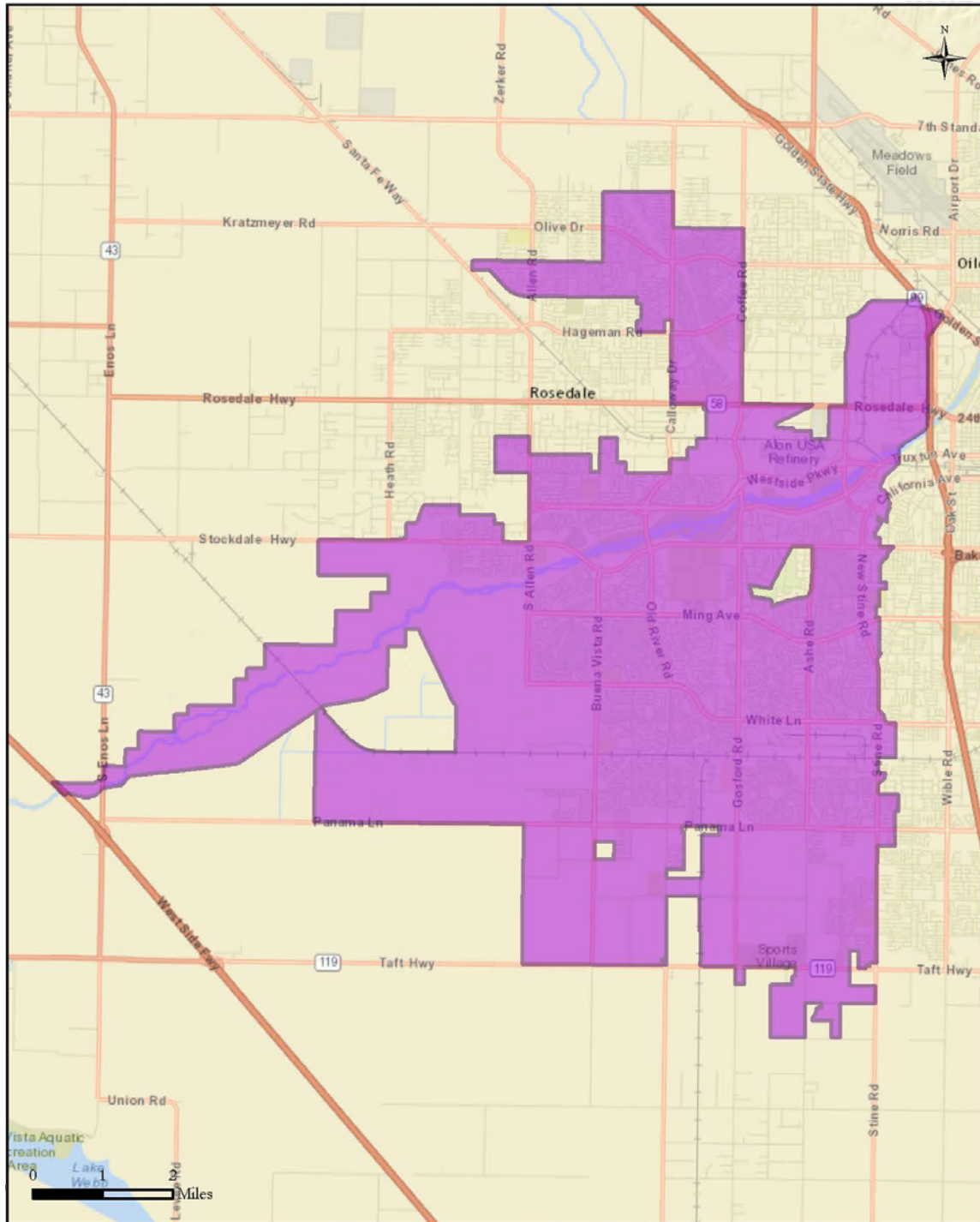


Plate 1 Water Purveyors in the Vicinity of the City of Bakersfield



**Plate 2 City of Bakersfield Domestic Water System's Service Area**

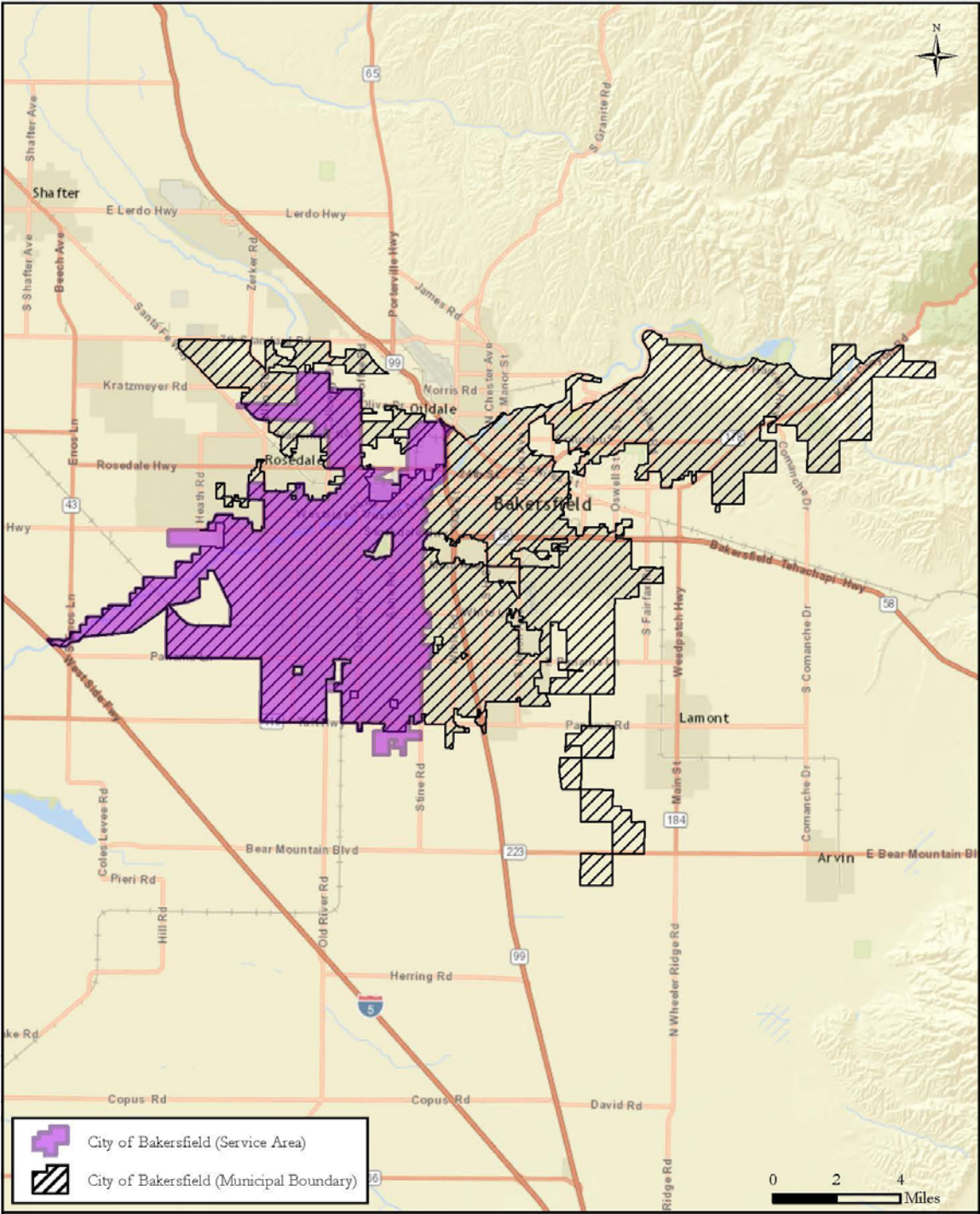


Plate 3 City of Bakersfield Water System Boundary and Municipal Boundary

### 3.2 SERVICE AREA BOUNDARY MAP

Service area Boundary maps are provided in in the body of the plan. The service area boundaries have been electronically submitted to DWR in KML format. The KML files were originally created in a Geographical Information Systems (GIS) shape file format and converted into a KML format. To the extent information was available, metadata was included in the KML files (including map projection, contact information, start and end dates for which the map is valid, constraints, attribute table definitions, and digitizing base).

### 3.3 SERVICE AREA CLIMATE

---

CWC 10631.

*(a) Describe the service area of the supplier, including... climate...*

---

The monthly historical average temperatures (including minimum and maximum), monthly historical average rainfall, and monthly evapotranspiration (ET<sub>o</sub>) in the vicinity of the City's service area is summarized in the tabulation below. Historical rainfall is provided in Appendix D. Historical climate information was obtained from the Western Regional Climate Center (WRCC) and from DWR's California Irrigation Management Information System (CIMIS).



**Service Area Climate Information**

| <b>Month</b>     | <b>Average Temperature<br/>(F)</b> | <b>Average Min. Temperature<br/>(F)</b> | <b>Average Max. Temperature<br/>(F)</b> | <b>Average Total Precipitation<br/>(Inches)</b> | <b>ETo<br/>(Inches)</b> |
|------------------|------------------------------------|---|---|---|-------------------------|
| <b>January</b>   | 47.8                               | 38.5                                    | 57.4                                    | 1.04  | 1.54                    |
| <b>February</b>  | 53.3                               | 42.1                                    | 63.6                                    | 1.16  | 2.33                    |
| <b>March</b>     | 57.3                               | 45.4                                    | 69.0                                    | 1.12  | 4.12                    |
| <b>April</b>     | 62.7                               | 49.7                                    | 75.7                                    | 0.67  | 5.61                    |
| <b>May</b>       | 70.3                               | 56.6                                    | 84.2                                    | 0.21  | 7.65                    |
| <b>June</b>      | 77.7                               | 63.3                                    | 92.1                                    | 0.07  | 8.65                    |
| <b>July</b>      | 83.1                               | 69.2                                    | 98.6                                    | 0.01  | 9.08                    |
| <b>August</b>    | 81.9                               | 67.7                                    | 96.7                                    | 0.04  | 8.45                    |
| <b>September</b> | 76.7                               | 63.1                                    | 91.0                                    | 0.10  | 6.12                    |
| <b>October</b>   | 67.2                               | 54.0                                    | 80.5                                    | 0.30  | 4.07                    |
| <b>November</b>  | 54.8                               | 44.1                                    | 67.3                                    | 0.59  | 2.06                    |
| <b>December</b>  | 47.2                               | 38.5                                    | 57.8                                    | 0.85  | 1.42                    |
| <b>Annual</b>    | 65.0                               | 52.7                                    | 77.8                                    | 6.17  | 61.1                    |

**Source:**

Historical average monthly precipitation and temperature information was obtained from the Western Regional Climate Center (<http://www.wrcc.dri.edu/>) and is based on data collected from Station 040442 (Bakersfield AP, California) from 1937 through 2015. Historical monthly average ETo information was obtained from the California Irrigation Management Information Systems (<http://www.cimis.water.ca.gov>) and is based on data collected from Station 125 (San Joaquin Valley).

The City of Bakersfield has a moderate climate with cloudless, warm, and dry summers and mild and semi-arid winters. The average temperature ranges from 47.2 degrees Fahrenheit (°F) in December to 83.1 °F in July. The average rainfall ranges from 0.01 inches in July to 1.16 inches in February. The Evapotranspiration ranges from 1.42 inches in December to 9.08 inches in July. There are no other demographic factors affecting water management.

### 3.3.1 CLIMATE CHANGE

The California Water Code does not require the City to address climate change. However, a discussion on single-dry year and multiple dry years is provided in Section 7.2 and a discussion on potential impacts to basin management practices is provided in Section 6.2.

### 3.4 SERVICE AREA POPULATION AND DEMOGRAPHICS

---

CWC 10631.

*(a) Describe the service area of the supplier, including current and projected population... 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 City's Domestic Water System service area is shown on Plate 1. City's Domestic Water System service area has a current population of about 146,500. Table 3-1R presents the current and projected population of the area encompassed by the City's Domestic Water System service area from 2015 to 2040. Projected populations in the City's Domestic Water System service area were based on projections obtained from the Southern California Association of Governments (SCAG). The SCAG data incorporates demographic trends, existing land use, general plan land use policies, and input and projections from the Department of Finance (DOF) and the US Census Bureau.



In addition to SCAG data, the City used Methodology 2 of DWR’s “Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use” to calculate the projected service area population from 2020 to 2040. Using Methodology 2, the City used its service area population in calendar year 2015 and the number of residential connections in calendar year 2015 to calculate the “Persons per Residential Connections” for calendar year 2015. Based on DWR’s Population Tool, the year 2015 population is about 146,500. From the City’s data, the City’s number of residential connections during 2015 was 41,112 meters. The “Persons per Residential Connections” is 3.56 (146,500 / 41,112). Based on the City’s Planning Division, it is assumed the City’s population will increase 1.8 percent per year. The City is projected to have a population of approximately 228,800 people by 2040. It is anticipated the population of the City’s Domestic Water System’s service area will grow an average of about 1.8 percent every year. The population estimate for 2015 in Table 3-1R is consistent with DWR requirements discussed in Section 5.4.1.

The City’s Wholesale Water System wholesales raw Kern River water to the two (2) Cal Water treatment plants as previously described. Please refer to Cal Water’s UWMP for their service area population and demographics.

| Table 3-1 Retail: Population - Current and Projected               |         |         |         |         |         |           |
|--|---------|---------|---------|---------|---------|-----------|
| Population Served  | 2015    | 2020    | 2025    | 2030    | 2035    | 2040(opt) |
|  | 146,496 | 160,164 | 175,107 | 191,444 | 209,306 | 228,834   |
| NOTES: Assumes an annual growth rate in the Domestic Water Service |         |         |         |         |         |           |

**Table 3-1R      Retail: Population – Current and Projected**

| Table 3-1 Wholesale: Population - Current and Projected   |         |         |         |         |         |           |
|---|---------|---------|---------|---------|---------|-----------|
| Population Served   | 2015    | 2020    | 2025    | 2030    | 2035    | 2040(opt) |
|   | 278,488 | 293,152 | 308,590 | 324,845 | 341,959 | 359,979   |
| NOTES: These values reflect only Cal Water's service area population, which the City's Wholesale System sales water to. Data is from Cal Water's 2015 UWMP. It is not possible or practicable to include population numbers of the other City's Wholesale System's customers. |         |         |         |         |         |           |

**Table 3-1W Wholesale: Population – Current and Projected**

### 3.4.1 OTHER DEMOGRAPHIC FACTORS

CWC 10631.

*(a) Describe the service area of the supplier, including... other demographic factors affecting the supplier's water management planning.*

No other demographic factors affect the City's water management planning. However, increased population will have an impact on water demand.

## CHAPTER 4

### SYSTEM WATER USE

#### 4.1 RECYCLED VERSUS POTABLE AND RAW WATER DEMAND

Chapter 4 addresses the Domestic Water System potable water demands and the Wholesale Water System raw water demands. Recycled water demands are addressed separately in Section 6.5, however, a summary is provided in Table 4-3R. Raw water is not served by the Domestic Water System and is not applicable to the Domestic Water System. The Wholesale Water System provides raw Kern River water for groundwater replenishment, to Cal Water for its surface water treatment plants, to other water suppliers, and to other local customers pursuant to pre-existing obligations, as shown in Table 4-3W.

#### 4.2 WATER USES BY SECTOR

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CWC 10631(e).

*(1) 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, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:*

- (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.*

*(2) The water use projections shall be in the same five-year increments described in subdivision (a).*

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The Domestic Water System's current and projected water demands are provided in five-year increments through 2040 in Tables 4-1R and 4-2R. Water demand sectors are also identified (see Section 4.2.1). The Domestic Water System's total water demand projections are based on the SB X7-7 calculations prepared in Section 5.7. The water demands for each individual water demand sector were projected based on the percentage breakdown of water demands from each individual water demands sector in 2015 (the percentages were then applied to the projected total water demands).

The Wholesale Water System does not have direct retail customers; therefore, segregation of water sales into residential, commercial, industrial, institution and governmental uses cannot be made. However, records of water deliveries from the Wholesale Water System to its water contractors and other users have been recorded and are summarized on Tables 4-1W and 4-2W. Tables 4-1W and 4-2W shows the past, current, and projected water use for the Kern River water.

| Table 4-1 Retail: Demands for Potable and Raw Water - Actual   |                                       |                                      |               |
|--|---------------------------------------|--------------------------------------|---------------|
| Use Type   | 2015 Actual                           |                                      |               |
|  | Additional Description<br>(as needed) | Level of Treatment<br>When Delivered | Volume        |
| Single Family  |                                       | Drinking Water                       | 23,526        |
| Multi-Family   |                                       | Drinking Water                       | 1,362         |
| Commercial   |                                       | Drinking Water                       | 5,932         |
| Industrial   |                                       | Drinking Water                       | 216           |
| Institutional/Governmental   | Public Authority                      | Drinking Water                       | 2,394         |
| Other  | Fire Service                          | Drinking Water                       | 0             |
| Other  | Construction Water                    | Drinking Water                       | 290           |
| Losses   |                                       | Drinking Water                       | 1,061         |
| Other  | Unbilled                              | Drinking Water                       | 440           |
| <b>TOTAL</b>   |                                       |                                      | <b>35,221</b> |
| NOTES: The City of Bakersfield had 43,789 metered service connections and 557 non-metered fire service connections at the end of 2015. The metered deliveries for the City were 33,720 acre-feet for 2015. |                                       |                                      |               |

**Table 4-1R      Retail: Demands for Potable and Raw Water - Actual**

**Table 4-2 Retail: Demands for Potable and Raw Water - Projected**

| Use Type                   | Additional Description<br>(as needed) | Projected Water Use<br><i>Report To the Extent that Records are Available</i> |               |               |               |               |
|----------------------------|---------------------------------------|---|---------------|---------------|---------------|---------------|
|                            |                                       | 2020  | 2025          | 2030          | 2035          | 2040-opt      |
| Single Family              |                                       | 30,318  | 33,147        | 36,239        | 39,620        | 43,317        |
| Multi-Family               |                                       | 1,755   | 1,919         | 2,098         | 2,294         | 2,508         |
| Commercial                 |                                       | 7,645   | 8,358         | 9,138         | 9,990         | 10,922        |
| Industrial                 |                                       | 278   | 304           | 333           | 364           | 398           |
| Institutional/Governmental | Public Authority                      | 3,085   | 3,373         | 3,688         | 1,032         | 4,408         |
| Other                      | Fire Service                          | 0   | 0             | 0             | 0             | 0             |
| Other                      | Construction Water                    | 374   | 409           | 447           | 488           | 534           |
| Losses                     |                                       | 1,934   | 2,115         | 2,312         | 2,528         | 2,764         |
| <b>TOTAL</b>               |                                       | <b>45,389</b>   | <b>49,625</b> | <b>54,255</b> | <b>56,316</b> | <b>64,851</b> |
| NOTES:                     |                                       |   |               |               |               |               |

**Table 4-2R      Retail: Demands for Potable and Raw Water - Projected**

| <b>Table 4-3 Retail: Total Water Demands</b>            |               |               |               |               |               |               |
|---|---------------|---------------|---------------|---------------|---------------|---------------|
|   | 2015          | 2020          | 2025          | 2030          | 2035          | 2040<br>(opt) |
| Potable and Raw Water<br><i>From Tables 4-1 and 4-2</i> | 35,221        | 45,389        | 49,625        | 54,255        | 56,316        | 64,851        |
| Recycled Water Demand*<br><i>From Table 6-4</i>         | 733           | 2,240         | 2,240         | 2,240         | 2,240         | 2,240         |
| <b>TOTAL WATER DEMAND</b>                               | <b>35,954</b> | <b>47,629</b> | <b>51,865</b> | <b>56,495</b> | <b>58,556</b> | <b>67,091</b> |
| NOTES:  |               |               |               |               |               |               |

**Table 4-3R      Retail: Total Water Demands**

**Table 4-1 Wholesale: Demands for Potable and Raw Water - Actual**

| Use Type                | 2015 Actual                                  |   |               |
|-------------------------|--|---|---------------|
|                         | Additional Description<br>(as needed)        | Level of<br>Treatment When<br>Delivered | Volume        |
| Sales to other agencies | KRC&I  | Raw Water                               | 1,781         |
| Sales to other agencies | Other Surface Water Demands                  | Raw Water                               | 1,909         |
| Sales to other agencies | Cal Water Northeast Treatment Plant          | Raw Water                               | 8,026         |
| Sales to other agencies | Cal Water Northwest (Garden) Treatment Plant | Raw Water                               | 1,125         |
| Groundwater recharge    | City Amenities                               | Raw Water                               | 817           |
| Groundwater recharge    | 2800 Acre Banking                            | Raw Water                               | 0             |
| Groundwater recharge    | River and Carrier Canal Recharge             | Raw Water                               | 3,928         |
| <b>TOTAL</b>            |  |   | <b>17,586</b> |

NOTES: 2015 was the driest year in recorded history.

**Table 4-1W Wholesale: Demands for Potable and Raw Water - Actual**

| Table 4-2 Wholesale: Demands for Potable and Raw Water - Projected |   |  |                |                |                |                |
|--|---|--|----------------|----------------|----------------|----------------|
| Use Type   | Additional Description                        | Projected Water Use<br>Report To the Extent that Records are Available |                |                |                |                |
|  |   | 2020   | 2025           | 2030           | 2035           | 2040 (opt)     |
| Sales to other agencies  | KRC&I   | 5,300  | 5,300          | 5,300          | 5,300          | 5,300          |
| Sales to other agencies  | Other Surface Water Demands                   | 34,481   | 24,481         | 24,481         | 24,481         | 24,481         |
| Sales to other agencies  | Cal Water Northeast Treatment Plant*          | 16,802   | 33,604         | 33,604         | 33,604         | 33,604         |
| Sales to other agencies  | Cal Water Northwest (Garden) Treatment Plant* | 10,000   | 10,000         | 10,000         | 10,000         | 10,000         |
| Groundwater recharge   | City Amenities                                | 1,000  | 1,000          | 1,000          | 1,000          | 1,000          |
| Groundwater recharge   | 2800 Acre Banking                             | 17,417   | 10,615         | 10,615         | 10,615         | 10,615         |
| Groundwater recharge   | River and Carrier Canal Recharge              | 50,000   | 50,000         | 50,000         | 50,000         | 50,000         |
| <b>TOTAL</b>   |   | <b>135,000</b>   | <b>135,000</b> | <b>135,000</b> | <b>135,000</b> | <b>135,000</b> |

NOTES: \*Determined from Cal Water's 2015 UWMP

**Table 4-2W Wholesale: Demands for Potable and Raw Water - Projected**

| Table 4-3 Wholesale: Total Water Demands                |        |         |         |         |         |           |
|---|--------|---------|---------|---------|---------|-----------|
|   | 2015   | 2020    | 2025    | 2030    | 2035    | 2040(opt) |
| Potable and Raw Water<br><i>From Tables 4-1 and 4-2</i> | 17,586 | 135,000 | 135,000 | 135,000 | 135,000 | 135,000   |
| Recycled Water Demand*<br><i>From Table 6-4</i>         | 0      | 0       | 0       | 0       | 0       | 0         |
| <b>TOTAL WATER DEMAND</b>                               | 17,586 | 135,000 | 135,000 | 135,000 | 135,000 | 135,000   |
| NOTES:  |        |         |         |         |         |           |

Table 4-3W Wholesale: Total Water Demands

#### 4.2.1 DEMAND SECTORS LISTED IN WATER CODE

As shown in Table 4-1R, the Domestic Water System service area includes the following water demand sectors listed in the California Water Code:

- Single-family residential  
(A single-family dwelling unit is a lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling. Single-family residential water demands are included in retail demands.)
- Multi-family  
(Multiple dwelling units are contained within one building or several buildings within one complex. Multi-family residential water demands are included in retail demands.)

- Commercial  
(Commercial users are defined as water users that provide or distribute a product or service. Commercial water demands are included in retail demands.)
- Institutional (and governmental)  
(Institutional users are defined as water user dedicated to public service. Institutional users include, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions. Institutional water demands are included in retail demands.)
- Industrial  
(Industrial users are defined as water users that are primarily a manufacturer or processor of materials as defined by the North American Industry Classification System (NAICS) code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development. Industrial water demands are included in retail demands.)
- Landscape  
(Landscape connections supply water solely for landscape irrigation. Landscapes users may be associated with multi-family, commercial, industrial, or institutional/governmental sites, but are considered a separate water use sector if the connection is solely for landscape irrigation. Landscape water demands are included in retail demands.)
- Distribution system losses  
(Distribution system losses are discussed in Section 4.3 and Appendix E.)



As shown in Table 4-1W, the Wholesale Water System service area includes the following water demand sectors listed in the California Water Code:

- Sales to Other Agencies

Water sales made to another agency. Projected sales may be based on projected demand provided by the receiving agency. There is inherent uncertainty in future projections, therefore, any projected sales reported in the Plan are for planning purposes only and are not considered a commitment on the part of the seller. This is a wholesale demand.

- Groundwater Recharge

The managed and intentional replenishment of natural groundwater supplies using man-made conveyances such as infiltration basins or injection wells. Water used for groundwater banking or storage may also be reported using this sector.

- Distribution system losses

(Distribution system losses are discussed in Section 4.3 and Appendix E.)

#### **4.2.2 DEMAND SECTORS IN ADDITION TO THOSE LISTED IN THE WATER CODE**

There are “other” water demand sectors that are not specifically listed in, nor required by the California Water Code, such as exchanges, surface water augmentation, transfers, wetlands or wildlife habitat, firefighting, line flushing, or other unbilled uses. Some agencies account for the entirety of their demand. The water use in these sectors is to be reported as records are available. The City’s Domestic Water System service area includes an “other” water demand sector which is not listed in the

California Water Code. The City includes the following under the “other” water demand sector:

- Non-metered Fire Services
- Public Administration
- Miscellaneous

#### 4.3 DISTRIBUTION SYSTEM WATER LOSSES

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CWC 10631(e)(1).

*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, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:...*

*(J) Distribution system water loss*

CWC 10631(e)(3).

*(A) For the 2015 urban water management plan update, the distribution system water loss shall be quantified for the most recent 12-month period available. For all subsequent updates, the distribution system water loss shall be quantified for each of the five years preceding the plan update.*

*(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.*

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The City’s Domestic Water System estimated its distribution system water loss over the most recent 12-month period from January 2015 to December 2015 using the methodology developed by the American Water Association (AWWA). The Domestic Water System distribution system water loss over the most recent 12-month period available, from January 2015 to December 2015, is provided in Table 4-4R. A copy of

the AWWA water system balance calculation for the Domestic Water System distribution system water loss is provided in Appendix E.

| Table 4-4 Retail: 12 Month Water Loss Audit Reporting  |                       |
|--|-----------------------|
| Reporting Period Start Date<br>(mm/yyyy)   | Volume of Water Loss* |
| 01/2015  | 1061                  |
| <i>* Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.</i> |                       |
| NOTES:   |                       |

**Table 4-4R      Retail: Water Loss Summary Most Recent 12 Month Period Available**

| Table 4-4 Wholesale: 12 Month Water Loss Audit Reporting   |                       |
|--|-----------------------|
| Reporting Period Start Date<br>(mm/yyyy)   | Volume of Water Loss* |
| NA   | NA                    |
| <i>* Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.</i> |                       |
| NOTES: Does not apply to the Wholesale Water System  |                       |

**Table 4-4W      Wholesale: Water Loss Summary Most Recent 12 Month Period Available**

#### 4.4 ESTIMATED FUTURE WATER SAVINGS

CWC 10631(e)(4).

(A) If available and applicable to an urban water supplier, water use projections may 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.*

The City's water demand projections are provided in Chapter 7 and are based on the water use targets identified in Section 5.7 pursuant to the Water Conservation Act of 2009 (or SB X7-7). The water demand projections incorporate water savings, or "passive savings", which are the result of implementation of new plumbing codes along with consumer awareness of the need to conserve water. The City's Water Conservation Ordinance, includes methods for current and ongoing reduction in water use and water waste. Historically, the City's water use rate averaged about 316 gallons per capita day (from 1995 through 2004). As identified in Section 5.8, the City's actual water use rate during 2015 was 215 gallons per capita day which is a decrease of about 101 gallons per capita day from the recent historical average and is the result of passive savings. The City's projected water use targets identified in Section 5.7, including a water use target of 253 gallons per capita day in 2020, incorporate ongoing water passive savings and reduced water use. As indicated in Table 4-5R, estimated future water savings have been considered as part of the City's water use projections.

| Table 4-5 Retail Only: Inclusion in Water Use Projections   |             |
|---|-------------|
| Are Future Water Savings Included in Projections?<br>(Refer to Appendix K of UWMP Guidebook)  | Yes         |
| If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc... utilized in demand projections are found. | Section 4.4 |
| Are Lower Income Residential Demands Included In Projections?   | Yes         |
| NOTES:  |             |

**Table 4-5R      Retail Only: Inclusion in Water Use Projection**

## 4.5 WATER USE FOR LOWER INCOME HOUSEHOLDS

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### 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.*

### California Health and Safety Code 50079.5.

*(a) "Lower income households" means persons and families whose income does not exceed the qualifying limits for lower income families... In the event the federal standards are discontinued, the department shall, by regulation, establish income limits for lower income households for all geographic areas of the state at 80 percent of area median income, adjusted for family size and revised annually.*

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The City's Domestic Water System water use projections (See Section 7.3) through 2040 include projected water demands from lower income single-family and multi-family households, as indicated in Table 4-5. For the Domestic Water System, water use projections for low income households make up about 29 percent of the City's projected retail water demands. Total Low Income water demands for 2015 was about 7,218 acre-feet and is projected to be about 7,489 acre-feet in 2040. These numbers are incorporated into Tables 4-2R and 4-3R.

The City's Wholesale Water System does not provide retail water service and therefore water use projections for low income households do not apply.

## 4.6 CLIMATE CHANGE

DWR has deemed Section 4.6 as optional. The City is not required by DWR to complete this section. However, a discussion on single-dry year and multiple dry years

is provided in Section 7.2 and a discussion on potential impacts to basin management practices is provided in Section 6.2.

## CHAPTER 5

### SB X7-7 BASELINE AND TARGETS

The Water Conservation Act of 2009 (or SB X7-7) requires retail urban water suppliers to determine target water use for the years 2015 and 2020 in order to help the state achieve a 20 percent reduction in urban water use by the year 2020. Methodologies for calculating baseline and compliance daily urban per capita water use for the consistent implementation of the Water Conservation Act of 2009 were previously published by DWR's "Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use", dated October 1, 2010. DWR provided updated methodologies in its Final "Guidebook for Urban Water Suppliers," dated March 2016. DWR's guidance documents were used by the City's Domestic Water System to determine the required water use parameters which are discussed below. The City's Domestic Water System developed the baselines and targets individually and not regionally. A copy of the Water Conservation Act of 2009 is provided in Appendix F.

#### 5.1 GUIDANCE FOR WHOLESALE AGENCIES

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CWC 10608.12(r).

*Urban wholesale water suppliers means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.*

CWC 10608.36.

*Urban wholesale water suppliers shall include in the urban water management plans... an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.*

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SBX7-7 requires Urban Wholesale Water Suppliers to “...include in the urban water management plans...an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.” The City’s Wholesale Water System provides Kern River water for groundwater replenishment to support the groundwater wells serving the City’s Domestic Water System. It also provides Kern River water to two (2) Cal Water surface water treatment plants, which deliver water to Cal Water’s Domestic Water Service Area and the City’s Domestic Water Service Area. The water use reductions required by SBX7-7 concurrently address the water use reductions for the City’s Wholesale Water System. For this Plan, the City’s Wholesale Water System has assumed its retail water contracts per capita water use will be reduced by 10 percent by 2015 and by 20 percent by 2020 in compliance with SBX7-7. In 2015 the City Council passed an ordinance (Ordinance 4804) restricting water days within the City limits to three (3) days per week. A second ordinance (Ordinance 4830) was passed in 2015 and gave trained City staff the ability to issue administrative citations within the City limits to violators of the City’s water conservation ordinances. These two ordinances, in addition to existing water conservation efforts and programs implemented by the City and Cal Water, helped achieve the water use reductions required by this section.

## **5.2 UPDATING CALCULATIONS FROM 2010 UWMP**

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### CWC 10608.20.

*(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).*

### Methodologies DWR 2010, Methodology 2 Service Area Population.

*Page 27 - Water suppliers may revise population estimates for baseline years between 2000 and 2010 when 2010 census information becomes available. DWR will examine discrepancy between the actual population estimate and DOF’s projections for 2010; if significant discrepancies are discovered, DWR may require some or all suppliers to update their baseline population estimates.*

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### **5.2.1 TARGET METHOD**

The methodology used in the City's 2010 Plan to determine the City's Domestic Water System's 2015 and 2020 urban water use targets was Target Method 1 as described in Chapter 5.7.1. For this 2015 Plan, Target Method 1 was also used and the values updated based on the most recent data. This is further discussed in Chapter 5.7.1.

### **5.2.2 REQUIRED USE OF 2010 U.S. CENSUS DATA**

The 2010 U.S. Census data was used in updating the baseline populations in this 2015 Plan. See Chapter 5.4 for the population methodology used.

### **5.2.3 SB X7-7 VERIFICATION FORM**

The City's Domestic Water System has updated its baseline and water use target calculations from 2010 (See Section 5.7). The required standardized tables in the SB X7-7 Verification Form are provided in Appendix G.

## **5.3 BASELINE PERIODS**

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#### CWC 10608.20.

*(e) An urban retail water supplier shall include in its urban water management plan due in 2010...the baseline daily per capita water use...along with the bases for determining those estimates, including references to supporting data.*

*(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).*

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The Baseline Daily Per Capita Water Use is defined as the average water use, expressed in gallons of water used per person per day (GPCD), for a continuous, multi-year baseline period. There were two different baseline periods (including a 10-year baseline period<sup>1</sup> and a 5-year baseline period<sup>2</sup>) for calculating Baseline Daily Per Capita Water Use in the the City's 2010 Plan. The baseline periods applicable for the City's 2015 Plan have been reviewed and are presented below.

### **5.3.1 DETERMINATION OF THE 10-15 YEAR BASELINE PERIOD (BASELINE GPCD)**

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#### CWC 10608.12.

*(b) "Base daily per capita water use" means any of the following:*

*(1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.*

*(2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.*

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The California Water Code allows an urban water supplier to calculate up to a 15-year baseline period if at least 10 percent of its 2008 retail water demands were met through recycled water deliveries within its service area, otherwise calculation of a 10-

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<sup>1</sup> Pursuant to CWC 10608.12(b)(1), the 10-year baseline period is based on "a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010"

<sup>2</sup> Pursuant to CWC 10608.12(b)(3), the 5-year baseline period is based on "a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010"

year baseline period is required. Recycled water made up less than 10 percent of the City's 2008 water deliveries, therefore, a 10-year baseline period between 1995 and 2004 was used, see SB X7-7 Table 1, Appendix G.

### **5.3.2 DETERMINATION OF THE 5-YEAR BASELINE PERIOD (TARGET CONFIRMATION)**

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#### CWC 10608.12.

*(b)(3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.*

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A 5-year baseline period City's Domestic Water System between 2006 and 2010 was used, see SB X7-7 Table 1, Appendix G.

## **5.4 SERVICE AREA POPULATION**

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#### CWC 10608.20.

*(e) An urban retail water supplier shall include in its urban water management plan due in 2010...the baseline daily per capita water use...along with the bases for determining those estimates, including references to supporting data.*

*(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.*

#### CWC 10644.

*(a)(2) The plan... shall include any standardized forms, tables, or displays specified by the department.*

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For the purposes of projecting water use targets (See Section 5.7), agencies must determine the population that they served for each baseline year in both of the baseline periods (identified in Section 5.3) and for the 2015 compliance year (calendar year 2015). The City's Domestic Water System has incorporated U.S. Census data through 2010 into baseline population calculations in this 2015 Plan (See Section 5.4.1) using DWR's Population Tool. The City's Domestic Water System updated its baseline population as well as its water use targets (See Section 5.7) previously calculated in its 2010 Plan.

#### **5.4.1 POPULATION METHODOLOGY**

The annual populations within the City's Domestic Water System service area for each year during the baseline periods (identified in Section 5.3) and for the 2015 compliance year (calendar year 2015) were estimated by DWR's online Population Tool (See SB X7-7 Table 2, Appendix G). As discussed in Section 3.2.1, the City's Domestic Water System service area boundary was submitted to the Population Tool in a "KML" file format (i.e. Google Earth format). The submitted KML file represents the City's Domestic Water System service area boundaries for 1990, 2000, 2010 and present (2015). The Population Tool utilized U.S. Census data from 1990, 2000, and 2010, along with the City's Domestic Water System service area boundaries for the corresponding years, to estimate the population served by the City's Domestic Water System in calendar years 1990, 2000, and 2010. The annual amounts of residential service connections within the City's Domestic Water System service area for each year from 1990 through 2015 were also entered into DWR's online Population Tool. Based on the actual population data (1990, 2000, and 2010) as well as the annual residential service connections (from 1990 through 2015), DWR's Population Tool estimated the annual population within the City's Domestic Water System service area for each year from 1990 to 2015. The City's Domestic Water System estimated populations during

the baseline periods are provided in SB X7-7 Table 3, Appendix G. More information on the population methodology is provided in DWR's Final "Guidebook for Urban Water Suppliers," dated March 2016.

## 5.5 GROSS WATER USE

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### CWC 10608.12.

*(g) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:*

- (1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.*
- (2) The net volume of water that the urban retail water supplier places into long-term storage.*
- (3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.*
- (4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.*

### California Code of Regulations Title 23 Division 2 Chapter 5.1 Article 1, Section 596.

*(a) An urban retail water supplier that has a substantial percentage of industrial water use in its service area is eligible to exclude the process water use of existing industrial water customers from the calculation of its gross water use to avoid a disproportionate burden on another customer sector.*

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Annual gross water use amounts within the City's Domestic Water System for each year of the 10-year baseline year (1995 to 2004) identified in Section 5.3.1, for each year of the 5-year baseline year (2006 to 2010) identified in Section 5.3.2, and for calendar year 2015 are based on the total amount of water entering the City's Domestic Water System distribution system from its water supply sources (groundwater production wells, imported State water, and Kern River water).

### **5.5.1 GROSS WATER TABLES**

Annual gross water use amounts within the City's Domestic Water System for each year of the 10-year baseline (1995 to 2004), 5-year baseline (2006-2010), and for calendar year 2015, are provided in SB X7-7 Table 4 (Appendix G).

The City's Domestic Water System currently does not use indirect recycled water within its service area, therefore, SB X7-7 Table 4-B (Appendix G) is not required by DWR to be completed.

Industrial process water is not included in the City's Domestic Water System gross water use, therefore, SB X7-7 Table 4-C.1, SB X7-7 Table 4-C.2, SB X7-7 Table 4-C.3, SB X7-7 Table 4-C.4, and SB X7-7 Table 4-D (Appendix G) are not required by DWR to be completed.

## **5.6 BASELINE DAILY PER CAPITAL WATER USE**

The "daily per capita water use" is based on GPCD within the City's Domestic Water System. The daily per capita water use is estimated by dividing gross water use (See Section 5.5 and Appendix G, SB X7-7 Table 4) by the service area population (See Section 5.4 and Appendix G, SBX 7-7 Table 3). The City's Domestic Water System's daily per capita water uses were determined for each year of the 10-year baseline (1995 to 2004), 5-year baseline (2006-2010), and for calendar year 2015 and are provided in SB X7-7 Table 5 (Appendix G). The table also provides the 10-Year and 5-Year Average Baseline GPCD. The 10 Year Average Baseline GPCD is 316. The 5-Year Average Baseline GPCD is 312.

## 5.7 2015 AND 2020 TARGETS

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### CWC 10608.20.

*(e) An urban retail water supplier shall include in its urban water management plan due in 2010... urban water use target, interim urban water use target,... along with the bases for determining those estimates, including references to supporting data.*

*(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan....*

---

As discussed in Section 5.2.1, “Target Method 1” was used in the City’s 2015 Plan to determine the City’s Domestic Water System’s 2015 and 2020 urban water use targets. A further discussion regarding the selected target method is provided below.

### 5.7.1 SELECT AND APPLY A TARGET METHOD

Calculation of the 2020 Urban Water Use Target includes adoption of one of four available methods (pursuant to California Water Code Section 10608.20(b)). The City’s Domestic Water System reviewed the following available methods.

Target Method 1: *Eighty percent of the urban retail water supplier’s 10 or 15 Year Baseline Per Capita Daily Water Use.*

Using this method, the Urban Water Use Target for the City’s Domestic Water System was calculated as **253 GPCD**, based on 80 percent of the City’s Domestic Water System’s Baseline Per Capita Daily Water Use of 316 GPCD. (See SB X7-7 Table 7-A, Appendix G).

Target Method 2: *Estimate using the sum of the specified three performance standards specified in California Water Code Section 10608.20(b)(2).*

Due to insufficient data, this target method was not considered.

Target Method 3: *Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's 20x2020 Water Conservation Plan.<sup>3</sup>*

The City's Domestic Water System's service area lies entirely within DWR Tulare Lake Hydrologic Region. According to SB X7-7 Table 7-E (Appendix G), the 2020 regional water use target for the Tulare Lake Hydrologic Region is 188 GPCD. The Target Method 3 regional use target for the Tulare Lake Hydrologic Region (or 95 percent of the 2020 regional water use target) is 179 GPCD.

Target Method 4: *Water Savings (DWR Provisional Method 4)*

Due to insufficient data, this target method was not considered.

After reviewing the results of the four target methods, Target Method 1 was used to determine the City's Domestic Water System's Urban Water Use Target for the 2020 calendar year and was calculated to be **253 GPCD** as indicated in SBX7-7 Tables 7 and 7-A (Appendix G).

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<sup>3</sup> California Department of Water Resources, State Water Resources Control Board, California Bay-Delta Authority, California Energy Commission, California Department of Public Health, California Public Utilities Commission, and California Air Resources Board. *20x2020 Water Conservation Plan*. February 2010.



### 5.7.2 5-YEAR BASELINE – 2020 TARGET CONFIRMATION

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CWC 10608.22.

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

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If an urban retail water supplier's 5-year baseline period water use is greater than 100 GPCD, the calculated 2020 Urban Water Use Target (See Section 5.7.1) shall be no greater than 95 percent of the 5-year baseline period water use. The City's Domestic Water System's calculated 5-year baseline period water use was 312 GPCD (See Section 5.3.2). The value calculated for 95 percent of the 5-year baseline period water use is **297 GPCD**. The City's Domestic Water System's 2020 Urban Water Use Target was initially determined using Target Method 1 above to be 253 GPCD, which is less than the value calculated in this step (297 GPCD). Therefore, no adjustment is needed to the City's Domestic Water System's 2020 Urban Water Use Target of **253 GPCD** (See SB X7-7 Table 7-F, Appendix G).

### 5.7.3 CALCULATE THE 2015 INTERIM URBAN WATER USE TARGET

The City's Domestic Water System's 2015 Interim Target is based on the value mid-point between the 10-year baseline period water (316 GPCD, See Section 5.3.1 and SB X7-7 Table 5, Appendix G,) and the confirmed 2020 Urban Water Use Target (253 GPCD, See Section 5.7.2 and SB X7-7 Table 7, Appendix G). The City's Domestic Water System's 2015 Interim Target is **284 GPCD** as indicated in SB X7-7 Table 8 (Appendix G).

#### 5.7.4 BASELINE AND TARGETS SUMMARY

A summary of the City's Domestic Water System's baseline water use and targets is provided in Table 5-1R.

| <b>Table 5-1 Baselines and Targets Summary</b><br><i>Retail Agency or Regional Alliance Only</i> |            |          |                        |                       |                        |
|--|------------|----------|------------------------|-----------------------|------------------------|
| Baseline Period  | Start Year | End Year | Average Baseline GPCD* | 2015 Interim Target * | Confirmed 2020 Target* |
| 10-15 year   | 1995       | 2004     | 316                    | 284                   | 253                    |
| 5 Year   | 2006       | 2010     | 312                    |                       |                        |
| *All values are in Gallons per Capita per Day (GPCD)   |            |          |                        |                       |                        |
| NOTES:   |            |          |                        |                       |                        |

**Table 5-1R Baselines and Target Summary**

#### 5.8 2015 COMPLIANCE DAILY PER CAPITA WATER USE (GPCD)

##### CWC 10608.12.

*(e) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period...*

##### CWC 10608.24.

*(a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.*

##### CWC 10608.20.

*(e) An urban retail water supplier shall include in its urban water management plan due in 2010 ... compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.*

### 5.8.1 MEETING THE 2015 TARGET

As discussed in Section 5.7.3, the City's Domestic Water System's 2015 Interim Target is **284 GPCD**. The City's Domestic Water System's actual water use during 2015 was **215 GPCD**. The City's Domestic Water System is currently in compliance with the 2015 Interim Target, as show in SB X7-7 Table 9 (Appendix G).

### 5.8.2 2015 ADJUSTMENTS TO 2015 GROSS WATER USE

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CWC 10608.24(d).

(1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:

(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.

(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.

(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.

(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

Methodology Document, Methodology 4.

*This section discusses adjustments to compliance-year GPCD because of changes in distribution area caused by mergers, annexation, and other scenarios that occur between the baseline and compliance years.*

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As discussed in Section 5.8.1, the City's Domestic Water System is currently in compliance with its 2015 Interim Target, therefore, no adjustments to the City's Domestic Water System's 2015 gross water use are needed (See Table 5-2R).

| <b>Table 5-2: 2015 Compliance</b><br><i>Retail Agency or Regional Alliance Only</i> |                                    |   |                         |                           |                       |                        |   |   |
|---|------------------------------------|---|-------------------------|---------------------------|-----------------------|------------------------|---|---|
| Actual<br>2015 GPCD*  | 2015<br>Interim<br>Target<br>GPCD* | <b>Optional Adjustments to 2015 GPCD</b><br>Enter "0" if no adjustment is made<br><i>From Methodology 8</i> |                         |                           |                       |                        | 2015 GPCD*<br>(Adjusted if<br>applicable) | Did Supplier<br>Achieve<br>Targeted<br>Reduction for<br>2015? Y/N |
|   |                                    | Extraordinary<br>Events*  | Economic<br>Adjustment* | Weather<br>Normalization* | TOTAL<br>Adjustments* | Adjusted<br>2015 GPCD* |   |   |
| 215   | 284                                | 0   | 0                       | 0                         | 0                     | 215                    | 215                                       | Yes   |
| <i>*All values are in Gallons per Capita per Day (GPCD)</i>                         |                                    |   |                         |                           |                       |                        |   |   |
| NOTES:  |                                    |   |                         |                           |                       |                        |   |   |

**Table 5-2R      2015 Compliance**

## 5.9 REGIONAL ALLIANCE

As discussed in Section 2.3.2, the City's 2015 Plan was not developed as part of a Regional Alliance. Information from the City's 2015 Plan is not required to be reported in a Regional Alliance report.

## **CHAPTER 6**

### **SYSTEM SUPPLIES**

The City's water supply sources for the Domestic Water System include groundwater produced from the Kern County groundwater basin and treated surface water from Cal Water North Garden Water Treatment Plant and ID4's water treatment plant. The water supply source for the Wholesale Water System is surface water from the Kern River. Details on the City's sources of water supply from groundwater (Section 6.2) and surface water (Section 6.3) are discussed below.

#### **6.1 PURCHASED OR IMPORTED WATER**

The Domestic Water System and Wholesale Water System does not use purchased or imported water to meet its water demands. (Treated surface water from Cal Water North Garden Water Treatment Plant and ID4's water treatment plant is discussed under Section 6.3 as "Surface Water").

#### **6.2 GROUNDWATER**

The City's Domestic Water System historically and currently supplies the majority of its customers water use by pumping groundwater from the Kern County groundwater basin, a sub-basin of the Southern San Joaquin Valley Groundwater Basin. Historically, the City's Domestic Water System has been able to meet the demands of its customers. The City's Wholesale System does not utilize pumped groundwater.

## 6.2.1 BASIN DESCRIPTION

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CWC 10631.

*(b) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*

*(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater.*

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### **Kern County Sub-Basin - Description**

The City of Bakersfield is located above a series of water bearing aquifers. These water aquifers are part of the larger groundwater basin called the Southern San Joaquin Valley Groundwater Basin, which is located within the Tulare Lake Hydrologic Region. The Tulare Lake Hydrologic Region covers about 17,000 square miles and has 12 distinct groundwater basins and 7 sub-basins within the San Joaquin Valley Groundwater Basin. The City's Domestic Water System is located in a sub-basin of the San Joaquin Valley Groundwater Basin called Kern County sub-basin. The location of the Kern County sub-basin is shown on Plate 5. The San Joaquin Valley Groundwater Basin is bounded on the north by the Kern County line, on the east by the Sierra Nevadas, on the west by the Coast Ranges and on the south by the San Emigdio and Tehachapi Mountains. The Kern River is the surface water feature that divides this area. The groundwater aquifers within the San Joaquin Valley Groundwater Basin are thick and are made up of unconsolidated sediments. These sediments are bordered by faults and mountain ridges and serve as effective barriers for groundwater movement. Due to the thickness of the sediment in this basin, many groundwater wells within the San Joaquin Valley Groundwater Basin exceed 1,000 feet in depth. All of the City's Domestic Water System's wells are located within the San Joaquin Valley Groundwater Basin. The average low and high flow rate of these wells are 300 gpm and 2,000 gpm,

respectively. Additional information on the San Joaquin Valley Groundwater Basin within the Tulare Lake Hydrologic Region can be found in DWR California Groundwater Bulletin 118, located in Appendix H of this plan.

## 6.2.2 GROUNDWATER MANAGEMENT

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### CWC 10631(b).

*(b) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*

*(1) A copy of any groundwater management plan adopted by the urban water supplier ... or any other specific authorization for groundwater management.*

*(2) ...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.*

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The Kern County sub-basin is not an adjudicated basin. The City's management of its water resources for the Kern County sub-basin is based on measured and recorded recharge and banking operations. Sources of recharge to the Kern County sub-basin include precipitation and runoff, Kern River channel and canal seepage, and spreading/banking, which are discussed in detail below. The City's Wholesale Water System accurately monitors these activities on a daily basis and publishes an annual report. The City's Domestic Water System accurately records groundwater pumping. One of the goals of water resource management is to limit groundwater extractions to no more than the "safe yield" for the groundwater basin. "Safe yield" occurs when the amount of water pumped from the basin is less than or equal to replenishment water supply into the basin.

### **6.2.2.1 SOURCES OF GROUNDWATER RECHARGE**

The City's Domestic Water System's major water supply historically has been groundwater. Therefore, groundwater replenishment from the Kern River water supply plays a vital role in the reliability of the City's Domestic Water System water supply. The groundwater replenishment activities described in the following sections benefit the City's Domestic Water System, the City of Bakersfield area and the Kern County groundwater basin.

#### **6.2.2.1.1 Captured Precipitation**

The City owns over 330 storm water basins which recharge captured precipitation within the City limits. This recharged water replenishes the groundwater basin and is stored for future beneficial use by the City's Domestic Water System.

#### **6.2.2.1.2 Kern River Channel and Carrier Canal**

The City's surface water is transported through the Kern River and the unlined Carrier Canal. A portion of this water is infiltrated and is recharged into the groundwater basin. This recharged water replenishes the groundwater basin and is stored for future beneficial use by the City's Domestic Water System. From 1978 to 2005 the quantity of the City's recharged water in the Kern River Channel and Carrier Canal varied greatly from 143,000 acre feet to 66 acre feet, with a yearly average of approximately 38,000 acre feet.

#### **6.2.2.1.3 "2,800 Acres"**

The City owns and operates a recharge facility in the west side of town called the "2,800 Acres" recharge facility. This facility is about 6 miles long and includes old river channels, overflow lands, and constructed spreading basins. It



is located in and along the Kern River approximately 8 miles west of Highway 99. The City began spreading water in the “2,800 Acres” in 1978 through the use of one basin and a number of temporary embankments. Additional basins have been built, increasing the number of acres available for spreading water and recharge. Currently there are approximately 1,470 acres available for replenishment activities. From 1978 to 2005 the quantity of recharged water in the 2,800 Acres varied greatly from 104,000 acre feet to zero acre feet, with a yearly average of approximately 18,000 acre feet.

#### **6.2.2.1.4 Kern County Water Agency Improvement District No. 4 (ID4)**

ID4 provides a supplemental water supply for portions of the urban Bakersfield area through the importation of water from the State Water Project (SWP). ID4 operations are based on providing imported water to the underground aquifers for groundwater replenishment and providing treated water for the City’s Domestic Water System and others. The purchases of SWP or federal water supplies are funded by ad valorem taxes within Zone of Benefit No. 7. ID4 also receives revenue through treated water sales, groundwater pumping charges, and interest earned on reserves. ID4 has an annual SWP Table ‘A’ contract amount of 82,946 acre-feet, of which about 60 percent (about 49,768 acre-feet) has been determined to be the long-term annual reliable supply, based on the Early Long Term Scenario analyzed in Appendix C of the 2015 SWP Delivery Capability Report SWP study (see Appendix I). Since 1988, ID4 has received about 58,000 acre-feet annually from the SWP. Approximately 25 percent of ID4 is within the City’s Domestic Water System’s service area. ID4 has indicated to the City that it will provide approximately 3,000 acre-feet of SWP water supply each year for groundwater recharge for the City’s Domestic Water System. In 2015, it provided 4,579 acre-feet to the City’s Domestic Water System for groundwater recharge.

#### **6.2.2.1.5 Treated Wastewater from Treatment Plant No. 3**

A portion of Wastewater Treatment Plant (WWTP) No. 3's denitrified secondary treated water is replenished to the basin by placing the treated effluent wastewater into percolation ponds. WWTP No. 3 is located on the southern end of the City's Domestic Water System service area. As future development occurs within the City's Domestic Water System service area, the City plans to provide more secondary treated water from WWTP No. 3 as groundwater replenishment. The City does not consider the recharged treated effluent as recycled water and an indirect potable reuse water supply for the City's Domestic Water System service area at this time. See Chapter 6.5 for a further discussion on wastewater and recycled water.

#### **6.2.2.1.6 Recharge from Urban Irrigation**

A small portion of groundwater recharge and replenishment comes from urban irrigation. Urban irrigation includes all outside irrigation for residential property, commercial property, parks, and other irrigated facilities within the urban area. This recharged water replenishes the groundwater basin and is stored for future beneficial use by the City's Domestic Water System.

#### **6.2.2.1.7 Recharge from City Water Amenities**

The City has several water amenities located in City parks that use Kern River water and incidentally recharge the groundwater basin. The Park at Riverwalk, AERA Park, and the two Truxtun Lakes use Kern River water for replenishment. This recharged water replenishes the groundwater basin and is stored for future beneficial use by the City's Domestic Water System.

### **California Statewide Groundwater Elevation Monitoring Program**

The 2014 Sustainable Groundwater Management Act (SGMA) directed DWR to establish initial groundwater basin priorities for the basins identified and defined in DWR's Bulletin 118. DWR finalized the basin prioritization in June 2014 through the California Statewide Groundwater Elevation Monitoring (CASGEM)<sup>4</sup> program. The CASGEM basin prioritization program is being used by DWR to focus resources towards implementing legislation to require all groundwater basins be monitored for seasonal and long-term groundwater elevation trends. DWR plans to evaluate the status of groundwater level monitoring in "High" or "Medium" priority groundwater basins. If DWR determines that groundwater levels in all or part of a High or Medium Priority basin are not being monitored, DWR will work cooperatively with local entities to establish a monitoring program. Compliance with DWR requirements allows the basin monitoring entities to be eligible to receive State water grants or loans. The Kern County (Basin 5-22.14) groundwater sub-basin is identified through CASGEM as a "high" priority basin.

#### **6.2.3 OVERDRAFT CONDITIONS**

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CWC 10631(b).

*(2) For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, 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 eliminate the long-term overdraft condition.*

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<sup>4</sup> [http://www.water.ca.gov/groundwater/casgem/basin\\_prioritization.cfm](http://www.water.ca.gov/groundwater/casgem/basin_prioritization.cfm)

For information regarding overdraft conditions, an excerpt of DWR's California Groundwater Bulletin 118 on the San Joaquin Valley Groundwater basin is located in Appendix H. Page 178 of Bulletin 118 states, "The Cities of Fresno, Bakersfield and Visalia have groundwater recharge programs to ensure that groundwater will continue to be a viable water supply in the future."

#### **6.2.4 HISTORICAL GROUNDWATER PUMPING**

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CWC 10631(b).

*(b) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:*

*(3) 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.*

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The City's Domestic Water System produces groundwater from the Kern County sub-basin of the San Joaquin Valley Groundwater Basin in the Tulare Lake Hydrologic Region. There are about 4 wells for every 640 acres within the City's Domestic Water System service area. The amount of groundwater the City's Domestic Water System has historically pumped from the Kern County sub-basin from 2011 to 2015 every year is shown on Table 6-1R.

As discussed in Section 6.2.2, the Kern County sub-basin is not an adjudicated basin; however, the portion of the basin where the City's Domestic Water System's service area is located is managed. The management of the groundwater water resources in the Kern County sub-basin is based on measured and recorded replenishment and banking operations. Sources of recharge to the Kern County sub-basin are discussed in detail in Section 6.2.2.1. The goal of the groundwater resource

management is to limit groundwater extractions to no more than the “safe yield” for the groundwater basin. “Safe yield” occurs when the amount of water pumped from the basin is less than or equal to the water replenishment into the basin. To address decreasing groundwater levels the City plans to increase its groundwater replenishment in the future and manage the groundwater in storage.

**Based on planned management practices including but not limited to increased Kern River recharge, anticipated future groundwater reserves and water conservation practices, the City’s Domestic Water System should be able to rely on the Kern County sub-basin for adequate customer supply over the next 25 years under single year and multiple year droughts.**

| Table 6-1 Retail: Groundwater Volume Pumped |  |          |          |         |          |         |
|---|--|----------|----------|---------|----------|---------|
| <input type="checkbox"/>                    | Supplier does not pump groundwater.<br>The supplier will not complete the table below. |          |          |         |          |         |
| Groundwater Type                            | Location or Basin Name   | 2011     | 2012     | 2013    | 2014     | 2015    |
| Alluvial Basin                              | Kern County Basin  | 35519.51 | 30806.29 | 36896.6 | 38073.05 | 31029.3 |
|   |  |          |          |         |          |         |
| <b>TOTAL</b>                                |  | 35,520   | 30,806   | 36,897  | 38,073   | 31,029  |
| NOTES:                                      |  |          |          |         |          |         |

**Table 6-1R      Retail: Groundwater Volume Pumped**

| Table 6-1 Wholesale: Groundwater Volume Pumped |  |      |      |      |      |      |
|--|--|------|------|------|------|------|
| <input checked="" type="checkbox"/>            | Supplier does not pump groundwater.<br>The supplier will not complete the table below. |      |      |      |      |      |
| Groundwater Type                               | Location or Basin Name   | 2011 | 2012 | 2013 | 2014 | 2015 |
|  |  |      |      |      |      |      |
|  |  |      |      |      |      |      |
|  |  |      |      |      |      |      |
| TOTAL  |  | 0    | 0    | 0    | 0    | 0    |
| NOTES:   |  |      |      |      |      |      |

Table 6-1W Wholesale: Groundwater Volume Pumped

## 6.3 SURFACE WATER

### 6.3.1 CAL WATER NORTH GARDEN WATER TREATMENT PLANT - RETAIL

In addition to groundwater supplies, the City's Domestic Water System also receives treated Kern River surface water from the Cal Water North Garden Water Treatment Plant. The Kern River water is supplied to the Cal Water treatment plant by the City's Wholesale Water System. In 2007, Cal Water began operation of its North Garden Water Treatment Plant. Tables 6-8R and 6-9R show the current and projected treated surface water supply from the treatment plant from 2015 through 2040, in five year increments. In 2015, the City received about 963 acre-feet of treated surface water supply from the treatment plant. The City projects to receive about 4,500 acre-feet per year of treated surface water supply from the treatment plant by 2020 for the Domestic Water System.

### **6.3.2 KERN COUNTY WATER AGENCY IMPROVEMENT DISTRICT NO. 4 - RETAIL**

The City's Domestic Water System also receives treated State Water Project water from ID4. ID4 has a supplemental water supply from the State Water Project. A portion of the water is treated by ID4 and distributed to the City's Domestic Water System customers. ID4 can additionally treat groundwater pumped and delivered via the Cross Valley Canal to the treatment plant as needed during a dry year. Tables 6-8R and 6-9R show the current and projected total treated water supply from ID4 from 2015 through 2040, in five year increments. In 2015, the City received about 3,229 acre-feet of treated water supply from ID4. The City projects to receive about 6,500 acre-feet per year of total treated water supply from ID4 by 2020 for the Domestic Water System.

### **6.3.3 KERN RIVER SURFACE WATER - WHOLESALE**

The City's Wholesale Water System's sole water supply source is surface water from the Kern River. The Kern River provides drainage for the southern Sierra Nevada Mountains and flows through the middle of the City of Bakersfield. The head waters of the Kern River are located near Mount Whitney and the river's main fork is joined by its major tributary, the South Fork, near Lake Isabella. Below Lake Isabella, the Kern River flows through the City of Bakersfield.

The City's Wholesale Water System's Kern River surface water rights are known as pre-1914 appropriative water rights, which are based on "first in time, first in right". Future water supply for the City Wholesale System will continue to be solely from the Kern River. Tables 6-8W and 6-9W show the current and projected surface water supply from the Kern River from 2015 through 2040, in five year increments. In 2015, the City's Wholesale Water System supplied about 16,882 acre-feet of surface water supply from the Kern River. On average, the City's Wholesale Water System's Kern

River water right supplies about 135,000 acre-feet per year of surface water. This number was based on a study performed in the City's Wholesale Water System's Kern River Flow and Municipal Water Program Final Environmental Impact Report (Final EIR) dated June 2012, which is incorporated by reference and a copy of the table of contents can be found in Appendix J. Table 2-2 of the Final EIR shows the 135,000 acre-feet is based on the average (mean) year historic Kern River water yield from 1954 – 2010, which is also attached in Appendix J. The 135,000 acre-feet does not include water released by other water rights holders or the City's Wholesale Water System because there is no guarantee the City's Wholesale Water System would receive the water released in the future. For planning purposes, the City's Wholesale Water System assumes that the Kern River water supply for 2020 through 2040 will be 135,000 acre feet per year.

#### **6.4 STORMWATER**

As previously discussed, sources of recharge to the Kern County sub-basin include captured precipitation. Refer to Chapter 6.2.2.1.1 for more information.

#### **6.5 WASTEWATER AND RECYCLED WATER**

The wastewater generated from the City's Domestic Water System service area is processed at the City's WWTP No. 3. A portion of wastewater treated at WWTP No. 3 is delivered as recycled water. The City's Wholesale Water System is not involved in wastewater treatment and discharge in any way.



### 6.5.1 RECYCLED WATER COORDINATION

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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...*

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The City's Domestic Water System management coordinated with the City's WWTP No. 3 management to determine treated wastewater and recycled water volumes.

### 6.5.2 WASTEWATER COLLECTION, TREATMENT, AND DISPOSAL

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CWC 10633(a).

*(Describe) 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).

*(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.*

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The City currently operates two sewage treatment plants; the WWTP No. 2 and WWTP No. 3. However, WWTP No. 2 is not located within and does not service the City's Domestic Water System service area and is not discussed in this Plan.

WWTP No. 3 was constructed in 1972 with an original capacity of about 4 million gallons per day (MGD). As the population of the City of Bakersfield continued to grow,

the treatment plant was expanded several times to accommodate growth. The current capacity of the WWTP No. 3 is 32 MGD with the average daily flow of about 16.6 MGD. The WWTP No. 3 provides primary, secondary, and tertiary treatment of incoming wastewater and includes storage ponds, clarifiers, solids processing facilities, activated sludge, digesters, and methane recovery and cogeneration facilities.

Table 6-2R shows the volume of wastewater collected from the City's Domestic Water System service area, which is subsequently treated at WWTP No.3. WWTP No. 3 also treats wastewater generated from outside of the City's Domestic Water System service area as shown on Table 6-3R. The City's Wholesale Water System does not distribute nor provide supplemental treatment to recycled water. Table 6-4R shows the amount of wastewater that meets recycled water standards, which is available for recycled water use within the City's service area.

| Table 6-2 Retail: Wastewater Collected Within Service Area in 2015 |  |  |  |                      |                                   |  |
|--|--|--|--|----------------------|-----------------------------------|--|
| <input type="checkbox"/>   | There is no wastewater collection system. The supplier will not complete the table below.            |  |  |                      |                                   |  |
|  | Percentage of 2015 service area covered by wastewater collection system <i>(optional)</i>            |  |  |                      |                                   |  |
|  | Percentage of 2015 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 2015 | Name of Wastewater Treatment Agency Receiving Collected Wastewater | Treatment Plant Name | Is WWTP Located Within UWMP Area? | Is WWTP Operation Contracted to a Third Party? <i>(optional)</i> |
|  |  |  |  |                      |                                   |  |
| City of Bakersfield  | Estimated  | 10,546   | City of Bakersfield  | WWTP No. 3           | Yes                               | No   |
|  |  |  |  |                      |                                   |  |
|  |  |  |  |                      |                                   |  |
| Total Wastewater Collected from Service Area in 2015:              |  | 10,546   |  |                      |                                   |  |
| NOTES:   |  |  |  |                      |                                   |  |

**Table 6-2R      Retail: Wastewater Collected Within Service Area in 2015**

**Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015**

| <input type="checkbox"/> No wastewater is treated or disposed of within the UWMP service area.<br>The supplier will not complete the table below. |                                       |                                |   |                    |  |                          |                    |                               |                              |                                  |
|---|---------------------------------------|--------------------------------|---|--------------------|--|--------------------------|--------------------|-------------------------------|------------------------------|----------------------------------|
| Wastewater Treatment Plant Name   | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number (optional) | Method of Disposal | Does This Plant Treat Wastewater Generated Outside the Service Area? | Treatment Level          | 2015 volumes       |                               |                              |                                  |
|   |                                       |                                |   |                    |  |                          | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area |
| WWTP 3  | BVV7-2A                               | LA Farms                       |   | Land disposal      | Yes  | Secondary, Undisinfected | 9,924              | 0                             | 0                            | 9,924                            |
| WWTP 3  | BVV7-2A                               | WWTP 3 Ponds                   |   | Percolation ponds  | Yes  | Secondary, Undisinfected | 7,936              | 7,936                         | 0                            | 0                                |
| WWTP 3  | BVV7-2A                               | Sports Village                 |   | Land disposal      | Yes  | Tertiary                 | 733                | 0                             | 733                          | 0                                |
| <b>Total</b>  |                                       |                                |   |                    |  |                          | <b>18,593</b>      | <b>7,936</b>                  | <b>733</b>                   | <b>9,924</b>                     |

NOTES: These 2015 volumes include wastewater generated outside of the City's Domestic Water Service Area.

**Table 6-3R Retail: Wastewater Treatment and Discharge within Service Area 2015**
**Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area**

| <input type="checkbox"/> Recycled water is not used and is not planned for use within the service area of the supplier.<br>The supplier will not complete the table below. |                                  |                    |            |              |                     |              |              |              |              |
|--|----------------------------------|--------------------|------------|--------------|---------------------|--------------|--------------|--------------|--------------|
| Name of Agency Producing (Treating) the Recycled Water:  |                                  |                    |            |              | City of Bakersfield |              |              |              |              |
| Name of Agency Operating the Recycled Water Distribution System:   |                                  |                    |            |              | City of Bakersfield |              |              |              |              |
| Supplemental Water Added in 2015   |                                  |                    |            |              |                     |              |              |              |              |
| Source of 2015 Supplemental Water  |                                  |                    |            |              |                     |              |              |              |              |
| Beneficial Use Type  | General Description of 2015 Uses | Level of Treatment | 2015       | 2020         | 2025                | 2030         | 2035         | 2040 (opt)   |              |
| Agricultural irrigation  |                                  |                    |            |              |                     |              |              |              |              |
| Landscape irrigation (excludes golf courses)   | Sports Village                   | Tertiary           | 733        | 2,240        | 2,240               | 2,240        | 2,240        | 2,240        |              |
| Golf course irrigation   |                                  |                    |            |              |                     |              |              |              |              |
| Commercial use   |                                  |                    |            |              |                     |              |              |              |              |
| Industrial use   |                                  |                    |            |              |                     |              |              |              |              |
| Geothermal and other energy production   |                                  |                    |            |              |                     |              |              |              |              |
| Seawater intrusion barrier   |                                  |                    |            |              |                     |              |              |              |              |
| Recreational impoundment   |                                  |                    |            |              |                     |              |              |              |              |
| Wetlands or wildlife habitat   |                                  |                    |            |              |                     |              |              |              |              |
| Groundwater recharge (IPR)*  |                                  |                    |            |              |                     |              |              |              |              |
| Surface water augmentation (IPR)*  |                                  |                    |            |              |                     |              |              |              |              |
| Direct potable reuse   |                                  |                    |            |              |                     |              |              |              |              |
| Other (Provide General Description)  |                                  |                    |            |              |                     |              |              |              |              |
| <b>Total:</b>  |                                  |                    | <b>733</b> | <b>2,240</b> | <b>2,240</b>        | <b>2,240</b> | <b>2,240</b> | <b>2,240</b> | <b>2,240</b> |

\*IPR - Indirect Potable Reuse

NOTES:

**Table 6-4R Retail: Current and Projected Recycled Water Direct Beneficial Uses within Service Area**

**Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2015**

| <input checked="" type="checkbox"/> Wholesale supplier neither distributes nor provides supplemental treatment to recycled water.<br>The supplier will not complete the table below. |                                       |                                |   |                    |  |                 |                    |                               |                              |                                  |
|--|---------------------------------------|--------------------------------|---|--------------------|--|-----------------|--------------------|-------------------------------|------------------------------|----------------------------------|
| Wastewater Treatment Plant Name  | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number (optional) | Method of Disposal | Does This Plant Treat Wastewater Generated Outside the Service Area? | Treatment Level | 2015 volumes       |                               |                              |                                  |
|  |                                       |                                |   |                    |  |                 | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area |
|  |                                       |                                |   |                    |  |                 |                    |                               |                              |                                  |
|  |                                       |                                |   |                    |  |                 |                    |                               |                              |                                  |
| <b>Total</b>   |                                       |                                |   |                    |  |                 | 0                  | 0                             | 0                            | 0                                |
| NOTES:   |                                       |                                |   |                    |  |                 |                    |                               |                              |                                  |

**Table 6-3W Wholesale: Wastewater Treatment and Discharge within Service Area 2015****Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area**

| <input checked="" type="checkbox"/> Recycled water is not directly treated or distributed by the supplier.<br>The supplier will not complete the table below. |                    |      |      |      |      |      |            |
|---|--------------------|------|------|------|------|------|------------|
| Name of Receiving Supplier or Direct Use by Wholesaler  | Level of Treatment | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 (opt) |
|   |                    |      |      |      |      |      |            |
|   |                    |      |      |      |      |      |            |
| <b>Total</b>  |                    | 0    | 0    | 0    | 0    | 0    | 0          |
| NOTES:  |                    |      |      |      |      |      |            |

**Table 6-4W Wholesale: Current and Projected Recycled Water Direct Beneficial Uses within Service Area**

### 6.5.3 RECYCLED WATER SYSTEM

Section 10633

(c) (Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use

Tertiary treated water from WWTP No. 3 is used to irrigate the State Farm Sports Village, a local soccer and football complex located on the south end of the City's Domestic Water System service area. Approximately 733 acre-feet of tertiary water

was used in 2015 for this purpose. This water would otherwise have to be provided by the City's Domestic Water System. In addition, WWTP No. 3 exported about 9,924 acre-feet of recycled water outside its service area to the City of Los Angeles for farm irrigation purposes in 2015. It should also be noted that approximately 7,936 acre feet of secondary treated denitrified water was disposed from WWTP No. 3 by use of percolation ponds in 2015. However, according to the UWMP 2015 Guidebook, this water cannot be considered as recycled water due to its lower level of treatment. Regardless, the City's considers this to be a benefit to the groundwater basin. The amount of treated effluent/recycled water used is shown in Table 6-4R.

#### **6.5.4 RECYCLED WATER BENEFICIAL USES**

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##### *Section 10633*

- (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*

##### *Section 10633*

- (e) (Provide) a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*
- 

The current recycled water use of tertiary treated recycled water from WWTP No. 3 is about 1 MGD with a maximum capacity of 2 MGD, which is the projected total demand from the Sports Village. The City plans to continue using recycled water to irrigate the State Farm Sports Village and increase the amount of tertiary treated

recycled water use to about 2,240 acre-feet per year starting in 2020 when the State Farm Sports Village is fully expanded, as shown in Table 6-4R.

WWTP No. 3 also provides recycled water to the City of Los Angeles owned farm. The farm is located near but outside the City's Domestic Water Service Area. The farm grows crops for non-human consumption. As shown in Table 6-3, the 2015 volume of recycled water delivered from WWTP No. 3 to the farm was 9,924 acre feet.

Based on the City's 2010 UWMP, the City's Domestic Water System's projected recycled water use in 2015 was 20,998 acre-feet. In 2015, the City's Domestic Water System's actual recycled water use was about 733 acre-feet. The large difference is due to the fact that the 2010 UWMP anticipated that the volume of water percolated into the groundwater basin could be considered a beneficial use. However, as stated in Chapter 6.5.3, the 2015 percolated water cannot be considered a beneficial use. Also, in 2010, the City considered agricultural irrigation as the City's recycled water demand. However, as stated in Chapter 6.5.3, agricultural irrigation is exported to outside the City's service area and therefore cannot be included in the 2015 recycled water demand. A comparison of the projected recycled water use for 2015 and actual recycled water use for 2015 is shown in Table 6-5R.

| Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual |   |                 |
|---|---|-----------------|
| <input type="checkbox"/>  | Recycled water was not used in 2010 nor projected for use in 2015.<br>The supplier will not complete the table below. |                 |
| Use Type  | 2010 Projection for 2015  | 2015 Actual Use |
| Agricultural irrigation   | 12,000  |                 |
| Landscape irrigation (excludes golf courses)                                      | 1,120   | 733             |
| Golf course irrigation  |   |                 |
| Commercial use  |   |                 |
| Industrial use  |   |                 |
| Geothermal and other energy production  |   |                 |
| Seawater intrusion barrier  |   |                 |
| Recreational impoundment  |   |                 |
| Wetlands or wildlife habitat  |   |                 |
| Groundwater recharge (IPR)  | 7,878   |                 |
| Surface water augmentation (IPR)  |   |                 |
| Direct potable reuse  |   |                 |
| Other   | Type of Use   |                 |
| <b>Total</b>  | <b>20,998</b>   | <b>733</b>      |
| NOTES:  |   |                 |

Table 6-5R Retail: 2010 Plan Recycled Water Use Projection Compared to 2015 Actual

| Table 6-5 Wholesale: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual |   |                 |
|--|---|-----------------|
| <input checked="" type="checkbox"/>  | Recycled water was not used or distributed by the supplier in 2010, nor projected for use or distribution in 2015.<br>The wholesale supplier will not complete the table below. |                 |
| Name of Receiving Supplier or Direct Use by Wholesaler                               | 2010 Projection for 2015  | 2015 actual use |
|  |   |                 |
|  |   |                 |
|  |   |                 |
| <b>Total</b>   | <b>0</b>  | <b>0</b>        |
| NOTES:   |   |                 |

Table 6-5W Wholesale: 2010 Plan Recycled Water Use Projection Compared to 2015 Actual

### 6.5.5 ACTIONS TO ENCOURAGE AND OPTIMIZE FUTURE RECYCLED WATER USE

#### Section 10633

- (f) *(Describe the) 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) *(Provide 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.*

The City has prepared an engineering report for the expansion of its WWTP No. 3. The report includes a discussion of expanding the tertiary treatment system from 2 MGD to 8 MGD. The treated recycled water from WWTP No. 3 would be used as street landscape irrigation and additional Sport Village irrigation as required.

| Table 6-6 Retail: Methods to Expand Future Recycled Water Use |   |                             |   |
|---|---|-----------------------------|---|
| <input type="checkbox"/>                                      | Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation. |                             |   |
|   | Provide page location of narrative in UWMP  |                             |   |
| Name of Action  | Description   | Planned Implementation Year | Expected Increase in Recycled Water Use |
| WWTP No. 3 Expansion  | Expansion of WWTP No. 3 tertiary facilities to accommodate increase irrigation demand at the Sports Village.  | 2020                        | 1,507                                   |
|   |   |                             |   |
|   |   |                             |   |
| <b>Total</b>  |   |                             | <b>1,507</b>                            |
| NOTES:  |   |                             |   |

**Table 6-6R      Retail: Methods to Expand Future Recycled Water Use**



## 6.6 DESALINATED WATER OPPORTUNITIES

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### *Section 10631(h)*

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

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Groundwater produced from the Kern County sub-basin is low in Total Dissolved Solids (TDS) and does not require desalination. According to the 2015 Consumer Confidence Report for the City's Domestic Water System service area, included in Appendix K, the average TDS value for the City Water System's wells is about 208 milligrams per liter (mg/l) and ranges from 110 mg/l to 680 mg/l, which are below the Secondary Maximum Contaminant Level of 1,000 mg/l. In addition, surface water from the Kern River is low in TDS and also does not require desalination. Therefore, the City Domestic and Wholesale Water Systems do not have the need to desalinate any of its water supplies at this time.

## 6.7 EXCHANGES OR TRANSFERS

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### *Section 10631(d)*

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

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The City's Domestic Water System does not have planned water exchanges or transfers on a short-term or long-term basis. However, the City's Wholesale Water System has the capability to participate in exchanges or transfers of water on a short-term or long-term basis with other water entities.

## 6.8 FUTURE WATER PROJECTS

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### *Section 10633*

*(g) ...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 average, single-dry, and multiple-dry 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.*

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### 6.8.1 ADDITIONAL KERN RIVER WATER

The Kern River was originally designated as a river with Fully Appropriated Status (FAS) by California State Water Resources Control Board (SWRCB) in 1964. In February 2010, SWRCB issued an order revising the status of the Kern River, finding that the river was no longer fully appropriated. In anticipation of SWRCB's revision of the FAS of the river, the City filed an application with the SWRCB to obtain rights to surplus, unappropriated, and available water in the Kern River.

The City's application to appropriate indicates that any surplus, unappropriated Kern River water, awarded by the SWRCB to the City will remain in the Kern River watercourse to support beneficial uses, including domestic purposes, municipal and industrial uses, protection of the public interest, environmental purposes, streamflow restoration, constructed wetlands, recreational uses, fish and wildlife restoration, underground aquifer supply, aquifer water quality enhancement, and underground water banking for drought and other emergencies. The City's application contemplates that SWRCB will determine if an anticipated supply of up to 87,000 AFY of unappropriated, surplus Kern River water will be available to the City. The City is unsure when and if the additional Kern River water will become available, but it is estimated the water will

become available in about 10 to 15 years. If the water becomes available to the City, the additional amount of Kern River surface water supply would be available to the City in average, single-dry and multiple dry years.

### 6.8.2 WWTP NO. 3 TERTIARY TREATMENT EXPANSION

As stated in Chapter 6.5.5, the City is investigating the expansion of the tertiary treatment system at WWTP No. 3 from 2 MGD to 8 MGD to be used as recycled water. A summary of this project is provided in Table 6-7R.

| Table 6-7 Retail: Expected Future Water Supply Projects or Programs |   |                            |   |                             |                              |   |
|---|---|----------------------------|---|-----------------------------|------------------------------|---|
| <input type="checkbox"/>  | 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. |                            |   |                             |                              |   |
| <input type="checkbox"/>  | Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.                  |                            |   |                             |                              |   |
|   | Provide page location of narrative in the UWMP  |                            |   |                             |                              |   |
| Name of Future Projects or Programs                                 | Joint Project with other agencies?  |                            | Description (if needed)                       | Planned Implementation Year | Planned for Use in Year Type | Expected Increase in Water Supply to Agency |
|   |   | <i>If Yes, Agency Name</i> |   |                             |                              |   |
| WWTP No. Tertiary Treatment Expansion                               | No  |                            | Expand tertiary treatment from 2 MGD to 8 MGD | 2020                        | Average Year                 | 6,721                                       |
|   |   |                            |   |                             |                              |   |
| NOTES:  |   |                            |   |                             |                              |   |

**Table 6-7R      Retail: Expected Future Water Supply Projects or Programs**

| Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs |   |                     |                            |                             |                              |   |
|--|---|---------------------|----------------------------|-----------------------------|------------------------------|---|
| <input type="checkbox"/>   | 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. |                     |                            |                             |                              |   |
| <input checked="" type="checkbox"/>                                    | 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.                  |                     |                            |                             |                              |   |
| See Section 6.8  | Provide page location of narrative in the UWMP  |                     |                            |                             |                              |   |
| Name of Future Projects or Programs                                    | Joint Project with other agencies?  |                     | Description<br>(if needed) | Planned Implementation Year | Planned for Use in Year Type | Expected Increase in Water Supply to Agency |
|  |   | If Yes, Agency Name |                            |                             |                              |   |
|  |   |                     |                            |                             |                              |   |
|  |   |                     |                            |                             |                              |   |
| NOTES:   |   |                     |                            |                             |                              |   |

**Table 6-7W Wholesale: Expected Future Water Supply Projects or Programs**

## 6.9 SUMMARY OF EXISTING AND PLANNED SOURCES OF WATER

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### *Section 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 10631(a).*
- (4) (Provide 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.*
- 

As discussed in Section 3.4, the City anticipates the population of its Domestic Water System service area to increase about 9 percent every five years starting from 2020 to 2040. Even though water demands are expected to increase as a result of the population increase, the City anticipates using its Kern River surface water supply for groundwater replenishment to ensure sufficient groundwater supplies for the next 25 years. Groundwater is expected to be the primary source of water supply for the Domestic Water System, supported by replenishment activities, banking programs, recycled water programs, and water use reduction. The City's Domestic Water System expects to meet anticipated consumer demands, over the next 25 years under single year and multiple year droughts. The actual quantities of the water supply sources available to the City during FY 2014-15 are summarized in Table 6-8. The City's Domestic Water System's projected amount of groundwater to be pumped within its Domestic Water Service area in the next 25 years (in five year increments) is shown on Table 6-9R. The projected pumped amounts include water use reductions per SBx7-7 from Table 5-1R. In 2015, the City pumped about 31,030 acre-feet in its Domestic Water Service area, and by 2040 the City projects it will pump about 53,851 acre-feet of groundwater.

Based on planned management practices including but not limited to Kern River recharge, development of increased groundwater reserves and water conservation practices, the City's Domestic Water System should be able to rely on the Kern County sub-basin for adequate supply for most of its demands over the next 25 years under single year and multiple year droughts.

| Table 6-8 Retail: Water Supplies — Actual |  |               |                |                                      |
|---|--|---------------|----------------|--------------------------------------|
| Water Supply                              | Additional Detail on Water Supply                            | 2015          |                |                                      |
|   |  | Actual Volume | Water Quality  | Total Right or Safe Yield (optional) |
| Groundwater                               |  | 31,029        | Drinking Water |                                      |
| Surface water                             | Kern River water treated by North Garden TP                  | 963           | Drinking Water |                                      |
| Surface water                             | SWP water Treated by KCWA ID4 TP                             | 3,229         | Drinking Water |                                      |
| Recycled Water                            | WWTP#3 Tertiary water supplied for Sports Village irrigation | 733           | Recycled Water |                                      |
| <b>Total</b>                              |  | <b>35,954</b> |                | <b>0</b>                             |
| NOTES:                                    |  |               |                |                                      |

**Table 6-8R      Retail: Water Supplies – Actual**

| Table 6-9 Retail: Water Supplies — Projected |                                   |  |                                      |                             |                                      |                             |                                      |                             |                                      |                             |                                      |
|--|-----------------------------------|--|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|
| Water Supply                                 | Additional Detail on Water Supply | Projected Water Supply<br>Report To the Extent Practicable |                                      |                             |                                      |                             |                                      |                             |                                      |                             |                                      |
|  |                                   | 2020   |                                      | 2025                        |                                      | 2030                        |                                      | 2035                        |                                      | 2040 (opt)                  |                                      |
|  |                                   | 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) |
| Groundwater                                  |                                   | 34,389   |                                      | 38,625                      |                                      | 43,255                      |                                      | 45,316                      |                                      | 53,851                      |                                      |
| Surface water                                | North Garden TP                   | 4,500  |                                      | 4,500                       |                                      | 4,500                       |                                      | 4,500                       |                                      | 4,500                       |                                      |
| Surface water                                | KCWA ID4                          | 6,500  |                                      | 6,500                       |                                      | 6,500                       |                                      | 6,500                       |                                      | 6,500                       |                                      |
| Recycled Water                               | WWTP #3 Tertiary                  | 2,240  |                                      | 2,240                       |                                      | 2,240                       |                                      | 2,240                       |                                      | 2,240                       |                                      |
| <b>Total</b>                                 |                                   | 47,629   | 0                                    | 51,865                      | 0                                    | 56,495                      | 0                                    | 58,556                      | 0                                    | 67,091                      | 0                                    |
| NOTES:                                       |                                   |  |                                      |                             |                                      |                             |                                      |                             |                                      |                             |                                      |

**Table 6-9R Retail: Water Supplies - Projected**

| Table 6-8 Wholesale: Water Supplies — Actual |                                   |               |               |                                      |
|--|-----------------------------------|---------------|---------------|--------------------------------------|
| Water Supply                                 | Additional Detail on Water Supply | 2015          |               |                                      |
|  |                                   | Actual Volume | Water Quality | Total Right or Safe Yield (optional) |
| Surface water                                | Kern River                        | 17,586        | Raw Water     |                                      |
| <b>Total</b>                                 |                                   | 17,586        |               | 0                                    |
| NOTES:                                       |                                   |               |               |                                      |

**Table 6-8W Wholesale: Water Supplies – Actual**

| Table 6-9 Wholesale: Water Supplies — Projected |                                   |  |                                      |                             |                                      |                             |                                      |                             |                                      |                             |                                      |
|---|-----------------------------------|--|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|-----------------------------|--------------------------------------|
| Water Supply                                    | Additional Detail on Water Supply | Projected Water Supply<br>Report To the Extent Practicable |                                      |                             |                                      |                             |                                      |                             |                                      |                             |                                      |
|   |                                   | 2020   |                                      | 2025                        |                                      | 2030                        |                                      | 2035                        |                                      | 2040 (opt)                  |                                      |
|   |                                   | 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) |
| Surface water                                   | Kern River                        | 135,000  |                                      | 135,000                     |                                      | 135,000                     |                                      | 135,000                     |                                      | 135,000                     |                                      |
| <b>Total</b>                                    |                                   | 135,000  | 0                                    | 135,000                     | 0                                    | 135,000                     | 0                                    | 135,000                     | 0                                    | 135,000                     | 0                                    |
| NOTES:  |                                   |  |                                      |                             |                                      |                             |                                      |                             |                                      |                             |                                      |

**Table 6-9W Wholesale: Water Supplies - Projected**

## **6.10 CLIMATE CHANGE IMPACTS TO SUPPLY**

The California Water Code does not require the City to address climate change. However, a discussion on single-dry year and multiple dry years is provided in Section 7.2 and a discussion on potential impacts to basin management practices is provided in Section 6.2.



## **CHAPTER 7**

### **WATER SUPPLY RELIABILITY ASSESSMENT**

#### **7.1 CONSTRAINTS ON WATER SOURCES**

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##### *Section 10631(c)*

- (2) *For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.*

##### *Section 10634*

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

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The following sections describe constraints on water sources on the City's water supplies, such as inconsistent availability of water supply or water quality issues.

##### **7.1.1 SUPPLY INCONSISTENCY**

The City Domestic and Wholesale Water Systems have not experienced long-term water supply deficiencies and historically have been able to meet its customer demands. The following sections discuss the City Domestic and Wholesale Water Systems' water sources that may not be available at a consistent level of use and the water demand management measures used by the City.

#### **7.1.1.1 GROUNDWATER**

As previously discussed in Section 6.2, the City's Domestic Water System's management of the groundwater supplies in the Kern County sub-basin is based on measured and recorded replenishment and banking operations. The goal of the groundwater management is to ensure the long term extractions are balanced with long term replenishment and banking operations. When the City's Domestic Water System experiences a wet year, the additional surface water is recharged into the basin (and is kept there) in anticipation of use when the City's Domestic Water System experiences a dry year. Consequently, the City's Domestic Water System will have additional groundwater available to meet its demands during dry years.

Currently, the City's Domestic Water System does have water quality issues in the groundwater that may limit the amount of water pumped from the basin, which are discussed in detail in Section 7.1.2.

#### **7.1.1.2 KERN RIVER WATER**

The City's Wholesale Water System has developed contractual stages of action for delivering water to Cal Water during critically dry years. The City's Wholesale Water System and Cal Water will meet, and mutually agree, as to when a "critically" dry year is occurring, or is about to occur, and the extent to which reductions and restrictions in the quantity of water delivered to the Cal Water treatment plant will be made. More details are discussed in Section 8.1.

Because of the variable nature of the Kern River surface water supply, the City's Wholesale Water System has undertaken efforts to obtain additional surface water supplies through the State Water Resources Control Board water rights application process.

The City's Wholesale Water System has also taken steps to supplement surface water variability by using more of its Kern River water supply to increase groundwater recharge in the Kern River channel, and taking other steps, to create a reserve dry year supply as discussed in more detail in Section 7.2.

#### **7.1.1.3 STATE WATER PROJECT WATER**

As previously discussed, the City's Domestic Water System receives a maximum yearly entitlement of 6,500 acre feet of treated water from ID4. ID4 brings imported State Water Project water to the City of Bakersfield area for treatment to serve portions of the urban Bakersfield area. The DWR considers several factors, including climatic and environmental, in estimating the amount of water available to the contractors' Table 'A' Entitlements. Table 'A' refers to a table in the Water Supply Contract between the State of California Department of Water Resources and the Kern County Water Agency, of which ID4 is a member unit agency. Table 'A' shows the State Water Project entitlement for KCWA. Historically during a wet year, ID 4 and the City of Bakersfield received about 82 percent of the Table 'A' Entitlements. If the Table 'A' Entitlement is less than 45 percent, the City may not receive water for that particular year. Typically, if the City's Domestic Water System does not receive its full entitlement of 6,500 acre-feet, the following are other options to deliver water:

1. (City's Preferred Option) Deliver Kern River surface water to the ID4 Water Treatment Plant to treat and deliver using the Northwest Feeder pipeline. The Northwest Feeder is the pipeline which supplies treated surface water to the City's Domestic Water System from the ID4 Water Treatment Plant.
2. Use its existing City groundwater wells to supply additional water directly to the City's Domestic Water System to make up for lack of State Water Project water delivered to the City's Domestic Water System from the Northwest Feeder.

3. The City's Domestic Water System can request ID4 water stored in their banking programs be delivered to the ID4 Plant for treatment and delivery using the Northwest Feeder. This would require the City and ID4 to enter into a Dry Year Supply agreement for that particular year.
4. The City can exchange its recharged water with other Districts that have Kern River water available in Lake Isabella Reservoir to be treated at either Cal Water's North Garden water treatment plant or ID4's water treatment plant and delivered to the City's Domestic Water System.

## **7.1.2 WATER QUALITY**

### **7.1.2.1 GROUNDWATER**

All of the City's Domestic Water System wells produce groundwater from the Kern County sub-basin. Groundwater is delivered directly to the distribution system. The City's Domestic Water System has reviewed historical water quality data, well locations, and perforations in an effort to generally identify areas that may be subject to elevated contaminants, such as arsenic, 1,2,3-Trichloropropane (TCP), and others. The City's Domestic Water System plotted this data on a map of its current and potential future service area in an effort to strategically site future wells. The City's Domestic Water System has some wells where wellhead treatment with ferric oxide media and granular activated carbon are used. Also, in the future, the City's Domestic Water System will evaluate methods for treating wells that have arsenic, TCP, and other contaminants. Some of the City's Domestic Water System's wells are currently temporarily off or inactive due to contaminants.

As population increases in the City's Domestic Water System's service area, the City's Domestic Water System will construct new municipal water supply wells and may

equip existing and new wells with wellhead treatment as required. New well sites will be pilot drilled and water quality samples will be taken at different depths. Based on this data, wells will be designed to produce water from “clean” zones, if possible of the groundwater basin. Through implementation of zone groundwater sampling and equipping new and existing groundwater wells with wellhead treatment, the City’s Domestic Water System expects groundwater quality to continue to utilize groundwater as a viable supply at least through 2040. Consequently, water quality issues can be mitigated so as not to affect the projected water supply reliability for the Domestic Water System through 2040, as shown in Table 6-9R.

#### **7.1.2.2 SUPPLEMENTAL SURFACE WATER**

The City’s Domestic Water System receives water from ID4. ID4 treats State Water Project water delivered from the California Aqueduct and KCWA’s Cross Valley Canal. It is expected water quality from the ID4’s Plant will continue to meet all regulatory standards at least through 2040. Consequently, the water quality of SWP water will not affect the projected supply reliability through 2040.

The City’s Domestic Water System also receives water from the Cal Water North Garden Water Treatment Plant. This plant treats Kern River water from the City’s Wholesale Water System and provides the treated water to the Cal Water service area and the City’s Domestic Water System service area. It is expected water quality from the North Garden Water Treatment Plant will continue to meet all regulatory standards at least through 2040. Consequently, the water quality of Kern River water delivered by the City’s Wholesale Water System will not affect the projected supply reliability through 2040.

## 7.2 RELIABILITY BY TYPE OF YEAR

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### *Section 10631(c)*

- (1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:*
- (a) an average water year,*
  - (b) a single dry water year,*
  - (c) multiple dry water years.*
- 

Based on the Domestic Water System's historical data, during average years, single dry years and multiple dry years, groundwater production for the City's Domestic Water System supply has provided a reliable supply of water to its customers. The following is a summary of the average year, single dry year, and multiple dry years demands and supplies for the Domestic Water System. Tables 7-1R and 7-1W summarizes these "base years" for average, single dry, and multiple dry years and provides the total amount of water supplies available to the City during those base years.

| Table 7-1 Retail: Basis of Water Year Data  |   |   |   |
|---|---|---|---|
| Year Type   | Base Year<br><i>If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000</i> | Available Supplies if Year Type Repeats |   |
|   |   | <input type="checkbox"/>                | Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.<br>Location _____ |
|   |   | <input checked="" type="checkbox"/>     | Quantification of available supplies is provided in this table as either volume only, percent only, or both.                    |
|   |   | Volume Available                        | % of Average Supply   |
| Average Year  | 2012  | 40,658                                  | 100%  |
| Single-Dry Year   | 2015  | 35,500                                  |   |
| Multiple-Dry Years 1st Year   | 2013  | 42,457                                  |   |
| Multiple-Dry Years 2nd Year   | 2014  | 43,728                                  |   |
| Multiple-Dry Years 3rd Year   | 2015  | 35,500                                  |   |
| Multiple-Dry Years 4th Year <i>Optional</i>   |   |   |   |
| Multiple-Dry Years 5th Year <i>Optional</i>   |   |   |   |
| Multiple-Dry Years 6th Year <i>Optional</i>   |   |   |   |
| Agency may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If an agency uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. |   |   |   |
| NOTES:  |   |   |   |

Table 7-1R      Retail: Bases of Water Year Data

| Table 7-1 Wholesale: Basis of Water Year Data   |  |   |  |
|---|--|---|--|
| Year Type   | <b>Base Year</b><br><i>If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000</i> | Available Supplies if Year Type Repeats |  |
|   |  | <input type="checkbox"/>                | Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location <u>Sections 7.1.1.2 and 8.1</u> |
|   |  | <input checked="" type="checkbox"/>     | Quantification of available supplies is provided in this table as either volume only, percent only, or both.   |
|   |  | Volume Available                        | % of Average Supply  |
| Average Year  | 1963   | 135,000                                 | 100%   |
| Single-Dry Year   | 2015   | 17,586                                  | 13%  |
| Multiple-Dry Years 1st Year   | 2013   | 33,656                                  | 25%  |
| Multiple-Dry Years 2nd Year   | 2014   | 26,265                                  | 19%  |
| Multiple-Dry Years 3rd Year   | 2015   | 17,586                                  | 13%  |
| Multiple-Dry Years 4th Year <i>Optional</i>   |  |   |  |
| Multiple-Dry Years 5th Year <i>Optional</i>   |  |   |  |
| Multiple-Dry Years 6th Year <i>Optional</i>   |  |   |  |
| Agency may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If an agency uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables. |  |   |  |
| NOTES:  |  |   |  |

Table 7-1W Wholesale: Bases of Water Year Data

## 7.2.1 TYPES OF YEARS

### 7.2.1.1 AVERAGE YEAR

As shown on Table 7-2R, the Domestic Water System's estimated Average Year water use for 2020 is 47,629 acre-feet. Water supply to satisfy these uses will be KCWA ID4 supplying 6,500 acre-feet of treated SWP water assuming full State Water project delivery, treated water from Cal Water North Garden Water Treatment Plant



supplying 4,500 acre-feet, from groundwater supplying 34,389 acre-feet and from tertiary water supplying 2,240 acre-feet.

As shown in Table 7-2W, the Wholesale Water System's estimated Average Year water use for 2020 through 2040 is 135,000 acre-feet per year from Kern River water.

#### **7.2.1.2 SINGLE DRY YEAR**

As shown in Table 7-3R, the Domestic Water System Single Dry Year water use for 2020 is estimated to be 43,342 acre-feet. By 2040, the estimated Single Dry Year water use is 61,053 acre-feet.

The City's Wholesale Water System has developed contractual stages of action for delivering water to Cal Water during critically dry years. The City's Wholesale Water System and Cal Water will confer and mutually agree as to when a "critically" dry year is occurring, or is about to occur, and the extent to which reductions and restrictions in the quantity of water delivered to the Cal Water treatment plant will be made. More details are discussed in Section 8.1. As shown in Table 7-3W, the Wholesale Water System's estimated Single Dry Year water use for 2020 through 2040 is 17,586 acre-feet.

#### **7.2.1.3 MULTIPLE DRY YEARS**

As shown in Table 7-4R, the Domestic Water System Multiple Dry Years water use for 2020 is estimated to be 47,629 acre-feet in the first year, 45,248 acre-feet in the second year and 43,342 acre-feet in the third year.

As shown in Table 7-4W, the Wholesale Water System Multiple Dry Years water use for 2020 is estimated to be 33,656 acre-feet in the first year, 26,265 acre-feet in the second year and 17,586 acre-feet in the third year.

#### **7.2.1.4 SUMMARY**

Based on current management practices and water supply reliability, the minimum water supplies available for the Domestic Water System and the Wholesale Water System at the end of an Average Water Year, a Single Dry Year, and Multiple Dry Years would be at least equal if not greater than the water demands, primarily due to groundwater banking, establishment of additional groundwater reserves, maintaining sufficient storage in Lake Isabella, and development of contractual stages of actions for delivering Kern River water.

#### **7.2.2 AGENCIES WITH MULTIPLE WATER SOURCES**

The City's Domestic Water System has multiple water sources as previously discussed. However, each of the City's water supply sources share the same base years. Consequently, the Domestic Water System is not required to report on different base years for each water source.

### **7.3 SUPPLY AND DEMAND ASSESSMENT**

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#### *Section 10635*

- (a) *Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal*

*water year, a single dry water year, and multiple dry 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.*

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As previously discussed in Section 3.1, the City's Domestic Water System applied SBX7-7 to estimate the City's 2015 Interim Urban Water Use Target of 284 GPCD and the City's 2020 Urban Water Use Target of 253 GPCD. These Urban Water Use Targets were then applied to estimate the Domestic Water System projected normal year demands in 2020, 2025, 2030, 2035 and 2040 as shown on Table 7-2R. The City Domestic and Wholesale Water Systems will continue to use groundwater, surface water, and recycled water as its future water supplies over the next 25 years. The following sections discuss the City's water service reliability assessment, which compares the City's supply and customer demand over the next 25 years during normal, dry and multiple dry years.

#### **7.3.1.1 NORMAL WATER YEAR**

As previously discussed, the City's Domestic Water System projected normal water year consumer demand over the next 25 years in five-year increments was based on the City's 2015 and 2020 Urban Water Use Targets of 284 GPCD and 253 GPCD, respectively. The City's Domestic Water System and Wholesale Water System projected supply was based on the minimum supplies needed by the City to meet projected normal year customer demand, as shown on Tables 6-9R and 6-9W. The comparison of the City's Domestic Water System and Wholesale Water System projected supply and consumer demand during a normal water year is shown on Tables 7-2R and 7-2W. The Domestic Water System and Wholesale Water System supply can meet customer demands during a normal water year for the next 25 years.

### 7.3.1.2 SINGLE-DRY YEAR

Historically when the City's Domestic Water System experienced a single-dry year, the water supplies were not affected by the single-dry year and the City was able to meet its consumer demands. The comparison of the projected water supply and customer demand during a single-dry year is shown on Tables 7-3R and 7-3W. As shown on Tables 7-3R and 7-3W, the Domestic Water System's and Wholesale Water System's water supply should be able to meet demands during a single-dry year for the next 25 years.

### 7.3.1.3 MULTIPLE DRY YEARS

Historically, when the Domestic Water System experienced multiple dry years, the water supplies were not affected and the Domestic Water System was able to meet its consumer demands. The comparison of the projected water supply and demand during multiple dry years for the Domestic Water System and Wholesale Water System are shown on Tables 7-4R and 7-4W. As shown on Tables 7-4R and 7-4W, the Domestic Water System and Wholesale Water System water supply should meet consumer demand during multiple dry years for the next 25 years.

| Table 7-2 Retail: Normal Year Supply and Demand Comparison |        |        |        |        |               |
|--|--------|--------|--------|--------|---------------|
|  | 2020   | 2025   | 2030   | 2035   | 2040<br>(Opt) |
| Supply totals<br>(autofill from Table 6-9)                 | 47,629 | 51,865 | 56,495 | 58,556 | 67,091        |
| Demand totals<br>(autofill from Table 4-3)                 | 47,629 | 51,865 | 56,495 | 58,556 | 67,091        |
| Difference   | 0      | 0      | 0      | 0      | 0             |
| NOTES:   |        |        |        |        |               |

**Table 7-2R      Retail: Normal Year Supply and Demand Comparison**

| Table 7-2 Wholesale: Normal Year Supply and Demand Comparison |         |         |         |         |               |
|---|---------|---------|---------|---------|---------------|
|   | 2020    | 2025    | 2030    | 2035    | 2040<br>(Opt) |
| Supply totals<br>(autofill from Table 6-9)                    | 135,000 | 135,000 | 135,000 | 135,000 | 135,000       |
| Demand totals<br>(autofill fm Table 4-3)                      | 135,000 | 135,000 | 135,000 | 135,000 | 135,000       |
| Difference  | 0       | 0       | 0       | 0       | 0             |
| NOTES:  |         |         |         |         |               |

Table 7-2W Wholesale: Normal Year Supply and Demand Comparison

| Table 7-3 Retail: Single Dry Year Supply and Demand Comparison |        |        |        |        |               |
|--|--------|--------|--------|--------|---------------|
|  | 2020   | 2025   | 2030   | 2035   | 2040<br>(Opt) |
| Supply totals  | 43,342 | 47,197 | 51,410 | 53,286 | 61,053        |
| Demand totals  | 43,342 | 47,197 | 51,410 | 53,286 | 61,053        |
| Difference   | 0      | 0      | 0      | 0      | 0             |
| NOTES:   |        |        |        |        |               |

Table 7-3R Retail: Single Dry Year Supply and Demand Comparison

| Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison |        |        |        |        |               |
|---|--------|--------|--------|--------|---------------|
|   | 2020   | 2025   | 2030   | 2035   | 2040<br>(Opt) |
| Supply totals   | 17,586 | 17,586 | 17,586 | 17,586 | 17,586        |
| Demand totals   | 17,586 | 17,586 | 17,586 | 17,586 | 17,586        |
| Difference  | 0      | 0      | 0      | 0      | 0             |
| NOTES:  |        |        |        |        |               |

Table 7-3W Wholesale: Single Dry Year Supply and Demand Comparison

| Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison |               |        |        |        |        |               |
|---|---------------|--------|--------|--------|--------|---------------|
|   |               | 2020   | 2025   | 2030   | 2035   | 2040<br>(Opt) |
| First year  | Supply totals | 47,629 | 51,865 | 56,495 | 58,556 | 67,091        |
|   | Demand totals | 47,629 | 51,865 | 56,495 | 58,556 | 67,091        |
|   | Difference    | 0      | 0      | 0      | 0      | 0             |
| Second year   | Supply totals | 45,248 | 49,272 | 53,670 | 55,628 | 63,736        |
|   | Demand totals | 45,248 | 49,272 | 53,670 | 55,628 | 63,736        |
|   | Difference    | 0      | 0      | 0      | 0      | 0             |
| Third year  | Supply totals | 43,342 | 47,197 | 51,410 | 53,286 | 61,053        |
|   | Demand totals | 43,342 | 47,197 | 51,410 | 53,286 | 61,053        |
|   | Difference    | 0      | 0      | 0      | 0      | 0             |
| NOTES:  |               |        |        |        |        |               |

**Table 7-4R      Retail: Multiple Dry Years Supply and Demand Comparison**

| Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison |               |        |        |        |        |            |
|--|---------------|--------|--------|--------|--------|------------|
|  |               | 2020   | 2025   | 2030   | 2035   | 2040 (Opt) |
| First year   | Supply totals | 33,656 | 33,656 | 33,656 | 33,656 | 33,656     |
|  | Demand totals | 33,656 | 33,656 | 33,656 | 33,656 | 33,656     |
|  | Difference    | 0      | 0      | 0      | 0      | 0          |
| Second year  | Supply totals | 26,265 | 26,265 | 26,265 | 26,265 | 26,265     |
|  | Demand totals | 26,265 | 26,265 | 26,265 | 26,265 | 26,265     |
|  | Difference    | 0      | 0      | 0      | 0      | 0          |
| Third year   | Supply totals | 17,586 | 17,586 | 17,586 | 17,586 | 17,586     |
|  | Demand totals | 17,586 | 17,586 | 17,586 | 17,586 | 17,586     |
|  | Difference    | 0      | 0      | 0      | 0      | 0          |
| NOTES:   |               |        |        |        |        |            |

**Table 7-4W Wholesale: Multiple Dry Years Supply and Demand Comparison**

## 7.4 REGIONAL SUPPLY RELIABILITY

### Section 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.*

This Plan describes water management tools and options used to maximize local resources and minimize the need to import water. These include Groundwater Basin Management Structure (Chapter 4.2), Recycled Water Opportunities (Chapter 4.5), Future Water Projects (Chapter 6.5), and DMMs (Chapter 9). In addition, the City

Wholesale System currently delivers water to its customers pursuant to its surface water rights on the Kern River. The City's Demand Management Measures are described in Chapter 9.



## **CHAPTER 8**

### **WATER SHORTAGE CONTINGENCY PLAN**

---

*Section 10632*

- (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier.*
- 

The City of Bakersfield has developed this chapter to be its Water Shortage Contingency Plan. In the event of a prolonged and severe drought, this plan may be implemented. The Water Shortage Contingency Plan prioritizes water use as shown below.

1. Health and Safety – Interior family use and fire suppression.
2. Commercial, Industrial and Governmental – Jobs and economic base.
3. Landscaping – Residential and business/commercial, parks.
4. New Demand – All projects.

#### **8.1 STAGES OF ACTION**

---

*Section 10632(a)*

- (1) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.*
-

Table 8-1 provides a description of the stages of action which may be triggered by a shortage in one or more of the City's Domestic Water System and Wholesale Water System water supply sources, depending on the severity of the shortage and its anticipated duration. The City's Domestic Water System is working on additional programs and plans to address water supply shortages which involve the increase of groundwater reserves to provide a five year consumer supply in cases of dry and drought years, as well as the pursuit of additional, unappropriated Kern River water supplies through the City's application to appropriate.

| Table 8-1 Retail and Wholesale<br>Stages of Water Shortage Contingency Plan                         |  |  |
|---|--|--|
| Stage   | Complete Both  |  |
|   | Percent Supply Reduction <sup>1</sup><br><i>Numerical value as a percent</i> | Water Supply Condition<br><i>(Narrative description)</i>   |
| 1   | 0-10%  | Variations in precipitation and mild droughts that may last only a year or two   |
| 2   | 11-20%   | Prolonged water shortages of moderate severity such as those caused by a multi-year drought  |
| 3   | 21-35%   | Most severe multi-year droughts, major failures in water production and distribution facilities, or by water concerns, especially in smaller isolated systems  |
| 4   | 36-50%   | An exceptional crisis that could be caused only by the most severe multi-year drought, natural disaster, or catastrophic failure of major water supply infrastructure. Impacts to public health and safety would be significant. |
| <sup>1</sup> One stage in the Water Shortage Contingency Plan must address a water shortage of 50%. |  |  |
| NOTES:  |  |  |

**Table 8-1      Retail and Wholesale: Stages of WSCP**

## 8.2 PROHIBITIONS ON END USES

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*Section 10632(a)*

- (4) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning*
  - (5) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.*
- 

Chapter 14.02 of the City Municipal Code (Water Use Regulations) and Ordinance No. 4804 (an Emergency Ordinance) include prohibitions on various wasteful water uses on outside irrigation. A copy of Chapter 14.02 of the City Municipal Code is provided in Appendix L. A copy of Ordinance No. 4804 is provided in Appendix M.

The City's Wholesale Water System does not provide water directly to retail customers. Consequently, the City's Wholesale System is not in a position to implement/enforce restrictions and prohibitions at the retail level.

Table 8-2R describes the types of wasteful use of water and appropriate enforcements.

| Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses  |   |   |  |
|---|---|---|--|
| Stage   | Restrictions and Prohibitions on End Users  | Additional Explanation or Reference<br>(optional)         | Penalty, Charge, or Other Enforcement? |
| 2   | Landscape - Limit landscape irrigation to specific days                                     | Every other day, three days per week                      | Yes                                    |
| 2   | Landscape - Restrict or prohibit runoff from landscape irrigation                           |   | Yes                                    |
| 2   | CII - Other CII restriction or prohibition  | Must reduce water usage consistent with reduction targets | Yes                                    |
| 3   | Other water feature or swimming pool restriction  |   | No                                     |
| 4   | Landscape - Prohibit all landscape irrigation   |   | No                                     |
| 4   | Other - Prohibit use of potable water for construction and dust control                     |   | No                                     |
| 4   | Other - Prohibit vehicle washing except at facilities using recycled or recirculating water |   | No                                     |
| NOTES: Please note that these restrictions are in addition to the permanent rules and regulations promulgated by the State Water Resources Control Board. |   |   |  |

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

### 8.3 PENALTIES, CHARGES, OTHER ENFORCEMENT OF PROHIBITIONS

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*Section 10632(a)*

*(6) Penalties or charges for excessive use, where applicable.*

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The City's Municipal Code Section 14.02.020, as shown below, indicates there are charges for violations of the Municipal Code. The following penalties and fines could be assessed city-wide:

#### 14.02.020 Penalty.

Failure to comply with these regulations may be punishable as an infraction, or misdemeanor pursuant to Bakersfield Municipal Code Section 1.40.010, an administrative citation pursuant to Bakersfield Municipal Code Section 14.02.030, or any other available allowed by law. (Ord. 4830; Ord. 4804)

#### 14.02.035 Administrative Fines.

- A. The fines for violation of this chapter shall be as follows:
  - 1. Fifty dollars for the first offense, one hundred fifty dollars for the second offense, and two hundred fifty dollars to one thousand dollars for each subsequent offense in a calendar year.
- B. Any administrative citation fine paid pursuant to subsection A shall be refunded if it is determined, after a hearing, that the person charged in the administrative citation was not responsible for the violation or that there was no violation as charged in the administrative citation. (Ord. 4830)

The City's Wholesale Water System is not in a position to directly control retail water use. The City's Wholesale Water System has not developed penalties or charges. The City's Wholesale Water System is obligated to deliver a contracted amount of water to Cal Water for the City's Domestic Water System.

## 8.4 CONSUMPTION REDUCTION METHODS

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#### *Section 10632(a)*

- (5) *Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and*

*have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.*

Consumption reduction methods utilized by the City include expand public information campaign, decrease line flushing, increase water waste patrols, increase frequency of meter reading, request mandatory customer reductions and implement drought ordinance. These consumption reduction methods and the corresponding stages are provided in Table 8-3R.

| <b>Table 8-3 Retail Only:<br/>Stages of Water Shortage Contingency Plan - Consumption Reduction Methods</b> |   |  |
|---|---|--|
| Stage   | Consumption Reduction Methods by Water Supplier | Additional Explanation or Reference<br>(optional)  |
| 2   | Expand Public Information Campaign              |  |
| 2   | Decrease Line Flushing                          |  |
| 3   | Increase Water Waste Patrols                    |  |
| 3   | Other   | Request mandatory customer reductions              |
| 3   | Other   | Implement drought ordinance                        |
| 4   | Increase Frequency of Meter Reading             | Monitor water use for compliance reduction targets |
|   |   |  |
| NOTES:  |   |  |

**Table 8-3R      Retail: Stages of WSCP – Consumption Reduction Methods**

## 8.5 DETERMINING WATER SHORTAGE REDUCTIONS

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*Section 10632(a)*

*(9) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.*

---

The City's Domestic Water System has incorporated procedures and practices to achieve water conservation and manage the water supply and to determine actual reductions in water use. Extensive records on consumption, production and use histories are maintained. In addition, the City's Wholesale Water System maintains records on its water sales.

The City's Domestic Water System measures and determines reductions in water use by using SWRCB's Drought Response Tool pursuant to SWRCB's Executive Order B-29-15 discussed in Section 8.2. Beginning October 2014, urban water suppliers were required to estimate and report the number of gallons of water per person per day used by residential customers it serves using the tool for submitting monthly water production data. The Drought Response Tool allows the City's Domestic Water System to calculate residential GPCD on a monthly basis for comparison with the City's Domestic Water System's baseline year 2013, which is set by the SWRCB.

## 8.6 REVENUE AND EXPENDITURE IMPACTS

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*Section 10632(a)*

*(7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water*

*supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.*

---

The City's Domestic Water System is operated under a service contract with Cal Water. However, the Domestic Water System water rates are set by the City. The City's Domestic Water System has not instituted tiered rates to encourage water conservation by its customers. As part of the rate structure, the monthly service charges generally cover the fixed cost of operation and the commodity rates are charged to compensate for the variable costs of providing water service. A copy of the City's Domestic Water System current rate schedule is included as Appendix N.

The City of Bakersfield has the ability to restructure its Domestic Water System rates on short notice through the means of Municipal Ordinances that allow the City Manager to issue Executive Orders on water rates. This method may be used, if needed, to structure rates to cover the additional costs and loss of water sales revenue incurred for enforcement and implementation of mandatory water reduction plans.

In 2015, the City's Wholesale Water System charged \$85.75 per acre-foot for raw Kern River water delivered for municipal and domestic uses. Since there are no water consumption reduction programs used by the Wholesale Water System, there are also no revenue and expenditure impacts. There is a direct pass through of any costs, which should have minimal net impact on revenue compared to expenditures.



## 8.7 RESOLUTION OR ORDINANCE

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*Section 10632(a)*

*(8) A draft water shortage contingency resolution or ordinance.*

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The City of Bakersfield adopted No. 4804, “An Emergency Ordinance Adding Chapter 14.02 to the Bakersfield Municipal Code Relating to Regulations for Urban Water Conservation to Limit Irrigation of Turf and Landscapes” on April 22, 2015, as shown in Appendix M. In addition, Chapter 14.02 of the Bakersfield Municipal Code includes Water Use Regulations, as shown in Appendix L.

## 8.8 CATASTROPHIC SUPPLY INTERRUPTION

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*Section 10632(a)*

*(3) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.*

---

During an acute and severe water shortage caused by a disaster (including, but not limited to, a regional power outage, an earthquake, or other disaster), the City will implement its Emergency Response Plan. The Emergency Response Plan addresses actions to be taken during an earthquake or other catastrophic events for its Domestic Water System, and is incorporated into this UWMP by reference and a copy of the table of contents is included in Appendix O.

It is unlikely the City's Wholesale Water System's water supply will be interrupted as a result of a catastrophe. The City's Wholesale Water System's supply system consists of the gravity flow of water from Isabella Reservoir into the Kern River and unlined channels and canals. The City's Wholesale Water System also has pipelines that transport Kern River water to a variety of users. The City's Wholesale Water System will also use the City's Emergency Response Plan.

## 8.9 MINIMUM SUPPLY NEXT THREE YEARS

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### *Section 10632(a)*

*(2) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.*

---

About 80 percent of the City's Domestic Water System water supply is pumped from groundwater, and the balance is delivered from the two surface water sources (Cal Water and ID4). Because the City is able to use the underlying aquifer to store Kern River water and SWP water from ID4 for future use during a dry year, the City's Domestic Water System is less vulnerable to the high variability of the runoff of Kern River water and the State Water Project supply.

Hydrologic records have been kept for the Kern River watershed since 1893. The driest historic three-year sequence (multiple dry years) in the Bakersfield area occurred from 2013 to 2015. The driest year on record occurred in 2015, with a total Kern River runoff of 13 percent of average. A normal or average water year would be similar to 1963, where the total Kern River runoff was 102 percent of average. Table 8-

4R shows the minimum water supplies needed by the City's Domestic Water System to meet potable water demands during the next three year period (multiple dry years).

The minimum water supply for a three-year dry period, as shown in Table 8-4R, is estimated to be 43,700 acre-feet per year, the majority of which, approximately 35,700 acre feet, would be as pumped groundwater. It is assumed the Domestic Water System would not receive any treated SWP water from ID4. However, ID4 can also receive raw water from the City's Wholesale Water System (Kern River water) and from ID4's recovery wells in their groundwater banking project areas. Therefore, ID4 will be able to supply 3,300 acre-feet, based on the 2015 dry year deliveries, of water to the Domestic Water System in addition to 2,500 acre feet from the Cal Water North Garden Water Treatment Plant. Also, it is assumed WWTP No. 3 would be able to provide approximately 2,200 acre feet of tertiary treated water for irrigation purposes.

The minimum water supply for a three-year dry period for the Wholesale Water System, as shown in Table 8-4W, is estimated to be 135,000 acre-feet per year.

| Table 8-4 Retail: Minimum Supply Next Three Years |        |        |        |
|---|--------|--------|--------|
|   | 2016   | 2017   | 2018   |
| Available Water Supply                            | 43,700 | 43,700 | 43,700 |
| NOTES:  |        |        |        |

**Table 8-4R      Retail: Minimum Supply Next Three Years**

| Table 8-4 Wholesale: Minimum Supply Next Three Years |         |         |         |
|--|---------|---------|---------|
|  | 2016    | 2017    | 2018    |
| Available Water Supply                               | 135,000 | 135,000 | 135,000 |
| NOTES:   |         |         |         |

**Table 8-4W      Wholesale: Minimum Supply Next Three Years**

## **CHAPTER 9**

### **DEMAND MANAGEMENT MEASURES**

The City's Domestic Water System and Wholesale Water System are not a member of the California Urban Water Conservation Council (CUWCC), therefore, not a signatory to the Memorandum of Understanding regarding Urban Water Conservation in California. Thus, the City's Domestic Water System and Wholesale Water System do not submit annual reports to the CUWCC.

In recent years the City's Domestic Water System and Cal Water have initiated several measures and programs to increase urban water conservation within and outside the City limits. The City's Domestic Water System is increasing urban water conservation through a combination of ordinances, municipal codes, the use of recycled water, and participation in regional water planning, all of which are discussed further in this chapter.

The City's Domestic Water System is committed to water conservation. The City's Domestic Water System offers water conservation programs to customers within the City's Domestic Water System's service area. The City's Domestic Water System directly and indirectly implements projects and demand management measures (DMM) that conserve water and increases the public's awareness of water conservation and other water-related issues. The City's Domestic Water System recognizes water conservation and DMMs are important to the reliability of water sources. As required by the Act, the City's Domestic Water System will address each of the water DMMs (Section 10631 (f)) in the sections below, implemented directly by the City's Domestic Water System or indirectly through Cal Water.

## 9.1 DEMAND MANAGEMENT MEASURES FOR WHOLESALE AGENCIES

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### Section 10632(a)

(f) *Provide a description of the (wholesale) supplier's water demand management measures. This description shall include all of the following:*

*(1)(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:*

*(ii) Metering.*

*(iv) Public education and outreach.*

*(vi) Water conservation program coordination and staffing support.*

*(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*

*(2) For an urban wholesale water supplier, as defined in Section 10608.12, (provide) a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.*

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### 9.1.1 METERING

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#### CWC 526

*(a) Notwithstanding any other provisions 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... located within its service area.*

#### CWC 527

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

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

---

The Wholesale Water System is fully metered. A water meter is defined as a device that measures the actual volume of water delivered to an account in conformance with the guidelines of the American Water Works Association. All wholesale water sold to Cal Water is metered prior to and after treatment at the two water treatment plants. All wholesale water diverted and sold for agricultural purposes is measured manually using overpour or pressure methods. Wholesale customers are billed monthly.

### **9.1.2 PUBLIC EDUCATION AND OUTREACH**

The City's Wholesale Water System does not directly implement a public education and outreach program because it does not have direct retail customers. All of the Wholesale Water System water is either provided for groundwater basin replenishment, for irrigation use and to retail water companies.

### **9.1.3 WATER CONSERVATION PROGRAM COORDINATION AND STAFFING SUPPORT**

The City's Wholesale Water System does not directly employ a water conservation coordinator because it does not have direct retail customers.

### **9.1.4 OTHER DEMAND MANAGEMENT MEASURES**

#### **9.1.4.1 SYSTEM WATER AUDITS, LEAK DETECTION, AND REPAIR SYSTEM LOSSES**

All water diverted via the Kern River channel, lined canals, or unlined canals is measured by City staff. Many of the City's water transportation facilities are unlined and any water that percolates or evaporates is considered "loss" even the percolated

recharged water is a benefit to the underlying aquifer. Detailed records of these losses are tracked and recorded on a daily basis.

## 9.2 DEMAND MANAGEMENT MEASURES FOR RETAIL AGENCIES

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### *Section 10631(f)*

- (A) *The narrative shall describe the water demand management measure 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.*
- 

### 9.2.1 WATER WASTE PREVENTION ORDINANCES

The City of Bakersfield has adopted various Municipal Code Ordinances relating to water wastage. The ordinances apply to all water utilities who supply water within the incorporated City of Bakersfield boundaries, as well as the City's Domestic Water System. These ordinances are in place at all time and are not dependent on water shortages. A list of these ordinances is provided and described below:

- 12.28.020 Water on sidewalks

Any person owning or having in his possession any water pipe, drain or hose and who permits the water there from to run across any sidewalk, public street or alleyway, so as

to injure the same or obstruct or interfere with the free travel thereon, or who permits said water to run into or upon the surface of the street, shall be punished as set forth in general penalty provision Section 1.40.010, excepting, however, that it is not unlawful to use a reasonable amount of water to clean any sidewalk or portion thereof within the city. (Ord. 3434 § 2, 1992: prior code§ 10.07.070)

•12.28.030 Allowing irrigation water to overflow into gutters

It is unlawful for the owner, agent or tenant of any dwelling house, apartment house, flat building or any building or premises in the city where water is used to irrigate or sprinkle the lawn or plants on or about said premises to allow the water so being used to run, or for such person to sprinkle said premises until the water floods the parking space between the sidewalk and the curb and overflows into the gutter and street. (Prior code § 8.56.010)

• 12.28.040 Duty to turn off water before it overflows into gutters

It shall be the duty of all owners, agents or tenants of dwelling houses, apartment houses, flat buildings and all such premises where water is used to irrigate or sprinkle the lawn and plants on or about said premises, to shut or turn off all water before the same runs over the curb in front of said premises and into the gutter and street. (Prior code§ 8.56.020)

• 14.04.300 Service connections, meters and customers' facilities - Water wastage

Where negligent or wasteful use of water exists on a customer's premises, seriously affecting the general service, the city may discontinue the service if such conditions are not corrected within five days after giving customer written notice of intent to do so. (Prior code § 1.46.150(g))



## 9.2.2 METERING

### [SECTION 10631 (f)(1)(b)(ii)]

#### CWC 526

- (a) *Notwithstanding any other provisions 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... located within its service area.*

#### CWC 527

- (a) *An urban water supplier that is not subject to Section 526 shall do both the following:*
- (1) *Install water meters on all municipal and industrial service connections located within its service area on or before January 1, 2025.*

For consistency with California Water Code (Section 526), this DMM refers to potable water systems. A water meter is defined as a device that measures the actual volume of water delivered to an account in conformance with the guidelines of the American Water Works Association. The City implements the following:

1. The City requires meters for all existing and new service connections on the City's Domestic Water System, excluding fire services.
2. Retail customers' meters are read monthly by volume of use and billed monthly.
3. Cal Water keeps an inventory of all meters on the retail water system. This inventory includes size, type, year installed, customer class served and manufacturer's warranty accuracy when new.
4. Cal Water keeps a schedule of meter testing and repair by size, type and customer class.

5. It is City policy to have dedicated domestic, landscape, and fire service lines for commercial accounts.

### **9.2.3 CONSERVATION PRICING**

The City's Domestic Water System's water rate schedule uses two components, a monthly service charge based upon the size of the customer's connection and a commodity rate based on actual water use. A billing unit for the commodity rate is equivalent to one hundred cubic feet which is commonly referred to as HCF or CCF. A customer in the City's Domestic Water System limits that has a one-inch connection is charged \$15.06 as a monthly service charge plus \$0.94/CCF, whereas a customer in the unincorporated areas with a one-inch connection is charged \$19.58 as a monthly service charge plus \$1.18/CCF. A customer in the City's Domestic Water System limits with a two-inch connection is charged \$31.28 as a monthly service charge plus \$0.94/CCF, whereas a customer in the unincorporated areas with a two-inch connection is charged \$40.67 charge plus \$1.18/CCF. A copy of the City's Domestic Water System's current rate schedule is located in Appendix N. The City's Domestic Water System water rate structure promotes water conservation. According to the CUWCC's Memorandum of Understanding Regarding Urban Water Conservation in California, a retail water purveyor's volumetric rate shall be deemed sufficiently consistent with the definition of conservation pricing. The City's Domestic Water System water rate structure for its domestic water users meets this criterion.

### **9.2.4 PUBLIC EDUCATION AND OUTREACH**

The City's Domestic Water System has implemented public information programs in the past directly through City's Domestic Water System sponsored events and through Cal Water's available programs. The City's Domestic Water System's public information programs include the following:

- On the City's website, there is a "Save Our Water" link, which takes users to the <http://saveourwater.com/> website, where users can find information on water conservation.
- The City has budgeted for sending out bill stuffers that educate and remind customers to conserve water.
- Customer's bills show a detailed summary of water use for the current month and the bills give a consumption history for the previous 12 months.
- The City offers free conservation kits, rebates, and vouchers to customers.
- Public releases on water and water conservation have been distributed to the media.
- The City participates in water conservation radio campaigns with other local purveyors.
- The City's Domestic Water System participates in "Water Awareness Month" each May, in conjunction with the Water Association of Kern County and the American Water Works Association.
- The City participates with ID4 in school educational programs. ID4 provides programs including classroom education, water facility tours, and radio and television ads. These programs are funded from general tax revenues derived in part from customers of the City's Domestic Water System's water system.

#### **9.2.5 PROGRAMS TO ASSESS AND MANAGE DISTRIBUTION SYSTEM REAL LOSS**

The goals of modern water loss control methods include both an increase in water use efficiency in the utility operations and proper economic valuation of water losses to support water loss control activities. In May 2009, AWWA published the 3rd

Edition M36 Manual Water Audits and Loss Control Programs. This DMM will incorporate these new water loss management procedures and apply them.

Within the City's Domestic Water System's service area, a leak detection and repair program is implemented through Cal Water and by the City's Domestic Water System directly. Cal Water, on behalf of the City's Domestic Water System, repairs leaks within the City's Domestic Water System's distribution system on a routine basis. In addition, the City's Domestic Water System has a continuing program of meter change-outs to systematically replace older meters. A sampling of the old meters are then tested for accuracy to evaluate the unaccounted for losses in the system.

The City's Domestic Water System closely monitors its water production and consumption to calculate the amount of "unaccountable water". Water loss can result from activities such as the installation of new water mains, difference in accuracy of meters, discharges from water facilities or water connections, street cleaning, and fire department training. If the City's Domestic Water System notices any abnormally high water use, Cal Water staff will go out to identify the problem and make any necessary repairs. This program is effective in maintaining distribution systems that deliver water effectively and efficiently with the least amount of water loss. The amount of water conserved through the City's Domestic Water System's program can be estimated by evaluating the average amount of "unaccounted for water". It should be noted the amount of City's Domestic Water System "unaccounted for water" does not change significantly from year to year and is typically about 7 percent.

In addition, the City's Domestic Water System has standards for water main installations within its system. These standards require pressure and leak testing before acceptance by the City's Domestic Water System. The standards for pressure and leak testing are patterned after the American Water Works Association, Specification C600 and Specification C603-78. Any new water system installations are constructed under strict standards for pressure and leak detection.

Large landscaped city-owned areas are monitored with computer-controlled irrigation systems to minimize water use and identify leaks in the system. The City's Recreation and Parks Department, the single largest water user, continues to implement irrigation efficiency technology using Rainbird's Maxicom system. This master control system monitors weather conditions and water use patterns to provide for efficient park and median island irrigation as well as alerting staff to potential waterline breaks or sprinkler head breaks.

#### **9.2.6 WATER CONSERVATION PROGRAM COORDINATION AND STAFFING SUPPORT**

In accordance with the operations and maintenance agreement between the City of Bakersfield and Cal Water for the City's Domestic Water System, Cal Water implements a Water Conservation or Waste of Water program for the City. This program is executed by Cal Water under the direction of the Cal Water's Water Conservation Coordinator of behalf of the City of Bakersfield. Cal Water's Water Conservation Coordinator is not employed directly by the City's Domestic Water System. The water conservation oversees all available conservation programs that are available to the City's Domestic Water System customers through Cal Water. The current water conservation coordinator develops and implements programs within the City's Domestic Water System's service area that meet the CUWCC BMP guidelines, which coincide with many of the DMMs. For an additional cost, the City may pay Cal Water to implement some DMMs that are not currently implemented. The City has received grant funding to implement more DMMs and uses Cal Water's water conservation coordinator to facilitate the program.

## **9.2.7 OTHER DEMAND MANAGEMENT MEASURES**

### **9.2.7.1 WATER SURVEY PROGRAMS FOR SINGLE-FAMILY RESIDENTIAL AND MULTIFAMILY RESIDENTIAL CUSTOMERS**

The City's Domestic Water System is operated and maintained by Cal Water and 100 percent of its service connections are metered, exclusive of public fire protection services (public fire hydrants). Having all its service connections metered provides accurate detail to the City, and the customer, of quantities of water used year over year and allows both the City and its customers the opportunity to monitor water consumption data. The following sections are water survey programs for single-family residential and multifamily residential customers offered directly or indirectly by the City's Domestic Water System.

#### **RESIDENTIAL ASSISTANT PROGRAMS**

**Water Conservation Survey** – Currently, the City's Domestic Water System residential customers are not eligible for the Residential Water Use Survey Program implemented by Cal Water's conservation department. However, Cal Water does meet with City customers if the customer calls regarding excessive water use at a residence or business location. The Cal Water representative will evaluate the problem and recommend a solution if the problem can be identified. Cal Water records all customer calls and site visits.

**Water Efficiency Inspections** – Cal Water has computerized a billing system for the Domestic Water System that automatically audits customer's water usage. The billing system monitors water consumption and flags unusual variations in consumption, Cal Water alerts the City about leaks in the Domestic Water System or inoperable meters. If problems exist, customers can request assistance from a Cal Water service representative. A Cal Water representative will visit the customer's site, assess the

water use, and make recommendations. If the Cal Water representative concludes the problem exists within the customer's system, Cal Water will recommend alternatives the customer can implement to repair the problem. If the Cal Water representative concludes the problem exists within the City's Domestic Water System's service connection, the representative will make the necessary repairs. This program effectively helps identify/eliminate leaks within customer's service connection and informs the customer of their water usage. The City plans to continue implementing this program.

### **LANDSCAPE WATER SURVEY**

#### **Check irrigation systems and timers for maintenance and repairs needed –**

Cal Water currently performs this activity on the City's Domestic Water System on an as needed basis and records all surveys conducted. The City plans to continue implementing this program.

**Develop customer irrigation schedule based on precipitation rate, local climate, irrigation system performance, and landscape conditions –** The City's Recreation and Parks Department is the biggest water user in the City's Domestic Water System service area. The City's Recreation and Parks Department has implemented a program installing smart irrigation controller systems at many of its park sites. These smart controllers consider precipitation rate, climate, irrigation system performance, and landscape conditions. Since all parks within the Domestic Water System service area are metered, the City's Domestic Water System will compare water usage at the park sites before and after the program is implemented in order to evaluate the effectiveness of this program.

**Provide information packet to customer; and provide customer with evaluation results and water savings recommendation –** Cal Water is available to meet with Domestic Water System customers interested in water savings evaluation and recommendation. Based on these evaluations/recommendations, the customer's

water usage decreases. This program is effective and works well in lowering customer's water usage.

#### **9.2.7.2 RESIDENTIAL PLUMBING RETROFIT**

The City received a grant which included funding for water conservation kits that contain water saving fixtures. The grant pays for vouchers and rebates for City's Domestic Water System customers who purchase water saving fixtures and appliances. Cal Water currently administers the City's program for the City's Domestic Water System.

The City's Domestic Water System distributes water conserving devices (including hose, nozzles and kitchen aerators) to customers that complete a request card with Cal Water, either at public outreach events or in Cal Water's Bakersfield District Office. Cal Water will then mail the items to the customer. This program effectively contributes to the conservation of water by providing the City's Domestic Water System's customers with alternate, water efficient plumbing retrofit devices.

In addition, the City of Bakersfield has adopted, by reference, the California Green Code (CGC) sections relating to low water use plumbing fixtures installed in new construction. The City's Domestic Water System periodically evaluates changes in the CGC and updates City's Domestic Water System standards to reflect changes in the law. Assembly Bill No. 2355 has been incorporated into the City Building, Green, and Plumbing Codes Standards as required. A majority of the City's Domestic Water System's 42,000 plus service connections were constructed in the last 25 years, and already include/benefit from the latest in water plumbing technology, including low flow toilets and fixtures.



### **9.2.7.3 CONSERVATION PROGRAMS FOR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL ACCOUNTS**

A conservation program for CII customers is implemented through Cal Water's operation and maintenance of the City's Domestic Water System's water system. All CII customers within the City's Domestic Water System's service area are metered and Cal Water has identified and ranked these customers according to use (commercial, industrial or institutional). If there is a leak or problem in the City's Domestic Water System's distribution system, the computerized billing system will alert the City's Domestic Water System by flagging all variations in water use. Also, based on customer requests, Cal Water will check for leaks. Cal Water provides information for CII customers in their water bills on water use. In addition, the City of Bakersfield has adopted the California Administrative Code, Title 24 (State Building Standards Code) relating to Energy Conservation in new building construction. The code specifically relates to energy conservation, but some of the provisions apply to the use of low-flow showerheads, lavatory faucets and sink faucets by CII customers. The City provides rebates and vouchers to CII users for outdoor irrigation nozzles and controllers, and for low flow toilets.

### **9.2.7.4 LARGE LANDSCAPE CONSERVATION PROGRAMS AND INCENTIVES**

The City's Domestic Water System does not directly implement a large landscape conservation program for landscaped areas within the City of Bakersfield. However, the majority of large landscape areas within the City Water System's service area are maintained by the City of Bakersfield Recreation and Parks Department. This department evaluates and reads irrigation meters seasonally to avoid water waste. As discussed previously in this Section, the City is implementing a program and installing computerized controlled irrigation systems in parks to water only when needed. In

addition, the City of Bakersfield plants drought tolerant trees and shrubs in its parks. These programs help reduce the amount of water needed for outdoor water use.

In addition, the City's Domestic Water System informs its customers about landscape water conservation. The City's Domestic Water System has included "envelope stuffers" on water conservation and water saving tips in customer's monthly bills. Special emphasis for public information has been placed on outdoor water use especially during the hot and dry summer months. The City's Domestic Water System also has a continual policy of meeting with a customer when there is a display of outside waste of water noticed. The City Water System adopted water waste prohibitions and ordinances also prohibit the waste of water for outdoor use.

### **9.3 IMPLEMENTATION OVER THE PAST FIVE YEARS**

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*CWC 10631*

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1)(A)... a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years.

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Many of the previously discussed demand management measures for the City's Domestic Water System and Wholesale Water System have been in effect over the past five years. A summary of each is provided below.

### **9.3.1 WATER WASTE PREVENTION ORDINANCES**

Over the past five years, the City continued to actively enforce its Chapter 14.02 of the Bakersfield Municipal Code (Appendix L) and Water Conservation Ordinance (See Appendix M).

### **9.3.2 METERING**

Over the past five years, the City continued to meter all water sales to its customers. The City does not have any unmetered accounts. Additionally, the City continued to meter all new services.

### **9.3.3 CONSERVATION PRICING**

Over the past five years, the City continued to implement its water rate structure for its domestic water users.

### **9.3.4 PUBLIC EDUCATION AND OUTREACH**

Over the past five years, the City's Domestic Water System continued to implement public information programs directly through City's Domestic Water System sponsored events and through Cal Water's available programs.

### **9.3.5 PROGRAMS TO ASSESS AND MANAGE DISTRIBUTION SYSTEM REAL LOSS**

Over the past five years, the City continued to implement water survey programs. The City's water system is completely metered and City staff conducts water audits,

leak detection and repair on its distribution system. The City continued to implement school education programs directly and in cooperation with ID4.

### **9.3.6 WATER CONSERVATION PROGRAM COORDINATION AND STAFFING SUPPORT**

Over the past five years, Cal Water continued to implement a Water Conservation or Waste of Water program for the City of Bakersfield. This program is executed by Cal Water under the direction of the Cal Water's Water Conservation Coordinator of behalf of the City of Bakersfield. Since 2014 the City has increased its water conservation personnel. It has also started offering free conservation kits, spray nozzles, rebates, and vouchers to its customers.

### **9.3.7 OTHER DEMAND MANAGEMENT MEASURES**

Over the past five years, the City continued to participate in water survey programs for single-family residential and multifamily residential customers offered directly or indirectly by the City's Domestic Water System and Conservation Programs for CII implemented through Cal Water's operation and maintenance of the City's Domestic Water System's water system.

## **9.4 PLANNED IMPLEMENTATION TO ACHIEVE WATER USE TARGETS**

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*CWC 10631*

- (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1)(A) ...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.

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The City's Domestic Water System's 2015 Interim Target was 284 GPCD and the confirmed 2020 Target is 253 GPCD. The City's Domestic Water System's actual water use during 2015 was 215 GPCD. Consequently, the City's Domestic Water System is in compliance with the 2015 Interim Target and confirmed 2020 Target does not need to implement additional DMMs. However, the City's Domestic Water System will continue to use its demand management measures to prevent future water waste.

## 9.5 MEMBERS OF THE CALIFORNIA URBAN WATER CONSERVATION COUNCIL

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CWC 10631

- (i) *For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivision (f) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that memorandum.*
- 

The City Domestic and Wholesale Water Systems are not a member of the CUWCC.

## 9.6 DEMAND MANAGEMENT MEASURES NOT IMPLEMENTED

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### *Section 10631*

- (g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:*
- (1) Take into account economic and non-economic factors, including environmental, social, health, customer impact, and technological factors.*
  - (2) Include a cost-benefit analysis, identifying total benefits and total costs.*
  - (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.*
  - (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.*
- 

The City's Domestic Water System and Wholesale Water System directly or indirectly implements all the DMMs.

## **CHAPTER 10**

### **PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION**

#### **10.1 INCLUSION OF ALL 2015 DATA**

The data provided in the City's 2015 Plan is provided on a calendar year basis through December 31, 2015 (as discussed in Section 2.4.2).

#### **10.2 NOTICE OF PUBLIC HEARING**

A public hearing will be held prior to adopting this Plan. The public hearing will provide an opportunity for the public to provide input to the Plan before it is adopted. All public input will be considered.

##### **10.2.1 NOTICE TO CITIES AND COUNTIES**

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*CWC 10621.*

*(b) Every urban water supplier required to prepare a plan shall... at least 60 days prior to the public hearing on the plan ... 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.*

*CWC 10642.*

*...The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area...*

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As discussed in Section 2.5.2. the City of Bakersfield coordinated the preparation of the Urban Water Management Plan with agencies in the area, the City of Bakersfield City Clerk, and the County of Kern. The City Domestic and Wholesale Water Systems notified these agencies at least sixty (60) days prior to the public hearing of the preparation of the 2015 Plan. This notification invited them to participate in the development of the Plan. A copy of the notification letters sent to these agencies is provided in Appendix C.

Additionally, a notice of public hearing was sent to the agencies in the area, the County of Kern, and the City of Bakersfield to inform them of the time and place of the public hearing. Copies of the notice of the public hearing are provided in Appendix P.

Tables 10-1R and 10-1W summarizes the cities and counties which were provided notifications by the City Domestic and Wholesale Water Systems.

| Table 10-1 Retail: Notification to Cities and Counties |                                     |                                     |
|--|-------------------------------------|-------------------------------------|
| City Name  | 60 Day Notice                       | Notice of Public Hearing            |
| City of Bakersfield                                    | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
|  | <input type="checkbox"/>            | <input type="checkbox"/>            |
| County Name  | 60 Day Notice                       | Notice of Public Hearing            |
| Kern County  | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
|  | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Notes:   |                                     |                                     |

**Table 10-1R    Retail: Notification to Cities and Counties**



| Table 10-1 Wholesale: Notification to Cities and Counties (select one) |   |                                     |
|--|---|-------------------------------------|
| <input type="checkbox"/>   | Supplier has notified more than 10 cities or counties in accordance with CWC 10621 (b) and 10642.<br><b>Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.</b> |                                     |
|  | Provide the page or location of this list in the UWMP.  |                                     |
| <input checked="" type="checkbox"/>                                    | Supplier has notified 10 or fewer cities or counties.<br><b>Complete the table below.</b>   |                                     |
| City Name  | 60 Day Notice   | Notice of Public Hearing            |
| City of Bakersfield  | <input checked="" type="checkbox"/>   | <input checked="" type="checkbox"/> |
|  | <input type="checkbox"/>  | <input type="checkbox"/>            |
|  | <input type="checkbox"/>  | <input type="checkbox"/>            |
| County Name  | 60 Day Notice   | Notice of Public Hearing            |
| Kern County  | <input checked="" type="checkbox"/>   | <input checked="" type="checkbox"/> |
|  | <input type="checkbox"/>  | <input type="checkbox"/>            |
| NOTES:   |   |                                     |

Table 10-1W Wholesale: Notification to Cities and Counties

## 10.2.2 NOTICE TO THE PUBLIC

CWC 10642.

*...Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection...Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code...*

Government Code 6066.

*Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such*

*publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.*

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The City Domestic and Wholesale Water Systems encourages the active involvement of the population within its service area to participate in the preparation of the Plan. Pursuant to Section 6066 of the Government Code, two weeks prior to the public hearing the City Domestic and Wholesale Water Systems published a notice of public hearing in the newspaper during the weeks of May 31, 2017 and June 7, 2017. A notice of public hearing was posted at the City Water Resources Department located at 1000 Buena Vista Rd, Bakersfield CA and on the City's website.

To ensure that the plan was available for review, the City Domestic and Wholesale Water Systems placed a copy of the 2015 draft Plan for review at the City Water Resources Department. An electronic copy was also made available on the City's website.

### **10.3 PUBLIC HEARING AND ADOPTION**

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*CWC 10642.*

*...Prior to adopting a plan, the urban water supplier shall hold a public hearing thereon.*

*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.*

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Prior to adopting the 2015 Plan, the City Domestic and Wholesale Water Systems held a public hearing on June 14, 2017 which included input from the community regarding the City's draft 2015 Plan. As part of the public hearing, the City Domestic Water System made available to the public information regarding determination of its water use targets (see Section 5.7.1) and economic impacts of implementation.

### **10.3.1 ADOPTION**

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*CWC 10642.*

*...After the hearing, the plan shall be adopted as prepared or as modified after the hearing.*

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Following the public hearing, the City adopted the draft Plan as its 2015 Plan. A copy of the resolution adopting the 2015 Plan is provided in Appendix Q.

### **10.4 PLAN SUBMITTAL**

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*CWC 10621.*

*(d) An urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.*

*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.*

CWC 10635.

*(b) 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.*

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#### **10.4.1 SUBMITTING A UWMP TO DWR**

Within 30 days of adoption of the 2015 Plan by the City, the City Domestic and Wholesale Water Systems will submit the adopted 2015 Plan to DWR. The 2015 Plan will be submitted through DWR's "Water Use Efficiency (WUE) Data Online Submittal Tool" website.

DWR previously provided a checklist to determine if an Urban Water Management Plan has addressed the requirements of the California Water Code. The City Domestic and Wholesale Water Systems have completed the DWR checklist by indicating where the required CWC elements can be found within the City's 2015 Plan (See Appendix B).

#### **10.4.2 ELECTRONIC DATA SUBMITTAL**

Within 30 days of adoption of the 2015 Plan, the City Domestic and Wholesale Water Systems will also submit all data tables associated with the 2015 Plan through DWR's WUE Data Online Submittal Tool" website.

#### **10.4.3 SUBMITTING A UWMP TO THE CALIFORNIA STATE LIBRARY**

Within 30 days of adoption of the 2015 Plan by the City, a copy (CD or hardcopy) of the 2015 Plan will be submitted to the State of California Library. A copy of the letter

to the State Library will be maintained in the City's file. The 2015 Plan will be mailed to the following address if sent by regular mail:

California State Library  
Government Publications Section  
P.O. Box 942837  
Sacramento, CA 94237-0001  
Attention: Coordinator, Urban Water Management Plans

The 2015 Plan will be mailed to the following address if sent by courier or overnight carrier:

California State Library  
Government Publications Section  
914 Capitol Mall  
Sacramento, CA 95814

#### **10.4.4 SUBMITTING A UWMP TO CITIES AND COUNTIES**

Within 30 days of adoption of the 2015 Plan by the City, a copy of the 2015 Plan will be submitted to the County of Kern Registrar / Records office and the City Clerk's Office. A copy of the letter to the County of Kern will be maintained in the City's file.

#### **10.5 PUBLIC AVAILABILITY**

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*CWC 10645.*

*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.*

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Within 30 days after submittal of the 2015 Plan to DWR, the City will make the 2015 Plan available at its office during normal business hours and on the City's website.

## **10.6 AMENDING AN ADOPTED UWMP**

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*CWC 10621.*

*(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).*

*CWC 10644.*

*(a)(1) 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.*

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If DWR requires significant changes to the City's 2015 Plan before it determines the Plan to be "complete," the City will submit an amended or revised Plan. The amendment or revised Plan will undergo adoption by the City's governing board. Within 30 days of adoption, the amendment or revised Plan will then be submitted to DWR, the State of California Library, the County of Kern Registrar / Records office, and the City Clerk's Office.