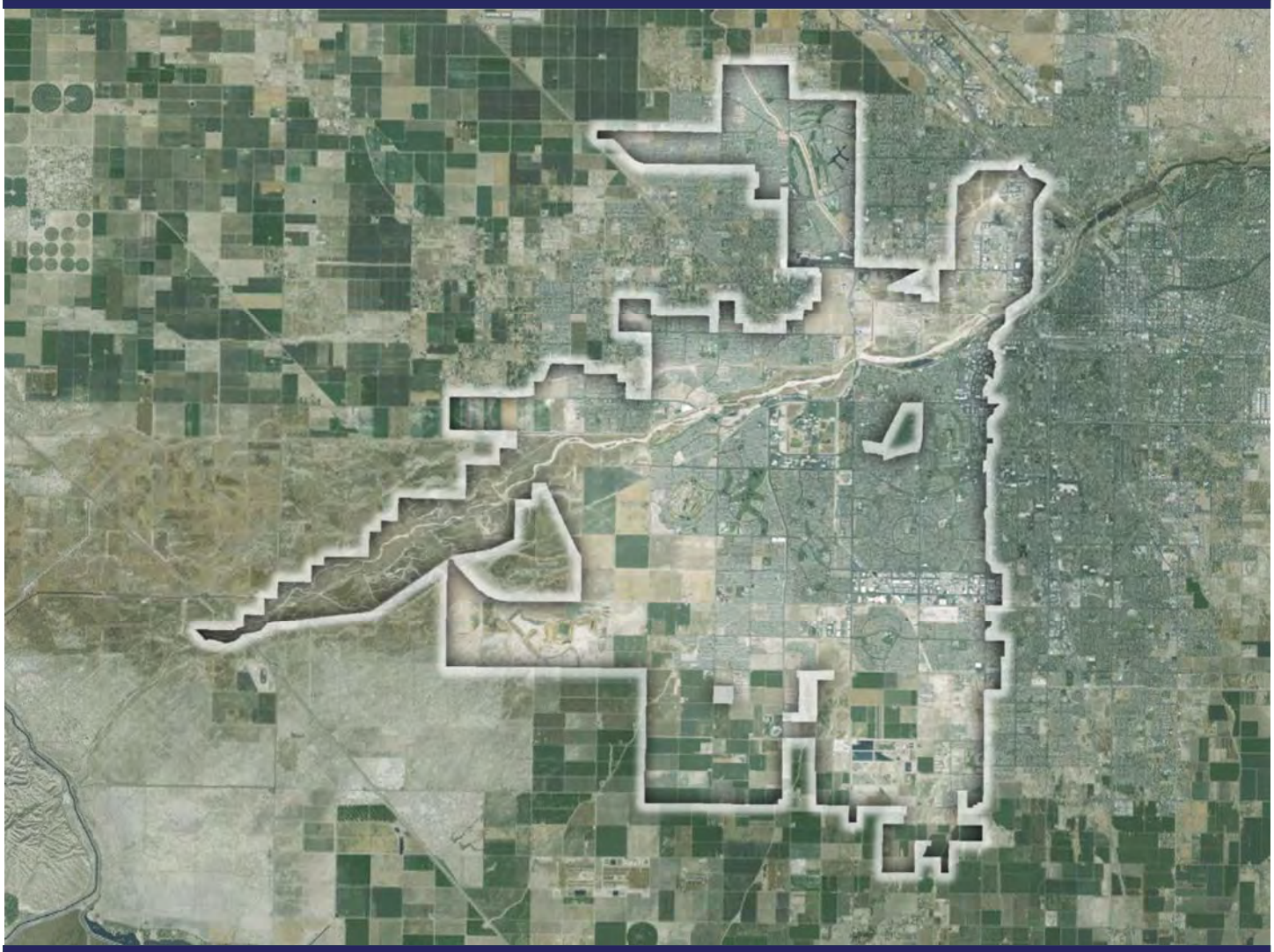
City of Bakersfield

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
^{o}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

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

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
	TOTAL	43,789	35,954
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** *if applicable*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		
NOTES:			

Table 2-2 Plan Identification

2.3.1 REGIONAL UWMP

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

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

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)	
☑	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables Are in Calendar Years
☐	UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)	
Units of Measure Used in UWMP	
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 Plan 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 uses 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)	
☐	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.
	Provide page number for location of the list.
☑	Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with CWC 10631. **Complete the table below.**
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.

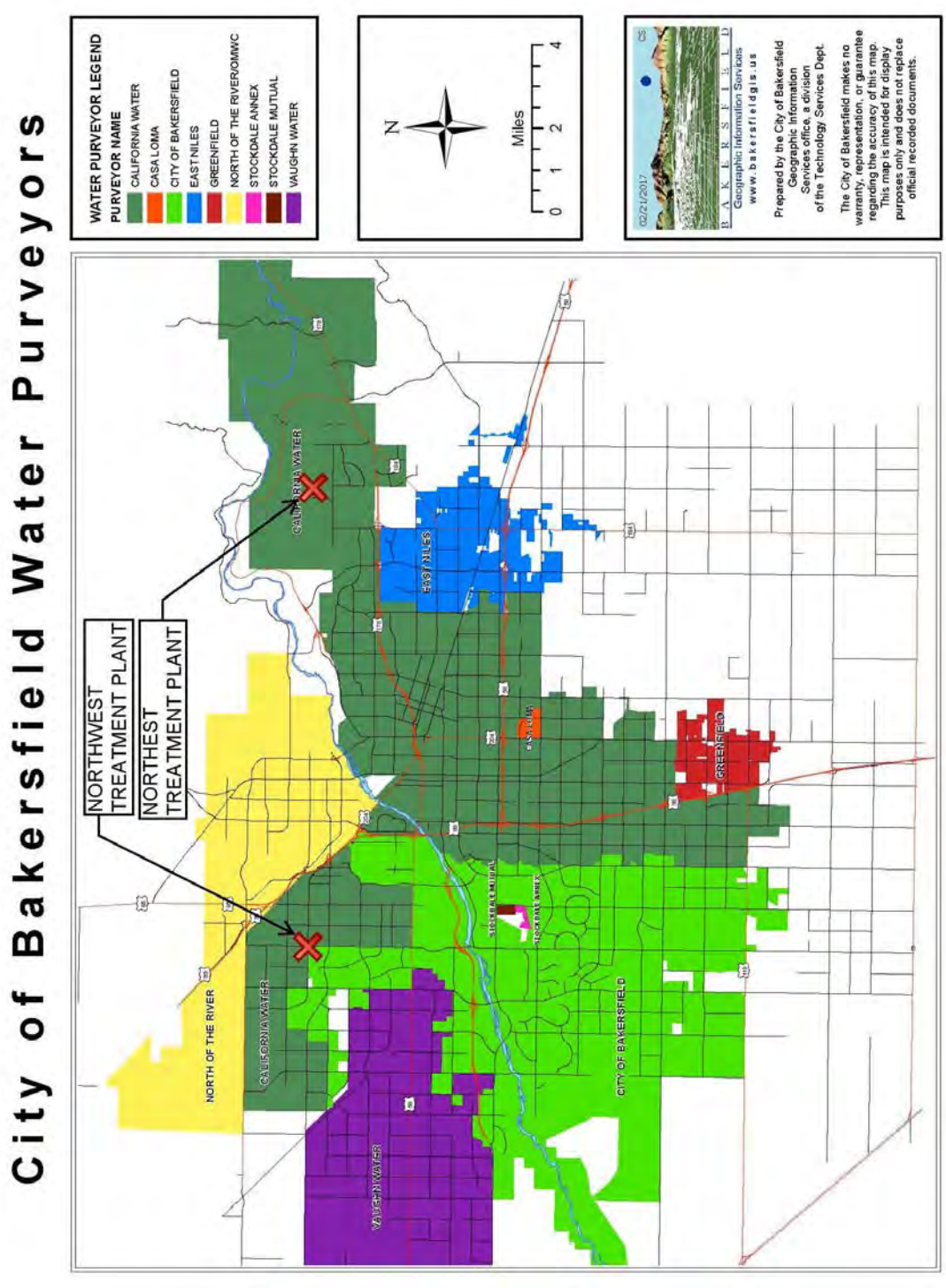

Plate 1 Water Purveyors in the Vicinity of the City of Bakersfield

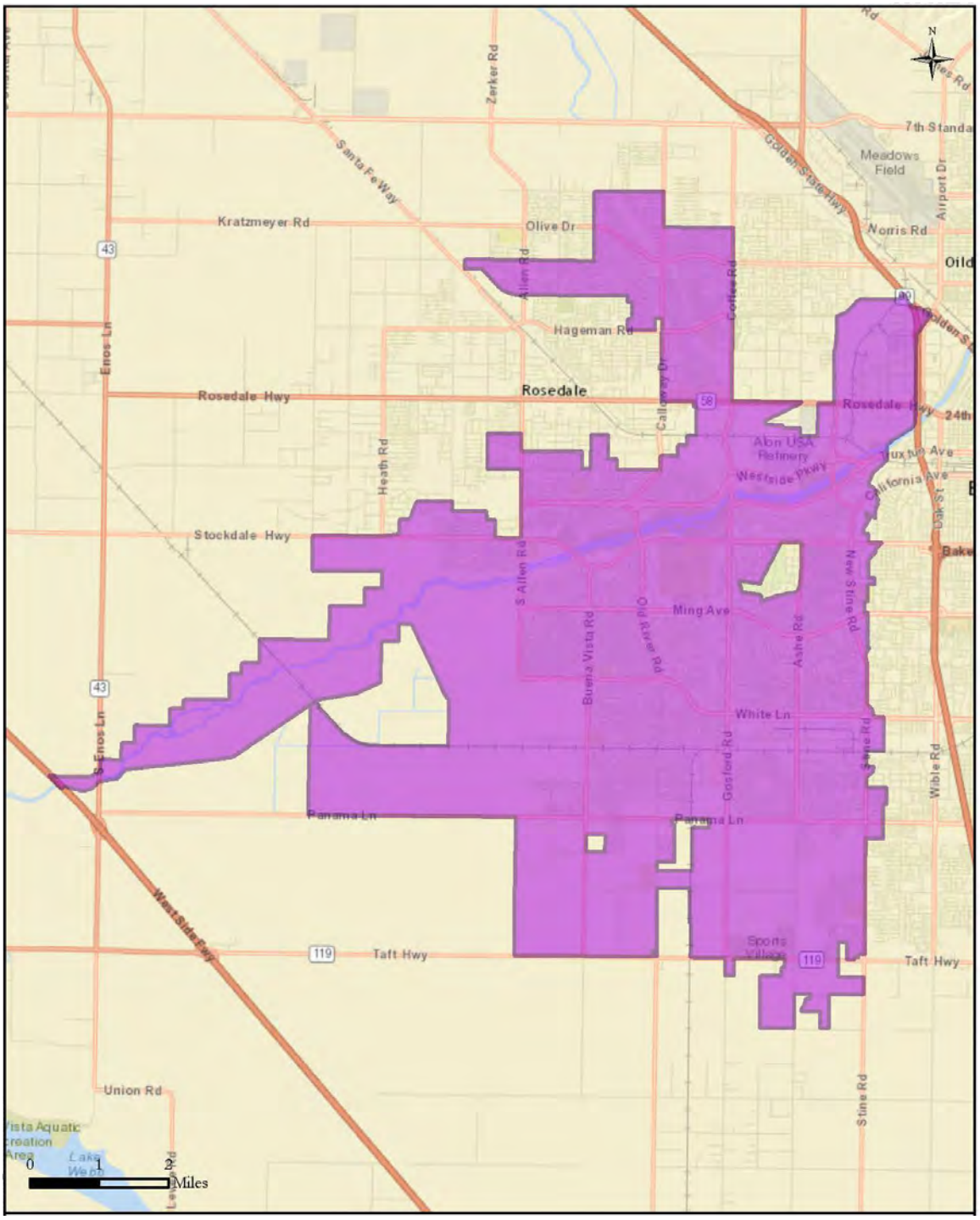

Plate 2 City of Bakersfield Domestic Water System's Service Area

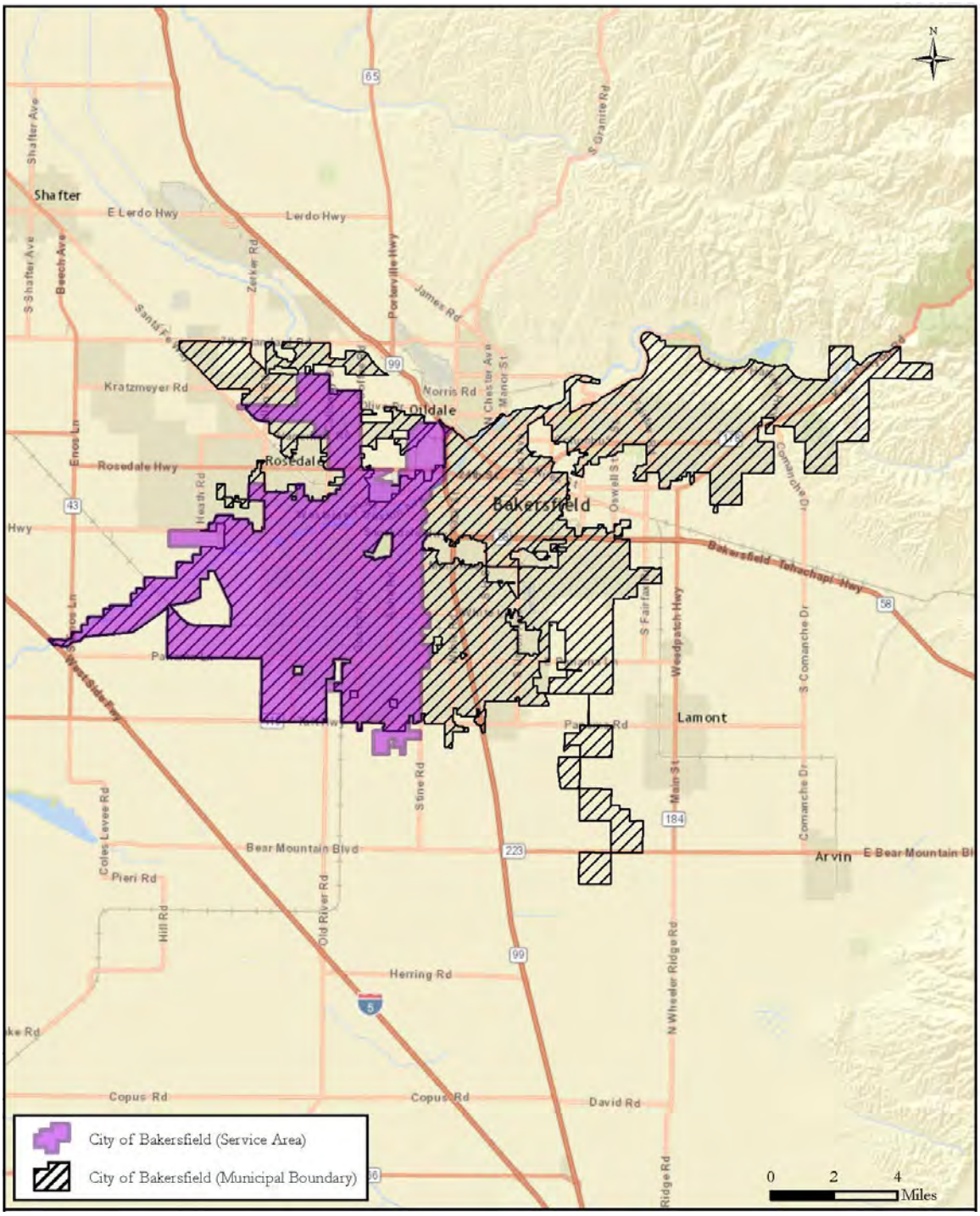

Plate 3 City of Bakersfield Water System Boundary and Municipal Boundary

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 (ETo) 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

Month	Average Temperature (F)	Average Min. Temperature (F)	Average Max. Temperature (F)	Average Total Precipitation (Inches)	ETo (Inches)
January	47.8	38.5	57.4	1.04	1.54
February	53.3	42.1	63.6	1.16	2.33
March	57.3	45.4	69.0	1.12	4.12
April	62.7	49.7	75.7	0.67	5.61
May	70.3	56.6	84.2	0.21	7.65
June	77.7	63.3	92.1	0.07	8.65
July	83.1	69.2	98.6	0.01	9.08
August	81.9	67.7	96.7	0.04	8.45
September	76.7	63.1	91.0	0.10	6.12
October	67.2	54.0	80.5	0.30	4.07
November	54.8	44.1	67.3	0.59	2.06
December	47.2	38.5	57.8	0.85	1.42
Annual	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://wwwcimis.water.ca.gov) and is based on data collected from Station 125 (San JoaquinValley).

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 "Methodolgies 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

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).

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 *(as needed)*	Level of Treatment 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
		TOTAL	35,221

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 *(as needed)*	Projected Water Use *Report To the Extent that Records are Available*				
		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
	TOTAL	45,389	49,625	54,255	56,316	64,851
NOTES:						

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

Table 4-3 Retail: Total Water Demands						
	2015	2020	2025	2030	2035	2040 *(opt)*
Potable and Raw Water *From Tables 4-1 and 4-2*	35,221	45,389	49,625	54,255	56,316	64,851
Recycled Water Demand* *From Table 6-4*	733	2,240	2,240	2,240	2,240	2,240
TOTAL WATER DEMAND	35,954	47,629	51,865	56,495	58,556	67,091
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 *(as needed)*	Level of Treatment When 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
		TOTAL	17,586
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 *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
	TOTAL	135,000	135,000	135,000	135,000	135,000
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 *From Tables 4-1 and 4-2*	17,586	135,000	135,000	135,000	135,000	135,000
Recycled Water Demand* *From Table 6-4*	0	0	0	0	0	0
TOTAL WATER DEMAND	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

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.

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 (mm/yyyy)	Volume of Water Loss*
01/2015	1061
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
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 (mm/yyyy)	Volume of Water Loss*
NA	NA
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
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? (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

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.

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

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.

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

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.

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

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).

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[1] and a 5-year baseline period[2]) 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)

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.

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-

[1] 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"

[2] 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)

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.

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

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.

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

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.

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

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.*[3]

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).

[3] 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

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.

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.

Table 5-1 Baselines and Targets Summary *Retail Agency or Regional Alliance Only*					
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

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.

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).

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

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.

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

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.

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)[4] 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

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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[4] 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

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.

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						
☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Kern County Basin	35519.51	30806.29	36896.6	38073.05	31029.3
	TOTAL	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						
☑	Supplier does not pump groundwater. 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

CWC 10633.

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

The 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

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.

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						
☐	There is no wastewater collection system. The supplier will not complete the table below.					
	Percentage of 2015 service area covered by wastewater collection system *(optional)*					
	Percentage of 2015 service area population covered by wastewater collection system *(optional)*					
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected 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? *(optional)*
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										
☐	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.									
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2015 volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
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
						Total	18,593	7,936	733	9,924
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								
☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.							
Name of Agency Producing (Treating) the Recycled Water:		City of 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)*								
		Total:	733	2,240	2,240	2,240	2,240	2,240
**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										
☑	Wholesale supplier neither distributes nor provides supplemental treatment to recycled water. 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
						Total	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							
☑	Recycled water is not directly treated or distributed by the supplier. 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)*
	Total	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

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			
☐	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.		
Use Type		**2010 Projection for 2015**	**2015 Actual Use**
Agricultural irrigation		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*		
Total		20,998	733
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		
☑	Recycled water was not used or distributed by the supplier in 2010, nor projected for use or distribution in 2015. 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
Total	0	0
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			
☐	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
		Total	1,507
NOTES:			

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

6.6 DESALINATED WATER OPPORTUNITIES

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.

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

Section 10631(d)

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

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

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.

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 investigation 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						
☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☐	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
		If Yes, Agency Name				
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						
☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☑	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
See Section 6.8	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
		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

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	
	Total	35,954		0
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 *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	
	Total	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	
	Total	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 *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	
	Total	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

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.

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

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** *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*	**Available Supplies if Year Type Repeats**	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☑ 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 *Optional*			
Multiple-Dry Years 5th Year *Optional*			
Multiple-Dry Years 6th Year *Optional*			
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	**Base Year** *If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000*	**Available Supplies if Year Type Repeats**	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location Sections 7.1.1.2 and 8.1	
		☑ 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 *Optional*			
Multiple-Dry Years 5th Year *Optional*			
Multiple-Dry Years 6th Year *Optional*			
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

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.

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 *(Opt)*
Supply totals *(autofill from Table 6-9)*	47,629	51,865	56,495	58,556	67,091
Demand totals *(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 *(Opt)*
Supply totals *(autofill from Table 6-9)*	135,000	135,000	135,000	135,000	135,000
Demand totals *(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 (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 (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 (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
Stages of Water Shortage Contingency Plan

Stage	Complete Both	
	Percent Supply Reduction[1] *Numerical value as a percent*	Water Supply Condition (*Narrative description*)
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 isloated systems
4	36-50%	An execptional 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.

[1] *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

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 *(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 consistant 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

Section 10632(a)

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

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 infracture, 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

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.

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

Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference *(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 ordanance
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

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

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

Section 10632(a)

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

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

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

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

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.

9.1.1 METERING

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 loses are tracked and recorded on a daily basis.

9.2 DEMAND MANAGEMENT MEASURES FOR RETAIL AGENCIES

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 devise 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

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.

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, he 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 SYSTEMREAL 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

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.

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

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

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

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 waters 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…

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	☑	☑
	☐	☐
County Name	60 Day Notice	Notice of Public Hearing
Kern County	☑	☑
	☐	☐
Notes:		

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

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

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

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.

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

CWC 10642.

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

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

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.

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 / Recorders 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

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.

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

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.

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 / Recorders office, and the City Clerk's Office.

APPENDIX A

Urban Water Management Planning Act

California Water Code Division 6, Part 2.6.

Chapter 1. General Declaration and Policy §10610-10610.4
Chapter 2. Definitions §10611-10617
Chapter 3. Urban Water Management Plans
Article 1. General Provisions §10620-10621
Article 2. Contents of Plans §10630-10634
Article 2.5. Water Service Reliability §10635
Article 3. Adoption And Implementation of Plans §10640-10645
Chapter 4. Miscellaneous Provisions §10650-10656

Chapter 1. General Declaration and Policy

SECTION 10610-10610.4

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

Chapter 2. Definitions

SECTION 10611-10617

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. “Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses,

reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

Chapter 3. Urban Water Management Plans

Article 1. General Provisions

SECTION 10620-10621

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

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

(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.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

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).

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) 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).

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

Article 2. Contents of Plan

SECTION 10630-10634

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). 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, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For 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.

(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.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) (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.

(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.

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

(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.

(J) Distribution system water loss.

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

(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.

(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.

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

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

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

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

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

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

(g) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water

use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in 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.

(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.

(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.

(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).

10631.1. (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

10631.2. (a) In addition to the requirements of Section 10631, an urban water management plan may, but is not required to, include any of the following information:

(1) An estimate of the amount of energy used to extract or divert water supplies.

(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.

(3) An estimate of the amount of energy used to treat water supplies.

(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.

(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.

(6) An estimate of the amount of energy used to place water into or withdraw from storage.

(7) Any other energy-related information the urban water supplier deems appropriate.

(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

10631.5. (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has

submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4) (A) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

(i) Compliance on an individual basis.

(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.

(B) The department may require additional information for any determination pursuant to this section.

(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.

(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

(f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

10631.7. The department, in consultation with the California Urban Water Conservation Council, shall convene an independent technical panel to provide information and recommendations to the department and the Legislature on new demand management measures, technologies, and approaches. The panel shall consist of no more than seven members, who shall be selected by the department to reflect a balanced representation of experts. The panel shall have at least one, but no more than two, representatives from each of the following: retail water suppliers, environmental organizations, the business community, wholesale water suppliers, and academia. The panel shall be convened by January 1, 2009, and shall report to the Legislature no later than January 1, 2010, and every five years thereafter. The department shall review the panel report and include in the final report to the Legislature the department's recommendations and comments regarding the panel process and the panel's recommendations.

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:

(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 that are applicable to each stage.

(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.

(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.

(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.

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

(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.

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

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

(b) Commencing with the urban water management plan update due July 1, 2016, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

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

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Article 2.5. Water Service Reliability

SECTION 10635

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.

(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.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

Article 3. Adoption and Implementation of Plans

SECTION 10640-10645

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

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. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. 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. 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.

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

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) (1) Notwithstanding Section 10231.5 of the Government Code, the department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part.

The report prepared by the department shall identify the exemplary elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

(2) A report to be submitted pursuant to paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.

(c) (1) For the purpose of identifying the exemplary elements of the individual plans, the department shall identify in the report water demand management measures adopted and implemented by specific urban water suppliers, and identified pursuant to Section 10631, that achieve water savings significantly above the levels established by the department to meet the requirements of Section 10631.5.

(2) The department shall distribute to the panel convened pursuant to Section 10631.7 the results achieved by the implementation of those water demand management measures described in paragraph (1).

(3) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

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.

Chapter 4. Miscellaneous Provisions

SECTION 10650-10656

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26

(commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

APPENDIX B

Completed Plan Checklist

Checklist Arranged by Water Code Section

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location *(Optional Column for Agency Use)*
10608.20(b)	Retail suppliers shall adopt a 2020 water use target using one of four methods.	Baselines and Targets	Section 5.7 and App E	**Section 5.7**
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5 and App E	**Chapter 5 Appendix G**
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	**Section 5.7.2**
10608.24(a)	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	**Section 5.8**
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.8.2	**Section 5.8.2**
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Section 10.3	**Section 10.3**
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	**Section 5.1**
10608.40	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	**Section 5.8**
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	**Section 2.1**
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	**Section 2.5.2**

10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	**Section 7.4**
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	**Section 10.2.1**
10621(d)	Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	**Sections 10.3.1 and 10.4**
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	**Section 3.1**
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	**Section 3.3**
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	**Sections 3.4 and 5.4**
10631(a)	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	**Section 3.4**
10631(a)	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	**Section 3.4**
10631(b)	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	**Chapter 6**
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	**Section 6.2**
10631(b)(1)	Indicate whether a groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2	**Section 6.2.2**
10631(b)(2)	Describe the groundwater basin.	System Supplies	Section 6.2.1	**Section 6.2.1**
10631(b)(2)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	**Section 6.2.2**
10631(b)(2)	For unadjudicated basins, indicate whether or not the department has identified the basin as overdrafted, or projected to become overdrafted. Describe efforts by the supplier to eliminate the long-term overdraft condition.	System Supplies	Section 6.2.3	**Section 6.2.3**
10631(b)(3)	Provide a detailed description and analysis of the location, amount, and sufficiency of	System Supplies	Section 6.2.4	**Section 6.2.4**

	groundwater pumped by the urban water supplier for the past five years			
10631(b)(4)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Sections 6.2 and 6.9	**Sections 6.2 and 6.9**
10631(c)(1)	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	**Section 7.1**
10631(c)(1)	Provide data for an average water year, a single dry water year, and multiple dry water years	Water Supply Reliability Assessment	Section 7.2	**Section 7.2**
10631(c)(2)	For any water source that may not be available at a consistent level of use, describe plans to supplement or replace that source.	Water Supply Reliability Assessment	Section 7.1	**Section 7.1**
10631(d)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7	**Section 6.7**
10631(e)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	**Section 4.2**
10631(e)(3)(A)	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	**Section 4.3**
10631(f)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Sections 9.2 and 9.3	**Sections 9.2 and 9.3**
10631(f)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	**Sections 9.1 and 9.3**
10631(g)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years.	System Supplies	Section 6.8	**Section 6.8**
10631(h)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	**Section 6.6**
10631(i)	CUWCC members may submit their 2013-2014 CUWCC BMP annual reports in lieu of, or in addition to, describing the DMM implementation in their UWMPs. This option is only allowable if the supplier has been found to be in full compliance with the CUWCC MOU.	Demand Management Measures	Section 9.5	**Section 9.5**
10631(j)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) – if any - with water use	System Supplies	Section 2.5.1	**Section 2.5.1**

	projections from that source.			
10631(j)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	**Section 2.5.1**
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	**Section 4.5**
10632(a) and 10632(a)(1)	Provide an urban water shortage contingency analysis that specifies stages of action and an outline of specific water supply conditions at each stage.	Water Shortage Contingency Planning	Section 8.1	**Section 8.1**
10632(a)(2)	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency.	Water Shortage Contingency Planning	Section 8.9	**Section 8.9**
10632(a)(3)	Identify actions to be undertaken by the urban water supplier in case of a catastrophic interruption of water supplies.	Water Shortage Contingency Planning	Section 8.8	**Section 8.8**
10632(a)(4)	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	**Section 8.2**
10632(a)(5)	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	**Section 8.4**
10632(a)(6)	Indicated penalties or charges for excessive use, where applicable.	Water Shortage Contingency Planning	Section 8.3	**Section 8.3**
10632(a)(7)	Provide an analysis of the impacts of each of the actions and conditions in the water shortage contingency analysis on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts.	Water Shortage Contingency Planning	Section 8.6	**Section 8.6**
10632(a)(8)	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	**Section 8.7**
10632(a)(9)	Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis.	Water Shortage Contingency Planning	Section 8.5	**Section 8.5**
10633	For wastewater and recycled water, coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.1	**Section 6.5.1**
10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area. Include quantification of the amount of	System Supplies (Recycled Water)	Section 6.5.2	**Section 6.5.2**

	wastewater collected and treated and the methods of wastewater disposal.			
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2.2	**Section 6.5.2**
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and 6.5.4	**Section 6.5.3 and 6.5.4**
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.4	**Section 6.5.4**
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.4	**Section 6.5.4**
10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.5	**Section 6.5.5**
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5	**Section 6.5.5**
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1	**Section 7.1**
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	**Section 7.3**
10635(b)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	**Section 10.4.4**
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	Plan Preparation	Section 2.5.2	**Section 2.5.2**
10642	Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the public hearing, and held a public hearing	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	**Sections 10.2.2, 10.3, and 10.5**

	about the plan.			
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Sections 10.2.1	**Sections 10.2.1**
10642	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	**Section 10.3.1**
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4.3	**Section 10.4.3**
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	**Section 10.4.4**
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	**Sections 10.4.1 and 10.4.2**
10645	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	**Section 10.5**

Checklist Arranged by Subject

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location *(Optional Column for Agency Use)*
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	**Section 2.1**
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	**Section 2.5.2**
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	Plan Preparation	Section 2.5.2	**Section 2.5.2**
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	**Section 3.1**
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	**Section 3.3**
10631(a)	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	**Section 3.4**
10631(a)	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	**Section 3.4**
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	**Sections 3.4 and 5.4**
10631(e)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	**Section 4.2**
10631(e)(3)(A)	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	**Section 4.3**
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	**Section 4.5**
10608.20(b)	Retail suppliers shall adopt a 2020 water use target using one of four methods.	Baselines and Targets	Section 5.7 and App E	**Section 5.7**
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along	Baselines and Targets	Chapter 5 and App E	**Chapter 5**

	with the bases for determining those estimates, including references to supporting data.			
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	**Section 5.7.2**
10608.24(a)	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	**Section 5.8**
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.8.2	**Section 5.8.2**
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	**Section 5.1**
10608.40	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	**Section 5.8**
10631(b)	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	**Chapter 6**
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	**Section 6.2**
10631(b)(1)	Indicate whether a groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2	**Section 6.2.2**
10631(b)(2)	Describe the groundwater basin.	System Supplies	Section 6.2.1	**Section 6.2.1**
10631(b)(2)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	**Section 6.2.2**
10631(b)(2)	For unadjudicated basins, indicate whether or not the department has identified the basin as overdrafted, or projected to become overdrafted. Describe efforts by the supplier to eliminate the long-term overdraft condition.	System Supplies	Section 6.2.3	**Section 6.2.3**
10631(b)(3)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.4	**Section 6.2.4**

10631(b)(4)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Sections 6.2 and 6.9	**Sections 6.2 and 6.9**
10631(d)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7	**Section 6.7**
10631(g)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years.	System Supplies	Section 6.8	**Section 6.8**
10631(h)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	**Section 6.6**
10631(j)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) – if any - with water use projections from that source.	System Supplies	Section 2.5.1	**Section 2.5.1**
10631(j)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	**Section 2.5.1**
10633	For wastewater and recycled water, coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.1	**Section 6.5.1**
10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area. Include quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	System Supplies (Recycled Water)	Section 6.5.2	**Section 6.5.2**
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2.2	**Section 6.5.2**
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and 6.5.4	**Section 6.5.3 and 6.5.4**
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.4	**Section 6.5.4**
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.4	**Section 6.5.4**
10633(f)	Describe the actions which may be taken to	System Supplies	Section 6.5.5	**Section 6.5.5**

	encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	(Recycled Water)		
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5	**Section 6.5.5**
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	**Section 7.4**
10631(c)(1)	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	**Section 7.1**
10631(c)(1)	Provide data for an average water year, a single dry water year, and multiple dry water years	Water Supply Reliability Assessment	Section 7.2	**Section 7.2**
10631(c)(2)	For any water source that may not be available at a consistent level of use, describe plans to supplement or replace that source.	Water Supply Reliability Assessment	Section 7.1	**Section 7.1**
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1	**Section 7.1**
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	**Section 7.3**
10632(a) and 10632(a)(1)	Provide an urban water shortage contingency analysis that specifies stages of action and an outline of specific water supply conditions at each stage.	Water Shortage Contingency Planning	Section 8.1	**Section 8.1**
10632(a)(2)	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency.	Water Shortage Contingency Planning	Section 8.9	**Section 8.9**
10632(a)(3)	Identify actions to be undertaken by the urban water supplier in case of a catastrophic interruption of water supplies.	Water Shortage Contingency Planning	Section 8.8	**Section 8.8**
10632(a)(4)	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	**Section 8.2**
10632(a)(5)	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	**Section 8.4**
10632(a)(6)	Indicated penalties or charges for excessive use, where applicable.	Water Shortage Contingency Planning	Section 8.3	**Section 8.3**

10632(a)(7)	Provide an analysis of the impacts of each of the actions and conditions in the water shortage contingency analysis on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts.	Water Shortage Contingency Planning	Section 8.6	**Section 8.6**
10632(a)(8)	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	**Section 8.7**
10632(a)(9)	Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis.	Water Shortage Contingency Planning	Section 8.5	**Section 8.5**
10631(f)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Sections 9.2 and 9.3	**Sections 9.2 and 9.3**
10631(f)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	**Sections 9.1 and 9.3**
10631(i)	CUWCC members may submit their 2013-2014 CUWCC BMP annual reports in lieu of, or in addition to, describing the DMM implementation in their UWMPs. This option is only allowable if the supplier has been found to be in full compliance with the CUWCC MOU.	Demand Management Measures	Section 9.5	**Section 9.5**
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Section 10.3	**Section 10.3**
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	**Section 10.2.1**
10621(d)	Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	**Sections 10.3.1 and 10.4**
10635(b)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	**Section 10.4.4**
10642	Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the public hearing, and held a public hearing	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	**Sections 10.2.2, 10.3, and 10.5**

	about the plan.			
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Sections 10.2.1	**Sections 10.2.1**
10642	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	**Section 10.3.1**
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4.3	**Section 10.4.3**
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	**Section 10.4.4**
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	**Sections 10.4.1 and 10.4.2**
10645	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	**Section 10.5**

APPENDIX C

Notification Memo of Preparation of Plan

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

February 29, 2016

City Clerk
City of Bakersfield
1600 Truxtun Avenue
Bakersfield, CA 93301

SUBJECT: Urban Water Management Plan 2015 Update

The Urban Water Management Planning Act requires every "urban water supplier[1]" to prepare and adopt an Urban Water Management Plan (UWMP) and periodically update that plan at least once every five years on or before December 31, in years ending in five and zero. Pursuant to Section 10621(d) of the UWMP Act, each urban water supplier shall update and submit its 2015 UWMP by July 1, 2016 to the California Department of Water Resources. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts.

The purpose of this letter is to notify your agency that the City of Bakersfield (City) is currently in the process of preparing its 2015 UWMP Update, and to encourage your agency's participation as we continue through this process. As an urban water supplier, the City is required pursuant to Section 10620(d)(2) of the UWMP Act to coordinate with water management agencies, relevant public agencies, and other water suppliers on the preparation of the UWMP. In an effort to encourage participation from agencies responsible for developing related reports and planning documents, the City invites your agency to provide input to assist in the development of our 2015 UWMP Update. Coordination between agencies ensures consistency in planning and reporting.

Prior to the July 1, 2016 deadline, the City will be holding a public hearing to accept comments regarding our 2015 UWMP Update. Your agency will again be notified at least 60 days before the public hearing date.

If you have any initial comments regarding the City's 2015 UWMP Update, please provide them to the City Water Resources Department within the next 15 business days to assist us in the UWMP update process.

Sincerely,

Art Chianello, P. E.
Water Resources Manager

[1]Section 10617 of the Urban Water Management Planning Act states, "*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.*

Water Resources Department • 1000 Buena Vista Road • Bakersfield • California 93311
(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

February 29, 2016

County Clerk
Kern County
1115 Truxtun Avenue
Bakersfield, CA 93301

SUBJECT: Urban Water Management Plan 2015 Update

The Urban Water Management Planning Act requires every "urban water supplier[1]" to prepare and adopt an Urban Water Management Plan (UWMP) and periodically update that plan at least once every five years on or before December 31, in years ending in five and zero. Pursuant to Section 10621(d) of the UWMP Act, each urban water supplier shall update and submit its 2015 UWMP by July 1, 2016 to the California Department of Water Resources. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts.

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BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

February 29, 2016

Kern County Planning and Development
2700 M Street Suite 100
Bakersfield, CA 93301

SUBJECT: Urban Water Management Plan 2015 Update

The Urban Water Management Planning Act requires every "urban water supplier[1]" to prepare and adopt an Urban Water Management Plan (UWMP) and periodically update that plan at least once every five years on or before December 31, in years ending in five and zero. Pursuant to Section 10621(d) of the UWMP Act, each urban water supplier shall update and submit its 2015 UWMP by July 1, 2016 to the California Department of Water Resources. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts.

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BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

February 29, 2016

California Water Service Company
3725 H Street
Bakersfield, CA 93304

SUBJECT: Urban Water Management Plan 2015 Update

The Urban Water Management Planning Act requires every "urban water supplier[1]" to prepare and adopt an Urban Water Management Plan (UWMP) and periodically update that plan at least once every five years on or before December 31, in years ending in five and zero. Pursuant to Section 10621(d) of the UWMP Act, each urban water supplier shall update and submit its 2015 UWMP by July 1, 2016 to the California Department of Water Resources. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts.

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Water Resources Manager

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BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

February 29, 2016

Kern County Water Agency ID 4
P. O. Box 58
Bakersfield, CA 93302

SUBJECT: Urban Water Management Plan 2015 Update

The Urban Water Management Planning Act requires every "urban water supplier[1]" to prepare and adopt an Urban Water Management Plan (UWMP) and periodically update that plan at least once every five years on or before December 31, in years ending in five and zero. Pursuant to Section 10621(d) of the UWMP Act, each urban water supplier shall update and submit its 2015 UWMP by July 1, 2016 to the California Department of Water Resources. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts.

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BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

February 29, 2016

Casa Loma Water Company
1016 Lomita Drive
Bakersfield, CA 93307

SUBJECT: Urban Water Management Plan 2015 Update

The Urban Water Management Planning Act requires every "urban water supplier[1]" to prepare and adopt an Urban Water Management Plan (UWMP) and periodically update that plan at least once every five years on or before December 31, in years ending in five and zero. Pursuant to Section 10621(d) of the UWMP Act, each urban water supplier shall update and submit its 2015 UWMP by July 1, 2016 to the California Department of Water Resources. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts.

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BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

February 29, 2016

East Niles Community Services District
P. O. Box 6038
Bakersfield, CA 93306

SUBJECT: Urban Water Management Plan 2015 Update

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(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

February 29, 2016

Greenfield County Water District
551 Taft Highway
Bakersfield, CA 93307

SUBJECT: Urban Water Management Plan 2015 Update

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(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

February 29, 2016

North Kern River Municipal Water District
400 Rio Del Norte Street
Bakersfield, CA 93308

SUBJECT: Urban Water Management Plan 2015 Update

The Urban Water Management Planning Act requires every "urban water supplier[1]" to prepare and adopt an Urban Water Management Plan (UWMP) and periodically update that plan at least once every five years on or before December 31, in years ending in five and zero. Pursuant to Section 10621(d) of the UWMP Act, each urban water supplier shall update and submit its 2015 UWMP by July 1, 2016 to the California Department of Water Resources. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts.

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BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

February 29, 2016

Oildale Mutual Water Company
P. O. Box 5638
Bakersfield, CA 93308

SUBJECT: Urban Water Management Plan 2015 Update

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Art Chianello, P. E.
Water Resources Manager

[1]Section 10617 of the Urban Water Management Planning Act states, "*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.*

Water Resources Department • 1000 Buena Vista Road • Bakersfield • California 93311
(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

February 29, 2016

Rosedale Rio Bravo Water Storage District
P. O. Box 20820
Bakersfield, CA 93390

SUBJECT: Urban Water Management Plan 2015 Update

The Urban Water Management Planning Act requires every "urban water supplier[1]" to prepare and adopt an Urban Water Management Plan (UWMP) and periodically update that plan at least once every five years on or before December 31, in years ending in five and zero. Pursuant to Section 10621(d) of the UWMP Act, each urban water supplier shall update and submit its 2015 UWMP by July 1, 2016 to the California Department of Water Resources. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts.

The purpose of this letter is to notify your agency that the City of Bakersfield (City) is currently in the process of preparing its 2015 UWMP Update, and to encourage your agency's participation as we continue through this process. As an urban water supplier, the City is required pursuant to Section 10620(d)(2) of the UWMP Act to coordinate with water management agencies, relevant public agencies, and other water suppliers on the preparation of the UWMP. In an effort to encourage participation from agencies responsible for developing related reports and planning documents, the City invites your agency to provide input to assist in the development of our 2015 UWMP Update. Coordination between agencies ensures consistency in planning and reporting.

Prior to the July 1, 2016 deadline, the City will be holding a public hearing to accept comments regarding our 2015 UWMP Update. Your agency will again be notified at least 60 days before the public hearing date.

If you have any initial comments regarding the City's 2015 UWMP Update, please provide them to the City Water Resources Department within the next 15 business days to assist us in the UWMP update process.

Sincerely,

Art Chianello, P. E.
Water Resources Manager

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BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

February 29, 2016

Vaughn Water Company
10014 Glenn Street
Bakersfield, CA 93312

SUBJECT: Urban Water Management Plan 2015 Update

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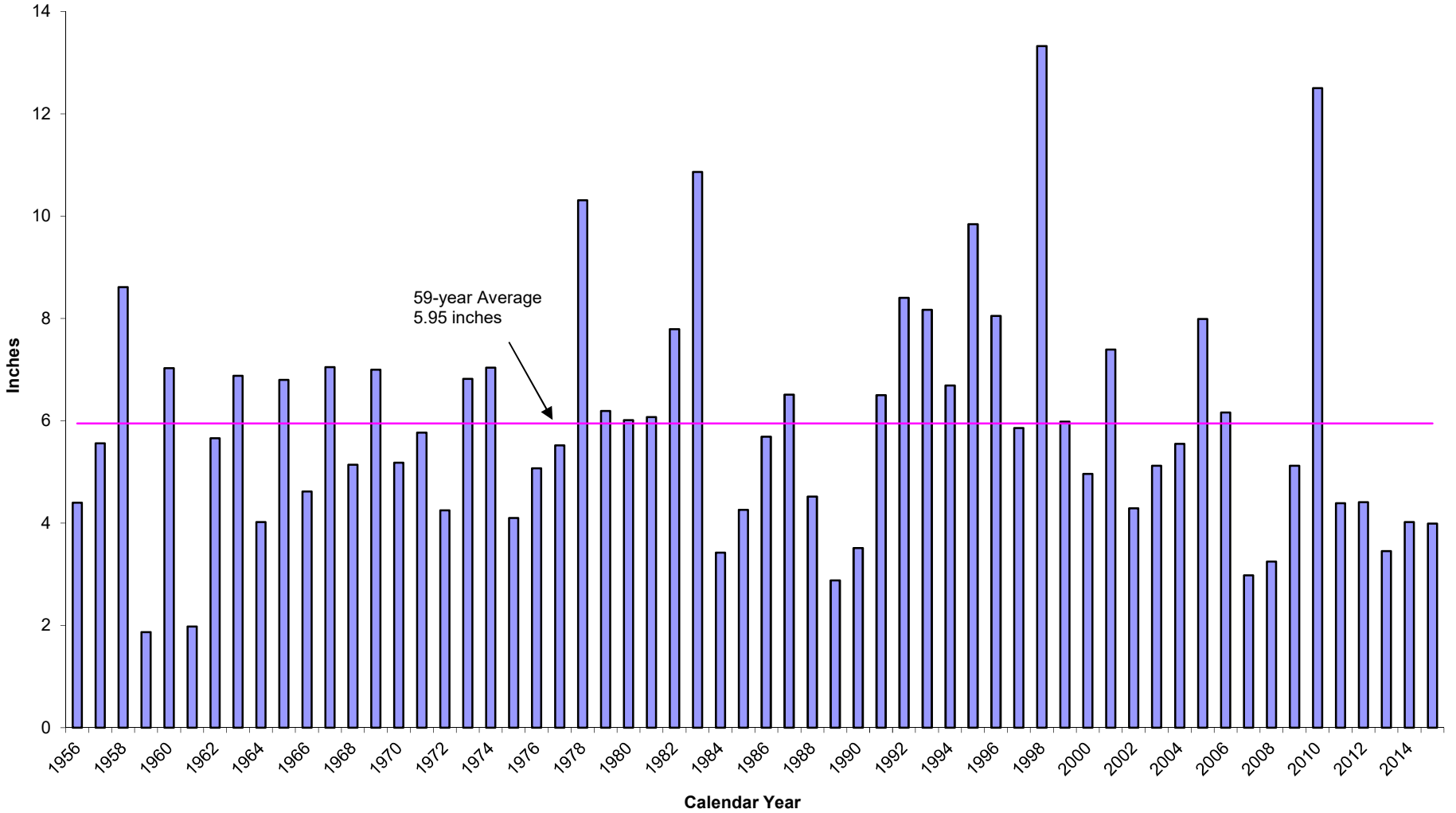
APPENDIX D

Historical Rainfall



Source: National Weather Service Forecast Office, San Joaquin Valley / Hanford, CA, Website for calendar years 1956 - 2015 (http://www.wrh.noaa.gov/hnx/bfl/normals/bflrnyr.pdf)

STETSON ENGINEERS INC.

Covina San Rafael Mesa, Arizona

WATER RESOURCE ENGINEERS

CITY OF BAKERSFIELD

59-YEAR ANNUAL RAINFALL

Figure 1

Z:\Jobs\2570\2570-03-2015 (Bakersfield)\03 Plates and Figures\Figure 1

APPENDIX E

AWWA Water Loss Audit Calculation

AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0

? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Bakersfield (CA1510031)
Reporting Year: 2015 | 1/2015 - 12/2015

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

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

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ---------->

					Pcnt:	Value:	
Volume from own sources:	8	31,029.299	acre-ft/yr	6	0.00%		acre-ft/yr
Water imported:	10	4,192.240	acre-ft/yr	6	0.00%		acre-ft/yr
Water exported:	n/a	0.000	acre-ft/yr				acre-ft/yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 35,221.539 acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	10	33,720.600	acre-ft/yr			
Billed unmetered:	n/a	0.000	acre-ft/yr			
Unbilled metered:	n/a	0.000	acre-ft/yr			
Unbilled unmetered:		440.269	acre-ft/yr	1.25%		acre-ft/yr

Default option selected for Unbilled unmetered - a grading of 5 is applied but not displayed

AUTHORIZED CONSUMPTION: 34,160.869 acre-ft/yr

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

WATER LOSSES (Water Supplied - Authorized Consumption)

1,060.669 acre-ft/yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		88.054	acre-ft/yr	0.25%		acre-ft/yr

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

Customer metering inaccuracies:	10	688.176	acre-ft/yr	2.00%		acre-ft/yr
Systematic data handling errors:		84.302	acre-ft/yr	0.25%		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 860.531 acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 200.139 acre-ft/yr

WATER LOSSES: 1,060.669 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 1,500.939 acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	10	515.0	miles
Number of active AND inactive service connections:	10	45,026	
Service connection density:		87	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 7 | 70.0 psi

COST DATA

Total annual cost of operating water system:	10	$20,789,762	$/Year	
Customer retail unit cost (applied to Apparent Losses):	10	$0.91	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	6		$/acre-ft	☑ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 83 out of 100 ***

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

PRIORITY AREAS FOR ATTENTION:

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

1: Volume from own sources
2: Variable production cost (applied to Real Losses)
3: Unauthorized consumption

AWWA Free Water Audit Software:
System Attributes and Performance Indicators

Water Audit Report for: City of Bakersfield (CA1510031)
Reporting Year: 2015 | 1/2015 - 12/2015

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 83 out of 100 ***

System Attributes:

	Apparent Losses:	860.531	acre-ft/yr
+	Real Losses:	200.139	acre-ft/yr
=	Water Losses:	1,060.669	acre-ft/yr
?	Unavoidable Annual Real Losses (UARL):	748.04	acre-ft/yr
	Annual cost of Apparent Losses:	$341,111	
	Annual cost of Real Losses:		Valued at Customer Retail Unit Cost

Return to Reporting Worksheet to change this assumpiton

Performance Indicators:

Financial:	Non-revenue water as percent by volume of Water Supplied:	4.3%	
	Non-revenue water as percent by cost of operating system:	2.9%	Real Losses valued at Customer Retail Unit Cost
Operational Efficiency:	Apparent Losses per service connection per day:	17.06	gallons/connection/day
	Real Losses per service connection per day:	3.97	gallons/connection/day
	Real Losses per length of main per day*:	N/A	
	Real Losses per service connection per day per psi pressure:	0.06	gallons/connection/day/psi
	From Above, Real Losses = Current Annual Real Losses (CARL):	200.14	acre-feet/year
?	Infrastructure Leakage Index (ILI) [CARL/UARL]:	0.27	

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline

APPENDIX F

Water Conservation Bill of 2009

California Water Code Division 6, Part 2.55.

Chapter 1. General Declarations and Policy §10608-10608.8
Chapter 2. Definitions §10608.12
Chapter 3. Urban Retail Water Suppliers §10608.16-10608.44
Chapter 4. Agricultural Water Suppliers §10608.48
Chapter 5. Sustainable Water Management §10608.50
Chapter 6 Standardized Data Collection §10608.52
Chapter 7 Funding Provisions §10608.56-10608.60
Chapter 8 Quantifying Agricultural Water Use Efficiency §10608.64

Chapter 1. General Declarations and Policy

SECTION 10608-10608.8

10608. The Legislature finds and declares all of the following:

(a) Water is a public resource that the California Constitution protects against waste and unreasonable use.

(b) Growing population, climate change, and the need to protect and grow California's economy while protecting and restoring our fish and wildlife habitats make it essential that the state manage its water resources as efficiently as possible.

(c) Diverse regional water supply portfolios will increase water supply reliability and reduce dependence on the Delta.

(d) Reduced water use through conservation provides significant energy and environmental benefits, and can help protect water quality, improve streamflows, and reduce greenhouse gas emissions.

(e) The success of state and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes related to water use or efficiency.

(f) Improvements in technology and management practices offer the potential for increasing water efficiency in California over time, providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses.

(g) The Governor has called for a 20 percent per capita reduction in urban water use statewide by 2020.

(h) The factors used to formulate water use efficiency targets can vary significantly from location to location based on factors including weather, patterns of urban and suburban development, and past efforts to enhance water use efficiency.

(i) Per capita water use is a valid measure of a water provider's efforts to reduce urban water use within its service area. However, per capita water use is less useful for measuring relative water use efficiency between different water providers. Differences in weather, historical patterns of urban and suburban development, and density of housing in a particular location need to be considered when assessing per capita water use as a measure of efficiency.

10608.4. It is the intent of the Legislature, by the enactment of this part, to do all of the following:

(a) Require all water suppliers to increase the efficiency of use of this essential resource.

(b) Establish a framework to meet the state targets for urban water conservation identified in this part and called for by the Governor.

(c) Measure increased efficiency of urban water use on a per capita basis.

(d) Establish a method or methods for urban retail water suppliers to determine targets for achieving increased water use efficiency by the year 2020, in accordance with the Governor's goal of a 20-percent reduction.

(e) Establish consistent water use efficiency planning and implementation standards for urban water suppliers and agricultural water suppliers.

(f) Promote urban water conservation standards that are consistent with the California Urban Water Conservation Council's adopted best management practices and the requirements for demand management in Section 10631.

(g) Establish standards that recognize and provide credit to water suppliers that made substantial capital investments in urban water conservation since the drought of the early 1990s.

(h) Recognize and account for the investment of urban retail water suppliers in providing recycled water for beneficial uses.

(i) Require implementation of specified efficient water management practices for agricultural water suppliers.

(j) Support the economic productivity of California's agricultural, commercial, and industrial sectors.

(k) Advance regional water resources management.

10608.8. (a) (1) Water use efficiency measures adopted and implemented pursuant to this part or Part 2.8 (commencing with Section 10800) are water conservation measures subject to the protections provided under Section 1011.

(2) Because an urban agency is not required to meet its urban water use target until 2020 pursuant to subdivision (b) of Section 10608.24, an urban retail water supplier's failure to meet those targets shall not establish a violation of law for purposes of any state administrative or judicial proceeding prior to

January 1, 2021. Nothing in this paragraph limits the use of data reported to the department or the board in litigation or an administrative proceeding. This paragraph shall become inoperative on January 1, 2021.

(3) To the extent feasible, the department and the board shall provide for the use of water conservation reports required under this part to meet the requirements of Section 1011 for water conservation reporting.

(b) This part does not limit or otherwise affect the application of Chapter 3.5 (commencing with Section 11340), Chapter 4 (commencing with Section 11370), Chapter 4.5 (commencing with Section 11400), and Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.

(c) This part does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors.

(d) The requirements of this part do not apply to an agricultural water supplier that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect. After the expiration of the Quantification Settlement Agreement, to the extent conservation water projects implemented as part of the Quantification Settlement Agreement remain in effect, the conserved water created as part of those projects shall be credited against the obligations of the agricultural water supplier pursuant to this part.

Chapter 2 Definitions

SECTION 10608.12

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.

(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.

(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.

(c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.

(d) "Commercial water user" means a water user that provides or distributes a product or service.

(e) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.

(f) "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.

(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.

(h) "Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.

(i) "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

(j) "Interim urban water use target" means the midpoint between the urban retail water supplier's base daily per capita water use and the urban retail water supplier's urban water use target for 2020.

(k) "Locally cost effective" means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.

(l) "Process water" means water used for producing a product or product content or water used for research and development, including, but not limited to, continuous manufacturing processes, water used for testing and maintaining equipment used in producing a product or product content, and water used in combined heat and power facilities used in producing a product or product content. Process water does not mean incidental water uses not related to the production of a product or product content, including, but not limited to, water used for restrooms, landscaping, air conditioning, heating, kitchens, and laundry.

(m) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050, that is used to offset potable demand, including recycled water supplied for direct use and indirect potable reuse, that meets the following requirements, where applicable:

(1) For groundwater recharge, including recharge through spreading basins, water supplies that are all of the following:

(A) Metered.

(B) Developed through planned investment by the urban water supplier or a wastewater treatment agency.

(C) Treated to a minimum tertiary level.

(D) Delivered within the service area of an urban retail water supplier or its urban wholesale water supplier that helps an urban retail water supplier meet its urban water use target.

(2) For reservoir augmentation, water supplies that meet the criteria of paragraph (1) and are conveyed through a distribution system constructed specifically for recycled water.

(n) "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:

(1) The capture and reuse of stormwater or rainwater.

(2) The use of recycled water.

(3) The desalination of brackish groundwater.

(4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.

(o) "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.

(p) "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

(q) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.

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

Chapter 3 Urban Retail Water Suppliers

SECTION 10608.16-10608.44

10608.16.(a) The state shall achieve a 20-percent reduction in urban per capita water use in California on or before December 31, 2020.

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

10608.20.(a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

(2) It is the intent of the Legislature that the urban water use targets described in paragraph (1) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

(b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

(c) If the department adopts a regulation pursuant to paragraph (4) of subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method

described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).

(d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.

(e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

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

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

(h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

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

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

(i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with subdivision (l) of Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the

Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

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

(2) An urban wholesale water supplier whose urban water management plan prepared pursuant to Part 2.6 (commencing with Section 10610) was due and not submitted in 2010 is granted an extension to July 1, 2011, to permit coordination between an urban wholesale water supplier and urban retail water suppliers.

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.

10608.24.(a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.

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

(c) An urban retail water supplier's compliance daily per capita water use shall be the measure of progress toward achievement of its urban water use target.

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

(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.
(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.

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

(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in

paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

(e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial percentage of industrial water use in its service area may exclude process water from the calculation of gross water use to avoid a disproportionate burden on another customer sector.

(f) (1) An urban retail water supplier that includes agricultural water use in an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) may include the agricultural water use in determining gross water use. An urban retail water supplier that includes agricultural water use in determining gross water use and develops its urban water use target pursuant to paragraph (2) of subdivision (b) of Section 10608.20 shall use a water efficient standard for agricultural irrigation of 100 percent of reference evapotranspiration multiplied by the crop coefficient for irrigated acres.

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

10608.26.(a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

(b) In complying with this part, an urban retail water supplier may meet its urban water use target through efficiency improvements in any combination among its customer sectors. An urban retail water supplier shall avoid placing a disproportionate burden on any customer sector.

(c) For an urban retail water supplier that supplies water to a United States Department of Defense military installation, the urban retail water supplier's implementation plan for complying with this part shall consider the conservation of that military installation under federal Executive Order 13514.

(d) (1) Any ordinance or resolution adopted by an urban retail water supplier after the effective date of this section shall not require existing customers as of the effective date of this section, to undertake changes in product formulation, operations, or equipment that would reduce process water use, but may provide technical assistance and financial incentives to those customers to implement efficiency measures for process water. This section shall not limit

an ordinance or resolution adopted pursuant to a declaration of drought emergency by an urban retail water supplier.

(2) This part shall not be construed or enforced so as to interfere with the requirements of Chapter 4 (commencing with Section 113980) to Chapter 13 (commencing with Section 114380), inclusive, of Part 7 of Division 104 of the Health and Safety Code, or any requirement or standard for the protection of public health, public safety, or worker safety established by federal, state, or local government or recommended by recognized standard setting organizations or trade associations.

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.

10608.32. All costs incurred pursuant to this part by a water utility regulated by the Public Utilities Commission may be recoverable in rates subject to review and approval by the Public Utilities Commission, and may be recorded in a memorandum account and reviewed for reasonableness by the Public Utilities Commission.

10608.36. Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

10608.40. Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans

submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

10608.42.(a) The department shall review the 2015 urban water management plans and report to the Legislature by July 1, 2017, on progress towards achieving a 20-percent reduction in urban water use by December 31, 2020. The report shall include recommendations on changes to water efficiency standards or urban water use targets to achieve the 20-percent reduction and to reflect updated efficiency information and technology changes.

(b) A report to be submitted pursuant to subdivision (a) shall be submitted in compliance with Section 9795 of the Government Code.

10608.43. The department, in conjunction with the California Urban Water Conservation Council, by April 1, 2010, shall convene a representative task force consisting of academic experts, urban retail water suppliers, environmental organizations, commercial water users, industrial water users, and institutional water users to develop alternative best management practices for commercial, industrial, and institutional users and an assessment of the potential statewide water use efficiency improvement in the commercial, industrial, and institutional sectors that would result from implementation of these best management practices. The taskforce, in conjunction with the department, shall submit a report to the Legislature by April 1, 2012, that shall include a review of multiple sectors within commercial, industrial, and institutional users and that shall recommend water use efficiency standards for commercial, industrial, and institutional users among various sectors of water use. The report shall include, but not be limited to, the following:

(a) Appropriate metrics for evaluating commercial, industrial, and institutional water use.

(b) Evaluation of water demands for manufacturing processes, goods, and cooling.

(c) Evaluation of public infrastructure necessary for delivery of recycled water to the commercial, industrial, and institutional sectors.

(d) Evaluation of institutional and economic barriers to increased recycled water use within the commercial, industrial, and institutional sectors.

(e) Identification of technical feasibility and cost of the best management practices to achieve more efficient water use statewide in the commercial, industrial, and institutional sectors that is consistent with the public interest and reflects past investments in water use efficiency.

10608.44. Each state agency shall reduce water use at facilities it operates to support urban retail water suppliers in meeting the target identified in Section 10608.16.

Chapter 4 Agricultural Water Suppliers

SECTION 10608.48

10608.48.(a) On or before July 31, 2012, an agricultural water supplier shall implement efficient water management practices pursuant to subdivisions (b) and (c).

(b) Agricultural water suppliers shall implement all of the following critical efficient management practices:

(1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).

(2) Adopt a pricing structure for water customers based at least in part on quantity delivered.

(c) Agricultural water suppliers shall implement additional efficient management practices, including, but not limited to, practices to accomplish all of the following, if the measures are locally cost effective and technically feasible:

(1) Facilitate alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.

(2) Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils.

(3) Facilitate the financing of capital improvements for on-farm irrigation systems.

(4) Implement an incentive pricing structure that promotes one or more of the following goals:

(A) More efficient water use at the farm level.

(B) Conjunctive use of groundwater.

(C) Appropriate increase of groundwater recharge.

(D) Reduction in problem drainage.

(E) Improved management of environmental resources.

(F) Effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.

(5) Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.

(6) Increase flexibility in water ordering by, and delivery to, water customers within operational limits.

(7) Construct and operate supplier spill and tailwater recovery systems.

(8) Increase planned conjunctive use of surface water and groundwater within the supplier service area.

(9) Automate canal control structures.

(10) Facilitate or promote customer pump testing and evaluation.

(11) Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.

(12) Provide for the availability of water management services to water users. These services may include, but are not limited to, all of the following:

(A) On-farm irrigation and drainage system evaluations.

(B) Normal year and real-time irrigation scheduling and crop evapotranspiration information.

(C) Surface water, groundwater, and drainage water quantity and quality data.

(D) Agricultural water management educational programs and materials for farmers, staff, and the public.

(13) Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage.

(14) Evaluate and improve the efficiencies of the supplier's pumps.

(d) Agricultural water suppliers shall include in the agricultural water management plans required pursuant to Part 2.8 (commencing with Section 10800) a report on which efficient water management practices have been implemented and are planned to be implemented, an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future. If an agricultural water supplier determines that an efficient water management practice is not locally cost effective or technically feasible, the supplier shall submit information documenting that determination.

(e) The data shall be reported using a standardized form developed pursuant to Section 10608.52.

(f) An agricultural water supplier may meet the requirements of subdivisions (d) and (e) by submitting to the department a water conservation plan submitted to the United States Bureau of Reclamation that meets the requirements described in Section 10828.

(g) On or before December 31, 2013, December 31, 2016, and December 31, 2021, the department, in consultation with the board, shall submit to the Legislature a report on the agricultural efficient water management practices that have been implemented and are planned to be implemented and an assessment of the manner in which the implementation of those efficient water management practices has affected and will affect agricultural operations, including estimated water use efficiency improvements, if any.

(h) The department may update the efficient water management practices required pursuant to subdivision (c), in consultation with the Agricultural Water Management Council, the United States Bureau of Reclamation, and the board. All efficient water management practices for agricultural water use pursuant to this chapter shall be adopted or revised by the department only after the department conducts public hearings to allow participation of the diverse geographical areas and interests of the state.

(i) (1) The department shall adopt regulations that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirement in paragraph (1) of subdivision (b).

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

Chapter 5 Sustainable Water Management

Section 10608.50

10608.50.(a) The department, in consultation with the board, shall promote implementation of regional water resources management practices through increased incentives and removal of barriers consistent with state and federal law. Potential changes may include, but are not limited to, all of the following:

(1) Revisions to the requirements for urban and agricultural water management plans.

(2) Revisions to the requirements for integrated regional water management plans.

(3) Revisions to the eligibility for state water management grants and loans.

(4) Revisions to state or local permitting requirements that increase water supply opportunities, but do not weaken water quality protection under state and federal law.

(5) Increased funding for research, feasibility studies, and project construction.

(6) Expanding technical and educational support for local land use and water management agencies.

(b) No later than January 1, 2011, and updated as part of the California Water Plan, the department, in consultation with the board, and with public input, shall propose new statewide targets, or review and update existing statewide targets, for regional water resources management practices, including, but not limited to, recycled water, brackish groundwater desalination, and infiltration and direct use of urban stormwater runoff.

Chapter 6 Standardized Data Collection

SECTION 10608.52

10608.52.(a) The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.

(b) At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24 and an agricultural water supplier's compliance with implementation of efficient water management practices pursuant to subdivision (a) of Section 10608.48. The form shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.

Chapter 7 Funding Provisions

Section 10608.56-10608.60

10608.56.(a) On and after July 1, 2016, an urban retail water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(b) On and after July 1, 2013, an agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(c) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for achieving the per capita reductions. The supplier may request grant or loan funds to achieve the per capita reductions to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(d) Notwithstanding subdivision (b), the department shall determine that an agricultural water supplier is eligible for a water grant or loan even though the supplier is not implementing all of the efficient water management practices described in Section 10608.48, if the agricultural water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the efficient water management practices. The supplier may request grant or loan funds to implement the efficient water management practices to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(e) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval documentation demonstrating that its entire service area qualifies as a disadvantaged community.

(f) The department shall not deny eligibility to an urban retail water supplier or agricultural water supplier in compliance with the requirements of this part and Part 2.8 (commencing with Section 10800), that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the requirements of this part or Part 2.8 (commencing with Section 10800).

10608.60.(a) It is the intent of the Legislature that funds made available by Section 75026 of the Public Resources Code should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for grants to implement this part. In the allocation of funding, it is the intent of the Legislature that the department give consideration to disadvantaged communities to assist in implementing the requirements of this part.

(b) It is the intent of the Legislature that funds made available by Section 75041 of the Public Resources Code, should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for direct expenditures to implement this part.

Chapter 8 Quantifying Agricultural Water Use Efficiency

SECTION 10608.64

10608.64. The department, in consultation with the Agricultural Water Management Council, academic experts, and other stakeholders, shall develop a methodology for quantifying the efficiency of agricultural water use. Alternatives to be assessed shall include, but not be limited to, determination of efficiency levels based on crop type or irrigation system distribution uniformity. On or before December 31, 2011, the department shall report to the Legislature on a proposed methodology and a plan for implementation. The plan shall include the estimated implementation costs and the types of data needed to support the methodology. Nothing in this section authorizes the department to implement a methodology established pursuant to this section.

APPENDIX G

Standardized Tables SB X7-7

Verification Form

SB X7-7 Table 0: Units of Measure Used in UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent with Table 2-3*
NOTES:

SB X7-7 Table-1: Baseline Period Ranges			
Baseline	**Parameter**	**Value**	**Units**
10- to 15-year baseline period	2008 total water deliveries	47,346	Acre Feet
	2008 total volume of delivered recycled water	0	Acre Feet
	2008 recycled water as a percent of total deliveries	0.00%	Percent
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	1995	
	Year ending baseline period range[3]	2004	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2006	
	Year ending baseline period range[4]	2010	

[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. *[2] The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.*

[3] The ending year must be between December 31, 2004 and December 31, 2010.

[4] The ending year must be between December 31, 2007 and December 31, 2010.

NOTES:

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

SB X7-7 Table 3: Service Area Population		
Year		**Population**
10 to 15 Year Baseline Population		
Year 1	1995	64,028
Year 2	1996	67,919
Year 3	1997	71,812
Year 4	1998	75,716
Year 5	1999	79,623
Year 6	2000	83,569
Year 7	2001	89,691
Year 8	2002	95,863
Year 9	2003	102,052
Year 10	2004	108,265
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2006	118,051
Year 2	2007	121,614
Year 3	2008	125,188
Year 4	2009	128,774
Year 5	2010	132,434
2015 Compliance Year Population		
2015		146,496
NOTES:		

SB X7-7 Table 4: Annual Gross Water Use *								
Baseline Year *Fm SB X7-7 Table 3*		**Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**Deductions**					**Annual Gross Water Use**
			Exported Water	**Change in Dist. System Storage** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use**	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1995	23,271			-		-	23,271
Year 2	1996	24,948			-		-	24,948
Year 3	1997	24,939			-		-	24,939
Year 4	1998	24,361			-		-	24,361
Year 5	1999	30,598			-		-	30,598
Year 6	2000	27,406			-		-	27,406
Year 7	2001	33,629			-		-	33,629
Year 8	2002	33,706			-		-	33,706
Year 9	2003	36,367			-		-	36,367
Year 10	2004	37,287			-		-	37,287
Year 11	0	-			-		-	-
Year 12	0	-			-		-	-
Year 13	0	-			-		-	-
Year 14	0	-			-		-	-
Year 15	0	-			-		-	-
10 - 15 year baseline average gross water use								**29,651**
5 Year Baseline - Gross Water Use								
Year 1	2006	36,713			-		-	36,713
Year 2	2007	42,451			-		-	42,451
Year 3	2008	47,346			-		-	47,346
Year 4	2009	49,586			-		-	49,586
Year 5	2010	43,210			-		-	43,210
5 year baseline average gross water use								**43,861**
2015 Compliance Year - Gross Water Use								
2015		35,221	-		-		-	**35,221**

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES:

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

Complete one table for each source.

Name of Source	Groundwater
This water source is:	
☑	The supplier's own water source
☐	A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1995	23,271		23,271
Year 2	1996	24,948		24,948
Year 3	1997	24,939		24,939
Year 4	1998	24,361		24,361
Year 5	1999	30,598		30,598
Year 6	2000	27,406		27,406
Year 7	2001	33,629		33,629
Year 8	2002	33,706		33,706
Year 9	2003	36,367		36,367
Year 10	2004	37,287		37,287
Year 11	0			-
Year 12	0			-
Year 13	0			-
Year 14	0			-
Year 15	0			-
5 Year Baseline - Water into Distribution System				
Year 1	2006	36,713		36,713
Year 2	2007	42,451		42,451
Year 3	2008	45,517		45,517
Year 4	2009	45,775		45,775
Year 5	2010	37,976		37,976
2015 Compliance Year - Water into Distribution System				
2015		31,029		31,029

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: Volume Entering the Distribution				
Name of Source	Kern River Water			
This water source is:				
☑	The supplier's own water source			
☐	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1995	0		0
Year 2	1996	0		0
Year 3	1997	0		0
Year 4	1998	0		0
Year 5	1999	0		0
Year 6	2000	0		0
Year 7	2001	0		0
Year 8	2002	0		0
Year 9	2003	0		0
Year 10	2004	0		0
Year 11	-			0
Year 12	-			0
Year 13	-			0
Year 14	-			0
Year 15	-			0
5 Year Baseline - Water into Distribution System				
Year 1	2006	0		0
Year 2	2007	0		0
Year 3	2008	1829		1,829
Year 4	2009	1845		1,845
Year 5	2010	1788		1,788
2015 Compliance Year - Water into Distribution System				
2015		963		963
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				
NOTES:				

SB X7-7 Table 4-A: Volume Entering the Distribution				
Name of Source	Imported State Water			
This water source is:				
☐	The supplier's own water source			
☑	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1995	0		0
Year 2	1996	0		0
Year 3	1997	0		0
Year 4	1998	0		0
Year 5	1999	0		0
Year 6	2000	0		0
Year 7	2001	0		0
Year 8	2002	0		0
Year 9	2003	0		0
Year 10	2004	0		0
Year 11	-			0
Year 12	-			0
Year 13	-			0
Year 14	-			0
Year 15	-			0
5 Year Baseline - Water into Distribution System				
Year 1	2006	0		0
Year 2	2007	0		0
Year 3	2008	0		0
Year 4	2009	1966		1,966
Year 5	2010	3446		3,446
2015 Compliance Year - Water into Distribution System				
2015		3,229		3,229
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				
NOTES:				

SB X7-7 Table 4-B: Indirect Recycled Water Use Deduction *(For use only by agencies that are deducting indirect recycled water)*

Baseline Year *Fm SB X7-7 Table 3*		**Surface Reservoir Augmentation**					**Groundwater Recharge**			**Total Deductible Volume of Indirect Recycled Water Entering the Distribution System**
		Volume Discharged from Reservoir for Distribution System Delivery	Percent Recycled Water	Recycled Water Delivered to Treatment Plant	Transmission/ Treatment Loss	Recycled Volume Entering Distribution System from Surface Reservoir Augmentation	Recycled Water Pumped by Utility*	Transmission/ Treatment Losses	Recycled Volume Entering Distribution System from Groundwater Recharge	
10-15 Year Baseline - Indirect Recycled Water Use										
Year 1	1995			-		-			-	-
Year 2	1996			-		-			-	-
Year 3	1997			-		-			-	-
Year 4	1998			-		-			-	-
Year 5	1999			-		-			-	-
Year 6	2000			-		-			-	-
Year 7	2001			-		-			-	-
Year 8	2002			-		-			-	-
Year 9	2003			-		-			-	-
Year 10	2004			-		-			-	-
Year 11	0			-		-			-	-
Year 12	0			-		-			-	-
Year 13	0			-		-			-	-
Year 14	0			-		-			-	-
Year 15	0			-		-			-	-
5 Year Baseline - Indirect Recycled Water Use										
Year 1	2006			-		-			-	-
Year 2	2007			-		-			-	-
Year 3	2008			-		-			-	-
Year 4	2009			-		-			-	-
Year 5	2010			-		-			-	-
2015 Compliance - Indirect Recycled Water Use										
2015				-		-			-	-

**Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.*

NOTES:

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1995	64,028	23,271	324
Year 2	1996	67,919	24,948	328
Year 3	1997	71,812	24,939	310
Year 4	1998	75,716	24,361	287
Year 5	1999	79,623	30,598	343
Year 6	2000	83,569	27,406	293
Year 7	2001	89,691	33,629	335
Year 8	2002	95,863	33,706	314
Year 9	2003	102,052	36,367	318
Year 10	2004	108,265	37,287	307
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				**316**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2006	118,051	36,713	278
Year 2	2007	121,614	42,451	312
Year 3	2008	125,188	47,346	338
Year 4	2009	128,774	49,586	344
Year 5	2010	132,434	43,210	291
5 Year Average Baseline GPCD				**312**
2015 Compliance Year GPCD				
2015		146,496	35,221	**215**
NOTES:				

SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	316
5 Year Baseline GPCD	312
2015 Compliance Year GPCD	215
NOTES:	

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

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
316	**253**
NOTES:	

SB X7-7 Table 7-E: Target Method 3				
Agency May Select More Than One as Applicable	Percentage of Service Area in This Hydrological Region	Hydrologic Region	"2020 Plan" Regional Targets	Method 3 Regional Targets (95%)
☐		North Coast	137	130
☐		North Lahontan	173	164
☐		Sacramento River	176	167
☐		San Francisco Bay	131	124
☐		San Joaquin River	174	165
☐		Central Coast	123	117
☑	100%	Tulare Lake	188	179
☐		South Lahontan	170	162
☐		South Coast	149	142
☐		Colorado River	211	200
Target *(If more than one region is selected, this value is calculated.)*				**179**
NOTES:				

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
312	297	253	**253**

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

NOTES:

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target *Fm SB X7-7 Table 7-F*	10-15 year Baseline GPCD *Fm SB X7-7 Table 5*	**2015 Interim Target GPCD**
253	316	**284**
NOTES:		

SB X7-7 Table 9: 2015 Compliance								
Actual 2015 GPCD	2015 Interim Target GPCD	Optional Adjustments *(in GPCD)* Enter "0" if Adjustment Not Used: Extraordinary Events	Weather Normalization	Economic Adjustment	TOTAL Adjustments	Adjusted 2015 GPCD	2015 GPCD *(Adjusted if applicable)*	**Did Supplier Achieve Targeted Reduction for 2015?**
215	284	*0*	*0*	*0*	-	215	215	**YES**
NOTES:								

APPENDIX H

Department of Water Resources

Bulletin 118

DEPARTMENT OF WATER RESOURCES

BULLETIN 118 · UPDATE 2003

CALIFORNIA'S GROUNDWATER

Cover photograph:
A typical agricultural well with the water discharge pipe and the electric motor that drives the pump.

Inset photograph:
Groundwater recharge ponds in the Upper Coachella Valley near the Whitewater River that use local and imported water. Recharge ponds are also called spreading basins or recharge basins.

State of California
The Resources Agency
Department of Water Resources

CALIFORNIA'S
GROUNDWATER

BULLETIN 118 *Update 2003*

October 2003

GRAY DAVIS
Governor
State of California

MARY D. NICHOLS
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The Resources Agency

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If you need this publication in an alternate form, contact the Department's Office of Water Education at 1-800-272-8869.

Foreword

Groundwater is one of California's greatest natural resources. In an average year, groundwater meets about 30 percent of California's urban and agricultural water demands. In drought years, this percentage increases to more than 40 percent. In 1995, an estimated 13 million Californians, nearly 43 percent of the State's population, were served by groundwater. The demand on groundwater will increase significantly as California's population grows to a projected 46 million by the year 2020. In many basins, our ability to optimally use groundwater is affected by overdraft and water quality impacts, or limited by a lack of data, management, and coordination between agencies.

Over the last few years, California voters and the Legislature have provided significant funding to local agencies for conjunctive use projects, groundwater recharge facilities, groundwater monitoring, and groundwater basin management activities under Proposition 13 and the Local Groundwater Management Assistance Act of 2000. Most recently, the 2002 passage of Proposition 50 will result in additional resources to continue recent progress toward sustaining our groundwater resources through local agency efforts. We are beginning to see significant benefits from these investments.

The State Legislature recognizes the need for groundwater data in making sound local management decisions. In 1999, the Legislature approved funding and directed the Department of Water Resources (DWR) to update the inventory of groundwater basins contained in Bulletin 118 (1975), *California's Ground Water* and Bulletin 118-80 (1980), *Ground Water Basins in California.* In 2001, the Legislature passed AB 599, requiring the State Water Resources Control Board to establish a comprehensive monitoring program to assess groundwater quality in each groundwater basin in the State and to increase coordination among agencies that collect groundwater contamination information. In 2002, the Legislature passed SB 1938, which contains new requirements for local agency groundwater management plans to be eligible for public funds for groundwater projects.

Effective management of groundwater basins is essential because groundwater will play a key role in meeting California's water needs. DWR is committed to assisting local agencies statewide in developing and implementing effective, locally planned and controlled groundwater management programs. DWR is also committed to federal and State interagency efforts and to partnerships with local agencies to coordinate and expand data monitoring activities that will provide necessary information for more effective groundwater management. Coordinated data collection at all levels of government and local planning and management will help to ensure that groundwater continues to serve the needs of Californians.

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California Department of Pesticide Regulation
California Department of Toxic Substances Control
California Department of Health Services
California State Water Resources Control Board
California Regional Water Quality Control Boards
United States Geological Survey
United States Bureau of Reclamation

We also wish to thank numerous reviewers who provided valuable comments on the April 2003 public review draft of this bulletin.

Acronyms and abbreviations

AB Assembly Bill
BMO Basin management objective
CAS California Aquifer Susceptibility
CVP Central Valley Project
DBCP Dibromochloropropane
DCE Dichloroethylene
DHS California Department of Health Services
DPR California Department of Pesticide Regulation
DTSC California Department of Toxic Substances Control
DWR California Department of Water Resources
DWSAP Drinking Water Source Assessment Program
EDB Ethylene dibromide
EC Electrical conductivity
EMWD Eastern Municipal Water District
EWMP Efficient water management
EPA U.S. Environmental Protection Agency
ESA Federal Endangered Species Act
ET Evapotranspiration
ETAW Evapotranspiration of applied water
EWA Environmental Water Account
GAMA Groundwater Ambient Monitoring and Assessment
GIS Geographic information system
GMA Groundwater Management Agency
gpm Gallons per minute
GRID Groundwater Resources Information Database
GRIST Groundwater Resources Information Sharing Team
H & S Health and Safety Code
HR Hydrologic region
ISI Integrated Storage Investigations
ITF Interagency Task Force
JPA Joint powers agreement
maf Million acre-feet
MCL Maximum contaminant level
mg/L Milligrams per liter
MOU Memorandum of understanding
MTBE Methyl tertiary-butyl ether
OCWD Orange County Water District
PAC Public Advisory Committee
PCE Tetrachloroethylene
PCA Possible contaminating activity
PPIC Public Policy Institute of California
ROD Record of Decision
RWQCB Regional Water Quality Control Board
SB Senate Bill
SGA Sacramento Groundwater Authority
SVOC Semi-volatile organic compound
SVWD Scotts Valley Water District
SWRCB State Water Resources Control Board

taf Thousand acre-feet
TCE Trichloroethylene
TDS Total dissolved solids
UWMP Urban water management plan
USACE U.S. Army Corps of Engineers
USBR U.S. Bureau of Reclamation
USC United States Code
USGS U.S. Geological Survey
VOC Volatile organic compound
WQCP Water Quality Control Plan

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San Joaquin River Hydrologic Region

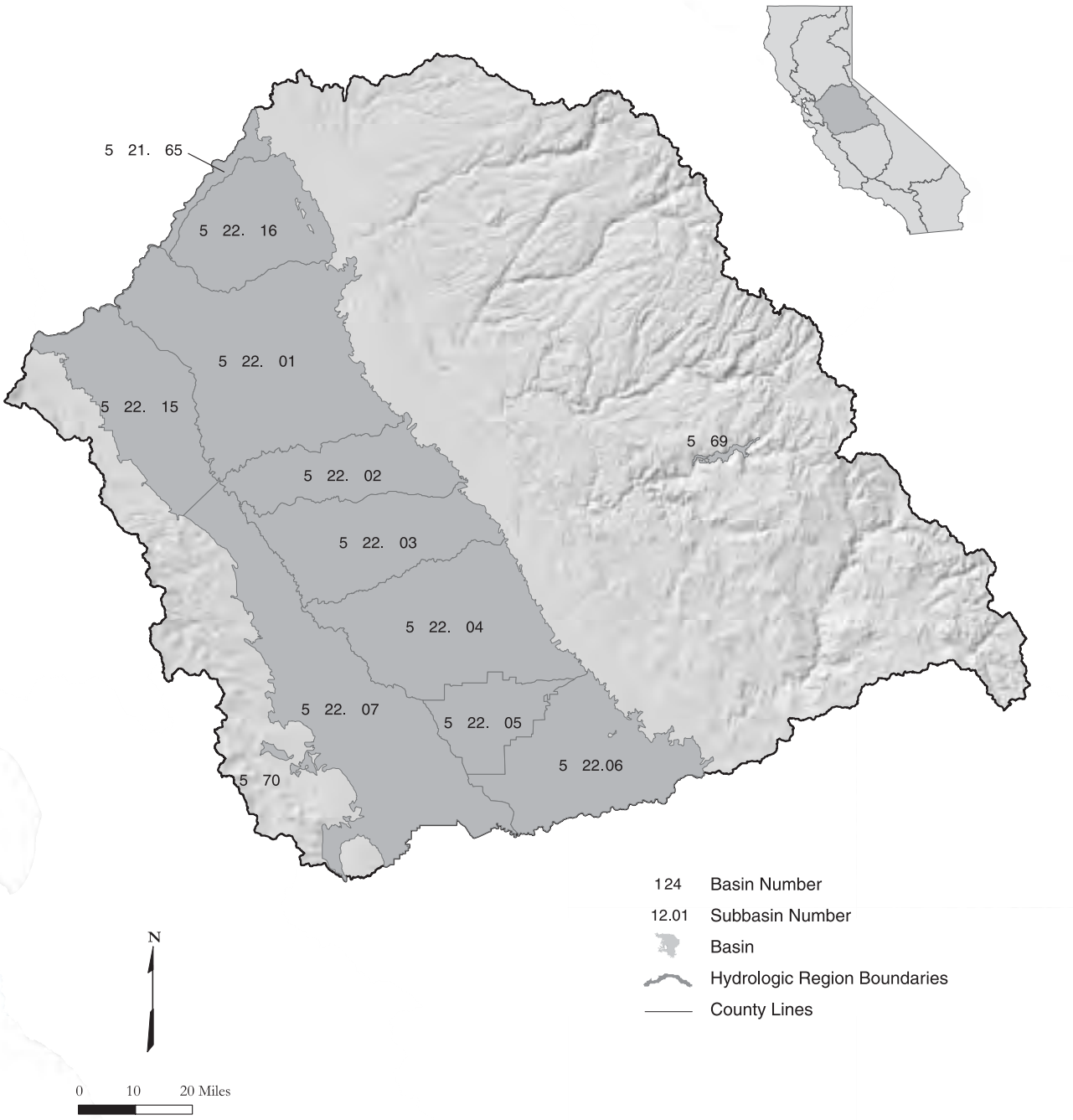


Figure 35 San Joaquin River Hydrologic Region

Basins and Subbasins of the San Joaquin River Hydrologic Region

Basin/subbasin	Basin name
5-22	San Joaquin Valley
5-22.01	Eastern San Joaquin
5-22.02	Modesto
5-22.03	Turlock
5-22.04	Merced
5-22.05	Chowchilla
5-22.06	Madera
5-22.07	Delta-Mendota
5-22.15	Tracy
5-22.16	Cosumnes
5-69	Yosemite Valley
5-70	Los Banos Creek Valley

Description of the Region

The San Joaquin River HR covers approximately 9.7 million acres (15,200 square miles) and includes all of Calaveras, Tuolumne, Mariposa, Madera, San Joaquin, and Stanislaus counties, most of Merced and Amador counties, and parts of Alpine, Fresno, Alameda, Contra Costa, Sacramento, El Dorado, and San Benito counties (Figure 35). The region corresponds to a portion near the middle of RWQCB 5. Significant geographic features include the northern half of the San Joaquin Valley, the southern part of the Sacramento-San Joaquin Delta, the Sierra Nevada and Diablo Range. The region is home to about 1.6 million people (DWR 1998). Major population centers include Merced, Modesto, and Stockton. The Merced area is entirely dependent on groundwater for its supply, as will be the new University of California at Merced campus.

Groundwater Development

The region contains two entire groundwater basins and part of the San Joaquin Valley Groundwater Basin, which continues south into the Tulare Lake HR. The San Joaquin Valley Groundwater Basin is divided into nine subbasins in this region. The basins underlie 3.73 million acres (5,830 square miles) or about 38 percent of the entire HR area.

The region is heavily groundwater reliant. Within the region groundwater accounts for about 30 percent of the annual supply used for agricultural and urban purposes. Groundwater use in the region accounts for about 18 percent of statewide groundwater use for agricultural and urban needs. Groundwater use in the region accounts for 5 percent of the State's overall supply from all sources for agricultural and urban uses (DWR 1998).

The aquifers are generally quite thick in the San Joaquin Valley subbasins, with groundwater wells commonly extending to depths of up to 800 feet. Aquifers include unconsolidated alluvium and consolidated rocks with unconfined and confined groundwater conditions. Typical well yields in the San Joaquin Valley range from 300 to 2,000 gpm with yields of 5,000 gpm possible. The region's only significant basin located outside of San Joaquin Valley is Yosemite Valley. Yosemite Valley Basin supplies water to Yosemite National Park and has substantial well yields.

Conjunctive Use

Since near the beginning of the region's agricultural development, groundwater has been used conjunctively with surface water to meet water needs. Groundwater was and is used when and where surface water is unable to fully meet demands either in time or area. For several decades, this situation was more of an incidental conjunctive use than a formal one. Historical groundwater use has resulted in some land subsidence in the southwest portion of the region.

Groundwater Quality

In general, groundwater quality throughout the region is suitable for most urban and agricultural uses with only local impairments. The primary constituents of concern are TDS, nitrate, boron, chloride, and organic compounds. The Yosemite Valley Groundwater Basin has exceptionally high quality groundwater.

Areas of high TDS content are primarily along the west side of the San Joaquin Valley and in the trough of the valley. The high TDS content of west-side groundwater is due to recharge of streamflow originating from marine sediments in the Coast Range. High TDS content in the trough of the valley is the result of concentration of salts due to evaporation and poor drainage. Nitrates may occur naturally or as a result of disposal of human and animal waste products and fertilizer. Boron and chloride are likely a result of concentration from evaporation near the valley trough. Organic contaminants can be broken into two categories, agricultural and industrial. Agricultural pesticides and herbicides have been detected in groundwater throughout the region, but primarily along the east side of the San Joaquin Valley where soil permeability is higher and depth to groundwater is shallower. The most notable agricultural contaminant is dibromochloropropane (DBCP), a now-banned soil fumigant and known carcinogen once used extensively on grapes and cotton. Industrial organic contaminants include TCE, dichloroethylene (DCE), and other solvents. They are found in groundwater near airports, industrial areas, and landfills.

Water Quality in Public Supply Wells

From 1994 through 2000, 689 public supply water wells were sampled in 10 of the 11 basins and subbasins in the San Joaquin River HR. Samples analyzed indicate that 523 wells, or 76 percent, met the state primary MCLs for drinking water. One-hundred-sixty-six wells, or 24 percent, have constituents that exceed one or more MCL. Figure 36 shows the percentages of each contaminant group that exceeded MCLs in the 166 wells.

Table 28 lists the three most frequently occurring contaminants in each of the six contaminant groups and shows the number of wells in the HR that exceeded the MCL for those contaminants.

Changes from Bulletin 118-80

The subbasins of the San Joaquin Valley, which were delineated as part of the 118-80 update, are given their first numeric designation in this report. Additionally, the Cosumnes Subbasin has been added to the subbasins within the San Joaquin River HR. It is worth noting that the southern portion of the South American Subbasin of the Sacramento Valley Groundwater Basin is also included as part of this HR. The subbasin names and numbers within the region are listed in Table 29.

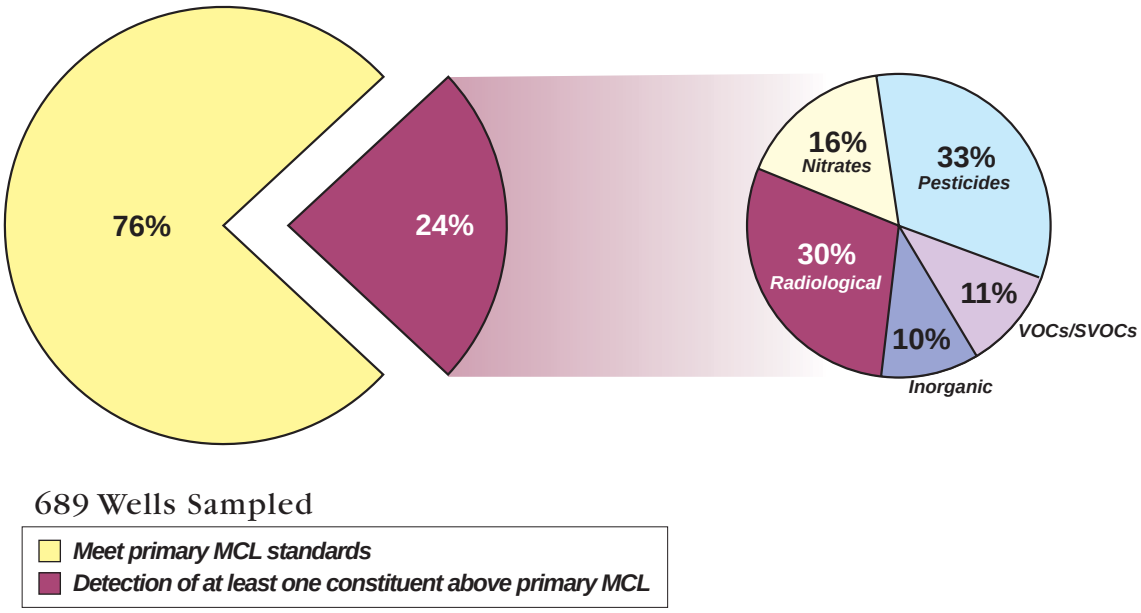


Figure 36 MCL exceedances in public supply wells in the San Joaquin River Hydrologic Region

Table 28 Most frequently occurring contaminants by contaminant group in the San Joaquin River Hydrologic Region

Contaminant group	Contaminant - # of wells	Contaminant - # of wells	Contaminant - # of wells
Inorganics – Primary	Aluminum – 4	Arsenic – 4	4 tied at 2 exceedances
Inorganics – Secondary	Manganese – 123	Iron – 102	TDS – 9
Radiological	Uranium – 33	Gross Alpha – 26	Radium 228 – 6
Nitrates	Nitrate (as NO_3) – 23	Nitrate + Nitrite – 6	Nitrate Nitrogen (NO_3-N) – 3
Pesticides	DBCP – 44	Di(2-Ethylhexyl)phthalate – 11	EDB – 6
VOCs	PCE – 8	Dichloromethane – 3	TCE – 3

DBCP = Dibromochloropropane
EDB = Ethylenedibromide
PCE = Tetrachloroethylene
TCE = Trichloroethylene
VOC = Volatile Organic Compound
SVOC = Semivolatile Organic Compound

Table 29 Modifications since Bulletin 118-80 of groundwater basins and subbasins in San Joaquin Hydrologic Region

Subbasin name	New number	Old number
Eastern San Joaquin	5-22.01	5-22
Modesto	5-22.02	5-22
Turlock	5-22.03	5-22
Merced	5-22.04	5-22
Chowchilla	5-22.05	5-22
Madera	5-22.06	5-22
Delta-Mendota	5-22.07	5-22
Tracy	5-22.15	5-22
Cosumnes	5-22.16	5-22

Table 30 San Joaquin River Hydrologic Region groundwater data

Basin/Subbasin	Basin Name	Area (acres)	Groundwater Budget Type	Well Yields (gpm)		Types of Monitoring			TDS (mg/L)	
				Maximum	Average	Levels	Quality	Title 22	Average	Range
5-22	SAN JOAQUIN VALLEY									
5-22.01	EASTERN SAN JOAQUIN	707,000	A	1,500	-	345	69	540	310	30 - 1,632
5-22.02	MODESTO	247,000	B	4,500	1000-2000	230	15	209	60-500	200-8300
5-22.03	TURLOCK	347,000	B	4,500	1000-2000	307	0	163	200-500	100-8300
5-22.04	MERCED	491,000	B	4,450	1500-1900	378	0	142	200-400	100-3600
5-22.05	CHOWCHILLA	159,000	B	4,750	750-2000	203	0	28	200-500	120-6400
5-22.06	MADERA	394,000	B	4,750	750-2000	378	0	127	200-400	100-6400
5-22.07	DELTA-MENDOTA	747,000	B	5,000	800-2000	816	0	120	770	210-86,000
5-22.15	TRACY	345,000	C	3,000	500-3,000	18	14	183	1,190	210-7,800
5-22.16	COSUMNES	281,000	A	1,500	-	75	13	72	218	140-438
5-69	YOSEMITE VALLEY	7,500	C	1,200	900	0	0	3	54	43-73
5-70	LOS BANOS CREEK VALLEY	4,840	C	-	-	0	0	0	-	-

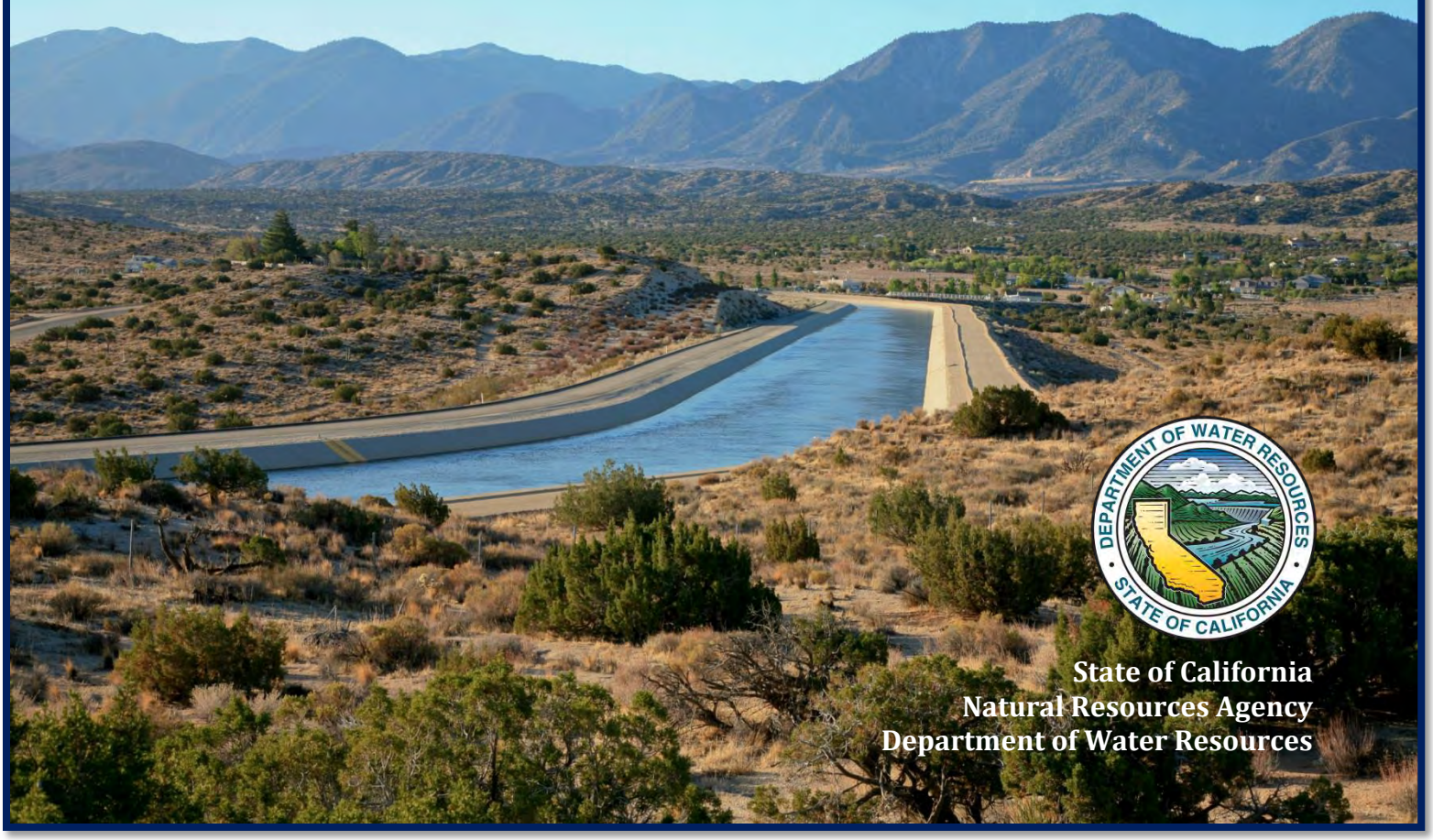
gpm - gallons per minute
mg/L - milligram per liter
TDS -total dissolved solids

APPENDIX I

2015 State Water Project Delivery Capability Report

The State Water Project
Final Delivery Capability Report 2015

July 2015



State of California
Natural Resources Agency
Department of Water Resources

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Summary

This report is intended to inform the public about key factors important to the operation of the State Water Project (SWP) and an estimate of its current delivery capability.

For many SWP water contractors, water provided by the SWP is a major component of the water supplies available to them. SWP contractors include cities, counties, urban water agencies, and agricultural irrigation districts. These local utilities and other public and private entities provide the water that Californians use at home and work every day and that helps to nourish the state's bountiful crops. Thus, the availability of water from the SWP is an important component to the water supply planning of its recipients and ultimately affects the amount of water that local residents and communities can use.

The availability of these water supplies may be highly variable. A wet water year may be followed by a dry or critically dry year. Knowing the probability that they will receive a certain amount of SWP water in a given year—whether it be a wet water year, a critical year, or somewhere in between—gives contractors a better sense of the degree to which they may need to implement increased conservation measures or plan for new additional, or back up sources of water supply to meet their needs.

The Delta is the key to the SWP's ability to deliver water to its agricultural and urban contractors in the North Bay, the South Bay, California Central Valley, and Southern California. All but five of the 29 SWP contractors receive water deliveries from the Delta (pumped by either the Harvey O. Banks or Barker Slough pumping plants).

Yet the Delta faces numerous challenges to its long-term sustainability. For example, climate change poses the threat of increased variability in floods and droughts, and sea level rise complicates efforts to manage salinity levels and preserve water quality in the Delta so that the water remains suitable for urban and agricultural uses. Among the other challenges are continued subsidence of Delta islands, many of which are already below sea level, and the related threat of a catastrophic levee failure as water pressure increases on fragile levees.

Protection of endangered and threatened fish species, such as the delta smelt, is also an important factor of concern for the Delta environment. Ongoing regulatory restrictions, such as those imposed by federal biological opinions on the effects of SWP and Central Valley Project (CVP) operations on these species also contribute to the challenges of determining the SWP's water delivery capability.

Two large-scale plans for the Delta that are being developed could affect SWP water delivery capability: the Delta Plan and the Bay Delta Conservation Plan (BDCP). When complete, the BDCP will provide the basis for issuing endangered species permits to operate the SWP and CVP. The BDCP seeks to improve the health of the ecological system as a whole.

The analyses in this report factor in all of the regulations governing SWP operations in the Delta and upstream, and assumptions about water uses in the upstream watersheds. Analyses were conducted that considered the amounts of water that SWP

contractors use and the amounts of water they choose to hold for use in a subsequent year.

Many of the same specific challenges to SWP operations described in the *State Water Project Delivery Reliability Report 2013* remain in 2015. Most notably, the effects on SWP pumping caused by issuance of the 2008 and 2009 federal biological opinions (BOs), which were reflected in the 2013 Report, continue to affect SWP delivery capability today. Hence, the differences between the 2013 and 2015 reports can be attributed primarily to updates in the assumptions and inputs to the simulation studies.

SWP exports have decreased since 2005, although the bulk of the change occurred by 2009 as the federal BOs went into effect, restricting operations. These effects are also reflected in the SWP delivery estimates. The most salient findings in this report are as follows:

- Under existing conditions, the average annual delivery of Table A water estimated for this 2015 Report is 2,550 taf/year, 3 taf less than the 2,553 taf/year estimated for the 2013 Report.

- The likelihood of existing-condition SWP Article 21 deliveries (supplemental deliveries to Table A water) being greater than 20 taf/year has decreased by 3% relative to the likelihood presented in the 2013 Report.

Section 1
Reasons to Assess SWP Water Delivery Capability

Two major factors underscore the importance of assessing the SWP's water delivery capability: the effects of population growth on California's balance of water supply and demand, and State legislation intended to help maintain a reliable water supply.

Population Growth, Land Use, and Water Supply

California's population has grown rapidly in recent years, with resulting changes in land use. This growth is expected to continue. From 1990 to 2005, California's population increased from about 29.8 million to about 36 million. Based on this trend, California's population has been projected to be more than 40.8 million by 2020. The "current trends" scenario depicted in the *California Water Plan 2013* for year-2050 conditions, based on the California Department of Finance's projections of 2010 U.S. Census data, assumes a population of nearly 51 million—a 75% increase in the 1990 population.

The amount of water available in California—or in different parts of the state—can vary greatly from year to year. Some areas may receive 2 inches of rain a year, while others are deluged with 100 inches or more. As land uses have changed, population centers have emerged in many locations without sufficient local water supplies. Thus, Californians have always been faced with the problem of how best to conserve, control, and move water from areas of abundant water to areas of water need and use.

Legislation on Ensuring a Reliable Water Supply

The laws described below impose specific requirements on both urban and agricultural water suppliers. These laws increase the importance of SWP water delivery capability estimates to water suppliers.

California Urban Water Management Planning Act

The Urban Water Management Planning Act was enacted in 1983(California Water Code, Sections 10610–10656). As amended, this law requires urban water suppliers to adopt urban water management plans (UWMPs) every 5 years and submit those plans to DWR. DWR reviews submitted plans to report to the legislature on the status of submitted plans and for the purposes of grant eligibility requirements.

UWMPs must include an estimate of water supply and demand for the 20-year planning time frame for three water year types, normal, single dry year and multi dry years. SWP contractors rely on the SWP water delivery capability estimates to develop the water supply estimates.

The most recent round of UWMPs (2010) was required to be adopted by July 1, 2011 and submitted to DWR by August 1, 2011.

Urban Water Conservation Law requires that the State of California reduce urban per capita water use statewide by 10% by the end of 2015 and 20% by the end of 2020. Water suppliers calculated baseline water use and set 2015 and 2020 water use targets in their 2010 UWMPs. Water suppliers will report on water use target compliance in the 2015 and 2020 UWMPs. DWR is required to report to the Legislature on progress toward meeting the State's 20% by 2020 goals.

DWR publishes a guidebook to assist water suppliers prepare their urban water management plans. DWR is currently updating the guidebook for the 2015 round of plans. Guidance documents are available at http://www.water.ca.gov/urbanwatermanagement.

The municipalities and water districts that have adopted 2010 UWMPs and submitted them to DWR are listed at http://www.water.ca.gov/urbanwatermanagement/2010uwmps/.

Water Conservation Act

The Water Conservation Act of 2009 (Senate Bill X7.7, Steinberg), enacted in November 2009, includes requirements for urban and agricultural suppliers. Water suppliers report on compliance with these requirements in either the urban or agricultural water management plans. DWR reviews submitted plans for consistency with Water Conservation Act requirements.

In addition, as part of the Water Conservation Act, agricultural water suppliers with 25,000 acres or more of irrigated land were required to prepare and adopt agricultural water management plans and submit the plans to DWR by the end of 2012 and then once every five years beginning in 2015. The Act also required suppliers to measure volumetrically water deliveries to farms and base the price of water sales at least in part on the volume of water delivered. Water suppliers were required to report on water measurement and water pricing in their water management plans.

In November 2012, DWR released a guidebook for developing agricultural water management plans: http://www.water.ca.gov/wateruseefficiency/sb7/docs/AgWaterManagementPlanGuidebook-FINAL.pdf.

Water agencies filing agricultural water management plans as of July 2013 are listed on a Web page maintained by DWR's Water Use and Efficiency Branch: http://www.water.ca.gov/wateruseefficiency/sb7/docs/2012_AWMPs_Received_07-16-2013.pdf.

Section 2
Regulatory Restrictions on SWP Delta Exports

Multiple needs converge in the Delta: the need to protect a fragile ecosystem, to support Delta recreation and farming, and to provide water for agricultural and urban needs throughout much of California. Various regulatory requirements are placed on the SWP's Delta operations to protect special-status species such as delta smelt and spring- and winter-run Chinook salmon. As a result, as described below, restrictions on SWP operations imposed by State and federal agencies contribute substantially to the challenges of accurately determining the SWP's water delivery capability in any given year.

Biological Opinions on Effects of Coordinated SWP and CVP Operations

Several fish species listed under the federal Endangered Species Act (ESA) as threatened or endangered are found in the Delta. The continued viability of populations of these species in the Delta depends in part on Delta flow levels. For this reason, the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) have issued several BOs since the 1990s on the effects of coordinated SWP/CVP operations on several listed species.

These BOs affect the SWP's water delivery capability for two reasons. Most notably, they include terms that restrict SWP exports from the Delta to specific amounts at certain times under certain conditions. In addition, the BOs' requirements are predicated on physical and biological conditions that occur daily while DWR's water supply models are based on monthly data.

The first BOs on the effects of SWP (and CVP) operations were issued in February 1993 (NMFS BO on effects of project operations on winter-run Chinook salmon) and March 1995 (USFWS BO on project effects on delta smelt and splittail). Among other things, the BOs contained requirements for Delta inflow, Delta outflow, and export pumping restrictions in order to protect listed species. These requirements imposed substantial constraints on Delta water supply operations. Many were incorporated into the 1995 *Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta* (1995 WQCP), as described under "Water Quality Objectives" later in this section.

The terms of the USFWS and NMFS BOs have become increasingly restrictive over the years. In 2004 the United States Bureau of Reclamation (Reclamation) sought a new BO from USFWS regarding the operation of the CVP and SWP (collectively, Projects). USFWS issued the opinion in 2005, finding that the proposed coordinated operations of the Projects were not likely to jeopardize the continued existence of the delta smelt or result in the destruction or adverse modification of its critical habitat. After judicial review, the 2005 BO was vacated and USFWS was ordered to prepare a new one. USFWS found that the proposed operations of the Project would result in jeopardy to

the delta smelt and in December 2008 issued a Jeopardy BO which included a Reasonable and Prudent Alternative (RPA) with more protective export restrictions and other actions intended to protect the delta smelt.

Similarly, in 2004 NMFS issued a BO on the effects of the coordinated operation of the Projects on salmonids, green sturgeon and Southern Resident killer whales and found that the proposed operations of the Projects were not likely to jeopardize the continued existence of the listed species or result in the destruction or adverse modification of their critical habitat. After judicial review, the 2004 BO was also vacated and NMFS was ordered to prepare a new one. In June 2009, NMFS issued a new Jeopardy BO covering effects on winter-run and spring-run Chinook salmon, steelhead, green sturgeon, and killer whales. Like the 2008 smelt BO, the salmon BO included an RPA with more protective export restrictions and other actions intended to protect listed species.

The USFWS BO includes requirements on operations in all but 2 months of the year. The BO calls for “adaptively managed” (adjusted as necessary based on the results of monitoring) flow restrictions in the Delta intended to protect delta smelt at various life stages. USFWS determines the required target flow, with the reductions accomplished primarily by reducing SWP and CVP exports. Because this flow restriction is determined based on fish location and decisions by USFWS staff, predicting the flow restriction and corresponding effects on export pumping with any great certainty poses a challenge. The USFWS BO also includes an additional salinity requirement in the Delta for September and October in wet and above-normal water years, calling for increased releases from SWP and CVP reservoirs to reduce salinity. Among other provisions included in the NMFS BO, limits on total Delta exports have been established for the months of April and May. These limits are mandated for all but extremely wet years.

The 2008 and 2009 BOs were issued shortly before and shortly after the Governor proclaimed a statewide water shortage state of emergency in February 2009, amid the threat of a third consecutive dry year. NMFS calculated that implementing its BO would reduce SWP and CVP Delta exports by a combined 5% to 7%, but DWR’s initial estimates showed an impact on exports closer to 10% in average years, combined with the effects of pumping restrictions imposed by BOs to protect delta smelt and other species. Both the 2008 USFWS and 2009 NMFS BOs were challenged in federal court on various grounds, including the failure by the services to use the best available science in the development of the BOs. U.S. District Judge Oliver Wanger found both BOs were not legally sufficient and remanded them to the agencies for further review and analysis. Both decisions were appealed to the Ninth Circuit, and in two separate decisions (March 2014 for the USFWS BO and December 2014 for the NMFS BO) the Ninth Circuit reversed in part and affirmed in part Judge Wanger’s rulings, finding the BOs complied with the ESA and upholding them in their entirety. As a result, the operational rules specified in the 2008 and 2009 BOs continue to be legally required and are the rules used in the analyses presented in Section 6 of this report.

The California Department of Fish and Wildlife (DFW) issued consistency determinations for both BOs under Section 2080.1 of the California Fish and Wildlife Code. The consistency determinations stated that the USFWS BO and the NMFS BO

would be consistent with the California Endangered Species Act (CESA). Thus, DFW allowed incidental take of species listed under both the federal ESA and CESA to occur during SWP and CVP operations without requiring DWR or the Reclamation to obtain a separate State-issued permit.

Delta Inflows

Delta inflows vary considerably from season to season, and from year to year. For example, in an above-normal year, nearly 85% of the total Delta inflow comes from the Sacramento River, more than 10% comes from the San Joaquin River, and the rest comes from the three eastside streams (the Mokelumne, Cosumnes, and Calaveras rivers).

The type of water year is also an important factor affecting the volume of Delta inflows. When hydrology is analyzed, water years are designated by DWR as “wet” (W), “above normal” (AN), “below normal” (BN), “dry” (D), or “critical” (C). All other factors (such as upstream level of development) being equal, much less water will flow into the Delta during a dry or critical water year (that is, during a drought) than during a wet or above-normal water year. Fluctuations in inflows are a substantial overall concern for the Delta, and a specific concern for the SWP; such fluctuations affect Delta water quality and fish habitat, which in turn trigger regulatory requirements that constrain SWP Delta pumping.

Delta inflows will also vary by time of year as the amount of precipitation varies by season. About 80% of annual precipitation occurs between November and March, and very little rain typically falls from June through September. Upstream reservoirs regulate this variability by reducing flood flows during the rainy season, and storing water to be released later in the year to meet water demands and flow and water quality requirements.

Water Quality Objectives

Because the Delta is an estuary, salinity is a particular concern. In the 1995 WQCP, the State Water Board set water quality objectives to protect beneficial uses of water in the Delta and Suisun Bay. The objectives must be met by the SWP (and federal CVP), as specified in the water right permits issued to DWR (and the U.S. Bureau of Reclamation). Those objectives—minimum Delta outflows, limits on SWP and CVP Delta exports, and maximum allowable salinity levels—are enforced through the provisions of the State Water Board's Water Right Decision 1641 (D-1641), issued in December 1999 and updated in March 2000.

DWR and Reclamation must monitor the effects of diversions and SWP and CVP operations to ensure compliance with existing water quality standards.

Among the objectives established in the 1995 WQCP and D-1641 are the “X2” objectives. X2 is defined as the distance in kilometers from Golden Gate

where salinity concentration in the Delta is 2 parts per thousand. The location of X2 is used as a surrogate measure of Delta ecosystem health.

D-1641 mandates the X2 objectives so that the State Water Board can regulate the location of the Delta estuary's salinity gradient during the 5-month period of February–June.

For the X2 objective to be achieved, the X2 position must remain downstream of Collinsville in the Delta for the entire 5-month period, and downstream of other specific locations in the Delta on a certain number of days each month from February through June. This means that Delta outflow must be at certain specified levels at certain times, which can limit the amount of water the SWP may pump at those times at its Harvey O. Banks Pumping Plant in the Delta.

Because of the relationship between seawater intrusion and interior Delta water quality, meeting the X2 objective also improves water quality at Delta drinking water intakes; however, meeting the X2 objectives can require a relatively large volume of water for outflow during dry months that follow months with large storms.

The 1995 WQCP and D-1641 also established an export/inflow (E/I) ratio. The E/I ratio is designed to provide protection for the fish and wildlife beneficial uses in the Bay Delta estuary. The E/I ratio limits the fraction of Delta inflows that are exported. When other restrictions are not controlling, Delta exports are limited to 35% of total Delta inflow from February through June and 65% of inflow from July through January.

Section 3
Ongoing Environmental and Policy Planning Efforts

It is hard to overstate the Delta's importance to California's economy and natural heritage. The Delta supplies a large share of the water used in the state. California would not be the same without that water — hundreds of billions of dollars of economic activity depend upon it. Southern California, with half of the state's population, gets almost a quarter of its average water supply from the Delta; Kern County, which produces nearly $3 billion annually in grapes, almonds, pistachios, milk, citrus and carrots, depends on the Delta for about a fifth of its irrigation supply; the west side of the San Joaquin Valley also produces billions of dollars' worth of food and depends on the Delta for about three-quarters of its irrigation supply; and the San Francisco Bay Area, including the innovation hub of Silicon Valley, takes about half of its water supply from the Delta and its tributaries.

At the same time, the hundreds of miles of river channels that crisscross the Delta's farmed islands provide a migratory pathway for Chinook salmon, which support an important West Coast fishing industry. Other native fish species depend upon the complex mix of fresh and salt water in the Delta estuary. Multiple stressors have impaired the ecological functions of the Delta, and concerns have been growing over the ability to balance the many needs of both people and the ecosystem.

In order to respond to these concerns considerable effort by government agencies and California water community as a whole has been spent during the past several decades to study ways that the problems in the Delta can be addressed, and the more recent attention to the effects of climate change has helped the water community to realize the urgency of addressing these problems. The essential part of all these efforts has been to find a comprehensive solution that brings various, sometimes competing, interests together in a coordinated and concerted set of actions. The Delta Plan and the Bay Delta Conservation Plan (BDCP) are two large-scale plans that are in development. Both plans could affect SWP water delivery capability in different ways, and at different scales.

Delta Plan

After years of concern about the Delta amid rising water demand and habitat degradation, the Delta Stewardship Council was created in legislation to achieve State-mandated coequal goals for the Delta. As specified in Section 85054 of the California Water Code:

> "Coequal goals" means the two goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place.

The final Delta Plan was adopted by the Council on May 16, 2013. The Delta Plan contains a set of 14 regulatory policies that will be enforced by the Delta Stewardship Council's appellate authority and oversight. The Delta Plan also contains 73 recommendations, which are non-regulatory but call out actions essential to achieving the coequal goals. The State Office of Administrative Law (OAL) approved the 14 regulations to implement the Delta Plan, which became effective with legally-enforceable regulations on September 1, 2013.

The 14 regulatory policies approved by the OAL include:

- Requiring those who use water from the Delta to certify in their water management plans that they are implementing all feasible efforts to use water efficiently and are developing additional local and regional water supplies;
- Reserving six high-priority areas for habitat restoration;
- Protecting agricultural land by requiring developers to locate new residential, commercial, or industrial development in areas planned for urban use;
- Requiring state and local agencies to locate, when feasible, water management facilities, ecosystem projects, and flood management infrastructure in ways that would reduce or avoid conflicts with agriculture and other existing planned uses; and requiring those agencies to consider locating the facilities on public land before using private land;
- Prohibiting encroachment on floodways and floodplains;
- Requiring developers of new residential subdivisions to include a level of flood protection that anticipates sea levels rising due to climate change; and
- Setting priorities for State investment in Delta flood levees.

Among the 73 recommendations in the Delta Plan are:

- Updating statewide water-use efficiency goals, groundwater management plans for areas using Delta water, streamlining water transfer procedures and developing a statewide system for reporting how much water is used;
- Having the State Water Resources Control Board update water quality objectives for the Sacramento and San Joaquin Rivers, controlling or reducing other Delta stressors such as contaminants and invasive species, expanding floodplains and riparian habitats and locating habitat restoration to accommodate sea-level rise;
- Encouraging agritourism, wildlife friendly farming practices, and recreational opportunities in the Delta; and

- Creating a Delta Flood Risk Management District to provide adequate funding for flood control and emergency preparedness.

In 2014, the Delta Stewardship Council launched the Delta Levees Investment Strategy (DLIS) that will combine economics, engineering, and decision-making techniques to identify funding priorities and assemble a comprehensive investment strategy for the Delta levees.

This investment strategy will be developed in collaboration with state agencies, local reclamation districts, Delta landowners and businesses, and other important stakeholders. It will be based on the best available data, research, and lessons learned from other state and local programs and planning efforts.

Bay Delta Conservation Plan (BDCP)

The Bay Delta Conservation Plan (BDCP) is a comprehensive plan prepared by a group of local water agencies, environmental and conservation organizations, State and federal agencies, and other interest groups to address a wide array of challenges that the water community in California has been facing for decades in the Sacramento-San Joaquin Delta.

The BDCP is being developed in compliance with the Federal Endangered Species Act (ESA) and the California Natural Communities Conservation Planning Act (NCCPA). When complete, the BDCP will provide the basis for the issuance of endangered species permits for the operation of the state and federal water projects. In the most basic sense, the BDCP provides a regulatory vehicle for project proponents to agree to implement a suite of habitat restoration measures, other stressor reduction activities, and water operations criteria in return for regulatory agency approval of the necessary long-term permits for the various projects and water operations (covered activities) to proceed. The heart of the BDCP is a long-term conservation strategy that sets forth actions needed for a healthy Delta.

The BDCP approach to addressing the Delta's challenges reflects a significant departure from the species-by-species approach utilized in previous efforts to manage Delta-specific species and habitats. Instead, the BDCP seeks to improve the health of the ecological system as a whole. Each conservation measure plays a part in an interconnected web of conservation activities designed to improve the health of natural communities and, in so doing, improve the overall health of the Delta ecosystem.

The BDCP attempts to balance contributions to the conservation of species in a way that is feasible given the variety of important uses in the Delta including flood protection, agriculture, and recreation, to name a few. Implementation of the Plan will occur over a 50-year time frame by a number of agencies and organizations with specific roles and responsibilities as prescribed by the Plan. A major part of implementation will be monitoring conservation measures to evaluate effectiveness, and revising actions through the adaptive management decision process.

The Plan, which has been in development since 2006, is undergoing intensive environmental review in the form of a state Environmental Impact Report and federal Environmental Impact Statement (EIR/S) to evaluate the impact of the Plan on all aspects of the environment, including the human environment, and identify alternatives and potential mitigation actions.

The draft BDCP and its associated EIR/S were released for public review in late 2013. Public comments were received until mid-2014. Partially-recirculated public draft documents are scheduled to be released in mid-2015. The reports are targeted to be final in 2016, after which a decision to proceed with the program would be made.

Section 4
Delta Levee Failure and the Delta Risk Management Strategy

The fragile Delta faces a multitude of risks that could affect millions of Californians. Foremost among those risks, as they could affect the SWP's water delivery capability, are the potential for levee failure and the ensuing flooding and water quality issues.

The Delta Risk Management Strategy (DRMS) was initiated in response to Assembly Bill 1200 (2005), which directed DWR to use 50-, 100-, and 200-year projections to evaluate the potential impacts on Delta water supplies associated with continued land subsidence, earthquakes, floods, and climate change. The discussions below describe DRMS Phase 1, which evaluated the risks, and DRMS Phase 2, which is proposing various solutions. Also discussed are other efforts currently being undertaken by DWR and other agencies to reduce risks to the Delta, enhance emergency response capabilities, and reduce the risk of interruption of Delta water exports by the SWP and CVP.

Effects of Emergencies on Water Supplies: Delta Risk Management Strategy (DRMS), Phase 1

Phase 1 of the DRMS, completed in 2008, assessed the performance of Delta and Suisun Marsh levees under various stressors and hazards and evaluated the consequences of levee failures to California as a whole.

The Delta is protected by levees built about 150 years ago. The levees are vulnerable to failure because most original levees were simply built with soils dredged from nearby channels, and were never engineered. Most islands in the Delta have flooded at least once over the past 100 years. For example, on June 3, 2004, a huge dry-weather levee failure occurred without warning on Upper Jones Tract in the south Delta, inundating 12,000 acres of farmland with about 160,000 acre-feet of water. Because many Delta islands are below sea level, deep and prolonged flooding could occur during a levee failure event, which could disrupt the quality and use of Delta water.

Levee failure can result from the combination of high river inflows, high tide, and high winds; however, levees can also fail in fair weather—even in the absence of a flood or seismic event—in a so-called "sunny day event." Damage caused by rodents, piping (in which a pipe-like opening develops below the base of the levee), or foundation movement could cause sunny-day levee breaches.

A breach of one or more levees and island flooding may affect Delta water quality and SWP operations. Depending on the hydrology and the size and locations of the breaches and flooded islands, a large amount of salt water may be pulled into the interior Delta from Suisun and San Pablo bays. When islands are flooded, DWR may

need to drastically decrease or even cease SWP Delta exports to evaluate the distribution of salinity in the Delta and avoid drawing saltier water toward the pumps.

An earthquake could also put Delta levees, and thus SWP water supplies, at risk. In 2008, the 2007 Working Group on California Earthquake Probabilities estimated a probability of 63% that a magnitude 6.7 or greater earthquake would strike the San Francisco Bay Area in the next 30 years. An earthquake could severely damage Delta levees, causing islands to flood with salty water. The locations most likely to be affected by an earthquake are the west and southwest portions of the Delta because these areas are closer to potential earthquake sources. Flooding of the west and southwest Delta is also more likely to interfere with conveyance of freshwater to export pumps.

Modeling of the effects of earthquakes on Delta islands was conducted by DWR for the DRMS Phase 1 report. Described in the *California Water Plan Update 2009,* the assessment found a 40% probability that a major earthquake occurring between 2030 and 2050 would cause 27 or more islands to flood at the same time. If 20 islands were flooded as a result of a major earthquake, the export of freshwater from the Delta could be interrupted by about a year and a half. Water supply losses of up to 8 million acre-feet would be incurred by SWP (and CVP) contractors and local water districts.

Managing and Reducing Risks: Delta Risk Management Strategy (DRMS), Phase 2

The Phase 2 report for the DRMS, issued in June 2011, evaluates alternatives to reduce the risk to the Delta and the state from adverse consequences of levee failure. “Building blocks” (individual improvements or projects, such as improving levees or raising highways) and trial scenarios (various combinations of building blocks) were developed for the DRMS Phase 2 report. The building blocks fall into three main categories:

- Conveyance improvements/
  flood risk reduction and life safety,
- Infrastructure risk reduction, and
- Environmental risk mitigation.

The first of these categories is most relevant to the SWP in terms of reducing the risk of disruption of SWP Delta exports, but the environmental risk mitigation category includes a building block calling for reduction of water exports from the Delta.

Four trial scenarios were developed to represent a range of possible risk reduction strategies:

- Trial Scenario 1—Improved Levees: Improve the reliability of Delta levees against flood-induced failures by providing up to 100-year flood protection.

- Trial Scenario 2—Armored Pathway (Through-Delta Conveyance): Improve the reliability of water conveyance by creating a route through the Delta that has high reliability and the ability to minimize saltwater intrusion into the south Delta.

- Trial Scenario 3—Isolated Conveyance Facility: Provide high reliability for conveyance of export water by building an isolated conveyance facility on the east side of the Delta.

- Trial Scenario 4—Dual Conveyance: Improve reliability and flexibility for conveyance of export water by constructing an isolated conveyance facility and a through-Delta conveyance. (This scenario would be much like a combination of Trial Scenarios 2 and 3.)

The findings of the DRMS Phase 2 report on these scenarios, as they apply to seismic risk and potential for disruption of SWP Delta exports, are as follows:

- Trial Scenario 1 (Improved Levees) would not reduce the risk of potential water export interruptions, nor would it change the seismic risk of most levees.

- Trial Scenario 2 (Armored Pathway [Through-Delta Conveyance]) would have the joint benefit of reducing the likelihood of levee failures from flood events and earthquakes and of significantly reducing the likelihood of export disruptions.

- The effects of Trial Scenario 3 (Isolated Conveyance) would be similar to those for the Armored Pathway scenario, but Trial Scenario 3 would not reduce the seismic risk of levee failure on islands that are not part of the isolated conveyance facility.

- Trial Scenario 4 (Dual Conveyance) would avoid the vulnerability of water exports associated with Delta levee vulnerability and would offer flexibility in water exports from the Delta and/or the isolated conveyance facility. However, seismic risk would not be reduced on islands not part of the export conveyance system or infrastructure pathway.

As noted in the discussion of the “enhanced emergency preparedness/response” building block in the DRMS Phase 2 report, analyses on resuming water exports after a levee failure were conducted by the Metropolitan Water District of Southern California, an SWP contractor. The studies found that a promising way to resume water exports would be to place structural barriers at selected channel locations in the Delta and complete strategic levee repairs, thus isolating an emergency freshwater conveyance “pathway” through channels that may be surrounded by islands flooded with saline water.

The DRMS study was the first comprehensive risk-based assessment of Delta levee failure and potential consequences to the State. Since the completion of the DRMS report several projects funded under the Delta Knowledge Improvement Program (DKIP) have been completed to fill the data gaps identified in DRMS. A goal of the DKIP is to complete bathymetry surveys of the entire Delta. Approximately 20% of the Delta has been surveyed thus far. Major on-going activities being funded by DKIP

include an economic study to assist the Delta Stewardship Council develop a comprehensive investment strategy for the Delta levees, a feasibility study to assist the Delta Protection Commission make recommendations on how to implement a Delta Flood Risk Management Assessment District, an investigation to determine how Delta levees on peat soils respond under seismic loading and development of potential designs of setback levees in the Delta to meet stability requirements while also incorporating desired habitat features.

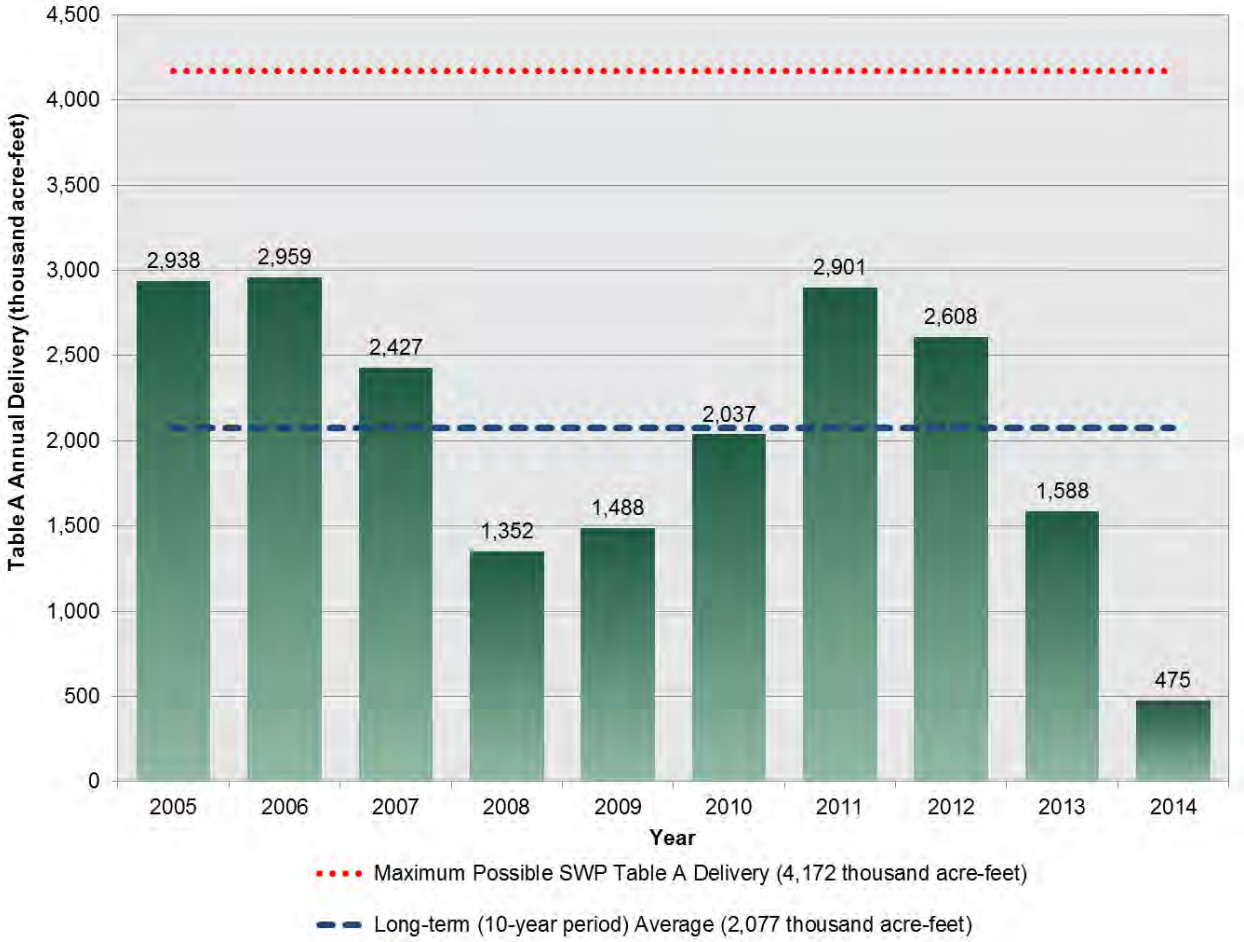
Section 5
State Water Project Historical Delivery Capability (2005-2014)

Section 7 of this report includes tables listing annual historical deliveries by various water classifications for each SWP contractor for 2005–2014.

Table 5-1 lists the maximum annual SWP Table A water delivery amounts for SWP Contractors. Figure 5-1 shows that deliveries of SWP Table A water for 2005–2014 range from an annual minimum of 475 taf to a maximum of 2,959 taf, with an average of 2,077 taf. Historical deliveries of SWP Table A water over this 10-year period are less than the maximum of 4,172 taf/year.

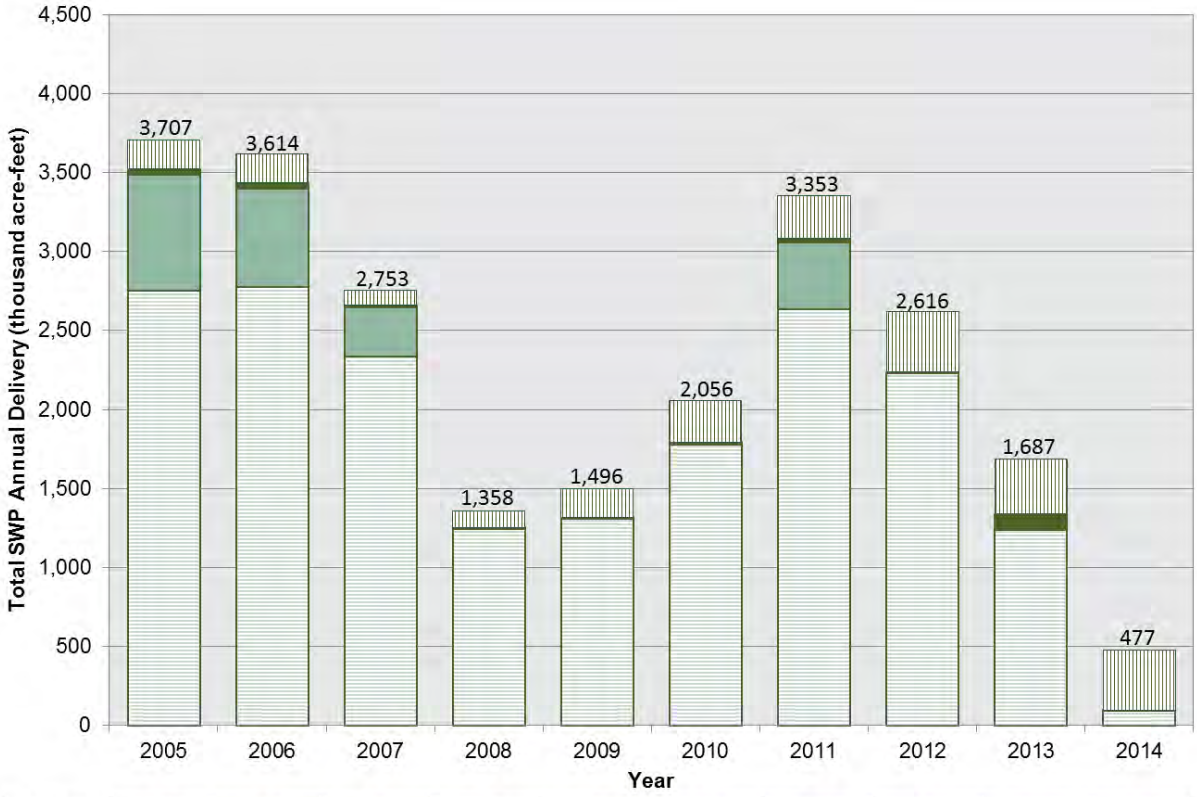
Total historical SWP deliveries, including Table A, Article 21, turnback pool, and carryover water, range from 3,707 to 477 taf/ year, with an average of 2,312 taf/year for the period of 2005–2014 (Figure 5-2).

Table 5-1. Maximum Annual SWP Table A Water Delivery Amounts for SWP Contractors	
Contractor	Maximum Table A Delivery Amounts (acre-feet)
Feather River Area Contractors	
Butte County	27,500
Yuba City	9,600
Plumas County Flood Control and Water Conservation District	2,700
Subtotal	**39,800**
North Bay Area Contractors	
Napa County Flood Control and Water Conservation District	29,025
Solano County Water Agency	47,506
Subtotal	**76,531**
South Bay Area Contractors	
Alameda County Flood Control and Water Conservation District, Zone 7	80,619
Alameda County Water District	42,000
Santa Clara Valley Water District	100,000
Subtotal	**222,619**
San Joaquin Valley Area Contractors	
Dudley Ridge Water District	50,343
Empire West Side Irrigation District	2,000
Kern County Water Agency	982,730
Kings County	9,305
Oak Flat Water District	5,700
Tulare Lake Basin Water Storage District	88,922
Subtotal	**1,139,000**
Central Coastal Area Contractors	
San Luis Obispo County Flood Control and Water Conservation District	25,000
Santa Barbara County Flood Control and Water Conservation District	45,486
Subtotal	**70,486**
Southern California Area Contractors	
Antelope Valley–East Kern Water Agency	141,400
Castaic Lake Water Agency	95,200
Coachella Valley Water District	138,350
Crestline–Lake Arrowhead Water Agency	5,800
Desert Water Agency	55,750
Littlerock Creek Irrigation District	2,300
Metropolitan Water District of Southern California	1,911,500
Mojave Water Agency	82,800
Palmdale Water District	21,300
San Bernardino Valley Municipal Water District	102,600
San Gabriel Valley Municipal Water District	28,800
San Gorgonio Pass Water Agency	17,300
Ventura County Watershed Protection District	20,000
Subtotal	**2,623,100**
TOTAL TABLE A AMOUNTS	**4,171,536**



Note: The differences in historical deliveries from the State Water Project Delivery Reliability Report 2013 are due to reclassification of the various components of water delivered to SWP contractors

Figure 5-1. Historical Deliveries of SWP Table A Water, 2005–2014



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Carryover	185	182	95	110	180	264	268	381	351	383
Turnback	38	34	16	3	2	11	31	8	99	1
Article 21	731	621	310	3	6	8	421	0	0	1
Table A	2753	2776	2332	1242	1308	1774	2633	2227	1238	92

Note: The differences in historical deliveries from the State Water Project Delivery Reliability Report 2013 are due to reclassification of the various components of water delivered to SWP contractors

Figure 5-2. Total Historical SWP Deliveries, 2005–2014 (by Delivery Type)

Section 6
Existing SWP Water Delivery Capability (2015)

This Section presents estimates of the SWP's existing (2015) water delivery capability. The estimates are presented below, alongside the results obtained from the 2013 Report. Like this 2015 Report, the 2013 Report incorporated the requirements of BOs issued by USFWS and NMFS in December 2008 and June 2009, respectively, on the effects of coordinated operations of the SWP and CVP. These BOs are discussed in detail in Section 2, "Regulatory Restrictions on SWP Delta Exports."

The discussions of SWP water delivery capability in this Section presents the results of DWR's updated modeling of the SWP's water delivery capability. A tabular summary of the modeling results is presented in Appendix B of this report, which is available online at http://baydeltaoffice.water.ca.gov/.

Appendix B also contains annual delivery probability curves (i.e., exceedance plots) to graphically show the estimated percentage of years in which a given annual delivery is equaled or exceeded.

Hydrologic Sequence

SWP delivery amounts are estimated in this 2015 Report for existing conditions using computer modeling that incorporates the historic range of hydrologic conditions (i.e., precipitation and runoff) that occurred from water years 1922 through 2003. The historic hydrologic conditions are adjusted to account for land-use changes (i.e., the current level of development) and upstream flow regulations that characterize 2015. By using this 82-year historical flow record, the delivery estimates modeled for existing conditions reflect a reasonable range of potential hydrologic conditions from wet years to critically dry years.

Existing Demand for Delta Water

Demand levels for the SWP water users in this report are derived from historical data and information from the SWP contractors themselves. The amount of water that SWP contractors request each year (i.e., demand) is related to:

- The magnitude and type of water demands,
- The extent of water conservation measures,
- Local weather patterns, and
- Water costs.

The existing level of development (i.e., the level of water use in the source areas from which the water supply originates) is based on recent land uses, and is assumed to be representative of existing conditions for the purposes of this 2015 Report.

SWP Table A Water Demands

The current combined maximum Table A amount is 4,172 taf/year. See Table 5-1 in Section 5, "State Water Project Historical Delivery Capability (2005-2014). Of the combined maximum Table A amount, 4,132 taf/year is the SWP's maximum Table A water available for delivery from the Delta.

The estimated demands by SWP contractors for deliveries of Table A water from the Delta under existing conditions is assumed to be the maximum SWP Table A delivery amount for the 2015 Report, similar to the 2013 Report (Table 6-1). Due to the fact that SWP contractors have been requesting the full amount in recent years, the 2013, and the 2015 Reports more accurately reflect the trend in demand.

Table 6-1. Comparison of Estimated Average, Maximum, and Minimum Demands for SWP Table A Water (Existing Conditions, in taf/year)

	2013 Report	2015 Report
Average	4,132	4,132
Maximum	4,132	4,132
Minimum	4,132	4,132

SWP Article 21 Water Demands

Under Article 21 of the SWP's long-term water supply contracts, contractors may receive additional water deliveries only under the following specific conditions:

- Such deliveries do not interfere with SWP Table A allocations and SWP operations;
- Excess water is available in the Delta;
- Capacity is not being used for SWP purposes or scheduled SWP deliveries; and
- Contractors can use the SWP Article 21 water directly or can store it in their own system (i.e., the water cannot be stored in the SWP system).

The demand for SWP Article 21 water by SWP contractors is assumed to vary depending on the month and weather conditions (i.e., amounts of precipitation and runoff). For the purposes of this discussion of SWP Article 21 water demands, a Kern wet year is defined as a year when the annual Kern River flow is projected to be greater than 1,500 taf. Kern River inflows are important because they are a major component of

the local water supply for Kern County Water Agency (KCWA), which is the second largest SWP contractor and possesses significant local groundwater recharge capability. During Kern wet years, KCWA uses more Kern River flows to recharge its groundwater storage and reduce its demand for Article 21 water.

As shown in Figure 6-1, existing demands for SWP Article 21 water estimated for this 2015 Report are assumed to be high during the spring and late fall in non–Kern wet years (214 taf/month) because the contractors cannot rely as heavily on the Kern River flows to recharge their groundwater storage. Demand for Article 21 water is also high during the winter months of December through March in all year types (202 taf in Kern wet years and 414 taf in non–Kern wet years). Demands are assumed to be very low (2 taf/month) from April through November of Kern wet years (because high Kern River flows provide groundwater recharge water) and from July through October of Kern dry years.

These demand patterns for SWP Article 21 water are identical to what was presented in the 2013 Report for existing conditions.

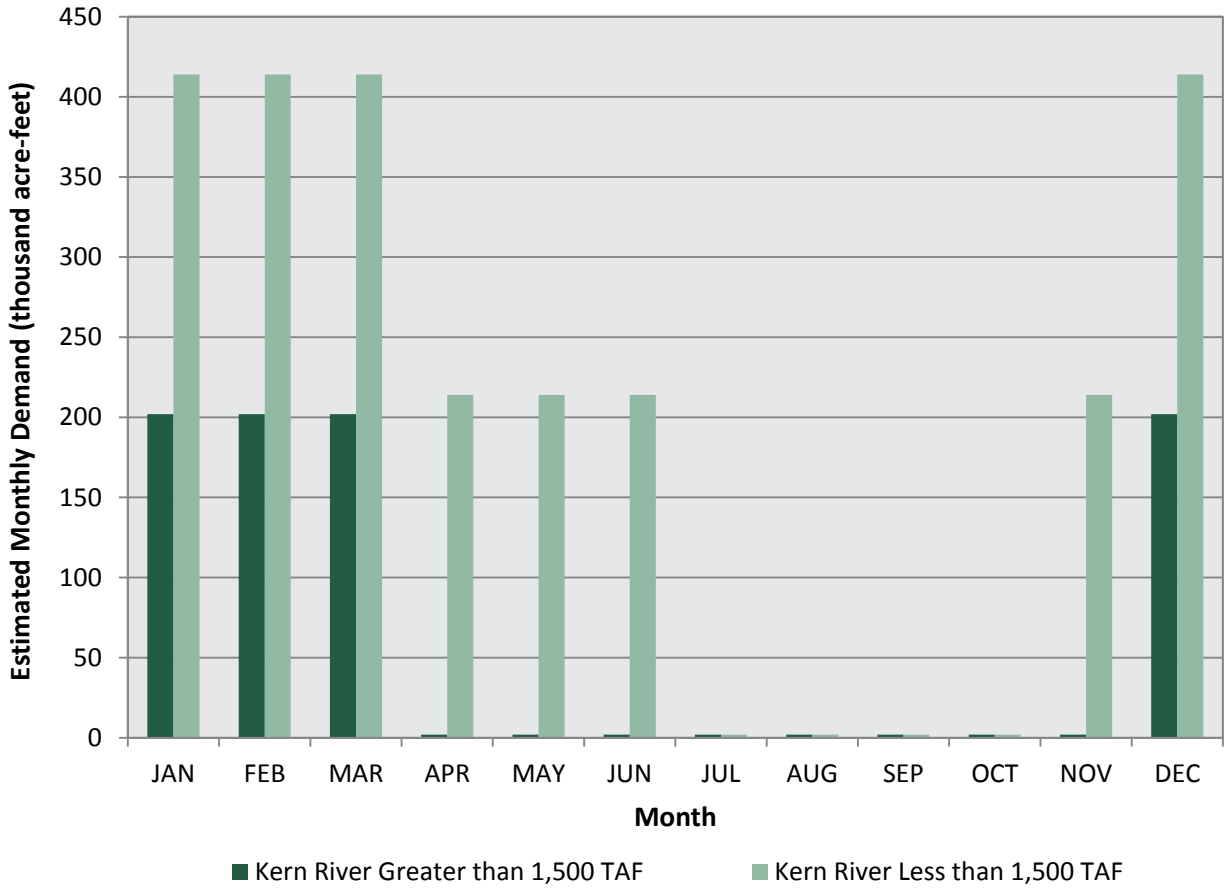
Estimates of SWP Table A Water Deliveries

Table 6-2 presents the annual average, maximum, and minimum estimates of SWP Table A deliveries from the Delta for existing conditions, as calculated for the 2013 and 2015 Reports. The average, maximum, and minimum Table A deliveries are relatively close in the 2013 and 2015 Reports.

Table 6-2. Comparison of Estimated Average, Maximum, and Minimum Deliveries of SWP Table A Water (Existing Conditions, in taf/year)

	2013 Report	2015 Report
Average	2,553	2,550
Maximum	3,996	4,055
Minimum	495	454

Assumptions about Table A and Article 21 water demands, along with operations for carryover water, have been updated in the model based on discussions with State Water Contractors staff and DWR's Operations and Control Office.



Note: Values shown are the maximum amount that can be delivered monthly. However, the actual capability of SWP water contractors to take this amount of SWP Article 21 water is not the sum of these maximum monthly values.

Figure 6-1. SWP Article 21 Demands during Non–Kern Wet Years and Kern Wet Years (Existing Conditions)

Figure 6-2 presents the estimated likelihood of delivery of a given amount of SWP Table A water under the existing conditions scenario, as estimated for both the 2013 and 2015 Reports. This figure shows that there is a 74% likelihood (79% with the 2013 Report) that more than 2,000 taf/year of Table A water will be delivered under the current estimates. The distribution of the delivery ranges has also changed since the 2013 Report. For example, Figure 6-2 shows a shift of Table A deliveries from the 2,500–3,000 taf/year range to the 3,000–3,500 taf/year range.

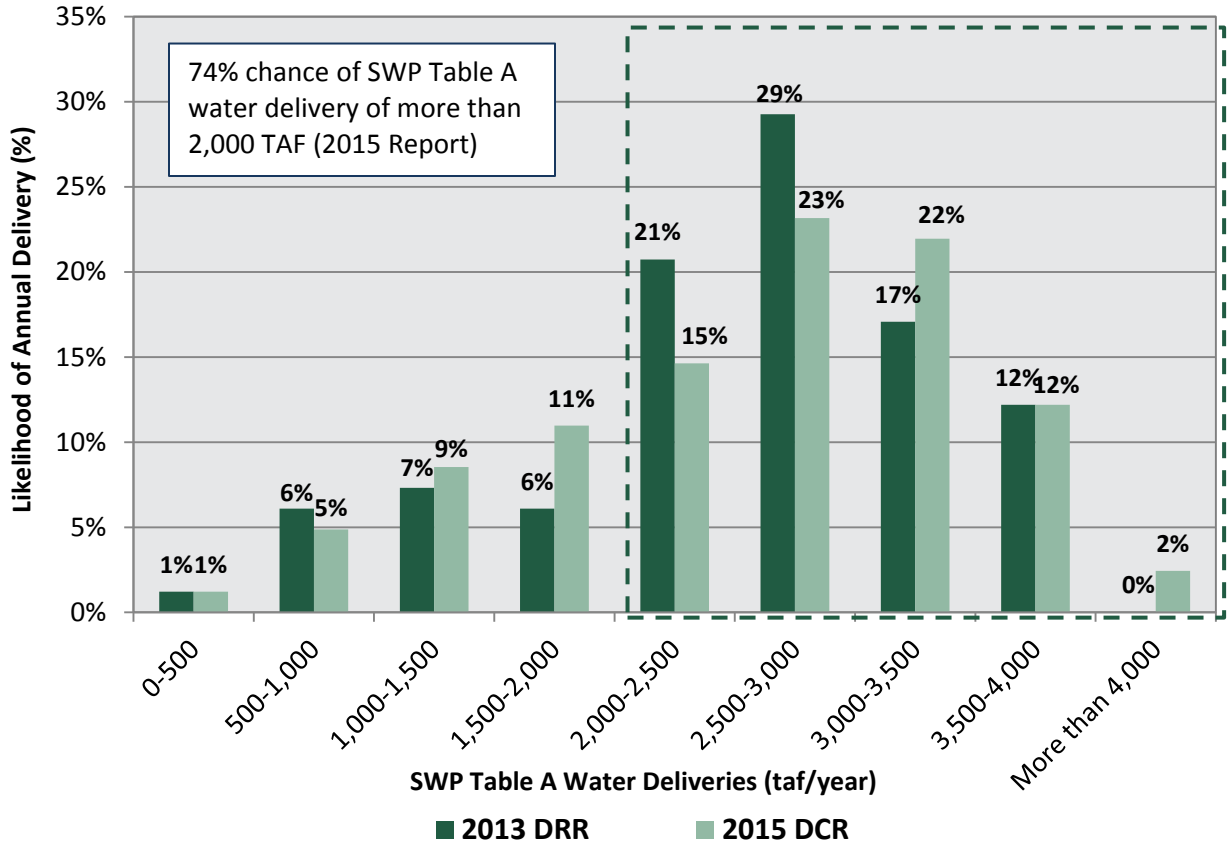


Figure 6-2. Estimated Likelihood of SWP Table A Water Deliveries, by Increments of 500 taf (Existing Conditions)

Wet-Year Deliveries of SWP Table A Water

Table 6-3 and Figure 6-3 present estimates of SWP Table A water deliveries under existing conditions during possible wet conditions and compares them with corresponding delivery estimates calculated for the 2013 Report. Wet periods for 2015 are analyzed using historical precipitation and runoff patterns from 1922–2003 as a reference, while accounting for existing 2015 conditions (e.g., land use, water infrastructure). For reference, the wettest single year on record was 1983.

The results of modeling existing conditions over historical wet years indicate that SWP Table A water deliveries during wet periods can be estimated to range between yearly averages of 4,055 to 3,123 taf.

Table 6-3 shows that the 2015 deliveries of SWP Table A water increased in wet periods (in comparison to the 2013 Report).

Table 6-3. Estimated Average and Wet-Period Deliveries of SWP Table A Water (Existing Conditions, in taf/year) and Percent of Maximum SWP Table A Amount, 4,132 taf/year

	Long-term Average (1921–2003)		Single Wet Year (1983)		Wet Periods							
					2 Years (1982–1983)		4 Years (1980–1983)		6 Years (1978–1983)		10 Years (1978–1987)	
2013 Report	2,553	62%	3,996	97%	3,880	94%	3,501	85%	3,361	81%	3,086	75%
2015 Report	2,550	62%	4,055	98%	3,946	95%	3,558	86%	3,414	83%	3,123	76%

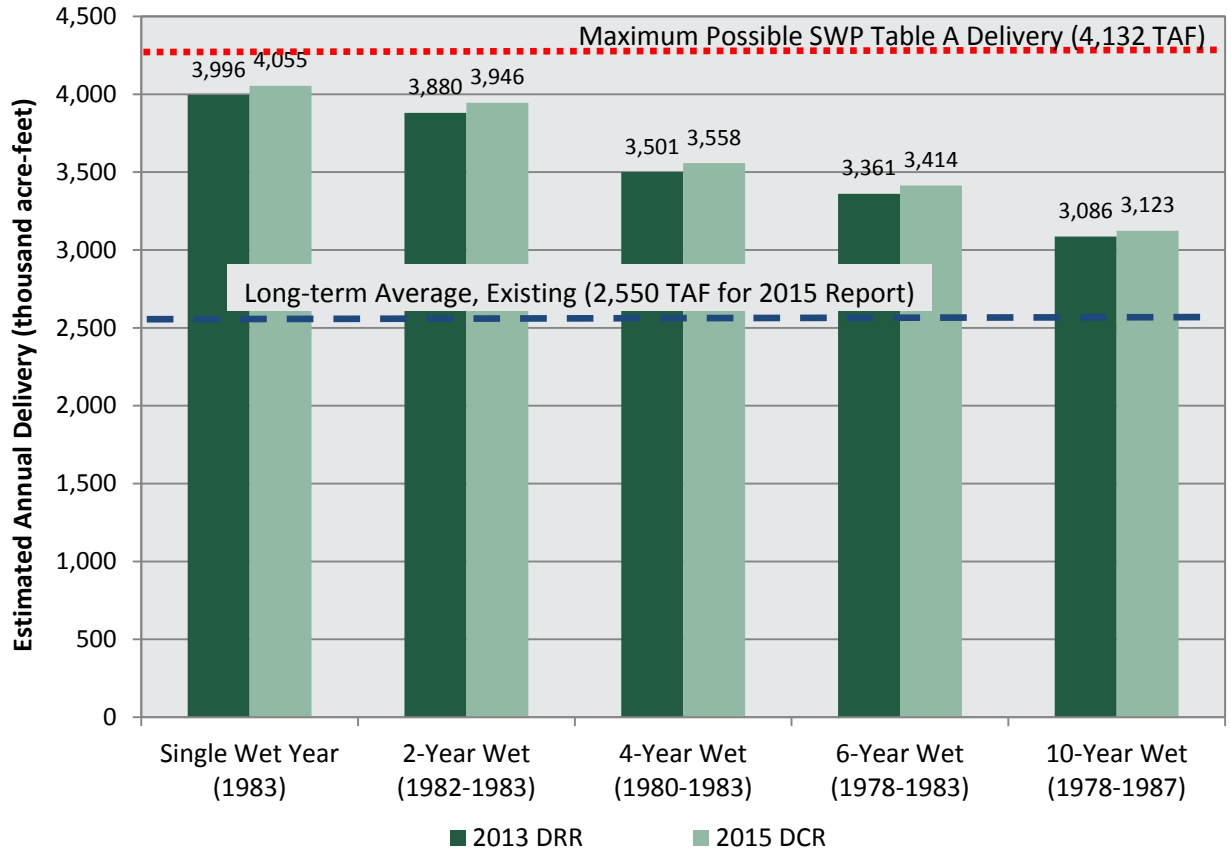


Figure 6-3. Estimated Wet-Period SWP Table A Water Deliveries (Existing Conditions)

Dry-Year Deliveries of SWP Table A Water

Table 6-4 and Figure 6-4 display estimates of existing-conditions deliveries of SWP Table A water during possible drought conditions and compares them with the corresponding delivery estimates calculated for the 2013 Report. Droughts are analyzed using the historical drought-period precipitation and runoff patterns from 1922 through 2003 as a reference, although existing 2015 conditions (e.g., land use, water infrastructure) are also accounted for in the modeling. For reference, the worst multiyear

drought on record was the 1929–1934 drought, although the brief drought of 1976–1977 was more intensely dry.

The results of modeling existing conditions under historical drought scenarios indicate that SWP Table A water deliveries during dry years can be estimated to range between yearly averages of 454 and 1,356 taf.

On average, the dry-period deliveries of Table A water are higher in this 2015 Report than in the 2013 Report because of model refinements (discussed in detail in Appendix B).

Table 6-4. Estimated Average and Dry-Period Deliveries of SWP Table A Water (Existing Conditions, in taf/year) and Percent of Maximum SWP Table A Amount, 4,132 taf/year

	Long-term Average (1921–2003)		Single Dry Year (1977)		Dry Periods							
					2-Year Drought (1976–1977)		4-Year Drought (1931–1934)		6-Year Drought (1987–1992)		6-Year Drought (1929–1934)	
2013 Report	2,553	62%	495	12%	1,269	31%	1,263	31%	1,176	28%	1,260	30%
2015 Report	2,550	62%	454	11%	1,165	28%	1,356	33%	1,182	29%	1,349	33%

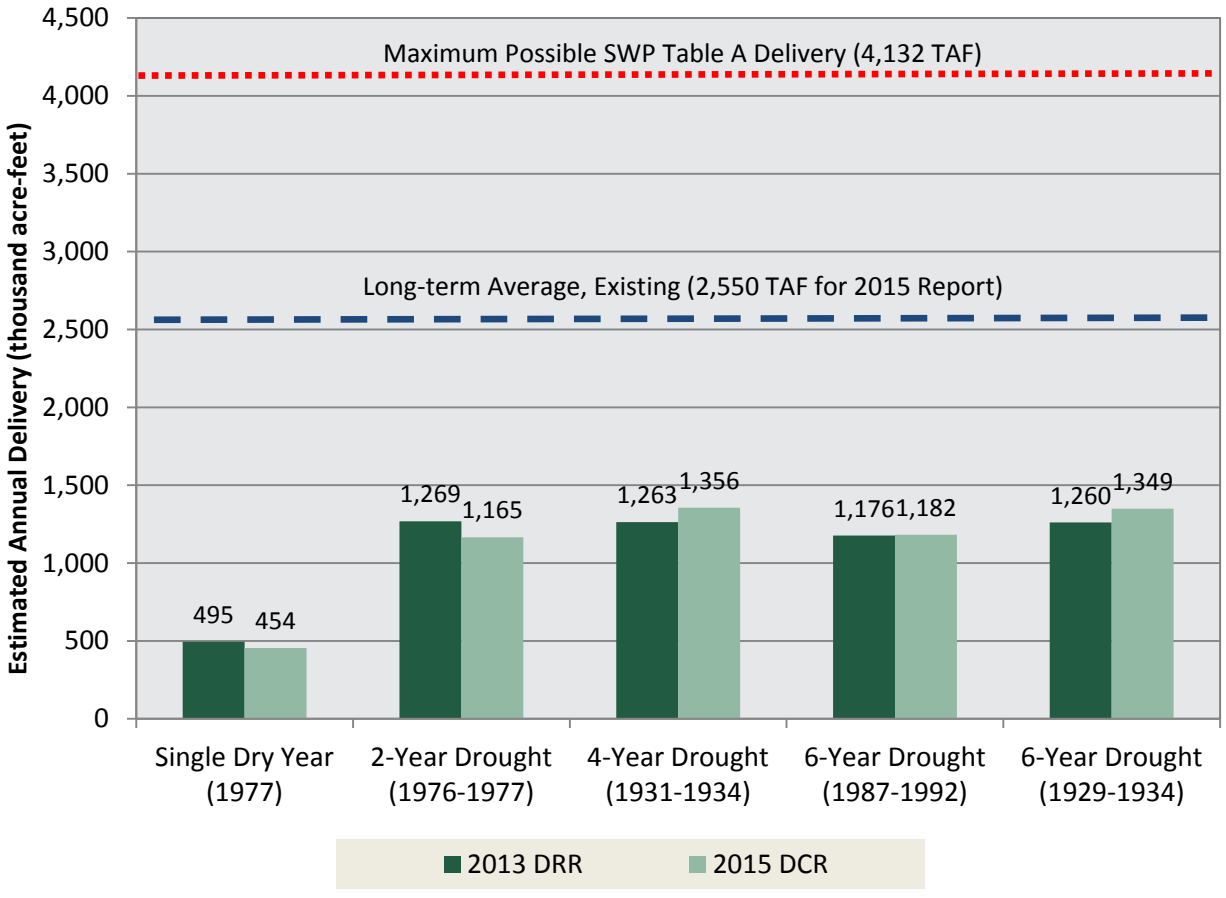


Figure 6-4. Estimated Dry-Period SWP Table A Water Deliveries (Existing Conditions)

Estimates of SWP Article 21 Water Deliveries

SWP water delivery is a combination of deliveries of Table A water and Article 21 water. Some SWP contractors store Article 21 water locally when extra water and capacity are available beyond that needed by normal SWP operations. Deliveries of SWP Article 21 water vary not only by year, but also by month. The estimated range of monthly deliveries of SWP Article 21 water is displayed in Figure 6-5. In May through October, essentially no Article 21 water is estimated to be delivered. In the late fall and winter (November through April), maximum monthly deliveries range from 82 to 339 taf/month.

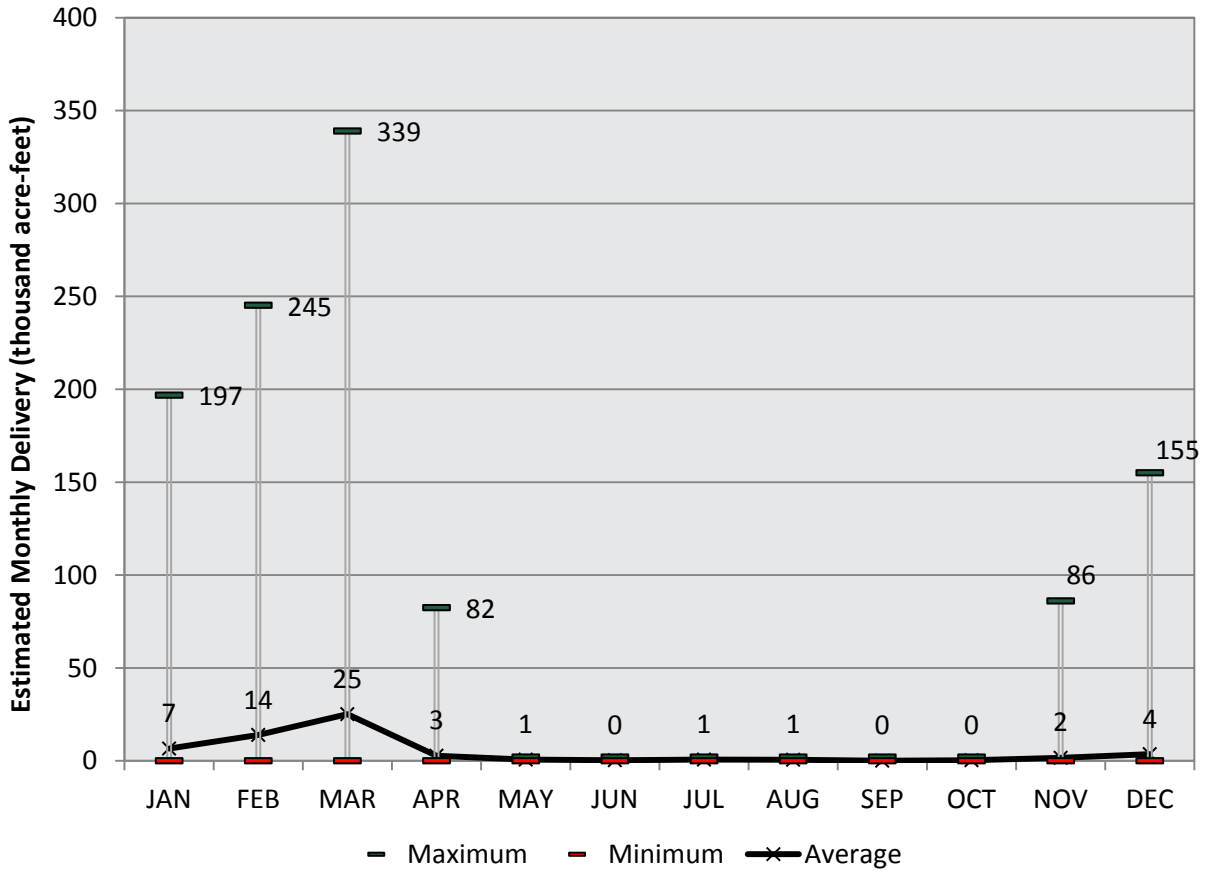


Figure 6-5. Estimated Range of Monthly Deliveries of SWP Article 21 Water (Existing Conditions)

The estimated likelihood that a given amount of SWP Article 21 water will be delivered is presented in Figure 6-6.

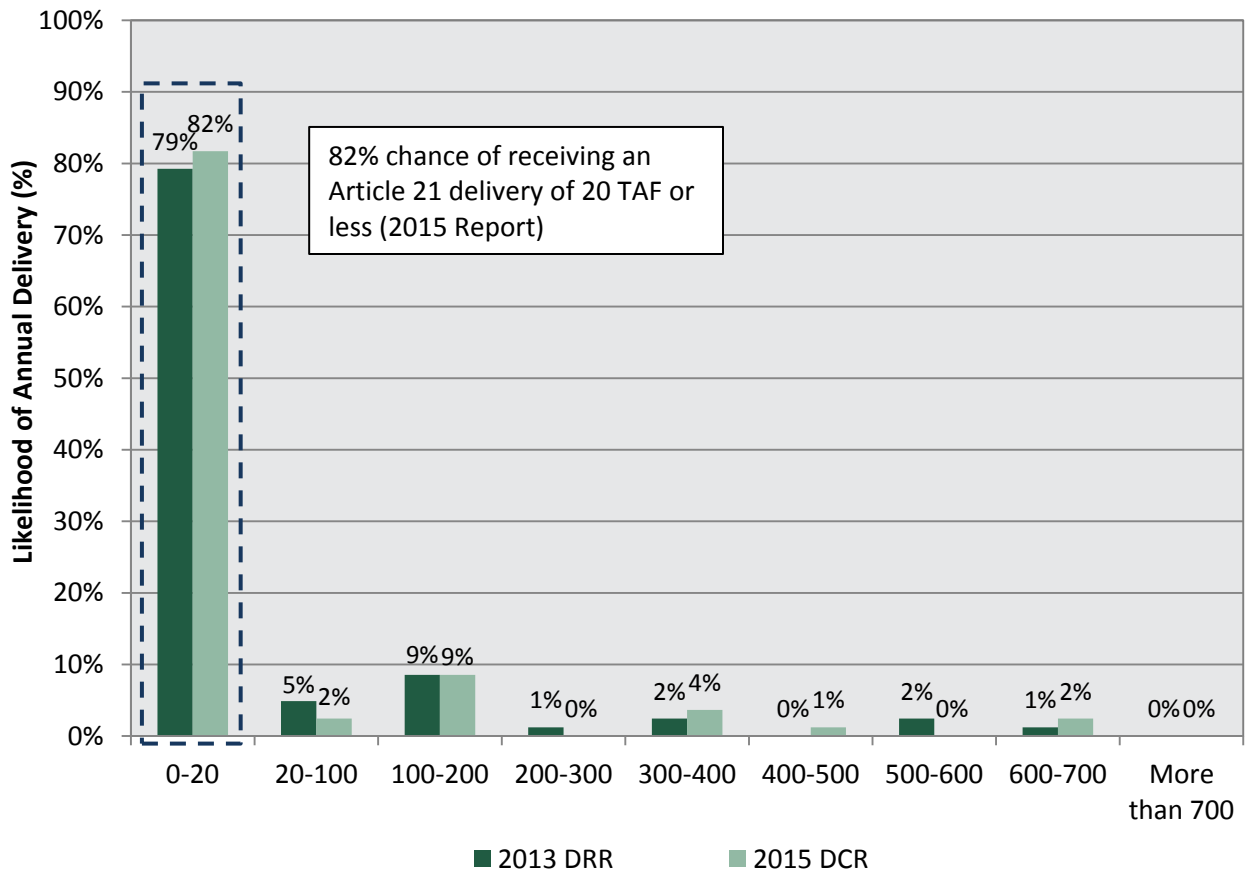


Figure 6-6. Estimated Likelihood of Annual Deliveries of SWP Article 21 Water (Existing Conditions)

Wet-Year Deliveries of SWP Article 21 Water

Table 6-5 shows the estimates of deliveries of SWP Article 21 water during wet periods under existing conditions. Estimated deliveries in wet years are approximately 1.7 to 5.6 times larger than the average existing-conditions delivery of SWP Article 21 water.

In general, the wet-period Article 21 deliveries in this 2015 Report are lower than in the 2013 Report.

Table 6-5. Estimated Average and Wet-Period Deliveries of SWP Article 21 Water (Existing Conditions, in taf/year)

	Long-term Average (1921–2003)	Single Wet Year (1983)	Wet Periods			
			2 Years (1982–1983)	4 Years (1980–1983)	6 Years (1978–1983)	10 Years (1978–1987)
2013 Report	58	333	265	196	135	152
2015 Report	56	316	204	134	93	134

Dry-Year Deliveries of SWP Article 21 Water

Although deliveries of SWP Article 21 water are smaller during dry years than during wet ones, opportunities exist to deliver SWP Article 21 water during multiyear drought periods. As modeled, deliveries in dry years are often small (less than 5 taf); however, longer drought periods can include several years that support Article 21 deliveries. Annual average Article 21 estimates for drought periods of 4 and 6 years vary greatly and can approach a significant fraction of the long-term average annual estimate, as shown in Table 6-6.

Table 6-6. Estimated Average and Dry-Period Deliveries of SWP Article 21 Water (Existing Conditions, in taf/year)

	Long-term Average (1921–2003)	Single Dry Year (1977)	Wet Periods			
			2-Year Drought (1976–1977)	4-Year Drought (1931–1934)	6-Year Drought (1987–1992)	6-Year Drought (1929–1934)
2013 Report	58	10	13	46	11	35
2015 Report	56	8	12	41	13	31

Section 7
Historical SWP Delivery Tables for 2005–2014

The State Water Project (SWP) contracts define several types of SWP water available for delivery to contractors under specific circumstances: Table A water, Article 21 water, turnback pool water, and carryover water. Many SWP contractors frequently use Article 21, turnback pool, and carryover water to increase or decrease the amount of water available to them under SWP Table A.

The Sacramento River Index, previously referred to as the "4 River Index" or "4 Basin Index," is the sum of the unimpaired runoff of four rivers: the Sacramento River above Bend Bridge near Red Bluff, Feather River inflow to Lake Oroville Reservoir, Yuba River at Smartville, and American River inflow to Folsom Lake. The five water year types used in the Sacramento River Index are as follows:

Table 7-1. Water year types used in the Sacramento River Index

Sacramento River Index	Water Year Type
1	Wet
2	Above Normal
3	Below Normal
4	Dry
5	Critical

Tables 7-2 through 7-11 list annual historical deliveries by SWP water type for each contractor for 2005 through 2014. Similar delivery tables are presented for years 2003–2012 in the *State Water Project Delivery Reliability Report 2013.* Any differences in values presented in this 2015 report and those in the 2013 report are due to reclassification of deliveries since the production of the 2013 report.

Table 7–2. Historical State Water Project Deliveries, Calendar Year 2005						
Contractor Location	SWP Contractor	SWP Water Type Delivered (acre–feet)				Total SWP Deliveries (acre–feet)
		Table A	Article 21	Carryover	Turnback	
Feather River Area	Butte County	527	-	-	-	527
	Plumas County FCWCD	-	-	-	-	-
	Yuba City	1,894	-	-	-	1,894
	Subtotal	**2,421**	**-**	**-**	**-**	**2,421**
North Bay Area	Napa County FCWCD	5,322	606	1,741	-	7,669
	Solano County WA	24,515	10,421	83	-	35,019
	Subtotal	**29,837**	**11,027**	**1,824**	**-**	**42,688**
South Bay Area	Alameda County FCWCD, Zone 7	38,388	-	7,849	275	46,512
	Alameda County WD	36,469	846	6,341	943	44,599
	Santa Clara Valley WD	89,476	6,298	12,133	342	108,249
	Subtotal	**164,333**	**7,144**	**26,323**	**1,560**	**199,360**
San Joaquin Valley Area	Dudley Ridge WD	51,609	28,197	821	1,286	81,913
	Empire West Side ID	1,448	1,799	587	-	3,834
	Kern County WA	893,439	453,078	8,985	22,397	1,377,899
	Kings County	8,100	11,504	-	202	19,806
	Oak Flat WD	4,067	-	-	127	4,194
	Tulare Lake Basin WSD	86,604	47,267	3,973	2,158	140,002
	Subtotal	**1,045,267**	**541,845**	**14,366**	**26,170**	**1,627,648**
Central Coastal Area	San Luis Obispo County FCWCD	4,006	245	-	-	4,251
	Santa Barbara County FCWCD	22,981	-	208	155	23,344
	Subtotal	**26,987**	**245**	**208**	**155**	**27,595**
Southern California Area	Antelope Valley–East Kern WA	57,205	-	2,626	-	59,831
	Castaic Lake WA	54,303	2,451	2,702	-	59,456
	Coachella Valley WD	26,984	-	12,819	2,716	42,519
	Crestline–Lake Arrowhead WA	807	-	-	-	807
	Desert WA	33,168	-	14,799	1,122	49,089
	Littlerock Creek ID	-	-	-	-	-
	Metropolitan WD of Southern California	1,247,183	168,300	106,032	6,530	1,528,045
	Mojave WA	10,360	-	1,201	-	11,561
	Palmdale WD	10,174	-	1,538	-	11,712
	San Bernardino Valley MWD	31,205	56	282	-	31,543
	San Gabriel Valley MWD	10,500	-	-	-	10,500
	San Gorgonio Pass WA	655	15	-	22	692
	Ventura County WPD	1,665	-	-	-	1,665
	Subtotal	**1,484,209**	**170,822**	**141,999**	**10,390**	**1,807,420**
TOTAL SWP DELIVERIES		**2,753,054**	**731,083**	**184,720**	**38,275**	**3,707,132**

Table 7–3. Historical State Water Project Deliveries, Calendar Year 2006						
Contractor Location	SWP Contractor	SWP Water Type Delivered (acre–feet)				Total SWP Deliveries (acre–feet)
		Table A	Article 21	Carryover	Turnback	
Feather River Area	Butte County	468	-	-	-	468
	Plumas County FCWCD	-	-	-	-	-
	Yuba City	4,148	1,194	-	-	5,342
	Subtotal	**4,616**	**1,194**	**-**	**-**	**5,810**
North Bay Area	Napa County FCWCD	7,317	300	172	-	7,789
	Solano County WA	12,070	18,195	390	-	30,655
	Subtotal	**19,387**	**18,495**	**562**	**-**	**38,444**
South Bay Area	Alameda County FCWCD, Zone 7	50,784	-	2,252	491	53,527
	Alameda County WD	39,570	1,922	1,331	256	43,079
	Santa Clara Valley WD	47,344	26,769	524	-	74,637
	Subtotal	**137,698**	**28,691**	**4,107**	**747**	**171,243**
San Joaquin Valley Area	Dudley Ridge WD	55,343	18,429	-	1,068	74,840
	Empire West Side ID	1,500	1,124	658	-	3,282
	Kern County WA	970,689	247,914	5,418	18,610	1,242,631
	Kings County	8,991	366	-	173	9,530
	Oak Flat WD	4,118	-	17	107	4,242
	Tulare Lake Basin WSD	48,361	58,059	-	1,787	108,207
	Subtotal	**1,089,002**	**325,892**	**6,093**	**21,745**	**1,442,732**
Central Coastal Area	San Luis Obispo County FCWCD	3,382	827	-	-	4,209
	Santa Barbara County FCWCD	19,255	4,020	-	-	23,275
	Subtotal	**22,637**	**4,847**	**-**	**-**	**27,484**
Southern California Area	Antelope Valley–East Kern WA	76,623	-	3,761	-	80,384
	Castaic Lake WA	56,758	2,089	3,905	-	62,752
	Coachella Valley WD	121,100	-	-	-	121,100
	Crestline–Lake Arrowhead WA	641	-	-	-	641
	Desert WA	50,000	-	-	-	50,000
	Littlerock Creek ID	-	-	-	-	-
	Metropolitan WD of Southern California	1,103,538	238,478	158,532	11,638	1,512,186
	Mojave WA	32,496	-	1,518	-	34,014
	Palmdale WD	10,374	1,653	335	130	12,492
	San Bernardino Valley MWD	31,902	-	3,427	-	35,329
	San Gabriel Valley MWD	13,524	-	-	-	13,524
	San Gorgonio Pass WA	4,278	-	-	-	4,278
	Ventura County WPD	1,850	-	-	-	1,850
	Subtotal	**1,503,084**	**242,220**	**171,478**	**11,768**	**1,928,550**
TOTAL SWP DELIVERIES		**2,776,424**	**621,339**	**182,240**	**34,260**	**3,614,263**

Table 7–4. Historical State Water Project Deliveries, Calendar Year 2007						
Contractor Location	SWP Contractor	SWP Water Type Delivered (acre–feet)				Total SWP Deliveries (acre–feet)
		Table A	Article 21	Carryover	Turnback	
Feather River Area	Butte County	720	-	-	-	720
	Plumas County FCWCD	-	-	-	-	-
	Yuba City	2,327	-	-	-	2,327
	Subtotal	**3,047**	**-**	**-**	**-**	**3,047**
North Bay Area	Napa County FCWCD	6,362	3,597	998	-	10,957
	Solano County WA	14,892	8,217	1,822	-	24,931
	Subtotal	**21,254**	**11,814**	**2,820**	**-**	**35,888**
South Bay Area	Alameda County FCWCD, Zone 7	32,972	912	2,895	378	37,157
	Alameda County WD	16,541	550	2,103	197	19,391
	Santa Clara Valley WD	38,812	4,840	8,161	469	52,282
	Subtotal	**88,325**	**6,302**	**13,159**	**1,044**	**108,830**
San Joaquin Valley Area	Dudley Ridge WD	28,457	8,953	2,000	269	39,679
	Empire West Side ID	397	1,172	515	-	2,084
	Kern County WA	592,423	99,861	19,645	4,683	716,612
	Kings County	4,924	474	305	43	5,746
	Oak Flat WD	3,420	41	69	27	3,557
	Tulare Lake Basin WSD	57,272	12,902	16,459	450	87,083
	Subtotal	**686,893**	**123,403**	**38,993**	**5,472**	**854,761**
Central Coastal Area	San Luis Obispo County FCWCD	3,752	24	-	-	3,776
	Santa Barbara County FCWCD	24,760	1,070	1,390	-	27,220
	Subtotal	**28,512**	**1,094**	**1,390**	**-**	**30,996**
Southern California Area	Antelope Valley–East Kern WA	74,459	-	4,364	-	78,823
	Castaic Lake WA	44,974	-	4,216	-	49,190
	Coachella Valley WD	72,660	-	-	568	73,228
	Crestline–Lake Arrowhead WA	1,768	-	-	-	1,768
	Desert WA	30,000	-	-	234	30,234
	Littlerock Creek ID	1,380	-	-	-	1,380
	Metropolitan WD of Southern California	1,146,900	166,517	28,098	8,962	1,350,477
	Mojave WA	45,372	-	737	-	46,109
	Palmdale WD	12,780	843	985	100	14,708
	San Bernardino Valley MWD	57,116	-	-	-	57,116
	San Gabriel Valley MWD	10,000	-	-	-	10,000
	San Gorgonio Pass WA	3,935	-	-	-	3,935
	Ventura County WPD	3,000	-	-	-	3,000
	Subtotal	**1,504,344**	**167,360**	**38,400**	**9,864**	**1,719,968**
TOTAL SWP DELIVERIES		**2,332,375**	**309,973**	**94,762**	**16,380**	**2,753,490**

Table 7–5. Historical State Water Project Deliveries, Calendar Year 2008						
Contractor Location	SWP Contractor	SWP Water Type Delivered (acre–feet)				Total SWP Deliveries (acre–feet)
		Table A	Article 21	Carryover	Turnback	
Feather River Area	Butte County	9,436	-	-	-	9,436
	Plumas County FCWCD	243	-	-	-	243
	Yuba City	1,923	-	-	-	1,923
	Subtotal	**11,602**	**-**	**-**	**-**	**11,602**
North Bay Area	Napa County FCWCD	3,636	1,219	7,363	21	12,239
	Solano County WA	10,436	1,510	12,389	-	24,335
	Subtotal	**14,072**	**2,729**	**19,752**	**21**	**36,574**
South Bay Area	Alameda County FCWCD, Zone 7	13,633	-	15,400	-	29,033
	Alameda County WD	4,206	-	8,659	37	12,902
	Santa Clara Valley WD	11,133	-	21,188	88	32,409
	Subtotal	**28,972**	**-**	**45,247**	**125**	**74,344**
San Joaquin Valley Area	Dudley Ridge WD	12,260	-	5,949	51	18,260
	Empire West Side ID	-	-	915	-	915
	Kern County WA	271,636	-	6,815	883	279,334
	Kings County	3,187	-	541	8	3,736
	Oak Flat WD	1,929	-	-	5	1,934
	Tulare Lake Basin WSD	32,302	-	281	85	32,668
	Subtotal	**321,314**	**-**	**14,501**	**1,032**	**336,847**
Central Coastal Area	San Luis Obispo County FCWCD	8,512	-	-	-	8,512
	Santa Barbara County FCWCD	11,311	-	2,532	40	13,883
	Subtotal	**19,823**	**-**	**2,532**	**40**	**22,395**
Southern California Area	Antelope Valley–East Kern WA	31,082	-	10,381	125	41,588
	Castaic Lake WA	18,710	-	12,146	-	30,856
	Coachella Valley WD	42,385	-	-	107	42,492
	Crestline–Lake Arrowhead WA	1,159	-	689	-	1,848
	Desert WA	17,500	-	-	44	17,544
	Littlerock Creek ID	805	-	-	-	805
	Metropolitan WD of Southern California	658,304	-	-	1,689	659,993
	Mojave WA	26,288	-	108	-	26,396
	Palmdale WD	4,226	-	-	19	4,245
	San Bernardino Valley MWD	26,562	-	4,444	-	31,006
	San Gabriel Valley MWD	10,080	-	-	-	10,080
	San Gorgonio Pass WA	5,419	-	300	-	5,719
	Ventura County WPD	3,798	-	-	-	3,798
	Subtotal	**846,318**	**-**	**28,068**	**1,984**	**876,370**
TOTAL SWP DELIVERIES		**1,242,101**	**2,729**	**110,100**	**3,202**	**1,358,132**

Table 7–6. Historical State Water Project Deliveries, Calendar Year 2009						
Contractor Location	SWP Contractor	SWP Water Type Delivered (acre–feet)				Total SWP Deliveries (acre–feet)
		Table A	Article 21	Carryover	Turnback	
Feather River Area	Butte County	10,206	-	-	-	10,206
	Plumas County FCWCD	200	-	-	-	200
	Yuba City	2,114	-	-	-	2,114
	Subtotal	**12,520**	**-**	**-**	**-**	**12,520**
North Bay Area	Napa County FCWCD	2,723	1,588	4,475	13	8,799
	Solano County WA	7,118	4,444	3,123	-	14,685
	Subtotal	**9,841**	**6,032**	**7,598**	**13**	**23,484**
South Bay Area	Alameda County FCWCD, Zone 7	11,745	-	14,584	-	26,329
	Alameda County WD	5,911	-	10,494	8	16,413
	Santa Clara Valley WD	9,188	-	23,867	54	33,109
	Subtotal	**26,844**	**-**	**48,945**	**62**	**75,851**
San Joaquin Valley Area	Dudley Ridge WD	13,185	-	7,810	32	21,027
	Empire West Side ID	1,034	-	-	-	1,034
	Kern County WA	325,426	-	56,367	544	382,337
	Kings County	3,153	-	70	5	3,228
	Oak Flat WD	1,825	-	66	3	1,894
	Tulare Lake Basin WSD	35,160	-	1,271	52	36,483
	Subtotal	**379,783**	**-**	**65,584**	**636**	**446,003**
Central Coastal Area	San Luis Obispo County FCWCD	9,723	-	-	-	9,723
	Santa Barbara County FCWCD	4,961	-	4,523	25	9,509
	Subtotal	**14,684**	**-**	**4,523**	**25**	**19,232**
Southern California Area	Antelope Valley–East Kern WA	13,499	-	18,408	77	31,984
	Castaic Lake WA	14,858	-	9,529	52	24,439
	Coachella Valley WD	40,845	-	-	66	40,911
	Crestline–Lake Arrowhead WA	1,000	-	893	-	1,893
	Desert WA	16,865	-	-	27	16,892
	Littlerock Creek ID	920	-	-	-	920
	Metropolitan WD of Southern California	696,817	-	10,721	1,042	708,580
	Mojave WA	30,300	-	242	-	30,542
	Palmdale WD	2,470	-	3,229	-	5,699
	San Bernardino Valley MWD	26,085	-	9,348	-	35,433
	San Gabriel Valley MWD	11,516	-	-	-	11,516
	San Gorgonio Pass WA	5,312	-	480	-	5,792
	Ventura County WPD	3,890	-	-	-	3,890
	Subtotal	**864,377**	**-**	**52,850**	**1,264**	**918,491**
TOTAL SWP DELIVERIES		**1,308,049**	**6,032**	**179,500**	**2,000**	**1,495,581**

Table 7–7. Historical State Water Project Deliveries, Calendar Year 2010						
Contractor Location	SWP Contractor	SWP Water Type Delivered (acre–feet)				Total SWP Deliveries (acre–feet)
		Table A	Article 21	Carryover	Turnback	
Feather River Area	Butte County	807	-	-	-	807
	Plumas County FCWCD	243	-	-	-	243
	Yuba City	2,331	-	-	-	2,331
	Subtotal	**3,381**	**-**	**-**	**-**	**3,381**
North Bay Area	Napa County FCWCD	7,275	2,207	2,845	90	12,417
	Solano County WA	13,793	5,298	3,661	-	22,752
	Subtotal	**21,068**	**7,505**	**6,506**	**90**	**35,169**
South Bay Area	Alameda County FCWCD, Zone 7	28,694	-	13,104	249	42,047
	Alameda County WD	11,668	-	10,889	14	22,571
	Santa Clara Valley WD	37,850	-	22,471	34	60,355
	Subtotal	**78,212**	**-**	**46,464**	**297**	**124,973**
San Joaquin Valley Area	Dudley Ridge WD	19,650	-	9,750	156	29,556
	Empire West Side ID	380	-	166	-	546
	Kern County WA	411,821	-	55,419	3,044	470,284
	Kings County	4,094	-	522	29	4,645
	Oak Flat WD	2,412	-	455	18	2,885
	Tulare Lake Basin WSD	39,835	-	3,199	275	43,309
	Subtotal	**478,192**	**-**	**69,511**	**3,522**	**551,225**
Central Coastal Area	San Luis Obispo County FCWCD	3,480	-	277	-	3,757
	Santa Barbara County FCWCD	8,640	-	8,995	140	17,775
	Subtotal	**12,120**	**-**	**9,272**	**140**	**21,532**
Southern California Area	Antelope Valley–East Kern WA	35,312	-	20,813	438	56,563
	Castaic Lake WA	37,054	-	14,501	295	51,850
	Coachella Valley WD	69,175	-	7,595	429	77,199
	Crestline–Lake Arrowhead WA	1,357	-	-	-	1,357
	Desert WA	27,875	-	3,135	173	31,183
	Littlerock Creek ID	1,150	-	-	-	1,150
	Metropolitan WD of Southern California	900,210	-	67,783	5,922	973,915
	Mojave WA	41,132	-	20	-	41,152
	Palmdale WD	5,585	-	5,325	59	10,969
	San Bernardino Valley MWD	38,133	-	11,273	-	49,406
	San Gabriel Valley MWD	14,400	-	-	-	14,400
	San Gorgonio Pass WA	5,226	-	1,608	6	6,840
	Ventura County WPD	4,075	-	-	-	4,075
	Subtotal	**1,180,684**	**-**	**132,053**	**7,322**	**1,320,059**
TOTAL SWP DELIVERIES		**1,773,657**	**7,505**	**263,806**	**11,371**	**2,056,339**

Table 7–8. Historical State Water Project Deliveries, Calendar Year 2011						
Contractor Location	SWP Contractor	SWP Water Type Delivered (acre–feet)				Total SWP Deliveries (acre–feet)
		Table A	Article 21	Carryover	Turnback	
Feather River Area	Butte County	1,092	-	-	-	1,092
	Plumas County FCWCD	98	-	-	-	98
	Yuba City	2,297	-	-	-	2,297
	Subtotal	**3,487**	**-**	**-**	**-**	**3,487**
North Bay Area	Napa County FCWCD	9,426	-	1,388	-	10,814
	Solano County WA	9,620	14,739	-	-	24,359
	Subtotal	**19,046**	**14,739**	**1,388**	**-**	**35,173**
South Bay Area	Alameda County FCWCD, Zone 7	39,066	-	11,675	1,319	52,060
	Alameda County WD	24,813	1,959	9,332	506	36,610
	Santa Clara Valley WD	64,538	970	20,491	-	85,999
	Subtotal	**128,417**	**2,929**	**41,498**	**1,825**	**174,669**
San Joaquin Valley Area	Dudley Ridge WD	40,141	11,666	5,524	823	58,154
	Empire West Side ID	1,626	138	151	-	1,915
	Kern County WA	753,707	194,119	119,773	16,068	1,083,667
	Kings County	5,294	552	558	152	6,556
	Oak Flat WD	2,644	-	71	-	2,715
	Tulare Lake Basin WSD	39,056	6,909	4,626	1,454	52,045
	Subtotal	**842,468**	**213,384**	**130,703**	**18,497**	**1,205,052**
Central Coastal Area	San Luis Obispo County FCWCD	3,340	-	479	-	3,819
	Santa Barbara County FCWCD	29,132	-	9,318	-	38,450
	Subtotal	**32,472**	**-**	**9,797**	**-**	**42,269**
Southern California Area	Antelope Valley–East Kern WA	77,549	7,629	5,888	-	91,066
	Castaic Lake WA	34,067	400	9,332	-	43,799
	Coachella Valley WD	88,017	-	-	2,262	90,279
	Crestline–Lake Arrowhead WA	423	-	51	-	474
	Desert WA	36,139	-	-	240	36,379
	Littlerock Creek ID	-	-	-	-	-
	Metropolitan WD of Southern California	1,286,935	181,610	55,540	8,237	1,532,322
	Mojave WA	4,831	-	268	-	5,099
	Palmdale WD	12,294	-	5,019	-	17,313
	San Bernardino Valley MWD	30,916	-	7,210	-	38,126
	San Gabriel Valley MWD	23,040	-	-	-	23,040
	San Gorgonio Pass WA	8,884	-	1,619	-	10,503
	Ventura County WPD	4,000	-	-	-	4,000
	Subtotal	**1,607,095**	**189,639**	**84,927**	**10,739**	**1,892,400**
TOTAL SWP DELIVERIES		**2,632,985**	**420,691**	**268,313**	**31,061**	**3,353,050**

Table 7–9. Historical State Water Project Deliveries, Calendar Year 2012						
Contractor Location	SWP Contractor	SWP Water Type Delivered (acre–feet)				Total SWP Deliveries (acre–feet)
		Table A	Article 21	Carryover	Turnback	
Feather River Area	Butte County	17,875	-	-	-	17,875
	Plumas County FCWCD	79	-	-	-	79
	Yuba City	2,695	-	-	-	2,695
	Subtotal	**20,649**	**-**	**-**	**-**	**20,649**
North Bay Area	Napa County FCWCD	5,065	-	4,278	64	9,407
	Solano County WA	11,673	-	9,641	-	21,314
	Subtotal	**16,738**	**-**	**13,919**	**64**	**30,721**
South Bay Area	Alameda County FCWCD, Zone 7	32,301	-	20,357	179	52,837
	Alameda County WD	11,951	-	8,787	93	20,831
	Santa Clara Valley WD	34,612	-	11,462	222	46,296
	Subtotal	**78,864**	**-**	**40,606**	**494**	**119,964**
San Joaquin Valley Area	Dudley Ridge WD	17,694	-	-	112	17,806
	Empire West Side ID	1,468	-	774	-	2,242
	Kern County WA	560,969	-	32,477	2,180	595,626
	Kings County	5,337	-	2,001	21	7,359
	Oak Flat WD	2,596	-	612	-	3,208
	Tulare Lake Basin WSD	53,630	-	32,081	197	85,908
	Subtotal	**641,694**	**-**	**67,945**	**2,510**	**712,149**
Central Coastal Area	San Luis Obispo County FCWCD	3,111	-	833	-	3,944
	Santa Barbara County FCWCD	20,874	-	43	-	20,917
	Subtotal	**23,985**	**-**	**876**	**-**	**24,861**
Southern California Area	Antelope Valley–East Kern WA	80,694	-	32,854	-	113,548
	Castaic Lake WA	42,707	-	11,350	-	54,057
	Coachella Valley WD	89,928	-	22,663	307	112,898
	Crestline–Lake Arrowhead WA	624	-	-	-	624
	Desert WA	36,238	-	8,461	124	44,823
	Littlerock Creek ID	-	-	-	-	-
	Metropolitan WD of Southern California	1,086,084	-	118,172	4,241	1,208,497
	Mojave WA	4,672	-	6,572	-	11,244
	Palmdale WD	9,959	-	4,736	-	14,695
	San Bernardino Valley MWD	65,102	-	47,870	-	112,972
	San Gabriel Valley MWD	18,720	-	-	-	18,720
	San Gorgonio Pass WA	5,968	-	4,956	-	10,924
	Ventura County WPD	4,353	-	-	-	4,353
	Subtotal	**1,445,049**	**-**	**257,634**	**4,672**	**1,707,355**
TOTAL SWP DELIVERIES		**2,226,979**	**-**	**380,980**	**7,740**	**2,615,699**

Table 7–10. Historical State Water Project Deliveries, Calendar Year 2013						
Contractor Location	SWP Contractor	SWP Water Type Delivered (acre–feet)				Total SWP Deliveries (acre–feet)
		Table A	Article 21	Carryover	Turnback	
Feather River Area	Butte County	9,233	-	-	-	9,233
	Plumas County FCWCD	366	-	-	-	366
	Yuba City	3,360	-	1,490	-	4,850
	Subtotal	**12,959**	**-**	**1,490**	**-**	**14,449**
North Bay Area	Napa County FCWCD	2,963	-	9,075	-	12,038
	Solano County WA	5,355	-	17,805	-	23,160
	Subtotal	**8,318**	**-**	**26,880**	**-**	**35,198**
South Bay Area	Alameda County FCWCD, Zone 7	14,059	-	21,042	2,596	37,697
	Alameda County WD	4,241	-	15,349	50	19,640
	Santa Clara Valley WD	9,353	-	16,261	10,749	36,363
	Subtotal	**27,653**	**-**	**52,652**	**13,395**	**93,700**
San Joaquin Valley Area	Dudley Ridge WD	6,113	-	9,951	5,412	21,476
	Empire West Side ID	1,004	-	482	16	1,502
	Kern County WA	314,466	-	73,303	37,005	424,774
	Kings County	2,851	-	591	1,000	4,442
	Oak Flat WD	583	-	2,200	7	2,790
	Tulare Lake Basin WSD	27,803	-	4,169	8,400	40,372
	Subtotal	**352,820**	**-**	**90,696**	**51,840**	**495,356**
Central Coastal Area	San Luis Obispo County FCWCD	1,178	-	2,503	-	3,681
	Santa Barbara County FCWCD	3,252	-	12,233	-	15,485
	Subtotal	**4,430**	**-**	**14,736**	**-**	**19,166**
Southern California Area	Antelope Valley–East Kern WA	37,628	-	13,386	-	51,014
	Castaic Lake WA	33,320	-	28,434	-	61,754
	Coachella Valley WD	48,423	-	-	164	48,587
	Crestline–Lake Arrowhead WA	1,368	-	2,000	-	3,368
	Desert WA	19,513	-	-	66	19,579
	Littlerock Creek ID	-	-	-	-	-
	Metropolitan WD of Southern California	619,863	-	106,288	32,267	758,418
	Mojave WA	25,294	-	2,852	-	28,146
	Palmdale WD	4,559	-	3,122	-	7,681
	San Bernardino Valley MWD	26,159	-	4,426	-	30,585
	San Gabriel Valley MWD	10,080	-	-	-	10,080
	San Gorgonio Pass WA	2,339	-	3,729	1,000	7,068
	Ventura County WPD	2,890	-	-	-	2,890
	Subtotal	**831,436**	**-**	**164,237**	**33,497**	**1,029,170**
TOTAL SWP DELIVERIES		**1,237,616**	**-**	**350,691**	**98,732**	**1,687,039**

Table 7–11. Historical State Water Project Deliveries, Calendar Year 2014						
Contractor Location	SWP Contractor	SWP Water Type Delivered (acre–feet)				Total SWP Deliveries (acre–feet)
		Table A	Article 21	Carryover	Turnback	
Feather River Area	Butte County	2,596	-	-	-	2,596
	Plumas County FCWCD	251	-	-	-	251
	Yuba City	96	-	4,085	-	4,181
	Subtotal	**2,943**	**-**	**4,085**	**-**	**7,028**
North Bay Area	Napa County FCWCD	41	1,444	9,731	-	11,216
	Solano County WA	450	-	9,231	-	9,681
	Subtotal	**491**	**1,444**	**18,962**	**-**	**20,897**
South Bay Area	Alameda County FCWCD, Zone 7	1,367	-	17,609	-	18,976
	Alameda County WD	-	-	10,326	-	10,326
	Santa Clara Valley WD	-	-	12,339	79	12,418
	Subtotal	**1,367**	**-**	**40,274**	**79**	**41,720**
San Joaquin Valley Area	Dudley Ridge WD	1,783	-	15,783	40	17,606
	Empire West Side ID	104	-	349	-	453
	Kern County WA	1,393	-	24,717	520	26,630
	Kings County	112	-	360	-	472
	Oak Flat WD	-	-	983	-	983
	Tulare Lake Basin WSD	3,942	-	3,181	-	7,123
	Subtotal	**7,334**	**-**	**45,373**	**560**	**53,267**
Central Coastal Area	San Luis Obispo County FCWCD	379	-	2,693	-	3,072
	Santa Barbara County FCWCD	289	-	10,533	-	10,822
	Subtotal	**668**	**-**	**13,226**	**-**	**13,894**
Southern California Area	Antelope Valley–East Kern WA	2,186	-	12,213	111	14,510
	Castaic Lake WA	451	-	7,743	-	8,194
	Coachella Valley WD	6,918	-	-	-	6,918
	Crestline–Lake Arrowhead WA	83	-	658	-	741
	Desert WA	2,788	-	-	-	2,788
	Littlerock Creek ID	115	-	-	-	115
	Metropolitan WD of Southern California	59,909	-	223,358	-	283,267
	Mojave WA	3,347	-	2,228	-	5,575
	Palmdale WD	1,005	-	3,670	-	4,675
	San Bernardino Valley MWD	-	-	6,452	-	6,452
	San Gabriel Valley MWD	1,434	-	-	-	1,434
	San Gorgonio Pass WA	603	-	4,572	-	5,175
	Ventura County WPD	93	-	-	-	93
	Subtotal	**78,932**	**-**	**260,894**	**111**	**339,937**
TOTAL SWP DELIVERIES		**91,735**	**1,444**	**382,814**	**750**	**476,743**

Appendix C:

Early Long-Term Scenario

Introduction

This appendix is a supplemental document to provide information on Early Long-Term (ELT) Scenario which is an alternative to the Delivery Capability Report (DCR) of 2015. This document presents a brief description of the model assumptions, updates, and state water project (SWP) contractor deliveries. The following items are discussed:

- Model assumptions
- Simulation results
    - Annual delivery for Table A, Article 56, and Article 21
    - SWP contractor annual deliveries

Overview of Model Assumptions

All the model assumptions and updates developed for the 2015 DCR simulation base scenario were also used for the ELT Scenario. In addition, this scenario assumes a 2025 emission level and 15 cm sea level rise. The assumptions specific to the ELT scenario are described in Public *Draft BDCP Appendix 5A-2 – Climate Change Approach and Implications for Aquatic Species*, which can be accessed through the following link:
http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/Public_Draft_BDCP_Appendix_5A_-_2_-_Climate_Change_Approach_and_Implications_for_Aquatic_Species.sflb.ashx

Table C.1. CalSim II Modeling Assumptions for 2015 DCR ELT

	ELT Assumptions[1]
Planning Horizon	2025
Period of Simulation	82 years (1922-2003)
HYDROLOGY	
Level of Development (land use)	2030 Level[2]
Climate Change	ELT (2025 emission level + 15 cm SLR)
DEMANDS	
North of Delta (excluding the American River)	
CVP	Land-use based, full build-out of contract amounts[3]
SWP (FRSA)	Land-use based, limited by contract amounts[4, 7]
Non-project	Land-use based, limited by water rights and SWRCB Decisions for Existing Facilities
Antioch Water Works	Pre-1914 water right
Federal refuges	Firm Level 2 water needs[5]
American River Basin	
Water rights	Year 2025, full water rights[6]
CVP	Year 2025, full contracts, including Freeport Regional Water Project[6]
San Joaquin River Basin[8]	
Friant Unit	Limited by contract amounts, based on current allocation policy
Lower basin	Land-use based, based on district level operations and constraints
Stanislaus River basin[9, 17]	Land-use based, based on New Melones Interim Operations Plan, up to full CVP Contractor deliveries (155 TAF/yr) depending on New Melones Index
South of Delta	
CVP	Demand based on contract amounts[3]
Federal refuges	Firm Level 2 water needs[5]
CCWD	195 TAF/yr CVP contract supply and water rights[10]
SWP [4, 11]	Demand based on full Table A amounts (4.13 MAF/yr)
Article 56	Based on 2001-2008 contractor requests
Article 21	MWD demand up to 200 TAF/month (December-March) subject to conveyance capacity, KCWA demand up to 180 TAF/month, and other contractor demands up to 34 TAF/month, subject to conveyance capacity
North Bay Aqueduct	77 TAF/yr demand under SWP contracts, up to 43.7 cfs of excess flow under Fairfield, Vacaville and Benicia Settlement Agreement NOD Allocation Settlement Agreement terms for Napa and Solano [15]

	ELT Assumptions[1]
FACILITIES	
System-wide	Existing facilities
Sacramento Valley	
Shasta Lake	Existing, 4,552 TAF capacity
Red Bluff Diversion Dam	Diversion dam operated with gates out all year, NMFS BO (Jun 2009) Action I.3.1[17]; assume permanent facilities in place
Colusa Basin	Existing conveyance and storage facilities
Lower American River	Hodge criteria for diversion at Fairbairn
Upper American River	PCWA American River pump station
Lower Sacramento River	Freeport Regional Water Project
Fremont Weir	Existing Weir
Delta Export Conveyance	
SWP Banks Pumping Plant (South Delta)	Physical capacity is 10,300 cfs, permitted capacity is 6,680 cfs in all months and up to 8,500 cfs during Dec 15th - Mar 15th depending on Vernalis flow conditions[18]; additional capacity of 500 cfs (up to 7,180 cfs) allowed Jul–Sep for reducing impact of NMFS BO (Jun 2009) Action IV.2.1[17] on SWP[19]
CVP C.W. "Bill" Jones Pumping Plant (formerly Tracy PP)	Permit capacity is 4,600 cfs in all months (allowed for by the Delta-Mendota Canal-California Aqueduct Intertie)
Upper Delta-Mendota Canal Capacity	Exports limited to 4,200 cfs plus diversion upstream from DMC constriction plus 400 cfs Delta-Mendota Canal-California Aqueduct Intertie
Los Vaqueros Reservoir	Enlarged storage capacity (160 TAF), existing pump location, Alternate Intake Project included[13]
San Joaquin River	
Millerton Lake (Friant Dam)	Existing, 520 TAF capacity
Lower San Joaquin River	City of Stockton Delta Water Supply Project, 30 mgd capacity
South of Delta (CVP/SWP project facilities)	
South Bay Aqueduct	SBA rehabilitation, 430 cfs capacity from junction with California Aqueduct to Alameda County FC&WSD Zone 7 point
California Aqueduct East Branch	Existing capacity
REGULATORY STANDARDS	
Trinity River	
Minimum Flow below Lewiston Dam	Trinity EIS Preferred Alternative (369-815 TAF/yr)
Trinity Reservoir end-of-September minimum storage	Trinity EIS Preferred Alternative (600 TAF/yr as able)

	ELT Assumptions[1]
Clear Creek	
Minimum flow below Whiskeytown Dam	Downstream water rights, 1963 Reclamation proposal to USFWS and NPS, predetermined Central Valley Protection Improvement Act 3406(b)(2) flows[20], and NMFS BO (Jun 2009) Action I.1.1[17]
Upper Sacramento River	
Shasta Lake end-of-September minimum storage	NMFS 2004 Winter-run Biological Opinion (1,900 TAF in non-critical dry years), and NMFS BO (Jun 2009) Action I.2.1[17]
Minimum flow below Keswick Dam	Flows for the SWRCB Water Rights Order 90-5, predetermined Central Valley Protection Improvement Act 3406(b)(2) flows, and NMFS BO (Jun 2009) Action I.2.2[17]
Feather River	
Minimum flow below Thermalito Diversion Dam	2006 Settlement Agreement (700 / 800 cfs)
Minimum flow below Thermalito Afterbay outlet	1983 DWR, DFG agreement (750 – 1,700 cfs)
Yuba River	
Minimum flow below Daguerre Point Dam	D-1644 Operations (Lower Yuba River Accord)[14]
American River	
Minimum flow below Nimbus Dam	American River Flow Management as required by NMFS BO (Jun 2009) Action II.1[17]
Minimum flow at H Street Bridge	SWRCB D-893
Lower Sacramento River	
Minimum flow near Rio Vista	SWRCB D-1641
Mokelumne River	
Minimum flow below Camanche Dam	Federal Energy Regulatory Commission 2916-029[12], 1996 (Joint Settlement Agreement) (100 – 325 cfs)
Minimum flow below Woodbridge Diversion Dam	Federal Energy Regulatory Commission 2916-029, 1996 (Joint Settlement Agreement) (25 – 300 cfs)
Stanislaus River	
Minimum flow below Goodwin Dam	1987 Reclamation, DFG agreement, and flows required for NMFS BO (Jun 2009) Action III.1.2 and III.1.3[17]
Minimum dissolved oxygen	SWRCB D-1422

	ELT Assumptions[1]
Merced River	
Minimum flow below Crocker-Huffman Diversion Dam	Davis-Grunsky (180 – 220 cfs, Nov – Mar), and Cowell Agreement
Minimum flow at Shaffer Bridge	Federal Energy Regulatory Commission 2179 (25 – 100 cfs)
Tuolumne River	
Minimum flow at Lagrange Bridge	Federal Energy Regulatory Commission 2299-024, 1995 (Settlement Agreement) (94 – 301 TAF/yr)
Updated Tuolumne River	New Don Pedro operations
San Joaquin River	
San Joaquin River below Friant Dam/Mendota Pool	Full San Joaquin River Restoration flows
Maximum salinity near Vernalis	SWRCB D-1641
Minimum flow near Vernalis	SWRCB D1641. VAMP is turned off since the San Joaquin River Agreement has expired.[16] NMFS BO (Jun 2009) Action IV.2.1 Phase II flows not provided due to lack of agreement for purchasing water
Sacramento-San Joaquin Delta	
Delta Outflow Index (flow and salinity)	SWRCB D-1641 and FWS BO (Dec 2008) Action 4[17]
Delta Cross Channel gate operation	SWRCB D-1641 with additional days closed from Oct 1-Jan 31 based on NMFS BO (Jun 2009) Action IV.1.2[17] (closed during flushing flows from Oct 1-Dec 14 unless adverse water quality conditions)
South Delta exports (Jones PP and Banks PP)	SWRCB D-1641 export limits as required by NMFS BO (June 2009) Action IV.2.1 Phase II[17] (additional 500 cfs allowed for Jul-Sep for reducing impact on SWP)[19]
Combined Flow in Old and Middle River (OMR)	FWS BO (Dec 2008) Actions 1-3 and NMFS BO (Jun 2009) Action IV.2.3[17]
OPERATIONS CRITERIA: RIVER-SPECIFIC	
Upper Sacramento River	
Flow objective for navigation (Wilkins Slough)	NMFS BO (Jun 2009) Action I.4[17]; 3,250 – 5,000 cfs based on CVP water supply condition
American River	
Folsom Dam flood control	Variable 400/670 flood control diagram (without outlet modifications)
Feather River	
Flow at mouth of Feather River (above Verona)	Maintain the DFG/DWR flow target of 2,800 cfs for Apr - Sep dependent on Oroville inflow and FRSA allocation
Stanislaus River	
Flow below Goodwin Dam	Revised Operations Plan and NMFS BO (Jun 2009) Action III.1.2 and III.1.3[17]

	ELT Assumptions[1]
San Joaquin River	
Salinity at Vernalis	Grasslands Bypass Project (full implementation)
OPERATIONS CRITERIA: SYSTEMWIDE	
CVP Water Allocation	
CVP settlement and exchange	100% (75% in Shasta critical years)
CVP refuges	100% (75% in Shasta critical years)
CVP agriculture	100% - 0% based on supply. South-of-Delta allocations are additionally limited due to D-1641, FWS BO (Dec 2008), and NMFS BO (Jun 2009) export restrictions[17]
CVP municipal & industrial	100% - 50% based on supply. South-of-Delta allocations are additionally limited due to D-1641, FWS BO (Dec 2008), and NMFS BO (Jun 2009) export restrictions[17]
SWP Water Allocation	
North of Delta (FRSA)	Contract-specific NOD Allocation Settlement Agreement terms for Butte and Yuba [15]
South of Delta (including North Bay Aqueduct)	Based on supply; equal prioritization between Ag and M&I based on Monterey Agreement; allocations are limited due to D-1641, FWS BO (Dec 2008), and NMFS BO (Jun 2009) export restrictions[17] NOD Allocation Settlement Agreement terms for Napa and Solano [15]
CVP/SWP Coordinated Operations	
Sharing of responsibility for in-basin use	1986 Coordinated Operations Agreement (FRWP and EBMUD 2/3 of the North Bay Aqueduct diversions are considered as Delta export, 1/3 of the North Bay Aqueduct diversion is considered as in-basin use)
Sharing of surplus flows	1986 Coordinated Operations Agreement
Sharing of restricted export capacity for project-specific priority pumping	Equal sharing of export capacity under SWRCB D-1641, FWS BO (Dec 2008), and NMFS BO (Jun 2009) export restrictions[17]
Water transfers	Acquisitions by SWP contractors are wheeled at priority in Banks Pumping Plant over non-SWP users; LYRA included for SWP contractors[19]
Sharing of export capacity for lesser priority and wheeling-related pumping	Cross Valley Canal wheeling (max of 128 TAF/yr), CALFED ROD defined Joint Point of Diversion (JPOD)
San Luis Reservoir	San Luis Reservoir is allowed to operate to a minimum storage of 100 TAF
CVPIA 3406(b)(2)	
Policy decision	Per May 2003 Department of Interior decision
Allocation	800 TAF/yr, 700 TAF/yr in 40-30-30 dry years, and 600 TAF/yr in 40-30-30 critical years
Actions	Pre-determined non-discretionary FWS BO (Dec 2008) upstream fish flow objectives (Oct-Jan) for Clear Creek and Keswick Dam, non-discretionary NMFS BO

	ELT Assumptions[1]
	(Jun 2009) actions for the American and Stanislaus Rivers, and NMFS BO (Jun 2009) actions leading to export restrictions[17]
Accounting adjustments	No discretion assumed under FWS BO (Dec 2008) and NMFS BO (Jun 2009)[17], no accounting
WATER MANAGEMENT ACTIONS	
Water Transfer Supplies (long term programs)	
Lower Yuba River Accord[19]	Yuba River acquisitions for reducing impact of NMFS BO export restrictions[17] on SWP
Phase 8	None
Water Transfers (short term or temporary programs)	
Sacramento Valley acquisitions conveyed through Banks PP[21]	Post analysis of available capacity

Notes:

[1] These assumptions have been developed under the direction of the Department of Water Resources and Bureau of Reclamation management team for the BDCP HCP and EIR/EIS. Additional modifications were made by Reclamation for its October 2014 NEPA NAA baselines and by DWR for the 2015 DCR.

[2] The Sacramento Valley hydrology used in the Existing Condition CalSim-II model reflects 2020 land-use assumptions associated with Bulletin 160-98. The San Joaquin Valley hydrology reflects draft 2030 land-use assumptions developed by Reclamation to support Reclamation studies.

[3] CVP contract amounts have been reviewed and updated according to existing and amended contracts, as appropriate. Assumptions regarding CVP agricultural and M&I service contracts and Settlement Contract amounts are documented in the Delivery Specifications attachments to the BDCP CalSim assumptions document.

[4] SWP contract amounts have been updated as appropriate based on recent Table A transfers/agreements. Assumptions regarding SWP agricultural and M&I contract amounts are documented in the Delivery Specifications attachments to the BDCP CalSim assumptions document.

[5] Water needs for Federal refuges have been reviewed and updated, as appropriate. Assumptions regarding firm Level 2 refuge water needs are documented in the Delivery Specifications attachments to the BDCP CalSim assumptions document. Refuge Level 4 (and incremental Level 4) water is not included.

[6] Assumptions regarding American River water rights and CVP contracts are documented in the Delivery Specifications attachments to the BDCP CalSim assumptions document. The Sacramento Area Water Forum agreement, its dry year diversion reductions, Middle Fork Project operations and "mitigation" water is not included.

[7] Demand for rice straw decomposition water from Thermalito Afterbay was added to the model and updated to reflect historical diversion from Thermalito in the October through January period.

[8] The new CalSim-II representation of the San Joaquin River has been included in this model package (CalSim-II San Joaquin River Model, Reclamation, 2005). Updates to the San Joaquin River have been included since the preliminary model release in August 2005. The model reflects the difficulties of on-going groundwater overdraft problems. The 2030 level of development representation of the San Joaquin River Basin does not make any attempt to offer solutions to groundwater overdraft problems. In addition a dynamic groundwater simulation is not yet developed for the San Joaquin River Valley. Groundwater extraction/ recharge and stream-groundwater interaction are static assumptions and may not accurately reflect a response to simulated actions. These limitations should be considered in the analysis of result

[9] The CALSIM II model representation for the Stanislaus River does not necessarily represent Reclamation's current or future operational policies. A suitable plan for supporting flows has not been developed for NMFS BO (Jun 2009) Action III.1.3.

[10] The actual amount diverted is reduced because of supplies from the Los Vaqueros project. The existing Los Vaqueros storage capacity is 100 TAF, and future storage capacity is 160 TAF. Associated water rights for Delta excess flows are included.

[11] Under Existing Conditions and the Future No Action baseline, it is assumed that SWP Contractors can take delivery of all Table A allocations and Article 21 supplies. Article 56 provisions are assumed and allow for SWP Contractors to manage storage and delivery conditions such that full Table A allocations can be delivered. Article 21 deliveries are limited in wet years under the assumption that demand is decreased in these conditions. Article 21 deliveries for the NBA are dependent on excess conditions only, all other Article 21 deliveries also require that San Luis Reservoir be at capacity and that Banks PP and the California Aqueduct have available capacity to divert from the Delta for direct delivery.

[12] Mokelumne River flows reflect EBMUD supplies associated with the Freeport Regional Water Project.

[13] The CCWD Alternate Intake Project, an intake at Victoria Canal, which operates as an alternate Delta diversion for Los Vaqueros Reservoir.

[14] D-1644 and the Lower Yuba River Accord are assumed to be implemented for Existing baselines. The Yuba River is not dynamically modeled in CALSIM II. Yuba River hydrology and availability of water acquisitions under the Lower Yuba River Accord are based on modeling performed and provided by the Lower Yuba River Accord EIS/EIR study team.

[15] This includes draft logic for the updated Allocation Settlement Agreement for four NOD contractors: Butte, Yuba, Napa and Solano.

[16] It is assumed that D-1641 requirements will be in place in 2030, and VAMP is turned off.

[17] In cooperation with Reclamation, National Marine Fisheries Service, Fish and Wildlife Service, and CA Department of Fish and Game, the CA Department of Water Resources has developed assumptions for implementation of the FWS BO (Dec 15th 2008) and NMFS BO (June 4th 2009) in CALSIM II.

[18] Current ACOE permit for Banks PP allows for an average diversion rate of 6,680 cfs in all months. Diversion rate can increase up to 1/3 of the rate of San Joaquin River flow at Vernalis during Dec 15th – Mar 15th up to a maximum diversion of 8,500 cfs, if Vernalis flow exceeds 1,000 cfs.

[19] Acquisitions of Component 1 water under the Lower Yuba River Accord, and use of 500 cfs dedicated capacity at Banks PP during Jul – Sep, are assumed to be used to reduce as much of the impact of the Apr-May Delta export actions on SWP contractors as possible.

[20] Delta actions, under USFWS discretionary use of CVPIA 3406(b)(2) allocations, are no longer dynamically operated and accounted for in the CALSIM II model. The Combined Old and Middle River Flow and Delta Export restrictions under the FWS BO (Dec 15th 2008) and the NMFS BO (June 4th 2009) severely limit any discretion that would have been otherwise assumed in selecting Delta actions under the CVPIA 3406(b)(2) accounting criteria. Therefore, it is anticipated that CVPIA 3406(b)(2) account availability for upstream river flows below Whiskeytown, Keswick and Nimbus Dams would be very limited. It appears the integration of BO RPA actions will likely exceed the 3406(b)(2) allocation in all water year types. For these baseline simulations, upstream flows on the Clear Creek and Sacramento River are pre-determined based on CVPIA 3406(b)(2) based operations from the Aug 2008 BA Study 7.0 and Study 8.0 for Existing and Future No Action baselines respectively. The procedures for dynamic operation and accounting of CVPIA 3406(b)(2) are not included in the CALSIM II model.

[21] Only acquisitions of Lower Yuba River Accord Component 1 water are included.

Key:

ACOE = Army Corps of Engineers
Ag = agricultural
BDCP = Bay-Delta Conservation Plan
BO = Biological Opinion
CALFED = CALFED Bay-Delta Program
CCWD = Contra Costa Water District
cfs = cubic feet per second
CVP = Central Valley Project
CVPIA = Central Valley Project Improvement Act
D-xxxx = Water Right Decision
DFG = California Department of Fish and Game
DMC = Delta-Mendota canal
DWR = California Department of Water Resources
EBMUD = East Bay Municipal Utility District
EIS = Environmental Impact Statement
ELT = Early Long-Term
FC&WSD = Flood Control and Water Service District
FERC = Federal Energy Regulatory Commission
FRSA = Feather River Service Area
FRWP = Freeport Regional Water Project
FWS = Fish and Wildlife Service
KCWA = Kern County Water Agency
LOD = Level of Development
LYRA = Lower Yuba River Accord
MAF/yr = million acre-feet per year
M&I = municipal and industrial
MWD = Metropolitan Water District
NAA = No Action Alternative
NEPA = National Environmental Policy Act
NMFS = National Marine Fisheries Service
NPS = National Park Service
PCWA = Placer County Water Agency
PP = Pumping Plant
Reclamation = United States Department of the Interior, Bureau of Reclamation
ROD = Record of Decision
SBA = South Bay Aqueduct
SLR = Sea Level Rise
SWP = State Water Project
SWRCB = State Water Resources Control Board
TAF = thousand acre-feet
TAF/month = thousand acre-feet per month
TAF/yr = thousand acre-feet per year
USFWS = United States Fish and Wildlife Service
VAMP = Vernalis Adaptive Management Plan
WR = water right
yr = year

Simulation Results for 2015 DCR ELT

The deliveries shown in this report only include those State Water Contractors that rely on delivery of water from the Sacramento-San Joaquin Delta; therefore, State Water Contractors in the Feather River area and upstream (i.e., Butte County, Plumas County Flood Control and Water Conservation District, and Yuba City) are excluded from this analysis. This section of the appendix presents results for the 2015 DCR ELT scenario.

SWP Table A Deliveries

Figure C.1 shows the comparison of SWP Table A delivery exceedence curves between the 2015 DCR Existing Conditions and 2015 DCR ELT studies. The Table A deliveries for State Water Contractors for 2015 DCR ELT scenario are shown in Table C.2 on the following page. The results for individual Contractor Table A deliveries are included at the end of this appendix.

Figure C.1. Comparison of SWP Table A delivery probability between 2015 DCR Existing Conditions and 2015 DCR ELT

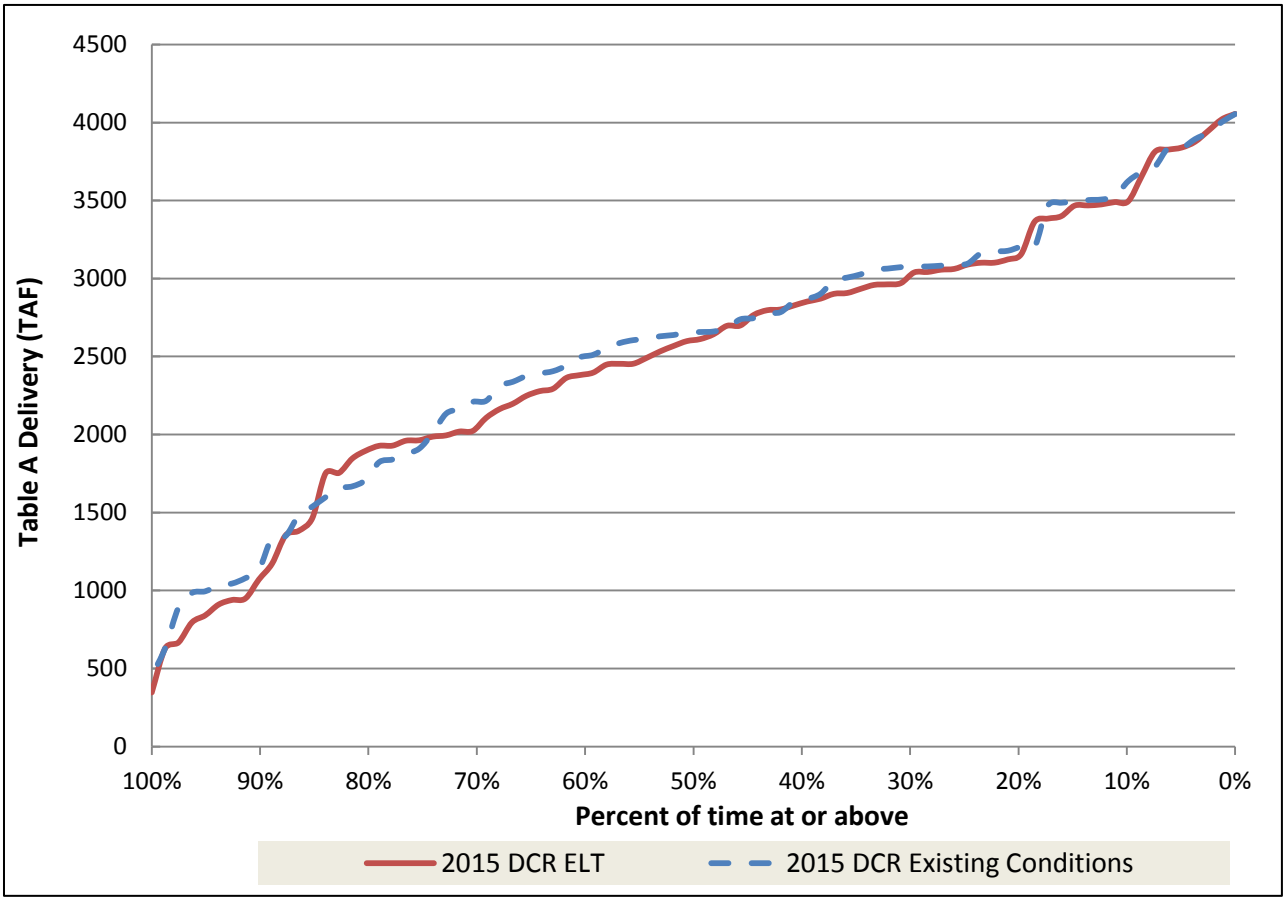


Table C.2. SWP Table A Deliveries for 2015 DCR ELT

Year	SWP Table A Demands	SWP Table A Delivery		Probability Curve (percent of time at or above given value)			
		Annual Volume (TAF)	Percent of Maximum SWP Table A	Year	SWP Table A Delivery (TAF)	Exceedance Frequency	Percent of Maximum SWP Table A
1922	4,133	2,853	69%	1983	4,056	0%	98%
1923	4,133	2,697	65%	1938	4,020	1%	97%
1924	4,133	795	19%	1980	3,948	2%	96%
1925	4,133	1,961	47%	1952	3,877	4%	94%
1926	4,133	2,023	49%	1969	3,839	5%	93%
1927	4,133	2,612	63%	1982	3,826	6%	93%
1928	4,133	3,089	75%	1998	3,812	7%	92%
1929	4,133	940	23%	1958	3,654	9%	88%
1930	4,133	1,963	48%	1941	3,495	10%	85%
1931	4,133	841	20%	1997	3,490	11%	84%
1932	4,133	1,929	47%	1967	3,475	12%	84%
1933	4,133	1,463	35%	1956	3,469	14%	84%
1934	4,133	1,173	28%	1984	3,467	15%	84%
1935	4,133	2,599	63%	1995	3,400	16%	82%
1936	4,133	2,970	72%	1943	3,384	17%	82%
1937	4,133	3,042	74%	1978	3,363	19%	81%
1938	4,133	4,020	97%	1986	3,156	20%	76%
1939	4,133	1,754	42%	1974	3,123	21%	76%
1940	4,133	2,643	64%	1951	3,102	22%	75%
1941	4,133	3,495	85%	1979	3,101	23%	75%
1942	4,133	2,959	72%	1928	3,089	25%	75%
1943	4,133	3,384	82%	1970	3,062	26%	74%
1944	4,133	1,847	45%	1973	3,057	27%	74%
1945	4,133	2,902	70%	1937	3,042	28%	74%
1946	4,133	2,907	70%	1996	3,039	30%	74%
1947	4,133	2,248	54%	1936	2,970	31%	72%
1948	4,133	2,163	52%	1975	2,963	32%	72%
1949	4,133	1,752	42%	1942	2,959	33%	72%
1950	4,133	2,293	55%	2000	2,934	35%	71%
1951	4,133	3,102	75%	1946	2,907	36%	70%
1952	4,133	3,877	94%	1945	2,902	37%	70%
1953	4,133	2,397	58%	1999	2,871	38%	69%
1954	4,133	2,567	62%	1922	2,853	40%	69%
1955	4,133	1,928	47%	1985	2,827	41%	68%
1956	4,133	3,469	84%	1966	2,801	42%	68%
1957	4,133	2,363	57%	1971	2,797	43%	68%
1958	4,133	3,654	88%	1965	2,766	44%	67%
1959	4,133	2,198	53%	1963	2,699	46%	65%
1960	4,133	1,986	48%	1923	2,697	47%	65%
1961	4,133	1,383	33%	1940	2,643	48%	64%
1962	4,133	2,454	59%	1927	2,612	49%	63%
1963	4,133	2,699	65%	1935	2,599	51%	63%
1964	4,133	2,448	59%	1954	2,567	52%	62%

Year	SWP Table A Demands	SWP Table A Delivery		Probability Curve (percent of time at or above given value)			
		Annual Volume (TAF)	Percent of Maximum SWP Table A	Year	SWP Table A Delivery (TAF)	Exceedance Frequency	Percent of Maximum SWP Table A
1965	4,133	2,766	67%	1993	2,533	53%	61%
1966	4,133	2,801	68%	2003	2,491	54%	60%
1967	4,133	3,475	84%	1962	2,454	56%	59%
1968	4,133	2,381	58%	1989	2,453	57%	59%
1969	4,133	3,839	93%	1964	2,448	58%	59%
1970	4,133	3,062	74%	1953	2,397	59%	58%
1971	4,133	2,797	68%	1968	2,381	60%	58%
1972	4,133	2,278	55%	1957	2,363	62%	57%
1973	4,133	3,057	74%	1950	2,293	63%	55%
1974	4,133	3,123	76%	1972	2,278	64%	55%
1975	4,133	2,963	72%	1947	2,248	65%	54%
1976	4,133	2,019	49%	1959	2,198	67%	53%
1977	4,133	347	8%	1948	2,163	68%	52%
1978	4,133	3,363	81%	2002	2,107	69%	51%
1979	4,133	3,101	75%	1926	2,023	70%	49%
1980	4,133	3,948	96%	1976	2,019	72%	49%
1981	4,133	1,995	48%	1981	1,995	73%	48%
1982	4,133	3,826	93%	1960	1,986	74%	48%
1983	4,133	4,056	98%	1930	1,963	75%	48%
1984	4,133	3,467	84%	1925	1,961	77%	47%
1985	4,133	2,827	68%	1932	1,929	78%	47%
1986	4,133	3,156	76%	1955	1,928	79%	47%
1987	4,133	1,070	26%	1994	1,896	80%	46%
1988	4,133	629	15%	1944	1,847	81%	45%
1989	4,133	2,453	59%	1939	1,754	83%	42%
1990	4,133	949	23%	1949	1,752	84%	42%
1991	4,133	667	16%	1933	1,463	85%	35%
1992	4,133	910	22%	1961	1,383	86%	33%
1993	4,133	2,533	61%	2001	1,353	88%	33%
1994	4,133	1,896	46%	1934	1,173	89%	28%
1995	4,133	3,400	82%	1987	1,070	90%	26%
1996	4,133	3,039	74%	1990	949	91%	23%
1997	4,133	3,490	84%	1929	940	93%	23%
1998	4,133	3,812	92%	1992	910	94%	22%
1999	4,133	2,871	69%	1931	841	95%	20%
2000	4,133	2,934	71%	1924	795	96%	19%
2001	4,133	1,353	33%	1991	667	98%	16%
2002	4,133	2,107	51%	1988	629	99%	15%
2003	4,133	2,491	60%	1977	347	100%	8%
Average	**4,133**	**2,501**	**61%**	**Average**	**2,501**		**61%**
Minimum	**4,133**	**347**	**8%**	**Minimum**	**347**		**8%**
Maximum	**4,133**	**4,056**	**98%**	**Maximum**	**4,056**		**98%**

Article 21 Deliveries

Table C.3 below shows the State Water Contractors' Article 21 deliveries for the 2015 DCR ELT scenario.

Table C.3. Article 21 Deliveries for 2015 DCR ELT

SWP Table Article 21 Deliveries (TAF)													
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
1921										0	0	2	**2**
1922	2	2	2	2	0	0	0	0	0	0	0	2	**10**
1923	2	0	2	2	1	0	2	0	0	0	0	0	**9**
1924	2	2	0	0	0	0	0	0	0	0	2	2	**8**
1925	2	2	2	2	2	0	0	2	0	0	0	0	**12**
1926	2	2	0	2	0	0	0	2	0	0	2	2	**12**
1927	2	2	2	2	0	0	2	0	0	0	0	2	**12**
1928	2	2	2	2	0	1	2	0	0	0	0	1	**12**
1929	2	2	2	2	0	0	0	2	0	0	0	2	**12**
1930	2	2	2	2	0	0	0	2	0	0	0	0	**10**
1931	2	2	0	0	0	0	0	2	0	0	0	2	**8**
1932	2	2	104	2	2	0	0	0	0	2	0	2	**116**
1933	2	2	2	2	2	0	0	2	0	0	0	2	**14**
1934	2	2	0	0	0	0	0	2	0	0	2	2	**10**
1935	2	2	2	2	2	0	0	2	0	0	0	0	**12**
1936	2	2	2	2	1	0	2	0	0	0	0	0	**11**
1937	2	2	182	2	2	0	0	0	0	0	2	2	**194**
1938	2	2	158	2	0	0	0	0	0	0	0	2	**166**
1939	2	2	2	0	1	1	2	0	0	0	0	0	**11**
1940	2	2	2	2	0	0	2	0	0	0	0	2	**12**
1941	2	2	2	2	0	0	0	2	0	0	0	2	**12**
1942	2	2	2	2	0	0	0	0	0	0	0	2	**10**
1943	2	2	2	2	0	0	2	0	0	0	0	0	**10**
1944	2	2	2	2	2	0	0	2	0	0	2	2	**16**
1945	2	2	103	2	1	0	0	0	0	0	2	2	**114**
1946	2	2	2	2	0	0	2	0	0	0	0	2	**12**
1947	2	2	2	2	2	0	0	2	0	0	0	0	**12**
1948	2	0	2	2	1	1	0	2	0	0	0	2	**12**
1949	2	2	2	2	2	0	0	2	0	0	0	0	**12**
1950	2	2	2	2	0	0	0	2	0	0	2	2	**14**
1951	93	237	208	2	0	0	2	0	0	0	0	2	**544**
1952	2	2	2	2	0	0	0	0	0	0	0	2	**10**
1953	2	2	2	2	0	0	0	2	0	0	0	0	**10**
1954	2	2	2	2	0	0	2	0	0	0	0	2	**12**
1955	2	2	2	2	2	0	0	2	0	0	0	2	**14**
1956	2	234	210	2	0	0	0	0	0	0	0	2	**450**
1957	2	2	2	2	0	0	2	0	0	0	0	2	**12**
1958	2	2	94	2	0	0	0	0	0	0	0	2	**103**
1959	2	2	2	2	0	1	2	0	0	0	0	0	**11**
1960	2	2	2	0	2	0	2	0	0	0	2	2	**14**
1961	2	2	2	0	2	1	0	2	0	0	2	2	**15**
1962	0	2	2	2	0	0	2	0	0	1	1	2	**12**
1963	2	2	2	2	0	0	2	0	0	0	0	2	**12**

SWP Table Article 21 Deliveries (TAF)													
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
1964	2	2	2	2	2	2	0	2	0	0	2	2	**18**
1965	2	2	2	2	0	0	1	0	0	0	0	2	**11**
1966	2	2	2	2	0	0	2	0	0	0	2	2	**14**
1967	2	2	2	2	0	0	0	0	0	0	0	2	**10**
1968	2	2	2	2	1	1	2	0	0	0	2	2	**17**
1969	2	73	81	2	0	0	2	0	0	0	0	2	**162**
1970	2	2	2	2	0	0	2	0	0	0	2	2	**14**
1971	2	2	2	2	0	0	2	2	0	0	0	2	**14**
1972	2	2	2	2	0	1	2	0	0	0	2	2	**15**
1973	2	108	157	2	0	0	2	0	0	0	2	2	**275**
1974	2	2	2	2	0	0	2	0	0	0	0	2	**12**
1975	2	2	2	2	0	0	0	0	0	0	0	2	**10**
1976	2	2	2	2	2	2	0	2	0	0	0	2	**16**
1977	2	0	0	0	0	0	0	0	0	0	0	2	**4**
1978	2	2	2	2	0	0	0	0	0	0	0	2	**10**
1979	2	2	24	2	2	0	0	0	0	2	2	2	**38**
1980	2	2	31	2	0	0	0	0	0	0	0	2	**39**
1981	2	2	2	2	2	0	0	2	0	2	2	2	**18**
1982	2	2	2	60	0	0	0	0	0	0	2	2	**70**
1983	2	2	67	2	0	0	2	0	0	0	64	146	**285**
1984	166	226	212	2	0	0	2	0	0	0	2	2	**611**
1985	2	2	2	2	0	1	2	0	0	0	0	2	**13**
1986	2	2	2	2	0	0	2	0	0	0	0	0	**10**
1987	2	2	2	0	2	0	0	2	0	0	0	2	**12**
1988	2	0	0	2	0	0	0	2	0	0	2	2	**10**
1989	2	0	2	2	0	0	2	2	2	0	0	0	**12**
1990	2	2	2	0	2	0	0	2	0	0	0	2	**12**
1991	2	2	2	2	2	0	0	2	0	0	0	2	**14**
1992	2	2	2	2	0	0	0	2	0	0	0	2	**12**
1993	2	2	2	2	0	0	0	0	0	0	0	2	**11**
1994	2	2	2	2	2	2	0	2	0	0	0	2	**16**
1995	2	2	2	2	0	0	0	0	0	0	0	2	**10**
1996	2	2	2	2	0	0	2	0	0	0	0	2	**12**
1997	2	2	49	2	0	0	2	0	0	0	0	2	**59**
1998	2	2	2	2	0	0	0	0	0	0	2	2	**12**
1999	2	2	2	2	0	0	2	0	0	0	0	2	**12**
2000	2	2	2	2	0	0	2	0	0	0	0	0	**10**
2001	2	2	2	2	2	0	0	2	0	0	2	2	**16**
2002	2	2	2	2	2	0	2	2	0	0	0	2	**16**
2003	2	2	2	2	0	0	2	2	0				**13**
Average	**5**	**12**	**22**	**2**	**1**	**0**	**1**	**1**	**0**	**0**	**1**	**3**	**49**
Minimum	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**
Maximum	**166**	**237**	**212**	**60**	**2**	**2**	**2**	**2**	**2**	**2**	**64**	**146**	**611**

SWP Exports from the Sacramento-San Joaquin Delta

Table C.4 below shows the SWP Exports from the Delta for the 2015 DCR ELT scenario.

Table C.4. SWP Exports for 2015 DCR ELT

SWP Exports from the Delta (TAF)													
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
1921										116	188	443	**747**
1922	220	186	287	74	69	332	411	411	393	168	127	266	**2,943**
1923	280	195	161	69	43	99	408	411	397	222	203	204	**2,694**
1924	169	121	18	18	18	6	18	18	22	172	207	190	**979**
1925	197	92	243	71	58	160	348	59	184	144	184	217	**1,958**
1926	198	96	18	135	132	97	380	18	147	128	397	230	**1,977**
1927	146	218	227	54	43	128	399	411	397	268	323	438	**3,051**
1928	213	125	223	66	43	104	359	411	397	117	160	324	**2,543**
1929	203	182	158	79	18	11	18	18	40	67	76	168	**1,039**
1930	147	137	155	56	61	120	411	194	358	125	163	136	**2,063**
1931	201	155	51	18	18	18	18	18	23	96	110	446	**1,173**
1932	219	384	221	42	43	40	256	156	130	120	167	167	**1,946**
1933	233	327	110	54	55	18	18	18	34	81	98	238	**1,284**
1934	390	274	63	18	18	18	18	18	78	129	204	230	**1,460**
1935	212	167	174	61	43	199	411	360	397	216	207	243	**2,691**
1936	134	485	360	59	43	119	411	411	397	330	174	250	**3,172**
1937	89	472	465	95	67	299	384	149	163	195	397	415	**3,191**
1938	459	472	426	155	380	306	411	411	386	169	64	437	**4,075**
1939	210	191	102	42	43	18	125	26	124	143	111	252	**1,389**
1940	159	189	416	85	43	162	350	411	397	213	125	276	**2,827**
1941	264	472	465	92	102	182	411	410	379	154	63	296	**3,289**
1942	371	312	338	83	89	223	411	411	389	187	80	243	**3,136**
1943	413	339	465	88	50	78	349	411	389	189	76	273	**3,119**
1944	209	211	151	54	43	133	411	18	151	151	397	232	**2,161**
1945	213	292	465	67	43	116	411	405	255	289	208	331	**3,095**
1946	254	305	349	54	43	118	374	411	397	211	150	446	**3,112**
1947	216	193	82	96	87	98	139	18	150	258	222	163	**1,722**
1948	125	32	156	61	43	159	411	411	397	223	216	245	**2,480**
1949	198	184	119	52	43	103	212	18	171	91	139	144	**1,474**
1950	133	148	211	69	47	110	411	267	397	368	397	472	**3,034**
1951	523	345	362	79	43	104	342	411	397	217	319	236	**3,377**
1952	311	230	461	114	157	278	411	411	397	176	68	438	**3,453**
1953	177	218	237	55	47	115	411	410	397	153	49	295	**2,563**
1954	128	139	212	52	43	156	333	411	397	225	258	433	**2,787**
1955	221	183	147	161	82	18	192	45	181	152	298	472	**2,152**
1956	523	358	387	62	65	238	411	411	395	169	29	434	**3,481**
1957	203	104	162	56	43	94	385	411	397	362	205	228	**2,650**
1958	159	237	465	152	110	257	411	411	397	199	66	436	**3,299**
1959	135	164	214	64	43	18	411	411	302	150	152	162	**2,226**
1960	200	128	149	18	66	90	411	163	156	124	228	192	**1,925**
1961	204	112	152	44	47	10	272	18	147	65	153	165	**1,390**
1962	160	189	235	62	43	93	411	411	397	411	397	219	**3,029**
1963	149	173	220	55	43	141	374	411	397	229	333	324	**2,850**
1964	208	179	147	18	45	18	411	18	129	138	177	269	**1,757**
1965	396	272	327	78	43	122	402	411	397	144	328	470	**3,389**

SWP Exports from the Delta (TAF)													
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
1966	251	221	185	59	43	99	386	296	152	148	214	240	**2,294**
1967	233	201	310	128	134	362	411	411	397	189	92	434	**3,301**
1968	210	129	219	55	43	98	408	411	397	221	244	434	**2,870**
1969	443	239	223	235	339	397	410	411	397	198	37	248	**3,576**
1970	523	314	316	42	43	109	411	411	394	50	397	244	**3,254**
1971	204	191	221	60	43	154	411	393	397	163	29	434	**2,701**
1972	196	101	143	161	103	96	411	390	185	259	397	234	**2,677**
1973	185	254	317	61	43	170	411	411	397	347	397	271	**3,265**
1974	276	220	261	70	43	144	410	411	397	205	21	440	**2,899**
1975	208	180	331	62	43	197	411	411	397	312	18	434	**3,003**
1976	202	186	181	72	48	16	288	53	91	112	125	118	**1,492**
1977	135	94	45	18	18	4	18	18	94	42	121	210	**818**
1978	209	300	315	107	107	216	411	411	397	237	181	438	**3,329**
1979	253	300	285	56	65	124	411	118	397	262	233	436	**2,941**
1980	475	485	298	67	77	225	411	411	397	258	124	435	**3,664**
1981	210	188	150	53	43	96	365	46	150	152	397	227	**2,077**
1982	259	457	465	364	150	235	411	411	397	411	397	472	**4,429**
1983	523	183	191	200	249	305	332	411	397	372	397	453	**4,014**
1984	377	358	387	60	43	121	397	411	390	247	397	433	**3,622**
1985	210	196	174	66	52	99	303	206	201	175	311	256	**2,249**
1986	132	472	465	111	84	174	411	411	389	229	40	228	**3,147**
1987	203	186	144	20	102	30	18	18	101	27	55	199	**1,105**
1988	146	17	107	56	51	18	37	18	79	23	237	196	**986**
1989	195	70	74	65	48	145	409	221	392	280	179	102	**2,180**
1990	190	172	62	18	56	13	157	18	111	64	80	56	**998**
1991	61	86	79	52	51	94	65	18	38	90	67	95	**797**
1992	138	99	148	42	43	95	18	18	99	18	36	197	**952**
1993	217	238	243	42	43	193	411	411	397	240	91	380	**2,905**
1994	197	185	126	37	61	12	251	38	202	109	169	189	**1,576**
1995	213	202	465	112	380	361	411	411	397	187	44	228	**3,410**
1996	179	485	400	72	52	102	410	411	397	130	120	472	**3,231**
1997	523	472	465	51	48	138	309	411	397	163	132	434	**3,543**
1998	195	472	465	114	131	397	411	411	397	194	397	242	**3,828**
1999	246	419	298	55	43	138	411	411	397	169	18	431	**3,036**
2000	139	349	362	52	43	160	345	411	397	173	92	255	**2,777**
2001	213	168	174	93	92	76	18	34	174	18	197	242	**1,501**
2002	164	185	160	42	43	100	386	60	186	93	156	237	**1,812**
2003	187	187	206	62	43	48	372	410	397				**2,659**
Average	**235**	**235**	**244**	**75**	**72**	**133**	**324**	**269**	**290**	**181**	**187**	**296**	**2,541**
Minimum	**61**	**17**	**18**	**18**	**18**	**4**	**18**	**18**	**22**	**18**	**18**	**56**	**797**
Maximum	**523**	**485**	**465**	**364**	**380**	**397**	**411**	**411**	**397**	**411**	**397**	**472**	**4,429**

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Individual Contractor Table A Deliveries - 2015 DCR ELT

The tables on the following pages show the Table A deliveries for each State Water Contractor for the 2015 DCR ELT scenario.

Table C.5. Alameda County FC&WCD-Zone 7: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	57	0	57	71%	1983	80	0%	100%
1923	48	2	50	62%	1938	80	1%	99%
1924	15	1	16	20%	1980	80	2%	99%
1925	37	0	37	46%	1958	80	4%	99%
1926	38	1	39	49%	1982	79	5%	98%
1927	51	1	52	64%	1969	79	6%	98%
1928	60	1	61	76%	1952	78	7%	96%
1929	15	2	16	20%	1998	75	9%	94%
1930	37	0	37	46%	1943	74	10%	92%
1931	16	1	17	22%	1995	72	11%	89%
1932	37	0	37	46%	1967	70	12%	87%
1933	29	1	30	37%	1956	70	14%	87%
1934	23	0	23	29%	1941	69	15%	86%
1935	51	0	51	63%	1984	69	16%	85%
1936	58	1	59	73%	1997	68	17%	85%
1937	58	2	60	74%	1978	68	19%	84%
1938	78	2	80	99%	1986	67	20%	84%
1939	35	2	37	46%	1951	63	21%	78%
1940	52	1	53	66%	1973	62	22%	77%
1941	68	1	69	86%	1928	61	23%	76%
1942	58	1	60	74%	1979	61	25%	75%
1943	73	2	74	92%	1974	61	26%	75%
1944	32	2	34	42%	1942	60	27%	74%
1945	58	1	59	73%	1937	60	28%	74%
1946	55	2	56	70%	1936	59	30%	73%
1947	42	2	44	54%	1996	59	31%	73%
1948	41	1	42	52%	1970	59	32%	73%
1949	33	1	34	43%	1945	59	33%	73%
1950	44	1	44	55%	2000	58	35%	71%
1951	62	1	63	78%	1975	57	36%	71%
1952	76	2	78	96%	1922	57	37%	71%
1953	41	2	43	53%	1946	56	38%	70%
1954	50	1	51	63%	1985	56	40%	70%
1955	35	1	37	45%	1965	56	41%	69%
1956	70	0	70	87%	1963	55	42%	68%
1957	40	2	42	52%	1999	54	43%	67%
1958	78	1	80	99%	1966	54	44%	67%
1959	37	2	39	48%	1971	53	46%	66%
1960	39	1	40	50%	1940	53	47%	66%
1961	32	1	33	41%	1927	52	48%	64%
1962	46	1	47	58%	1935	51	49%	63%
1963	54	1	55	68%	1954	51	51%	63%
1964	49	2	50	62%	2002	51	52%	63%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	54	1	56	69%	1964	50	53%	62%
1966	52	2	54	67%	1923	50	54%	62%
1967	69	1	70	87%	2003	50	56%	62%
1968	43	2	45	55%	1993	49	57%	60%
1969	78	1	79	98%	1989	48	58%	60%
1970	57	2	59	73%	1962	47	59%	58%
1971	51	2	53	66%	1968	45	60%	55%
1972	41	1	42	52%	1950	44	62%	55%
1973	61	1	62	77%	1947	44	63%	54%
1974	59	2	61	75%	1953	43	64%	53%
1975	56	2	57	71%	1994	42	65%	52%
1976	35	2	37	46%	1957	42	67%	52%
1977	6	1	7	9%	1972	42	68%	52%
1978	68	0	68	84%	1948	42	69%	52%
1979	59	2	61	75%	1960	40	70%	50%
1980	78	2	80	99%	1926	39	72%	49%
1981	34	2	36	45%	1959	39	73%	48%
1982	78	1	79	98%	1930	37	74%	46%
1983	78	2	80	100%	1925	37	75%	46%
1984	68	1	69	85%	1939	37	77%	46%
1985	54	2	56	70%	1932	37	78%	46%
1986	66	2	67	84%	1976	37	79%	46%
1987	18	2	19	24%	1955	37	80%	45%
1988	12	0	12	15%	1981	36	81%	45%
1989	48	0	48	60%	1949	34	83%	43%
1990	22	1	23	28%	1944	34	84%	42%
1991	13	0	13	16%	1961	33	85%	41%
1992	19	0	19	24%	1933	30	86%	37%
1993	49	0	49	60%	2001	24	88%	30%
1994	41	1	42	52%	1934	23	89%	29%
1995	72	1	72	89%	1990	23	90%	28%
1996	57	2	59	73%	1987	19	91%	24%
1997	67	2	68	85%	1992	19	93%	24%
1998	74	2	75	94%	1931	17	94%	22%
1999	52	2	54	67%	1929	16	95%	20%
2000	56	1	58	71%	1924	16	96%	20%
2001	23	2	24	30%	1991	13	98%	16%
2002	51	0	51	63%	1988	12	99%	15%
2003	48	1	50	62%	1977	7	100%	9%
Average	**48**	**1**	**50**	**62%**		**50**		**62%**
Maximum	**78**	**2**	**80**	**100%**		**80**		**100%**
Minimum	**6**	**0**	**7**	**9%**		**7**		**9%**

Table C.6. Alameda County WD: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	31	0	31	73%	1969	42	0%	100%
1923	26	0	26	62%	1969	42	1%	100%
1924	8	0	8	18%	1938	42	2%	100%
1925	20	0	20	47%	1938	42	4%	100%
1926	21	0	21	49%	1938	42	5%	100%
1927	27	0	27	65%	1980	42	6%	100%
1928	32	0	32	76%	1952	41	7%	97%
1929	8	0	8	18%	1998	39	9%	94%
1930	20	0	20	47%	1943	39	10%	92%
1931	9	0	9	20%	1995	38	11%	91%
1932	20	0	20	47%	1956	37	12%	89%
1933	15	0	15	36%	1967	37	14%	88%
1934	12	0	12	29%	1941	36	15%	86%
1935	27	0	27	65%	1984	36	16%	86%
1936	31	0	31	74%	1978	36	17%	86%
1937	31	0	31	74%	1997	36	19%	85%
1938	42	0	42	100%	1986	35	20%	84%
1939	19	0	19	44%	1951	33	21%	79%
1940	28	0	28	66%	1973	33	22%	78%
1941	36	0	36	86%	1928	32	23%	76%
1942	31	0	31	74%	1974	32	25%	75%
1943	39	0	39	92%	1979	31	26%	75%
1944	17	0	17	40%	1942	31	27%	74%
1945	31	0	31	74%	1945	31	28%	74%
1946	29	0	29	70%	1937	31	30%	74%
1947	23	0	23	54%	1936	31	31%	74%
1948	22	0	22	52%	1922	31	32%	73%
1949	18	0	18	42%	1996	31	33%	73%
1950	23	0	23	56%	1970	30	35%	72%
1951	33	0	33	79%	2000	30	36%	72%
1952	41	0	41	97%	1975	30	37%	71%
1953	22	0	22	52%	1946	29	38%	70%
1954	27	0	27	63%	1965	29	40%	69%
1955	19	0	19	45%	2003	29	41%	69%
1956	37	0	37	89%	1985	29	42%	69%
1957	22	0	22	51%	1963	29	43%	68%
1958	42	0	42	100%	1999	28	44%	67%
1959	20	0	20	47%	1966	28	46%	66%
1960	21	0	21	50%	1940	28	47%	66%
1961	17	0	17	40%	1971	28	48%	66%
1962	25	0	25	59%	1935	27	49%	65%
1963	29	0	29	68%	1927	27	51%	65%
1964	26	0	26	62%	2002	27	52%	65%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	29	0	29	69%	1954	27	53%	63%
1966	28	0	28	66%	1964	26	54%	62%
1967	37	0	37	88%	1993	26	56%	62%
1968	23	0	23	54%	1923	26	57%	62%
1969	42	0	42	100%	1989	26	58%	62%
1970	30	0	30	72%	1962	25	59%	59%
1971	28	0	28	66%	1950	23	60%	56%
1972	22	0	22	52%	1968	23	62%	54%
1973	33	0	33	78%	1947	23	63%	54%
1974	32	0	32	75%	1994	22	64%	52%
1975	30	0	30	71%	1972	22	65%	52%
1976	19	0	19	45%	1948	22	67%	52%
1977	3	0	3	8%	1953	22	68%	52%
1978	36	0	36	86%	1957	22	69%	51%
1979	31	0	31	75%	1960	21	70%	50%
1980	42	0	42	100%	1926	21	72%	49%
1981	18	0	18	43%	1930	20	73%	47%
1982	42	0	42	100%	1925	20	74%	47%
1983	42	0	42	100%	1932	20	75%	47%
1984	36	0	36	86%	1959	20	77%	47%
1985	29	0	29	69%	1976	19	78%	45%
1986	35	0	35	84%	1955	19	79%	45%
1987	9	0	9	22%	1939	19	80%	44%
1988	6	0	6	15%	1981	18	81%	43%
1989	26	0	26	62%	1949	18	83%	42%
1990	11	0	11	27%	1944	17	84%	40%
1991	7	0	7	16%	1961	17	85%	40%
1992	10	0	10	24%	1933	15	86%	36%
1993	26	0	26	62%	1934	12	88%	29%
1994	22	0	22	52%	2001	12	89%	28%
1995	38	0	38	91%	1990	11	90%	27%
1996	31	0	31	73%	1992	10	91%	24%
1997	36	0	36	85%	1987	9	93%	22%
1998	39	0	39	94%	1931	9	94%	20%
1999	28	0	28	67%	1929	8	95%	18%
2000	30	0	30	72%	1924	8	96%	18%
2001	12	0	12	28%	1991	7	98%	16%
2002	27	0	27	65%	1988	6	99%	15%
2003	29	0	29	69%	1977	3	100%	8%
Average	**26**	**0**	**26**	**62%**		**26**		**62%**
Maximum	**42**	**0**	**42**	**100%**		**42**		**100%**
Minimum	**3**	**0**	**3**	**8%**		**3**		**8%**

Table C.7. Antelope Valley-East Kern WA: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	103	0	103	73%	1938	141	0%	100%
1923	87	0	87	62%	1969	141	1%	100%
1924	25	0	25	18%	1969	141	2%	100%
1925	67	0	67	47%	1969	141	4%	100%
1926	69	0	69	49%	1980	141	5%	100%
1927	92	0	92	65%	1998	133	6%	94%
1928	108	0	108	76%	1958	129	7%	91%
1929	26	0	26	18%	1952	128	9%	91%
1930	67	0	67	47%	1956	126	10%	89%
1931	29	0	29	20%	1941	122	11%	86%
1932	67	0	67	47%	1984	122	12%	86%
1933	51	0	51	36%	1978	122	14%	86%
1934	40	0	40	29%	1943	121	15%	86%
1935	92	0	92	65%	1997	120	16%	85%
1936	104	0	104	74%	1967	117	17%	82%
1937	105	0	105	74%	1951	112	19%	79%
1938	141	0	141	100%	1973	110	20%	78%
1939	34	0	34	24%	1928	108	21%	76%
1940	94	0	94	66%	1974	106	22%	75%
1941	122	0	122	86%	1979	106	23%	75%
1942	105	0	105	74%	1942	105	25%	74%
1943	121	0	121	86%	1945	105	26%	74%
1944	57	0	57	40%	1937	105	27%	74%
1945	105	0	105	74%	1936	104	28%	74%
1946	99	0	99	70%	1986	103	30%	73%
1947	68	0	68	48%	1922	103	31%	73%
1948	73	0	73	52%	1996	103	32%	73%
1949	60	0	60	42%	1970	102	33%	72%
1950	78	0	78	56%	2000	101	35%	72%
1951	112	0	112	79%	1975	100	36%	71%
1952	128	0	128	91%	1995	99	37%	70%
1953	73	0	73	52%	1946	99	38%	70%
1954	89	0	89	63%	1965	98	40%	69%
1955	63	0	63	45%	1963	97	41%	68%
1956	126	0	126	89%	1999	94	42%	67%
1957	73	0	73	51%	1966	94	43%	66%
1958	129	0	129	91%	1940	94	44%	66%
1959	66	0	66	47%	1971	93	46%	66%
1960	71	0	71	50%	1935	92	47%	65%
1961	25	0	25	18%	1927	92	48%	65%
1962	84	0	84	59%	1954	89	49%	63%
1963	97	0	97	68%	1993	88	51%	62%
1964	51	0	51	36%	1923	87	52%	62%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	98	0	98	69%	1985	84	53%	60%
1966	94	0	94	66%	1962	84	54%	59%
1967	117	0	117	82%	1989	81	56%	57%
1968	77	0	77	54%	1950	78	57%	56%
1969	141	0	141	100%	1968	77	58%	54%
1970	102	0	102	72%	1972	73	59%	52%
1971	93	0	93	66%	1948	73	60%	52%
1972	73	0	73	52%	1953	73	62%	52%
1973	110	0	110	78%	1957	73	63%	51%
1974	106	0	106	75%	1960	71	64%	50%
1975	100	0	100	71%	1926	69	65%	49%
1976	64	0	64	45%	1947	68	67%	48%
1977	11	0	11	8%	1930	67	68%	47%
1978	122	0	122	86%	1925	67	69%	47%
1979	106	0	106	75%	1932	67	70%	47%
1980	141	0	141	100%	1959	66	72%	47%
1981	61	0	61	43%	2003	65	73%	46%
1982	141	0	141	100%	1976	64	74%	45%
1983	141	0	141	100%	1955	63	75%	45%
1984	122	0	122	86%	1981	61	77%	43%
1985	84	0	84	60%	1949	60	78%	42%
1986	103	0	103	73%	1944	57	79%	40%
1987	31	0	31	22%	1964	51	80%	36%
1988	22	0	22	15%	2002	51	81%	36%
1989	81	0	81	57%	1933	51	83%	36%
1990	17	0	17	12%	1994	45	84%	32%
1991	23	0	23	16%	1934	40	85%	29%
1992	34	0	34	24%	2001	40	86%	28%
1993	88	0	88	62%	1992	34	88%	24%
1994	45	0	45	32%	1939	34	89%	24%
1995	99	0	99	70%	1987	31	90%	22%
1996	103	0	103	73%	1931	29	91%	20%
1997	120	0	120	85%	1929	26	93%	18%
1998	133	0	133	94%	1924	25	94%	18%
1999	94	0	94	67%	1961	25	95%	18%
2000	101	0	101	72%	1991	23	96%	16%
2001	40	0	40	28%	1988	22	98%	15%
2002	51	0	51	36%	1990	17	99%	12%
2003	65	0	65	46%	1977	11	100%	8%
Average	**83**	**0**	**83**	**59%**		**83**		**59%**
Maximum	**141**	**0**	**141**	**100%**		**141**		**100%**
Minimum	**11**	**0**	**11**	**8%**		**11**		**8%**

Table C.8. Castaic Lake WA: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	69	0	69	73%	1958	95	0%	100%
1923	59	0	59	62%	1969	95	1%	100%
1924	17	0	17	18%	1969	95	2%	100%
1925	45	0	45	47%	1969	95	4%	100%
1926	47	0	47	49%	1938	95	5%	100%
1927	62	0	62	65%	1980	95	6%	100%
1928	73	0	73	76%	1952	92	7%	97%
1929	17	0	17	18%	1998	89	9%	94%
1930	45	0	45	47%	1943	88	10%	92%
1931	19	0	19	20%	1995	86	11%	90%
1932	45	0	45	47%	1956	85	12%	89%
1933	34	0	34	36%	1967	84	14%	88%
1934	27	0	27	29%	1941	82	15%	86%
1935	62	0	62	65%	1984	82	16%	86%
1936	70	0	70	74%	1978	82	17%	86%
1937	70	0	70	74%	1997	81	19%	85%
1938	95	0	95	100%	1986	80	20%	84%
1939	40	0	40	42%	1951	75	21%	79%
1940	63	0	63	66%	1973	74	22%	78%
1941	82	0	82	86%	1928	73	23%	76%
1942	71	0	71	74%	1974	71	25%	75%
1943	88	0	88	92%	1979	71	26%	75%
1944	38	0	38	40%	1942	71	27%	74%
1945	71	0	71	74%	1945	71	28%	74%
1946	66	0	66	70%	1937	70	30%	74%
1947	48	0	48	51%	1936	70	31%	74%
1948	49	0	49	52%	1922	69	32%	73%
1949	40	0	40	42%	1996	69	33%	73%
1950	53	0	53	56%	1970	69	35%	72%
1951	75	0	75	79%	2000	68	36%	72%
1952	92	0	92	97%	1975	68	37%	71%
1953	49	0	49	52%	1946	66	38%	70%
1954	60	0	60	63%	1965	66	40%	69%
1955	43	0	43	45%	1963	65	41%	68%
1956	85	0	85	89%	1985	64	42%	67%
1957	49	0	49	51%	1999	63	43%	67%
1958	95	0	95	100%	1966	63	44%	66%
1959	45	0	45	47%	1940	63	46%	66%
1960	45	0	45	47%	1971	62	47%	66%
1961	36	0	36	38%	1935	62	48%	65%
1962	56	0	56	59%	1927	62	49%	65%
1963	65	0	65	68%	1954	60	51%	63%
1964	59	0	59	62%	1964	59	52%	62%

SWP Table A Deliveries for 2015 Study						Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A		Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	66	0	66	69%		1993	59	53%	62%
1966	63	0	63	66%		1923	59	54%	62%
1967	84	0	84	88%		2002	59	56%	61%
1968	52	0	52	54%		1989	58	57%	61%
1969	95	0	95	100%		1962	56	58%	59%
1970	69	0	69	72%		1950	53	59%	56%
1971	62	0	62	66%		1968	52	60%	54%
1972	49	0	49	52%		1972	49	62%	52%
1973	74	0	74	78%		1948	49	63%	52%
1974	71	0	71	75%		1953	49	64%	52%
1975	68	0	68	71%		1957	49	65%	51%
1976	43	0	43	45%		1947	48	67%	51%
1977	8	0	8	8%		1994	47	68%	50%
1978	82	0	82	86%		2003	47	69%	49%
1979	71	0	71	75%		1926	47	70%	49%
1980	95	0	95	100%		1930	45	72%	47%
1981	41	0	41	43%		1925	45	73%	47%
1982	95	0	95	100%		1960	45	74%	47%
1983	95	0	95	100%		1932	45	75%	47%
1984	82	0	82	86%		1959	45	77%	47%
1985	64	0	64	67%		1976	43	78%	45%
1986	80	0	80	84%		1955	43	79%	45%
1987	21	0	21	22%		1981	41	80%	43%
1988	15	0	15	15%		1949	40	81%	42%
1989	58	0	58	61%		1939	40	83%	42%
1990	24	0	24	25%		1944	38	84%	40%
1991	15	0	15	16%		1961	36	85%	38%
1992	23	0	23	24%		1933	34	86%	36%
1993	59	0	59	62%		1934	27	88%	29%
1994	47	0	47	50%		2001	27	89%	28%
1995	86	0	86	90%		1990	24	90%	25%
1996	69	0	69	73%		1992	23	91%	24%
1997	81	0	81	85%		1987	21	93%	22%
1998	89	0	89	94%		1931	19	94%	20%
1999	63	0	63	67%		1929	17	95%	18%
2000	68	0	68	72%		1924	17	96%	18%
2001	27	0	27	28%		1991	15	98%	16%
2002	59	0	59	61%		1988	15	99%	15%
2003	47	0	47	49%		1977	8	100%	8%
Average	**58**	**0**	**58**	**61%**			**58**		**61%**
Maximum	**95**	**0**	**95**	**100%**			**95**		**100%**
Minimum	**8**	**0**	**8**	**8%**			**8**		**8%**

Table C.9. Coachella Valley WD: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	93	0	93	67%	1938	136	0%	98%
1923	84	7	91	66%	1980	136	1%	98%
1924	25	2	27	19%	1983	136	2%	98%
1925	65	0	65	47%	1952	132	4%	96%
1926	68	0	68	49%	1998	129	5%	93%
1927	86	0	86	62%	1982	128	6%	93%
1928	98	4	102	74%	1958	128	7%	93%
1929	25	8	33	24%	1958	128	9%	93%
1930	66	0	66	47%	2003	120	10%	87%
1931	28	0	28	20%	1967	118	11%	85%
1932	65	0	65	47%	1995	117	12%	85%
1933	49	0	49	36%	1997	116	14%	84%
1934	40	0	40	29%	1941	116	15%	84%
1935	87	0	87	63%	1986	115	16%	83%
1936	95	4	98	71%	1956	114	17%	82%
1937	95	7	102	74%	1984	111	19%	80%
1938	128	7	136	98%	1978	111	20%	80%
1939	61	10	71	51%	1979	105	21%	76%
1940	87	0	87	63%	1974	104	22%	75%
1941	111	5	116	84%	1970	103	23%	74%
1942	96	2	98	71%	1937	102	25%	74%
1943	88	7	95	69%	1996	102	26%	74%
1944	56	9	65	47%	1928	102	27%	74%
1945	95	0	95	69%	1951	102	28%	74%
1946	90	7	97	70%	1973	100	30%	72%
1947	74	7	81	59%	1975	99	31%	71%
1948	71	0	71	52%	1936	98	32%	71%
1949	58	0	58	42%	1942	98	33%	71%
1950	77	0	77	56%	1985	97	35%	70%
1951	102	0	102	74%	2000	97	36%	70%
1952	125	8	132	96%	1946	97	37%	70%
1953	71	10	81	59%	1999	96	38%	69%
1954	85	0	85	61%	1945	95	40%	69%
1955	62	3	65	47%	1943	95	41%	69%
1956	114	0	114	82%	1966	94	42%	68%
1957	71	9	80	58%	1922	93	43%	67%
1958	128	0	128	93%	1971	93	44%	67%
1959	65	10	75	54%	1965	91	46%	66%
1960	69	0	69	50%	1923	91	47%	66%
1961	55	0	55	40%	1964	91	48%	66%
1962	81	0	81	59%	1963	88	49%	64%
1963	88	0	88	64%	1940	87	51%	63%
1964	84	7	91	66%	1935	87	52%	63%

SWP Table A Deliveries for 2015 Study						Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A		Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	89	2	91	66%		2002	86	53%	62%
1966	87	7	94	68%		1927	86	54%	62%
1967	113	5	118	85%		1954	85	56%	61%
1968	75	7	82	59%		1989	84	57%	61%
1969	128	0	128	93%		1993	84	58%	60%
1970	93	10	103	74%		1968	82	59%	59%
1971	86	7	93	67%		1962	81	60%	59%
1972	72	5	76	55%		1947	81	62%	59%
1973	100	0	100	72%		1953	81	63%	59%
1974	96	8	104	75%		1957	80	64%	58%
1975	91	7	99	71%		1950	77	65%	56%
1976	62	7	69	50%		1972	76	67%	55%
1977	11	0	11	8%		1959	75	68%	54%
1978	111	0	111	80%		1994	74	69%	54%
1979	96	9	105	76%		1948	71	70%	52%
1980	128	7	136	98%		1939	71	72%	51%
1981	59	10	69	50%		1976	69	73%	50%
1982	128	0	128	93%		1981	69	74%	50%
1983	128	7	136	98%		1960	69	75%	50%
1984	111	0	111	80%		1926	68	77%	49%
1985	89	9	97	70%		1930	66	78%	47%
1986	108	7	115	83%		1925	65	79%	47%
1987	30	8	38	28%		1932	65	80%	47%
1988	21	0	21	15%		1944	65	81%	47%
1989	84	0	84	61%		1955	65	83%	47%
1990	37	2	38	28%		1949	58	84%	42%
1991	22	0	22	16%		1961	55	85%	40%
1992	33	0	33	24%		1933	49	86%	36%
1993	84	0	84	60%		2001	46	88%	33%
1994	72	2	74	54%		1934	40	89%	29%
1995	117	0	117	85%		1990	38	90%	28%
1996	93	9	102	74%		1987	38	91%	28%
1997	109	7	116	84%		1992	33	93%	24%
1998	120	8	129	93%		1929	33	94%	24%
1999	87	9	96	69%		1931	28	95%	20%
2000	92	5	97	70%		1924	27	96%	19%
2001	39	7	46	33%		1991	22	98%	16%
2002	86	0	86	62%		1988	21	99%	15%
2003	117	3	120	87%		1977	11	100%	8%
Average	**81**	**4**	**85**	**61%**			**85**		**61%**
Maximum	**128**	**10**	**136**	**98%**			**136**		**98%**
Minimum	**11**	**0**	**11**	**8%**			**11**		**8%**

Table C.10. County of Kings: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	7	0	7	73%	1938	9	0%	100%
1923	6	0	6	62%	1938	9	1%	100%
1924	2	0	2	18%	1938	9	2%	100%
1925	4	0	4	47%	1938	9	4%	100%
1926	5	0	5	49%	1938	9	5%	100%
1927	6	0	6	65%	1980	9	6%	100%
1928	7	0	7	76%	1952	9	7%	97%
1929	2	0	2	18%	1998	9	9%	94%
1930	4	0	4	47%	1943	9	10%	92%
1931	2	0	2	20%	1956	8	11%	89%
1932	4	0	4	47%	1967	8	12%	88%
1933	3	0	3	36%	1941	8	14%	86%
1934	3	0	3	29%	1984	8	15%	86%
1935	6	0	6	65%	1978	8	16%	86%
1936	7	0	7	74%	1997	8	17%	85%
1937	7	0	7	74%	1986	8	19%	84%
1938	9	0	9	100%	1995	7	20%	80%
1939	2	0	2	17%	1951	7	21%	79%
1940	6	0	6	66%	1973	7	22%	78%
1941	8	0	8	86%	1928	7	23%	76%
1942	7	0	7	74%	1974	7	25%	75%
1943	9	0	9	92%	1979	7	26%	75%
1944	4	0	4	40%	1942	7	27%	74%
1945	7	0	7	74%	1945	7	28%	74%
1946	6	0	6	70%	1937	7	30%	74%
1947	3	0	3	27%	1936	7	31%	74%
1948	5	0	5	52%	1922	7	32%	73%
1949	4	0	4	42%	1996	7	33%	73%
1950	5	0	5	56%	1970	7	35%	72%
1951	7	0	7	79%	2000	7	36%	72%
1952	9	0	9	97%	1975	7	37%	71%
1953	5	0	5	52%	1946	6	38%	70%
1954	6	0	6	63%	1965	6	40%	69%
1955	4	0	4	45%	1963	6	41%	68%
1956	8	0	8	89%	1999	6	42%	67%
1957	5	0	5	51%	1966	6	43%	66%
1958	9	0	9	100%	1940	6	44%	66%
1959	4	0	4	47%	1971	6	46%	66%
1960	2	0	2	25%	1935	6	47%	65%
1961	2	0	2	20%	1927	6	48%	65%
1962	5	0	5	59%	1954	6	49%	63%
1963	6	0	6	68%	1964	6	51%	62%
1964	6	0	6	62%	1993	6	52%	62%

SWP Table A Deliveries for 2015 Study						Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A		Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	6	0	6	69%		1923	6	53%	62%
1966	6	0	6	66%		1962	5	54%	59%
1967	8	0	8	88%		1950	5	56%	56%
1968	5	0	5	54%		1968	5	57%	54%
1969	9	0	9	100%		1989	5	58%	54%
1970	7	0	7	72%		1972	5	59%	52%
1971	6	0	6	66%		1948	5	60%	52%
1972	5	0	5	52%		1953	5	62%	52%
1973	7	0	7	78%		1957	5	63%	51%
1974	7	0	7	75%		1926	5	64%	49%
1975	7	0	7	71%		1930	4	65%	47%
1976	4	0	4	45%		1925	4	67%	47%
1977	1	0	1	8%		1932	4	68%	47%
1978	8	0	8	86%		2003	4	69%	47%
1979	7	0	7	75%		1959	4	70%	47%
1980	9	0	9	100%		1976	4	72%	45%
1981	4	0	4	43%		1955	4	73%	45%
1982	9	0	9	100%		1985	4	74%	43%
1983	9	0	9	100%		1981	4	75%	43%
1984	8	0	8	86%		1949	4	77%	42%
1985	4	0	4	43%		1944	4	78%	40%
1986	8	0	8	84%		1933	3	79%	36%
1987	2	0	2	22%		2002	3	80%	32%
1988	1	0	1	15%		1934	3	81%	29%
1989	5	0	5	54%		2001	3	83%	28%
1990	1	0	1	10%		1947	3	84%	27%
1991	1	0	1	16%		1994	2	85%	26%
1992	2	0	2	24%		1960	2	86%	25%
1993	6	0	6	62%		1992	2	88%	24%
1994	2	0	2	26%		1987	2	89%	22%
1995	7	0	7	80%		1931	2	90%	20%
1996	7	0	7	73%		1961	2	91%	20%
1997	8	0	8	85%		1929	2	93%	18%
1998	9	0	9	94%		1924	2	94%	18%
1999	6	0	6	67%		1939	2	95%	17%
2000	7	0	7	72%		1991	1	96%	16%
2001	3	0	3	28%		1988	1	98%	15%
2002	3	0	3	32%		1990	1	99%	10%
2003	4	0	4	47%		1977	1	100%	8%
Average	**5**	**0**	**5**	**59%**			**5**		**59%**
Maximum	**9**	**0**	**9**	**100%**			**9**		**100%**
Minimum	**1**	**0**	**1**	**8%**			**1**		**8%**

Table C.11. Crestline-Lake Arrowhead WA: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	4	0	4	73%	1982	6	0%	100%
1923	4	0	4	62%	1983	6	1%	100%
1924	1	0	1	18%	1958	6	2%	100%
1925	3	0	3	47%	1938	6	4%	100%
1926	3	0	3	49%	1938	6	5%	100%
1927	4	0	4	65%	1980	6	6%	100%
1928	4	0	4	76%	1952	6	7%	97%
1929	1	0	1	18%	1998	5	9%	94%
1930	3	0	3	47%	1943	5	10%	92%
1931	1	0	1	20%	1995	5	11%	91%
1932	3	0	3	47%	1956	5	12%	89%
1933	2	0	2	36%	1967	5	14%	88%
1934	2	0	2	29%	1941	5	15%	86%
1935	4	0	4	65%	1984	5	16%	86%
1936	4	0	4	74%	1978	5	17%	86%
1937	4	0	4	74%	1997	5	19%	85%
1938	6	0	6	100%	1986	5	20%	84%
1939	1	0	1	22%	1951	5	21%	79%
1940	4	0	4	66%	1973	5	22%	78%
1941	5	0	5	86%	1928	4	23%	76%
1942	4	0	4	74%	1974	4	25%	75%
1943	5	0	5	92%	1979	4	26%	75%
1944	2	0	2	40%	1942	4	27%	74%
1945	4	0	4	74%	1945	4	28%	74%
1946	4	0	4	70%	1937	4	30%	74%
1947	3	0	3	54%	1936	4	31%	74%
1948	3	0	3	52%	1922	4	32%	73%
1949	2	0	2	42%	1996	4	33%	73%
1950	3	0	3	56%	1970	4	35%	72%
1951	5	0	5	79%	2000	4	36%	72%
1952	6	0	6	97%	1975	4	37%	71%
1953	3	0	3	52%	1946	4	38%	70%
1954	4	0	4	63%	1965	4	40%	69%
1955	3	0	3	45%	1985	4	41%	69%
1956	5	0	5	89%	1963	4	42%	68%
1957	3	0	3	51%	1999	4	43%	67%
1958	6	0	6	100%	1966	4	44%	66%
1959	3	0	3	47%	1940	4	46%	66%
1960	3	0	3	50%	1971	4	47%	66%
1961	2	0	2	40%	2003	4	48%	65%
1962	3	0	3	59%	1935	4	49%	65%
1963	4	0	4	68%	1927	4	51%	65%
1964	4	0	4	62%	2002	4	52%	65%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	4	0	4	69%	1954	4	53%	63%
1966	4	0	4	66%	1964	4	54%	62%
1967	5	0	5	88%	1993	4	56%	62%
1968	3	0	3	54%	1923	4	57%	62%
1969	6	0	6	100%	1989	4	58%	62%
1970	4	0	4	72%	1962	3	59%	59%
1971	4	0	4	66%	1950	3	60%	56%
1972	3	0	3	52%	1968	3	62%	54%
1973	5	0	5	78%	1947	3	63%	54%
1974	4	0	4	75%	1994	3	64%	52%
1975	4	0	4	71%	1972	3	65%	52%
1976	3	0	3	45%	1948	3	67%	52%
1977	0	0	0	8%	1953	3	68%	52%
1978	5	0	5	86%	1957	3	69%	51%
1979	4	0	4	75%	1960	3	70%	50%
1980	6	0	6	100%	1926	3	72%	49%
1981	2	0	2	43%	1930	3	73%	47%
1982	6	0	6	100%	1925	3	74%	47%
1983	6	0	6	100%	1932	3	75%	47%
1984	5	0	5	86%	1959	3	77%	47%
1985	4	0	4	69%	1976	3	78%	45%
1986	5	0	5	84%	1955	3	79%	45%
1987	1	0	1	22%	1981	2	80%	43%
1988	1	0	1	15%	1949	2	81%	42%
1989	4	0	4	62%	1944	2	83%	40%
1990	2	0	2	27%	1961	2	84%	40%
1991	1	0	1	16%	1933	2	85%	36%
1992	1	0	1	24%	1934	2	86%	29%
1993	4	0	4	62%	2001	2	88%	28%
1994	3	0	3	52%	1990	2	89%	27%
1995	5	0	5	91%	1992	1	90%	24%
1996	4	0	4	73%	1939	1	91%	22%
1997	5	0	5	85%	1987	1	93%	22%
1998	5	0	5	94%	1931	1	94%	20%
1999	4	0	4	67%	1929	1	95%	18%
2000	4	0	4	72%	1924	1	96%	18%
2001	2	0	2	28%	1991	1	98%	16%
2002	4	0	4	65%	1988	1	99%	15%
2003	4	0	4	65%	1977	0	100%	8%
Average	**4**	**0**	**4**	**61%**		**4**		**61%**
Maximum	**6**	**0**	**6**	**100%**		**6**		**100%**
Minimum	**0**	**0**	**0**	**8%**		**0**		**8%**

Table C.12. Desert WA: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	32	0	32	57%	1983	53	0%	94%
1923	32	7	39	70%	2003	51	1%	92%
1924	10	2	12	22%	1980	51	2%	91%
1925	26	0	26	47%	1938	50	4%	91%
1926	27	0	27	49%	1952	50	5%	89%
1927	31	0	31	56%	1998	49	6%	88%
1928	33	5	38	69%	1943	47	7%	85%
1929	10	9	19	35%	1958	44	9%	79%
1930	26	0	26	47%	1958	44	10%	79%
1931	11	0	11	20%	1982	44	11%	79%
1932	26	0	26	47%	1997	44	12%	78%
1933	20	0	20	36%	1967	43	14%	77%
1934	16	0	16	29%	1941	42	15%	76%
1935	32	0	32	57%	1999	42	16%	75%
1936	32	4	36	65%	1970	41	17%	74%
1937	32	8	41	73%	1979	41	19%	73%
1938	44	7	50	91%	1937	41	20%	73%
1939	25	9	34	61%	1984	40	21%	73%
1940	31	0	31	56%	1964	40	22%	72%
1941	38	4	42	76%	1995	40	23%	72%
1942	33	1	34	60%	1975	40	25%	72%
1943	41	7	47	85%	1974	40	26%	72%
1944	22	4	27	48%	1986	40	27%	72%
1945	33	0	33	58%	1971	40	28%	71%
1946	31	7	37	67%	1957	39	30%	70%
1947	30	6	36	65%	1956	39	31%	70%
1948	29	0	29	52%	1923	39	32%	70%
1949	23	0	23	42%	1985	39	33%	69%
1950	31	0	31	56%	1928	38	35%	69%
1951	35	0	35	62%	1953	38	36%	69%
1952	43	7	50	89%	1959	38	37%	68%
1953	29	10	38	69%	1978	38	38%	68%
1954	32	0	32	57%	2000	38	40%	68%
1955	25	4	28	51%	1946	37	41%	67%
1956	39	0	39	70%	1966	37	42%	67%
1957	29	11	39	70%	1996	37	43%	66%
1958	44	0	44	79%	1936	36	44%	65%
1959	26	12	38	68%	1947	36	46%	65%
1960	28	0	28	50%	1981	36	47%	64%
1961	22	0	22	40%	1951	35	48%	62%
1962	33	0	33	58%	1972	34	49%	62%
1963	30	0	31	55%	1973	34	51%	61%
1964	33	8	40	72%	1939	34	52%	61%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	30	1	32	57%	1942	34	53%	60%
1966	31	6	37	67%	1976	34	54%	60%
1967	39	4	43	77%	1968	33	56%	59%
1968	30	3	33	59%	1989	33	57%	58%
1969	44	0	44	79%	1945	33	58%	58%
1970	32	9	41	74%	1962	33	59%	58%
1971	31	9	40	71%	2002	32	60%	57%
1972	29	5	34	62%	1993	32	62%	57%
1973	34	0	34	61%	1965	32	63%	57%
1974	33	7	40	72%	1922	32	64%	57%
1975	31	9	40	72%	1935	32	65%	57%
1976	25	8	34	60%	1954	32	67%	57%
1977	4	0	4	8%	1994	32	68%	57%
1978	38	0	38	68%	1927	31	69%	56%
1979	33	8	41	73%	1950	31	70%	56%
1980	44	7	51	91%	1940	31	72%	56%
1981	24	12	36	64%	1963	31	73%	55%
1982	44	0	44	79%	1948	29	74%	52%
1983	44	9	53	94%	1955	28	75%	51%
1984	38	3	40	73%	1960	28	77%	50%
1985	30	8	39	69%	1926	27	78%	49%
1986	37	3	40	72%	1944	27	79%	48%
1987	12	4	16	29%	1930	26	80%	47%
1988	9	0	9	15%	1925	26	81%	47%
1989	33	0	33	58%	1932	26	83%	47%
1990	15	2	17	30%	1949	23	84%	42%
1991	9	0	9	16%	2001	22	85%	40%
1992	13	0	13	24%	1961	22	86%	40%
1993	32	0	32	57%	1933	20	88%	36%
1994	29	3	32	57%	1929	19	89%	35%
1995	40	0	40	72%	1990	17	90%	30%
1996	32	5	37	66%	1987	16	91%	29%
1997	37	6	44	78%	1934	16	93%	29%
1998	41	8	49	88%	1992	13	94%	24%
1999	31	11	42	75%	1924	12	95%	22%
2000	31	6	38	68%	1931	11	96%	20%
2001	16	7	22	40%	1991	9	98%	16%
2002	32	0	32	57%	1988	9	99%	15%
2003	47	4	51	92%	1977	4	100%	8%
Average	**30**	**4**	**33**	**60%**		**33**		**60%**
Maximum	**47**	**12**	**53**	**94%**		**53**		**94%**
Minimum	**4**	**0**	**4**	**8%**		**4**		**8%**

Table C.13. Dudley Ridge WD: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	37	0	37	73%	1969	50	0%	100%
1923	31	0	31	62%	1969	50	1%	100%
1924	9	0	9	18%	1938	50	2%	100%
1925	24	0	24	47%	1958	50	4%	100%
1926	25	0	25	49%	1958	50	5%	100%
1927	33	0	33	65%	1980	50	6%	100%
1928	38	0	38	76%	1952	49	7%	97%
1929	9	0	9	18%	1998	47	9%	94%
1930	24	0	24	47%	1943	47	10%	92%
1931	10	0	10	20%	1956	45	11%	89%
1932	24	0	24	47%	1967	44	12%	88%
1933	18	0	18	36%	1941	44	14%	86%
1934	14	0	14	29%	1984	43	15%	86%
1935	33	0	33	65%	1978	43	16%	86%
1936	37	0	37	74%	1997	43	17%	85%
1937	37	0	37	74%	1951	40	19%	79%
1938	50	0	50	100%	1973	39	20%	78%
1939	16	0	16	31%	1995	39	21%	78%
1940	33	0	33	66%	1928	38	22%	76%
1941	44	0	44	86%	1974	38	23%	75%
1942	37	0	37	74%	1979	38	25%	75%
1943	47	0	47	92%	1942	37	26%	74%
1944	20	0	20	40%	1945	37	27%	74%
1945	37	0	37	74%	1937	37	28%	74%
1946	35	0	35	70%	1936	37	30%	74%
1947	27	0	27	54%	1922	37	31%	73%
1948	26	0	26	52%	1996	37	32%	73%
1949	21	0	21	42%	1970	36	33%	72%
1950	28	0	28	56%	1986	36	35%	72%
1951	40	0	40	79%	2000	36	36%	72%
1952	49	0	49	97%	1975	36	37%	71%
1953	26	0	26	52%	1946	35	38%	70%
1954	32	0	32	63%	1965	35	40%	69%
1955	23	0	23	45%	1963	34	41%	68%
1956	45	0	45	89%	1999	33	42%	67%
1957	26	0	26	51%	1966	33	43%	66%
1958	50	0	50	100%	1940	33	44%	66%
1959	24	0	24	47%	1971	33	46%	66%
1960	25	0	25	50%	1935	33	47%	65%
1961	20	0	20	40%	1927	33	48%	65%
1962	30	0	30	59%	1954	32	49%	63%
1963	34	0	34	68%	1964	31	51%	62%
1964	31	0	31	62%	1993	31	52%	62%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	35	0	35	69%	1923	31	53%	62%
1966	33	0	33	66%	1989	30	54%	60%
1967	44	0	44	88%	1962	30	56%	59%
1968	27	0	27	54%	1950	28	57%	56%
1969	50	0	50	100%	2003	28	58%	55%
1970	36	0	36	72%	1968	27	59%	54%
1971	33	0	33	66%	1947	27	60%	54%
1972	26	0	26	52%	2002	26	62%	52%
1973	39	0	39	78%	1994	26	63%	52%
1974	38	0	38	75%	1972	26	64%	52%
1975	36	0	36	71%	1948	26	65%	52%
1976	23	0	23	45%	1953	26	67%	52%
1977	4	0	4	8%	1957	26	68%	51%
1978	43	0	43	86%	1960	25	69%	50%
1979	38	0	38	75%	1926	25	70%	49%
1980	50	0	50	100%	1930	24	72%	47%
1981	15	0	15	31%	1925	24	73%	47%
1982	50	0	50	100%	1932	24	74%	47%
1983	50	0	50	100%	1959	24	75%	47%
1984	43	0	43	86%	1985	23	77%	46%
1985	23	0	23	46%	1976	23	78%	45%
1986	36	0	36	72%	1955	23	79%	45%
1987	11	0	11	21%	1949	21	80%	42%
1988	7	0	7	15%	1944	20	81%	40%
1989	30	0	30	60%	1961	20	83%	40%
1990	13	0	13	26%	1933	18	84%	36%
1991	8	0	8	16%	1939	16	85%	31%
1992	12	0	12	23%	1981	15	86%	31%
1993	31	0	31	62%	1934	14	88%	29%
1994	26	0	26	52%	2001	14	89%	28%
1995	39	0	39	78%	1990	13	90%	26%
1996	37	0	37	73%	1992	12	91%	23%
1997	43	0	43	85%	1987	11	93%	21%
1998	47	0	47	94%	1931	10	94%	20%
1999	33	0	33	67%	1929	9	95%	18%
2000	36	0	36	72%	1924	9	96%	18%
2001	14	0	14	28%	1991	8	98%	16%
2002	26	0	26	52%	1988	7	99%	15%
2003	28	0	28	55%	1977	4	100%	8%
Average	**30**	**0**	**30**	**60%**		**30**		**60%**
Maximum	**50**	**0**	**50**	**100%**		**50**		**100%**
Minimum	**4**	**0**	**4**	**8%**		**4**		**8%**

Table C.14. Empire West Side ID: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	1	0	1	73%	1938	2	0%	100%
1923	1	0	1	62%	1938	2	1%	100%
1924	0	0	0	15%	1938	2	2%	100%
1925	1	0	1	47%	1938	2	4%	100%
1926	1	0	1	49%	1938	2	5%	100%
1927	1	0	1	65%	1980	2	6%	100%
1928	2	0	2	76%	1952	2	7%	97%
1929	0	0	0	15%	1998	2	9%	94%
1930	1	0	1	47%	1943	2	10%	92%
1931	0	0	0	17%	1956	2	11%	89%
1932	1	0	1	47%	1967	2	12%	88%
1933	1	0	1	36%	1941	2	14%	86%
1934	0	0	0	24%	1984	2	15%	86%
1935	1	0	1	65%	1978	2	16%	86%
1936	1	0	1	74%	1995	2	17%	85%
1937	1	0	1	74%	1997	2	19%	85%
1938	2	0	2	100%	1986	2	20%	84%
1939	1	0	1	44%	1951	2	21%	79%
1940	1	0	1	66%	1973	2	22%	78%
1941	2	0	2	86%	1928	2	23%	76%
1942	1	0	1	74%	1974	2	25%	75%
1943	2	0	2	92%	1979	1	26%	75%
1944	1	0	1	40%	1942	1	27%	74%
1945	1	0	1	74%	1945	1	28%	74%
1946	1	0	1	70%	1937	1	30%	74%
1947	1	0	1	43%	1936	1	31%	74%
1948	1	0	1	52%	1922	1	32%	73%
1949	1	0	1	42%	1996	1	33%	73%
1950	1	0	1	56%	1970	1	35%	72%
1951	2	0	2	79%	2000	1	36%	72%
1952	2	0	2	97%	1975	1	37%	71%
1953	1	0	1	52%	1946	1	38%	70%
1954	1	0	1	63%	1965	1	40%	69%
1955	1	0	1	45%	1985	1	41%	69%
1956	2	0	2	89%	1963	1	42%	68%
1957	1	0	1	51%	1999	1	43%	67%
1958	2	0	2	100%	1966	1	44%	66%
1959	1	0	1	47%	1940	1	46%	66%
1960	1	0	1	50%	1971	1	47%	66%
1961	1	0	1	40%	1935	1	48%	65%
1962	1	0	1	59%	1927	1	49%	65%
1963	1	0	1	68%	1954	1	51%	63%
1964	1	0	1	62%	1964	1	52%	62%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	1	0	1	69%	1993	1	53%	62%
1966	1	0	1	66%	1923	1	54%	62%
1967	2	0	2	88%	1962	1	56%	59%
1968	1	0	1	54%	2003	1	57%	58%
1969	2	0	2	100%	1989	1	58%	58%
1970	1	0	1	72%	1950	1	59%	56%
1971	1	0	1	66%	1968	1	60%	54%
1972	1	0	1	52%	1994	1	62%	52%
1973	2	0	2	78%	1972	1	63%	52%
1974	2	0	2	75%	1948	1	64%	52%
1975	1	0	1	71%	1953	1	65%	52%
1976	1	0	1	45%	2002	1	67%	51%
1977	0	0	0	8%	1957	1	68%	51%
1978	2	0	2	86%	1960	1	69%	50%
1979	1	0	1	75%	1926	1	70%	49%
1980	2	0	2	100%	1930	1	72%	47%
1981	1	0	1	43%	1925	1	73%	47%
1982	2	0	2	100%	1932	1	74%	47%
1983	2	0	2	100%	1959	1	75%	47%
1984	2	0	2	86%	1976	1	77%	45%
1985	1	0	1	69%	1955	1	78%	45%
1986	2	0	2	84%	1939	1	79%	44%
1987	0	0	0	22%	1981	1	80%	43%
1988	0	0	0	10%	1947	1	81%	43%
1989	1	0	1	58%	1949	1	83%	42%
1990	0	0	0	18%	1944	1	84%	40%
1991	0	0	0	13%	1961	1	85%	40%
1992	0	0	0	16%	1933	1	86%	36%
1993	1	0	1	62%	2001	1	88%	28%
1994	1	0	1	52%	1934	0	89%	24%
1995	2	0	2	85%	1987	0	90%	22%
1996	1	0	1	73%	1990	0	91%	18%
1997	2	0	2	85%	1931	0	93%	17%
1998	2	0	2	94%	1992	0	94%	16%
1999	1	0	1	67%	1929	0	95%	15%
2000	1	0	1	72%	1924	0	96%	15%
2001	1	0	1	28%	1991	0	98%	13%
2002	1	0	1	51%	1988	0	99%	10%
2003	1	0	1	58%	1977	0	100%	8%
Average	**1**	**0**	**1**	**61%**		**1**		**61%**
Maximum	**2**	**0**	**2**	**100%**		**2**		**100%**
Minimum	**0**	**0**	**0**	**8%**		**0**		**8%**

Table C.15. Kern County WA-AG: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	616	0	616	73%	1938	848	0%	100%
1923	525	0	525	62%	1958	848	1%	100%
1924	148	0	148	17%	1969	848	2%	100%
1925	401	0	401	47%	1969	848	4%	100%
1926	414	0	414	49%	1969	848	5%	100%
1927	551	0	551	65%	1980	847	6%	100%
1928	648	0	648	76%	1952	822	7%	97%
1929	150	0	150	18%	1998	795	9%	94%
1930	402	0	402	47%	1956	753	10%	89%
1931	167	0	167	20%	1967	745	11%	88%
1932	399	0	399	47%	1941	733	12%	86%
1933	294	0	294	35%	1995	733	14%	86%
1934	235	0	235	28%	1984	732	15%	86%
1935	554	0	554	65%	1978	731	16%	86%
1936	625	0	625	74%	1997	721	17%	85%
1937	628	0	628	74%	1943	718	19%	85%
1938	848	0	848	100%	1951	672	20%	79%
1939	219	0	219	26%	1973	662	21%	78%
1940	562	0	562	66%	1986	651	22%	77%
1941	733	0	733	86%	1928	648	23%	76%
1942	632	0	632	74%	1974	636	25%	75%
1943	718	0	718	85%	1979	635	26%	75%
1944	336	0	336	40%	1942	632	27%	74%
1945	629	0	629	74%	1945	629	28%	74%
1946	591	0	591	70%	1937	628	30%	74%
1947	388	0	388	46%	1936	625	31%	74%
1948	438	0	438	52%	1922	616	32%	73%
1949	357	0	357	42%	1996	616	33%	73%
1950	471	0	471	56%	1970	611	35%	72%
1951	672	0	672	79%	2000	607	36%	72%
1952	822	0	822	97%	1975	602	37%	71%
1953	438	0	438	52%	1946	591	38%	70%
1954	536	0	536	63%	1965	589	40%	69%
1955	380	0	380	45%	1963	579	41%	68%
1956	753	0	753	89%	1985	567	42%	67%
1957	436	0	436	51%	1999	564	43%	67%
1958	848	0	848	100%	1966	564	44%	66%
1959	397	0	397	47%	1940	562	46%	66%
1960	392	0	392	46%	1971	556	47%	66%
1961	191	0	191	22%	1935	554	48%	65%
1962	501	0	501	59%	1927	551	49%	65%
1963	579	0	579	68%	1954	536	51%	63%
1964	404	0	404	48%	1993	525	52%	62%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	589	0	589	69%	1923	525	53%	62%
1966	564	0	564	66%	1962	501	54%	59%
1967	745	0	745	88%	1989	497	56%	59%
1968	461	0	461	54%	1950	471	57%	56%
1969	848	0	848	100%	1968	461	58%	54%
1970	611	0	611	72%	2003	461	59%	54%
1971	556	0	556	66%	1972	440	60%	52%
1972	440	0	440	52%	1948	438	62%	52%
1973	662	0	662	78%	1953	438	63%	52%
1974	636	0	636	75%	1957	436	64%	51%
1975	602	0	602	71%	1926	414	65%	49%
1976	368	0	368	43%	1964	404	67%	48%
1977	68	0	68	8%	1930	402	68%	47%
1978	731	0	731	86%	1925	401	69%	47%
1979	635	0	635	75%	1932	399	70%	47%
1980	847	0	847	100%	1959	397	72%	47%
1981	350	0	350	41%	1960	392	73%	46%
1982	848	0	848	100%	1947	388	74%	46%
1983	848	0	848	100%	1955	380	75%	45%
1984	732	0	732	86%	1976	368	77%	43%
1985	567	0	567	67%	1949	357	78%	42%
1986	651	0	651	77%	1981	350	79%	41%
1987	173	0	173	20%	1944	336	80%	40%
1988	122	0	122	14%	2002	328	81%	39%
1989	497	0	497	59%	1933	294	83%	35%
1990	131	0	131	16%	1994	264	84%	31%
1991	132	0	132	16%	2001	239	85%	28%
1992	137	0	137	16%	1934	235	86%	28%
1993	525	0	525	62%	1939	219	88%	26%
1994	264	0	264	31%	1961	191	89%	22%
1995	733	0	733	86%	1987	173	90%	20%
1996	616	0	616	73%	1931	167	91%	20%
1997	721	0	721	85%	1929	150	93%	18%
1998	795	0	795	94%	1924	148	94%	17%
1999	564	0	564	67%	1992	137	95%	16%
2000	607	0	607	72%	1991	132	96%	16%
2001	239	0	239	28%	1990	131	98%	16%
2002	328	0	328	39%	1988	122	99%	14%
2003	461	0	461	54%	1977	68	100%	8%
Average	**505**	**0**	**505**	**60%**		**505**		**60%**
Maximum	**848**	**0**	**848**	**100%**		**848**		**100%**
Minimum	**68**	**0**	**68**	**8%**		**68**		**8%**

Table C.16. Kern County WA-MI: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	98	0	98	73%	1969	135	0%	100%
1923	83	0	83	62%	1938	135	1%	100%
1924	24	0	24	18%	1938	135	2%	100%
1925	64	0	64	47%	1938	135	4%	100%
1926	66	0	66	49%	1982	135	5%	100%
1927	88	0	88	65%	1980	134	6%	100%
1928	103	0	103	76%	1952	130	7%	97%
1929	25	0	25	18%	1998	126	9%	94%
1930	64	0	64	47%	1943	125	10%	92%
1931	27	0	27	20%	1956	120	11%	89%
1932	63	0	63	47%	1967	118	12%	88%
1933	48	0	48	36%	1995	118	14%	87%
1934	39	0	39	29%	1941	116	15%	86%
1935	88	0	88	65%	1984	116	16%	86%
1936	99	0	99	74%	1978	116	17%	86%
1937	100	0	100	74%	1997	114	19%	85%
1938	135	0	135	100%	1986	108	20%	80%
1939	33	0	33	24%	1951	107	21%	79%
1940	89	0	89	66%	1973	105	22%	78%
1941	116	0	116	86%	1928	103	23%	76%
1942	100	0	100	74%	1974	101	25%	75%
1943	125	0	125	92%	1979	101	26%	75%
1944	54	0	54	40%	1942	100	27%	74%
1945	100	0	100	74%	1945	100	28%	74%
1946	94	0	94	70%	1937	100	30%	74%
1947	51	0	51	38%	1936	99	31%	74%
1948	70	0	70	52%	1922	98	32%	73%
1949	57	0	57	42%	1996	98	33%	73%
1950	75	0	75	56%	1970	97	35%	72%
1951	107	0	107	79%	2000	96	36%	72%
1952	130	0	130	97%	1975	95	37%	71%
1953	70	0	70	52%	1946	94	38%	70%
1954	85	0	85	63%	1965	93	40%	69%
1955	60	0	60	45%	1963	92	41%	68%
1956	120	0	120	89%	1999	90	42%	67%
1957	69	0	69	51%	1966	89	43%	66%
1958	135	0	135	100%	1940	89	44%	66%
1959	63	0	63	47%	1971	88	46%	66%
1960	59	0	59	44%	1935	88	47%	65%
1961	29	0	29	21%	1927	88	48%	65%
1962	79	0	79	59%	1954	85	49%	63%
1963	92	0	92	68%	1993	83	51%	62%
1964	58	0	58	43%	1923	83	52%	62%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	93	0	93	69%	1985	81	53%	60%
1966	89	0	89	66%	1989	80	54%	60%
1967	118	0	118	88%	1962	79	56%	59%
1968	73	0	73	54%	1950	75	57%	56%
1969	135	0	135	100%	1968	73	58%	54%
1970	97	0	97	72%	1972	70	59%	52%
1971	88	0	88	66%	1948	70	60%	52%
1972	70	0	70	52%	1953	70	62%	52%
1973	105	0	105	78%	1957	69	63%	51%
1974	101	0	101	75%	1926	66	64%	49%
1975	95	0	95	71%	2003	66	65%	49%
1976	61	0	61	45%	1930	64	67%	47%
1977	11	0	11	8%	1925	64	68%	47%
1978	116	0	116	86%	1932	63	69%	47%
1979	101	0	101	75%	1959	63	70%	47%
1980	134	0	134	100%	1976	61	72%	45%
1981	58	0	58	43%	1955	60	73%	45%
1982	135	0	135	100%	1960	59	74%	44%
1983	135	0	135	100%	2002	59	75%	44%
1984	116	0	116	86%	1964	58	77%	43%
1985	81	0	81	60%	1981	58	78%	43%
1986	108	0	108	80%	1949	57	79%	42%
1987	29	0	29	22%	1944	54	80%	40%
1988	21	0	21	15%	1947	51	81%	38%
1989	80	0	80	60%	1933	48	83%	36%
1990	19	0	19	14%	1994	39	84%	29%
1991	22	0	22	16%	1934	39	85%	29%
1992	32	0	32	24%	2001	38	86%	28%
1993	83	0	83	62%	1939	33	88%	24%
1994	39	0	39	29%	1992	32	89%	24%
1995	118	0	118	87%	1987	29	90%	22%
1996	98	0	98	73%	1961	29	91%	21%
1997	114	0	114	85%	1931	27	93%	20%
1998	126	0	126	94%	1929	25	94%	18%
1999	90	0	90	67%	1924	24	95%	18%
2000	96	0	96	72%	1991	22	96%	16%
2001	38	0	38	28%	1988	21	98%	15%
2002	59	0	59	44%	1990	19	99%	14%
2003	66	0	66	49%	1977	11	100%	8%
Average	**80**	**0**	**80**	**60%**		**80**		**60%**
Maximum	**135**	**0**	**135**	**100%**		**135**		**100%**
Minimum	**11**	**0**	**11**	**8%**		**11**		**8%**

Table C.17. Littlerock Creek ID: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	2	0	2	73%	1938	2	0%	100%
1923	1	0	1	62%	1938	2	1%	100%
1924	0	0	0	18%	1938	2	2%	100%
1925	1	0	1	47%	1938	2	4%	100%
1926	1	0	1	49%	1938	2	5%	100%
1927	1	0	1	65%	1980	2	6%	100%
1928	2	0	2	76%	1998	2	7%	94%
1929	0	0	0	18%	1943	2	9%	92%
1930	1	0	1	47%	1956	2	10%	89%
1931	0	0	0	20%	1967	2	11%	88%
1932	1	0	1	47%	1941	2	12%	86%
1933	1	0	1	36%	1984	2	14%	86%
1934	1	0	1	29%	1978	2	15%	86%
1935	2	0	2	65%	1995	2	16%	85%
1936	2	0	2	74%	1997	2	17%	85%
1937	2	0	2	74%	1986	2	19%	84%
1938	2	0	2	100%	1952	2	20%	83%
1939	1	0	1	25%	1951	2	21%	79%
1940	2	0	2	66%	1973	2	22%	78%
1941	2	0	2	86%	1928	2	23%	76%
1942	2	0	2	74%	1974	2	25%	75%
1943	2	0	2	92%	1979	2	26%	75%
1944	1	0	1	40%	1942	2	27%	74%
1945	2	0	2	74%	1945	2	28%	74%
1946	2	0	2	70%	1937	2	30%	74%
1947	1	0	1	46%	1936	2	31%	74%
1948	1	0	1	52%	1922	2	32%	73%
1949	1	0	1	42%	1996	2	33%	73%
1950	1	0	1	56%	1970	2	35%	72%
1951	2	0	2	79%	2000	2	36%	72%
1952	2	0	2	83%	1975	2	37%	71%
1953	1	0	1	52%	1946	2	38%	70%
1954	1	0	1	63%	1965	2	40%	69%
1955	1	0	1	45%	1963	2	41%	68%
1956	2	0	2	89%	1999	2	42%	67%
1957	1	0	1	51%	1966	2	43%	66%
1958	2	0	2	100%	1940	2	44%	66%
1959	1	0	1	47%	1971	2	46%	66%
1960	1	0	1	33%	1935	2	47%	65%
1961	1	0	1	27%	1927	1	48%	65%
1962	1	0	1	59%	1954	1	49%	63%
1963	2	0	2	68%	1964	1	51%	62%
1964	1	0	1	62%	1993	1	52%	62%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	2	0	2	69%	1923	1	53%	62%
1966	2	0	2	66%	1962	1	54%	59%
1967	2	0	2	88%	1989	1	56%	58%
1968	1	0	1	54%	1950	1	57%	56%
1969	2	0	2	100%	1968	1	58%	54%
1970	2	0	2	72%	1985	1	59%	54%
1971	2	0	2	66%	1972	1	60%	52%
1972	1	0	1	52%	1948	1	62%	52%
1973	2	0	2	78%	1953	1	63%	52%
1974	2	0	2	75%	1957	1	64%	51%
1975	2	0	2	71%	2003	1	65%	50%
1976	1	0	1	45%	1926	1	67%	49%
1977	0	0	0	8%	1930	1	68%	47%
1978	2	0	2	86%	1925	1	69%	47%
1979	2	0	2	75%	1932	1	70%	47%
1980	2	0	2	100%	1959	1	72%	47%
1981	1	0	1	43%	1947	1	73%	46%
1982	2	0	2	100%	1976	1	74%	45%
1983	2	0	2	100%	1955	1	75%	45%
1984	2	0	2	86%	2002	1	77%	43%
1985	1	0	1	54%	1981	1	78%	43%
1986	2	0	2	84%	1949	1	79%	42%
1987	1	0	1	22%	1944	1	80%	40%
1988	0	0	0	15%	1994	1	81%	36%
1989	1	0	1	58%	1933	1	83%	36%
1990	0	0	0	15%	1960	1	84%	33%
1991	0	0	0	16%	1934	1	85%	29%
1992	1	0	1	24%	2001	1	86%	28%
1993	1	0	1	62%	1961	1	88%	27%
1994	1	0	1	36%	1939	1	89%	25%
1995	2	0	2	85%	1992	1	90%	24%
1996	2	0	2	73%	1987	1	91%	22%
1997	2	0	2	85%	1931	0	93%	20%
1998	2	0	2	94%	1929	0	94%	18%
1999	2	0	2	67%	1924	0	95%	18%
2000	2	0	2	72%	1991	0	96%	16%
2001	1	0	1	28%	1988	0	98%	15%
2002	1	0	1	43%	1990	0	99%	15%
2003	1	0	1	50%	1977	0	100%	8%
Average	**1**	**0**	**1**	**60%**		**1**		**60%**
Maximum	**2**	**0**	**2**	**100%**		**2**		**100%**
Minimum	**0**	**0**	**0**	**8%**		**0**		**8%**

Table C.18. Metropolitan WDSC: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	1,244	0	1,244	65%	1983	1,845	0%	97%
1923	1,142	145	1,288	67%	1938	1,815	1%	95%
1924	344	40	385	20%	1980	1,751	2%	92%
1925	905	0	905	47%	1952	1,746	4%	91%
1926	934	0	934	49%	1998	1,732	5%	91%
1927	1,159	0	1,159	61%	1969	1,657	6%	87%
1928	1,308	83	1,391	73%	1982	1,647	7%	86%
1929	350	153	503	26%	1997	1,598	9%	84%
1930	906	0	906	47%	1941	1,579	10%	83%
1931	389	0	389	20%	1984	1,567	11%	82%
1932	900	0	900	47%	1967	1,540	12%	81%
1933	684	0	684	36%	1956	1,520	14%	80%
1934	547	0	547	29%	1995	1,507	15%	79%
1935	1,171	0	1,171	61%	1958	1,488	16%	78%
1936	1,261	75	1,336	70%	1978	1,474	17%	77%
1937	1,267	146	1,413	74%	1979	1,452	19%	76%
1938	1,668	146	1,815	95%	1943	1,450	20%	76%
1939	800	199	999	52%	1974	1,439	21%	75%
1940	1,166	0	1,166	61%	1970	1,432	22%	75%
1941	1,480	99	1,579	83%	1937	1,413	23%	74%
1942	1,275	32	1,306	68%	1996	1,406	25%	74%
1943	1,303	147	1,450	76%	1986	1,403	26%	73%
1944	771	152	923	48%	1928	1,391	27%	73%
1945	1,270	0	1,270	66%	1975	1,364	28%	71%
1946	1,194	147	1,340	70%	1985	1,358	30%	71%
1947	1,026	138	1,163	61%	1951	1,357	31%	71%
1948	988	0	988	52%	1999	1,354	32%	71%
1949	806	0	806	42%	1946	1,340	33%	70%
1950	1,061	0	1,061	56%	1973	1,336	35%	70%
1951	1,357	0	1,357	71%	1936	1,336	36%	70%
1952	1,589	157	1,746	91%	2000	1,332	37%	70%
1953	988	194	1,181	62%	1942	1,306	38%	68%
1954	1,149	0	1,149	60%	1966	1,306	40%	68%
1955	856	59	915	48%	1971	1,306	41%	68%
1956	1,520	0	1,520	80%	1923	1,288	42%	67%
1957	982	178	1,159	61%	1945	1,270	43%	66%
1958	1,488	0	1,488	78%	1964	1,260	44%	66%
1959	894	200	1,094	57%	1922	1,244	46%	65%
1960	945	0	945	49%	1965	1,220	47%	64%
1961	725	0	725	38%	1953	1,181	48%	62%
1962	1,122	0	1,122	59%	1963	1,180	49%	62%
1963	1,174	6	1,180	62%	1935	1,171	51%	61%
1964	1,128	132	1,260	66%	1940	1,166	52%	61%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	1,188	33	1,220	64%	1947	1,163	53%	61%
1966	1,169	137	1,306	68%	1927	1,159	54%	61%
1967	1,440	99	1,540	81%	1957	1,159	56%	61%
1968	1,040	92	1,132	59%	2003	1,154	57%	60%
1969	1,657	0	1,657	87%	1954	1,149	58%	60%
1970	1,234	199	1,432	75%	1989	1,147	59%	60%
1971	1,161	144	1,306	68%	1993	1,141	60%	60%
1972	991	92	1,084	57%	1968	1,132	62%	59%
1973	1,336	0	1,336	70%	1962	1,122	63%	59%
1974	1,284	155	1,439	75%	1959	1,094	64%	57%
1975	1,214	150	1,364	71%	1972	1,084	65%	57%
1976	860	142	1,002	52%	1950	1,061	67%	56%
1977	153	0	153	8%	1994	1,036	68%	54%
1978	1,474	0	1,474	77%	2002	1,032	69%	54%
1979	1,281	171	1,452	76%	1981	1,019	70%	53%
1980	1,603	148	1,751	92%	1976	1,002	72%	52%
1981	819	200	1,019	53%	1939	999	73%	52%
1982	1,647	0	1,647	86%	1948	988	74%	52%
1983	1,680	165	1,845	97%	1960	945	75%	49%
1984	1,477	90	1,567	82%	1926	934	77%	49%
1985	1,185	173	1,358	71%	1944	923	78%	48%
1986	1,296	107	1,403	73%	1955	915	79%	48%
1987	416	143	559	29%	1930	906	80%	47%
1988	294	0	294	15%	1925	905	81%	47%
1989	1,147	0	1,147	60%	1932	900	83%	47%
1990	474	31	505	26%	1949	806	84%	42%
1991	307	0	307	16%	1961	725	85%	38%
1992	451	0	451	24%	1933	684	86%	36%
1993	1,141	0	1,141	60%	2001	683	88%	36%
1994	993	42	1,036	54%	1987	559	89%	29%
1995	1,507	0	1,507	79%	1934	547	90%	29%
1996	1,244	162	1,406	74%	1990	505	91%	26%
1997	1,455	144	1,598	84%	1929	503	93%	26%
1998	1,563	168	1,732	91%	1992	451	94%	24%
1999	1,166	188	1,354	71%	1931	389	95%	20%
2000	1,226	106	1,332	70%	1924	385	96%	20%
2001	539	143	683	36%	1991	307	98%	16%
2002	1,032	0	1,032	54%	1988	294	99%	15%
2003	1,087	67	1,154	60%	1977	153	100%	8%
Average	**1,079**	**75**	**1,153**	**60%**		**1,153**		**60%**
Maximum	**1,680**	**200**	**1,845**	**97%**		**1,845**		**97%**
Minimum	**153**	**0**	**153**	**8%**		**153**		**8%**

Table C.19. Mojave WA: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	60	0	60	73%	1938	83	0%	100%
1923	51	0	51	62%	1958	83	1%	100%
1924	15	0	15	18%	1958	83	2%	100%
1925	39	0	39	47%	1958	83	4%	100%
1926	40	0	40	49%	1982	83	5%	100%
1927	54	0	54	65%	1980	83	6%	100%
1928	63	0	63	76%	1952	80	7%	97%
1929	15	0	15	18%	1998	78	9%	94%
1930	39	0	39	47%	1943	77	10%	92%
1931	17	0	17	20%	1995	76	11%	91%
1932	39	0	39	47%	1956	74	12%	89%
1933	30	0	30	36%	1967	73	14%	88%
1934	24	0	24	29%	1941	72	15%	86%
1935	54	0	54	65%	1984	71	16%	86%
1936	61	0	61	74%	1978	71	17%	86%
1937	61	0	61	74%	1997	70	19%	85%
1938	83	0	83	100%	1986	69	20%	84%
1939	22	0	22	27%	1951	66	21%	79%
1940	55	0	55	66%	1973	65	22%	78%
1941	72	0	72	86%	1928	63	23%	76%
1942	62	0	62	74%	1974	62	25%	75%
1943	77	0	77	92%	1979	62	26%	75%
1944	33	0	33	40%	1942	62	27%	74%
1945	61	0	61	74%	1945	61	28%	74%
1946	58	0	58	70%	1937	61	30%	74%
1947	44	0	44	54%	1936	61	31%	74%
1948	43	0	43	52%	1922	60	32%	73%
1949	35	0	35	42%	1996	60	33%	73%
1950	46	0	46	56%	1970	60	35%	72%
1951	66	0	66	79%	2000	59	36%	72%
1952	80	0	80	97%	1975	59	37%	71%
1953	43	0	43	52%	1946	58	38%	70%
1954	52	0	52	63%	1965	57	40%	69%
1955	37	0	37	45%	1985	57	41%	69%
1956	74	0	74	89%	1963	57	42%	68%
1957	43	0	43	51%	1999	55	43%	67%
1958	83	0	83	100%	1966	55	44%	66%
1959	39	0	39	47%	1940	55	46%	66%
1960	41	0	41	50%	1971	54	47%	66%
1961	33	0	33	40%	1935	54	48%	65%
1962	49	0	49	59%	1927	54	49%	65%
1963	57	0	57	68%	2002	53	51%	65%
1964	51	0	51	62%	1954	52	52%	63%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	57	0	57	69%	1964	51	53%	62%
1966	55	0	55	66%	1993	51	54%	62%
1967	73	0	73	88%	1923	51	56%	62%
1968	45	0	45	54%	1989	51	57%	62%
1969	83	0	83	100%	2003	51	58%	61%
1970	60	0	60	72%	1962	49	59%	59%
1971	54	0	54	66%	1950	46	60%	56%
1972	43	0	43	52%	1968	45	62%	54%
1973	65	0	65	78%	1947	44	63%	54%
1974	62	0	62	75%	1994	43	64%	52%
1975	59	0	59	71%	1972	43	65%	52%
1976	37	0	37	45%	1948	43	67%	52%
1977	7	0	7	8%	1953	43	68%	52%
1978	71	0	71	86%	1957	43	69%	51%
1979	62	0	62	75%	1960	41	70%	50%
1980	83	0	83	100%	1926	40	72%	49%
1981	35	0	35	43%	1930	39	73%	47%
1982	83	0	83	100%	1925	39	74%	47%
1983	83	0	83	100%	1932	39	75%	47%
1984	71	0	71	86%	1959	39	77%	47%
1985	57	0	57	69%	1976	37	78%	45%
1986	69	0	69	84%	1955	37	79%	45%
1987	18	0	18	22%	1981	35	80%	43%
1988	13	0	13	15%	1949	35	81%	42%
1989	51	0	51	62%	1944	33	83%	40%
1990	22	0	22	27%	1961	33	84%	40%
1991	13	0	13	16%	1933	30	85%	36%
1992	20	0	20	24%	1934	24	86%	29%
1993	51	0	51	62%	2001	23	88%	28%
1994	43	0	43	52%	1939	22	89%	27%
1995	76	0	76	91%	1990	22	90%	27%
1996	60	0	60	73%	1992	20	91%	24%
1997	70	0	70	85%	1987	18	93%	22%
1998	78	0	78	94%	1931	17	94%	20%
1999	55	0	55	67%	1929	15	95%	18%
2000	59	0	59	72%	1924	15	96%	18%
2001	23	0	23	28%	1991	13	98%	16%
2002	53	0	53	65%	1988	13	99%	15%
2003	51	0	51	61%	1977	7	100%	8%
Average	**51**	**0**	**51**	**61%**		**51**		**61%**
Maximum	**83**	**0**	**83**	**100%**		**83**		**100%**
Minimum	**7**	**0**	**7**	**8%**		**7**		**8%**

Table C.20. Napa County FC&WCD: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	29	0	29	100%	1963	29	0%	100%
1923	27	0	27	94%	1963	29	1%	100%
1924	10	0	10	33%	1963	29	2%	100%
1925	20	0	20	68%	1963	29	4%	100%
1926	20	0	20	68%	1922	29	5%	100%
1927	29	0	29	99%	1922	29	6%	100%
1928	29	0	29	99%	1922	29	7%	100%
1929	10	0	10	33%	1922	29	9%	100%
1930	20	0	20	68%	1922	29	10%	100%
1931	10	0	10	33%	1922	29	11%	100%
1932	10	0	10	33%	1938	29	12%	100%
1933	10	0	10	33%	1938	29	14%	100%
1934	10	0	10	33%	1938	29	15%	100%
1935	20	0	20	68%	1938	29	16%	100%
1936	27	0	27	94%	1942	29	17%	100%
1937	20	0	20	68%	1942	29	19%	100%
1938	29	0	29	100%	1942	29	20%	100%
1939	27	0	27	94%	1942	29	21%	100%
1940	29	0	29	99%	1942	29	22%	100%
1941	29	0	29	100%	1942	29	23%	100%
1942	29	0	29	100%	1942	29	25%	100%
1943	29	0	29	100%	1942	29	26%	100%
1944	20	0	20	68%	1942	29	27%	100%
1945	27	0	27	94%	1942	29	28%	100%
1946	29	0	29	99%	1942	29	30%	100%
1947	20	0	20	68%	1942	29	31%	100%
1948	27	0	27	94%	2003	29	32%	99%
1949	20	0	20	68%	1928	29	33%	99%
1950	20	0	20	68%	1928	29	35%	99%
1951	29	0	29	99%	1928	29	36%	99%
1952	29	0	29	100%	1927	29	37%	99%
1953	29	0	29	100%	1927	29	38%	99%
1954	29	0	29	99%	1927	29	40%	99%
1955	20	0	20	68%	1927	29	41%	99%
1956	29	0	29	100%	1927	29	42%	99%
1957	29	0	29	99%	1927	29	43%	99%
1958	29	0	29	100%	1954	29	44%	99%
1959	27	0	27	94%	1954	29	46%	99%
1960	20	0	20	68%	1954	29	47%	99%
1961	20	0	20	68%	1923	27	48%	94%
1962	27	0	27	94%	1923	27	49%	94%
1963	29	0	29	100%	1923	27	51%	94%
1964	20	0	20	68%	1923	27	52%	94%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	29	0	29	100%	1923	27	53%	94%
1966	27	0	27	94%	1923	27	54%	94%
1967	29	0	29	100%	1923	27	56%	94%
1968	27	0	27	94%	1936	27	57%	94%
1969	29	0	29	100%	1936	27	58%	94%
1970	29	0	29	100%	1936	27	59%	94%
1971	29	0	29	100%	1936	27	60%	94%
1972	27	0	27	94%	1925	20	62%	68%
1973	29	0	29	99%	1925	20	63%	68%
1974	29	0	29	100%	1925	20	64%	68%
1975	29	0	29	100%	1925	20	65%	68%
1976	20	0	20	68%	1925	20	67%	68%
1977	10	0	10	33%	1925	20	68%	68%
1978	29	0	29	99%	1925	20	69%	68%
1979	20	0	20	68%	1925	20	70%	68%
1980	29	0	29	99%	1925	20	72%	68%
1981	20	0	20	68%	1926	20	73%	68%
1982	29	0	29	100%	1926	20	74%	68%
1983	29	0	29	100%	1926	20	75%	68%
1984	29	0	29	100%	1926	20	77%	68%
1985	27	0	27	94%	1937	20	78%	68%
1986	29	0	29	100%	1937	20	79%	68%
1987	20	0	20	68%	1937	20	80%	68%
1988	10	0	10	33%	1937	20	81%	68%
1989	20	0	20	68%	1937	20	83%	68%
1990	10	0	10	33%	1937	20	84%	68%
1991	10	0	10	33%	1937	20	85%	68%
1992	10	0	10	33%	1924	10	86%	33%
1993	29	0	29	99%	1924	10	88%	33%
1994	10	0	10	33%	1924	10	89%	33%
1995	29	0	29	100%	1924	10	90%	33%
1996	29	0	29	100%	1924	10	91%	33%
1997	29	0	29	100%	1924	10	93%	33%
1998	29	0	29	100%	1924	10	94%	33%
1999	29	0	29	100%	1924	10	95%	33%
2000	29	0	29	99%	1931	10	96%	33%
2001	20	0	20	68%	1931	10	98%	33%
2002	20	0	20	68%	1931	10	99%	33%
2003	29	0	29	99%	1931	10	100%	33%
Average	**24**	**0**	**24**	**81%**		**24**		**81%**
Maximum	**29**	**0**	**29**	**100%**		**29**		**100%**
Minimum	**10**	**0**	**10**	**33%**		**10**		**33%**

Table C.21. Oak Flat WD: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	4	0	4	73%	1938	6	0%	100%
1923	4	0	4	62%	1983	6	1%	100%
1924	1	0	1	18%	1958	6	2%	100%
1925	3	0	3	47%	1958	6	4%	100%
1926	3	0	3	45%	1982	6	5%	100%
1927	4	0	4	65%	1980	6	6%	100%
1928	4	0	4	76%	1952	6	7%	97%
1929	1	0	1	15%	1998	5	9%	94%
1930	3	0	3	47%	1943	5	10%	92%
1931	1	0	1	20%	1995	5	11%	90%
1932	3	0	3	47%	1956	5	12%	89%
1933	2	0	2	30%	1967	5	14%	88%
1934	1	0	1	24%	1941	5	15%	86%
1935	4	0	4	65%	1984	5	16%	86%
1936	4	0	4	74%	1978	5	17%	86%
1937	4	0	4	74%	1997	5	19%	85%
1938	6	0	6	100%	1986	5	20%	83%
1939	2	0	2	29%	1951	5	21%	79%
1940	4	0	4	66%	1973	4	22%	78%
1941	5	0	5	86%	1928	4	23%	76%
1942	4	0	4	74%	1974	4	25%	75%
1943	5	0	5	92%	1979	4	26%	75%
1944	2	0	2	34%	1942	4	27%	74%
1945	4	0	4	74%	1945	4	28%	74%
1946	4	0	4	70%	1937	4	30%	74%
1947	3	0	3	44%	1936	4	31%	74%
1948	3	0	3	52%	1922	4	32%	73%
1949	2	0	2	42%	1996	4	33%	73%
1950	3	0	3	56%	1970	4	35%	72%
1951	5	0	5	79%	2000	4	36%	72%
1952	6	0	6	97%	1975	4	37%	71%
1953	3	0	3	52%	1946	4	38%	70%
1954	4	0	4	63%	1965	4	40%	69%
1955	3	0	3	45%	1963	4	41%	68%
1956	5	0	5	89%	1999	4	42%	67%
1957	3	0	3	51%	1966	4	43%	66%
1958	6	0	6	100%	1940	4	44%	66%
1959	3	0	3	47%	1971	4	46%	66%
1960	2	0	2	41%	1935	4	47%	65%
1961	2	0	2	33%	1927	4	48%	65%
1962	3	0	3	59%	1954	4	49%	63%
1963	4	0	4	68%	1985	4	51%	63%
1964	4	0	4	62%	1964	4	52%	62%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	4	0	4	69%	1993	4	53%	62%
1966	4	0	4	66%	1923	4	54%	62%
1967	5	0	5	88%	1989	4	56%	62%
1968	3	0	3	54%	1962	3	57%	59%
1969	6	0	6	100%	2003	3	58%	58%
1970	4	0	4	72%	1950	3	59%	56%
1971	4	0	4	66%	1968	3	60%	54%
1972	3	0	3	52%	2002	3	62%	53%
1973	4	0	4	78%	1972	3	63%	52%
1974	4	0	4	75%	1948	3	64%	52%
1975	4	0	4	71%	1953	3	65%	52%
1976	3	0	3	45%	1957	3	67%	51%
1977	0	0	0	8%	1930	3	68%	47%
1978	5	0	5	86%	1925	3	69%	47%
1979	4	0	4	75%	1932	3	70%	47%
1980	6	0	6	100%	1959	3	72%	47%
1981	2	0	2	28%	1926	3	73%	45%
1982	6	0	6	100%	1976	3	74%	45%
1983	6	0	6	100%	1955	3	75%	45%
1984	5	0	5	86%	1947	3	77%	44%
1985	4	0	4	63%	1994	2	78%	43%
1986	5	0	5	83%	1949	2	79%	42%
1987	1	0	1	20%	1960	2	80%	41%
1988	1	0	1	10%	1944	2	81%	34%
1989	4	0	4	62%	1961	2	83%	33%
1990	1	0	1	18%	1933	2	84%	30%
1991	1	0	1	16%	1939	2	85%	29%
1992	1	0	1	16%	2001	2	86%	28%
1993	4	0	4	62%	1981	2	88%	28%
1994	2	0	2	43%	1934	1	89%	24%
1995	5	0	5	90%	1931	1	90%	20%
1996	4	0	4	73%	1987	1	91%	20%
1997	5	0	5	85%	1990	1	93%	18%
1998	5	0	5	94%	1924	1	94%	18%
1999	4	0	4	67%	1992	1	95%	16%
2000	4	0	4	72%	1991	1	96%	16%
2001	2	0	2	28%	1929	1	98%	15%
2002	3	0	3	53%	1988	1	99%	10%
2003	3	0	3	58%	1977	0	100%	8%
Average	**3**	**0**	**3**	**60%**		**3**		**60%**
Maximum	**6**	**0**	**6**	**100%**		**6**		**100%**
Minimum	**0**	**0**	**0**	**8%**		**0**		**8%**

Table C.22. Palmdale WD: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	15	0	15	73%	1958	21	0%	100%
1923	13	0	13	62%	1938	21	1%	100%
1924	4	0	4	18%	1938	21	2%	100%
1925	10	0	10	47%	1938	21	4%	100%
1926	10	0	10	49%	1969	21	5%	100%
1927	14	0	14	65%	1980	21	6%	100%
1928	16	0	16	76%	1998	20	7%	94%
1929	4	0	4	18%	1943	20	9%	92%
1930	10	0	10	47%	1956	19	10%	89%
1931	4	0	4	20%	1967	19	11%	88%
1932	10	0	10	47%	1941	18	12%	86%
1933	8	0	8	36%	1984	18	14%	86%
1934	6	0	6	29%	1978	18	15%	86%
1935	14	0	14	65%	1995	18	16%	86%
1936	16	0	16	74%	1997	18	17%	85%
1937	16	0	16	74%	1986	18	19%	84%
1938	21	0	21	100%	1952	18	20%	83%
1939	5	0	5	21%	1951	17	21%	79%
1940	14	0	14	66%	1973	17	22%	78%
1941	18	0	18	86%	1928	16	23%	76%
1942	16	0	16	74%	1974	16	25%	75%
1943	20	0	20	92%	1979	16	26%	75%
1944	9	0	9	40%	1942	16	27%	74%
1945	16	0	16	74%	1945	16	28%	74%
1946	15	0	15	70%	1937	16	30%	74%
1947	9	0	9	44%	1936	16	31%	74%
1948	11	0	11	52%	1922	15	32%	73%
1949	9	0	9	42%	1996	15	33%	73%
1950	12	0	12	56%	1970	15	35%	72%
1951	17	0	17	79%	2000	15	36%	72%
1952	18	0	18	83%	1975	15	37%	71%
1953	11	0	11	52%	1946	15	38%	70%
1954	13	0	13	63%	1965	15	40%	69%
1955	10	0	10	45%	1963	15	41%	68%
1956	19	0	19	89%	1999	14	42%	67%
1957	11	0	11	51%	1966	14	43%	66%
1958	21	0	21	100%	1940	14	44%	66%
1959	10	0	10	47%	1971	14	46%	66%
1960	7	0	7	32%	1935	14	47%	65%
1961	5	0	5	23%	1927	14	48%	65%
1962	13	0	13	59%	1954	13	49%	63%
1963	15	0	15	68%	1964	13	51%	62%
1964	13	0	13	62%	1993	13	52%	62%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	15	0	15	69%	1923	13	53%	62%
1966	14	0	14	66%	1962	13	54%	59%
1967	19	0	19	88%	1989	12	56%	57%
1968	12	0	12	54%	1950	12	57%	56%
1969	21	0	21	100%	1968	12	58%	54%
1970	15	0	15	72%	1985	11	59%	54%
1971	14	0	14	66%	1972	11	60%	52%
1972	11	0	11	52%	1948	11	62%	52%
1973	17	0	17	78%	1953	11	63%	52%
1974	16	0	16	75%	1957	11	64%	51%
1975	15	0	15	71%	2003	11	65%	50%
1976	10	0	10	45%	1926	10	67%	49%
1977	2	0	2	8%	1930	10	68%	47%
1978	18	0	18	86%	1925	10	69%	47%
1979	16	0	16	75%	1932	10	70%	47%
1980	21	0	21	100%	1959	10	72%	47%
1981	9	0	9	43%	1976	10	73%	45%
1982	21	0	21	100%	1955	10	74%	45%
1983	21	0	21	100%	1947	9	75%	44%
1984	18	0	18	86%	1981	9	77%	43%
1985	11	0	11	54%	2002	9	78%	43%
1986	18	0	18	84%	1949	9	79%	42%
1987	5	0	5	22%	1944	9	80%	40%
1988	3	0	3	15%	1933	8	81%	36%
1989	12	0	12	57%	1994	7	83%	34%
1990	2	0	2	11%	1960	7	84%	32%
1991	3	0	3	16%	1934	6	85%	29%
1992	5	0	5	24%	2001	6	86%	28%
1993	13	0	13	62%	1992	5	88%	24%
1994	7	0	7	34%	1961	5	89%	23%
1995	18	0	18	86%	1987	5	90%	22%
1996	15	0	15	73%	1939	5	91%	21%
1997	18	0	18	85%	1931	4	93%	20%
1998	20	0	20	94%	1929	4	94%	18%
1999	14	0	14	67%	1924	4	95%	18%
2000	15	0	15	72%	1991	3	96%	16%
2001	6	0	6	28%	1988	3	98%	15%
2002	9	0	9	43%	1990	2	99%	11%
2003	11	0	11	50%	1977	2	100%	8%
Average	**13**	**0**	**13**	**60%**		**13**		**60%**
Maximum	**21**	**0**	**21**	**100%**		**21**		**100%**
Minimum	**2**	**0**	**2**	**8%**		**2**		**8%**

Table C.23. San Bernardino Valley MWD: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	66	0	66	65%	1938	99	0%	97%
1923	61	8	69	68%	1980	99	1%	97%
1924	18	2	21	20%	1983	99	2%	97%
1925	49	0	49	47%	1952	97	4%	95%
1926	50	0	50	49%	1998	95	5%	93%
1927	62	0	62	60%	1943	93	6%	90%
1928	70	5	74	73%	1982	91	7%	89%
1929	19	9	28	27%	1958	91	9%	89%
1930	49	0	49	47%	1958	91	10%	89%
1931	21	0	21	20%	1997	86	11%	83%
1932	48	0	48	47%	1967	86	12%	83%
1933	37	0	37	36%	1941	84	14%	82%
1934	29	0	29	29%	1995	83	15%	81%
1935	63	0	63	61%	1986	82	16%	80%
1936	67	4	71	70%	1956	81	17%	79%
1937	68	8	76	74%	1984	79	19%	77%
1938	91	8	99	97%	1978	79	20%	77%
1939	45	11	57	55%	1979	78	21%	76%
1940	62	0	62	61%	1974	77	22%	75%
1941	79	5	84	82%	1970	77	23%	75%
1942	68	2	70	68%	2003	76	25%	74%
1943	84	8	93	90%	1937	76	26%	74%
1944	41	8	50	48%	1996	75	27%	73%
1945	68	0	68	66%	1928	74	28%	73%
1946	64	8	72	70%	1975	73	30%	71%
1947	55	8	63	61%	1985	73	31%	71%
1948	53	0	53	52%	1999	73	32%	71%
1949	43	0	43	42%	1951	72	33%	70%
1950	57	0	57	56%	1946	72	35%	70%
1951	72	0	72	70%	1936	71	36%	70%
1952	88	9	97	95%	2000	71	37%	70%
1953	53	11	64	62%	1973	71	38%	69%
1954	61	0	61	60%	1971	70	40%	68%
1955	46	3	49	48%	1966	70	41%	68%
1956	81	0	81	79%	1942	70	42%	68%
1957	53	10	63	61%	1923	69	43%	68%
1958	91	0	91	89%	1964	69	44%	67%
1959	48	11	59	58%	1945	68	46%	66%
1960	51	0	51	50%	1922	66	47%	65%
1961	41	0	41	40%	1965	65	48%	63%
1962	60	0	60	59%	1953	64	49%	62%
1963	63	0	63	61%	1963	63	51%	61%
1964	62	7	69	67%	1947	63	52%	61%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	63	2	65	63%	1957	63	53%	61%
1966	62	8	70	68%	1935	63	54%	61%
1967	80	5	86	83%	2002	62	56%	61%
1968	56	5	61	59%	1940	62	57%	61%
1969	91	0	91	89%	1927	62	58%	60%
1970	66	11	77	75%	1989	62	59%	60%
1971	62	8	70	68%	1954	61	60%	60%
1972	53	5	58	57%	1993	61	62%	60%
1973	71	0	71	69%	1968	61	63%	59%
1974	68	9	77	75%	1962	60	64%	59%
1975	65	9	73	71%	1959	59	65%	58%
1976	46	8	54	53%	1972	58	67%	57%
1977	8	0	8	8%	1950	57	68%	56%
1978	79	0	79	77%	1939	57	69%	55%
1979	68	10	78	76%	1994	56	70%	55%
1980	91	8	99	97%	1981	55	72%	54%
1981	44	11	55	54%	1976	54	73%	53%
1982	91	0	91	89%	1948	53	74%	52%
1983	91	8	99	97%	1960	51	75%	50%
1984	79	0	79	77%	1926	50	77%	49%
1985	63	10	73	71%	1944	50	78%	48%
1986	77	6	82	80%	1955	49	79%	48%
1987	22	8	30	29%	1930	49	80%	47%
1988	16	0	16	15%	1925	49	81%	47%
1989	62	0	62	60%	1932	48	83%	47%
1990	27	2	29	28%	1949	43	84%	42%
1991	16	0	16	16%	1961	41	85%	40%
1992	25	0	25	24%	2001	37	86%	36%
1993	61	0	61	60%	1933	37	88%	36%
1994	54	2	56	55%	1987	30	89%	29%
1995	83	0	83	81%	1934	29	90%	29%
1996	66	9	75	73%	1990	29	91%	28%
1997	78	8	86	83%	1929	28	93%	27%
1998	86	10	95	93%	1992	25	94%	24%
1999	62	11	73	71%	1931	21	95%	20%
2000	65	6	71	70%	1924	21	96%	20%
2001	29	8	37	36%	1991	16	98%	16%
2002	62	0	62	61%	1988	16	99%	15%
2003	72	4	76	74%	1977	8	100%	8%
Average	**59**	**4**	**63**	**61%**		**63**		**61%**
Maximum	**91**	**11**	**99**	**97%**		**99**		**97%**
Minimum	**8**	**0**	**8**	**8%**		**8**		**8%**

Table C.24. San Gabriel Valley MWD: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	21	0	21	73%	1982	29	0%	100%
1923	18	0	18	62%	1982	29	1%	100%
1924	5	0	5	18%	1938	29	2%	100%
1925	14	0	14	47%	1938	29	4%	100%
1926	14	0	14	49%	1938	29	5%	100%
1927	19	0	19	65%	1980	29	6%	100%
1928	22	0	22	76%	1952	28	7%	97%
1929	5	0	5	18%	1998	27	9%	94%
1930	14	0	14	47%	1943	27	10%	92%
1931	6	0	6	20%	1995	26	11%	91%
1932	14	0	14	47%	1956	26	12%	89%
1933	10	0	10	36%	1967	25	14%	88%
1934	8	0	8	29%	1941	25	15%	86%
1935	19	0	19	65%	1984	25	16%	86%
1936	21	0	21	74%	1978	25	17%	86%
1937	21	0	21	74%	1997	24	19%	85%
1938	29	0	29	100%	1986	24	20%	84%
1939	5	0	5	19%	1951	23	21%	79%
1940	19	0	19	66%	1973	22	22%	78%
1941	25	0	25	86%	1928	22	23%	76%
1942	21	0	21	74%	1974	22	25%	75%
1943	27	0	27	92%	1979	22	26%	75%
1944	12	0	12	40%	1942	21	27%	74%
1945	21	0	21	74%	1945	21	28%	74%
1946	20	0	20	70%	1937	21	30%	74%
1947	15	0	15	54%	1936	21	31%	74%
1948	15	0	15	52%	1922	21	32%	73%
1949	12	0	12	42%	1996	21	33%	73%
1950	16	0	16	56%	1970	21	35%	72%
1951	23	0	23	79%	2000	21	36%	72%
1952	28	0	28	97%	1975	20	37%	71%
1953	15	0	15	52%	1946	20	38%	70%
1954	18	0	18	63%	1965	20	40%	69%
1955	13	0	13	45%	1985	20	41%	69%
1956	26	0	26	89%	1963	20	42%	68%
1957	15	0	15	51%	1999	19	43%	67%
1958	29	0	29	100%	1966	19	44%	66%
1959	13	0	13	47%	1940	19	46%	66%
1960	14	0	14	50%	1971	19	47%	66%
1961	11	0	11	40%	1935	19	48%	65%
1962	17	0	17	59%	1927	19	49%	65%
1963	20	0	20	68%	2002	19	51%	65%
1964	18	0	18	62%	1954	18	52%	63%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	20	0	20	69%	1964	18	53%	62%
1966	19	0	19	66%	1993	18	54%	62%
1967	25	0	25	88%	1923	18	56%	62%
1968	16	0	16	54%	2003	18	57%	62%
1969	29	0	29	100%	1989	18	58%	62%
1970	21	0	21	72%	1962	17	59%	59%
1971	19	0	19	66%	1950	16	60%	56%
1972	15	0	15	52%	1968	16	62%	54%
1973	22	0	22	78%	1947	15	63%	54%
1974	22	0	22	75%	1994	15	64%	52%
1975	20	0	20	71%	1972	15	65%	52%
1976	13	0	13	45%	1948	15	67%	52%
1977	2	0	2	8%	1953	15	68%	52%
1978	25	0	25	86%	1957	15	69%	51%
1979	22	0	22	75%	1960	14	70%	50%
1980	29	0	29	100%	1926	14	72%	49%
1981	12	0	12	43%	1930	14	73%	47%
1982	29	0	29	100%	1925	14	74%	47%
1983	29	0	29	100%	1932	14	75%	47%
1984	25	0	25	86%	1959	13	77%	47%
1985	20	0	20	69%	1976	13	78%	45%
1986	24	0	24	84%	1955	13	79%	45%
1987	6	0	6	22%	1981	12	80%	43%
1988	4	0	4	15%	1949	12	81%	42%
1989	18	0	18	62%	1944	12	83%	40%
1990	8	0	8	27%	1961	11	84%	40%
1991	5	0	5	16%	1933	10	85%	36%
1992	7	0	7	24%	1934	8	86%	29%
1993	18	0	18	62%	2001	8	88%	28%
1994	15	0	15	52%	1990	8	89%	27%
1995	26	0	26	91%	1992	7	90%	24%
1996	21	0	21	73%	1987	6	91%	22%
1997	24	0	24	85%	1931	6	93%	20%
1998	27	0	27	94%	1939	5	94%	19%
1999	19	0	19	67%	1929	5	95%	18%
2000	21	0	21	72%	1924	5	96%	18%
2001	8	0	8	28%	1991	5	98%	16%
2002	19	0	19	65%	1988	4	99%	15%
2003	18	0	18	62%	1977	2	100%	8%
Average	**18**	**0**	**18**	**61%**		**18**		**61%**
Maximum	**29**	**0**	**29**	**100%**		**29**		**100%**
Minimum	**2**	**0**	**2**	**8%**		**2**		**8%**

Table C.25. San Gorgonio Pass WA: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	13	0	13	73%	1982	17	0%	100%
1923	11	0	11	62%	1982	17	1%	100%
1924	3	0	3	18%	1938	17	2%	100%
1925	8	0	8	47%	1938	17	4%	100%
1926	8	0	8	49%	1938	17	5%	100%
1927	11	0	11	65%	1980	17	6%	100%
1928	13	0	13	76%	1952	17	7%	97%
1929	3	0	3	18%	1998	16	9%	94%
1930	8	0	8	47%	1943	16	10%	92%
1931	4	0	4	20%	1995	16	11%	91%
1932	8	0	8	47%	1956	15	12%	89%
1933	6	0	6	36%	1967	15	14%	88%
1934	5	0	5	29%	1941	15	15%	86%
1935	11	0	11	65%	1984	15	16%	86%
1936	13	0	13	74%	1978	15	17%	86%
1937	13	0	13	74%	1997	15	19%	85%
1938	17	0	17	100%	1986	15	20%	84%
1939	4	0	4	22%	1951	14	21%	79%
1940	11	0	11	66%	1973	14	22%	78%
1941	15	0	15	86%	1928	13	23%	76%
1942	13	0	13	74%	1974	13	25%	75%
1943	16	0	16	92%	1979	13	26%	75%
1944	7	0	7	40%	1942	13	27%	74%
1945	13	0	13	74%	1945	13	28%	74%
1946	12	0	12	70%	1937	13	30%	74%
1947	9	0	9	54%	1936	13	31%	74%
1948	9	0	9	52%	1922	13	32%	73%
1949	7	0	7	42%	1996	13	33%	73%
1950	10	0	10	56%	1970	12	35%	72%
1951	14	0	14	79%	2000	12	36%	72%
1952	17	0	17	97%	1975	12	37%	71%
1953	9	0	9	52%	1946	12	38%	70%
1954	11	0	11	63%	1965	12	40%	69%
1955	8	0	8	45%	1985	12	41%	69%
1956	15	0	15	89%	2003	12	42%	69%
1957	9	0	9	51%	1963	12	43%	68%
1958	17	0	17	100%	1999	12	44%	67%
1959	8	0	8	47%	1966	11	46%	66%
1960	9	0	9	50%	1940	11	47%	66%
1961	7	0	7	40%	1971	11	48%	66%
1962	10	0	10	59%	1935	11	49%	65%
1963	12	0	12	68%	1927	11	51%	65%
1964	11	0	11	62%	2002	11	52%	65%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	12	0	12	69%	1954	11	53%	63%
1966	11	0	11	66%	1964	11	54%	62%
1967	15	0	15	88%	1993	11	56%	62%
1968	9	0	9	54%	1923	11	57%	62%
1969	17	0	17	100%	1989	11	58%	62%
1970	12	0	12	72%	1962	10	59%	59%
1971	11	0	11	66%	1950	10	60%	56%
1972	9	0	9	52%	1968	9	62%	54%
1973	14	0	14	78%	1947	9	63%	54%
1974	13	0	13	75%	1994	9	64%	52%
1975	12	0	12	71%	1972	9	65%	52%
1976	8	0	8	45%	1948	9	67%	52%
1977	1	0	1	8%	1953	9	68%	52%
1978	15	0	15	86%	1957	9	69%	51%
1979	13	0	13	75%	1960	9	70%	50%
1980	17	0	17	100%	1926	8	72%	49%
1981	7	0	7	43%	1930	8	73%	47%
1982	17	0	17	100%	1925	8	74%	47%
1983	17	0	17	100%	1932	8	75%	47%
1984	15	0	15	86%	1959	8	77%	47%
1985	12	0	12	69%	1976	8	78%	45%
1986	15	0	15	84%	1955	8	79%	45%
1987	4	0	4	22%	1981	7	80%	43%
1988	3	0	3	15%	1949	7	81%	42%
1989	11	0	11	62%	1944	7	83%	40%
1990	5	0	5	27%	1961	7	84%	40%
1991	3	0	3	16%	1933	6	85%	36%
1992	4	0	4	24%	1934	5	86%	29%
1993	11	0	11	62%	2001	5	88%	28%
1994	9	0	9	52%	1990	5	89%	27%
1995	16	0	16	91%	1992	4	90%	24%
1996	13	0	13	73%	1987	4	91%	22%
1997	15	0	15	85%	1939	4	93%	22%
1998	16	0	16	94%	1931	4	94%	20%
1999	12	0	12	67%	1929	3	95%	18%
2000	12	0	12	72%	1924	3	96%	18%
2001	5	0	5	28%	1991	3	98%	16%
2002	11	0	11	65%	1988	3	99%	15%
2003	12	0	12	69%	1977	1	100%	8%
Average	**11**	**0**	**11**	**61%**		**11**		**61%**
Maximum	**17**	**0**	**17**	**100%**		**17**		**100%**
Minimum	**1**	**0**	**1**	**8%**		**1**		**8%**

Table C.26. San Luis Obispo County FC&WCD: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	18	0	18	73%	1938	25	0%	100%
1923	15	0	15	62%	1938	25	1%	100%
1924	5	0	5	18%	1938	25	2%	100%
1925	12	0	12	47%	1958	25	4%	100%
1926	12	0	12	49%	1958	25	5%	100%
1927	16	0	16	65%	1980	25	6%	100%
1928	19	0	19	76%	1952	24	7%	97%
1929	5	0	5	18%	1998	23	9%	94%
1930	12	0	12	47%	1943	23	10%	92%
1931	5	0	5	20%	1956	22	11%	89%
1932	12	0	12	47%	1967	22	12%	88%
1933	9	0	9	36%	1941	22	14%	86%
1934	7	0	7	29%	1984	22	15%	86%
1935	16	0	16	65%	1978	22	16%	86%
1936	18	0	18	74%	1997	21	17%	85%
1937	19	0	19	74%	1986	21	19%	84%
1938	25	0	25	100%	1995	21	20%	83%
1939	11	0	11	44%	1951	20	21%	79%
1940	17	0	17	66%	1973	20	22%	78%
1941	22	0	22	86%	1928	19	23%	76%
1942	19	0	19	74%	1974	19	25%	75%
1943	23	0	23	92%	1979	19	26%	75%
1944	10	0	10	40%	1942	19	27%	74%
1945	19	0	19	74%	1945	19	28%	74%
1946	17	0	17	70%	1937	19	30%	74%
1947	13	0	13	50%	1936	18	31%	74%
1948	13	0	13	52%	1922	18	32%	73%
1949	11	0	11	42%	1996	18	33%	73%
1950	14	0	14	56%	1970	18	35%	72%
1951	20	0	20	79%	2000	18	36%	72%
1952	24	0	24	97%	1975	18	37%	71%
1953	13	0	13	52%	1946	17	38%	70%
1954	16	0	16	63%	1965	17	40%	69%
1955	11	0	11	45%	1985	17	41%	69%
1956	22	0	22	89%	1963	17	42%	68%
1957	13	0	13	51%	1999	17	43%	67%
1958	25	0	25	100%	1966	17	44%	66%
1959	12	0	12	47%	1940	17	46%	66%
1960	12	0	12	50%	2003	16	47%	66%
1961	10	0	10	40%	1971	16	48%	66%
1962	15	0	15	59%	1935	16	49%	65%
1963	17	0	17	68%	1927	16	51%	65%
1964	16	0	16	62%	1954	16	52%	63%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	17	0	17	69%	2002	16	53%	63%
1966	17	0	17	66%	1964	16	54%	62%
1967	22	0	22	88%	1993	15	56%	62%
1968	14	0	14	54%	1923	15	57%	62%
1969	25	0	25	100%	1989	15	58%	62%
1970	18	0	18	72%	1962	15	59%	59%
1971	16	0	16	66%	1950	14	60%	56%
1972	13	0	13	52%	1968	14	62%	54%
1973	20	0	20	78%	1994	13	63%	52%
1974	19	0	19	75%	1972	13	64%	52%
1975	18	0	18	71%	1948	13	65%	52%
1976	11	0	11	45%	1953	13	67%	52%
1977	2	0	2	8%	1957	13	68%	51%
1978	22	0	22	86%	1947	13	69%	50%
1979	19	0	19	75%	1960	12	70%	50%
1980	25	0	25	100%	1926	12	72%	49%
1981	11	0	11	43%	1930	12	73%	47%
1982	25	0	25	100%	1925	12	74%	47%
1983	25	0	25	100%	1932	12	75%	47%
1984	22	0	22	86%	1959	12	77%	47%
1985	17	0	17	69%	1976	11	78%	45%
1986	21	0	21	84%	1955	11	79%	45%
1987	5	0	5	22%	1939	11	80%	44%
1988	4	0	4	15%	1981	11	81%	43%
1989	15	0	15	62%	1949	11	83%	42%
1990	7	0	7	27%	1944	10	84%	40%
1991	4	0	4	16%	1961	10	85%	40%
1992	6	0	6	24%	1933	9	86%	36%
1993	15	0	15	62%	1934	7	88%	29%
1994	13	0	13	52%	2001	7	89%	28%
1995	21	0	21	83%	1990	7	90%	27%
1996	18	0	18	73%	1992	6	91%	24%
1997	21	0	21	85%	1987	5	93%	22%
1998	23	0	23	94%	1931	5	94%	20%
1999	17	0	17	67%	1929	5	95%	18%
2000	18	0	18	72%	1924	5	96%	18%
2001	7	0	7	28%	1991	4	98%	16%
2002	16	0	16	63%	1988	4	99%	15%
2003	16	0	16	66%	1977	2	100%	8%
Average	**15**	**0**	**15**	**62%**		**15**		**62%**
Maximum	**25**	**0**	**25**	**100%**		**25**		**100%**
Minimum	**2**	**0**	**2**	**8%**		**2**		**8%**

Table C.27. Santa Barbara County FC&WCD: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	33	0	33	73%	1958	45	0%	100%
1923	28	0	28	62%	1938	45	1%	100%
1924	8	0	8	18%	1938	45	2%	100%
1925	22	0	22	47%	1938	45	4%	100%
1926	22	0	22	49%	1938	45	5%	100%
1927	30	0	30	65%	1980	45	6%	100%
1928	35	0	35	76%	1952	44	7%	97%
1929	8	0	8	18%	1998	43	9%	94%
1930	22	0	22	47%	1943	42	10%	92%
1931	9	0	9	20%	1956	40	11%	89%
1932	21	0	21	47%	1967	40	12%	88%
1933	16	0	16	36%	1941	39	14%	86%
1934	13	0	13	29%	1984	39	15%	86%
1935	30	0	30	65%	1978	39	16%	86%
1936	34	0	34	74%	1997	39	17%	85%
1937	34	0	34	74%	1986	38	19%	83%
1938	45	0	45	100%	1995	38	20%	82%
1939	9	0	9	20%	1951	36	21%	79%
1940	30	0	30	66%	1973	36	22%	78%
1941	39	0	39	86%	1928	35	23%	76%
1942	34	0	34	74%	1974	34	25%	75%
1943	42	0	42	92%	1979	34	26%	75%
1944	18	0	18	40%	1942	34	27%	74%
1945	34	0	34	74%	1945	34	28%	74%
1946	32	0	32	70%	1937	34	30%	74%
1947	14	0	14	31%	1936	34	31%	74%
1948	24	0	24	52%	1922	33	32%	73%
1949	19	0	19	42%	1996	33	33%	73%
1950	25	0	25	56%	1970	33	35%	72%
1951	36	0	36	79%	2000	33	36%	72%
1952	44	0	44	97%	1975	32	37%	71%
1953	24	0	24	52%	1946	32	38%	70%
1954	29	0	29	63%	1965	32	40%	69%
1955	20	0	20	45%	1963	31	41%	68%
1956	40	0	40	89%	1999	30	42%	67%
1957	23	0	23	51%	1966	30	43%	66%
1958	45	0	45	100%	1940	30	44%	66%
1959	21	0	21	47%	1971	30	46%	66%
1960	13	0	13	29%	1935	30	47%	65%
1961	11	0	11	23%	1927	30	48%	65%
1962	27	0	27	59%	1954	29	49%	63%
1963	31	0	31	68%	1964	28	51%	62%
1964	28	0	28	62%	1993	28	52%	62%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	32	0	32	69%	1923	28	53%	62%
1966	30	0	30	66%	1962	27	54%	59%
1967	40	0	40	88%	1985	26	56%	56%
1968	25	0	25	54%	1989	26	57%	56%
1969	45	0	45	100%	1950	25	58%	56%
1970	33	0	33	72%	1968	25	59%	54%
1971	30	0	30	66%	1972	24	60%	52%
1972	24	0	24	52%	1948	24	62%	52%
1973	36	0	36	78%	1953	24	63%	52%
1974	34	0	34	75%	1957	23	64%	51%
1975	32	0	32	71%	1926	22	65%	49%
1976	20	0	20	45%	1930	22	67%	47%
1977	4	0	4	8%	2003	22	68%	47%
1978	39	0	39	86%	1925	22	69%	47%
1979	34	0	34	75%	1932	21	70%	47%
1980	45	0	45	100%	1959	21	72%	47%
1981	19	0	19	43%	1976	20	73%	45%
1982	45	0	45	100%	1955	20	74%	45%
1983	45	0	45	100%	1981	19	75%	43%
1984	39	0	39	86%	1949	19	77%	42%
1985	26	0	26	56%	1944	18	78%	40%
1986	38	0	38	83%	2002	17	79%	37%
1987	10	0	10	22%	1933	16	80%	36%
1988	7	0	7	15%	1947	14	81%	31%
1989	26	0	26	56%	1994	14	83%	31%
1990	6	0	6	12%	1960	13	84%	29%
1991	7	0	7	16%	1934	13	85%	29%
1992	11	0	11	24%	2001	13	86%	28%
1993	28	0	28	62%	1992	11	88%	24%
1994	14	0	14	31%	1961	11	89%	23%
1995	38	0	38	82%	1987	10	90%	22%
1996	33	0	33	73%	1931	9	91%	20%
1997	39	0	39	85%	1939	9	93%	20%
1998	43	0	43	94%	1929	8	94%	18%
1999	30	0	30	67%	1924	8	95%	18%
2000	33	0	33	72%	1991	7	96%	16%
2001	13	0	13	28%	1988	7	98%	15%
2002	17	0	17	37%	1990	6	99%	12%
2003	22	0	22	47%	1977	4	100%	8%
Average	**27**	**0**	**27**	**59%**		**27**		**59%**
Maximum	**45**	**0**	**45**	**100%**		**45**		**100%**
Minimum	**4**	**0**	**4**	**8%**		**4**		**8%**

Table C.28. Santa Clara Valley WD: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	73	0	73	73%	1983	100	0%	100%
1923	62	0	62	62%	1969	97	1%	97%
1924	18	0	18	18%	1938	97	2%	97%
1925	47	0	47	47%	1952	96	4%	96%
1926	49	0	49	49%	1982	95	5%	95%
1927	65	0	65	65%	1980	95	6%	95%
1928	76	0	76	76%	1958	93	7%	93%
1929	18	0	18	18%	1998	93	9%	93%
1930	47	0	47	47%	1943	92	10%	92%
1931	20	0	20	20%	1995	91	11%	91%
1932	47	0	47	47%	1956	89	12%	89%
1933	36	0	36	36%	1967	88	14%	88%
1934	29	0	29	29%	1941	86	15%	86%
1935	65	0	65	65%	1984	86	16%	86%
1936	74	0	74	74%	1978	86	17%	86%
1937	74	0	74	74%	1997	85	19%	85%
1938	97	0	97	97%	1986	84	20%	84%
1939	44	0	44	44%	1951	79	21%	79%
1940	66	0	66	66%	1973	78	22%	78%
1941	86	0	86	86%	1928	76	23%	76%
1942	74	0	74	74%	1974	75	25%	75%
1943	92	0	92	92%	1979	75	26%	75%
1944	40	0	40	40%	1942	74	27%	74%
1945	74	0	74	74%	1945	74	28%	74%
1946	70	0	70	70%	1937	74	30%	74%
1947	54	0	54	54%	1936	74	31%	74%
1948	52	0	52	52%	1922	73	32%	73%
1949	42	0	42	42%	1996	73	33%	73%
1950	56	0	56	56%	1970	72	35%	72%
1951	79	0	79	79%	2000	72	36%	72%
1952	96	0	96	96%	1975	71	37%	71%
1953	52	0	52	52%	1946	70	38%	70%
1954	63	0	63	63%	1965	69	40%	69%
1955	45	0	45	45%	1985	69	41%	69%
1956	89	0	89	89%	1963	68	42%	68%
1957	51	0	51	51%	1999	67	43%	67%
1958	93	0	93	93%	1966	66	44%	66%
1959	47	0	47	47%	1940	66	46%	66%
1960	50	0	50	50%	1971	66	47%	66%
1961	40	0	40	40%	1935	65	48%	65%
1962	59	0	59	59%	1927	65	49%	65%
1963	68	0	68	68%	2003	65	51%	65%
1964	62	0	62	62%	2002	65	52%	65%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	69	0	69	69%	1954	63	53%	63%
1966	66	0	66	66%	1964	62	54%	62%
1967	88	0	88	88%	1993	62	56%	62%
1968	54	0	54	54%	1923	62	57%	62%
1969	97	0	97	97%	1989	62	58%	62%
1970	72	0	72	72%	1962	59	59%	59%
1971	66	0	66	66%	1950	56	60%	56%
1972	52	0	52	52%	1968	54	62%	54%
1973	78	0	78	78%	1947	54	63%	54%
1974	75	0	75	75%	1994	52	64%	52%
1975	71	0	71	71%	1972	52	65%	52%
1976	45	0	45	45%	1948	52	67%	52%
1977	8	0	8	8%	1953	52	68%	52%
1978	86	0	86	86%	1957	51	69%	51%
1979	75	0	75	75%	1960	50	70%	50%
1980	95	0	95	95%	1926	49	72%	49%
1981	43	0	43	43%	1930	47	73%	47%
1982	95	0	95	95%	1925	47	74%	47%
1983	100	0	100	100%	1932	47	75%	47%
1984	86	0	86	86%	1959	47	77%	47%
1985	69	0	69	69%	1976	45	78%	45%
1986	84	0	84	84%	1955	45	79%	45%
1987	22	0	22	22%	1939	44	80%	44%
1988	15	0	15	15%	1981	43	81%	43%
1989	62	0	62	62%	1949	42	83%	42%
1990	27	0	27	27%	1944	40	84%	40%
1991	16	0	16	16%	1961	40	85%	40%
1992	24	0	24	24%	1933	36	86%	36%
1993	62	0	62	62%	1934	29	88%	29%
1994	52	0	52	52%	2001	28	89%	28%
1995	91	0	91	91%	1990	27	90%	27%
1996	73	0	73	73%	1992	24	91%	24%
1997	85	0	85	85%	1987	22	93%	22%
1998	93	0	93	93%	1931	20	94%	20%
1999	67	0	67	67%	1929	18	95%	18%
2000	72	0	72	72%	1924	18	96%	18%
2001	28	0	28	28%	1991	16	98%	16%
2002	65	0	65	65%	1988	15	99%	15%
2003	65	0	65	65%	1977	8	100%	8%
Average	**61**	**0**	**61**	**61%**		**61**		**61%**
Maximum	**100**	**0**	**100**	**100%**		**100**		**100%**
Minimum	**8**	**0**	**8**	**8%**		**8**		**8%**

Table C.29. Solano County WA: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	48	0	48	100%	1938	48	0%	100%
1923	40	0	40	84%	1938	48	1%	100%
1924	12	0	12	25%	1938	48	2%	100%
1925	23	0	23	48%	1938	48	4%	100%
1926	23	0	23	48%	1938	48	5%	100%
1927	44	0	44	93%	1938	48	6%	100%
1928	44	0	44	93%	1922	48	7%	100%
1929	12	0	12	25%	1922	48	9%	100%
1930	23	0	23	48%	1922	48	10%	100%
1931	12	0	12	25%	1922	48	11%	100%
1932	12	0	12	25%	1963	48	12%	100%
1933	12	0	12	25%	1963	48	14%	100%
1934	10	0	10	22%	1963	48	15%	100%
1935	23	0	23	48%	1963	48	16%	100%
1936	40	0	40	84%	1942	48	17%	100%
1937	23	0	23	48%	1942	48	19%	100%
1938	48	0	48	100%	1942	48	20%	100%
1939	40	0	40	84%	1942	48	21%	100%
1940	44	0	44	93%	1942	48	22%	100%
1941	48	0	48	100%	1942	48	23%	100%
1942	48	0	48	100%	1942	48	25%	100%
1943	48	0	48	100%	1942	48	26%	100%
1944	23	0	23	48%	1942	48	27%	100%
1945	40	0	40	84%	1942	48	28%	100%
1946	44	0	44	93%	1942	48	30%	100%
1947	23	0	23	48%	1942	48	31%	100%
1948	40	0	40	84%	1927	44	32%	93%
1949	23	0	23	48%	1927	44	33%	93%
1950	23	0	23	48%	1927	44	35%	93%
1951	44	0	44	93%	1927	44	36%	93%
1952	48	0	48	100%	1927	44	37%	93%
1953	48	0	48	100%	1927	44	38%	93%
1954	44	0	44	93%	1927	44	40%	93%
1955	23	0	23	48%	1927	44	41%	93%
1956	48	0	48	100%	1927	44	42%	93%
1957	44	0	44	93%	1940	44	43%	93%
1958	48	0	48	100%	1940	44	44%	93%
1959	40	0	40	84%	1940	44	46%	93%
1960	23	0	23	48%	2003	43	47%	91%
1961	23	0	23	48%	1923	40	48%	84%
1962	40	0	40	84%	1923	40	49%	84%
1963	48	0	48	100%	1923	40	51%	84%
1964	23	0	23	48%	1923	40	52%	84%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	48	0	48	100%	1923	40	53%	84%
1966	40	0	40	84%	1923	40	54%	84%
1967	48	0	48	100%	1923	40	56%	84%
1968	40	0	40	84%	1923	40	57%	84%
1969	48	0	48	100%	1923	40	58%	84%
1970	48	0	48	100%	1923	40	59%	84%
1971	48	0	48	100%	1923	40	60%	84%
1972	40	0	40	84%	1947	23	62%	48%
1973	44	0	44	93%	2002	23	63%	48%
1974	48	0	48	100%	1925	23	64%	48%
1975	48	0	48	100%	1925	23	65%	48%
1976	23	0	23	48%	1925	23	67%	48%
1977	12	0	12	25%	1925	23	68%	48%
1978	44	0	44	93%	1925	23	69%	48%
1979	23	0	23	48%	1925	23	70%	48%
1980	44	0	44	93%	1925	23	72%	48%
1981	23	0	23	48%	1925	23	73%	48%
1982	48	0	48	100%	1925	23	74%	48%
1983	48	0	48	100%	1925	23	75%	48%
1984	48	0	48	100%	1925	23	77%	48%
1985	40	0	40	84%	1925	23	78%	48%
1986	48	0	48	100%	1925	23	79%	48%
1987	23	0	23	48%	1925	23	80%	48%
1988	12	0	12	25%	1925	23	81%	48%
1989	23	0	23	48%	1925	23	83%	48%
1990	12	0	12	25%	1937	23	84%	48%
1991	12	0	12	25%	1937	23	85%	48%
1992	12	0	12	25%	1924	12	86%	25%
1993	44	0	44	93%	1924	12	88%	25%
1994	12	0	12	25%	1924	12	89%	25%
1995	48	0	48	100%	1931	12	90%	25%
1996	48	0	48	100%	1931	12	91%	25%
1997	48	0	48	100%	1931	12	93%	25%
1998	48	0	48	100%	1931	12	94%	25%
1999	48	0	48	100%	1931	12	95%	25%
2000	44	0	44	93%	1931	12	96%	25%
2001	23	0	23	48%	1931	12	98%	25%
2002	23	0	23	48%	1931	12	99%	25%
2003	43	0	43	91%	1934	10	100%	22%
Average	**35**	**0**	**35**	**73%**		**35**		**73%**
Maximum	**48**	**0**	**48**	**100%**		**48**		**100%**
Minimum	**10**	**0**	**10**	**22%**		**10**		**22%**

Table C.30. Tulare Lake Basin WSD: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	65	0	65	73%	1938	89	0%	100%
1923	55	0	55	62%	1938	89	1%	100%
1924	16	0	16	18%	1938	89	2%	100%
1925	42	0	42	47%	1938	89	4%	100%
1926	43	0	43	49%	1958	89	5%	100%
1927	58	0	58	65%	1980	89	6%	100%
1928	68	0	68	76%	1952	86	7%	97%
1929	16	0	16	18%	1998	83	9%	94%
1930	42	0	42	47%	1956	79	10%	89%
1931	18	0	18	20%	1967	78	11%	88%
1932	42	0	42	47%	1941	77	12%	86%
1933	32	0	32	36%	1984	77	14%	86%
1934	25	0	25	29%	1978	77	15%	86%
1935	58	0	58	65%	1997	76	16%	85%
1936	66	0	66	74%	1943	74	17%	84%
1937	66	0	66	74%	1951	70	19%	79%
1938	89	0	89	100%	1973	69	20%	78%
1939	15	0	15	17%	1928	68	21%	76%
1940	59	0	59	66%	1974	67	22%	75%
1941	77	0	77	86%	1979	67	23%	75%
1942	66	0	66	74%	1942	66	25%	74%
1943	74	0	74	84%	1995	66	26%	74%
1944	36	0	36	40%	1945	66	27%	74%
1945	66	0	66	74%	1937	66	28%	74%
1946	62	0	62	70%	1936	66	30%	74%
1947	34	0	34	38%	1922	65	31%	73%
1948	46	0	46	52%	1996	65	32%	73%
1949	37	0	37	42%	1970	64	33%	72%
1950	49	0	49	56%	2000	64	35%	72%
1951	70	0	70	79%	1975	63	36%	71%
1952	86	0	86	97%	1946	62	37%	70%
1953	46	0	46	52%	1965	62	38%	69%
1954	56	0	56	63%	1963	61	40%	68%
1955	40	0	40	45%	1999	59	41%	67%
1956	79	0	79	89%	1966	59	42%	66%
1957	46	0	46	51%	1940	59	43%	66%
1958	89	0	89	100%	1971	58	44%	66%
1959	42	0	42	47%	1935	58	46%	65%
1960	31	0	31	35%	1927	58	47%	65%
1961	16	0	16	18%	1954	56	48%	63%
1962	53	0	53	59%	1993	55	49%	62%
1963	61	0	61	68%	1923	55	51%	62%
1964	38	0	38	42%	1986	54	52%	60%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	62	0	62	69%	2003	53	53%	60%
1966	59	0	59	66%	1962	53	54%	59%
1967	78	0	78	88%	1950	49	56%	56%
1968	48	0	48	54%	1985	49	57%	55%
1969	89	0	89	100%	1968	48	58%	54%
1970	64	0	64	72%	1972	46	59%	52%
1971	58	0	58	66%	1948	46	60%	52%
1972	46	0	46	52%	1953	46	62%	52%
1973	69	0	69	78%	1957	46	63%	51%
1974	67	0	67	75%	1989	44	64%	50%
1975	63	0	63	71%	1926	43	65%	49%
1976	40	0	40	45%	1930	42	67%	47%
1977	7	0	7	8%	1925	42	68%	47%
1978	77	0	77	86%	1932	42	69%	47%
1979	67	0	67	75%	1959	42	70%	47%
1980	89	0	89	100%	1976	40	72%	45%
1981	38	0	38	43%	1955	40	73%	45%
1982	89	0	89	100%	1981	38	74%	43%
1983	89	0	89	100%	1964	38	75%	42%
1984	77	0	77	86%	1949	37	77%	42%
1985	49	0	49	55%	2002	37	78%	42%
1986	54	0	54	60%	1944	36	79%	40%
1987	11	0	11	13%	1947	34	80%	38%
1988	8	0	8	9%	1933	32	81%	36%
1989	44	0	44	50%	1960	31	83%	35%
1990	14	0	14	16%	1934	25	84%	29%
1991	14	0	14	16%	2001	25	85%	28%
1992	12	0	12	14%	1994	18	86%	20%
1993	55	0	55	62%	1931	18	88%	20%
1994	18	0	18	20%	1929	16	89%	18%
1995	66	0	66	74%	1961	16	90%	18%
1996	65	0	65	73%	1924	16	91%	18%
1997	76	0	76	85%	1939	15	93%	17%
1998	83	0	83	94%	1991	14	94%	16%
1999	59	0	59	67%	1990	14	95%	16%
2000	64	0	64	72%	1992	12	96%	14%
2001	25	0	25	28%	1987	11	98%	13%
2002	37	0	37	42%	1988	8	99%	9%
2003	53	0	53	60%	1977	7	100%	8%
Average	**52**	**0**	**52**	**58%**		**52**		**58%**
Maximum	**89**	**0**	**89**	**100%**		**89**		**100%**
Minimum	**7**	**0**	**7**	**8%**		**7**		**8%**

Table C.31. Ventura County WPD: 2015 DCR ELT

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1922	15	0	15	73%	1938	20	0%	100%
1923	12	0	12	62%	1938	20	1%	100%
1924	4	0	4	18%	1938	20	2%	100%
1925	9	0	9	47%	1998	19	4%	94%
1926	10	0	10	49%	1982	19	5%	93%
1927	13	0	13	65%	1980	19	6%	93%
1928	15	0	15	76%	1958	19	7%	93%
1929	4	0	4	18%	1952	18	9%	90%
1930	9	0	9	47%	1956	18	10%	89%
1931	4	0	4	20%	1941	17	11%	86%
1932	9	0	9	47%	1984	17	12%	86%
1933	7	0	7	36%	1978	17	14%	86%
1934	6	0	6	29%	1943	17	15%	86%
1935	13	0	13	65%	1997	17	16%	85%
1936	15	0	15	74%	1995	17	17%	85%
1937	15	0	15	74%	1967	16	19%	82%
1938	20	0	20	100%	1951	16	20%	79%
1939	9	0	9	44%	1973	16	21%	78%
1940	13	0	13	66%	1986	16	22%	78%
1941	17	0	17	86%	1928	15	23%	76%
1942	15	0	15	74%	1974	15	25%	75%
1943	17	0	17	86%	1979	15	26%	75%
1944	8	0	8	40%	1942	15	27%	74%
1945	15	0	15	74%	1945	15	28%	74%
1946	14	0	14	70%	1937	15	30%	74%
1947	11	0	11	54%	1936	15	31%	74%
1948	10	0	10	52%	1922	15	32%	73%
1949	8	0	8	42%	1996	15	33%	73%
1950	11	0	11	56%	1970	14	35%	72%
1951	16	0	16	79%	2000	14	36%	72%
1952	18	0	18	90%	1975	14	37%	71%
1953	10	0	10	52%	1946	14	38%	70%
1954	13	0	13	63%	1965	14	40%	69%
1955	9	0	9	45%	1963	14	41%	68%
1956	18	0	18	89%	1999	13	42%	67%
1957	10	0	10	51%	1966	13	43%	66%
1958	19	0	19	93%	1940	13	44%	66%
1959	9	0	9	47%	1971	13	46%	66%
1960	10	0	10	50%	1935	13	47%	65%
1961	8	0	8	40%	1927	13	48%	65%
1962	12	0	12	59%	2002	13	49%	65%
1963	14	0	14	68%	1985	13	51%	64%
1964	12	0	12	62%	1954	13	52%	63%

SWP Table A Deliveries for 2015 Study					Probability Curve			
Year	Delivery w/o Article 56 Carryover (TAF)	Article 56 Carryover (TAF)	Total Table A Delivery (TAF)	Percent of Maximum Table A	Year	Total Table A Delivery (TAF)	Exceedence Frequency (%)	Percent of Maximum Table A
1965	14	0	14	69%	1964	12	53%	62%
1966	13	0	13	66%	1993	12	54%	62%
1967	16	0	16	82%	1923	12	56%	62%
1968	11	0	11	54%	1989	12	57%	62%
1969	20	0	20	100%	1962	12	58%	59%
1970	14	0	14	72%	2003	11	59%	57%
1971	13	0	13	66%	1950	11	60%	56%
1972	10	0	10	52%	1968	11	62%	54%
1973	16	0	16	78%	1947	11	63%	54%
1974	15	0	15	75%	1994	10	64%	52%
1975	14	0	14	71%	1972	10	65%	52%
1976	9	0	9	45%	1948	10	67%	52%
1977	2	0	2	8%	1953	10	68%	52%
1978	17	0	17	86%	1957	10	69%	51%
1979	15	0	15	75%	1960	10	70%	50%
1980	19	0	19	93%	1926	10	72%	49%
1981	9	0	9	43%	1930	9	73%	47%
1982	19	0	19	93%	1925	9	74%	47%
1983	20	0	20	100%	1932	9	75%	47%
1984	17	0	17	86%	1959	9	77%	47%
1985	13	0	13	64%	1976	9	78%	45%
1986	16	0	16	78%	1955	9	79%	45%
1987	4	0	4	22%	1939	9	80%	44%
1988	3	0	3	15%	1981	9	81%	43%
1989	12	0	12	62%	1949	8	83%	42%
1990	5	0	5	27%	1944	8	84%	40%
1991	3	0	3	16%	1961	8	85%	40%
1992	5	0	5	24%	1933	7	86%	36%
1993	12	0	12	62%	1934	6	88%	29%
1994	10	0	10	52%	2001	6	89%	28%
1995	17	0	17	85%	1990	5	90%	27%
1996	15	0	15	73%	1992	5	91%	24%
1997	17	0	17	85%	1987	4	93%	22%
1998	19	0	19	94%	1931	4	94%	20%
1999	13	0	13	67%	1929	4	95%	18%
2000	14	0	14	72%	1924	4	96%	18%
2001	6	0	6	28%	1991	3	98%	16%
2002	13	0	13	65%	1988	3	99%	15%
2003	11	0	11	57%	1977	2	100%	8%
Average	**12**	**0**	**12**	**61%**		**12**		**61%**
Maximum	**20**	**0**	**20**	**100%**		**20**		**100%**
Minimum	**2**	**0**	**2**	**8%**		**2**		**8%**

APPENDIX J

Kern River Flow and Municipal Water Program

Final EIR

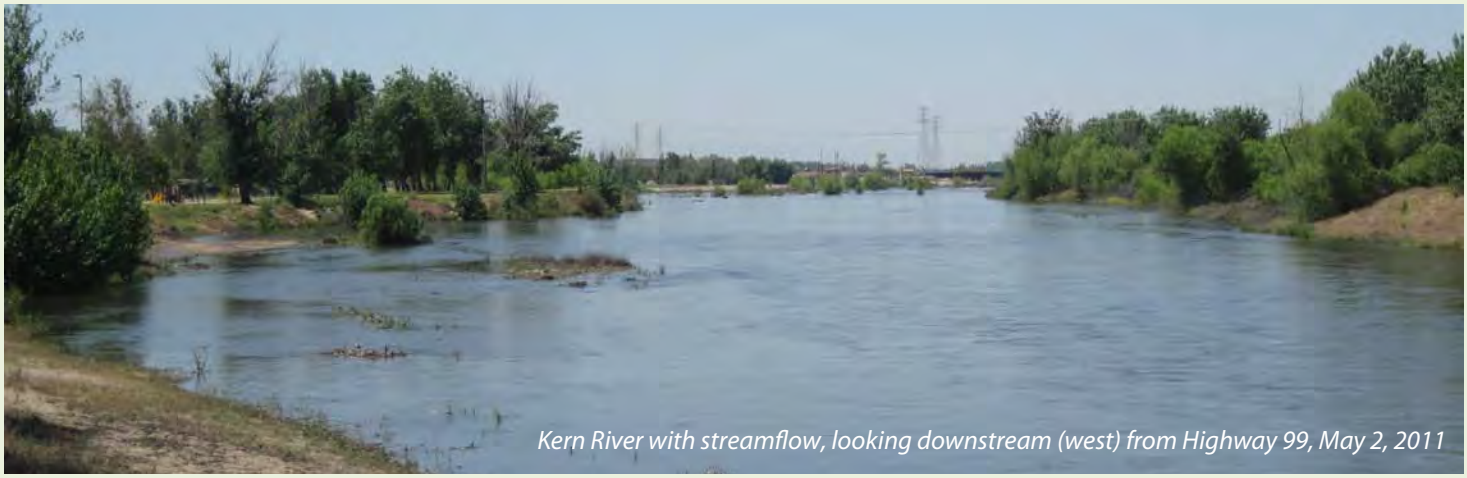
City of Bakersfield - Water Resources Department

Kern River Flow and Municipal Water Program

Draft Environmental Impact Report

June 2012

Dry Kern River bed looking downstream (west) from Highway 99, September 30, 2009



Kern River with streamflow, looking downstream (west) from Highway 99, May 2, 2011

Kern River Flow and Municipal Water Program
Draft Environmental Impact Report

SCH# 2011021042

City of Bakersfield
Water Resources Department

1000 Buena Vista Road
Bakersfield, CA 93311

June 2012

City of Bakersfield – Water Resources Department. *Kern River Flow and Municipal Water Program—Draft Environmental Impact Report.* 2012. June. Bakersfield, CA.

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	Quantity (TAF)												Total Annual (TAF)
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	
City Water Obligations													
Water Treatment Plants	0.5	1.7	1.5	1.3	1.6	2	2.1	2.1	2	1.6	1.4	1	19
Kern River Canal & Irrigating Company (KRC&I)	0.05	0.15	0.45	0.8	1.05	1.10	1.10	1.10	0.73	0.30	0.15	0.03	7
Olcese Water District	0.02	0.05	0.08	0.10	0.12	0.13	0.13	0.13	0.13	0.08	0.03	0.02	1
City Water Feature Amenities [c]	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	5
Miller-Haggin Obligations + Isabella Evaporation Losses, and Preexisting Delivery Obligations [b]	0	0	3.3	3.3	3.3	3.3	3.3	3.3	0	0	0	0	20
Long-Term Sale to Rosedale-Rio Bravo Water Storage District	3.4	3.3	3.3	0	0	0	0	0	0	0	0	0	10
Current Minimum Obligations	4.4	5.6	9.1	5.9	6.5	7.0	7.1	7.1	3.3	2.4	2.0	1.5	62
Kern River Water Yield (1954–2010)													
City Historic Rights[a]													
Median Year	1.1	1.1	16.1	18.4	22.5	20.1	9.9	0.7	0	0	0.1	0.4	90
Average Year (mean)	1.5	1.7	17.1	19.7	28.3	25.2	14.2	5.9	0.4	0.3	0.4	1.1	116
Dry Year (25th percentile)	0.3	0.8	8.0	13.6	16.3	11.3	1.8	0	0	0	0	0	52
Wet Year (75th percentile)	1.4	1.3	24	24.8	36.4	31.9	19.9	11.4	0.9	0.7	0.8	1.1	155
Kern River Canal & Irrigating Company (KRC&I) Laterals													
Median Year	0	0	0	0.8	3.5	2.5	0	0	0	0	0	0	7
Average Year (mean)	1.2	1.3	0.5	2	4.7	3.7	1.1	0.3	0.2	0	0.2	1	16
Dry Year (25th percentile)	0	0	0	0.1	1.3	0.4	0	0	0	0	0	0	2
Wet Year (75th percentile)	0.7	0.5	0.8	3.4	7.2	5.8	1.6	0	0	0	0	0	20
Old South Fork Right													
Median Year	0.5	0.5	0	0.2	0.3	0.2	0.1	0	0	0	0.1	0.2	2
Average Year (mean)	0.4	0.4	0.1	0.2	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.3	3
Dry Year (25th percentile)	0.1	0.4	0	0.1	0.2	0.1	0	0	0	0	0	0	1
Wet Year (75th percentile)	0.6	0.6	0.1	0.3	0.3	0.3	0.2	0.1	0.5	0.3	0.4	0.6	4
Total Historic City Water Yield: *Sum of City Base, KRC&I Laterals, and Old South Fork Deliveries*													
Median Year	1.6	1.6	16.2	19.4	26.4	22.8	10	0.7	0.1	0	0.2	0.5	99
Average Year (mean)	3	3.5	17.7	21.9	33.3	29.2	15.5	6.4	0.8	0.5	0.8	2.4	135
Dry Year (25th percentile)	0.4	1.2	8	13.8	17.8	11.8	1.8	0	0	0	0	0.1	55
Wet Year (75th percentile)	2.7	2.3	24.9	28.5	44	38	21.7	11.6	1.4	1	1.2	1.7	179

Table 2-2. *(continued)* City of Bakersfield Current Minimum Obligations and Kern River Yields

	Quantity (TAF)												Total Annual (TAF)
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	

Notes: TAF = thousand acre-feet
(a) Water deliveries do not include water released by other rights holders or the City of Bakersfield.
(b) Miller-Haggin Obligations include river channel and canal recharge to make deliveries to first point canals below the Kern Island right and to deliver second point water and lower River water to second point undiminished during the March-August period. Preexisting delivery obligations are from agreements assumed by the City upon the City's purchase of Kern River water rights. These include agreements with Kern County for Isabella Recreation Pool, Lake Ming, and Hart Park. Other year to year miscellaneous water sales are not included in the City Existing Water Obligations.
(c) City Water Feature Amenities = Truxtun Lakes, The Park at RiverWalk, Aera Park Pond, Wilson Ponds, etc.
Note: This table is reproduced in Chapter 3, Section 3.7 "Water Supply and Groundwater Resources" as Table 3.7-1

City of Bakersfield - Water Resources Department

Kern River Flow and Municipal Water Program

Final Environmental Impact Report

September 2012

Kern River looking downstream (west) from Highway 99 in 2009

Kern River looking downstream (west) from Highway 99 in 2011

BAKERSFIELD

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APPENDIX K

2015 Consumer Confidence Report

2015 Water Quality Table

(Continued)

Inorganic Chemicals	Year Tested	Unit	SMCL	PHG (MCLG)	Exceeded Standard?	Range	Average	Range	Average	Source of Substance
Sodium	2013–2015	ppm	n/a	n/a	**No**	15–150	35	27–34	30	Erosion of natural deposits; seawater influence
Specific conductance	2013–2015	µS/cm	1600	n/a	**No**	174–1070	322	256–357	306	Erosion of natural deposits; seawater influence
Strontium	2014–2015	ppb	n/a	n/a	**No**	72–980	328	—	—	Erosion of natural deposits
Sulfate	2013–2015	ppm	500	n/a	**No**	9.3–280	33	29–51	36	Runoff/leaching from natural deposits; industrial wastes
Total dissolved solids	2013–2015	ppm	1000	n/a	**No**	110–680	208	148–224	183	Runoff/leaching from natural deposits
Vanadium	2013–2015	ppb	NL=50	n/a	**No**	ND–18	12	—	—	Erosion of natural deposits; manufacturing of alloys and steel
Zinc	2013–2015	ppm	5.0	n/a	**No**	ND–0.18	0.01	0.06–0.1	0.08	Runoff/leaching from natural deposits; industrial wastes
Organic Chemicals	**Year Tested**	**Unit**	**SMCL**	**PHG (MCLG)**	**Exceeded Standard?**	**Range**	**Average**	**Range**	**Average**	**Source of Substance**
Bromomethane	2013–2015	ppb	n/a	n/a	**No**	ND–0.35	0.01	—	—	Discharge from industrial chemical factories
1,4-Dioxane	2013–2015	ppb	NL=1	n/a	**No**	ND–0.8	0.1	—	—	Industrial solvent or solvent stabilizer for chlorinated solvents or volatile organic compounds
1,2,3-Trichloropropane (TCP)[8]	2013–2015	ppt	NL=5	0.7	**Yes**	ND–460	70	—	—	Pesticide that may still be present in soils due to runoff/leaching; various industrial uses

[8]Currently, there is no MCL or SMCL for TCP, but there is a notification level because it is a constituent of interest. Cal Water is working closely with the DDW, conducting extensive monitoring, and investigating acceptable treatment methods. According to the Office of Environmental Health and Hazard Assessment, some people who consume water containing TCP in excess of the notification level over many years may have an increased risk of getting cancer, based on laboratory studies.

APPENDIX L

Chapter 14.02 Bakersfield Municipal Code

Chapter 14.02 WATER USE REGULATIONS

14.02.010 Outside irrigation restrictions.

A. In addition to the rules and regulations promulgated by the State Water Resources Control Board relative to water usage, outside irrigation of ornamental landscapes or turf with potable water is allowed by water users a maximum of three days per week as follows:

1. Water users with EVEN addresses may water on Sunday, Wednesday, and Friday only.

2. Water users with ODD addresses may water on Tuesday, Thursday, and Saturday only.

3. All outside irrigation is prohibited on Mondays.

B. Outside irrigation in a manner that causes water to flow onto adjacent property, non-irrigated areas, sidewalks, and/or gutters is strictly prohibited.

C. Outside irrigation is advised to be done after six p.m. and before nine a.m. for optimal efficiency.

D. In addition to the above, commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, shall immediately implement water efficiency measures to reduce potable water usage in an amount consistent with the reduction targets of the State Water Resources Control Board as amended from time to time. (Ord. 4830 § 1, 2015; Ord. 4804 § 2, 2015)

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 remedies allowed by law. (Ord. 4830 § 1, 2015; Ord. 4804 § 2, 2015)

14.02.030 Administrative citation.

A. Whenever an enforcement officer charged with the enforcement of this chapter determines that a violation of a provision has occurred, the enforcement officer shall have the authority to issue an administrative citation to any person responsible for the violation. Said enforcement officer shall be a trained employee from the city's water department.

B. Each administrative citation shall contain the following information:

1. The date of the violation or, if the date of the violation is unknown, then the date the violation is identified;

2. The address or a definite description of the location where the violation occurred;

3. The section of the code violated and a description of the violation;

4. The amount of the fine and how to pay it;

5. A description of the administrative citation review process;

6. An order prohibiting the continuation or repeated occurrence of the code violation described in the administrative citation; and

7. The name and signature of the citing enforcement officer.

C. The fine shall be paid to the city within thirty days from the date of the administrative citation; payment of a fine under this section shall not excuse or discharge any continuation or repeated occurrence of the code violation that is the subject of the administrative citation.

D. The city may collect any past due administrative citation fine by use of all available legal means. (Ord. 4830 § 1, 2015)

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 § 1, 2015)

14.02.040 Administrative citation review process.

Any recipient of an administrative citation may appeal the citation by completing a request for hearing form and returning it to the city within thirty days from the date of the administrative citation, together with an advance deposit of the fine.

A. No appeal hearing to contest an administrative citation shall be held unless the fine has been deposited in advance.

B. An appeal hearing shall be set for a date that is not less than fifteen days and not more than sixty days from the date that the request for hearing is filed.

C. The appellant shall be notified of the time and place set for the hearing at least ten calendar days prior to the date of the hearing.

D. At the hearing, the appellant shall have the opportunity to testify and to present evidence concerning the administrative citation.

E. The failure of the appellant to appear at the appeal hearing shall constitute a forfeiture of the fine and a failure to exhaust their administrative remedies.

F. The administrative citation and any additional report submitted by the enforcement officer shall constitute prima facie evidence of the respective facts contained in those documents.

G. The hearing officer may continue the hearing and/or request additional information from the enforcement officer or the recipient of the administrative citation prior to issuing a written decision.

H. Any person aggrieved by an administrative decision of a hearing officer on an administrative citation appeal may obtain review of the administrative decision by filing a petition for review with the Kern County Superior Court in accordance with the timelines and provisions set forth in California Government Code Section 53069.4. (Ord. 4830 § 1, 2015)

14.02.045 Administrative hearing officer.

The city manager shall designate the hearing officer for the appeal hearing.

A. After considering all of the testimony and evidence submitted at the appeal hearing, the hearing officer shall issue a written decision to uphold or dismiss the administrative citation and shall list in the decision the reasons for that decision. The decision of the hearing officer shall be final.

B. If the hearing officer determines that the administrative citation should be upheld, the hearing officer may increase or decrease the fine amount. The appellant must pay the city any increased amount within thirty days of receiving the decision of the hearing officer.

C. If the hearing officer determines that the administrative citation should be dismissed or the fine reduced, the city shall refund the appropriate amount of the deposited fine within thirty days.

D. The employment, performance evaluation, compensation and benefits of the hearing officer shall not be directly or indirectly conditioned upon the amount of administrative citation fines upheld by the hearing officer. (Ord. 4830 § 1, 2015)

APPENDIX M

Ordinance No. 4804

ORDINANCE 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.

BE IT ORDAINED by the Council of the City of Bakersfield as follows:

WHEREAS, on January 17, 2014, Edmund G. Brown, Governor of California, proclaimed a State of Emergency to exist in the State of California due to severe drought conditions; and

WHEREAS, on April 25, 2014, the Governor signed an Executive Order directing the State Water Board to adopt emergency regulations as it deems necessary, pursuant to California Water Code section 1058.5, to ensure that urban water suppliers implement drought response plans to limit outdoor irrigation and other wasteful water practices; and

WHEREAS, California Water Code section 1058.5 grants the State Water Board the authority to adopt emergency regulations during a period when the Governor has issued a proclamation of emergency based upon drought conditions or in response to drought conditions that exist, or are threatened, in a critically dry year immediately preceded by two or more consecutive below normal, dry, or critically dry years; and

WHEREAS, on July 15, 2014, the State Water Board approved an emergency regulation for urban water conservation that required urban water suppliers to implement the stage of its water shortage contingency plan that imposes restrictions on outdoor irrigation, which resulted in the City implementing Stage 3 of its Urban Water Management Plan; and

WHEREAS, as of March 3, 2015, Central and Southern Sierra snowpack is at 20 and 21 percent of average, respectively, and without significant March snowfall, the Sierra snow water content may be the lowest in recorded history; and

WHEREAS, due to these drought conditions and dry conditions for the past several years, storage in California's reservoirs is also below historic average levels; and

WHEREAS, on March 17, 2015, The State Water Board found that an emergency still exists due to severe drought conditions and that adoption of additional emergency regulations with specific prohibitions on water uses was

necessary to promote water conservation to maintain an adequate supply during the drought emergency; and

WHEREAS, the emergency regulation approved by the State Water Board requires urban water suppliers that do not already impose a limit on the number of days that outdoor watering is allowed to limit outdoor irrigation of turf and ornamental landscapes; and

WHEREAS, the City of Bakersfield currently does not impose a limit on the number of days that outdoor watering is allowed, so the City of Bakersfield must adopt this ordinance limiting the number of days that outdoor watering is allowed; and

WHEREAS, on April 1, 2015, the Governor issued a third Executive Order directing the State Water Board to adopt even more stringent regulations on water use; and

WHEREAS, the April 2014 Executive Order suspended the requirement for review under the California Environmental Quality Act (CEQA) for certain activities, including adoption of emergency regulations, and on December 22, 2014, Executive Order B-28-14, extended the suspension of CEQA through May 31, 2016; and

WHEREAS, this Ordinance is necessary for the immediate preservation of the public health, peace, property, and safety.

NOW, THEREFORE, BE IT ORDAINED by the Council of the City of Bakersfield as follows: or

1. The above recitals are true and correct.

2. Section 02 of Chapter 14 of the Bakersfield Municipal Code is hereby added to read as follows:

14.02 Water Use Regulations

A. Outside Irrigation.

1. In addition to the rules and regulations promulgated by the State Water Resources Control Board relative to water usage, outside irrigation of ornamental landscapes or turf with potable water is allowed by water users a maximum of **three days per week as follows:**
    - Water users with **EVEN** addresses may water on **Sunday, Wednesday, and Friday** only.

- Water users with **ODD** addresses may water on **Tuesday, Thursday, and Saturday** only.
- All outside irrigation is prohibited on Mondays.

2. Outside irrigation in a manner that causes water to flow onto adjacent property, non-irrigated areas, sidewalks, and/or gutters is strictly prohibited.
3. Outside irrigation is advised to be done after 6:00 p.m. and before 9:00 a.m. for optimal efficiency.
4. In addition to the above, commercial, industrial, and institutional properties, such as campuses, golf courses, and cemeteries, shall immediately implement water efficiency measures to reduce potable water usage in an amount consistent with the reduction targets of the State Water Resources Control Board as amended from time to time.

B. Penalty.

1. Failure to comply with these regulations may be punishable as an infraction or misdemeanor pursuant to Bakersfield Municipal Code Section 1.40.010 or any other available remedies allowed by law.

3. Pursuant to Section 23 of the Charter, this ordinance shall take effect beginning April 23, 2015.

---oo0oo---

I HEREBY CERTIFY that the foregoing Ordinance was first read at a regular meeting of the City Council of the City on the 22 day of April, 2015, and was passed and adopted at a regular meeting of the City Council held on the 22 day of April, 2015, by the following vote:

AYES: ✓ ✓ ✓ ✓ ✓
NOES: COUNCIL MEMBER RIVERA, MAXWELL, WEIR, SMITH, HANSON, SULLIVAN, PARLIER
ABSTAIN: COUNCIL MEMBER Sullivan
ABSENT: COUNCIL MEMBER
COUNCIL MEMBER Rivera

Roberta Gafford

ROBERTA GAFFORD, CMC
CITY CLERK AND EX OFFICIO of the
Council of the City of Bakersfield

APPROVED APR 22 2015

By

HARVEY L. HALL
Mayor

APPROVED AS TO FORM:
VIRGINIA GENNARO
City Attorney

By Virginia Gennaro

VIRGINIA GENNARO
City Attorney

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CITY OF BAKERSFIELD ORIGINAL

AFFIDAVIT OF POSTING DOCUMENTS

STATE OF CALIFORNIA)
) ss.
County of Kern)

ROBERTA GAFFORD, being duly sworn, deposes and says:

That she is the duly appointed, acting and qualified City Clerk of the City of Bakersfield; and that on the 24th day of April, 2015 she posted on the Bulletin Board at City Hall, a full, true and correct copy of the following: Ordinance No. 4804, passed by the Bakersfield City Council at a meeting held on the 22nd day of April, 2015 and entitled:

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.

ROBERTA GAFFORD
City Clerk and Ex Officio of the
Council of the City of Bakersfield

By: _____
DEPUTY City Clerk

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CITY OF BAKERSFIELD ORIGINAL

APPENDIX N

Rate Structure

EXHIBIT "A"

City of Bakersfield

EFFECTIVE JULY 1, 2016

Department of Water Resources

Water Rates for

City Domestic Water Service Area and Fairhaven Water Service Area

SCHEDULE OF RATES

General Metered Service	Current Rates	
	Within City Limits	Fairhaven & Unincorporated Areas

Quantity Rates:

Per 100 cubic ft/month	$ 0.94	$ 1.18

Monthly Readiness-To-Serve Charge:

5/8" x 3/4" Service	$ 9.88	$ 12.85
1" Service	$ 15.06	$ 19.58
1-1/2" Service	$ 22.98	$ 29.87
2" Service	$ 31.28	$ 40.67
3" Service	$ 57.80	$ 75.14
4" Service	$ 84.02	$ 109.22
6" Service	$ 151.00	$ 196.30
8" Service	$ 232.12	$ 301.75
10" Service	$ 319.95	$ 415.94

Reconnection Fees	
Collect @ Door	$15.00
Reconnection	$25.00
After Hours	$65.00
Cage & Lock	$30.00
NSF	$10.00

Monthly Private Fire Protection Service Charge:

1-1/2" Connection	$ 9.33	$ 12.13
2" Connection	$ 12.44	$ 16.17
3" Connection	$ 18.66	$ 24.25
4" Connection	$ 24.87	$ 32.34
6" Connection	$ 37.30	$ 48.49
8" Connection	$ 49.74	$ 64.66
10" Connection	$ 62.17	$ 80.83
12" Connection	$ 74.61	$ 97.00

"Monthly Readiness-To-Serve Charge" is applied to all services and any quantity of water used is an additional charge computed at the quantity rate.

Conditions of service remain the same.

APPENDIX O

Emergency Response Plan

Emergency Response Plan

City of Bakersfield

Bakersfield, California

June, 2004

Updated May 2008

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APPENDIX P

Notice of Public Hearing

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

May 29, 2017

City Clerk
City of Bakersfield
1600 Truxtun Avenue
Bakersfield, CA 93301

SUBJECT: Notice of Public Hearing

The City of Bakersfield (City) will hold a PUBLIC HEARING on June 14, 2017 at 2:00 PM for the purpose of adopting its 2015 draft Urban Water Management Plan.

The 2015 draft Urban Water Management Plan (Plan) was prepared pursuant to the "Urban Water Management Planning Act", California Water Code, Sections 10610 through 10656. The State Department of Water Resources requires every urban water supplier to prepare and adopt a Plan and periodically update that plan at least once every five years, in years ending in five and zero.

The PUBLIC HEARING will be held during the City of Bakersfield Water Board meeting:

Date: June 14, 2017
Time: 2:00 PM
Place: Water Resources Department
1000 Buena Vista Road
Bakersfield, CA 93311

The City invites all interested parties and groups to attend and present their comments. A copy of the draft 2015 Plan is available at the City's office and website. Please provide comments by 5 p.m. on Monday June 12th to the Water Resources Department at 1000 Buena Vista Road, Bakersfield, CA 93311.

Sincerely,

Art Chianello

Art Chianello, P. E.
Water Resources Manager

Water Resources Department • 1000 Buena Vista Road • Bakersfield • California 93311
(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

B A K E R S F I E L D

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

May 29, 2017

County Clerk
County of Kern
1115 Truxtun Avenue
Bakersfield, CA 93301

SUBJECT: Notice of Public Hearing

The City of Bakersfield (City) will hold a PUBLIC HEARING on June 14, 2017 at 2:00 PM for the purpose of adopting its 2015 draft Urban Water Management Plan.

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Sincerely,

Art Chianello

Art Chianello, P. E.
Water Resources Manager

Water Resources Department • 1000 Buena Vista Road • Bakersfield • California 93311
(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

May 29, 2017

Kern County Planning and Development
2700 M Street Suite 100
Bakersfield, CA 93301

SUBJECT: Notice of Public Hearing

The City of Bakersfield (City) will hold a PUBLIC HEARING on June 14, 2017 at 2:00 PM for the purpose of adopting its 2015 draft Urban Water Management Plan.

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Sincerely,

Art Chianello

Art Chianello, P. E.
Water Resources Manager

Water Resources Department • 1000 Buena Vista Road • Bakersfield • California 93311
(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

May 29, 2017

California Water Service Company
3725 H Street
Bakersfield, CA 93304

SUBJECT: Notice of Public Hearing

The City of Bakersfield (City) will hold a PUBLIC HEARING on June 14, 2017 at 2:00 PM for the purpose of adopting its 2015 draft Urban Water Management Plan.

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Date: June 14, 2017
Time: 2:00 PM
Place: Water Resources Department
1000 Buena Vista Road
Bakersfield, CA 93311

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Sincerely,

Art Chianello

Art Chianello, P. E.
Water Resources Manager

Water Resources Department • 1000 Buena Vista Road • Bakersfield • California 93311
(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

May 29, 2017

Kern County Water Agency ID4
P.O. Box 58
Bakersfield, CA 93302

SUBJECT: Notice of Public Hearing

The City of Bakersfield (City) will hold a PUBLIC HEARING on June 14, 2017 at 2:00 PM for the purpose of adopting its 2015 draft Urban Water Management Plan.

The 2015 draft Urban Water Management Plan (Plan) was prepared pursuant to the "Urban Water Management Planning Act", California Water Code, Sections 10610 through 10656. The State Department of Water Resources requires every urban water supplier to prepare and adopt a Plan and periodically update that plan at least once every five years, in years ending in five and zero.

The PUBLIC HEARING will be held during the City of Bakersfield Water Board meeting:

Date: June 14, 2017
Time: 2:00 PM
Place: Water Resources Department
1000 Buena Vista Road
Bakersfield, CA 93311

The City invites all interested parties and groups to attend and present their comments. A copy of the draft 2015 Plan is available at the City's office and website. Please provide comments by 5 p.m. on Monday June 12th to the Water Resources Department at 1000 Buena Vista Road, Bakersfield, CA 93311.

Sincerely,

Art Chianello, P. E.
Water Resources Manager

Water Resources Department • 1000 Buena Vista Road • Bakersfield • California 93311
(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

May 29, 2017

Casa Loma Water Company
1016 Lomita Drive
Bakersfield, CA 93307

SUBJECT: Notice of Public Hearing

The City of Bakersfield (City) will hold a PUBLIC HEARING on June 14, 2017 at 2:00 PM for the purpose of adopting its 2015 draft Urban Water Management Plan.

The 2015 draft Urban Water Management Plan (Plan) was prepared pursuant to the "Urban Water Management Planning Act", California Water Code, Sections 10610 through 10656. The State Department of Water Resources requires every urban water supplier to prepare and adopt a Plan and periodically update that plan at least once every five years, in years ending in five and zero.

The PUBLIC HEARING will be held during the City of Bakersfield Water Board meeting:

Date: June 14, 2017
Time: 2:00 PM
Place: Water Resources Department
1000 Buena Vista Road
Bakersfield, CA 93311

The City invites all interested parties and groups to attend and present their comments. A copy of the draft 2015 Plan is available at the City's office and website. Please provide comments by 5 p.m. on Monday June 12th to the Water Resources Department at 1000 Buena Vista Road, Bakersfield, CA 93311.

Sincerely,

Art Chianello

Art Chianello, P. E.
Water Resources Manager

Water Resources Department • 1000 Buena Vista Road • Bakersfield • California 93311
(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

May 29, 2017

East Niles Community Services District
P.O. Box 6038
Bakersfield, CA 93306

SUBJECT: Notice of Public Hearing

The City of Bakersfield (City) will hold a PUBLIC HEARING on June 14, 2017 at 2:00 PM for the purpose of adopting its 2015 draft Urban Water Management Plan.

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The PUBLIC HEARING will be held during the City of Bakersfield Water Board meeting:

Date: June 14, 2017
Time: 2:00 PM
Place: Water Resources Department
1000 Buena Vista Road
Bakersfield, CA 93311

The City invites all interested parties and groups to attend and present their comments. A copy of the draft 2015 Plan is available at the City's office and website. Please provide comments by 5 p.m. on Monday June 12th to the Water Resources Department at 1000 Buena Vista Road, Bakersfield, CA 93311.

Sincerely,

Art Chianello, P. E.
Water Resources Manager

Water Resources Department • 1000 Buena Vista Road • Bakersfield • California 93311
(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

May 29, 2017

Greenfield County Water District
551 Taft Highway
Bakersfield, CA 93307

SUBJECT: Notice of Public Hearing

The City of Bakersfield (City) will hold a PUBLIC HEARING on June 14, 2017 at 2:00 PM for the purpose of adopting its 2015 draft Urban Water Management Plan.

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The PUBLIC HEARING will be held during the City of Bakersfield Water Board meeting:

Date: June 14, 2017
Time: 2:00 PM
Place: Water Resources Department
1000 Buena Vista Road
Bakersfield, CA 93311

The City invites all interested parties and groups to attend and present their comments. A copy of the draft 2015 Plan is available at the City's office and website. Please provide comments by 5 p.m. on Monday June 12th to the Water Resources Department at 1000 Buena Vista Road, Bakersfield, CA 93311.

Sincerely,

Art Chianello, P. E.
Water Resources Manager

Water Resources Department • 1000 Buena Vista Road • Bakersfield • California 93311
(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

May 29, 2017

North Kern River Municipal Water District
400 Rio Del Norte Street
Bakersfield, CA 93308

SUBJECT: Notice of Public Hearing

The City of Bakersfield (City) will hold a PUBLIC HEARING on June 14, 2017 at 2:00 PM for the purpose of adopting its 2015 draft Urban Water Management Plan.

The 2015 draft Urban Water Management Plan (Plan) was prepared pursuant to the "Urban Water Management Planning Act", California Water Code, Sections 10610 through 10656. The State Department of Water Resources requires every urban water supplier to prepare and adopt a Plan and periodically update that plan at least once every five years, in years ending in five and zero.

The PUBLIC HEARING will be held during the City of Bakersfield Water Board meeting:

Date: June 14, 2017
Time: 2:00 PM
Place: Water Resources Department
1000 Buena Vista Road
Bakersfield, CA 93311

The City invites all interested parties and groups to attend and present their comments. A copy of the draft 2015 Plan is available at the City's office and website. Please provide comments by 5 p.m. on Monday June 12th to the Water Resources Department at 1000 Buena Vista Road, Bakersfield, CA 93311.

Sincerely,

Art Chianello

Art Chianello, P. E.
Water Resources Manager

Water Resources Department • 1000 Buena Vista Road • Bakersfield • California 93311
(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

May 29, 2017

Oildale Mutual Water Company
P.O. Box 5638
Bakersfield, CA 93308

SUBJECT: Notice of Public Hearing

The City of Bakersfield (City) will hold a PUBLIC HEARING on June 14, 2017 at 2:00 PM for the purpose of adopting its 2015 draft Urban Water Management Plan.

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Date: June 14, 2017
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Place: Water Resources Department
1000 Buena Vista Road
Bakersfield, CA 93311

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Sincerely,

Art Chianello

Art Chianello, P. E.
Water Resources Manager

Water Resources Department • 1000 Buena Vista Road • Bakersfield • California 93311
(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

May 29, 2017

Rosedale-Rio Bravo Water Storage District
P. O. Box 20820
Bakersfield, CA 93390

SUBJECT: Notice of Public Hearing

The City of Bakersfield (City) will hold a PUBLIC HEARING on June 14, 2017 at 2:00 PM for the purpose of adopting its 2015 draft Urban Water Management Plan.

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Bakersfield, CA 93311

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Sincerely,

Art Chianello, P. E.
Water Resources Manager

Water Resources Department • 1000 Buena Vista Road • Bakersfield • California 93311
(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

BAKERSFIELD

WATER RESOURCES DEPARTMENT
Art R. Chianello, P.E. • Water Resources Manager

May 29, 2017

Vaughn Water Company
10014 Glenn Street
Bakersfield, CA 93312

SUBJECT: Notice of Public Hearing

The City of Bakersfield (City) will hold a PUBLIC HEARING on June 14, 2017 at 2:00 PM for the purpose of adopting its 2015 draft Urban Water Management Plan.

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Place: Water Resources Department
1000 Buena Vista Road
Bakersfield, CA 93311

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Sincerely,

Art Chianello, P. E.
Water Resources Manager

Water Resources Department • 1000 Buena Vista Road • Bakersfield • California 93311
(661) 326-3715 • Fax (661) 852-2127 • E-Mail: water@bakersfieldcity.us

NOTICE OF PUBLIC HEARING

The City of Bakersfield (City) will hold a PUBLIC HEARING on June 14, 2017 at 2:00 PM for the purpose of adopting its 2015 draft Urban Water Management Plan.

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The PUBLIC HEARING will be held during the City of Bakersfield Water Board meeting at 2:00 PM, Wednesday, June 14, 2017 at the Water Resources Department, 1000 Buena Vista Road, Bakersfield, CA 93311.

The City invites all interested parties and groups to attend and present their comments. A copy of the draft 2015 Plan is available at the Water Resources Department and website. Please provide comments by 5 p.m. on Monday June 12th to the Water Resources Department at 1000 Buena Vista Road, Bakersfield, CA 93311.

APPENDIX Q

Resolution Adopting the 2015 Urban Water Management Plan

RESOLUTION NO. 080-17

A RESOLUTION OF THE COUNCIL OF THE CITY OF BAKERSFIELD ADOPTING THE 2015 URBAN WATER MANAGEMENT PLAN

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

WHEREAS, the City of Bakersfield is an urban supplier of water providing water to a population of over 145,000; and

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

WHEREAS, the Plan must be adopted after public review and hearing, and filed with the California Department of Water Resources; and

WHEREAS, the City has therefore, prepared and circulated for public review a final draft Plan, and a properly noticed public hearing regarding said Plan was held by the City of Bakersfield Water Resources Department on June 14, 2017; and

WHEREAS, The City Water Board unanimously recommends (2-0 per Water Board Meeting held June 14, 2017) the City Council approve the resolution to adopt the 2015 UWMP; and

WHEREAS, the City of Bakersfield did prepare and filed said Plan with the California Department of Water Resources by July 28, 2017.

NOW, THEREFORE, BE IT RESOLVED, by the Council of the City of Bakersfield as follows:

1. The 2015 Urban Water Management Plan is hereby adopted and ordered filed with the Clerk of the City Council;

2. The Water Resources Manager is hereby authorized and directed to implement the Water Conservation Programs as set forth in the 2015 Urban Water Management Plan, which includes water shortage contingency analysis and recommendations to the City of Bakersfield Water Board regarding necessary procedures, rules, and regulations to carry out effective and equitable water conservation and water recycling programs.

3. In a water shortage, the Water Board is hereby authorized to declare a Water Shortage Emergency according to the Water Shortage Stages and Triggers indicated in the Plan, and implement necessary elements of the Plan.

--------o0o--------

I HEREBY CERTIFY that the foregoing Resolution was passed and adopted by the Council of the City of Bakersfield at a regular meeting thereof held on June 28, 2017, by the following vote:

AYES: COUNCIL MEMBER RIVERA, GONZALES, WEIR, SMITH, ~~FREEMAN~~, SULLIVAN, PARLIER
NOES: COUNCIL MEMBER None
ABSTAIN: COUNCIL MEMBER Freeman
ABSENT: COUNIL MEMBER None

Julie Drinkard for

Christopher Gerry
ACTING CITY CLERK *and Ex Officio Clerk of the Council of the City of Bakersfield*

APPROVED JUN 2 8 2017

Karen Goh

KAREN GOH
MAYOR of the City of Bakersfield

APPROVED AS TO FORM:

VIRGINIA GENNARO
City Attorney

BY: R Iger

RICHARD IGER
Deputy City Attorney