Central Coast Water Authority
Urban Water Management Plan
2020 Update

DRAFT

June 2021

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CENTRAL COAST WATER AUTHORITY

2020 Urban Water Management Plan

June 2021

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AF	Acre-Foot
APA	Administrative Procedure Act
BDCP	Bay Delta Conservation Plan
BMP	Best Management Practices
BO	Biological Opinion
BRP	Business Resumption Plan
CCWA	Central Coast Water Authority
CEQA	California Environmental Quality Act
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
D-1641	SWRCB Water Rights Decision 1641
DBP	Disinfection Byproducts
DCR	Delivery Capacity Report
DDW	Division of Drinking Water
DEIR	Draft Environmental Impact Report
Delta	Sacramento-San Joaquin Delta
DFG	Department of Fish and Game
DMM	Demand Management Measures
DPH	Department of Public Health
DWR	Department of Water Resources
DWR Form 38	Public Water System Statistics Form
ERP	Emergency Response Plan
ESA	Endangered Species Act
FEIR	Final Environmental Impact Report

FWS	United States Fish and Wildlife Service
IRWMP	Integrated Regional Water Management Plan
ITP	Incidental take permit
maf	Million Acre-Feet
MIB	2-methylisoborneol
MOU	Memorandum of Understanding
MWQI	Municipal Water Quality Investigations
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
OES	Office of Emergency Services
PPWTP	Polonio Pass Water Treatment Plant
RPA	Reasonable and Prudent Alternative
RWEP	Regional Water Efficiency Program
SCADA	Supervisory Control and Data Acquisition
SIMS	State Emergency Management System
SEP	State Emergency Plan
SBCFCWCD	Santa Barbara County Flood Control and Water Conservation District
SGMA	Sustainable Groundwater Management Act
SLOCFCWCD	San Luis Obispo County Flood Control and Water Conservation District
SWRCB	State Water Resources Control Board
SYRWCDID#1	Santa Ynez River Water Conservation District, Improvement District No. 1
State	State of California
SWP	State Water Project
SWRCB	State Water Resources Control Board
SSLOCSD	South San Luis Obispo County Sanitation District
taf	Thousand Acre-Feet

TOC	Total Organic Carbon
T&O	Taste and Odor
USBR	United States Bureau of Reclamation
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act
Water Agency	Santa Barbara County Water Agency
WSCP	Water shortage Contingency Plan
WSRA	Water Supply Retention Agreements

Lay Description of Urban Water Management in Central Coast Water Authority

This 2020 Urban Water Management Plan (UWMP) was prepared for the Central Coast Water Authority (CCWA), a wholesale supplier of urban water for thirteen water agencies in Santa Barbara County. This document describes the roles and responsibilities of CCWA, available water supplies, water demands, water reliability, and mitigation programs performed in droughts to secure additional water. This document is an update to CCWA's 2015 UWMP.

CCWA obtains its water primarily from the State Water Project, which delivers water through a series of canals and pipelines from Northern California. CCWA then treats the water to drinking water standards and delivers it to the water agencies. CCWA only provides some of the water needed by these agencies. As a result, the agencies also have other water supplies and implement water conservation programs to help meet their full water demands.

In 2020, CCWA delivered 12,175 acre-feet to the urban agencies. The urban agencies have combined water contracts to provide water supply systems with a capacity of 43,886 acre-feet of water but usually only some of the water is available due to the natural variation of rainfall from year to year as well as drought, environmental regulations or other reasons. A report by the State estimates that the water contracts will have a future reliability of about 59% in 2020 and gradually slide to 56% in 2045. In dry years the water supply can be as low as 5% of the contract amount.

CCWA has a Supplemental Water Purchase Program that allows the water agencies to ask CCWA to find and purchase extra water supplies during droughts. This program is voluntary but has successfully secured other water supplies in dry years and will be continued into the future.

1 Introduction and Overview

1.1 Introduction

This 2020 Urban Water Management Plan (UWMP) has been prepared in response to the California Urban Water Management Planning Act (UWMP Act), California Water Code, Division 6, Part 2.6, Sections 10610 through 10650[1]. The UWMP Act requires every urban water supplier to prepare and adopt an UWMP as well as to update and adopt the UWMP every five years. This 2020 UWMP must be completed by July 1, 2021.

Section 10617 of the California Water Code defines an "urban water supplier' as a public water system that that provides water for municipal purposes either directly or indirectly to more than 3,000 customers, or supplies more than 3,000 acre-feet (AF) of water annually. The Central Coast Water Authority (CCWA) is considered an urban water supplier because it is classified as a public water system by the California State Water Resources Control Board, Division of Drinking Water (DDW) and it supplies more than 3,000 AF of water per year. In 1994, DDW issued a permit to CCWA to operate as a public water system and the associated Water System Number for CCWA is CA4210030.

Although CCWA meets the definition of an urban water supplier, it can be further classified as a wholesale urban water supplier. This classification is recognized in the California Water Code and there are several instances in the Code where the UWMP requirements for wholesaler and retail urban water suppliers are different. The primary differences are as follows:

- The Demand Management Measures (DMM) for wholesalers are different from those required for retailers. A description of the DMMs implemented by CCWA is presented in Section 8.0 of this UWMP.

- Wholesaler suppliers are not required to develop baseline and target values for daily per capita use. This data is developed by the retail urban water supplier.

An urban water supplier that does not prepare, adopt, and submit an UWMP to the California Department of Water Resources (DWR) is ineligible to receive certain grant, loans and special drought assistance from the State of California (State). Consequently, in order to preserve the ability to seek assistance from the State of California, CCWA has prepared this 2020 UWMP. To ensure all required components of the UWMP have been addressed, the DWR UWMP Checklist and the DWR Standardized UWMP Tables were completed and they are presented in **Appendix B**[2].

1.2 The Central Coast Water Authority

The CCWA was formed in 1991 through a Joint Exercise of Powers Agreement[3] among nine public agencies in Santa Barbara County. CCWA was specifically formed for the purpose of designing, building and operating the facilities needed to deliver water from the State Water Project (SWP) to the various entities entitled to receive that water in Santa Barbara County. Also in 1991, pursuant to the Transfer of Financial Responsibility Agreement,[4] CCWA assumed responsibility for Santa Barbara County Flood Control and Water Conservation District's State Water Supply Contract with the California Department of Water Resources (DWR).[5] As a result, CCWA is responsible for the delivery of all SWP water to Santa Barbara County. Pursuant to 13 Water Supply Agreements,[6] CCWA delivers SWP water to its eight member agencies and five other entities (collectively, the

"CCWA Participants"). The CCWA member agencies are the Cities of Buellton, Guadalupe, Santa Barbara and Santa Maria, Carpinteria Valley Water District, Goleta Water District, Montecito Water District and Santa Ynez River Water Conservation District, Improvement District No. 1 (SYRWCD, ID#1). The other entities are the Golden State Water Company, Vandenberg Space Force Base, La Cumbre Mutual Water Company, Morehart Land Company, and the Raytheon Systems Company.

The CCWA Board of Directors is composed of elected Board and City Council members from each of the eight member agencies. Each vote on CCWA's Board of Directors is weighted roughly in proportion to the member's allocation of SWP water entitlement that was held in 1991. Table 1-1 outlines the voting percentage for each member of the CCWA Board of Directors.

Table 1-1: Board of Directors Voting Weights

Agency	Percentage
City of Guadalupe	1.15%
City of Santa Maria	43.19%
City of Buellton	2.21%
Santa Ynez RWCD, Improvement District #1	7.64%
Goleta Water District	17.20%
City of Santa Barbara	11.47%
Montecito Water District	9.50%
Carpinteria Valley Water District	7.64%
TOTAL	100.00%

All CCWA Participants are represented on the CCWA Operations Committee. All CCWA Participants are identifies in Table 1-2 below, along with their respective SWP "Table A Amounts," which is the maximum quantity of SWP annual water supply for which each CCWA Participant has contracted:

Table 1-2. Santa Barbara County Project Participant Table A Amount

	Table A Amount (AF)		
CCWA Participant	**Original Table A**	**Drought Buffer**	**Total Table A**
City of Buellton	578	58	636
Carpinteria Valley Water District	2,000	200	2,200
Goleta Water District	4,500	2,950	7,450
City of Guadalupe	550	55	605
La Cumbre Mutual Water Company	1,000	100	1,100
Montecito Water District	3,000	300	3,300
Morehart Land Company	200	20	220
City of Santa Barbara	3,000	300	3,300
Raytheon Company	50	5	55
City of Santa Maria	16,200	1,620	17,820
Santa Ynez River Water Conservation District, Improvement District #1	2,000	200	2,200
Golden State Water Company	500	50	550
Vandenberg Space Force Base	5,500	550	6,050
Subtotal	**39,078**	**6,408**	**45,486**

Several of CCWA's Participants are retail urban water suppliers and responsible for preparing their own UWMPs as well. (See additional discussion below in Section 2.1.)

CCWA also delivers SWP water to San Luis Obispo County. Pursuant to an agreement with DWR,[7] CCWA operates and maintains the SWP conveyance facilities in San Luis Obispo and Santa Barbara Counties (Phase II Coastal Branch) that permits the delivery of SWP water to both Santa Barbara and San Luis Obispo counties. In addition, CCWA owns and operates the Polonio Pass Water Treatment Plant in northern San Luis Obispo County. CCWA also contracts with the San Luis Obispo County Flood Control and Water Conservation District (SLOCFCWCD)[8] for the treatment and conveyance of the SWP water to San Luis Obispo County. In turn, SLOCFCWCD contracts with 11 participants in San Luis Obispo ("San Luis Obispo Participants"). All CCWA Participants and San Luis Obispo Participants receive potable water treated at the Polonio Pass Water Treatment Plant.

The San Luis Obispo County Participants are presented in Table 1-3 below[9], along with their respective SWP Table A Amounts.[10]

Table 1-3. San Luis Obispo Project Participants Table A Amounts

Agency	Table A[1]
Avila Beach Community Services District	100
Avila Valley Mutual Water Company, Inc	20
California Men's Colony (State)	400
County of SLO C.S.A. No. 16, I.D. #1	100
County of SLO (Op Center & Reg. Park)	425
City of Morro Bay	1,313
Oceano Community Services District	750
City of Pismo Beach	1,240
San Luis Coastal Unified School District	7
San Miguelito Mutual Water Company	275
SLO Co. Comm. Coll. District (Cuesta College)	200
TOTAL	4,830

CCWA does not have a direct relationship with the San Luis Obispo Project Participants; only with SLOCFCWCD. Since SLOCFCWCD delivers treated drinking water to the San Luis Obispo Participants, it is classified as a wholesale urban water supplier.

2 Plan Preparation

Due to CCWA's role as a wholesale water supplier, it is important that the efforts in preparing this UWMP and updated Water Shortage Contingency Plan (WSCP), which will be a component of the UWMP, be coordinated with CCWA Participants, other related agencies and the public. In fact, the UWMP Act requires CCWA Participants (see also discussion below in Section 2.2) to exchange important information concerning projections of service population, water supply demand and available water supply sources. Accordingly, CCWA implemented an organized coordination program to ensure that the pertinent data and issues are presented accurately. Table 2-1 presents the agencies and the role each played in coordinating the development of this UWMP:

Table 2-1. Coordination Matrix

Coordination and Public Involvement						
Entities	**Coordination and Public Involvement Actions**					
	Helped write the plan	**Was contacted for assistance**	**Received copy or link to the draft**	**Commented on the draft**	**Attended public meetings**	**Received a notice of intention to adopt**
County of San Luis Obispo – Flood Control and Water Conservation District			✔			✔
County of Santa Barbara – Flood Control and Water Conservation District			✔			✔
San Luis Obispo Participants			✔			✔
CCWA Participants		✔	✔			✔
Other Relevant Public Agencies			✔			✔

The CCWA UWMP coordination efforts focused on three groups presented below:

2.1 Santa Barbara County Participants

The first step in preparing the CCWA UWMP included contacting each CCWA Participant to establish an open line of communication between the staff members. Through contacting each project participant, CCWA determined that only six of the thirteen CCWA Participants are required to prepare an UWMP (Table 2-2). The remaining seven do not quality as they are well below the 3,000 service connections and 3,000 AF of supplied water criteria that triggers the UWMP requirement.

Each CCWA Participant was asked to provide projections of water supply needs for their respective service areas in five-year increments through 2040. CCWA also provided each participant an estimate of the available water from the CCWA system. Estimated projections included a long-term average availability, single dry year availability and multi-dry year availability for a five-year drought scenario.

Table 2-2. Santa Barbara County Project Participants UWMP Requirement

Agency	UWMP Required
City of Buellton	No
Carpinteria Valley Water District	Yes
Goleta Water District	Yes
City of Guadalupe	No
La Cumbre Mutual Water Company	No
Montecito Water District	Yes
Morehart Land Company	No
City of Santa Barbara	Yes
Raytheon Company	No
City of Santa Maria	Yes
Santa Ynez RWCD, Improvement District #1	No
Golden State Water Company	Yes
Vandenberg Space Force Base	No

2.2 San Luis Obispo County Participants

In San Luis Obispo County, the SLOCFCWCD is preparing its own UWMP since it is considered a wholesale urban water supplier to the San Luis Obispo County water purveyors. Consequently, to ensure consistent accurate information, all data and data analysis concerning the San Luis Obispo water purveyors will be found in the UWMP prepared by SLOCFCWCD.

CCWA staff consulted with SLOCFCWCD staff during the preparation work on the two agencies' respective UWMPs. Both CCWA and SLOCFCWCD staff continued on-going dialog as both agencies developed their respective UWMP, as well as exchanging copies of the UWMPs for review and comment.

2.3 County of Santa Barbara, Water Resource Division

The County of Santa Barbara, Water Resources Division of the Public Works Department is comprised of two separate dependent special districts: the Santa Barbara County Flood Control and Water Conservation District (SBCFCWCD) and the County Water Agency (Water Agency).[11] These two special district programs were consolidated into the Water Resources Division of the Public Works Department in February 1994 as part of a department-wide reorganization. Both the SBCFCWCD and the Water Agency have boundaries that coincide with the County's boundary. The Board of Supervisors acts as the Board of Directors of each agency and the staffs of each agency are county employees.

- **SBCFCWCD**. Currently, the primary purpose of the SBCFCWCD is to provide flood protection and to conserve storm, flood and surface waters for beneficial public use. When the District was first created in 1955 by the State legislature in response to severe flooding and damage suffered from storms in the early 1950s, its primary charge was to implement a program of channel maintenance and capital improvements to mitigate the threat to life and property from flooding. SBCFCWCD is also the contracting entity for the SWP. See Section 3.1 for details on SBCFCWCD's role with the SWP and its relationship with CCWA.

- **Water Agency.** The Santa Barbara County Water Agency was established by the state legislature in 1945 to control and conserve storm, flood and other surface waters for beneficial use and to enter into contracts for water supply. Today, the Water Agency is primarily involved in projects for the storage, diversion, transportation, delivery and sale of water. It prepares investigations and reports on the County's water requirements, the water needs of projected development and the efficient use of water. It provides technical assistance to other County departments, water districts, and the public concerning water availability and water well locations and design.

CCWA staff consulted with SBCFCWCD and Water Agency staff during the preparation of the CCWA UWMP. Since neither the SBCFCWCD nor Water Agency is a water supplier, neither is required to prepare an UWMP.

2.4 Public

CCWA recognizes the importance of obtaining public input on its programs and documents. To that end, CCWA mailed notices to approximately 40 agencies and individuals requesting feedback on the draft UWMP and WSCP. See Appendix C for contact information, notices and other outreach materials. The notice provided information regarding how to obtain a copy of the draft plan and the dates and locations of the public workshops.

The Draft Plan was made available for public inspection at local libraries, as well as on CCWA website (www.ccwa.com). In addition, a copy of the draft UWMP was available for public review at the CCWA Office in Buellton. Draft copies were sent electronically for review and comment to all CCWA retail water supply agencies, wastewater agencies, cities, and special interest groups before the public hearing. Public notices regarding the availability of the UWMP for public inspection were posted in the local newspapers and on the CCWA website.

A public workshop was held on June 14, 2021 in CCWA's Buellton office to provide an overview of the UWMP and solicit public feedback. Public Notices and sign-in sheets for the public workshop is presented in Appendix C.

2.5 Plan Adoption, Submittal, and Implementation

The 2020 UWMPs and WSCPs are required to be adopted by each urban water supplier and submitted to the DWR by July 1, 2021. Accordingly, the CCWA Board of Directors will consider adoption of the 2021 CCWA UWMP and WSCP at its regular meeting on June 24, 2021. A public notice was issued in advance of this Board Meeting, in accordance with Section 6066, California Government Code. The Board Resolution is presented in Appendix D.

Once the UWMP and WSCP have been adopted by the CCWA Board of Directors, copies will be submitted electronically to DWR, the California State Library, and every city and county within which CCWA provides water supplies within 30 days of adoption. Should any changes to the UWMP or WSCP be made after adoption, the CCWA Board of Directors will consider and adopt the changes during a properly notified Board of Directors meeting. Copies of amendments or changes to the UWMP or WSCP will be submitted to DWR, the California State Library, and any city or county within which CCWA provides water supplies within 30 days of adoption. In addition, within 30 days of submitting the UWMP and WSCP to DWR, a copy of the UWMP and WSCP will be made available for public review.

3 System Description

3.1 Service Area Physical Description

The CCWA operates and maintains the Coastal Branch Phase II Extension of the Coastal Branch Aqueduct Pipeline, which is part of the SWP (see Figure 3-1). The CCWA supplies treated water for its Participants and for San Luis Obispo Participants. In addition, the service areas for each CCWA Participant are presented in Appendix E.

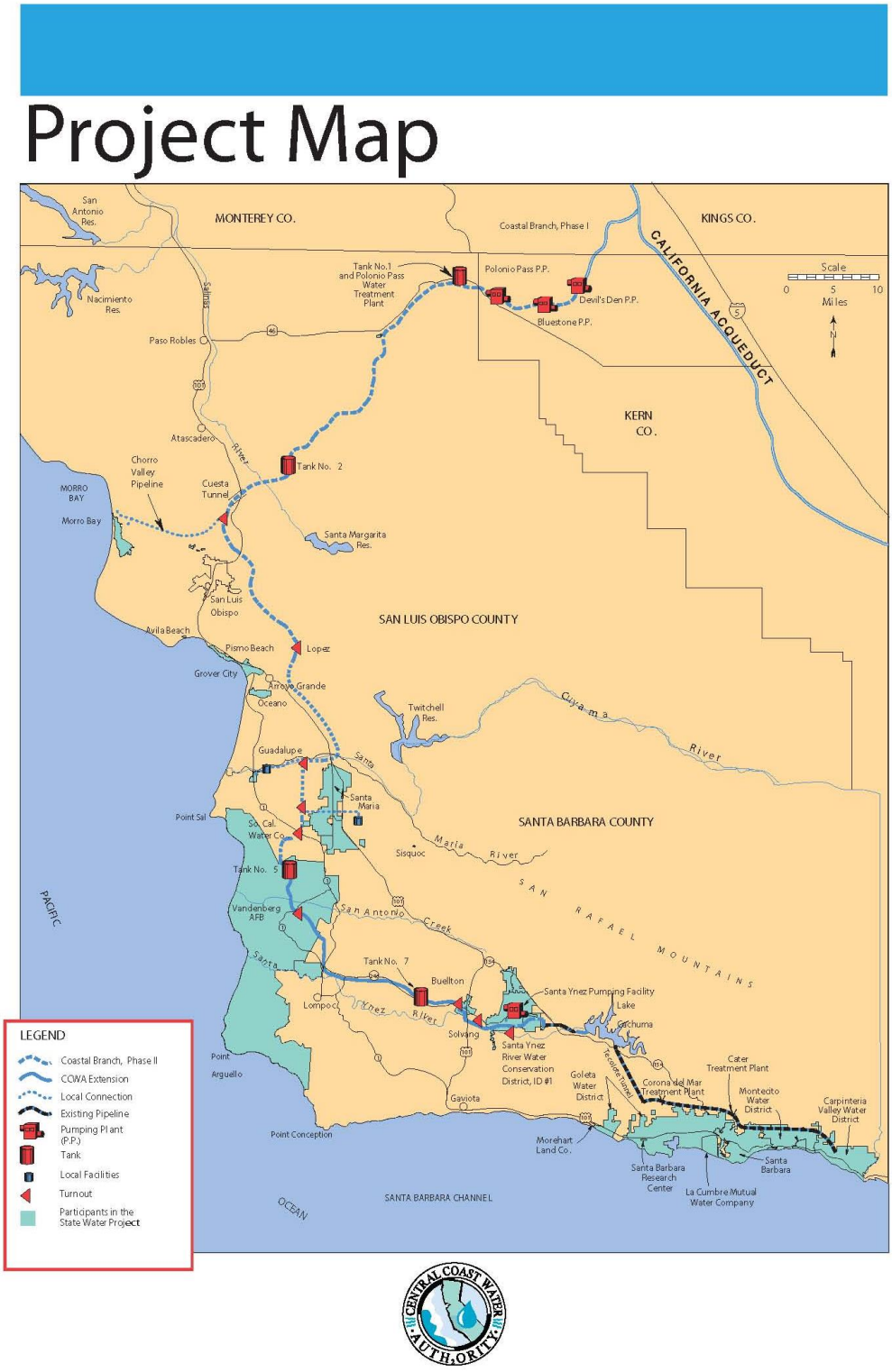


Figure 3-1 Phase II Coastal Branch and CCWA Extension

3.2 Service Area Climate

The climate in the area served by CCWA is best described as Mediterranean, characterized by hot, dry summers in inland areas, with more temperate weather along the coast, and cool, moist winters. Summers are dry with temperatures as high as 110°F in the inland areas. Winters are somewhat cool with temperatures as low as 20°F. Average annual precipitation in the region varies from 17 to 24 inches in the coastal areas to approximately 14 inches in the more arid, eastern locations. A more detailed listing of relevant weather parameters (evapotranspiration (ETo), average high temperature and average rainfall) for selected representative areas within CCWA's service area can be found in Table 3-1 through Table 3-3 and Figure 3-2 through Figure 3-4:

Table 3-1 Monthly Averages for ETo, Temperature, & Precipitation (Santa Maria)

Monthly Averages for ETo, Temperature, & Precipitation (Santa Maria)														
	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yr Ave
ETo (inches)	232	2.15	2.66	3.86	4.76	5.60	5.58	5.55	5.16	3.73	3.63	2.34	1.83	3.90
Ave Max Temp. (F)	047946	63.3	64.3	64.8	66.9	68.3	70.6	72.8	73.2	74.4	73.5	69.2	64.3	68.8
Ave Min Temp. (F)	047946	39.0	40.9	42.0	43.5	46.8	50.1	53.1	53.6	52.2	48.1	42.6	38.7	45.9
Ave Precipitation (inches)	047946	2.53	2.73	2.31	1.06	0.28	0.05	0.03	0.03	0.19	0.52	1.32	1.96	13.00

Table 3-2 Monthly Averages for ETo, Temperature, & Precipitation (Santa Ynez/Cachuma Lake)

Monthly Averages for ETo, Temperature, & Precipitation (Santa Ynez/Cachuma Lake)														
	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yr Ave
ETo (inches)	64	1.87	2.37	3.78	5.02	5.98	6.39	6.61	6.17	4.84	3.67	2.29	1.70	4.22
Ave Max Temp. (F)	041253	65.5	66.7	68.8	73.0	77.5	83.8	90.5	91.1	88.2	82.2	73.2	66.3	77.2
Ave Min Temp (F)	041253	38.6	40.1	41.7	43.4	46.7	49.2	52.1	52.2	51.3	48.0	42.7	38.5	45.4
Precipitation (inches)	041253	4.39	4.65	3.47	1.54	0.38	0.04	0.01	0.03	0.21	0.66	1.93	3.09	20.39

Table 3-3 Monthly Averages for ETo, Temperature, & Precipitation (Santa Barbara)

Monthly Averages for ETo, Temperature, & Precipitation (Santa Barbara)														
	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yr Ave
ETo (inches)	107	1.80	2.30	3.6	4.59	5.05	4.88	5.39	5.23	4.05	3.26	2.16	1.69	3.66
Ave Max Temp. (F)	047902	64.9	65.6	66.8	69.0	69.9	72.4	75.9	77.1	76.7	74.4	70.9	66.4	70.8
Ave Min Temp (F)	047902	43.0	44.6	46.2	48.6	51.3	54.3	57.3	57.9	56.4	52.5	46.9	43.4	50.2
Precipitation (inches)	047902	3.98	3.86	2.97	1.21	0.36	0.08	0.02	0.03	0.20	0.69	1.50	2.82	17.73

Note: Temperature and precipitation data-Western Regional Climate Center[12]

- http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7946, Santa Maria - Period of Record 1/1/1948 to 6/9/2016
- http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca1253, Lake Cachuma – Period of Record 3/1/1952 to 6/10/2016
- http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7902, Santa Barbara - Period of Record 1/1/1893 to 6/9/2016

ETo data-The California Irrigation Management Information System (CIMIS)[13]

- *www.cimis.water.ca.gov*
  - *Santa Maria Period of Record April 2011 to September 2016.*
  - *Santa Ynez Period of Record November 1986 to January 2021*
  - *Santa Barbara. Period of Record April 1993 to January 2021*

Figure 3-2 Historical Precipitation for Northern Santa Barbara County Area.

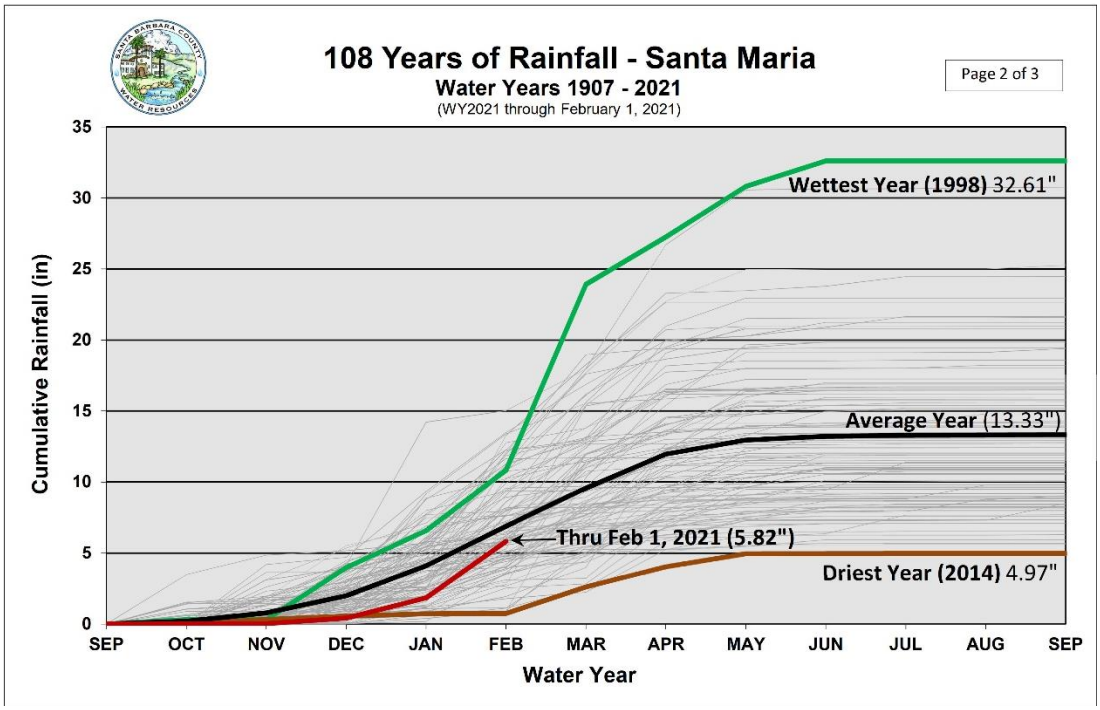


Figure 3-3 Historical Precipitation for Central Santa Barbara County Area.

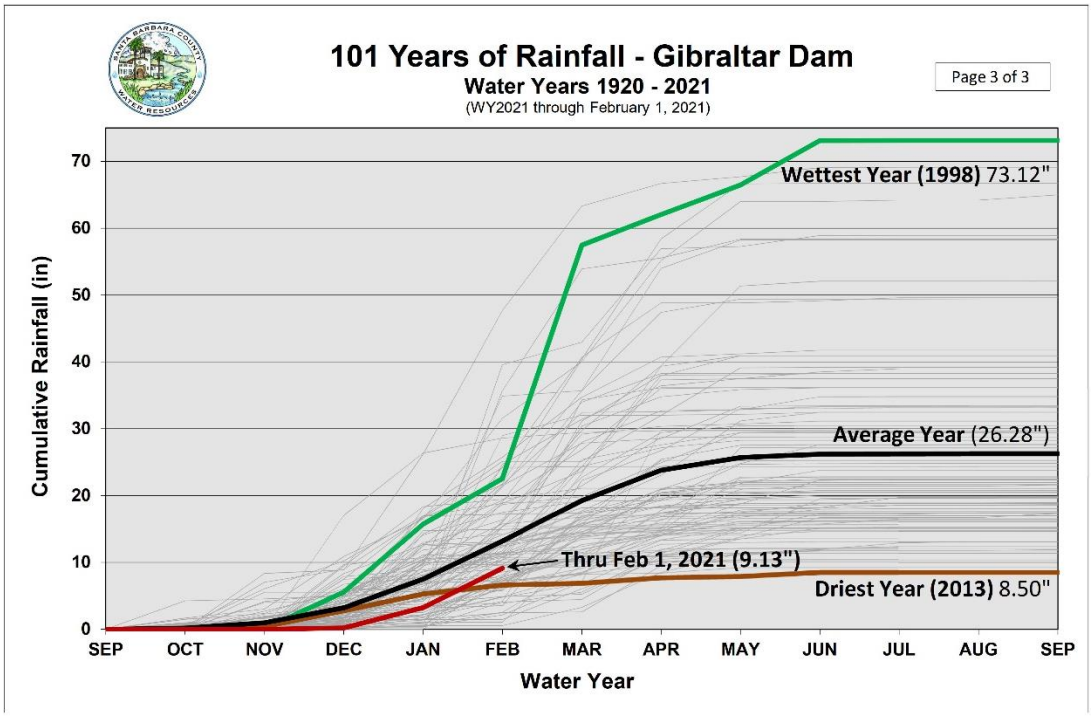
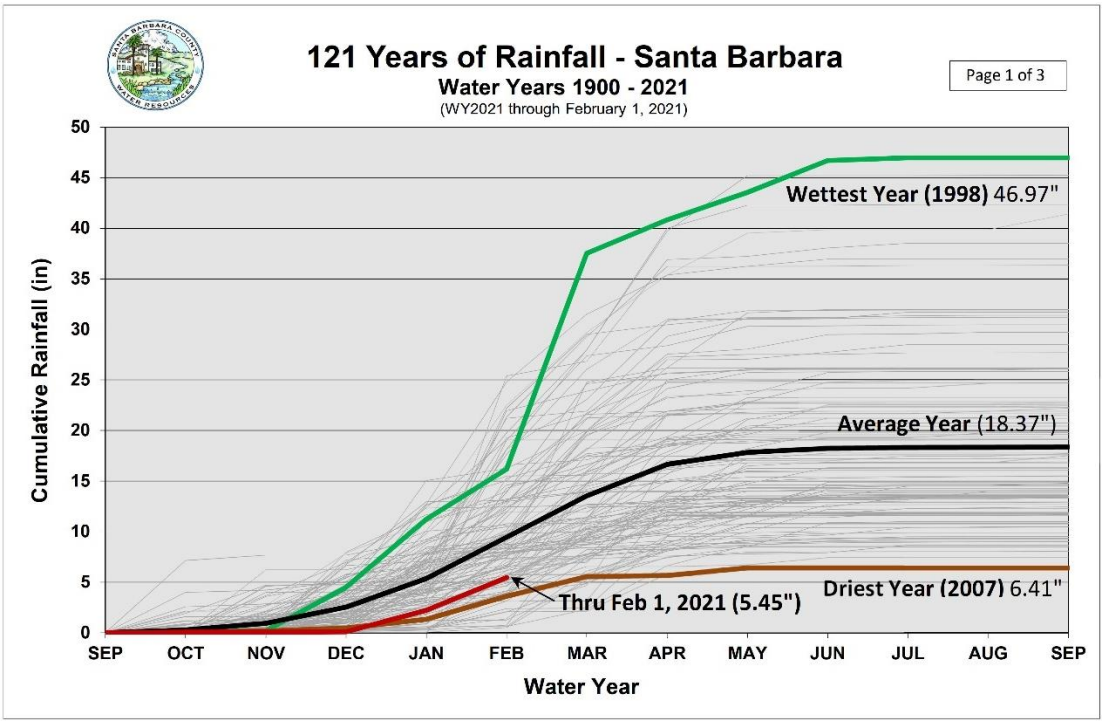


Figure 3-4 Historical Precipitation for Southern Santa Barbara County Area.



3.3 Service Area Population

The Santa Barbara County Association of Governments (SBCAG) published a report entitled "Regional Growth Forecast 2050" in January 2019.[14] The summary data for the population forecast, at the jurisdiction level, from this report is presented in Table 3-4.

Table 3-4 Santa Barbara County Population Forecast

Jurisdiction	2017	2025	2030	2035	2040	2050
Buellton	5,300	5,700	5,900	6,200	6,400	6,600
Carpinteria	13,700	14,200	14,300	14,500	14,600	14,700
Goleta	31,900	32,500	33,100	33,700	34,300	34,700
Guadalupe	7,600	8,100	8,400	8,600	8,900	9,100
Lompoc	43,600	47,800	49,000	50,000	51,300	52,200
Lompoc Unincorporated	16,300	16,700	16,900	17,100	17,400	17,500
Santa Barbara	94,800	97,300	98,600	99,900	101,100	102,000
Santa Maria	108,500	121,900	127,600	133,300	139,000	143,100
Santa Maria/Guadalupe/Cuyama	37,000	38,400	39,000	39,500	40,100	40,500
Santa Ynez Unincorporated	13,400	13,700	13,900	14,100	14,300	14,400
Solvang	5,800	6,000	6,000	6,200	6,300	6,300
South Coast/Other Unincorporated	75,500	76,600	77,200	78,300	79,500	80,300
County Total	453,500	478,600	489,900	501,500	513,300	521,700

Note: Totals independently rounded.

Source: SBCAG, Regional Growth Forecast 2050, January 2019. Summary of Tables 8 and 11.

Another source of population data are Annual Water System Reports. DDW requires all public water systems to prepare and submit an Annual Water System Report and this report contains information about population as well as a variety of other operational data.

Considering that the SBCAG report does not specifically include the population data for all CCWA Participants, both the Annual Water System Report and the SBCAG Report were utilized to prepare the population projection presented in Table 3-5. The 2019 population for each CCWA Participant service area, as reported in the Annual Water System Report, was used as the basis of the population projections from 2020 to 2045. The growth rates shown in the SBCAG report for the closest community match for each CCWA Participant were used to project the 2019 population to future years.

Table 3-5 Central Coast Water Authority Participant Population Projection

CCWA Participant	2020	2025	2030	2035	2040	2045
City of Buellton	5,517	5,726	5,967	6,205	6,447	6,531
Carpinteria Valley Water District	15,433	15,711	15,868	16,027	16,187	16,252
City of Santa Barbara	95,024	97,209	98,473	99,753	101,050	101,454
Goleta Water District	86,952	87,822	89,315	90,922	92,468	93,023
City of Guadalupe	7,605	7,787	8,068	8,350	8,634	8,737
La Cumbre Mutual Water Company	4,874	4,923	5,006	5,097	5,183	5,214
Montecito Water District	11,439	11,611	11,762	11,915	12,070	12,130
Morehart Land Company[1]	n/a	n/a	n/a	n/a	n/a	n/a
Golden State Water Company	4,462	4,859	5,088	5,317	5,545	5,628
Raytheon Company[2]	n/a	n/a	n/a	n/a	n/a	n/a
City of Santa Maria	108,501	118,158	123,711	129,278	134,837	136,860
Santa Ynez ID#1	12,533	12,796	12,956	13,174	13,391	13,463
Vandenberg Space Force Base	15,001	15,226	15,409	15,640	15,874	15,954
CCWA Participant Population	367,341	381,828	391,622	401,677	411,686	415,247
County Total Population	460,900	478,600	489,900	501,500	513,300	517,500
Percent of Santa Barbara County Population	79.70%	79.78%	79.94%	80.10%	80.20%	80.24%

[1] Morehart Land Company is a land developer and has no population data

[2] Raytheon Company has no population data

Notes:
2019 Population as reported by CCWA Participant in the 2019 Annual Water System Report (EAR) submitted to SWRCB DDW.

2020, 2025, 2030, 2035, 2040, 2045 and 2050 CCWA Participant Projectection calculated using population forecasts percent change (Tables 10 and 13), SBCAG, Regional Growth Forecast 2050, Jan 2019.
La Cumbre Mutual Water Company projections calculated using Goleta forecast percent change.
Montecito Water District projections calculated using South Coast Unincorporated forecast percent change.
Population projection for Santa Ynez ID#1 includes the population projection for Santa Ynez (based on the Santa Ynez Unincorporated forecast percent change) and the population projection for the City of Solvang because Solvang resides withing the Santa Ynez ID#1 service area.
Vandenberg Space Force Base projection calculated using nearby Lompoc Unincorporated forecast percent change.

County Total Population from Table 8, SBCAG, Regional Growth Forecast 2050, Jan 2019
Percent of Santa Barbara County Population is calculated

3.4 Service Area Economy

The California Department of Transportation produces long term socio-economic forecasts for each County in the State of California, through its Economic Analysis Branch. These long-term economic forecasts are updated annually and are produced to assist local and regional agencies in their planning efforts. The forecasts provide both historical data and a forecast from 2020 to 2050. To provide a general snapshot of the socioeconomics of Santa Barbara County, copies of the 2019 updated forecasts are included in Appendix F[15]. The summary tables of the 2020 updated forecasts are presented below.

Table 3-6 Caltrans Santa Barbara County Socio-Economic Forecast

Santa Barbara County Economic Forecast

Economic Indicators — 2015-2019 History, 2020-2050 Forecast

	Population (people)	House-holds (thousands)	Net Migration (people)	New Homes Permitted (homes)	Registered Vehicles (thousands)	Personal Income (billions)	Taxable Retail Sales (billions)	Total Taxable Sales (billions)	Real Industrial Production (billions)	Real per Capita Income (dollars)	Unemployment Rate (percent)	Real Farm Production (billions)	Inflation Rate (percent)
2015	444,421	144.9	1,583	1,071	394	$25.4	$4.8	$6.8	$3.4	$63,938	5.3	1.7	0.9
2016	447,267	146.4	392	884	404	$25.5	$4.8	$6.9	$3.3	$62,794	5.1	1.6	1.9
2017	449,950	147.1	422	1,263	403	$26.6	$4.9	$7.1	$3.4	$63,183	4.5	1.7	2.8
2018	452,953	148.1	963	846	406	$28.0	$5.2	$7.3	$3.5	$63,695	4.0	1.6	3.8
2019	454,529	149.5	-408	1,069	414	$29.5	$5.3	$7.6	$3.5	$65,002	3.7	1.6	3.1
2020	455,475	149.7	-1,102	882	412	$29.3	$4.1	$5.9	$3.7	$63,810	8.9	1.6	0.7
2021	458,660	150.7	1,133	900	413	$30.1	$4.9	$7.0	$3.7	$63,958	7.0	1.6	2.1
2022	461,513	151.6	863	918	414	$31.4	$5.1	$7.4	$3.6	$64,519	6.0	1.6	2.5
2023	463,874	152.5	433	924	416	$32.7	$5.4	$7.7	$3.7	$65,238	5.3	1.6	2.7
2024	465,984	153.4	240	923	417	$34.1	$5.6	$8.0	$3.7	$66,052	4.8	1.6	2.5
2025	467,948	154.2	163	917	418	$35.4	$5.9	$8.4	$3.7	$66,700	4.6	1.7	2.4
2026	469,902	155.0	205	920	419	$36.9	$6.0	$8.6	$3.8	$67,537	4.4	1.7	2.3
2027	471,730	155.8	162	921	421	$38.4	$6.2	$8.9	$3.9	$68,437	4.2	1.7	2.2
2028	473,529	156.6	209	923	422	$39.9	$6.4	$9.1	$3.9	$69,372	4.1	1.7	2.3
2029	475,260	157.5	194	909	423	$41.4	$6.6	$9.4	$4.0	$69,967	4.0	1.7	2.4
2030	476,992	158.3	238	894	425	$42.8	$6.8	$9.7	$4.0	$70,575	3.9	1.7	2.3
2031	478,591	159.0	233	882	426	$44.3	$6.9	$9.9	$4.1	$71,181	3.8	1.8	2.2
2032	480,069	159.8	213	869	427	$45.7	$7.1	$10.1	$4.1	$71,595	3.7	1.8	2.4
2033	481,517	160.5	267	860	428	$47.2	$7.2	$10.3	$4.2	$72,246	3.8	1.8	2.0
2034	482,888	161.3	314	842	429	$48.8	$7.4	$10.6	$4.2	$72,864	3.9	1.8	2.2
2035	484,206	162.0	385	824	430	$50.4	$7.6	$10.8	$4.3	$73,479	4.0	1.8	2.3
2036	485,436	162.7	409	802	431	$52.2	$7.8	$11.2	$4.3	$73,895	4.0	1.9	2.7
2037	486,638	163.4	478	786	432	$54.0	$8.1	$11.5	$4.3	$74,254	4.1	1.9	2.8
2038	487,811	164.1	570	772	433	$55.9	$8.3	$11.8	$4.4	$74,748	4.0	1.9	2.6
2039	488,909	164.7	584	759	434	$57.9	$8.5	$12.2	$4.4	$75,164	4.1	1.9	2.8
2040	489,945	165.4	651	743	435	$59.9	$8.8	$12.5	$4.4	$75,615	4.1	1.9	2.7
2041	490,859	166.0	677	730	435	$62.1	$9.0	$12.8	$4.5	$76,275	4.2	2.0	2.5
2042	491,702	166.6	703	715	436	$64.2	$9.2	$13.1	$4.5	$77,003	4.3	2.0	2.4
2043	492,509	167.2	739	700	437	$66.5	$9.4	$13.5	$4.6	$77,787	4.3	2.0	2.3
2044	493,170	167.8	664	685	437	$68.7	$9.6	$13.7	$4.6	$78,683	4.2	2.0	2.1
2045	493,747	168.4	662	665	438	$71.1	$9.9	$14.1	$4.7	$79,548	4.0	2.1	2.3
2046	494,264	169.0	653	649	438	$73.5	$10.1	$14.4	$4.7	$80,326	4.1	2.1	2.2
2047	494,713	169.6	646	632	438	$75.7	$10.3	$14.7	$4.8	$80,963	4.0	2.1	2.2
2048	495,107	170.1	643	616	439	$78.0	$10.6	$15.1	$4.8	$81,535	4.1	2.1	2.2
2049	495,323	170.6	533	600	439	$80.5	$10.8	$15.5	$4.8	$82,292	4.2	2.2	2.2
2050	495,454	171.1	536	585	439	$82.9	$11.1	$15.8	$4.9	$83,018	4.3	2.2	2.2

Overall, annual population growth is expected to decrease in Santa Barbara County from 3,500 in 2017 to 800 by 2060. This is due to a combination of factors including a relatively constant number of births, rising mortality as baby-boomers age, and forecasted slow decline in net in-migration.

Between 2017 and 2050, countywide population in Santa Barbara County is expected to increase by 15%, while both jobs and households are expected to increase by 25%. In the 2017-2050 forecast horizon, the City of Santa Maria is expected to experience the greatest population growth (32%), followed by Buellton (24%) and Guadalupe (20%), while the South Coast Cities of Carpinteria, Santa Barbara and Goleta are forecasted to grow by less than 9%. In the City of Santa Barbara, job growth is forecasted to outpace population growth by a factor of 2.6 while in the City of Santa Maria, population growth is forecasted to outpace job growth by a factor of 3.1.

Housing production in the next five years is expected to be similar to the previous five years. The southern and middle parts of Santa Barbara County, including both the tourist destination of the City of Santa Barbara and the wine industry in the Santa Ynez Valley, are among the most expensive housing markets in the United States. Houses in the northern part of the county are less than half as expensive as in the southern part of the county. In 2019, real estate was the largest share of the financial activities sub-sector, building maintenance was the largest share of the professional and business services sub-sector, and software publishing was the largest share

of the information sub-sector. In 2021, employment in Santa Barbara County is expected to recover from the job losses of the Coronavirus Recession.

4 System Demands

This section characterizes the water demand by CCWA Participants and presents projections of future demand for water supply. CCWA maintains information on deliveries of SWP water to each participant. Since each CCWA participant has additional sources of water supply, the water deliveries made by CCWA do not translate to individual retailer system demand.

Historically, the DWR required all public water systems to complete a form entitled "Public Water System Statistics,"[16] also known as DWR Form 38, on an annual basis. This form required each water purveyor to provide basic water system information, water production data, number and type of service connections and the total volume of delivered water to each type of service connection.

In addition, the State Water Resources Control Board, Division of Drinking Water (DDW) currently requires all public water systems to prepare and submit an Annual Water System Report[17]. The content of the DDW report varied historically from year to year and generally included an inventory of water supply sources, number of service connections and total volume of water produced. However, the 2020 DDW Annual Water System Report now requires the same data requested in the DWR Form 38.

The SBCFCWCD and CCWA Participants provided CCWA with the DWR Form 38s and the DDW Annual Water System Reports for each CCWA participant. This information was reviewed and tabulated as a way to characterize the demand for water supply within each participant's water system. In addition, the volumes of SWP water delivered to each CCWA Santa Barbara County participant is presented.

As indicated in Section 1.2, CCWA delivers SWP water to the SLOFCWCD through the Chorro Valley and Lopez Turnouts. Since SLOFCWCD is classified as a wholesale water supplier, it is preparing an UWMP for its water purveyors. Consequently, to avoid duplication of efforts, all data analysis related to the San Luis Obispo County water purveyors can be found in the UWMP prepared by SLOFCWCD.

4.1 Total CCWA Santa Barbara County Participant Water Demands

For each of the CCWA Santa Barbara County project participants, the water supply data presented in the DWR Form 38 and DDW Annual Reports were reviewed and summarized. The data for 2015 and 2020 was selected, in accordance with DWR guidelines, for evaluation. The results are presented in Table 4-1 for 2015 and Table 4-2 for 2020.

Table 4-1 2015 Customer Class and Delivery Volumes

2015 Customer Class and Delivery Volume Data															
Participant	Number of Service Connections							Delivery Volumes							
	Single Family	Multi-Residential	Commercial Institutional	Industrial	Landscape	Other	Agricultural	Single Family	Multi-Residential	Commercial Institutional	Industrial	Landscape	Other	Agricultural	Wholesale
Buellton	1216	140	160	21	32	0	0	400.0	90.0	359.0	36.0	81.0	0.0	0.0	0.0
Carpinteria	3217	348	275	58	51	133	406	739.7	413.2	349.3	167.9	49.8	0.0	2,129.7	0.0
Golden State Water Co (1)	10885	118	327	5	53	1	0	4,056.0	195.3	736.6	1.2	141.8	0.6	0.0	0.0
Goleta	13301	1720	1010	0	241	0	162	3,251.2	1,635.5	1,991.3	0.0	1,215.5	1.7	3,159.7	0.0
Guadalupe	1810	11	115	0	27	5	0	450.2	5.5	479.6	0.0	28.9	23.5	0.0	0.0
La Cumbre	1324	63	28	0	37	0	38	1,064.1	0.0	0.0	0.0	0.0	0.0	76.0	0.0
Montecito	4224	64	259	0	0	7	45	2,482.0	66.0	552.0	0.0	0.0	106.0	315.0	0.0
Morehart (2)	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
Raytheon (3)	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
Santa Barbara	16955	6402	2624	56	764	0	62	4,131.3	2,373.9	1,836.9	194.4	409.1	582.3	157.2	0.0
Santa Maria	18426	854	1840	96	546	246	0	5,113.0	1,811.0	2,144.0	559.0	1,120.0	416.0	0.0	331.0
Santa Ynez ID1	2429	0	0	0	0	4	112	1,665.0	0.0	0.0	0.0	0.0	30.3	2,314.0	28.2
Solvang	1723	69	222	26	85	0	0	554.6	92.8	208.0	35.0	90.9	1.9	0.0	0.0
Vandenberg	999	22	127	12	1	0	0	362.3	0.0	589.3	6.9	185.8	0.0	0.0	0.0
SLOFCWCD															

Note: 1. Golden State Water Company Data is comprised of the Orcutt and Tanglewood Public Water Systems

2. The Morehart Land Company is a land developer for the planned community of Naples

3. Raytheon is an industrial/commercial participant

Table 4-2 2020 Customer Class and Delivery Data

2020 Customer Class and Delivery Volume Data															
Participant	Number of Service Connections							Delivery Volumes							
	Single Family	Multi-Residential	Commercial Institutional	Industrial	Landscape	Other	Agricultural	Single Family	Multi-Residential	Commercial Institutional	Industrial	Landscape	Other	Agricultural	Wholesale
Buellton	1230	353	190	37	21	0	0	464	119	278	40	103	0	0	0
Carpinteria	3265	350	283	58	58	132	385	915	461	366	61	90	10	2093	23
Casamalia	49	0	5	0	0	0	0	7	0	1	0	0	0	0	0
Cuyama	212	0	22	0	20	0	0	68	0	12	0	34	0	0	0
Golden State Water Co (1)	11159	142	434	5	71	0	0	4297	203	664	1	208	0	0	0
Goleta	13374	1822	984	0	288	497	165	3509	1814	1893	0	1162	0	2351	0
Guadalupe	2202	11	113	0	40	4	0	611	6	288	0	78	2	0	0
La Cumbre	1315	63	27	0	37	0	28	1207	0	0	0	0	0	54	0
Los Alamos	471	84	32	0	16	11	0	165	40	20	0	44	3	0	0
Mission Hills	1269	0	10	0	2	0	0	474	0	26	0	0	0	0	0
Montecito	4261	66	263	0	0	0	42	3181	100	456	0	0	145	293	0
Santa Barbara	16922	6747	2706	53	800	0	65	4328	2639	1533	151	447	684	138	0
Santa Maria	19178	871	1873	95	617	254	0	5398	1885	1950	722	1430	254	0	1117
Santa Ynez ID1	2440	0	155	0	0	10	98	1692	0	175	0	0	63	1660	0
Solvang	1782	71	224	26	87	0	0	763	101	175	32	153	0	0	0
Vandenberg	2422	56	66	0	17	0	0	874	81	94	0	182	0	0	0
Vandenberg AFB (2)	6	0	12	0	5	0	0	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data

Note: 1. Golden State Water Company Data is comprised of the Orcutt and Tanglewood Public Water Systems

2. Individual connections are not metered at Vandenberg AFB, instead total water to delivered to the AFB is metered

3. No data is available for Raytheon or Morehart Land Company

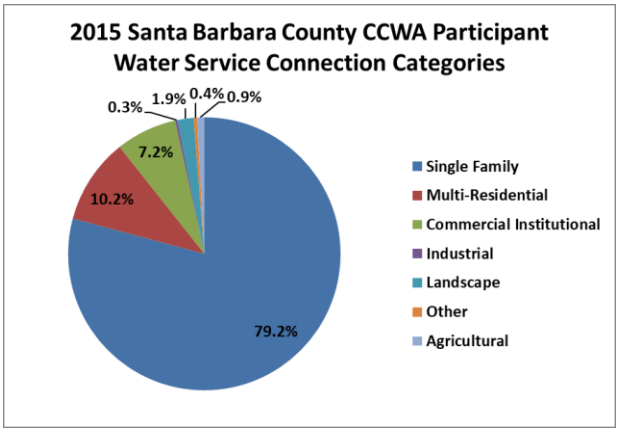
To characterize the CCWA Santa Barbara County project participants' demand for water supply, three aspects were evaluated: distribution of customer class, water deliveries to each customer class, and portion of water supply provided by CCWA. The CCWA Santa Barbara County participants were evaluated as a group, as opposed to individual systems. The results of the review are as follows:

4.1.1 Customer Class

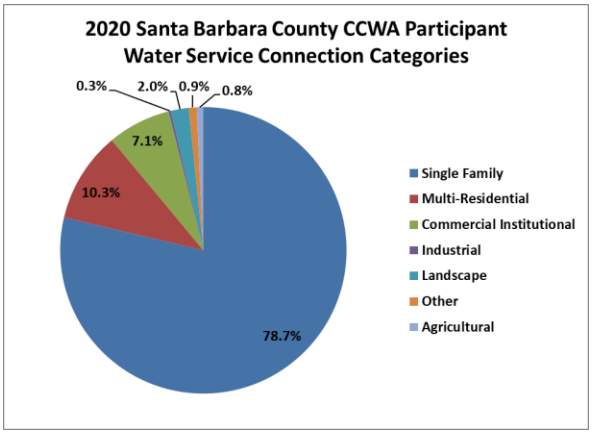
The DWR Form 38 and DDW Annual Water System Report provides six defined customer classes and a seventh category called "other". Each Public Water System provides the number of service connection per customer class and the monthly volume delivered to each customer class.

The data compiled from DWR Form 38 and the DDWA Annual Water System Report indicates that the primary customer classes that are serviced by the CCWA Santa Barbara County participants include single-family residential, followed by multi-residential and commercial/institutional customer classes. These three categories represent over 95% of the total number of service connections. No significant changes in the distribution of customer classes can be observed when comparing 2015 data to 2020 data. The aggregate customer class distribution for CCWA Santa Barbara County participants is graphically presented in Graph 4-1 for 2015 and Graph 4-2 for 2020

Graph 4-1. 2015 Service Connections



Graph 4-2. 2020 Service Connection



Although the above graphs suggest that agricultural customer service connections are few, there are project participants that provide up to 50% of their total water supply to agricultural customers. This illustrates the higher demand for water typically required by agricultural service connections as compared to other customer classes. The four CCWA Santa Barbara County participants that deliver significant volumes of water to agricultural customers are as follows:

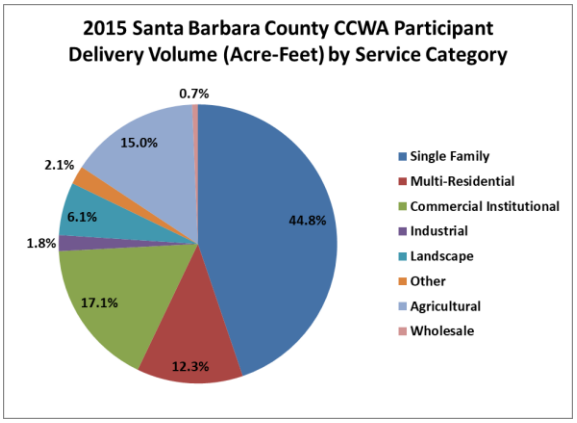
- Santa Ynez River Conservation District Improvement District #1, with approximately 3.6% of its total service connections assigned to the agricultural customer class.
- Goleta Water District, with approximately 1% of its total service connections assigned to the agricultural customer class.
- Carpinteria Water District, with approximately 8.5% of its total service connections assigned to the agricultural customer class.
- La Cumbre Mutual Water Company, with approximately 1.9% of its total service connections assigned to the agricultural customer class.
- Montecito Water District, with approximately 1% of its total service connections is assigned to the agricultural customer class.

4.1.2 Total Volume Delivered by Service Connection Category

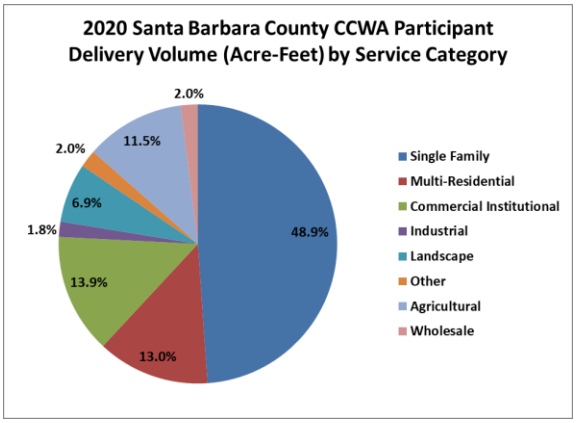
As reported in DWR Form 38 and DDW Annual Water System Report, the CCWA Santa Barbara County project participants delivered approximately 11,673 AF in 2015 and approximately 30,411 AF in 2020 as a group to their respective customers. The large difference occurred because 2015 was a critically dry year with significant water use restrictions. The aggregate delivery volume for each customer class distribution for CCWA

Santa Barbara County project participants is graphically presented in Graph 4-3 for 2015 and Graph 4-4 for 2020.

Graph 4-3. 2010 Delivery Volumes



Graph 4-4. 2015 Delivery Volumes



Although the customer classes of single-family residential, multi-family residential and commercial/institutional represented over 95% of the number of service connections, these three classes account for roughly 74% in 2015 and 76% in 2020 of the water delivered by Santa Barbara County project participants to their respective systems.

As evidenced in the graphs above, agricultural service connections represent a significant portion of the total water demand for CCWA Santa Barbara County participants. These agricultural service connections required approximately 15% in 2015 and 12% in 2020 of water delivered, even though the number of agricultural service connections is less than 1% of the total number of connections. The participants with the highest percentage of water delivered to the agricultural customer class are as follows:

- Santa Ynez River Conservation District Improvement District #1 delivering approximately 46.2% of its total water supply to agricultural customer class service connections.
- Goleta Water District delivering approximately 21.9% of its total water supply to agricultural customer class service connections.
- Carpinteria Water District delivering approximately 52.1% of its total water supply to agricultural customer class service connections.
- La Cumbre Mutual Water Company delivering approximately 4.3% of its total water supply to agricultural customer class service connections.
- Montecito Water District, delivering approximately 7.0% of its total water supply to agricultural customer class service connections.

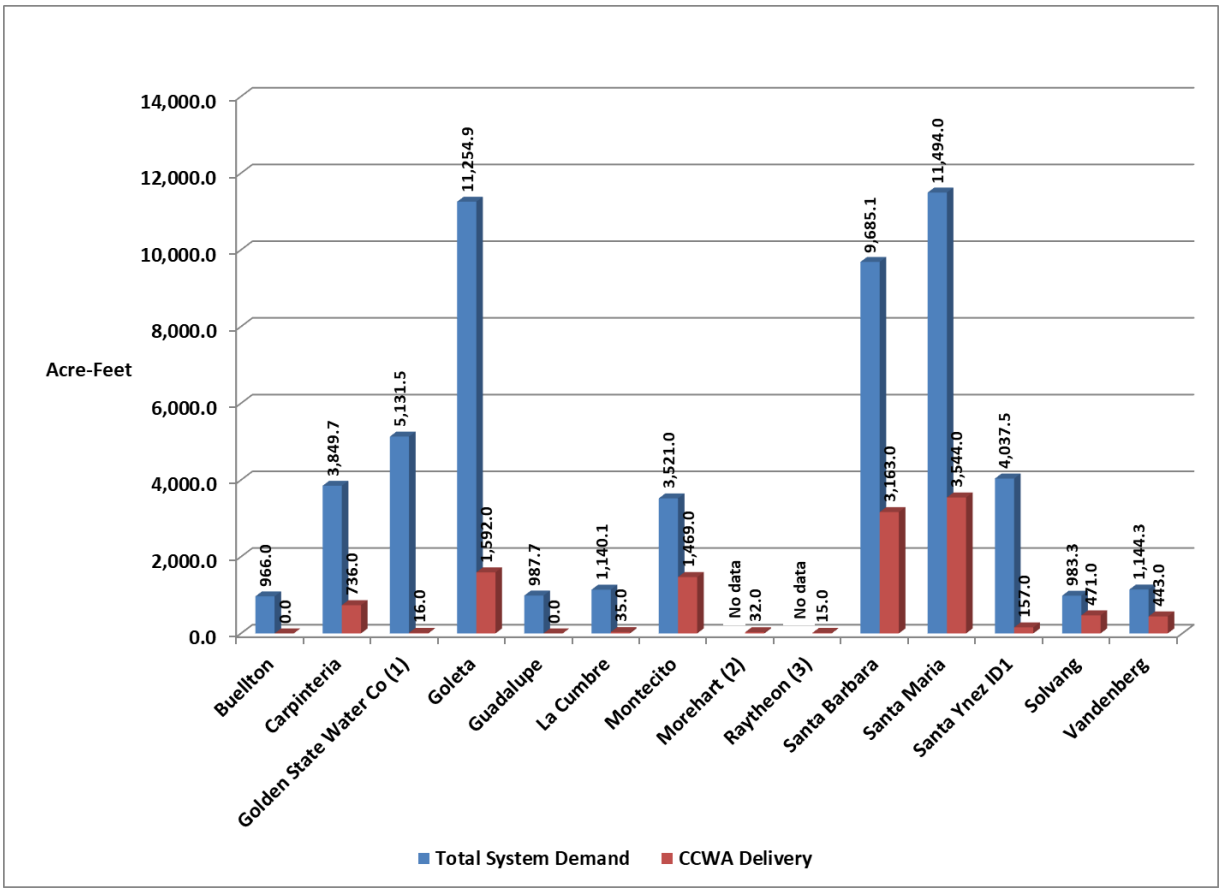
4.1.3 Comparing CCWA Deliveries to Total Reported Supply

The mission of CCWA is to provide high quality, reliable, supplemental water to Santa Barbara and San Luis Obispo Counties. The key word in CCWA's mission statement is "supplemental." All of CCWA's project participants maintain and utilize additional sources of water supply. Each CCWA participant manages its own portfolio of water supplies that best meets its long-term and short-term needs. The water provided by CCWA is only one source of water supply for CCWA Participants and this source is also interrupted on an annual basis for scheduled maintenance work. Each year, DWR ceases water delivery operations in the Coastal Branch of the SWP for the purposes of conducting maintenance work. These annual outages typically last from two to

four weeks per year. CCWA Participants are required to rely upon other sources of water supply during these annual maintenance events.

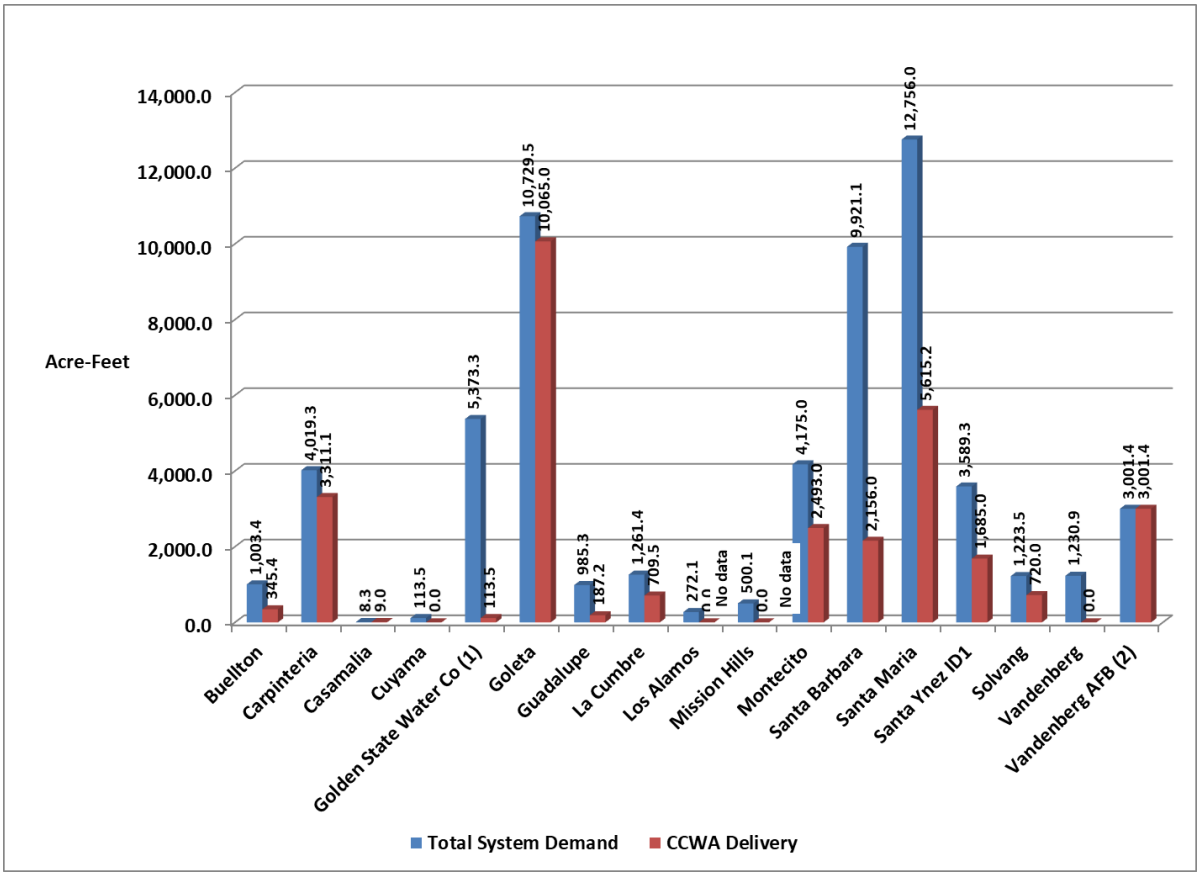
As indicated earlier, the CCWA Santa Barbara County project participants delivered 54,195 AF of water to their respective customers in 2015. Of this amount, CCWA delivered 11,673 AF of water. To illustrate the portion of water delivered to each participant, the total system demand and CCWA deliveries were plotted and presented in Graph 4-5.

Graph 4-5. 2015 Project Participant System Demand and CCWA Deliveries



In 2020, the CCWA Santa Barbara County project participants delivered 60,163 AF of water to their respective customers. CCWA delivered 12,175 AF of this total amount. To illustrate the portion of water delivered to each participant, the total system demand and CCWA physical delivery was plotted and presented in Graph 4-6.

Graph 4-6. 2020 Project Participant System Demand and CCWA Deliveries

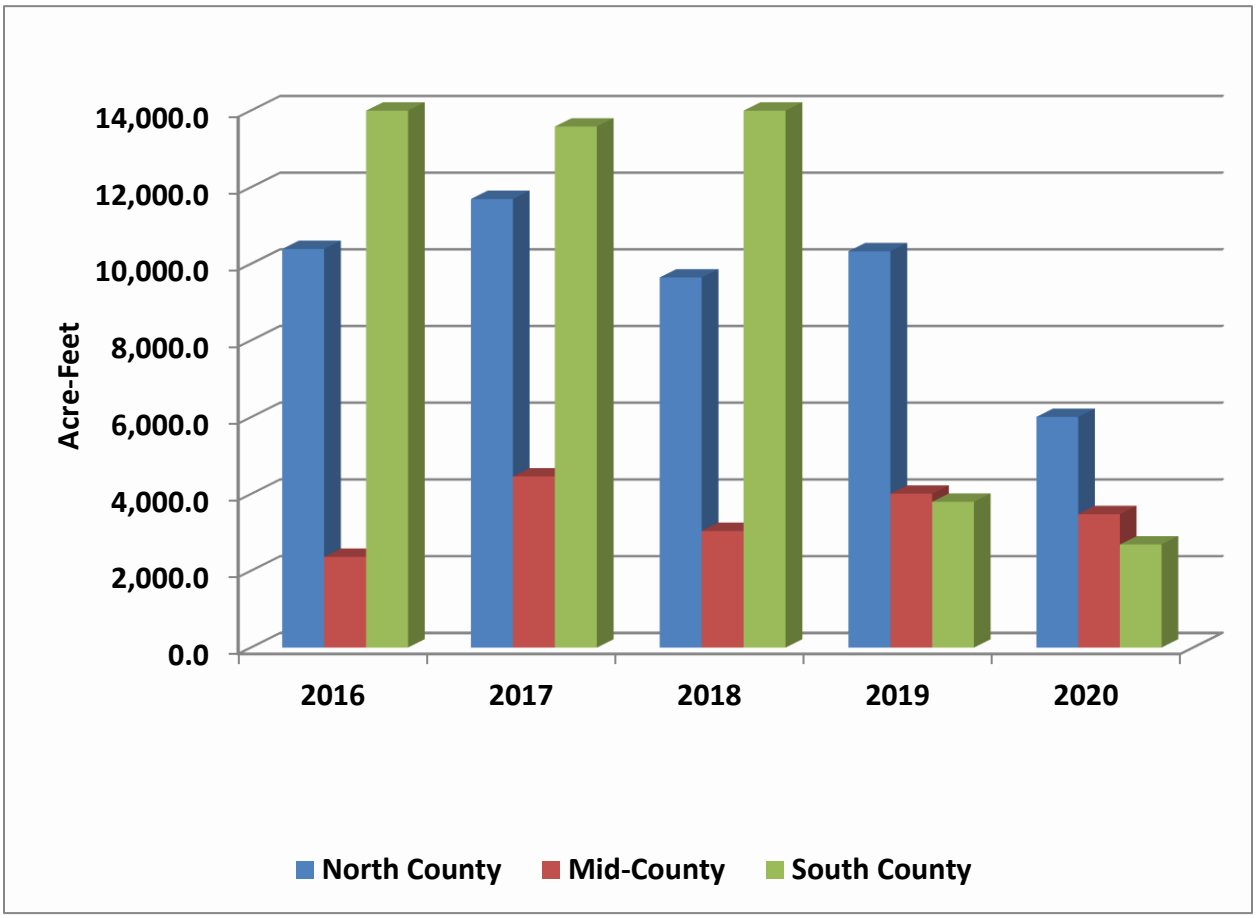


There is an observable shift in delivery pattern between 2016 and 2020. Since 2016, most CCWA Participants shifted towards using less of their local supplies to meet system demand, while Golden State Water Company, Santa Barbara, and Vandenberg shifted towards increasing their reliance on local sources to meet their system demand. This shift in delivery pattern is likely due to measures taken to recover from the effects of drought that occurred from 2013 to 2016. As the drought progressed, it impacted each of the CCWA Participants in different ways, which depended on where they were located within the County.

For the South Coast CCWA Participants, the groundwater basins within these agencies' respective service areas are relatively small in size and are more at risk when operated beyond their sustainable yields. Consequently, South Coast agencies are more reliant on local surface water as compared to CCWA Participants located north of Lake Cachuma. As the drought progressed, the local surface water supplies were diminished and the South Coast CCWA Participants needed to import more supplemental SWP water to compensate and meet their system demands.

In contrast, for CCWA Participants located north of Lake Cachuma, the groundwater basins within their respective service areas are relatively large and can generally be operated beyond their sustainable yield on a short-term basis without significant risk. Further, the importation of SWP water greatly benefited these north County groundwater basins through allowing the basins to recharge to much higher levels than was possible before importation of SWP water. Consequently, when the drought progressed, the CCWA Participants north of Lake Cachuma were able to rely on their local groundwater resources to meet system demand.

Graph 4-7. Shift in CCWA Delivery Pattern



4.1.4 Santa Ynez Exchange Agreement

The Santa Ynez Water Exchange Agreement[18] is an innovative water management strategy that was put into effect during the original construction of the CCWA system. This agreement provided the CCWA Participants located in southern portion of Santa Barbara County an opportunity to receive SWP water through existing infrastructure, as opposed to building a new pipeline around Lake Cachuma.

Lake Cachuma is utilized directly for water supply by five water purveyors. These water purveyors have water supply agreements with the Santa Barbara County Water Agency, which in turn has a Master Water Supply Agreement with the USBR.[19] The five purveyors known as the Cachuma Member Units and their project allocations are as follows:

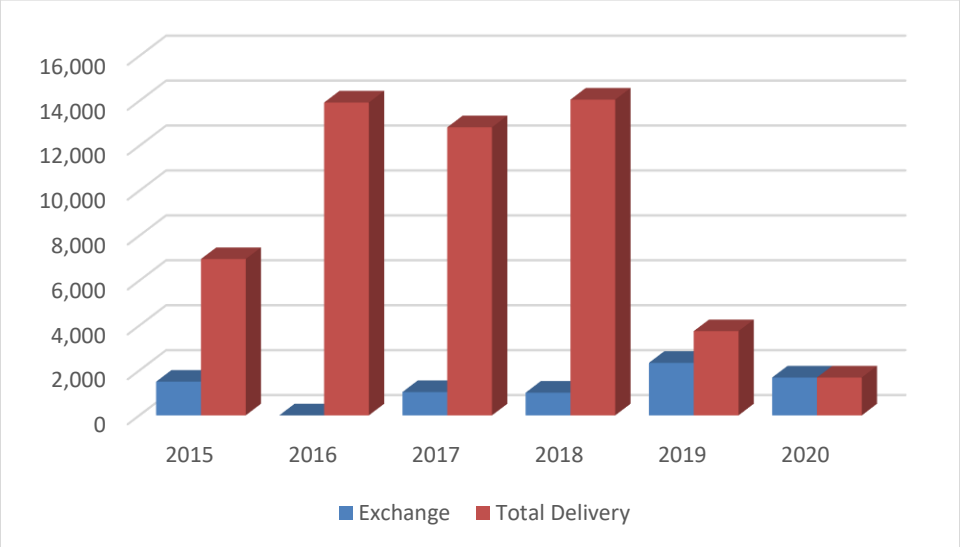
- Carpinteria Valley Water District - 10.94%
- City of Santa Barbara - 32.19%
- Goleta Water District - 36.25%
- Montecito Water District - 10.31%
- SYRWCDID#1 - 10.31%

SYRWCDID#1 is located north of Lake Cachuma while all of the other Cachuma Member Units are located south of Lake Cachuma. The exchange agreement takes advantage of this fact and the related infrastructure. The agreement included SYRWCDID#1 selling its 5-mile pipeline from the Santa Ynez Valley to Lake Cachuma to CCWA for use in conveying SWP water to Lake Cachuma. Subsequently, SYRWCDID#1 exchanges its Lake Cachuma water that would have normally been delivered to SYRWCDID#1 to be delivered to the other Cachuma Member Units. In exchange, the South County Cachuma Member Units cause the delivery of a like amount of SWP water to SYRWCDID#1 on a gallon-for-gallon exchange basis.

This exchange has many advantages to both SYRWCDID#1 and the South Coast Cachuma Member Units. SYRWCDID#1 receives SWP water which has a superior quality compared to Lake Cachuma water and local groundwater supplies. While, the South Coast Cachuma Member Units will avoid the cost of pumping water to the Lake. In addition, South Coast Cachuma Member Unit will benefit from the increased conveyance capacity that the exchange can provide. In times of urgent need to deliver high volumes to the lake, the exchange essentially provides conveyance capacity that adds to the conveyance capacity of the Santa Ynez Pumping Plant. However, these advantages can only occur if the parties have water to exchange.

In times of plenty, the South Coast CCWA Participants will typically request SWP water deliveries in sufficient quantity to meet their obligations under the Santa Ynez Exchange Agreement. However, when the demand of water rises or the capacity of Lake Cachuma becomes critically low, the South Coast CCWA Participants will begin to request deliveries well above the minimum amount to fulfill their obligations under the Santa Ynez Exchange Agreement. Graph 4-8 demonstrate the a mix of wet and dry years and represents the volume delivered to the South Coast agencies through the exchange and the total volume delivered through the exchange and through the Santa Ynez Pumping Plant.

Graph 4-8. Santa Ynez Exchange



4.2 CCWA Water Demand

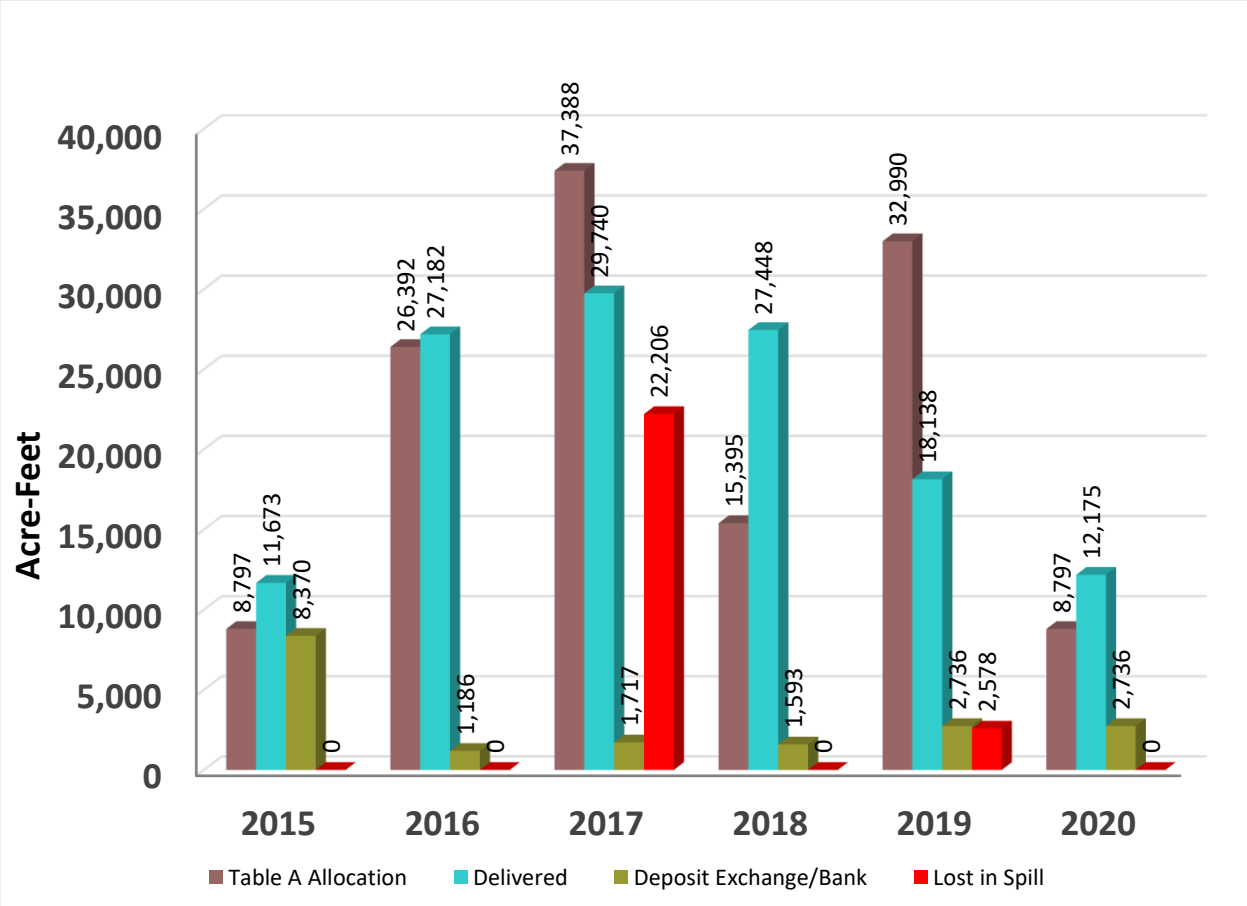
4.2.1 CCWA Historical Demand

The CCWA Participants have multiple sources of water supply to respond to their own customer's water supply needs. There are a number of factors that determine the demand for water supply from the CCWA system by the CCWA Participants. These factors may include water quality issues, water production rates and availability from other sources, water transfer arrangements and many others. The demand for water from the CCWA system is ultimately a management decision by the CCWA Participants.

It is CCWA's responsibility to take measures to maximize the amount of water available to its project participants, up to the Table A amount (See Section 5.2 for explanation of Table A). Although the annual DWR SWP allocation may vary from year to year, higher water delivery volumes are possible through the use of carry-over water, surplus water, water transfers, exchanges and groundwater banking opportunities. CCWA has always been successful in its ability to deliver larger volumes of water than the DWR allocation alone would provide and continues to meet the annual SWP demand for each of its project participants.

Graph 4-9 presents the annual SWP Table A allocation, water deliveries to CCWA Participants, water lost due to a spill of SWP contractor supplies from San Luis Reservoir in 2016, and water transferred to another SWP contractor or groundwater bank from 2016 to 2020. Based on this data, it is clear that CCWA has the ability to deliver greater volumes of water than the SWP allocation would provide, as observed in 2015, 2018 and 2020. Also, as can be observed each year, water can be transferred to/from another SWP contractor or groundwater bank for the purpose of securing and increasing the reliability of water supplies for use in times of drought.

Graph 4-9. 2015 through 2020, Delivered Water and Table A Allocation



Note: Exchanges were performed with Carpinteria, Goleta, Montecito and Santa Barbara

One of the key advantages of the CCWA system is that is connects to statewide infrastructure, which provides the ability to move water from almost anywhere in the state. This ability allows for the optimum management of a given year's SWP Table A allocation. It can be utilized for supply or delivered to another SWP contractor or groundwater bank with the commitment to return the water in the future. In addition, the connection to statewide infrastructure allows CCWA to identify, secure and convey supplemental water from almost anywhere in the state to Santa Barbara County.

4.2.2 CCWA Water Demand Projections

An initial objective of importing water from the SWP into Santa Barbara and San Luis Obispo Counties was to reduce the overdraft of local groundwater basins. The Environmental Impact Report prepared for the Phase II Coastal Branch of the SWP and for the Mission Hills Extension Project[20] indicated that both Santa Barbara and San Luis Obispo Counties had water demands well above the average safe sustainable yield for the area, with deficits of between 60,000 and 61,000 AF per year in 1985. The EIR further stated that importation of SWP water was not designed to eliminate the water supply deficit, but to help reduce it.

All CCWA Participants have continued to maintain a variety of water supply sources to draw upon. The available sources include groundwater sources, developed local surface water supplies, desalination and recycled water. Therefore, the water imported by CCWA represents only one source of supply to its project participants.

Due to the year-to-year variability of supply in the SWP, CCWA's charge is to make a reliable and consistent water supply available for the benefit of its project participants.

Most SWP water that is not utilized for local water demand in any given year is stored within the SWP system, banked, transferred, or exchanged. The State Water Supply Contract includes provisions that allow these water management practices. Additionally, surplus water (also known as Article 21 water – see Section 5.2.1 for further explanation) can be requested by any SWP Contractor for delivery, when it is available. This management practice provides a level of protection against drought since it allows SWP contractors to store water for use in current or subsequent years to augment supply.

To estimate water delivery projections into the future, CCWA relies upon the guidance provided by DWR. As discussed more fully in Section 5.3.2 of this UWMP, DWR conducts a delivery capability study[21] for the SWP operation every two years to provide contractors with information about the SWP's ability to deliver water under current conditions as well as selected future conditions. The studies utilize an 82-year historical record of flows in the Delta and the use of a sophisticated flow model known as CALSIM II. The results of this study were utilized by CCWA to prepare estimated projections of water availability for each CCWA participant, following DWR estimation protocol.

According to the 2019 DWR DCR, the long-term reliability of SWP water to Santa Barbara County project participants is 59% of the Table A amount in 2019 and reduces to 57% of the Table A amount in 2035. Following the DWR estimation protocol, the long-term average of available water was calculated every five years starting in 2020 and ending in 2045. The results of this calculation are presented in Table 4-3. Since CCWA's system demand is defined as the water available in any given year, the results presented in Table 4-3 are the projections for future CCWA system demand.

Table 4-3 Long Term Average Delivery Projections

Long Term Average, Acre-feet per Year									
Participant	Table A	Buffer	Total Table A	2020	2025	2030	2035	2040	2045
Predicted SWP Allocation				58.9%	58.4%	57.8%	57.3%	56.8%	56.3%
Buellton	578	58	636	374	371	368	364	361	358
Carpinteria	2,000	200	2,200	1,295	1,284	1,272	1,261	1,249	1,238
Golden State Water Co	500	50	550	324	321	318	315	312	309
Goleta	4,500	2,950	7,450	4,386	4,347	4,308	4,269	4,230	4,191
Guadalupe	550	55	605	356	353	350	347	344	340
La Cumbre	1,000	100	1,100	648	642	636	630	625	619
Montecito	3,000	300	3,300	1,943	1,926	1,908	1,891	1,874	1,856
Morehart	200	20	220	130	128	127	124	125	124
Raytheon	50	5	55	32	32	32	32	31	31
Santa Barbara	3,000	300	3,300	1,943	1,926	1,908	1,891	1,874	1,856
Santa Maria	16,200	1,620	17,820	10,492	10,399	10,305	10,212	10,118	10,025
Santa Ynez ID1	500	200	700	412	408	405	401	394	394
Solvang	1,350	150	1,500	883	875	867	860	852	844
Vandenberg	5,500	550	6,050	3,562	3,530	3,499	3,467	3,435	3,404

Although the CCWA Santa Barbara County participants may not need all of the water available in a given year, by virtue of being connected to a state-wide system, available water can be banked, exchanged or transferred in a variety of ways to further offset the risk of drought exposure in future years. Both short- and long-term measures are available to obtain additional water supplies beyond the annual allocation. These measures are discussed further in Chapter 5 and 6.

4.3 Distribution System Water Losses

The American Water Works Association developed software designed to guide a water distribution system operator through a water audit. DWR prepared the DWR Method Water Audit, which was based on the AWWA method. California Water Code Section 10631 (J) requires water supplier to quantify distribution water losses using the DWR Water Audit Method.

CCWA maintains a water delivery database, which serves as the basis of the water audit. This database is populated with monthly delivery data that is processed from flow measurements made at the individual Turnout meters and the DWR "sales" meter located at the inlet of the CCWA Water Treatment Plant. The DWR "sales" meter essentially measures water entering the CCWA system and the Turnout meters are measuring the water leaving the CCWA system.

The flow data is processed as follows. At the end of the month, DWR will provide CCWA with the monthly total of water delivered to the CCWA Water Treatment Plant. Since the DWR meter is the official "sale" meter to CCWA, the total deliveries to the Turnouts must be corrected to match the DWR monthly total. This ensures that each CCWA participant is paying their fair share of the DWR variable costs.

First, the DWR monthly total is compared to the sum of all Turnout monthly totals. If the DWR total and the Turnout totals are within 3%, the individual Participant totals will be reconciled to match the DWR monthly total. This entails an allocation that is based on the amount of water delivered in the month to each participant. This results in either adding or subtracting to the Turnout meter total so that the sum of all Turnout meters

will equal the DWR monthly total. If the DWR total and the Turnout totals are greater than 3%, the difference is investigated further.

From 2016 to 2020, 129,804 AF was billed to CCWA Participants. This value matched the DWR total but is 372AF higher than the Turnout meter raw values for this period. This difference is reported as distribution systems losses. This number includes all meter errors and water losses through the Water Treatment Plant. The completed AWWA-Water Audit Software printouts are presented in Appendix G.

CCWA implements a number of other leak detection methods to ensure that leaks are identified in a prompt manner and repaired. The Infrastructure Leakage Index (ILI) is a performance indicator of real water loss from the supply network of a water distribution system. Quick repairs allow for CCWA to retain an average Infrastructure Leakage Index (ILI) of 1.04 from 2016 to 2020, which represents relatively low system losses. The Water Audit Data Validity Score measures the overall quality of the data in the analysis. Overall, The Authority has maintained a data validity score of 73 since 2016.

A detailed discussion of CCWAs annual hydrostatic testing and monthly statistical analysis of flows versus losses is described in Section 8.1.4.

Table 4-4: Water Audit Results (2016-2020)

Description	2016	2017	2018	2019	2020
Water Supplied (AF/Yr)	31,489	32,864	30,243	20,878	14,702
Water Losses (AF/Yr)	30	197	293	46	-194
Percent Water Loss	0.09%	0.6%	0.97%	0.22%	-1.32%
Data Validity Score	73	73	73	73	73
Infrastructure Leakage Index	1.0	0.3	1.2	0.5	2.2

5 CCWA System Supplies

CCWA's source of water supply is imported water from the SWP. CCWA's Water Supply Agreements with each of its project participants stipulate that imported SWP water will be an interruptible source of supply. In addition, the Environmental Impact Report for the Phase II Coastal Branch indicated that imported SWP water is a supplemental source of water.

5.1 State Water Project (SWP) Description

The SWP is a water storage and delivery system of reservoirs, aqueducts, power plants, and pumping plants that extends for more than 600 miles (Figure 5-1). Its main purpose is to divert and store surplus water during wet periods and distribute it to areas in Northern California, the San Francisco Bay area, the San Joaquin Valley, the Central Coast, and Southern California. It is also used for recreation and to control floods, generate power, protect fish and wildlife, and manage water quality in the Delta.

The keystone of the SWP is Lake Oroville, which conserves water from the Feather River watershed. It is the SWP's largest storage facility with a capacity of about 3.5 million acre-feet (maf). Releases from Lake Oroville flow down the Feather River into the Sacramento River, which drains the northern portion of California's Central Valley. The Sacramento River flows into the Delta, comprised of 738,000 acres of land interlaced with channels that receive runoff from about 40% of the state's land area. The SWP and the Central Valley Project (CVP) rely on Delta channels as a conduit to move water from the Sacramento River inflow to the points of diversion in the south Delta. Thus, the Delta is actually part of the SWP conveyance system, making the Delta a key component in SWP deliveries. The significance of the Delta to SWP deliveries is described in more detail below.

From the northern Delta, Barker Slough Pumping Plant diverts water for delivery to Napa and Solano counties through the North Bay Aqueduct. Near Byron in the southern Delta, the SWP diverts water into Clifton Court Forebay for delivery south of the Delta. Banks pumping plant lifts water from Clifton Court Forebay into the California Aqueduct, which channels the water to Bethany Reservoir. The water delivered to Bethany Reservoir from Banks Pumping Plant is either delivered into the South Bay Aqueduct for use in the San Francisco Bay Area or continues down the California Aqueduct to O'Neil Forebay, Gianelli Pumping-Generating Plant, and San Luis Reservoir.

Figure 5-1 State Water Project System

San Luis Reservoir is jointly operated by DWR and USBR and has a storage capacity of more than 2 maf. DWR's share of gross storage in the reservoir is about 1.062 maf. Generally, water is pumped into San Luis Reservoir during late fall through early spring, and is temporarily stored for release back to the California Aqueduct to meet summertime peaking demands for SWP and CVP contractors.

SWP water not stored in San Luis Reservoir and water eventually released from San Luis reservoir continues to flow south through the San Luis Canal, a portion of the California Aqueduct jointly owned by DWR and USBR. As water flows through the San Joaquin Valley, deliveries of CVP water are made through numerous turnouts to farmlands in the service areas of the CVP. Near Kettleman City, the Coastal Branch Aqueduct splits from the California Aqueduct for water delivery to agricultural areas to the west and municipal and industrial water users in San Luis Obispo and Santa Barbara counties.

The remaining water conveyed by the California Aqueduct travels farther in the San Joaquin Valley to agriculture users such as Kern County Water Agency before reaching Edmonston Pumping Plant, which raises the water high enough to travel across the Tehachapi Mountains into Antelope Valley. In Antelope Valley, the Aqueduct divides into the East and West Branches. The East Branch carries water into Silverwood Lake and Lake Perris. Water in the West Branch flows to Quail Lake, Pyramid Lake, and Castaic Lake.

Twenty-nine state water contractors have signed long-term water supply contracts with DWR for 4,173 maf per year. Signed in the 1960s, all contracts are in effect to at least 2035 and are essentially uniform. Each contract contains a schedule of the maximum amount of water the contractor can receive annually. This schedule is contained in SWP Table A. The annual amount was designed to increase each year, with most contractors reaching their maximum amount in 1990. In most cases, SWP water is an important component of local water supplies. Five contractors use SWP water primarily for agricultural purposes and the remaining 24 contractors use SWP water primarily for municipal purposes. All available water is allocated annually in proportion to each contractor's annual SWP Table A amount.

5.2 SWP Water Supply Contract

The SWP Water Supply Contract[6] between the DWR and 29 SWP Water Contractors (Contractors) specifies the terms and conditions governing the water delivery and cost repayment for the SWP.

"Table A" is a table attached to the SWP Water Supply Contract. Comprehension of the purpose of Table A is important in understanding how the SWP Water Supply Contract is administered. All water-supply related costs of the SWP are paid 100% by the Contractors, and the SWP Table A serves as a basis for allocating many of those costs. In addition, SWP Table A plays a key role in the annual allocation of available supply among Contractors. When the SWP was being planned, the amount of water projected to be available for delivery to the Contractors was 4.173 maf per year. This was referred to as the maximum project yield, and it was recognized that in some years the project would be unable to deliver that amount and in other years project supply could exceed that amount. The SWP Table A amount was used as the basis for apportioning available supply to each Contractor and as a factor in calculating each Contractor's share of the project's costs. Other contract provisions permit changes to an individual Contractor's SWP Table A under special circumstances.

Every year, DWR conducts modeling studies of the SWP system to determine the allocation, or percentage of the amount of Table A that can be delivered by the SWP system. This allocation is revised throughout the year as hydrologic conditions and other factors change.

5.2.1 SWP Water Supply Classifications

The SWP Water Supply Contract defines several classifications of water available for delivery to Contractors under specific circumstances. All classifications are considered "project" water. Many Contractors make frequent use of these additional water types to increase or decrease the amount available to them under SWP Table A.

- **SWP Table A Water** Each contract's SWP Table A is the amount in AF that is used to determine the portion of available supply to be delivered to that Contractor. SWP Table A water is given first priority for delivery.

- **Carryover Water** Pursuant to the SWP Water Supply Contract, Contractors have the opportunity to carry over a portion of their allocated water approved for delivery in the current year for delivery during the next year. The carryover program was designed to encourage the most effective and beneficial use of water and to avoid obligating the Contractors to use or lose the water by December 31 of each year. The water supply contracts states the criteria for carrying over SWP Table A water from one year to the next. Normally, carryover water is water that has been exported during the year from the Delta, has not been delivered to the Contractor during that year, and has remained stored in the SWP share of San Luis Reservoir. Storage for carryover water no longer becomes available to the Contractors if it interferes with storage of SWP water for project needs. Once this occurs, the carryover water is

converted to Article 21 water at a defined rate, linked to the production rate of the Banks Pumping Plant.

- **SWP Article 21 Water.** Article 21 of the SWP Water Supply Contract permits delivery of water in excess of the delivery of SWP Table A and some other water types to those Contractors requesting it. It is available under specific conditions.

- **Turnback Pool Water.** Contractors may choose to offer their allocated SWP Table A water excess to their needs to other Contractors through two pools in February and March. Contributing Contractors receive a reduction in charges, and taking Contractors pay extra.

5.2.2 SWP Contract Term

The Department of Water Resources (DWR) provides water supply from the State Water Project (SWP) to 29 SWP Contractors (Contractors) in exchange for Contractor payment of all costs associated with providing that supply. DWR and each of the Contractors entered into substantially uniform long-term water supply contracts (Contracts) in the 1960s with initial 75-year terms, which thus would begin to expire in 2035. While the Contracts provide for continued water service to the Contractors beyond the initial term, efforts are currently underway to extend the Contracts to improve financing for the SWP.

The majority of the capital costs associated with the development and maintenance of the SWP are financed using revenue bonds. These bonds have historically been sold with 30-year terms. It has become more challenging in recent years to affordably finance capital expenditures for the SWP because bonds used to finance these expenditures are limited to terms that only extend to the year 2035, currently a 14-year amortization period. To ensure continued affordability of debt service to Contractors, it was necessary to extend the termination date of the Contracts to allow DWR to continue to be able sell bonds with 30-year terms.

Public negotiations to extend the Contracts took place between DWR and the Contractors during 2013 and 2014. An 'Agreement in Principle' was reached and was the subject of analysis under the requirements of the California Environmental Quality Act (CEQA) (Notice of Preparation dated September 12, 2104). On December 11, 2018, DWR Director approved the Water Supply Contract Extension Project. In accordance with CEQA, DWR also filed its Notice of Determination for the project with the Governor's Office of Planning and Research. In addition, DWR filed an action in Sacramento County Superior Court to validate the Contract Extension Amendments (https://water.ca.gov/Programs/State-Water-Project/Management/Water-Supply-Contract-Extension). After CEQA was completed and contract language was finalized, DWR and 18 contractors have executed the Extension Amendment. CCWA and SBCFCWCD have approved the Extension Amendment, but it has not yet been fully executed. The Extension Amendment would extend the contracts through 2085 and improve the project's overall financial integrity and management. The Extension Amendment is the subject to a validation action and two CEQA lawsuits. Because of the pending legal challenges of the Contract-Extension amendment, DWR has not yet implemented the provisions of the amendment to allow for issuance of bonds beyond the year 2035.

5.2.3 SWP Conveyance Capacity

The original 1963 SWP Water Supply Contractors for SBCFCWCD, now represented by CCWA, had a Table A amount of 60,000 AF per year. This was reduced to 57,700 AF per year in January 1964 (Amendment #2). In 1981, the Table A amount was reduced again to 45,486 AF per year (Amendment #9). In 1994, the SWP contract was amended (Amendment 16) to specify the pipeline flow capacity of the Phase II Coastal Branch as being 42,986 AF per year. This conveyance capacity is defined in Tables B1 and B2 of the amended SWP Water Supply Contract, which stipulated the proportionate share of the capital costs and variable costs for the

Phase II Coastal Branch pipeline. The Table A amount was not changed due to the Goleta Valley Water District retaining 2,500 AF in Table A with no associated pipeline capacity for use as drought buffer (42,986 + 2,500 = 45,486). The 42,986 AF per year also includes the 10% drought buffer acquired by CCWA for its project participants during the design phase of the Phase II Coastal Branch.

In the case of SLOCFCWCD, the SWP Water Supply Contract has a Table A amount of 25,000 AF per year. However, CCWA and SLOCFCWCD have entered into a Water Treatment Master Agreement that limits contract outlines the available capacity for treatment as well as flow capacity for SLOCFCWCD to which is 4,830 AF per year.

5.2.4 Drought Buffer

Drought buffer is a term used to identify a source of supply within the SWP system that will provide a higher level of reliability during times of drought and low DWR Table A allocations. There are two forms of drought buffer that are utilized by CCWA, CCWA Participants and SLOCFCWCD on the Coastal Branch and they are as follows:

- Acquire or maintain a higher Table A amount than pipeline flow capacity. By having a higher Table A Amount than the pipeline capacity, the DWR allocation process will not impact pipeline delivery operations until the DWR allocation is reduced to a level where available Table A is equal to pipeline capacity. This is the technique currently in use by SLOCFCWCD, as they have 25,000 AF per year in Table A amount and a pipeline conveyance capacity of only 4,830 AF per year.

- Acquire or maintain higher Table A amount and pipeline capacity. This essentially is increasing both supply and conveyance as a method of providing reliable annual water deliveries. The Goleta Valley Water District, one of CCWA's member agencies, has 2,500 AF per year of this category of drought buffer. CCWA also has a drought butter of 3,908 AF per year, which increases the reliability of all CCWA Participants' deliveries each year.

5.2.5 Dry Year Programs

Dry Year Programs are methods of obtaining water from other sources, such as from other SWP contractors, during times of drought. The main advantage of the SWP system is that it provides the means for water transfers from throughout the State of California. Water from other SWP contractors and other non-project water can be wheeled through the existing infrastructure, subject to a variety of conditions and approvals. Each Water Supply Agreement between CCWA and its project participants specifically includes the provision that allows the pipeline to be utilized for conveyance for other water sources, if SWP water is unavailable or less than the full Table A amount.

5.3 CCWA Deliveries

To illustrate how SWP deliveries may vary with time, a review of the monthly 2015 and 2020 delivery records was conducted and the results are presented below:

5.3.1 CCWA 2015 and 2020 Deliveries

In 2015, CCWA delivered a total of 11,673 AF of water to Santa Barbara County. This translates to approximately 26% of the full Table A amount for CCWA (45,486 AF). To put this level of utilization into

perspective, DWR's initial Table A Allocation for 2015 was 10% and was increased two more times to ultimately reach 20% in March 2015 (Table 5-1). The reason why more was water able to be delivered is that Participants utilized carryover water or water purchased through the Supplemental Water Purchase Program.

Table 5-1 2015 DWR Annual Allocation Adjustments

Date	Notice Number[22]	Allocation
12/01/14	14-10	10%
1/15/15	15-01	15%
3/2/15	15-03	20%

In contrast to 2015, CCWA Participants received 12,175 AF of water in 2020, which translates to 27% of Table A. DWR's initial Table A Allocation for 2020 was 10% and was raised two times to reach 20% (Table 5-2). These were both dry years and had similar schedules for allocation. Again, deliveries exceeded the annual DWR allocation because CCWA Participants utilized carryover water or water purchased through the Supplemental Water Purchase Program.

Table 5-2 2020 DWR Annual Allocation Adjustments

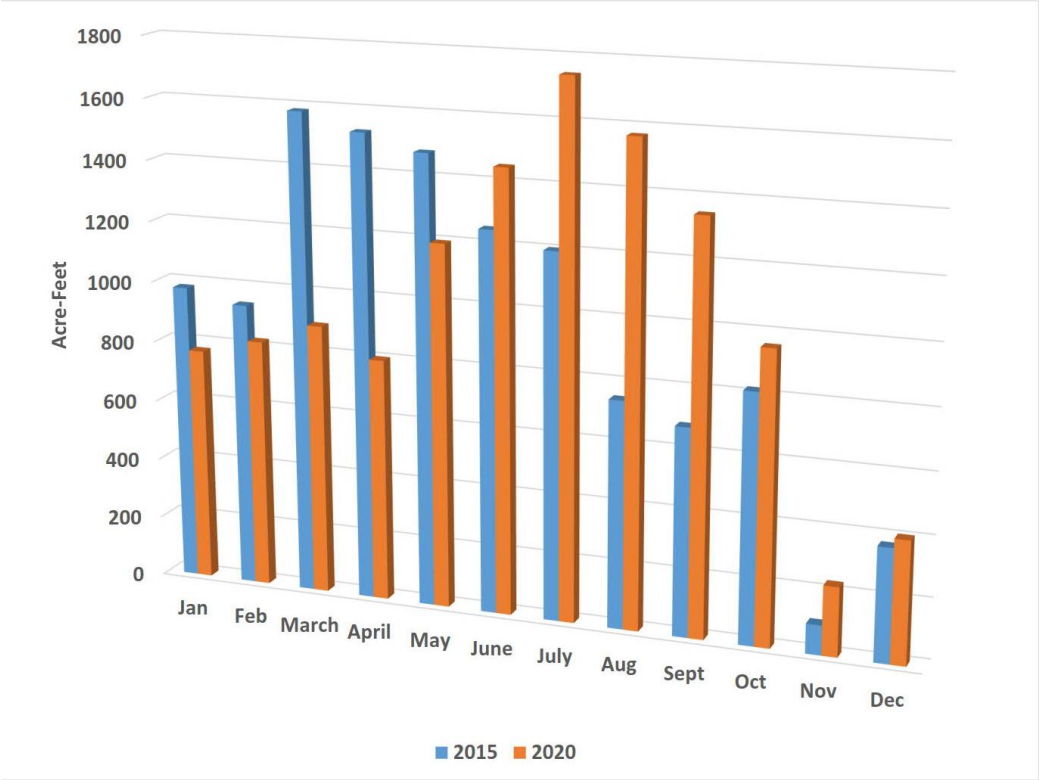
Date	Notice Number[23]	Allocation
12/02/19	19-12	10%
1/24/20	20-02	15%
5/2/15	20-05	20%

DWR will increase the annual allocation throughout the winter season due, in part, to the amount of precipitation in the Feather River watershed, which provides the source of supply for the Oroville Reservoir. The releases from this reservoir are an important factor in DWR's ability to export water from the Sacramento-San Joaquin Delta.

A measure of the amount of precipitation for the Feather River watershed is the Northern Sierra 8-Station Rain Index[24]. This index indicated that precipitation in rain year 2014/2015 (October 1 2014 to September 30 2015) was 37.2% of average and in rain year 2019/2020 (October 1 2019 to September 30 2020) was 31.7% of average.

The monthly delivery volumes for each CCWA participant are presented in the Graph 5-1below. Although each year had a similar total allocation, the monthly patterns of delivery for 2015 and 2020 are very different. In 2020, there is a significant peak in deliveries occurring in the summer months. In contrast, the peak deliveries in 2015 occurred in the spring months. The lowest monthly deliveries occur in the month of November. This is primarily due to the annual DWR winter maintenance shutdown, which lasts for several weeks.

Graph 5-1. 2010 and 2015 CCWA Monthly Delivery



5.3.2 CCWA Projected Deliveries

DWR prepares a biennial report to assist SWP contractors and local planners in assessing the near and long-term availability of supplies from the SWP. DWR issued its most recent update, the 2019 DWR State Water Project Delivery Capability Report (DCR), in August 2020. In the 2019 update, DWR provides SWP supply estimates for SWP contractors to use in their planning efforts, including for use in their 2020 UWMPs. The 2019 DCR includes DWR's estimates of SWP water supply availability under both current and future conditions.

DWR's estimates of SWP deliveries are based on a computer model that simulates monthly operations of the SWP and Central Valley Project systems. Key assumptions and inputs to the model comprise of the facilities included in the system, hydrologic inflows to the system, regulatory and operational constraints on system operations, and projected contractor demands for SWP water.

In the 2019 DCR model study under existing conditions, DWR assumed: existing facilities, hydrologic inflows to the model based on 82 years of historical inflows (1922 through 2003), current regulatory and operational constraints including 2018 Coordinated Operation Agreement Amendment, 2019 biological opinions and 2020 Incidental Take Permit, and contractor demands at maximum Table A Amounts. The long-term average allocation reported in the 2019 DCR for the existing conditions study provide appropriate estimates of the SWP water supply availability under current conditions.

To evaluate SWP supply availability under future conditions, the 2019 DCR included a model study representing hydrologic and sea level rise conditions at 2040. The future condition study used all of the same model assumptions as the study under existing conditions, but reflected changes expected to occur from climate

change, specifically projected temperature and precipitation changes centered around 2035 (2020 to 2049) and a 45 cm sea level rise. For the long-term planning purposes of this UWMP, the long-term average allocations reported for the future conditions study from 2019 DCR is the most appropriate estimate of future SWP water supply availability.

CCWA staff utilized the reliability data in the 2019 DCR that was developed by DWR for Santa Barbara County. Following DWR's estimation protocol, the long-term average reliability of the SWP operation was estimated. As indicated in Chapter 4, CCWA's mission is to serve as a source of water supply to its project participants and plans to deliver the amount of water available from the SWP. The project participants will manage this volume of water as their individual systems needs dictate. The anticipated long-term water deliveries from 2020 to 2045 are presented in 5-year intervals in Table 5-3.

Table 5-3 Long Term Average Water Delivery Estimate

Long Term Average, Acre-feet per Year									
Participant	Table A	Buffer	Total Table A	2020	2025	2030	2035	2040	2045
Predicted SWP Allocation				58.9%	58.4%	57.8%	57.3%	56.8%	56.3%
Buellton	578	58	636	374	371	368	364	361	358
Carpinteria	2,000	200	2,200	1,295	1,284	1,272	1,261	1,249	1,238
Golden State Water Co	500	50	550	324	321	318	315	312	309
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Morehart	200	20	220	130	128	127	124	125	124
Raytheon	50	5	55	32	32	32	32	31	31
Santa Barbara	3,000	300	3,300	1,943	1,926	1,908	1,891	1,874	1,856
Santa Maria	16,200	1,620	17,820	10,492	10,399	10,305	10,212	10,118	10,025
Santa Ynez ID1	500	200	700	412	408	405	401	394	394
Solvang	1,350	150	1,500	883	875	867	860	852	844
Vandenberg	5,500	550	6,050	3,562	3,530	3,499	3,467	3,435	3,404

5.4 CCWA Participant Water Sources

CCWA was formed for the sole purpose of designing, constructing and operating the facilities needed to bring SWP water to the agencies that contracted to receive that water. Since the SWP is considered an interruptible supply, CCWA Participants have other sources of water supply.[19, 20, 25] The following is a brief summary of the portfolio of water supplies maintained by the CCWA Participants in Santa Barbara County:

5.4.1 City of Buellton

The City of Buellton's service area is approximately 1,025 acres and potable water is provided to residential, commercial and industrial customers. There are no agricultural irrigated lands within city limits. Currently, the City of Buellton relies upon two sources of water for domestic supply and they are as follows:

- **State Water Project:** The City of Buellton has a SWP allotment of 578 AF per year with an additional 58 AF per year drought buffer.

- **Groundwater:** The City of Buellton has four active groundwater production wells that are permitted by the California DPH. These groundwater wells draw water from the Buellton Uplands Groundwater Basin and the Santa Ynez River Riparian Basin.

5.4.2 Carpinteria Valley Water District

The Carpinteria Valley Water District's service area is approximately 11,300 acres. Domestic water service is provided to a population of about 18,500 and approximately 3,883 acres of irrigated crops, ranging from lemons and avocados to various nursery products. Currently, Carpinteria Valley Water District relies on three sources of supply to meet water demand in its service area and they are as follows:

- **Cachuma Project:** Carpinteria Valley Water District is one of five water purveyors that have a Water Supply Agreement with the Santa Barbara County Water Agency for use of the Lake Cachuma as a source of water supply. The Water Agency, in turn, has the Master Water Supply Contract with the USBR. Carpinteria Valley Water District's Project Water Allocation for the Cachuma Project is 10.94%. The annual yield of the Cachuma Project has been determined to be 25,714 AF, which translates to roughly 2,813 AF per year for the Carpinteria Valley Water District. However, Carpinteria Valley Water District also receives as much as 400 AF per year from Cachuma project water from SWP exchanges with Santa Ynez ID1.

- **State Water Project:** Carpinteria Valley Water District has an SWP allotment of 2,000 AF per year with an additional 200 AF per year drought buffer.

- **Groundwater:** Carpinteria Valley Water District has three active groundwater production wells that are permitted by the California DPH. These groundwater wells draw water from the Carpinteria Groundwater Basin. This basin has not been adjudicated, but is under management by the Carpinteria Groundwater Sustainability Agency (CGSA). The CGSA is in the process of developing a Groundwater Sustainability Plan. The Plan is expected to be complete by 2024.

5.4.3 Golden State Water Company

Golden State Water Company is regulated by the California Public Utility Commission and is a private investor-owned utility company. The Golden State Water Company has grouped five individual water systems within the Santa Maria Valley into one Customer Service Area. The five systems are known as (1) Orcutt, (2) Tanglewood, (3) Lake Marie, (4) Sisquoc and (5) Nipomo. All five systems share common management and the same operations crew. All water rates are based on the Golden State Water Company's investments and pass-through costs for these five water systems as a group.

In terms of supplying SWP water to the Golden State Water Company, there is one turnout on the CCWA system that provides water to the Tanglewood System. Golden State Water Company also obtains access to SWP deliveries for its Orcutt System through wheeling SWP water through the City of Santa Maria turnout and accepting water from the City of Santa Maria through one of three system interconnections. The sources of water supply for the Tanglewood and Orcutt System are as follows:

- **State Water Project:** The Golden State Water Company has a SWP allotment of 500 AF per year with an additional 50 AF per year of drought buffer.

- **Groundwater:** The Golden State Water Company has two active groundwater production wells in its Tanglewood System and twelve active production wells in its Orcutt System that are permitted by the California DPH. These groundwater wells draw water from the Santa Maria Groundwater Basin. This

Basin is adjudicated and part of the settlement, the Company participates in the management and operation of the Twitchell reservoir, which is operated for the purposes of groundwater recharge within the Santa Maria Basin.

5.4.4 Goleta Water District

The Goleta Water District provides water to approximately 85,000 customers in Goleta and parts of Santa Barbara. The Goleta Water District spans 29,000 acres and extends from the Santa Barbara County South Coast area west to Santa Barbara's city limits at El Capitan. It is bound on the south by the ocean and on the north by the foothills of the Santa Ynez Mountains.

Currently, the Goleta Water District relies on four sources of supply to meet water demand in its service area and they are as follows:

- **Cachuma Project:** Goleta Water District is one of five water purveyors that have a Water Supply Agreement with the Santa Barbara County Water Agency for use of Lake Cachuma as a source of water supply. The Water Agency, in turn, has the Master Water Supply Contract with the USBR. Goleta's Project Water Allocation for the Cachuma Project is 36.25%. The annual yield of the Cachuma Project has been determined to be 25,714 AF, which translates to roughly 9,321 AF per year for the Goleta Water District.

- **State Water Project:** Goleta Water District has a SWP allotment of 4,500 AF per year with an additional 450 AF per year drought buffer. In addition, Goleta Water District has contracted for 2,500 AF of special drought buffer.

- **Groundwater:** Goleta Water District has nine active groundwater production wells that are permitted by the California DPH. These groundwater wells draw water from the Goleta Groundwater Basin. The North-Central portion of this Basin was adjudicated via the "Wright Judgment" (Martha H. Wright et al. v. Goleta Water District et al., 1989, Amended Judgment, Superior Court of Santa Barbara County Case No. SM57969). To proactively manage the Goleta Groundwater Basin, Goleta Water District customers enacted the voter-approved SAFE Water Supplies Ordinance in 1991 (amended 1994) to ensure the Basin is effectively managed. An additional measure implemented by Goleta Water District, in coordination with the La Cumbre Mutual Water Company, includes the preparation of the Goleta Groundwater Basin Groundwater Management Plan. This plan, most recently updated in 2016, addresses groundwater issues, adopts Basin Management Objectives, and outlines management strategies for the basin.

- **Recycled Water:** Goleta Water District receives tertiary disinfected recycled water from the Goleta Sanitary District for distribution within its service area. Goleta Sanitary District has a permitted capacity to produce tertiary disinfected recycled water at a rate of 3.0 MGD.

5.4.5 La Cumbre Mutual Water Company

The La Cumbre Mutual Water Company was formed in 1925 to serve water to landowners in Hope Ranch and the area between Hollister Avenue and Hope Ranch, totaling approximately 2,000 acres. The La Cumbre Mutual Water Company provides water to its shareholders on a non-profit mutual-benefit basis. Every landowner within the service area is an owner of this company. The ownership is attached to the land and the amount of ownership is proportional to acreage.

Currently, the La Cumbre Mutual Water Company relies on two sources of supply to meet water demand in its service area and they are as follows:

- **State Water Project:** The La Cumbre Mutual Water Company has a SWP allotment of 1,000 AF per year with an additional 100 AF per year drought buffer. SWP water is treated at the PPWTP in northern San Luis Obispo County and is conveyed to the Santa Ynez Valley Pumping Plant where the water is de-chlorinated before it is pumped to Lake Cachuma. The water is then subsequently delivered from Lake Cachuma to the Cater Surface Water Treatment Plant, operated by the City of Santa Barbara, for treatment. La Cumbre Mutual Water Company then receives water from the City of Santa Barbara.

- **Groundwater:** The La Cumbre Mutual Water Company has six active groundwater wells that are permitted by California State Water Resources Control Board Division of Drinking Water (DDW). Five wells draw water from the Goleta Central Basin which is adjudicated (see discussion above regarding the Goleta Groundwater Basin). One well draws water from the Foothill basin. This basin is not adjudicated.

5.4.6 Montecito Water District

The Montecito Water District encompasses an area of 9,888 acres, of which approximately 6,883 acres are developed (approximately 94% as residential and 6% as commercial/institutional) and approximately 451 acres are currently used for agriculture. Currently, the Montecito Water District relies on six sources of supply to meet water demand in its service area and they are as follows:

- **Cachuma Project:** Montecito Water District is one of five water purveyors that have a Water Supply Agreement with the Santa Barbara County Water Agency for use of Lake Cachuma as a source of water supply. The Water Agency, in turn, has the Master Water Supply Contract with the USBR. The District receives 10.31% of the available Cachuma Project supplies annually. The annual yield of the Cachuma Project has been determined to be 25,714 AF, which translates up to 2,651 AFY for the Montecito Water District.

- **Jameson Lake, Fox and Alder Creeks:** Montecito Water District owns and operates a 4,848 AF surface water reservoir on the upper Santa Ynez River. Annual deliveries from this source are limited to 2,000 AFY and typically make up approximately 20% to 45% of the District's total annual demands. In addition, the District has diversions on Fox and Alder Creeks, tributaries of the Santa Ynez River which contribute to water available and delivered from Jameson Lake. Water from these sources is delivered through the Santa Ynez Mountains via Doulton Tunnel to the District's service area.

- **Doulton Tunnel:** The Doulton Tunnel is a 2.2 mile tunnel through the Santa Ynez Mountains delivering water from Jameson Lake, and Fox and Alder Creeks to the District's service area. Annual infiltration has historically ranged from 130 AFY to 1662 AFY, with the average annual delivery over the last 20 years being 324 AF.

- **State Water Project:** The Montecito Water District has a SWP allotment of 3,000 AFY with an additional 300 AF per year drought buffer. The historical average allocation since deliveries began in Santa Barbara County is 61%, or 2,013 AF.

- **Groundwater:** The Montecito Water District has six active potable groundwater production wells that are permitted by the California DPH. These groundwater wells draw water from the Montecito Groundwater Basin, with annual deliveries ranging from 0 to 700 AFY. In 2020, the basin was determined by California Department of Water Resources to be a medium priority basin and is being

managed by the Montecito Groundwater Basin Groundwater Sustainability Agency in accordance with the 2014 Sustainable Groundwater Management Act.

- **Desalination:** Through a 50-year Water Supply Agreement, the Montecito Water District participates with the City of Santa Barbara in its Charles E. Meyer Desalination Facilities for the receipt of 1,430 AF of water per year. This delivery of water by the City to the District takes place annually irrespective of hydrologic conditions beginning in January 2022. This source will make up approximately 40% of the District's annual water supply needs.

5.4.7 Morehart Land Company

Morehart Land Company is a privately held California corporation owned by the Morehart family. Its primary business is real estate investment and ranching. In 1977, the Morehart Land Company acquired the majority of lots within the Townsite of Naples, which is located along the ocean, 12 miles north of Santa Barbara, California. The Townsite of Naples consists of 415 largely undeveloped lots which have a combined area of approximately 605 acres. Lot sizes range from 5,036 square feet to 3.7 acres. Six blocks have been developed and contain 23 homes, the last two of which were built in the mid-1980s.

The Morehart Land Company has developed water rights, groundwater wells and a water treatment plant and storage facility to serve the townsite and possibly nearby properties. Negotiations are underway with Goleta Water District to obtain a water transfer agreement by which Goleta Water District will transfer the Morehart Land Company's State Water allotment through its existing facilities to the Company's distribution connection. Currently, the Morehart Land Company has 200 AF in SWP water, with an additional 20 AF of drought buffer.

5.4.8 Raytheon

The Raytheon Company employs approximately 1,450 people at its primary facility, which is located in Goleta, and approximately 150 people at its branch facility, which is located in Santa Maria. It owns approximately 9.4 acres of land in Goleta and owns or rents 14 buildings with a total of approximately 640,000 square feet of space in Goleta and owns approximately 75 acres of land and one building of approximately 121,000 square feet of space in Santa Maria.

Raytheon has contracted for 50 AF of water from the State Water Project with an additional drought buffer of 5 AF per year. This water will be used primarily as a supplemental supply for system reliability.

5.4.9 City of Santa Barbara

The City of Santa Barbara encompasses 21 square miles and currently provides water to a population of approximately 95,650 people, or 27,405 municipal and industrial service connections. The City of Santa Barbara relies on seven sources of supply to meet water demand in its service area and they are as follows:

- **Gibraltar Reservoir:** This reservoir is owned by the City of Santa Barbara and is located on the Santa Ynez River. The current reservoir capacity is 4,559 AF, with an annual yield of approximately 3,510 AF per year. Water from this reservoir is delivered through the Santa Ynez Mountains to Santa Barbara via Mission Tunnel.

- **Devil's Canyon Creek:** The City of Santa Barbara maintains a small diversion works on Devil's Canyon Creek below Gibraltar Dam which diverts water from Devil's Canyon Creek into Mission Tunnel. The range of annual yield is 0 to 557 AF per year, with an average of 120 AF per year.

- **Cachuma Project:** The City of Santa Barbara is one of five water purveyors that have a Water Supply Agreement with the Santa Barbara County Water Agency for use of Lake Cachuma as a source of water supply. The Water Agency, in turn, has the Master Water Supply Contract with the USBR. The City's Project Water Allocation for the Cachuma Project is 32.19%. The annual yield of the Cachuma Project has been determined to be 25,714 AF, which translates to roughly 8,277 AF per year for the City of Santa Barbara.

- **Mission Tunnel:** This structure is a 3.7 mile tunnel through the Santa Ynez Mountains running from the North Portal, located approximately 1,700 feet downstream of Gibraltar Dam to the South Portal, located on Mission Creek approximately 3 miles north of downtown Santa Barbara. Water supplies from infiltration to Mission Tunnel have varied from a low of 500 AFY in 1951 to a high of 2,375 AFY, with an average annual yield of 1,125 AFY.

- **Groundwater:** The City of Santa Barbara has nine groundwater production wells that are permitted by the California DPH. Currently, six of those wells are active. Groundwater is produced from three groundwater basins: Storage Unit 1 (located in the vicinity of downtown), the Foothill Basin (located in the upper State Street area), and Storage Unit 3 (located generally in the Westside area). Groundwater quality in Storage Unit 3 is quite poor, and the water is used to supplement the City's recycled water system on an as-needed basis.

- **State Water Project:** The City of Santa Barbara has a SWP allotment of 3,000 AF per year with an additional 300 AF per year drought buffer.

- **Desalination:** The City of Santa Barbara constructed a reverse osmosis seawater desalination facility as an emergency water supply during the drought of 1990. The City maintained permits to provide for a desalination supply of up to 10,000 AFY. The facility was reactivated during the recent drought and started producing potable water in May 2017 with a capacity to produce 3,125 AFY. In February 2021, City Council adopted a policy recommendation to operate ocean desalination as part of the City's water supply portfolio to support drought preparedness, response, and recovery. Under this policy, the desalination plant will operate at its current capacity (3,125 AFY) to protect and optimize the City's other water supplies and to enhance the City's ability in preparing for and responding to future drought conditions.

5.4.10 City of Santa Maria

The City of Santa Maria encompasses an area of approximately 14,361 acres (22.44 square miles). The City lies along the Santa Maria River and within the Santa Maria Valley. The City expects that the undeveloped land within its boundaries will continue to be developed and that the City's estimated population at build out, in the year 2030, will be approximately 115,000 persons. Currently, the City of Santa Maria relies upon two sources of water for domestic supply and they are as follows:

- **State Water Project:** The City of Santa Maria has an SWP allotment of 16,200 AF per year with an additional 1,620 AF per year of drought buffer.

- **Groundwater:** The City of Santa Maria has six active groundwater production wells that are permitted by the State Water Resources Control Board Division of Drinking Water. These groundwater wells draw water from the Santa Maria Groundwater Basin. This Basin is adjudicated and as part of the settlement, the City participates in the Twitchell Management Authority which supports the

management and operation of the Twitchell reservoir for the purposes of groundwater recharge within the Santa Maria Basin.

5.4.11 Santa Ynez River Water Conservation District, Improvement District #1

Located in the central portion of Santa Barbara County, Improvement District No.1 (ID No.1)serves the communities of Santa Ynez, Los Olivos, Ballard, the Santa Ynez Band of Chumash Indians, and the City of Solvang on a limited basis. It covers about 10,850 acres. Currently, ID No.1 relies on four sources of supply to meet water demand in its service area and they are as follows:

- **Cachuma Project:** ID No.1 is one of five water purveyors that have a Water Supply Agreement with the Santa Barbara County Water Agency to receive annual water supplies from the Cachuma Project. The Water Agency, in turn, has the Master Water Supply Contract with the USBR. ID No.1's contractual share of the Cachuma Project yield is 10.31%. The current operational yield of the Cachuma Project, as calculated and agreed upon among the Water Agency, USBR, and the Cachuma Member Units, is 25,714 AF per year, which translates to roughly 2,651 AF per year for ID No.1, assuming a full annual allocation by USBR. Pursuant to a 1993 Exchange Agreement among CCWA, ID No.1, the other four Cachuma Project Participants, and La Cumbra Mutual Water Company, ID No.1 receives SWP water in exchange for its Cachuma Project water on a one-for-one basis.

- **State Water Project:** As a CCWA participant, ID No.1 has a SWP Table A allotment of 2,000 AF per year with an additional 200 AF per year drought buffer. ID No.1 contracts 1,500 AF per year of its SWP Table A allotment to the City of Solvang.

- **Groundwater:** ID No.1 has nine active groundwater production wells that are included in the permit issued to ID No.1 by the California State Water Resources Control Board (SWRCB), Division of Drinking Water (DDW). These groundwater wells draw water from the Santa Ynez Uplands Groundwater Basin.

- **River Water:** ID No.1 has ten active river production wells that are included in the permit issued to ID No.1 by DDW. These wells produce water from the Santa Ynez River Alluvium pursuant to water rights licenses issued by the SWRCB.

5.4.12 Vandenberg Space Force Base

Vandenberg Space Force Base consists of 86,000 acres of open lands in the Lompoc-Guadalupe-Santa Maria triangle. Today, the base is operated by Air Force Space Command's 30th Space Wing. Population is 14,971 permanent or long-term residents. Currently, Vandenberg Space Force Base relies on two sources of supply to meet water demand in its service area and they are as follows:

- **State Water Project:** Vandenberg Space Force Base has a SWP allotment of 5,500 AF per year with an additional 550 AF per year of drought buffer.

- **Groundwater**. Vandenberg Space Force Base has four active groundwater production wells that are permitted by the California DPH. These groundwater wells draw water from the Lompoc Groundwater Basin.

5.5 Transfer Opportunities

CCWA can increase water supply reliability by participating in voluntary water transfer programs. Since the California drought of 1987-1992, the concept of water transfers has evolved into a viable supplemental source to improve supply reliability. The initial concept for water transfers was codified into law in 1986 when the California Legislature adopted the "Katz" Law (California Water Code, Sections 1810-1814)[26] and the Costa-Isenberg Water Transfer Law of 1986 (California Water Code, Sections 470, 475, 480-483)[27]. These laws help define parameters for water transfers and set up a variety of approaches through which water or water rights can be transferred among individuals or agencies.

Up to 27 million AF of water are delivered for agricultural use every year. Over half of this water is used in the Central Valley, and much of it is delivered by, or adjacent to, SWP and CVP conveyance facilities. This proximity to existing water conveyance facilities provides a mechanism for the voluntary transfer of water to many urban areas, including CCWA, via the SWP. Such water transfers can involve water sales, conjunctive use and groundwater substitution, and water sharing, and usually occur as a form of spot, option, or core transfers agreements (see descriptions below). The cost of a water transfer varies depending on the type, term, timing and location of the transfer.

One of the most important aspects of any resource planning process is flexibility. A flexible strategy minimizes unnecessary or redundant investments (or stranded costs). The voluntary purchase or exchange of water between willing participants can be an effective means of achieving flexibility. However, not all water transfers or exchanges have the same effectiveness in meeting resource needs.

5.5.1 Categories of Water Transfers

Through the resource planning process and ultimate implementation, several different types of water transfers and exchanges could be undertaken:

- **Permanent Transfers:** Agreements to purchase a defined quantity or Table A amount of water every year. These transfers have the benefit of more certainty in costs and supply, but in some years can be surplus to imported water (available in most years) that is already paid for.

- **Spot Market Transfers:** Water that is purchased only during the time of need (such as during a drought). Payments for these transfers occur only when water is actually requested and delivered, but there is usually greater uncertainty in terms of costs and availability of supply. An additional risk of spot market transfers is that the purchases may be subject to institutional limits or restricted access (e.g., requiring the purchasing agency to institute rationing before it is eligible to participate in the program). A recent example of this kind of transfer is DWR implementing the Drought Water Bank (DWB) in response to a third year of drought. The DWB provided 74,100 AF of water through Delta transfers for use in the San Joaquin Valley and Southern California. In addition to the water provided by the DWB, another 200,185 AF of water was transferred through the Delta through separate transfer agreements.

- **Option Contracts:** Agreements that specify the amount of water needed and the frequency or probability that the supply will be called upon (an option). Typically, a relatively low up-front option payment is required and, if the option is actually called upon, a subsequent payment would be made for the amount called. These transfers have the best characteristics of both core and spot transfers. With option contracts, the potential for redundant supply is minimized, as are the risks associated with cost and supply availability.

- **Exchanges:** Exchanges occur when participants have different delivery requirements during certain portions of the year or during various year types (wet, normal, dry, etc.). Exchangers offer water to other participants in exchange for water at a later time. Exchanges can take place over single or several years and can be even (1 AF for 1 AF) or uneven (1 AF during a dry year for 2 AF during a wet year).

5.5.2 Examples of Recent CCWA Water Transfers/Exchanges

CCWA participates in a number of water transfers and exchanges. The programs are identified and presented to the CCWA Participants as conditions merit. Examples of the programs implemented since 2015 are as follows:

- **2016 Antelope Valley – East Kern Water Agency Exchange, SWPAO #16017**. CCWA/SBCFCWCD entered into an Exchange Agreement with the Antelope Valley-East Kern Water Agency (AVEK) and DWR. The Agreement authorized CCWA to receive up to 10,000 AF of AVEK's approved Table A allocation water in 2016, in exchange for CCWA returning 5,000 AF of its future approved Table A allocation water before December 31, 2026 (2:1 exchange).

- **2016 Castaic Lake Water Agency Exchange (now Santa Clarita Valley Water Agency), SWPAO #16034**. CCWA/SBCFCWCD entered into an Exchange Agreement with the Castaic Lake Water Agency (Castaic) and DWR. The Agreement authorized CCWA to receive up to 1,500 AF of Castaic's approved Table A allocation water in 2016, in exchange for CCWA returning 750 AF of its future approved Table A allocation water before December 31, 2026 (2:1 exchange).

- **2017 Metropolitan Water District of Southern California, SWPAO #17005** – CCWA/SBCFCWCD entered into an Exchange Agreement with the Metropolitan Water District of Southern California (MWDSC) for the purpose of moving CCWA water supplies stored in San Luis Reservoir to the MWDSC service area for use prior to a spill event at San Luis Reservoir. This was a measure to assist CCWA from losing water supplies that were classified as Article 56(c) carryover water once the spill event at San Luis Reservoir proceeded. The agreement would allow up to 15,584 AF of water to be transferred from CCWA to MWDSC prior to the 2017 spill event, with a return of up to 10,389 AF to CCWA by December 31, 2017. The water transfer had a 2:3 return ratio, less a defined portion of the MWDSC Spill Volume and less half of the Article 21 water accepted by CCWA.

- **2017 Department of Water Resources 2017 Turnback Pool A and B**. As provided by Article 56 of the SWP Water Supply Agreement, SWP Contractors that do not plan to use all of their current year Table A allocation may offer it for sale through the DWR Turnback Pool Program. However, there are two conditions that must be met before a SWP Contractor can sell a portion of its current year Table A allocation and they are: (1) the SWP Contractor does not plan to store any of its current year Table A allocation and (2) the SWP Contractor did not carry-over water from its prior year Table A allocation. The difference between Turnback Pool A and B is the time of year in which they are offered, with Pool A being available earlier in the year and Pool B being available later in the year. CCWA participated in both Turnback Pools, with purchasing 265 AF in Turnback Pool A and 136 AF in Turnback Pool B.

- **2018 Mojave Water Agency, SWPAO #18016**. CCWA/SBCFCWCD entered into an Exchange Agreement with the Mojave Water Agency (Mojave) and DWR. The Agreement authorized CCWA to receive up to 5,633 AF of Mojave's approved Table A allocation water in 2018, in exchange for CCWA returning 1,409 AF of its future approved Table A allocation water before December 31, 2028 (4:1 exchange).

- **2018 Semitropic Water Banking and Exchange Program, SWPAO #17022**. The Semitropic Water Storage District (Semitropic) is a member agency of the Kern County Water Agency (Kern), a State Water Project Contractor. The Montecito Water District is a CCWA Participant. The Montecito Water District and Semitropic entered into an agreement entitled "Agreement between Montecito Water District and Semitropic Water Storage District and its Improvement Districts for Participation in the Stored Water Recovery Unit of the Semitropic Water Banking and Exchange Program".

  To facilitate the water banking agreement between Montecito Water District and Semitropic, CCWA/SBCFCWCD entered into an Exchange Agreement with the Kern and DWR. This agreement allows CCWA to deliver some of its SWP water supplies for storage in Semitropic through December 31, 2035. All water delivered will be returned by Kern to CCWA by December 31, 2035, less 10% basin losses.

- **2019 Mojave Water Agency, SWPAO #19006**. CCWA/SBCFCWCD entered into an Exchange Agreement with the Mojave Water Agency (Mojave) and DWR. The Agreement authorized CCWA to receive up to 6,200 AF of Mojave's approved Table A allocation water in 2019, in exchange for CCWA returning 1,550 AF of its future approved Table A allocation water before December 31, 2028 (4:1 exchange). However, due to changing water supply conditions, CCWA did not take delivery of water through this Exchange Agreement.

- **2020 Mojave Water Agency, SWPAO #20004**. CCWA/SBCFCWCD entered into an Exchange Agreement with the Mojave Water Agency (Mojave) and DWR. The Agreement authorized CCWA to receive up to 1,000 AF of Mojave's approved Table A allocation water in 2020, in exchange for CCWA returning 250 AF of its future approved Table A allocation water before December 31, 2030 (4:1 exchange). However, due to changing water supply conditions, CCWA took delivery of 400 AF of water through this Exchange Agreement, with a commitment to return 100 AF by December 31, 2030.

5.6 Groundwater Banking Opportunities

Conjunctive use is a well-established water management method of using multiple water supply sources to achieve improved supply reliability. Most conjunctive use concepts are based on storing water within groundwater basins during times of water surplus. During dry periods and drought the water could be recovered from the groundwater basins for use as supply at a time when surface water supplies would likely be limited. With recent developments in conjunctive use and groundwater banking, significant opportunities exist to improve water supply reliability for CCWA.

Groundwater banking programs involve storing available surface water supplies during wet years in groundwater basins either locally or in locations convenient to water transportation facilities. Water is typically stored either directly by surface spreading or injection, or indirectly by supplying surface water to farmers for their use in-lieu of their intended groundwater pumping. During water shortages, the stored water could be pumped out and conveyed through the California Aqueduct. There are several conjunctive use and groundwater banking opportunities throughout the State that are available to CCWA.

CCWA has been researching the available groundwater banking programs for its participants. Two programs have been studied and they include the following:

5.6.1 Irvine Ranch Water District – Strand Ranch Groundwater Bank

The Irvine Ranch Water District (IRWD) owns land within Kern County, known as Strand Ranch. This property has been integrated into a water banking program operated by the Rosedale-Rio Bravo Water Storage

District, which is a member agency of the Kern County Water Agency (Kern), a State Water Project Contractor. IRWD is a member agency of the Municipal Water District of Orange County (MWDOC), which is a member of the Metropolitan Water District of Southern California (MWDSC), a State Water Project Contractor.

CCWA/SBCFCWCD, on behalf of the Carpentaria Water District (a CCWA Participant), entered into an exchange agreement with MWDSC to provide CCWA water to MWDSC for IRWD use in their Strand Ranch operation. In addition, CCWA/SBCFCWCD entered into a "change in point of delivery" agreement with DWR, MWDSC and Kern to allow delivery of CCWA water to be stored at the Strand Ranch operation and to allow the eventual return of the water back to CCWA.

The agreements provide for a 2:1 exchange plus 15% Basin losses. Two agreements have been signed including one for delivering 1,000 AF with a return of 425 AF by December 31, 2023, and another for delivering 700 AF with a return of 298 AF by December 31, 2025.

5.6.2 Semitropic Water Banking and Exchange Program

The Semitropic Water Banking and Exchange Program is a groundwater banking opportunity. A description of the 2018 banking and exchange program is in Section 5.5.2.

5.7 Desalinated Water Opportunities

Desalination represents a significant potential opportunity to increase the available water supplies in California. In 2016, the Desalination Amendment to the State Water Resources Control Board's State Water Quality Control Plan for Ocean Waters (Ocean Plan) came into full effect. The amendment requires that new or expanded seawater desalination plants in California use the best available site, design, technology, and mitigation measures feasible to minimize intake and mortality of all forms of marine life. The Desalination Amendment establishes a uniform statewide approach for protecting the beneficial uses of ocean water from degradation due to seawater intake and discharge of brine waste from desalination facilities through four primary components:

- Clarify the State Water Board's authority over desalination facility intakes and discharges
- Provide direction to the regional water boards regarding the determination required by Water Code section 13142.5, subdivision (b) for the evaluations of the best available site, design, technology, and mitigation measures feasible to minimize the intake and mortality of all forms of marine life at new or expanded desalination facilities.
- A narrative receiving water limitation for salinity applicable to all desalination facilities to ensure that brine discharges to marine waters meet the biological characteristics narrative water quality objective and do not cause adverse effects to aquatic life beneficial uses.
- Monitoring and reporting requirements that include effluent monitoring, as well as monitoring of the water column bottom sediments and benthic community health to ensure that the effluent plume is not harming aquatic life beyond the brine mixing zone.

The State Water Board documented twelve existing and six proposed desalination facilities on the California Coast, as of late 2019. Three of the existing desalination plants were located in San Luis Obispo County (City of Morro Bay, Diablo Canyon Nuclear Power Plant and Morro Bay Power Plant) and two of the existing plants are located in Santa Barbara County (Gaviota Oil Heating Facility and Charles E. Meyer Desalination Facility in the City of Santa Barbara) (Figure 5-2). There were no proposed projects in either county as of late 2019 (see

Figure 5-3). With the exception of the City of Santa Barbara's system, all of the existing desalination facilities in Santa Barbara and San Luis Obispo Counties were well below 1 MGD. The City of Santa Barbara system was reported at 2.8 to 8.9 MGD.

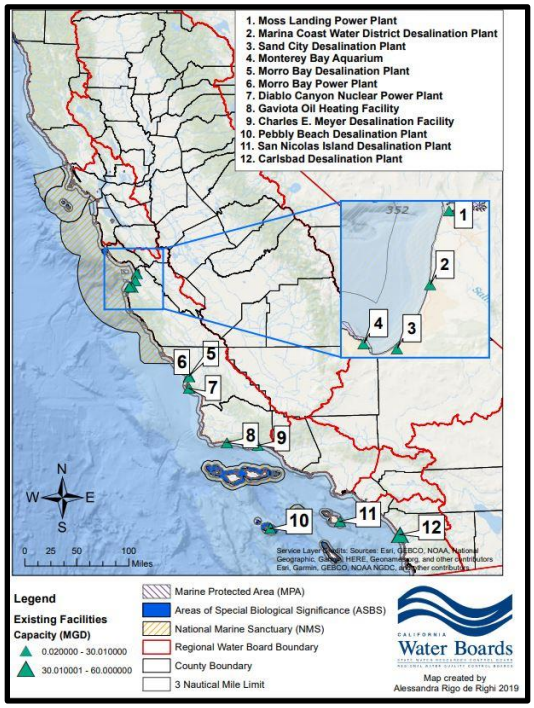


Figure 5-2. Existing Desalination Facilities

Figure 5-3 Proposed Desalination Facilities

The approved Ocean Plan is implemented through the National Pollutant Elimination System (NPDES) permits or Waste Discharge Requirements issued by the applicable Regional Water Quality Control Board, in consultation with the State Water Resources Control Board. Specific discharge requirements apply to all desalination facilities and intake-related requirements apply to all new or expanded seawater desalination facilities.

Another source of information on seawater desalination facilities in Santa Barbara County includes a report prepared by RMC Consultant entitled "Long Term Supplemental Water Supply Alternatives Report"[28]. This report was prepared for the County of Santa Barbara and was published in December 2015. One of the categories of water supplies investigated included seawater desalination facilities. As part of the report, RMC investigated favorable locations for seawater desalination facilities and focused on wastewater treatment plants with ocean outfalls and other locations that had favorable geologic conditions for subsurface ocean water intakes.

The RMC report identifies nine potential seawater desalination facility locations, with two located in southern San Luis Obispo County, two in middle Santa Barbara County, four on the South Coast and one mobile desalination system. When evaluating the use of desalination facilities for regional use, all will involve the use of the CCWA/DWR pipeline to distribute water throughout Santa Barbara County. This would involve a variety of methods that includes both exchange and direct delivery concepts.

Additional details of the local public desalination studies and facilities are presented below:

5.7.1 City of Santa Barbara and Montecito Water District Desalination

The City constructed a reverse osmosis seawater desalination facility as an emergency water supply during the drought of 1990. In 1995, the plant was dedicated as the Charles Meyer Desalination Facility in honor of Commissioner Meyer's long and dedicated service on the City Water Commission. The facility has since been incorporated into the City's long-term supply plan as a way of reducing shortages due to depleted surface supplies during drought. A portion of the reverse osmosis filtration equipment was subsequently sold, leaving a current capacity of 3,125 AF per year. In May 2017, the City began distributing this water into the water system, meeting approximately 30 percent of the City's demand, and in February 2021 the City included ocean desalination in the City's water supply portfolio (see Section 5.4.9). In July 2020, the City of Santa Barbara signed a 50 year water supply agreement with Montecito Water District for 1,430 AF annually in surplus water, meeting 40 percent of Montecito's water demand. Desalination provides the surplus water, accounting for 46 percent of the desalination plant capacity. Treatment production capacity at the plant is expected to increase within the permitted capacity, although the agreement allows the City to provide Montecito with water from any source. A conveyance pipeline project will be constructed to move water from the desalination plant to the Cater Water Treatment Plant for delivery to Montecito Water District.

5.7.2 City of Morro Bay Desalination

The City of Morro Bay no longer operates the desalination plant that provided a portion of the City's water supply since the 1990s due to disrepair of the facility (City of Morro Bay 2018). is the only operating desalination facility in San Luis Obispo County. In the past, the City of Morro Bay has used the saltwater reverse osmosis (SWRO) treatment plant to treat water from saltwater wells and to remove nitrates from freshwater wells.

5.7.3 Northern Cities Desalination Evaluation

The City of Arroyo Grande, the City of Grover Beach, and the Oceano Community Services District, known as the Northern Cities, participated in the evaluation of a desalination project in 2008[29] to supplement their existing potable water sources. Currently, all three agencies receive water from various sources, including the California SWP, Lopez Lake Reservoir, and groundwater from the Arroyo Grande Plain Hydrologic Subarea that is part of the Santa Maria Valley Groundwater Basin.

Recent projections of water supply shortfalls in the region motivated the agencies to conduct a more detailed study of desalination as a supplemental water supply. The 2008 study focused on utilizing the existing South San Luis Obispo County Sanitation District's (SSLOCSD) wastewater treatment plant to take advantage of utilizing the existing ocean outfall, while having the plant located near seawater. The feasibility study was based on a 2,300 AFY seawater desalination facility. Some of the major points of interest and concern of this study include:

- Twenty or more beach wells may be needed to provide enough seawater to produce the required 2,300 AFY potable water.
- Permitting and environmental issues could be complex, and implementation could take eight years or longer.

Initial capital cost was estimated to be in the range of $35 million, and customer rates could be increased by 18 percent to over 100 percent to fund the project and would cost, approximately $2,300 per AF or more, on a 20-year life cycle basis.

5.7.4 Nipomo Community Service District Desalination Evaluation

The Nipomo Community Service District (NCSD) conducted a series of studies to identify alternative sources of water supply in 2007.[30] This agency's sole source of water supply is from groundwater wells. Due to groundwater levels falling to levels below sea-level, the NCSD moved forward with the evaluation for a 6,300 AFY desalination facility. The conclusion of the study indicated:

- On a net worth basis, a desalination project would cost approximately $79,000,000, not including contingencies or cost escalation. If cost escalation is considered, then the project will cost approximately $98,210,000.

- Additional costs will be required for modification of the distribution system to accommodate the new source of supply.

- The consultant noted the fact that two large desalination projects (Monterey Bay and Dana Point Facilitates) have required significant time, effort and expense, but have not received all of the required permits to operate the full scale systems.

- The consultant noted the proximity of the Northern Cities Desalination Project and indicated that its close proximity could potential hamper permitting efforts for the Nipomo System.

5.7.5 Diablo Canyon Nuclear Power Plant Desalination Facility

The Diablo Canyon Nuclear Power Plant, operated by Pacific Gas and Electric Company, will cease power generation no later 2025. PG&E is currently soliciting ideas and offers for future use of the facilities. Due to the plant's needs for ultra-pure water, the power plant is equipped with a seawater desalination facility. The system is not currently operated at its full treatment capacity. The capacity is currently estimated at 500 AFY without modification and 1,300 AFY with some improvements to the treatment facility. In 2016 the San Luis County Board of Supervisors voted to begin planning a project to make Diablo Canyon Power Plant's excess desalinated water available in the south county. In order to receive water produced from this plant, a seven mile pipeline would need to be constructed to connect to the end of the Lopez Lake pipeline in Avila Beach California.

5.8 Recycled Water and Local Groundwater

CCWA was formed to operate and maintain the Coastal Branch of the SWP and the local facilities required to deliver SWP to Santa Barbara and San Luis Obispo Counties, and to manage the delivery of SWP water to Participants in both counties. There are no plans to expand the charter of CCWA to include the management and/or distribution of recycled water or local groundwater.

5.9 Future Water Projects

CCWA Participants are forward thinking and sophisticated water managers. A wide variety of potential projects are under evaluation, as follows:

5.9.1 Additional Supply Project

An ongoing planning effort to increase long-term supply reliability for both the SWP and CVP is taking place through the Delta Conveyance Project. The Delta Conveyance Project facilities would allow for greater flexibility in balancing the needs of the estuary with the reliability of water supplies. The plan would also provide other benefits, such as reducing the risk of long outages from Delta levee failures.

Public negotiations between Department of Water Resources ("DWR") and Public Water Agencies ("PWA's") for the Delta Conveyance Project began in 2019 and were completed in April 2020. These negotiations led to an Agreement in Principle ("AIP") for an Amendment to the State Water Contract regarding the Delta Conveyance Project. The Parties' goal was to equitably allocate costs and benefits of a Delta Conveyance Facility and to preserve State Water Project operational flexibility. A decision by each participating PWA for approving a contract amendment with DWR would not occur until after the environmental review for the Delta Conveyance Project is completed. CCWA was a participant in the Delta Conveyance Program negotiations process and decided to opt-out of the program at its October 24, 2019 meeting. CCWA decision to opt-out of Delta Conveyance Project has been communicated to DWR and other PWA participants.

5.9.2 SBCFCWCD and Suspended Table A Reacquisition

The original 1963 State Water Contract between SBCFCWCD and DWR provided for the delivery of up to 57,700 AFY of Table A Amount from SWP to Santa Barbara County. In 1981, SBCFCWCD and DWR executed an amendment to the State Water Contract (Amendment No. 9) that reduced the Table A amount from 57,700 to 45,486 AFY. As a result, the remaining 12,214 AF was suspended by DWR and no additional payments have been made by SBFCWCD since 1982. The 12,214 AF of SWP water supply entitlement is known as "Suspended Table A Water" and CCWA/SBFCWCD has the option of reacquiring this Suspended Table A Water through payment of past costs plus interest. The possible future project is to reacquire the Suspended Table A Water.

Since Phase II of the Coastal Branch and the local facilities were designed to convey only 42,985 AF, the reacquisition of the Suspended Table A Water would have the potential to increase the reliability of SWP deliveries to Santa Barbara County, but the capacity of the existing facilities would not change. Each year DWR determines the percent allocation of the Table A amount that will be delivered based upon a number of variables. The allocation is determined through consideration of both hydrologic and regulatory constraints, as well as reservoir storage, accretions, transportation losses, etc. Through reacquiring the Suspended Table A Water, CCWA Participant's allocation will be based on a larger contract amount. By having a larger amount, CCWA Participants will enhance the reliability of their SWP water supply in two important ways:

- During high allocation years, participants will be able to utilize a number of available water banking opportunities which increases the reliability of supply during low allocation years.

- During low allocation years, participants will be able to receive volumes of water more consistent with their contract amounts. The volume of delivered water will be larger because (1) the allocation percentage will be applied to a larger contract amount and (2) water stored in water banks as a result of higher contract allocation amount during wetter years can also be used to augment imported supplies.

Suspended Table A provides 12,214 AF of additional Table A contract amount. For a long-term average reliability of 59% at 2019 conditions, this translates to an average of 7,206 AF of potential additional supply. On February 14, 2020, CCWA published a Notice of Preparation for the project. Preparation of a draft environmental impact report is underway.

5.9.3 SLOFCWCD and CCWA Long Term Exchange

SLOFCWCD executed a Water Supply Agreement with the DWR in 1963 for a Table A amount of 25,000 AF. This Agreement was to fund the construction of water conservation and conveyance facilities for the SWP. DWR moved forward with the construction of these facilities, which included Phase I of the Coastal Branch conveyance facilities. The Coastal Branch facilities were designed to handle the 25,000 acre-feet requested by SLOFCWCD. Construction of Phase II of the Coastal Branch was not immediately constructed and was delayed indefinitely by SLOFCWCD, as allowed by the SWP Water Supply Agreement.

When the design for the Phase II Coastal Branch was initiated, SLOFCWCD ultimately decided not to fund construction of conveyance facilities for the full 25,000 AF Table A amount. Rather, SLOFCWCD entered into the Master Water Treatment Agreement with CCWA. This agreement specified that the treatment plant and the pipeline would provide SLOFCWCD with 4,830 AFY of treatment and conveyance capacity. This measure provided a very high level of reliability for the SLOFCWCD subcontractors, as the annual DWR allocation would need to fall to less than 19.3% to impact delivery requests to the San Luis Obispo water purveyors.

Currently, there is interest by the San Luis Obispo County water purveyors to secure additional treatment plant and pipeline flow capacity. Since, SLOFCWCD has 25,000 AF of Table A contract amount, they typically have more than 4,830 AF available in any given year. Accordingly, CCWA and SLOFCWCD are exploring potential exchange concepts that would be mutually beneficial.

5.9.4 CCWA Water Management Strategies Study

CCWA, along with San Luis Obispo County (together the Coastal Branch Contractors), is developing a water management strategies study for maximizing the utility of State Water Project water supplies and integrating it with their local supplies. Potential water management measures may include transfers, exchanges, and banking. The scope of work includes:

- Summarizing applicable regulatory requirements of the Coastal Branch Contractors' SWP contract including provisions addressing storage in SWP facilities and outside of a contractor's service area (Article 56), transportation of non-project water (Article 55), water transfers, and exchanges; the anticipated new SWP Water Management Amendment; ongoing SWP practices related to carryover water, interruptible water, and annual allocations; and regulations from other agencies with jurisdiction over water management actions.

- Developing consensus with Coastal Branch Contractors and their stakeholders for selection criteria of water management measures such as transfers, exchanges, and banking. Selection criteria include cost, reliability and control of conveyance, ability to deliver and return water, water losses and other factors such as water quality and location.

- Developing and presenting to Coastal Branch Contractors 2-4 generalized hypothetical combinations of water management measures, representative of situations facing CCWA member agencies, as examples of water management optimization strategies. This work includes:

    - Identifying and describing potential physical and operational water management measures available to meet Coastal Branch Contractors' needs.

- Describing and quantifying conveyance capability of the California Aqueduct and the Coastal Branch including a comparison of design and/or historical capacity vs. CALSIM modelled capacity.

- Evaluating individual and combined water management measures including quantifying minimum level of deliveries, average level of deliveries, storage in banking sites, cost, and other selection criteria.

6 Water Supply Reliability

CCWA provides a supplemental source of water supply to its Project Participants. It is also an interruptible supply, as specified in each of the Project Participant's Water Supply Agreements. In fact, DWR ceases water delivery operations on the SWP Coastal Branch on an annual basis for maintenance work. This maintenance shutdown is typically scheduled during the winter months and lasts from two to four weeks. During this time, all CCWA Participants are required to utilize their other sources of water supply to meet the water supply demand of their individual systems. It is CCWA's mission to deliver the SWP water that is available to each project participant and to manage undelivered SWP as each project participant dictates.

The UWMP Act requires urban water suppliers to compare the total projected demand for water supply with the amount of water supply that is available over the next twenty years, in five-year increments. As described in Section 4.2, the demand for water from the CCWA system is highly influenced by the management decisions of the retail water purveyors. To respond to end user demands for water supply, the retail purveyor will first select the source of supply to be utilized, and then convey it to where the water is needed. The selection of which source of supply to be used in responding to the end user demand for water involves both short term and long-term considerations. Since the CCWA system is only one of the sources that are available to the CCWA Participants, it is difficult to predict the proportion of retail system demand that will be met by water supplied by the CCWA system in any given year.

In terms of the amount of water supply that is available over the next twenty years, DWR has provided data and estimation protocols to assist with the assessment. The estimation of available supply in future years is termed "water supply reliability". The reliability estimations that are presented in this chapter are strictly focused on the routine delivery of Table A water. Water Transfers, Surplus Water (Article 21) and Groundwater Banking are not considered. This chapter presents the reliability assessment for CCWA's source of water supply, based on individual Project Participant Table A Amount and Drought Buffer. It also presents a reliability assessment of a single-dry year and multiple-year (5-year) drought.

6.1 Water Supply Reliability Estimations

Each water supply source has its own reliability characteristics. In any given year, the variability in weather patterns around the state may affect the availability of water supplies. The various engineered water supply systems throughout the state can only capture what nature provides, in terms of rainfall and run-off patterns. However, there are numerous other factors that influence the availability of water that include regulatory restrictions, operational status of key pumping and storage facilities and many other factors.

As discussed in Section 5.2, each SWP contractor's Water Supply Contract contains a Table A Amount that identifies the maximum amount of Table A water that contractor may request each year. However, the amount of SWP water actually allocated to contractors each year is dependent on a number of factors than can vary significantly from year to year. The primary factors affecting SWP supply availability include the availability of water at the source of supply in northern California, the ability to transport that water from the source to the primary SWP diversion point in the southern Delta and the magnitude of total contractor demand for that water. In many years, the availability of SWP supplies to CCWA and the other SWP contractors is less than their maximum Table A Amounts and can be significantly less in very dry years.

As discussed in Section 5.3.2, DWR's 2019 SWP Delivery Capability Report,[23] prepared biennially, assists SWP contractors and local planners in assessing the reliability of the SWP component of their overall supplies. In its Reliability Report, DWR presents the results of its analysis of the reliability of SWP supplies, based on model studies of SWP operations. In general, DWR model studies show the anticipated amount of SWP supply that

would be available for a given SWP water demand, given an assumed set of physical facilities and operating constraints, based on 82 years of historic hydrology. The results are interpreted as the capability of the SWP to meet the assumed SWP demand, over a range of hydrologic conditions, for that assumed set of physical facilities and operating constraints.

DWR's estimates of SWP deliveries are based on a computer model that simulates monthly operations of the SWP and Central Valley Project systems. Key assumptions and inputs to the model comprise of the facilities included in the system, hydrologic inflows to the system, regulatory and operational constraints on system operations, and projected contractor demands for SWP water.

DWR presents the SWP delivery capability resulting from these studies as a percent of maximum contractor Table A Amounts, which is called the reliability factor. The following sections provide an estimate of the availability of SWP supply during various hydrologic conditions based on these reliability factors.

6.1.1 Reliability Factor Estimates

DWR provided contractor specific estimates for the reliability factors for the years between 1922 and 2003, as modeled under current conditions.[31] This data was utilized, following DWR guidance, to estimate the long-term average, the single driest year, and five-year drought reliability factors. Table 6-1 represent the results of these calculations:

Table 6-1 CCWA Reliability Factor Estimate – Santa Barbara County (SBCFCWCD)

				5-Year Drought - Option 1: 1988 - 1992				
Year	Long Term Average	Single Dry Year 1977	Lowest Allocation on Record	5-Year Drought Year 1: 1988	5-Year Drought Year 2: 1989	5-Year Drought Year 3: 1990	5-Year Drought Year 4: 1991	5-Year Drought Year 5: 1992
2020	58.88%	7.0%	5.0%	11.0%	46.0%	14.0%	25.0%	17.0%
2025	58.35%	8.0%	5.0%	11.0%	48.7%	14.0%	24.0%	17.7%
2030	57.83%	9.0%	5.0%	11.0%	51.3%	14.0%	23.0%	18.3%
2035	57.30%	10.0%	5.0%	11.0%	54.0%	14.0%	22.0%	19.0%
2040	56.78%	11.0%	5.0%	11.0%	56.7%	14.0%	21.0%	19.7%
2045	56.26%	12.0%	5.0%	11.0%	59.3%	14.0%	20.0%	20.3%

6.1.2 Long Term Average Condition

As required by DWR guidelines, the long term annual average delivery has been calculated for each CCWA Project Participant in five year increments from 2020 to 2045. All calculations follow the estimation protocol outlined in the DWR Reliability Report. The Table A amount and drought buffer amount for each CCWA Project Participant was utilized in the delivery estimate, provided that the conveyance capacity allocation for each participant was not exceeded. Table 6-2 presents the results of these calculations:

Table 6-2 Long Term Average Delivery Estimate

Long Term Average, Acre-feet per Year									
Participant	Table A	Buffer	Total Table A	2020	2025	2030	2035	2040	2045
Predicted SWP Allocation				58.9%	58.4%	57.8%	57.3%	56.8%	56.3%
Buellton	578	58	636	374	371	368	364	361	358
Carpinteria	2,000	200	2,200	1,295	1,284	1,272	1,261	1,249	1,238
Golden State Water Co	500	50	550	324	321	318	315	312	309
Goleta	4,500	2,950	7,450	4,386	4,347	4,308	4,269	4,230	4,191
Guadalupe	550	55	605	356	353	350	347	344	340
La Cumbre	1,000	100	1,100	648	642	636	630	625	619
Montecito	3,000	300	3,300	1,943	1,926	1,908	1,891	1,874	1,856
Morehart	200	20	220	130	128	127	124	125	124
Raytheon	50	5	55	32	32	32	32	31	31
Santa Barbara	3,000	300	3,300	1,943	1,926	1,908	1,891	1,874	1,856
Santa Maria	16,200	1,620	17,820	10,492	10,399	10,305	10,212	10,118	10,025
Santa Ynez ID1	500	200	700	412	408	405	401	394	394
Solvang	1,350	150	1,500	883	875	867	860	852	844
Vandenberg	5,500	550	6,050	3,562	3,530	3,499	3,467	3,435	3,404

6.1.3 Single Year Drought

As required by DWR guidelines, the available delivery for the single driest year was calculated for each CCWA Project Participant in five-year increments from 2015 to 2040. All calculations follow the estimation protocol outlined in the DWR Reliability Report. The Table A amount and drought buffer amount for each CCWA Project Participant was utilized in the delivery estimate, provided that the conveyance capacity allocation for each participant was not exceeded. Table 6-3 and Table 6-4 presents the results of these calculations for years 1977 and 2014, which have reliability factors of 7% and 5%, respectively.

Table 6-3 Single Dry Year Delivery Estimate, Based on 1977

Single Driest Year, 1977, Acre-Feet per Year									
Participant	Table A	Buffer	Total Table A	2020	2025	2030	2035	2040	2045
Predicted SWP Allocation				7.0%	8.0%	9.0%	10.0%	11.0%	12.0%
Buellton	578	58	636	45	51	57	64	70	76
Carpinteria	2,000	200	2,200	154	176	198	220	242	264
Golden State Water Co	500	50	550	39	44	50	55	61	66
Goleta	4,500	2,950	7,450	522	596	671	745	820	894
Guadalupe	550	55	605	42	48	54	61	67	73
La Cumbre	1,000	100	1,100	77	88	99	110	121	132
Montecito	3,000	300	3,300	231	264	297	330	363	396
Morehart	200	20	220	15	18	20	22	24	26
Raytheon	50	5	55	4	4	5	6	6	7
Santa Barbara	3,000	300	3,300	231	264	297	330	363	396
Santa Maria	16,200	1,620	17,820	1,247	1,426	1,604	1,782	1,960	2,138
Santa Ynez ID1	500	200	700	49	56	63	70	77	84
Vandenberg	5,500	550	6,050	424	484	545	605	666	726

Table 6-4 Single Dry Year Delivery Estimate, Based on 2014

Lowest Allocation on Record, 2014, Acre-Feet per Year									
Participant	Table A	Buffer	Total Table A	2020	2025	2030	2035	2040	2045
Predicted SWP Allocation				5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Buellton	578	58	636	32	32	32	32	32	32
Carpinteria	2,000	200	2,200	110	110	110	110	110	110
Golden State Water Co	500	50	550	28	28	28	28	28	28
Goleta	4,500	2,950	7,450	373	373	373	373	373	373
Guadalupe	550	55	605	30	30	30	30	30	30
La Cumbre	1,000	100	1,100	55	55	55	55	55	55
Montecito	3,000	300	3,300	165	165	165	165	165	165
Morehart	200	20	220	11	11	11	11	11	11
Raytheon	50	5	55	3	3	3	3	3	3
Santa Barbara	3,000	300	3,300	165	165	165	165	165	165
Santa Maria	16,200	1,620	17,820	891	891	891	891	891	891
Santa Ynez ID1	500	200	700	35	35	35	35	35	35
Vandenberg	5,500	550	6,050	303	303	303	303	303	303

The extremely dry sequence from the beginning of January 2013 through the end of 2014 was one of the driest two-year periods in the historical record. Water year 2013 was a year with two hydrologic extremes. October through December 2012 was one of the wettest fall periods on record, but was followed by the driest consecutive 12 months on record. Accordingly, the 2013 State Water Project (SWP) supply allocation was a low 35% of SWP Table A Amounts. The 2013 hydrology ended up being even drier than DWR's conservative hydrologic forecast, so the SWP began 2014 with reservoir storage lower than targeted levels and less stored water available for 2014 supplies. Compounding this low storage situation, 2014 also was an extremely dry year, with runoff for water year 2014 the fourth driest on record. Due to extraordinarily dry conditions in 2013 and 2014, the 2014 SWP water supply allocation was a historically low 5% of Table A Amounts. The dry hydrologic conditions that led to the low 2014 SWP water supply allocation were extremely unusual, and to date have not been included in the SWP delivery estimates presented in DWR's 2015 Delivery Capability Report.

The exceedingly dry sequence from the beginning of January 2013 through the end of 2014 was one of the driest two-year periods in the historical record. As noted above, the circumstances that led to the low 2014 SWP water supply allocation were unusual, and likely have a low probability of occurrence in the future. Thus, the assumption for CCWA is that a 5% allocation represents the "worst-case" scenario.

6.1.4 Five-Year Drought

The average delivery for a five-year drought period was calculated for each CCWA Project Participant in five year increments from 2020 to 2045. All calculations follow the estimation protocol outlined in the DWR Reliability Report. The Table A amount and drought buffer amount for each CCWA Project Participant was utilized in the delivery estimate, provided that the conveyance capacity allocation for each participant was not exceeded. Table 6-5 presents the results of these calculations:

Table 6-5 Five Year Drought Delivery Estimate – Based on 1988 to 1992

Five Year Drought, 1988-1992, Acre-Feet per Year									
Participant	Table A	Buffer	Total Table A	2020	2025	2030	2035	2040	2045
Predicted SWP Allocation				22.6%	23.1%	23.5%	24.0%	24.5%	24.9%
Buellton	578	58	636	144	147	149	153	156	158
Carpinteria	2,000	200	2,200	497	508	517	528	539	548
Golden State Water Co	500	50	550	124	127	129	132	135	137
Goleta	4,500	2,950	7,450	1,684	1,721	1,751	1,788	1,825	1,855
Guadalupe	550	55	605	137	140	142	145	148	151
La Cumbre	1,000	100	1,100	249	254	259	264	270	274
Montecito	3,000	300	3,300	746	762	776	792	809	822
Morehart	200	20	220	50	51	52	53	54	55
Raytheon	50	5	55	12	13	13	13	13	14
Santa Barbara	3,000	300	3,300	746	762	776	792	809	822
Santa Maria	16,200	1,620	17,820	4,027	4,116	4,188	4,277	4,366	4,437
Santa Ynez ID1	500	200	700	158	162	165	168	172	174
Vandenberg	5,500	550	6,050	1,367	1,398	1,422	1,452	1,482	1,506

6.2 Comparison of Demand and Supply

As discussed previously, the CCWA Participants have multiple sources of water supply. The CCWA system is only one of those sources. In responding to the long-term and short-term needs for water supply, the retail water supplier will determine the best use of each available source of supply. The water demand upon the CCWA system is highly dependent on the management decision by the individual Project Participants, as opposed to arising directly from an end user demand for water supply. Consequently, it is difficult to predict the level of water demand for the CCWA system.

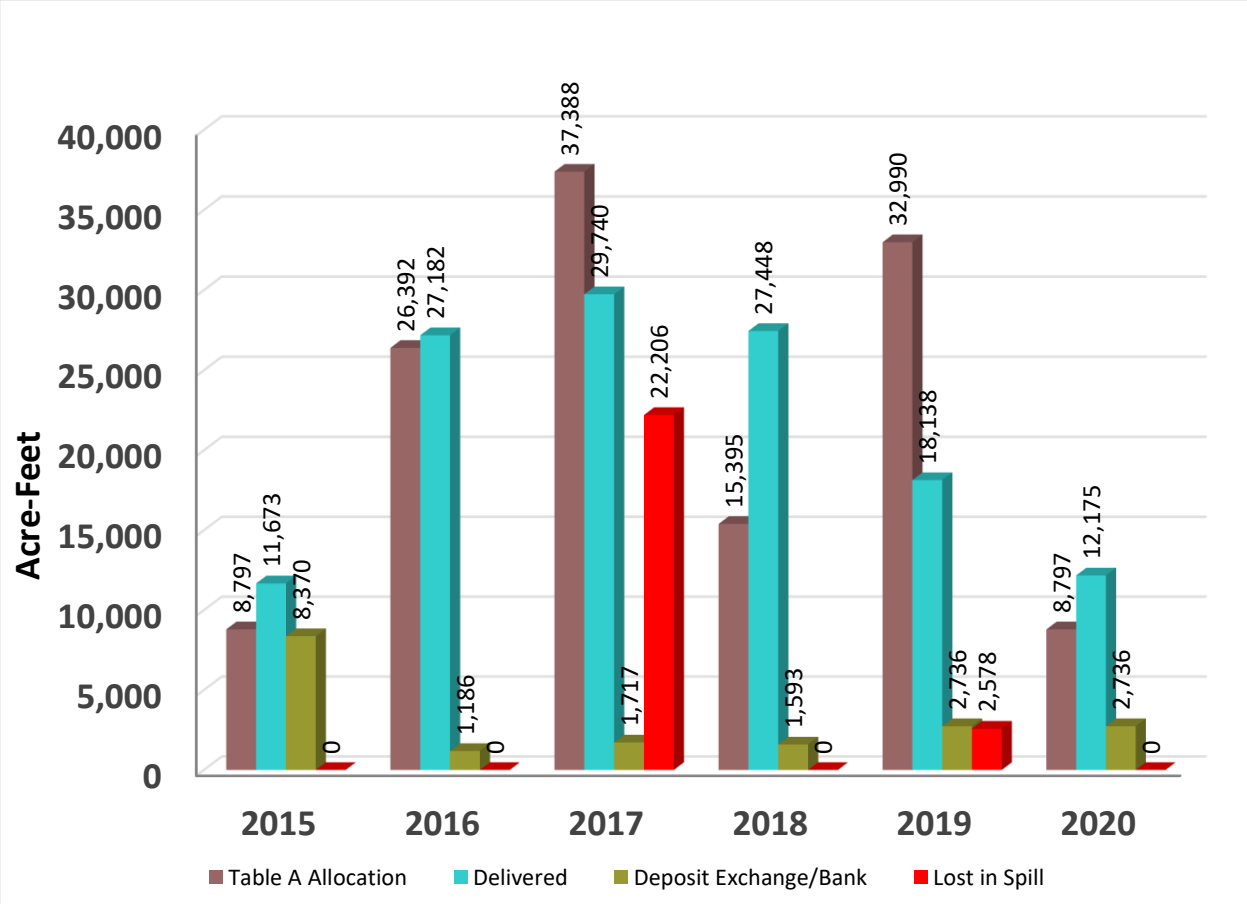
However, the essential question that the comparison of available supply to demand is whether each Project Participant has enough water to meet the demand for water supply for their respective systems. To address this question, a review of the historical water delivery records will provide insight. Table 6-6 and Graph 6-1 presents the actual deliveries, expressed as a percent of the Table A amount, from 2016 through 2020. The associated DWR annual allocations are also presented.

Table 6-6 CCWA Deliveries, as Percent of Table A, Compared to DWR Annual Allocation

CCWA Participants Actual Deliveries, 2010 through 2015 in Percent Table A									
Participant	Table A	Buffer	Total Table A	2015	2016	2017	2018	2019	2020
Predicted SWP Allocation				20%	60%	85%	35%	75%	20%
Buellton	578	58	636	0.0%	12.9%	61.0%	25.3%	46.5%	54.6%
Carpinteria	2,000	200	2,200	33.5%	43.4%	80.1%	84.0%	27.7%	12.3%
Golden State Water Co	500	50	550	2.9%	8.2%	37.5%	91.3%	67.5%	16.7%
Goleta	4,500	2,950	7,450	21.4%	81.6%	63.5%	71.5%	18.4%	8.1%
Guadalupe	550	55	605	0.0%	46.1%	96.5%	52.6%	79.8%	36.7%
La Cumbre	1,000	100	1,100	3.2%	38.7%	61.5%	57.0%	4.3%	84.4%
Montecito	3,000	300	3,300	44.5%	44.1%	96.8%	104.3%	27.6%	12.3%
Morehart	200	20	220	14.5%	18.6%	16.4%	20.9%	0.9%	22.3%
Raytheon	50	5	55	27.3%	52.7%	81.8%	54.5%	0.0%	45.5%
Santa Barbara	3,000	300	3,300	95.8%	164.9%	95.2%	104.4%	26.0%	12.2%
Santa Maria	16,200	1,620	17,820	19.9%	56.5%	61.2%	49.5%	53.2%	32.0%
Santa Ynez ID1	500	200	700	22.4%	58.1%	307.3%	78.9%	173.6%	98.9%
Vandenberg	5,500	550	6,050	7.3%	31.0%	31.8%	38.4%	41.3%	40.3%

Note: 1. Green Highlight represents deliveries in excess of DWR allocation

Graph 6-1 Historical Deliveries Compared to DWR Allocation



As can be observed in the historical delivery record, deliveries and DWR allocation has varied significantly since 2015. In several years deliveries exceeded the allocation due to supplemental sources of SWP water that were obtained by project participants.

To meet demand for water during drought years, the CCWA system will be able to facilitate the delivery of additional supplies above the DWR annual allocation amount. This is accomplished through the use of many reliability measures that are available. These measures include drought buffer, carryover water, water transfers among CCWA Participants, water transfers with other SWP contractors, water transfers from "non-project" sources, DWR dry year purchase programs, exchanges and potential groundwater banking programs. All of these programs are possible because of the physical connection to a state-wide distribution system.

The spill in 2017 was high due to drought response measures being interrupted by a historic wet year. Certain measures were taken to reduce the spill including transferring some of the water to other agencies. The 2019 spill was much lower due to the water deliveries to groundwater banks and repayment of water debt before the spill event.

6.3 Water Quality

CCWA provides water from the State Water Project (SWP) to participants in Santa Barbara and San Luis Obispo Counties. SWP water comes from the Sacramento-San Joaquin Delta (Delta) which is fed by rain and snow from the Sierra Nevada, Cascade, and Coastal mountain ranges. Water from the Delta is pumped into a series of canals and reservoirs and provides water to urban and agricultural consumers throughout the Bay Area and central and southern California. Water flowing through the Delta is of generally high quality; however certain water quality aspects may vary considerably due to conditions in the Delta. Total organic carbon (TOC) concentrations also increase as the water flows through the Delta due to agricultural drainage from peat soil islands in the Delta. Treated wastewater discharged into the Delta also contributes towards increased minerals and TOC.

Treatment Process

This SWP source water is treated at Polonio Pass WTP by conventional surface water treatment, with enhanced coagulation, sedimentation, filtration and disinfection with free chlorine. CCWA uses data provided by the Municipal Water Quality Investigations (MWQI) Program[1] and its own water monitoring programs to make adjustments at the treatment plant to produce water to the highest standards attainable. CCWA's treatment plant, at Polonio Pass, utilizes conventional treatment to provide a multi-barrier strategy. The first barrier is advanced coagulation which removes organic and sediment particulates as well as dissolved organic matter. Removing particles improves the anti-microbial action of the disinfectants and the removal of dissolved organic matter removes a microbial food source as well as precursors for disinfection byproducts. The water is then passed through a second barrier of activated carbon filters to remove remaining particulate matter down to micron size. The filters also adsorb additional organic matter. Finally, the water enters the third barrier, a dedicated chlorine contactor. Chlorine kills any remaining microbes that have made it through the treatment process. After a sufficient chlorination contact time, ammonia is added to the water to form chloramines. Chloramines are similar to chlorine and prevent the growth of bacteria in the distribution system, which delivers water from the treatment plant to CCWA's project participants. Monitoring data reported in the California SWP Watershed Sanitary Survey 2016 Update indicate that current treatment for *Cryptosporidium*, *Giardia* and viruses continue to be appropriate for the Polonio Pass WTP.

Disinfection Byproducts

The TOC and bromide in Delta source water have the potential to form harmful disinfection byproducts (DBP) by reacting with chlorine or chloramines in the treatment process. Water in the San Luis Reservoir has a greater likelihood of forming disinfection byproducts during the spring and summer when the most water is released from the reservoir to flow south in the Aqueduct (Watershed Sanitary Survey 2016 Update)[32]. In order to reduce

[1] The MWQC Program improves the usability of Delta water as a municipal source by providing monitoring, forecasting and reporting of SWP water quality at sites in the Delta.

the potential for the formation of DBPs, TOC levels are reduced prior to the disinfection. The concentration of TOC vin water from the Delta varies from below 2 mg/L to more than 10 mg/L in water from the Delta. The cost of treatment fluctuates with the amount of chemicals necessary to remove the organic carbon.

Mineral Content

Another important property of SWP water is the mineral content. SWP water is generally low in alkalinity and dissolved minerals, such as calcium, magnesium, sodium, potassium, iron, manganese, nitrate, and sulfate. Most of these do not have health-based concerns, but "hard" water (water high in calcium, magnesium, and iron) can cause several problems for consumers, such as the formation of white crusts in plumbing fixtures, water spots, damage to water heaters, and excess use of soaps. Nitrate is the main exception, as it has significant health effects for infants; however, the nitrate content of SWP water is very low. Low alkalinity levels affect the coagulation treatment process. Alkalinity is necessary to react with aluminum sulfate (alum) used in the treatment process to cause coagulation and flocculation of suspended solids and colloidal particles. The reaction of alum with alkalinity also removes excess alum from the processed water. Without this reaction, some alum may stay dissolved in the water and be released in the processed water. Alum has been linked to health-related problems. The use of additional chemicals may be used to compensate for low alkalinity leading to higher treatment costs. Also of significance is the chloride content. Although not a human health risk, chloride can have a negative impact on agricultural activities and regulatory compliance for local sanitation agencies.

Taste and Odor Issues

Water from the Delta is also susceptible to taste and odor (T&O) problems associated with algal growth in the Delta. This is typically a seasonal problem only occurring in the warmer months which, when accompanied by high nutrient concentrations, can lead to algal blooms. Some algae, especially blue-green algae, release 2-methylisoborneol (MIB) and geosmin which are T&O chemicals associated with musty and earthy taste and smells. Both of these compounds have very low odor thresholds and can be sensed by some people at concentrations around 10 to 30 parts per trillion. The source of these compounds is not fully understood so CCWA uses a combination of monitoring by the DWR in the Delta and at San Luis Reservoir and monitoring of the water entering the treatment plant to forecast a possible spike in the levels of these two T&O compounds. In the case of an actual T&O event, CCWA is prepared to remove these contaminants using powdered activated carbon in the treatment process.

System Shut-Down

Each winter the DWR performs maintenance and inspections on the Coastal Branch of the SWP, which requires the PPWTP to shut down and the Coastal Branch to be slowly dewatered to provide access to the canal and pipelines. As the water flow decreases, concentrations of ammonia in the canal can rise significantly. During the shutdown, ammonia levels may continue to rise in the raw water tanks at the treatment plant. The management of the excess ammonia prior to and following the plant shutdown creates a challenge in the treatment of the water along with extra expenses associated with the use of additional chemicals. This has been remedied to some extent by the removal of sediment buildup in the canal and pumping plant forebays of the Coastal Branch as part of the routine maintenance performed during the winter shutdowns.

6.3.2 Treated Water Quality Impacts on Reliability

The ability to control nitrification is critical to reliability during drought conditions. To reduce disinfection byproduct formation, the CCWA WTP adjusts the pH of water leaving the Chlorine Contact Basin and subsequently doses ammonia to form a chloramine secondary disinfectant. While chloramines are very effective in controlling disinfection byproducts, this treatment presents the potential of nitrification, which is a process that can ultimately reduce the chloramine secondary disinfectant to non-detectable concentrations. This is a condition that needs to be avoided since Drinking Water Standards require that all treated surface water to continuously have a detectable secondary disinfectant. One of parameter that influences when nitrification occurs is water age following treatment. The potential for nitrification increases as water age increases, which

becomes as important consideration during drought conditions when water deliveries may be reduced due to lack of supply. As water deliveries are reduced, the water age within the aqueduct begin to increase. The point at which a drinking water aqueduct using chloramine secondary disinfectant will need to shut down is when the nitrification process cannot be adequately controlled.

CCWA has a comprehensive nitrification monitoring and control strategy in place which have allowed CCWA to operate the WTP and pipeline to less than 50% of the minimum design flow rate of the system. This greatly improves reliability of the CCWA system. CCWA does not believe that water quality will negatively impact its ability to provide a reliable supply of water over the next twenty years, although water quality is certainly a consideration in water supply planning. CCWA's approach has been to monitor water quality both upstream and downstream of the treatment plant and to use that information to treat the water to the highest standards attainable.

6.4 Operational Factors Effecting SWP Deliveries

While Table A identifies the maximum annual amount of Table A water a SWP contractor may request, the amount of SWP water actually available and allocated to SWP contractors each year is dependent on a number of factors and can vary significantly from year to year. The primary factors affecting SWP supply availability include: the availability of water at the source of supply in northern California, the ability to transport that water from the source to the primary SWP diversion point in the southern Delta, and the magnitude of total contractor demand for that water.

6.4.1 Availability of SWP Source Water

SWP supplies originate in northern California, primarily from the Feather River watershed. The availability of these supplies is dependent on the amount of precipitation in the watershed, the amount of that precipitation that runs off into the Feather River, water use by others in the watershed and the amount of water in storage in the SWP's Lake Oroville at the beginning of the year. Variability in the location, timing, amount and form (rain or snow) of precipitation, as well as how wet or dry the previous year was, produces variability from year to year in the amount of water that flows into Lake Oroville. However, Lake Oroville acts to regulate some of that variability, storing high inflows in wetter years that can be used to supplement supplies in dry years with lower inflows.

6.4.2 Ability to Convey SWP Source Water

Water released from Lake Oroville flows down natural river channels into the Delta. The Delta is a network of channels and reclaimed islands at the confluence of the Sacramento and San Joaquin rivers. The SWP and the CVP use Delta channels to convey water to the southern Delta for diversion, making the Delta a focal point for water distribution throughout the state.

A number of issues affecting the Delta can impact the ability to divert water supplies from the Delta, including water quality, fishery protection and levee system integrity. Water quality in the Delta can be adversely affected by both SWP and CVP diversions, which primarily affect salinity, as well as by urban discharge and agricultural runoff that flows into the Delta, which can increase concentrations of constituents such as mercury, organic carbon, selenium, pesticides, toxic pollutants and reduce dissolved oxygen. The Delta also provides a unique estuarine habitat for many resident and migratory fish species, some of which are listed as threatened or endangered. The decline in some fish populations is likely the result of a number of factors, including water diversions, habitat destruction, degraded water quality through urban runoff and wastewater discharge, and the introduction of non-native species. Delta islands are protected from flooding by an extensive levee system.

Levee failure and subsequent island flooding can lead to increased salinity requiring the temporary shut-down of SWP pumps.

In order to address some of these issues, SWP and CVP operations in the Delta are limited by a number of regulatory and operational constraints. These constraints are primarily incorporated into the SWRCB's Water Rights Decision [33]1641 (D-1641), which establishes Delta water quality standards and outflow requirements that the SWP and CVP must comply with.

Litigation over the recent and the updated 2019 Biological Opinions (BO) and 2020 Incidental Take Permit (ITP) will likely take several years. The SWP and CVP projects began operating to the new requirements in 2020. Throughout implementation any party may seek preliminary injunctive relief during the litigation, such as that sought by the plaintiffs in the 2019 Biological Opinion cases. It is likely that the 2019 Biological Opinions and 2020 Incidental Take Permit will govern operations until final judicial determinations on the merits are made. Thus, it is unlikely that SWP water supply would increase beyond that resulting from the limitations in the 2019 Biological Opinion and 2020 ITP during this timeframe.

The requirements in the BOs are based on real-time physical and biological phenomena (such as turbidity, water temperature and location of fish), which results in uncertainty in estimating potential impacts on supply of the additional constraints imposed by the BOs.

6.4.3 Demand for SWP Water

The reliability of SWP supplies is affected by the total amount of water requested and used by SWP contractors, since an increase in total requests increases the competition for limited SWP supplies. As previously mentioned, contractor Table A Amounts in the SWP Water Supply Contracts have ramped up over time, based on projected increases in population and water demand at the time the contracts were signed. Urban SWP contractors' requests for SWP water were low in the early years of the SWP, but have increased steadily over time, although more slowly than the ramp-up in their Table A Amounts, which reached a maximum for most contractors in the early to mid-1990s. Since that time, urban contractors' requests for SWP have continued to increase until recent years when nearly all SWP contractors are requesting their maximum Table A Amounts.

6.5 Drought Risk Assessment

A new requirement for UWMPs is to prepare a 5-year drought risk assessment for the years 2021 to 2025 and identify response actions and mitigation measures to address the water shortages. This analysis is not applicable to CCWA since they provide a wholesale water supply and are not responsible for response actions. CCWA does offer mitigation measures by securing supplemental water for the participants, but this is only done at their specific request. In addition, the supplies vary by circumstances, availability, and participant demand, and it is not feasible to predict or assign what would be available during a specific dry year. CCWA can only provide what water is available. When requested to find supplies CCWA makes a good faith effort to secure supplemental waters, but is not responsible for resolving other agency's water shortages. More details on CCWA's roles and the Supplemental Water Program are provided below.

The Central Coast Water Authority (CCWA) is a Joint Powers Authority that was formed by its member agencies to design, construct, operate and maintenance the Coastal Branch of the State Water Project and the associated CCWA aqueduct extension. The charter of CCWA does not include imposing water conservation measures on its member agencies, rather is serves as a source of water supply for its member agencies. Conservation measures and water management planning remains with each CCWA member agency. Also, CCWA acts as directed by its member agencies through the CCWA Board of Directors.

CCWA's main function is to respond to the water management needs of its member agencies. In times of abundant supply, CCWA will facilitate a range of actions, as directed by its member agencies, to manage excess supplies to effectively store the excess supplies for later use. Likewise, in times of drought, CCWA will facilitate securing supplemental supplies of water that can be delivered through the SWP system, as directed by its member agencies. However, each CCWA Participant has its own unique portfolio of water supplies and, as a result, each has a unique way of responding to their customers demand for water supply.

As described in the Water Contingency Shortage Plan (Appendix H), CCWA has developed a program that will allow individual CCWA member agencies to pursue supplemental sources of water supply or to pursue participation in a groundwater bank. This program isolates all of the CCWA member agencies from the liabilities associated with the transactions of individual member agencies. This program is essential due to the wide range of possible responses to changing conditions. A review of the response actions implemented through this program is presented below:

Table 6-7: History of Supplemental Water Program

Year	DWR Final Allocation	Spill Event at San Luis Reservoir	Supplemental Water	Ground Water Bank Deposit
2016	60%	No	2016 Antelope Valley – East Kern Water Agency Exchange, SWPAO #16017 (10,000 AF for Carpinteria, Montecito and Santa Barbara). 2016 Castaic Lake Water Agency Exchange, SWPAO #16034 (1,500 AF for Goleta).	
2017	85%	Yes	2017 Department of Water Resources 2017 Turn-Back Pool A and B (401 AF for Carpinteria, Goleta, Montecito, Santa Barbara, Santa Maria and Solvang)	2017 Strand Ranch Groundwater Bank, SWPAO #17001 and #17002 (1,000 AF Deposit for Carpinteria).
2018	35%	No	2018 Mojave Water Agency, SWPAO #18016 (5,633 AF for Carpinteria, Montecito and Santa Barbara)	2018 Semitropic Water Banking and Exchange Program, SWPAO #17022 (900 AF Deposit in 2018 for Montecito).
2019	75%	Yes	2019 Mojave Water Agency, SWPAO #19006 (6,200 AF but none taken).	2019 Strand Ranch Groundwater Bank, SWPAO #19031 (700 AF Deposit Carpinteria).
2020	20%	No	2020 Mojave Water Agency, SWPAO #20004 (1,000 AF but only 400 AF taken by La Cumbre Mutual Water).	2018 Semitropic Water Banking and Exchange Program, SWPAO #17022 (1,100 AF Deposit in 2020 for Montecito).

An important function of the CCWA operation is to fully characterize the source of supply for CCWA Participants so that they can incorporate this information into their individual water management strategies. CCWA management will provide frequent updates on the current year available supply at each Board of Directors Meeting and at each Operating Committee Meeting. This update includes the current status of precipitation and snow levels of the SWP's watershed, current reservoir levels, and the results of DWR periodic special studies regarding potential changes to the amount of available supply as well as DWR's annual position analysis. In addition, a Water Delivery Status Report is also posted on the agency's website. This report provides the amount of available water supply for the current year and the amount delivered to date for the given year.

6.6 Climate Change Impact on State Water Project Water

This section includes a general discussion on climate change followed by analyses of climate change impacts to water demands, water supply, and water supply reliability.

General Discussion on Climate Change

Climate change model projections indicate that California in general can expect to be impacted by the following:

- Increased temperatures
- Changes in the timing and quantity of precipitation
- Increased risk of wildfires
- Increased risk of flooding, and
- Sea-level rise

The Santa Barbara County Integrated Regional Water Management Plan (IRWMP) (Dudek, 2019)[34] presented a summary of climate change findings from various studies and models, which is included in Table 6-8.

Table 6-8: Impacts of Climate Change on the Region by Mid-Century

Impact	Ranges*
Temperature	Winter: Projected increases of 4°F to 5°F Summer: Projected increases of 5°F to 6°F
Precipitation	5- to 7-inch decrease in average annual rainfall Increase in annual precipitation variability, fewer and more intense storms, and longer dry periods
Sea-Level Rise	4–30 centimeters (cm) by 2030 12–61 cm by 2050 42–167 cm by 2100
Supply	State Water Project delivery decrease of 7%–10% by 2050, and 21%–25% by 2100; changes to local supply not quantified
Wildfire	Low to moderate increase in projected fire risk
Flooding	Greater flood magnitudes**

Source: Information compiled by the Cooperating Partners in 2018.
* Changes to occur by 2100 unless otherwise noted.
** Greater flood magnitudes are anticipated to result from more frequent atmospheric river-storm events (Fourth California Climate Change Assessment and the corresponding Regional Reports (http://www.climateassessment.ca.gov).

The effects of climate change are addressed and quantified in the DWR Delivery Capability Report, as previously described. CCWA communicates this information to its member agencies to characterize the impacts of climate change. CCWA Participants will, in turn, utilize this information and incorporate it into their own unique plans for managing the effects of climate change. Additional information regarding climate

change effects to the water supplies available to Santa Barbara County can be found in the County's Integrated Regional Water Management Plan (IRWMP).

Impacts to Water Demands

The IRWMP identified the primary expected effect from climate change in the future is an increase in average global temperature. By the mid-century, temperatures in the Central Coast area are projected to increase 4°–5°Fahrenheit during the winter and increase 5°–6°Fahrenheit during the summer and by the end of the century. Annual average temperatures are anticipated to be 7°–8°Fahrenheit higher than the historic average. Increases in temperature may be expected to impact water resources through changes to precipitation patterns, evapotranspiration rate increases, increased customer water use, increased wildfire potential, and faster snowmelt. These potential impacts are likely to impact the State Water Project supplies.

The IRWMP also noted the frequency of extreme hot days was also projected to increase significantly from 3 to 4 extreme hot days in the historical period (1985–2014), 6 to 10 extreme hot days by 2030, 9 to 18 extreme hot days by 2050, and 23 to 43 extreme hot days by 2090.

As climate change becomes noticeable and quantifiable, the CCWA member agencies response will need to include reducing demands to match possible reduction of water supplies from the SWP. At this point, impacts from possible climate change are not quantifiable. Reduction of the per capita demands in the system can help respond to climate change in two ways. Reduced water demands equate to less energy use through reduced groundwater pumping and/or movement of water supplies through the system. Further reduction of per capita water demands may be challenging to achieve, as the CCWA member agencies have already implemented many demand management or conservation methodologies.

It is anticipated that climate change related temperatures increases and more hot days will impact landscape water demands within member agency jurisdictions; however, as the member agencies likely have goals to maintain their per capita use goal, overall water demands are not anticipated to increase. Temperature rises will translate to increased evapotranspiration rates, which may trigger possible mitigation measures to reduce water demands for landscape such as requiring less landscaping, increased use of drought tolerant plantings, or more efficient irrigation strategies by member agencies.

Impacts to Water Supplies

The IRWMP quoted the County's Long Term Supplemental Water Supply Alternatives Report (Long Term Supplemental Water Supply Alternatives Report, County of Santa Barbara, 2015)[35], which stated that future water availability for some municipal suppliers will be reduced by lost reservoir capacity and reduced reliability of SWP deliveries. In addition, climate change effects such as extended periods of drought and more frequent occurrence as well as variance in the frequency and intensity of rain and storm events and the increased frequency and intensity of fires will all further limit water supplies locally and throughout the state. SWP deliveries are affected each year by weather conditions within the source areas and measures to protect habitat in key water transport facilities, particularly within the Sacramento/San Joaquin River Delta.

The IRWMP said that imported water supply from the SWP is projected to decrease from current levels by 7% to 10% by 2050, and 21% to 25% by 2100. Seawater inundation in coastal aquifers; increased evapotranspiration rates due to increased temperatures; changes in the amount, timing, and quality of runoff and recharge as precipitation patterns change; increased sedimentation to reservoirs due to increased wildfires; more extreme storm events; longer and more frequent droughts; and damage to infrastructure due to increased flooding and sea-level rise all present significant risk to local water supply. Although these risks have not been quantified, they are widely recognized. These impacts could be reduced through various mitigation measures by CCWA member agencies.

The IRWMP states that sea-level rise has the potential to impact water supplies in Santa Barbara County through seawater intrusion into coastal aquifers, impacts to water infrastructure, and decreased deliveries from the SWP. Seawater intrusion did occur in the Santa Barbara Groundwater Basin in the late 1970s due to heavy pumping, which was later reversed by effective pumping practices and groundwater injection. In Santa Barbara County, basins that are subject to the Sustainable Groundwater Management Act (SGMA) have or will be preparing Groundwater Sustainability Plans (GSP) and will be monitoring for possible seawater intrusion. If needed the Groundwater Sustainability Agencies (GSA) will implement measures to limit seawater intrusion that might impact local groundwater supplies used by the CCWA member agencies.

The CCWA member agencies will need to meet these potential reductions in SWP surface water supplies by improved water efficiency measures, additional groundwater recharge or a reduction in groundwater pumping in wet years to leave water in the aquifer for drier years.

Impacts on Water Supply Reliability

Statewide, rainfall and snowfall are expected to change in terms of both type and timing, also as indicated by the IRWMP. The state is already experiencing decreases to natural snowpack in the Sierra Nevada, which has implications for SWP deliveries. Climate change will likely cause more precipitation to fall as rain, and warmer temperatures will cause snowpack to melt 4 to 14 days earlier in the season. DWR is predicting that the Sierra snowpack will experience a 25% to 40% reduction from current levels by 2050 based on historical modeling, with additional decreases caused by warmer storms due to climate change. At the local level, changes in the timing and intensity of precipitation could negatively affect groundwater recharge, runoff flowing to rivers and reservoirs, flooding frequency, and length of the dry season and resulting increased risk of wildfires and vegetation die off. The local impacts could affect the local supplies of CCWA member agencies.

A significant portion of Santa Barbara County is occupied by forest land, and wildfire is already a common occurrence in the Region due primarily to the warm, dry climate. Earlier onset of dryness that lasts longer and becomes more intense is likely to result in a low to moderate increase in fire risk according to the IRWMP. The annual area burned by fire in Santa Barbara County is projected to increase under climate change. An increase in the average annual area burned by wildfires would result in increased sedimentation to reservoirs, negatively impacting water quality, reducing storage capacity, and potentially reducing delivery of local supplies due to operational impacts to CCWA member agencies.

The Coastal Branch of the SWP delivers water originating in Northern California to water agencies in Santa Barbara and San Luis Obispo Counties including the CCWA. The Sacramento–San Joaquin River Delta is the central hub of the SWP. Potential impacts to the Delta resulting from climate change include increased risk of levee failure, reduced water quality, and reduced water supply, all of which could significantly impact SWP operations, and the reliability of the supply of water delivered through the CCWA to its member agencies. Sea-level rise threatens to disrupt deliveries from the SWP if saltwater advances into the Delta and increased quantities of fresh water would need to be released to protect water quality.

The CCWA member agencies will need to consider adapting to reduced deliveries from the SWP as a component of climate change adaptation. Climate change and sea level rise have both been taken into account in determining the future reliability and future allocations as presented in the 2019 SWP Delivery Capability Report (DWR, 2020).

7 Water Shortage Contingency Planning

The Urban Water Management Planning Act requires that the UWMP include a Water Shortage Contingency Plan (WSCP) that documents procedures for evaluating water supplies, declaring water shortages due to a drought or catastrophic event, and responding with conservation measures or mitigation actions. Since CCWA is a pass-through wholesale water agency some of the components of the WSCP, such as water conservation measures, are not applicable.

CCWA's Water Shortage Contingency Plan (WSCP) is an independent document from the UWMP and can be found in Appendix H. The previous WSCP was documented in the Water Shortage Contingency Planning chapter of the 2015 UWMP. The WSCP has been reorganized and expanded based on new State requirements. The main topics covered in the updated WSCP include:

- Water Supply Agreement with Participants
- Procedures for Evaluating Water Supplies
- Water Shortage Stages and Response Actions
- Mitigation Measures
- Catastrophic Water Supply Interruption
- Public Outreach
- Legal Authority of the Plan
- Revenue Reductions and Expense Increases
- Monitoring and Evaluating the Plan

8 Demand Management Measures

The UWMP Act defines a set of Demand Management Measures (DMM), which are a set of specific methods employed by a water supplier to encourage and facilitate water conservation. The UWMP Act requires that any water management grant or loan that is administered by DWR, State Water Resource Control Board or California Bay-Delta Authority (Funding Agencies) and issued to an urban water supplier must be conditioned to require implementation of applicable DMMs.

In 2014, the section of the California Water Code that addressed DMMs was significantly modified. DWR formed the Independent Technical Panel (ITP) to provide information and recommendations to DWR and the State Legislature on new DMMs, technologies and approaches to water efficiency. The ITP issued a report that recommended the UWMP Act be amended to simplify, clarify and update the DMM reporting requirements. In response to the recommendations, the Legislature enacted changes to the DMM requirements for both retail and wholesale water suppliers. For wholesale water suppliers, there are three specific measures and a fourth "other" category of DMMs, as listed below:

- Metering
- Public Education and Outreach
- Water Conservation program coordination and staffing support
- Other DMMs that have a significant impact on water use as measured in gallons per capita per day.

The UWMP Act also requires wholesale water suppliers to provide a narrative discussion in their UWMP that addresses asset management and wholesale assistance programs.

CCWA powers are set forth in the Joint Exercise of Powers Agreement that created CCWA, as that agreement was amended in 2017. CCWA does not have the legal authority to implement some of the wholesaler DMMs.

8.1 CCWA's Wholesale Demand Management Measures

CCWA does implement some of the wholesale DMMs. A description of the CCWA's wholesale DMM efforts is presented below:

8.1.1 Water Metering

The CCWA pipeline has ten turnouts where water is delivered. Each turnout is equipped with a meter that provides continuous measurement of flow rate and also provides totalized delivery volumes. The meters are monitored continuously through the CCWA Supervisory Control and Data Acquisition system. On a monthly basis, the total recorded delivery volume for each turnout is reviewed and reconciled with Master Meters, as required by contract. All variable costs associated with the CCWA operation is based on the monthly totals of each participant turnout.

The CCWA Instrumentation, Calibration and Repair Department is charged with the responsibility of servicing the turnout meters to ensure they perform to industry standards. The service includes routine calibration and replacement of faulty parts or complete meters, as appropriate. The meters in use are as follows:

Table 8-1 CCWA Meters

Turnout	Type of Meter	Min Flow gpm	Max Flow gpm
Chorro	Venturi	500	3,500
Lopez	Venturi	500	3,500
Guadalupe	Venturi	65	680
Santa Maria	Venturi	1,480	15,500
So Cal	Venturi	185	1,950
Vandenberg	Venturi	550	5,500
Buellton	Venturi	100	500
Solvang	Venturi	140	1,300
Santa Ynez	Venturi	500	6,000
Lake Cachuma	Electromagnetic	0	32cfs

8.1.2 Public Education and Outreach

CCWA does not disseminate water conservation information to the public or school system, other than by providing links to conservation resources on its website. In Santa Barbara County, public education and outreach is handled by the Regional Water Efficiency Program (RWEP).

8.1.3 Water Conservation Program Coordination and Staffing

CCWA has assigned staff to be responsible for the water loss program, which is a DMM for wholesale water suppliers. CCWA's Water Treatment Plant Supervisor is primarily responsible for implementing the water loss control program, as described in Section 8.3.4.

8.1.4 Water Loss Control

The CCWA distribution system consists of a 122 mile long pipeline, ranging from 36-inches to 60-inches in diameter. The pressure within the pipeline can range from atmospheric pressure within the pipeline reservoirs to pressures reaching up to 400 psi. Due to the length of the pipeline and the remote locations in which the pipeline traverses, it is critically important to implement a comprehensive leak detection program.

To address the critical need for leak detection, CCWA has implemented a program that consists of a variety of physical inspection, testing and analytical techniques. The leak detection tasks that are in use at CCWA are as follows:

- Visual Ground Surface Inspections. The full 122 mile Right-of-Way for the CCWA pipeline is inspected for a variety of purposes throughout the year. One element of each inspection is to identify any evidence of leakage from the pipeline. The evidence can include excess growth of vegetation, water seeping from the ground surface, leakage from one of the pipeline appurtenance vaults, leakage in any aboveground pipe or piping within the appurtenance vaults. The pipeline right-of-way is inspection during the annual valve exercise and vault assessment program, the annual close interval survey of the cathodic protection system and the annual mowing of the right-of-way. There also numerous other maintenance and repair tasks that bring CCWA staff along the pipeline right-of-way.

  In addition to CCWA staff inspections, an informational flier is mailed to every owner of property in which the pipeline crosses. In this flier, information about the pipeline and its associated

structures is provided and also provides information about how to report a leak to CCWA. The CCWA website also provides important contact information if a leak is detected by the member of the public as well.

- Periodic Hydrostatic Testing of the Pipeline. Typically, DWR will shut down the Coastal Branch of the SWP once per year to conduct maintenance work for a period of two to four weeks. This shut down results in the CCWA pipeline being shut down for delivery operations as well. Although maintenance work is planned for some sections of the pipeline, there are section that will remain idle and fully charge with water. During this planned outage, CCWA staff will make pressure measurements within the sections of pipeline that are idle at the start of the shutdown and at the end of the shutdown. Considering that the shutdown lasts up to four weeks, even a small leak can be detected. The pressure measurements are reviewed annually immediately following a winter shutdown. If there is a loss of pressure, additional investigation will be implemented.

- Periodic Internal Inspection of the Pipeline. During the annual DWR winter shutdown, CCWA staff will conduct internal pipeline inspections for selected sections of the pipeline. A different section of the pipeline is inspected with each winter shutdown to ensure a good coverage of all sections of the pipeline. The interior inspections look for potential damage to the pipe, such as pipe deflection arising from excessive ground surface loading or improper installation, delamination of the protective mortar lining, excessive corrosion or any other compromise of the pipe's integrity that may have led to leakage or lead to future leakage.

- Annual AWWA Water Audit Analysis. The American Water Work Association developed software designed to guide a water distribution system operator through a water audit. DWR prepared the DWR Method Water Audit, which was based on the AWWA method. California Water Code Section 10631 (J) requires water supplier to quantify distribution water losses using the DWR Water Audit Method. CCWA.

  CCWA maintains a water delivery database, which serves as the basis of the water audit. This database contains the monthly delivery volumes to each CCWA Participant. Each CCWA Participant Turnout has a flow meter and the total monthly delivery is logged. Also, at the end of each month, DWR will provide CCWA with the monthly total of water delivered to the CCWA Water Treatment Plant, as the DWR meter is the official "sale" meter to CCWA. The DWR monthly total is compared to the sum of all Turnout monthly totals. If the DWR total and the Turnout totals are within 3%, the individual Participant totals will be reconciled to match the DWR monthly total. This entails an allocation based on the amount of water delivered in the month to each participant to either add or subtract so that the sum of all Turnout meters will equal the DWR monthly total. If the DWR total and the Turnout totals are greater than 3%, the difference is investigated further.

  From 2016 to 2020, 129,804 AF was billed to CCWA Participants. This value matched the DWR total but about 400 AF higher than the Turnout meter raw values for this period. This difference is reported as distribution systems losses. This number includes all meter errors and water losses through the Water Treatment Plant. This indicates that the pipeline has relatively low leakage and is currently in good condition. Completed AWWA-Water Audit Software printouts are also presented in Appendix G.

- Analysis of Daily Delivery Data. The water entering the CCWA distribution system is measured by the Water Treatment Plant outlet meter and the water leaving the distribution system is measured by ten Turnout meters. As part of the leak detection program, the daily delivery totals

for WTP outlet meter are compared to the sum total of the Turnout meters. Due to the errors inherently associated with flow measurements, there will always be a difference between the total volume measured going into the distribution system and the total volume measured leaving the distribution system.

In order to evaluate if the pipeline is leaking, the daily flow data is analyzed to determine if the WTP outlet meter and the Turnout meters are measuring the same volume. If the analysis suggests that the same volume is not being measured, this would constitute evidence of a potential leak that would require additional investigation.

CCWA utilizes an analytical method for inspecting the flow data for evidence of potential leakage. A correlation plot is used to evaluate potential leakage in the daily delivery totals. The correlation plot uses the daily Turnout meter totals (Y axis) plotted as a function of the WTP meter totals (X axis). A trend line and a Coefficient of Determination (R^2) is calculated and plotted for this graph. From the best fit line equation for this plot, the difference between the predicted value and actual value are calculated (residual). The residual data is then plotted on a separate graph with the same range of WTP volumes. If the Coefficient of Determination is less than 0.9, this would be evidence of a potential leak and additional investigation is merited If the residual values have an organized curvilinear relationship with increasing WTP daily totals, this would be evidence of a potential leak and additional investigation is merited. If the residuals are random, it strongly suggests that the difference between the WTP meter and the Turnout meters are related to measurement error only. The 2016-2020 monthly correlation plots are presented in Appendix J.

8.2 Review of Implemented DMMs from 2015 to 2020

The main Demand Management Measures directly implemented by CCWA include the metering of all water deliveries and the water loss program. Both programs have been in place throughout the last five years, with no issue.

The metering of all Turnouts included annual calibrations and service to ensure accurate readings.

In regards to the water loss program, three major leaks were detected during the last five years. The leaks in question are as follows:

- **April 25, 2017 - Tank 7 Inlet Vault**. During maintenance work by a CCWA Instrumentation Technician, the inlet sleeve valve of Tank 7 was inadvertently closed. The sleeve valve closure progressed quickly and this generated a pressure transient sufficient in size to shatter a 4-inch PVC utility water line that was connected to the main aqueduct pipeline, on the upstream side of the inlet sleeve valve. Although the tap and isolation valve are constructed of metal components, the utility water line downstream of the isolation valve is constructed of PVC. Unfortunately, the isolation valve was not closed as required when the line is not in use. The purpose of the PVC utility water line is to provide water supply while the Tank is offline for maintenance. The water supply is mainly used to assist with Tank cleaning procedures.

  CCWA Distribution staff responded to a utility water line break immediately and closed the utility water isolation valve to stop the leak. However, the vault filled with 5 feet of water before staff could isolate the break. The flooding resulted in the damage to much of the instrumentation and wiring in the Tank 7 inlet vault. Consequently, Instrumentation staff re-wired the entire inlet vault and reinstalled all the required instrumentation. The materials costs of the repair were in the $8,000 range and all repair work was completed with in-house staff.

- **June 7, 2017 - Air-Vacuum Air-Release (AV/AR) Valve at STAT 618+35**. During routine valve exercising and vault inspection, CCWA Distribution staff identified a leaking AV/AR Valve that was also not properly functioning. Staff closed the isolation valve located on the Valve riser pipe between the main aqueduct pipeline and the AV/AR Valve. The AV/AR Valve was subsequently repaired during the winter shutdown of 2017.

- **June 20, 2020 - Bradbury Dam Outlet Vault Leak.** On Sunday, June 21, 2020, Bureau staff contacted CCWA staff to report a leak within the CCWA vault, located near the Bradbury Outlet Works Building. CCWA staff responded immediately through shutting down the Santa Ynez Pumping Plant and also conducted an inspection of the leak site.

  Based on our inspection, the HDPE flange connection to the CCWA pipeline developed a crack. We determined that the root cause of the damage was movement of the HDPE pipe downslope, which translated into a high level of torque to the flange. CCWA's repair plan was to replace the HDPE flange as well as the connecting pipe spool with SDR 11 HDPE components (one class higher in thickness) and to construct an additional pipe anchor assembly at this location to eliminate the torquing force at this connection. This repair was completed within two weeks using in-house staff.

8.3 CCWA Asset Management Program

An asset management program is in place at CCWA. The program consists of three elements that addresses routine maintenance, condition assessment and long-term planning for replacing or improving CCWA assets. A description of the program follows:

8.3.1 Routine Maintenance

The goal of any asset management program is to ensure that all assets are routinely serviced to ensure reliable operation and to maximize service life. CCWA accomplishes this goal through two key tools: (1) use of a computerized maintenance management systems (CMMS) and (2) the use of qualified and skilled employees.

CCWA has utilized a CMMS since the agency's inception. CMMS is database software that will maintain an inventory of assets, the associated maintenance tasks for each asset, a schedule of all maintenance tasks and location of each asset. The software will also provide automated notification of when maintenance tasks are required, accept work completion reports and also allow for entry of discrepancy reports for requesting work to be completed. There are also a wide range of capabilities of the software to allow for specific work instruction, safety procedures and any other pertinent data in the work order produced by the software. Finally, CMMS software can also produce management reports so that the status of maintenance activities can be rapidly assessed and utilized for work planning purposes.

CCWA staff convenes weekly supervisor meetings in which CMMS management reports are used to plan the workweek. Supervisors of each department attend and work is coordinated among the departments, as needed.

The most important part of a maintenance program is the use of highly qualified and skilled staff. CCWA implements its maintenance program through four primary departments: (1) Instrumentation/Electrical/Network, (2) Distribution, (3) Treatment Operations and (4) WTP Maintenance. Each department is staffed with employees that are qualified and skilled for the work they are responsible for. In addition, each department has a training plan for their staff to maintain and enhance the knowledge and skill of each employee.

8.3.2 Condition Assessment

Beyond routine maintenance, CCWA implements a variety of assessment program to determine the performance of assets as a way to plan for refurbishment or replacement. The programs currently in place at CCWA include the following:

- **Cathodic Protection Program**. The pipeline is protected from corrosion by an impressed current cathodic protection (CP) system. This system consists of a series of rectifiers that are electrically connected to the pipe. The rectifiers are also electrically connected to a near-by deep-bed anode. This arrangement creates conditions where the pipeline is protected from corrosion while the deep-bed anode is corroded instead.

  The operation of the CP system must be routinely assessed to ensure that the cathodic protection remains within its protective range. The assessment of the CP system function includes monitoring of the electrical potential created by the CP system at fixed testing stations located along the pipeline route as well as close interval survey where CCWA staff walks directly above the pipeline to measure the electrical potential. In addition, where needed, special cathodic investigations are carried out.

  Since CP systems only protect the exterior of the pipeline, additional cathodic protection is needed to protect the interior of the pipeline. The CCWA/DWR pipeline has a motor lining, which is designed to provide internal cathodic protection. To monitor the effectiveness of the lining, CCWA staff conducts annual internal inspections of selected sections of the pipeline to check the physical condition of the motor lining. The internal inspections are performed during the annual DWR winter maintenance shutdown, typically scheduled for two to four weeks in November. The sections of pipeline inspected will rotate from year to year.

  Finally, the chemistry of the water in the pipeline is sampled and tested weekly to determine if conditions exist that would facilitate degradation of the mortar lining of the pipe. The water samples are analyzed for the Calcium Carbonate Precipitation Potential and the Langmier Index. These indices will indicate if calcium carbonate will be likely to precipitate onto the walls of the pipe or not. A calcium carbonate precipitation on the pie interior walls will assist with prevention of corrosion of the metal pipe.

- **Leak Detection Program**. As discussed in Section 7.3.4, CCWA implements a program to detect leakage from the pipeline. In short, the program includes hydro-static testing of pipeline segments during winter shutdown, pipeline Right-of-Way inspections for evidence of leakage, analysis of flow measurements into and out of the pipeline and internal pipeline inspections. The locations of leaks will be identified in the CCWA GIS system.

- **Winter Preparation Inspection Program**. The DWR/CCWA pipeline is 122 miles long and passes through a wide variety of terrain. Along the pipeline alignment, there are certain locations that are at a higher risk of erosional damage from heavy winter storms. To assess the erosion control systems put into place at these locations, annual winter preparation inspections are conducted, as well as post-storm inspections.

  The inspections will identify drainage area, concentrated flow paths of storm water run-off, condition of drainage facilities, if present, and the extent of damage, if present. If the erosion control features require service or repair, they will be serviced prior to the storm event.

- **Valve Exercise/Valve Vault Assessments**. Every year, all valve on the pipeline will be inspected and fully exercised through fulling opening and closing each valve. In addition, the condition of the concrete valve vaults will be assessed, along with the area immediately surrounding the vault. Standardized forms and common descriptive terms are used to document the condition of the valves, associated vaults and immediate area surrounding the vault.

- **Electric Motors and Pumps Assessments**. All electric motors and pumps are assessed as follows: (1) monthly vibration monitoring, (2) annual integrity testing of the electric motor winding insulation, (3) annual wire-to-wire efficiency testing, (4) annual infrared camera inspections of motor control centers and switchgear, and (5) at reinstallation or as needed, a mechanical check of shaft alignment between motor and pump as well as verification of pump clearance specifications.

- **Major Facilities Assessment Program**. All major structures and facilities are assessed on an annual basis. CCWA staff conducts the following assessments: (1) pavement assessments, (2) structure paint assessments, (3) concrete assessments, (4) fencing/gates/locks/signage assessment and (5) assessment of the condition of miscellaneous valves, piping, drainage, venting, screens, etc. CCWA staff receives training on assessment methods to ensure consistent assessments and the use of common nomenclature of conditions.

  In addition to staff assessments, specialized vender are also utilized by CCWA to evaluate the conditions of CCWA assets. These specialized venders include: (1) licensed land surveyors to conduct the biennial monument survey of the pipeline seismic joint, which crosses the San Andreas Fault, (2) potable water divers for the five year internal tank inspection and cleaning, (3) structural engineers for assessments of selected structure, as needed.

8.3.3 Capital Improvement Program

CCWA is in the process of developing its first formal Capital Improvement Program (CIP). As the various facilities and systems that are operated and maintained by CCWA ages, there will be a need for projects to replace, refurbish and improve those facilities and systems. Not only will the number of these kinds of project increase but their magnitude in both costs and potential impact on operations will increase as well. In addition, the CCWA Board of Directors may find that the CCWA System can be improved or modified to provide addition benefits to CCWA Participants. Consequently, there is a need to carefully consider what specific projects are required or desired by the CCWA Board of Directors and to plan and schedule their implementation. The project identification, planning, prioritization and scheduling steps are the basic steps of preparing a formal CIP.

Another important purpose of a formal CIP is that it provides a format in which to communicate to the CCWA Board of Directors a more comprehensive long range plan for the CCWA system operation and development. The current method for presenting projects to the CCWA Board of Directors is through the annual budgeting process. Historically, all projects are funded on a current year basis and are included in the agency's draft budget, which is submitted to the CCWA Board of Directors for approval. This process does not provide a full view of multi-year projects nor does it provide a definitive long term plan. A formal CIP is needed to adequately communicate to the CCWA Board Directors the ongoing work of careful planning and prioritizing of projects.

CCWA is moving forward with developing a formal CIP through retaining the services of an experienced engineering consultant to assist CCWA staff. As with all CIPs, the basic elements will include the following

- Identification of Projects. Since the purpose of the CIP is to communication the long term development plans for the CCWA System, it is important to identify the size of the projects to bring to the Boards attention. For the purposes of initial evaluation, CCWA staff will use $75,000 as the threshold level in which to include a project in the CIP. The Board may decide to increase or reduce this threshold level

  In terms of identifying projects, there are two kinds of projects: (1) projects identified through routine facility assessments and (2) projects that improve the CCWA system that provided additional benefits to CCWA Participants, such as expanding the water treatment plant for example.

- Identify Funding for Projects. For the CCWA operation, all funding of projects occurs through the annual budgeting process for the CCWA operation. However, for large projects, the Board may decide to direct staff to pursue grant funding opportunities. Since applying for grants is a project in itself and may require an extended timeframe to secure a grant, this may be the first step in developing a project.

- Budgeting Project. A formal CIP will allow the Board to fully consider the costs and schedule of a multi-year project. In addition, annual updates of the CIP will allow updates to project costs estimates and other important updates for the Board to consider. This will improve the current method of submitting projects on a current year budget basis only.

- Implementing Projects. A standard project management approach will be utilized in organizing and implementing projects. Every project will be described, in terms of cost and schedule, as a multi-phased project to include the phases shown below:

  - Project initiation. Once a project is identified, staff will need to prepare a description of the project as well as provide justification for the project. This is the very early stages of the project and is the basis for initial approval. If the project is approved, the next step will be implemented.

  - Planning/Predesign. For large projects, preliminary engineering is required to estimate the order of magnitude scope and cost of the project. Either staff or a consulting engineer can be utilized in developing these estimates. Following this step, the Board may want to provide additional review as to whether to approve the project for further development.

  - Design. Once a project has been approved by the Board, the project will be designed by a consulting engineering firm. If the design contract exceeds $30,000, staff will request approval from the Board before awarding the contract, consistent with the CCWA Purchasing Policies. Generally, the design will be incorporated into a Request-For-Bids (RFB) document, using CCWA's standard contracts and front end specifications for public works projects.

  - Construction Bid and Award. Once the RFB is finalized, it will be advertised as required by public procurement regulations. The competitive bidding process will follow establish public works project protocol. Once bids have been publicly opened, the Bids will be reviewed to determine if the contractor is responsible and if the Bid was responsive to Bid Documents. Once this process is completed, the lowest responsible and responsive Bid will be presented to the Board for consideration for contract award.

  - Construction. The construction phase will include the efforts of CCWA staff and engineering inspectors to closely monitor the progress of the construction to ensure adherence to the requirements of the Contract Documents as well as identify potential changes to the work that

may to CCWA's benefit. Staff will provide periodic updates to the Board and may also potentially request modifications of the work underway.

- Post Construction. This step is critical in terms of releasing the contractor from the project through verifying work was completed as required by the Contract Documents, all releases from future contractor and subcontractor claims have been secured and that as built records are completed.

8.3.4 Encroachment Permit Program

The CCWA/DWR pipeline is typically constructed within exclusive easements through private property. An easement is a property right that is purchased from the property owner and is defined in an easement agreement. Once the easement is procured, the property owner cannot construct on or modify their property within the easement that would infringe on the use of the easement.

In general there are two kinds of easements: exclusive and non-exclusive easements. In the case of non-exclusive easements, a property owner will have reasonable access to the easement for construction or other modification of the property, as long as it does not infringe on the purpose of the easement. In the case of exclusive easements, the easement owner can exclude the property owner from constructing on or modifying their property within the easement for any reason. Typically, the DWR/CCWA pipeline has both exclusive and non-exclusive easements. The exclusive easement defined as being within two feet of the pipeline itself and the non-exclusive easement is typically defined as a strip of land 60 feet wide and following the length of the pipeline.

The encroachment permit program manages the issue of property owners needing to build or modify their land within the pipeline easement. The term encroachment refers to a property owner building or otherwise modifying their property within the easement boundaries, which may or may not be authorized. To ensure that all encroachments are authorized, the encroachment permit program starts with a formal exchange of engineering data and construction plans between the property owner and CCWA/DWR. This exchange of engineering data allows for a process where a mutually acceptable project can be agreed upon. The agreement is documented by a permit issued by the easement owner to the property owner.

A big part of any encroachment permit program is the ability to store and retrieve engineering data for any section of the pipeline. To address this need, CCWA utilizes a Geographical Information System (GIS), which is a database software system that uses geolocation as its main organizing method. This system is utilized for a wide variety of purposes including providing engineering data to property owners or other public agencies for utility coordination, to identify USA alert clearance requests, to store approved encroachment permits and many other uses.

Other important components of the encroachment permit program is to conduct inspection and surveillance of the pipeline right-of-way to identify and address unauthorized encroachments within the easement, observing construction of authorized encroachments to ensure the pipeline and related facilities are protected from damage and to establish good relationships with the property owners along the right-of-way. With regards to property owner relations, CCWA also mails a brochure to all property owners on a biannual basis. This brochure will ensure that property owners have contact information to report leaks, unusual activity on the pipeline as well as information about the encroachment permit process and USA alert requirements.

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