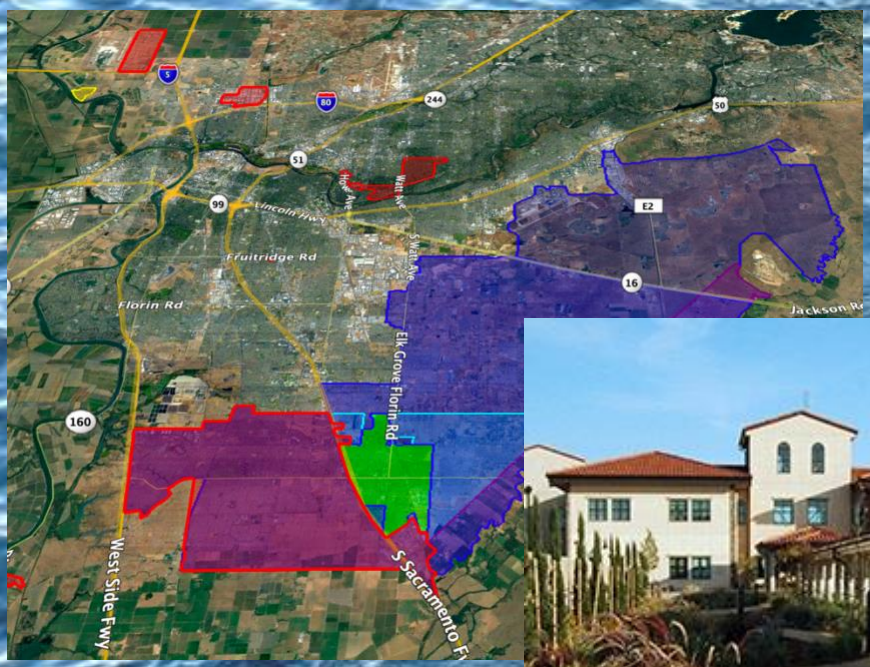



# 2020 Urban Water Management Plan

DEPARTMENT OF WATER RESOURCES
SACRAMENTO COUNTY
WATER AGENCY

Prepared by

Tully & Young
Comprehensive Water Planning

Final: Adopted June 15, 2021

# Table of Contents

# List of Tables

# List of Figures

# *Appendices*

# *List of Preparers*

Tully & Young, Inc.
*Gwyn-Mohr Tully, J.D.*
*Greg Young, P.E.*
*Kris Olof*
*Galen Davis*
*Dave Bolland*
*Jingcheng Xu*
*Jennie McCarl*

Sacramento County Water Agency
*Esther Kinyua – Project Manager*
*Mike Huot*
*Michael Grinstead*
*Forrest Williams*

This 2020 Urban Water Management Plan was prepared under the direction of a California licensed civil engineer.

# *Executive Summary*
# *Layperson's Description*

After the devastating drought in the late 1970s, the California Legislature declared California's water supplies a limited resource, subject to ever-increasing demands and that the long-term, reliable supply of water is essential to protect California's businesses, communities, agricultural production, and environmental interests. The Legislature also recognized a need to strengthen local and regional drought planning and increase statewide resilience to drought and climate change. Thus, in 1983, the California Legislature created the Urban Water Management Planning Act (UWMPA).[1] The UWMPA requires urban water suppliers serving over 3,000 customers or supplying at least 3,000 acre-feet of water annually to prepare and adopt an urban water management plan every five years,[2] and demonstrate water supply reliability in a normal year, single dry year, and droughts lasting at least five years over a twenty-year planning horizon.[3] The UWMPA also requires each urban water supplier to prepare a drought risk assessment and water shortage contingency plan.[4] And last, beginning in July 2022, each urban water supplier must prepare an annual water supply and demand assessment.[5] The California Legislature asserts that aggregating all of these legal requirements at the urban water supplier level will improve local, regional, and statewide water planning and water resilience.

At a practical level, the Urban Water Management Plan (UWMP) is the legal and technical water management foundation for urban water suppliers throughout California. A well-constructed UWMP will provide the supplier's elected officials, management, staff, and customers with an understanding of past, current, and future water conditions and management. The UWMP integrates local and regional land use planning, regional water supply, infrastructure, and demand management projects as well as providing for statewide challenges that may manifest through climate change and evolving regulations. Thoughtful urban water management planning provides an opportunity for the supplier to integrate supplies and demands in a balanced and methodical planning platform that addresses short-term and long-term planning conditions. In brief, the UWMP gathers, characterizes, and synthesizes water-related information from numerous sources into a plan with local, regional, and statewide practical utility.

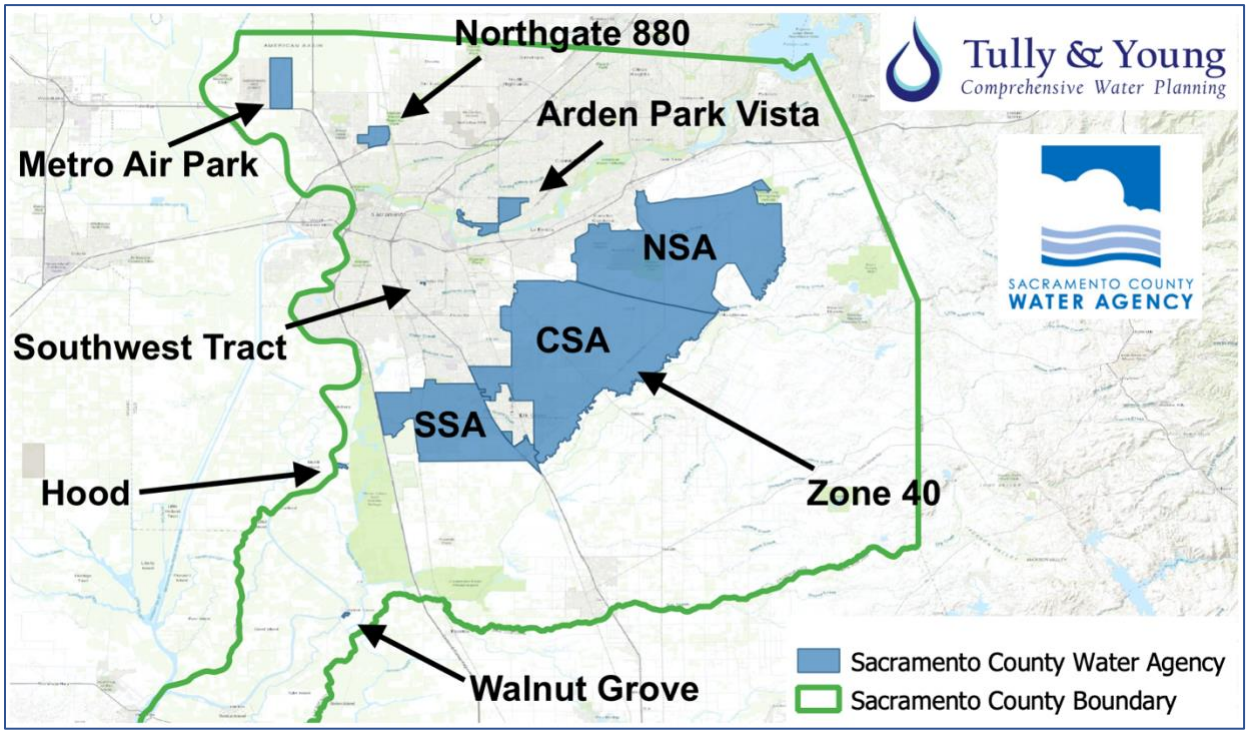
[1] California Water Code Section 10610 *et seq*. (Chapter 1 added by Stats. 1983, Ch. 1009, Sec. 1) and its subsequent amendments
[2] California Water Code Section 10610 *et seq*.
[3] California Water Code Sections 10631-10635
[4] California Water Code Sections 10632
[5] California Water Code Sections 10632.1

## ES-1 Sacramento County Water Agency

The Sacramento County Water Agency (SCWA) was formed in 1952 as a special act district codified in Chapter 66 of the California Water Code Appendix.[6] The SCWA Act states that SCWA was created, in part, "for purposes of controlling and conserving storm, flood and other surface water for any beneficial purpose… and obtaining of ground or other water or a water supply and the production, storage, transmission, distribution, sale, or other disposition of such water…."[7] The SCWA Act further establishes that SCWA's service area boundaries include "all of the territory within the County of Sacramento."[8] As such, SCWA's fundamental purpose is to provide safe and reliable drinking water to its wholesale and retail customers throughout Sacramento County.

SCWA encompasses seven water service areas and provides retail water service to approximately 59,000 residential and commercial customers in Sacramento County.[9] SCWA also wholesales water to Elk Grove Water District and works with neighboring water suppliers and land use agencies to ensure long-term water system reliability. Figure ES-1 below shows SCWA's service area boundary as well as the seven service areas: Metro Air Park, Northgate 880, Arden Park Vista, Southwest Tract, Zone 40, Hood Water Maintenance District (Hood), and East Walnut Grove (Walnut Grove). Within Zone 40 there are further subdivisions into the North Service Area (NSA), Central Service Area (CSA), and South Service Area (SSA).

*Figure ES-1: SCWA Water Service Area*




[6] California Water Code Appendix, Sacramento County Water Agency Act, Section 66-1 *et seq*., 1952. (SCWA Act)
[7] California Water Code Appendix, Sacramento County Water Agency Act, Chapter 66, 1952.
[8] SCWA Act Section 66-1.
[9] SCWA has eight public water systems but those are contained wholly within the seven service areas.

## ES-2 SCWA Water Service Reliability

Each of SCWA's seven service areas are served with a unique set of water supplies. Each of the seven service areas have long-term water reliability in normal, single dry years, and five consecutive dry years through 2045. The details related to these conclusions are contained in the main chapters of SCWA's 2020 UWMP. The information below generally describes the water system reliability for each service area.

- **Metro Air Park**: Water supply delivered from the City of Sacramento to meet current demands of approximately 125 acre-feet and 2045 demands of approximately 5,715 acre-feet.
- **Northgate 880**: Water supply is derived from SCWA's groundwater supplies to meet current demands of approximately 1,345 acre-feet and 2045 demands of approximately 1,365 acre-feet
- **Arden Park Vista**: Water supply is derived from SCWA's groundwater supplies to meet current demands of approximately 3,560 acre-feet and 2045 demands of 3,217 acre-feet.
- **Southwest Tract**: Water supply is derived from a water supply contract with California American Water Company to meet current demands of approximately 30 acre-feet and 2045 demands of approximately 24 acre-feet.
- **Zone 40**: Zone 40 has a number of potable surface water supplies, a non-potable surface water supplies, and groundwater available to meet its customers' demands.
  - Zone 40 potable water supplies consist of three water rights from the Sacramento River, two Central Valley Project contracts for water, a contract for water with Aerojet, a contract supply from North Delta Water Agency, and groundwater supplies to meet current demands of approximately 37,620 acre-feet and 2045 demands of 74,388 acre-feet.
  - Zone 40 non-potable supplies consist of a contract for recycled water supplies from Sacramento Regional County Sanitation District to meet current non-potable demands of approximately 962 acre-feet and 2045 demands of approximately 3,300 acre-feet.
- **Hood Water Maintenance District**: The Hood Water Maintenance District service area water supply is entirely derived from SCWA's groundwater supplies to meet current demands of approximately 30 acre-feet and 2045 demands projected to be 31 acre-feet
- **East Walnut Grove**: The East Walnut Grove service area water supply is entirely derived from SCWA's groundwater supplies to meet current demands of approximately 60 acre-feet and projected 2045 demands of 56 acre-feet.

In summary, SCWA's diverse potable and non-potable surface water supply portfolio, combined with its conjunctive management of groundwater resources, provide stable and reliable water supplies to meet SCWA's current and 2045 future water demands in all seven service areas as well as its wholesale delivery obligations. This supply reliability encompasses normal, single dry, and five consecutive dry year scenarios.

# Chapter 1
# Introduction

Formed in 1952, the Sacramento County Water Agency (SCWA) provides safe and reliable drinking water to approximately 59,000 residential and commercial customers in Sacramento County. SCWA is an independent Agency but operates as a department within the Sacramento County government structure. SCWA's service area boundaries coincide with Sacramento County boundaries. However, its retail water service encompasses seven specific geographic areas within the county boundary, each of them created within SCWA's enabling legislation as a separate "benefit zone".[10] SCWA also provides wholesale water to the City of Elk Grove.

Ensuring an adequate supply of water is available to serve the existing and future needs for SCWA's residential and Commercial, Institutional and Industrial (CII) customers is a critical component of successful operations. This Urban Water Management Plan (UWMP) draws on local, regional, and statewide inputs to synthesize information from numerous sources into a reliable water management action plan designed to be referred by SCWA's Board, Management, and Staff.

## 1.1 Background and Purpose

SCWA has prepared this 2020 UWMP to comply with the Urban Water Management Planning Act (UWMPA) requirements for urban water suppliers.[11] This 2020 UWMP addresses SCWA's water management planning efforts to assure adequate water supplies to meet forecast demands over the next 25 years. As required by the UWMPA, SCWA's 2020 UWMP specifically assesses the availability of its supplies to meet forecast water uses during average, single-dry and five consecutive drought years through 2045. Verification that future demands will not exceed supplies and assuring the availability of supplies in dry-year conditions are critical outcomes of this 2020 UWMP.

The 2020 UWMP is an update to SCWA's 2015 UWMP and presents new data and analysis as required by the California Department of Water Resources (DWR) and the California Water Code (CWC) since 2015. The 2020 UWMP is also a comprehensive water planning document that describes existing and future supply reliability, forecasts future water uses, presents demand management progress, and identifies local and regional cooperative efforts to meet projected water use.

The UWMP is designed to be a valuable water management and planning tool to guide and inform the SCWA Board of Directors, managers, customers, and the State of California about its water management

[10] Although there are seven service areas, SCWA has eight public water systems contained in those service areas.
[11] California Water Code sections 10610 through 10657.

practices. The 2020 UWMP reflects SCWA's planning assumptions and goals and should be used in combination with other planning resources and documents over the UWMP planning horizon.

The State of California's drought vulnerability and the additional pressures of climate change and population growth have emphasized the importance of planning ahead to meet water demands with potentially at-risk water supplies. This forward planning is an important outcome of the 2020 UWMP.

## 1.2 Basis for Plan Preparation

SCWA operates Public Water Systems as described in California Health and Safety Code 116275. SCWA qualifies as both a Wholesale Water Supplier and Retail Urban Water Supplier as described in Water Code Section 10617, providing water for municipal purposes to more than 3,000 customers or 3,000 acre/feet of water per year. SCWA wholesales water to Elk Grove Water District. These characteristics require SCWA to prepare an Urban Water Management plan every five years. SCWA owns and operates smaller water systems which fall below the service threshold for UWMP reporting; however, these systems are included in this plan. SCWA's Public Water System details are listed in Table 1-1.

*Table 1-1: Public Water System Information*

| Public Water System Number | Public Water System Name |
|---|---|
| CA3400101 | Hood Water Maintenance District |
| CA3400106 | East Walnut Grove |
| CA3400156 | Southwest Tract Water Maintenance District |
| CA3400173 | Northgate 880 |
| CA3410002 | Arden Park Vista |
| CA3410029 | Laguna Vineyard |
| CA3410704 | Mather-Sunrise |
| CA3400473 | Metro Air Park[12] |
| Total Connections approximately 59,000[13] | |

The State Legislature passed numerous new requirements since the 2015 UMWP which are detailed throughout this 2020 UWMP.[14] Major updates to the requirements are listed below along with a reference to the corresponding section in which they are addressed in this document.

- **Five Consecutive Dry-Year Water Reliability Assessment:** The Legislature modified the dry-year water reliability planning from a "multiyear" time period to a "drought lasting five consecutive water years" designation. This statutory change requires a Supplier to analyze the reliability of its water supplies to meet its water use over an extended drought period. This new

[12] SCWA designated Zone 50: Metro Air Park Special Planning Area

[13] Total connections are described in more detail in Chapter 2.

[14] California Water Code Section 10608 to 10608.44; Section 10609 to 10609.38; Section 10610 to 10657

requirement is addressed in Chapter 3—Water Supply Characterization, Chapter 4–Water Use, and Chapter 5— Water Service Reliability Assessment.

- **Drought Risk Assessment (DRA):** Due to the severity of recent California droughts and the variability associated with climate change predictions, the California Legislature created a DRA requirement for UWMPs. The DRA requires assessment over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability for five consecutive dry years. The DRA is informed by Chapter 3 – Supply Characterization and formally addressed in Chapter 5— Water Service Reliability Assessment and Chapter 6—Water Shortage Contingency Plans.
- **Seismic Risk:** Evaluating seismic risk to water system infrastructure and facilities and having a mitigation plan is now required by the Water Code. Incorporating the water system into regional or county hazard mitigation planning is an important aspect of this new statue. Seismic risk is addressed in Chapter 6.
- **Water Shortage Contingency Plan:** In 2018, the Legislature modified the UWMPA to require a Water Shortage Contingency Plan (WSCP) with specific elements. The WSCP is a document that provides a Supplier with an action plan for a drought or catastrophic water supply shortage. The WSCP is described in Chapter 6 of this UWMP.
- **Groundwater Supplies Coordination:** 2020 UWMPs are required to be consistent with Groundwater Sustainability Plans following the 2014 Legislature enactment of the 2014 Sustainable Groundwater Management Act (SGMA). SCWA's Groundwater Supplies are described in Chapter 3—Water Supply Characterization.
- **Lay Description:** A synopsis of the fundamental determinations of the UWMP is a new statutory requirement in 2020. This section of the is intended for new staff, new governing members, customers, and the media, and it can ensure a consistent representation of the Supplier's detailed analysis.

## 1.3 Coordination and Outreach

As required by the UWMPA, Sacramento County Water Agency has coordinated with nearby agencies while developing this UWMP to ensure consistency with other related planning efforts such as city and county General Plans, Water Master Plans (WMP) and Groundwater Sustainability Plans (GSP). This requirement includes coordination with (a) water suppliers that share a common water source, (b) relevant water management agencies that affect SCWA's water assets, and relevant public agencies that may have land use or other regulatory relationships with the SCWA. SCWA has prepared this 2020 UWMP in coordination with regional water purveyors and has appropriately notified and coordinated with other appropriate local government agencies as listed in Table 1-2.

SCWA is also a member of the Regional Water Authority (RWA), a joint powers authority, created by water purveyors in the Sacramento region to have a unified approach to regional water issues. The RWA provides members and associates significant regional coordination to enhance water management practices. Moreover, SCWA encourages active involvement by diverse populations in preparing its UWMP and gathers input through public communications and public meetings.

Further, as stipulated in Water Code Section 10621(b), every urban water supplier shall seek active involvement from diverse elements of the community. SCWA sought public participation with a hearing and notices to members of the community. These coordination efforts and Statutory Requirements for Notice are also included in Table 1-2.

*Table 1-2: Public and Agency Coordination*

| Coordinating Agencies | Coordinate Regarding Demands | Sent Copy of Draft UWMP | Sent 60-Day Notice | Notice of Public Hearing |
|---|---|---|---|---|
| Cities, Counties, Customers, and Interested Parties | | | | |
| Sacramento Groundwater Authority | | | X | |
| City of Elk Grove | X | | X | |
| City of Sacramento | X | | X | |
| Regional Water Authority | | | X | |
| Sacramento County Department of Water Resources | X | | X | |
| Golden State Water Company | | | X | |
| U.S. Bureau of Reclamation | | | X | |
| Sacramento Central Groundwater Authority | | | X | |
| Cal American Water Company | | | X | |
| City of Rancho Cordova | | | X | |
| General Public | | | | |

### 1.3.1 Water Supplier Information Exchange

Water Code Section 10631 requires wholesale and retail water agencies to provide each other with information regarding water supply and demand. Since SCWA receives water from other entities and provides water as a wholesaler to its retail customers, it has coordinated on both sides with supply and demand information. SCWA has water supplies derived from appropriative water rights issued by the State Water Resources Control Board, regional agency contract rights with various entities – including the City of Sacramento, Sacramento Regional County Sanitation District, and Aerojet-Rocketdyne, and contract rights with the United States Bureau of Reclamation. SCWA's wholesale customer is Elk Grove Water District. SCWA exchanged wholesale water supplier information with the City of Sacramento and the United States Bureau of Reclamation in accordance with the UWMP Act. SCWA exchanged retail water supplier information with Elk Grove Water District in accordance with the UWMP Act.

### 1.3.2 Statutory Requirements for Notice

In accordance with the UWMPA, notification of the UWMP update was provided to cities and counties within the service area at least 60 days prior to the public hearing of the plan as required by Section 10621(b) of the Water Code. Since SCWA is a part of the County of Sacramento it did not need to notify the County. Electronic copies of the final UWMP will be provided to the County no later than 30 days after its submission to DWR.

## 1.4 UWMP Adoption

SCWA held a public hearing regarding its 2020 UWMP on June 15, 2021. Before the hearing, a draft was made available for public inspection at the SCWA administration building and on the SCWA's website. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication of the hearing date and time in the Sacramento Bee in accordance with Government Code 6066 and posting of the hearing at the SCWA administration building.

SCWA's elected body adopted this 2020 UWMP on June 15, 2021. A copy of the adopted 2020 UWMP will be submitted to DWR, provided to the County and the California State Library, and posted onto SCWA website.

SCWA plans to submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption. These include the following required DWR Excel workbooks:

- "FINAL Submittal 2020 UWMP Tables 04.02.2021.xls"
- "FINAL SBX7-7 Verification Form 04.02.2021.xls"
- "FINAL Energy Use Tables 04.01.21.xls"

The contents of this UWMP are meant to provide flexible management options for the recommended actions. The reliability assessments, for example, follow predicted land use planning and suggested water supply management actions that should be implemented or adjusted in the five year period between this UWMP and the 2025 UWMP update. Thus, implementation of this plan is intended to be flexible to meet changing conditions over the 2020 UWMP's five year planning horizon.

## 1.5 Document Organization

This UWMP is organized as follows:

- Chapter 2 provides a description of the SCWA service area, demographic characteristics and climate, and describes the future population the Agency anticipates needing to serve.
- Chapter 3 describes SCWA's current and future water supplies and the availability of the supplies through 2045.
- Chapter 4 details the customer uses, including the past and future estimated uses, and describes the SCWA's past and on-going demand management measures.
- Chapter 5 presents the SCWA's water system service reliability into the future, including an assessment of reliability if a drought occurred over the next five consecutive years.
- Chapter 6 is SCWA's stand-alone water shortage contingency plan, incorporated as a chapter in this UWMP, but also available to be shared and utilized separate from the UWMP.

## NOTE TO DWR:

Sacramento County Water Agency has written this Urban Water Management Plan (UWMP) primarily as a water resources planning tool to effectively manage water supply, reliability and demand. This UWMP also satisfies all the requirements of the Urban Water Management Planning Act (UWMPA).

The body of the document provides narratives, analysis and data that DWR requests in its 2020 UWMP Guidebook, including changes to the California Water Code since 2015. Efforts have also been made to include enhancements to this document wherever possible as recommended in the 2020 UWMP Guidebook.

To facilitate review by DWR for compliance with the UWMPA, data from the body of the document has been transferred into required DWR submittal tables consistent with the organization of the tables in Appendix E of the 2020 UWMP Guidebook. These tables are separately uploaded to DWR's web portal. This UWMP has been reviewed for adequacy according to the UWMP Checklist as contained in Appendix F in the 2020 UWMP Guidebook.

# Chapter 2
# Water Service and System Description

Sacramento County is located in the northern part of California's Central Valley, east of the San Francisco Bay Area along the confluence of the Sacramento and American Rivers. The County stretches from the Sacramento River on the West to the base of the Sierra Foothills on the east and covers about 994 square miles. The northern portion of the county is dominated by the City of Sacramento and its metro area whereas the southern portion is dominated by crop lands and the delta.

Sacramento County Water Agency (SCWA) was formed by a special legislative act in 1952 giving the County the Authority to create assessment zones to fund and manage water projects. SCWA is one of 27 water purveyors within Sacramento County and primarily provides for southern and southeastern Sacramento County as well as some industrial areas, suburban communities, small county enclaves, and future development areas which lie outside of other purveyor service areas.

## 2.1 SCWA Water Service Areas

Operated as the County Water Resources Department, SCWA has created several assessment zones to enable potable water related projects. SCWA currently provides water service to seven different hydraulic areas as well as wholesale water to the Elk Grove Water District. These service areas include: Metro Air Park, Northgate 880, Arden Park Vista, Southwest Tract, Zone 40, Hood Water Maintenance District (Hood), and East Walnut Grove (Walnut Grove). SCWA's Zone 40 service area represents the largest group of customers and linked hydraulic service areas (see Figure 2-1). Each service area is further described below.

### 2.1.1 Zone 40 Service Area

The Zone 40 service area is the largest area served by SCWA and includes interconnected infrastructure facilities that facilitate the use of a diversity of water supplies. The Zone 40 has three service areas as follows:

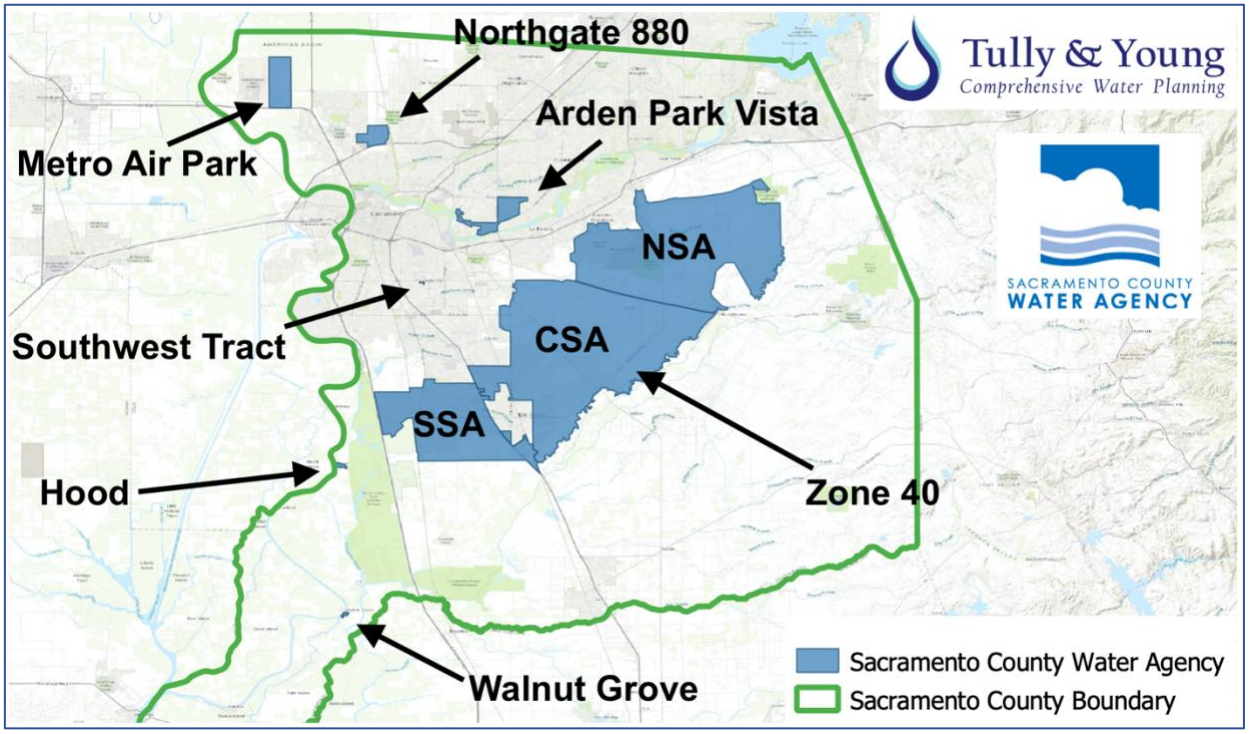
- North Service Area (NSA)
- Central Service Area (CSA)
- South Service Area (SSA)

#### North Service Area

The NSA is located south of the American River and includes part of the City of Rancho Cordova. Historically, the NSA was supplied exclusively by groundwater. In recent years, SCWA has supplied

surface water supply to the NSA from the Vineyard Water Treatment Plant (WTP), as part of the agency's conjunctive use program. The NSA is the least developed of the three service areas, with currently less than 10 percent of the projected build out population. This service area includes the old Mather and Sunrise Corridor systems. SCWA assumed ownership of the Mather System shortly after the County of Sacramento took over Mather Air Force Base after it was decommissioned by the United States Air Force in the mid-1990s. In the case of the Sunrise Corridor System, SCWA was asked to take ownership and provide water service after the system was constructed through an assessment district in the late 1980's. Most of the land within the NSA boundary is rural and undeveloped but significant growth is anticipated over the next 30 years.[15]

*Figure 2-1: Water Service Area*




## Central Service Area

The CSA is located to the south of the NSA and is supplied by surface water from the Vineyard WTP and groundwater. The CSA is partially developed with approximately 38% of the projected build out population.[16] SCWA provides wholesale water to Elk Grove Water District within the CSA. This service area includes the old Grantline-99 system, as well as the newer Vineyard, Vineyard Springs, and North Vineyard Station areas. The CSA is predominately residential with a small number of commercial and institutional customers and a large rural component to the east.

[15] According to current customer account information, NSA has nearly 6,800 connections of the 28,800 anticipated at build-out.

[16] According to current customer account information, CSA has nearly 14,400 connections of the 38,300 anticipated at build-out.

### South Service Area

The SSA is located south of the CSA and to the west of Highway 99. The SSA is the most developed of the three service areas, with currently nearly 90% of the projected build out population.[17] The SSA is supplied by a mix of surface water, groundwater, and recycled water. The surface water comes from the Vineyard SWTP and is conveyed through the CSA. The Franklin Intertie can also supply treated surface water from the City of Sacramento. This service area currently supplies the Laguna, East Franklin, and Laguna Ridge areas. The SSA is predominantly residential with some commercial and institutional customers.

## 2.1.2 Arden Park Vista

The Arden Park Vista service area is located north of the American River and east of the City of Sacramento. The system began with the development of the Sierra Oaks and Arden Park areas approximately 80 years ago. The service area predominantly consists of single-family residential customers. The Arden Park Vista service area water system is supplied by groundwater wells with the ability to purchase water from adjacent agencies, if necessary, and consists of one pressure zone. The system remains a groundwater-based system dependent on system pressure to cycle well pumps on and off, along with supplemental water supplied from interconnections with the City of Sacramento and Sacramento Suburban Water District (SSWD). As this area was constructed long before water meters were standard practice, it is the only remaining area with a significant number of unmetered customers. SCWA anticipates completing conversion of all customers to meters by 2025.

## 2.1.3 Metro Air Park

Metro Air Park is a newer retail service area located north of Highway 5 next to the Sacramento International Airport. This area is planned as an industrial hub with two shipping facilities and warehouses currently operating and more in development. Wholesale water service for this area is a contract supply from the City of Sacramento. As this area has no residential or institutional uses, demand patterns will be different than typical service areas.

## 2.1.4 Northgate 880

The Northgate 880 service area is located east of Highway 5 and north of Highway 80. This area is isolated from other SCWA service area and is fed only by local groundwater supplies. The area is nearly built out with the majority of uses being commercial and industrial. Development of the area is primarily industrial and heavy commercial use.

## 2.1.5 Hood Water Maintenance District (Hood)

The Hood Water Maintenance District (Hood) service area is located in the southern part of Sacramento County along the east side of the Sacramento River. The approximately 75 residential and six

[17] According to current customer account information, SSA has nearly 33,000 connections of the 38,100 anticipated at build-out.

commercial customers are supplied by groundwater wells using a single pressure zone system. SCWA took over operation and maintenance of this water system in the 1970s.

### 2.1.6 East Walnut Grove (Walnut Grove)

The East Walnut Grove service area is located in the southern part of Sacramento County along the east side of the Sacramento River within the town of Walnut Grove. Water is supplied from groundwater wells using a single pressure zone. Service is provided to just over 100 residential and 30 commercial customers, with additional services for a few institutional users and park landscaping. SCWA took over operation and maintenance of this water system in 2002.

### 2.1.7 Southwest Tract Water Maintenance District

The Southwest Tract Water Maintenance District (Southwest Tract) service area is located in central Sacramento County, south of the American River, near Fruitridge Road and Stockton Boulevard. Southwest Tract is a small service area with approximately 18 single-family accounts, 12 multi-family connections and one institutional service. The Southwest Tract is served by groundwater supply derived from the SCWA's formation of the Southwest Water Maintenance District in 1958 and a water service agreement with Fruitridge Vista Water Company (Fruitridge) executed in 1970. This agreement was subsequently assumed by another water agency that is serving the Southwest Tract area.

### 2.1.8 Service Area Summary

Altogether SCWA provides water service to approximately 59,000 residential, commercial, irrigation, industrial and institutional/governmental service connections throughout all the water service areas. Much of the development is low-density, single-family housing and retail related commercial use, with the exception of the Northgate and Metro Air Park service areas which are predominantly warehouse and light industrial customers. Table 2-1(a) through Table 2-1(g) provide the historical and current number of service connections by customer class.

*Table 2-1(a): Zone 40 Customer Water Service Connections*

| Customer Class | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Single Family Residential | 46,909 | 47,962 | 48,827 | 49,457 | 50,708 | 51,657 |
| Multi-Family Residential | 238 | 276 | 279 | 306 | 313 | 317 |
| Commercial/Institutional | 1075 | 1089 | 1,103 | 1,093 | 1,122 | 1,108 |
| Industrial | 117 | 118 | 117 | 117 | 119 | 118 |
| Landscape Irrigation | 866 | 891 | 906 | 912 | 937 | 948 |
| Other | 45 | 43 | 43 | 43 | 42 | 41 |
| Total | 49,250 | 50,379 | 51,275 | 51,928 | 53,241 | 54,189 |

*Table 2-1(b): Arden Park Vista Customer Water Service Connections*

| Customer Class | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Single Family Residential | 2,777 | 2,789 | 2,831 | 2,834 | 2,830 | 2,692 |
| Multi-Family Residential | 1,305 | 1,305 | 1,425 | 1,425 | 1,283 | 1,283 |
| Commercial/Institutional | 195 | 198 | 201 | 198 | 201 | 202 |
| Landscape Irrigation | 17 | 16 | 16 | 17 | 19 | 19 |
| Other | 6 | 6 | 7 | 5 | 7 | 2 |
| Total | 4,300 | 4,314 | 4,480 | 4,479 | 4,340 | 4,198 |

*Table 2-1(c): Northgate 880 Customer Water Service Connections*

| Customer Class | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Commercial/Institutional | 153 | 164 | 186 | 197 | 213 | 213 |
| Industrial | 89 | 79 | 58 | 23 | 30 | 30 |
| Landscape Irrigation | 20 | 20 | 26 | 29 | 29 | 29 |
| Other | 14 | 14 | 14 | 14 | 14 | 14 |
| Total | 276 | 277 | 284 | 263 | 286 | 286 |

*Table 2-1(d): Metro Air Park Customer Water Service Connections*

| Customer Class | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Commercial/Institutional | 0 | 0 | 1 | 2 | 2 | 4 |
| Landscape Irrigation | 0 | 0 | 2 | 2 | 2 | 6 |
| Total | 0 | 0 | 3 | 4 | 4 | 10 |

*Table 2-1(e): Hood Water Maintenance District Customer Water Service Connections*

| Customer Class | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Single Family Residential | 76 | 76 | 75 | 75 | 75 | 76 |
| Commercial/Institutional | 6 | 6 | 6 | 6 | 6 | 6 |
| Total | 82 | 82 | 81 | 81 | 81 | 82 |

*Table 2-1(f): East Walnut Grove Customer Water Service Connections*

| Customer Class | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Single Family Residential | 110 | 110 | 112 | 112 | 116 | 116 |
| Multi-Family Residential | 5 | 5 | 5 | 5 | 5 | 5 |
| Commercial/Institutional | 38 | 38 | 39 | 39 | 41 | 41 |
| Landscape Irrigation | 4 | 4 | 4 | 4 | 4 | 4 |
| Total | 157 | 157 | 160 | 160 | 166 | 166 |

*Table 2-1(g): Southwest Tract Customer Water Service Connections*

| Customer Class | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Single Family Residential | 17 | 17 | 17 | 17 | 18 | 18 |
| Multi-Family Residential | 12 | 12 | 12 | 12 | 12 | 12 |
| Commercial/Institutional | 1 | 1 | 1 | 1 | 1 | 1 |
| **Total** | 30 | 30 | 30 | 30 | 31 | 31 |

## 2.2 Service Area Climate

Typical of the California Central Valley, Sacramento County has a Mediterranean climate with hot, dry summers and cool, wet winters. Historical averages show January as the coolest and wettest month, and July as the hottest and driest. The wet season is from October to April with a 30-year annual average rainfall of 19.94 inches. The annual mean temperature is 61.5 degrees, but the summer months can regularly see average highs in the mid-high 90s, and average winter lows hover down in the 30s and 40s. Other climate characteristics include frequent tule fog coinciding with the rainy season which brings dense fog caused by high relative humidity (after rain) and rapid cooling during the night. The fog can get trapped, due to temperature inversions common in the Sacramento valley, for days or even weeks. Snow is rare but cold fronts can bring freezing temperatures with trace amounts of snow and ice. Autumn starts warm and dry and becomes cooler, wetter, and foggier later into the season. The last rains in spring are generally in late April or early May.

Figure 2-2 shows the average monthly temperature, rainfall, and evapotranspiration (ETo) for the service area. Actual annual rainfall totals deviate quite significantly from the 30-year average as illustrated in Figure 2-3. In most years, precipitation totals fall below the mean.

### 2.2.1 Climate Change

While the California Water Code does not prescribe specific climate change planning and management measures for water suppliers, it does emphasize that climate change is appropriate to consider when assessing drought risk assessment, water conservation and use efficiency, and demand management and supply—both in a historical and projected context.

Sacramento County's climate is highly variable with respect to precipitation and temperature. The dry summer months make the state extremely susceptible to drought when a deficiency in precipitation materializes, especially in mountain snowpack. Much of the water supply comes from the mountains falling as winter rain or snow and is then stored as snowpack and subsequently captured in reservoirs and appropriated throughout the year.

*Figure 2-2: Average Climate Conditions*[18]

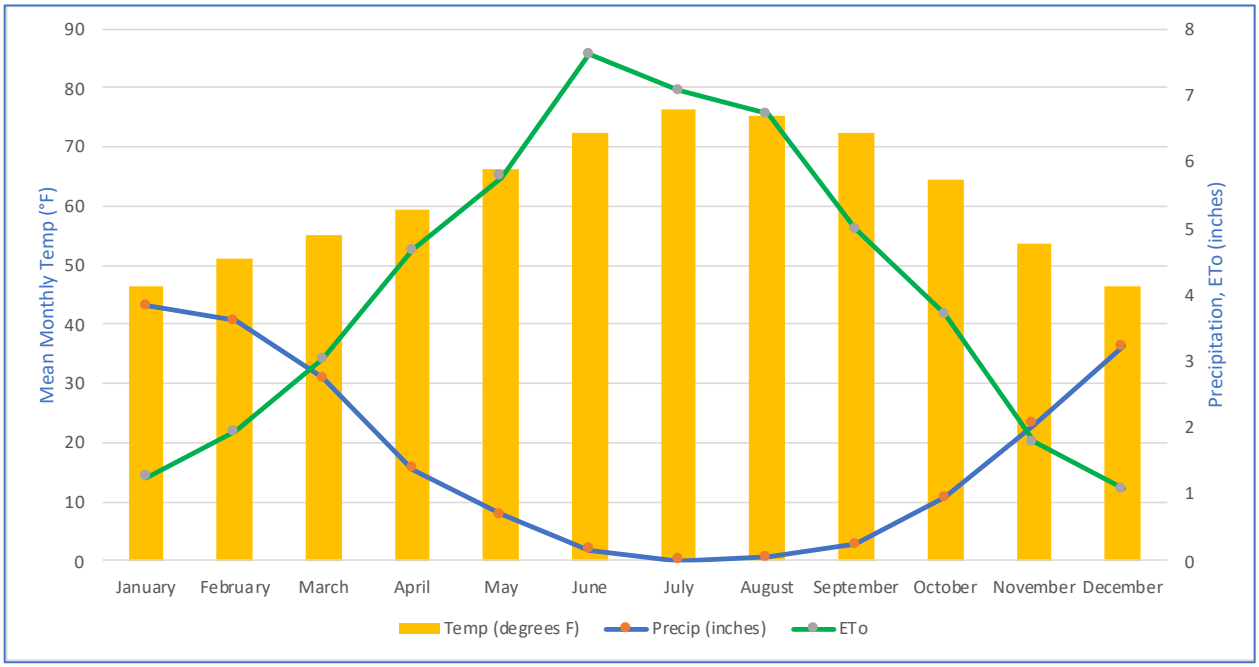
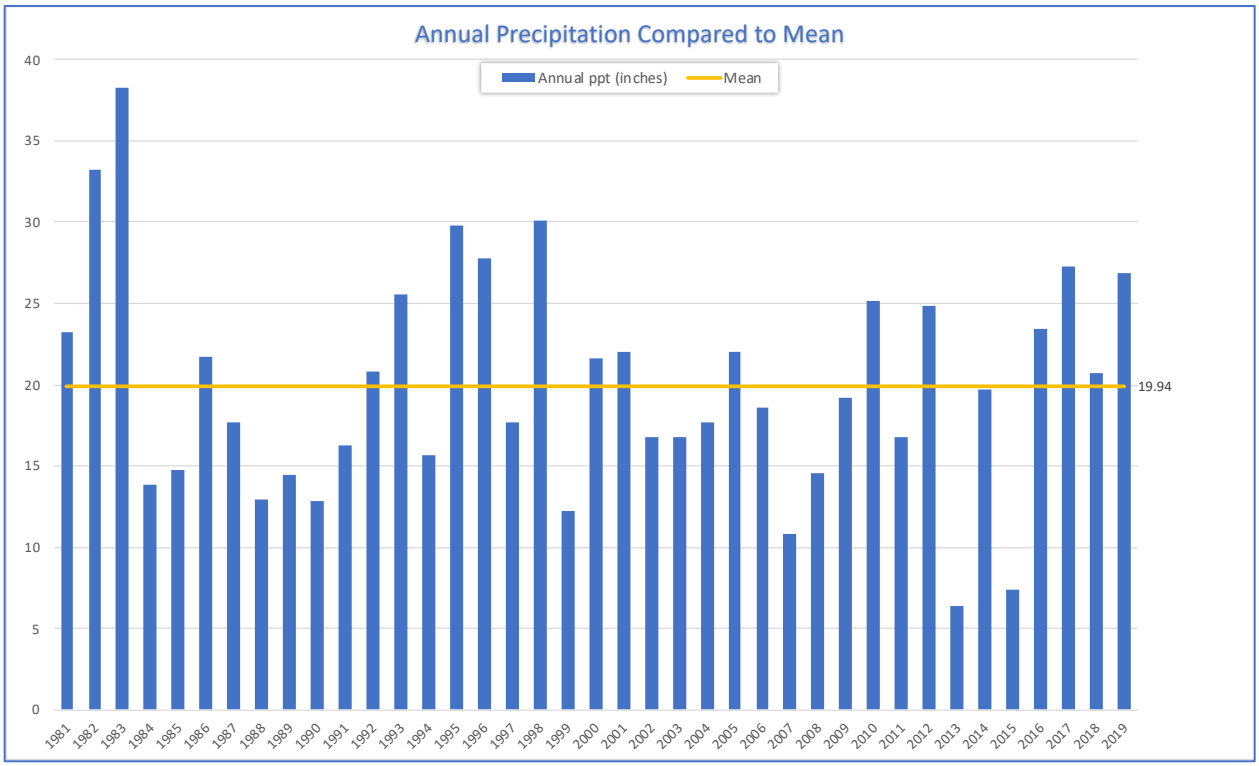


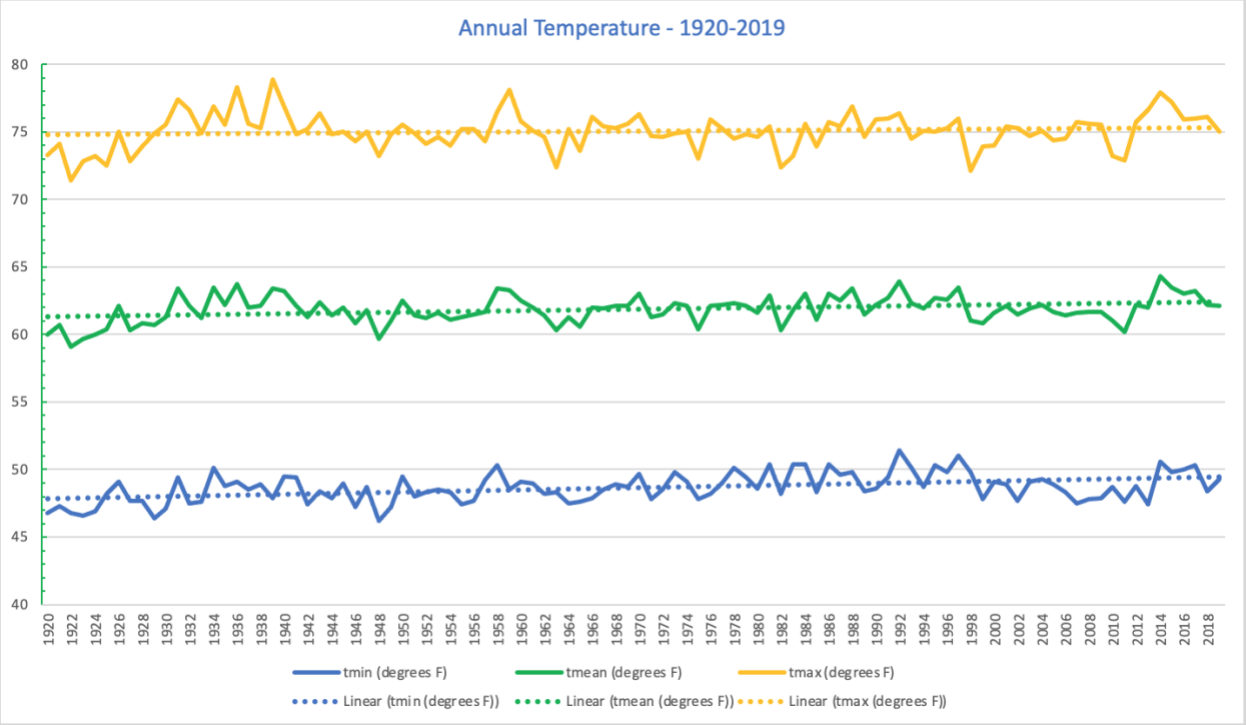

*Figure 2-3: Annual Precipitation Variability (1981-2019)*




[18] Temperature and rainfall data represents annual averages from 1981-2019 from the PRISM Climate Group https://prism.oregonstate.edu/ Location: Lat: 38.4474 Lon: -121.4110 Elev: 26ft; ETo data is from CIMIS Verona - Sacramento Valley - Station 235 from May 2012 – Oct 2020.

The Regional Water Authority (RWA), of which SCWA is a member, partnered with other local water purveyors and the U.S. Department of the Interior, Bureau of Reclamation on a climate change study called the American River Basin Study (ARBS) with the purpose of developing climate change adaptation strategies specific to the Basin[19]. Much of Sacramento County is located in the western portion of the basin and study area. Sacramento County has experienced a general warming trend over the last 100 years, as shown by the trendlines in Figure 2-4.

*Figure 2-4: Historical Annual Temperature (1920-2019)[20]*




Surface air temperatures are projected to increase steadily, with average summer temperatures increasing by approximately 7.2 degrees Fahrenheit (°F) by the end of the 21st century (Figure 2), and winter temperatures increasing by 4.9°F. Projections of daily maximum and minimum temperatures suggest similar warming trends during all seasons, with maximum temperatures projected to increase as much as 7.3°F during the summer months.

Climate change is generally forecast to bring higher temperatures, more variability in precipitation and more frequent and prolonged droughts. Although there is a lack of a clear trend in projected annual precipitation, by the end of the 21st century the average fall and spring precipitation is expected to decrease, with winter and summer precipitation increasing. Increasing variability is also projected in winter and fall precipitation.

[19] Full findings and approved ARBS study can be found at www.pcwa.net/planning/arbs

[20] Temperature and rainfall data represents annual averages from 1981-2019 from the PRISM Climate Group https://prism.oregonstate.edu/ Location: Lat: 38.4474 Lon: -121.4110 Elev: 26ft

Water supplies in the SCWA region are inextricably tied to the Sierra snowpack runoff, and the ARBS indicates that the Snow Water Equivalent (SWE) is projected to decrease significantly due to higher average surface temperatures and precipitation variability. Historical average SWE for the American River basin is 3.1 inches. It is forecasted to decrease to 2.0 inches across all climate scenarios and future time periods. Areas that accumulate snow are projected to have up to a 12-inch decrease in average annual SWE, resulting in a loss of snow by 50-75% through the end of the century[21]. This will place strain on summer and fall water supply in Sacramento County and throughout the state due to earlier runoff. Peak runoff is expected to shift by more than a month earlier by mid to late century. Increased evapotranspiration would also accompany the intensification of hotter extreme temperatures.

Currently available documents from SCWA assume that current supply availability remains flat but recent documents qualify this with the uncertainties related to climate change impacts on supply availability, habitat and species considerations, and changing flow requirements.

This 2020 UWMP Update includes additional Climate Change discussion in Chapters 3 and 4.

## 2.3 Current and Projected Population, Land Use, Economy, and Demographics

Service area population and land use projections are critical to developing a useful planning framework as population dynamics and growth are a primary influence on water use. These projections directly influence planning measures for system supply, delivery, infrastructure, and demand management. Similarly, understanding the SCWA's economic, social, and demographic trends give valuable insight to water management and planning. This section of the UWMP addresses these factors to provide a supportable basis for forecasting future water use.

### 2.3.1 Current Population and Historic Trends

Since being the largest major settlement adjacent to the first major gold find during the California Gold Rush, Sacramento grew at a rapid rate. With the City of Sacramento tripling in size between 1850 and 1860, there was a rapid development of lands around the City of Sacramento to provide food and resources to the growing City. As such, growth in the County started in the northwestern portion adjacent to the City of Sacramento and has grown in all directions. Currently, the population is primarily growing in the remaining areas to the east and southeast of the City – areas predominantly served by the SCWA in the Zone 40 service area (see Figure 2-1).

Table 2-2 presents the recent and estimated current population for the various SCWA service areas. Because the various service areas do not easily correlate to existing boundaries represented by the California Department of Finance in their historic and recent population analyses, the estimates in the table are derived using a variety of methods as represented in the footnotes. There is no estimated

[21] American River Basin Study

population present in the Northgate 880 or Metro Air Park areas because those areas have no residential developments.

*Table 2-2: Estimated Population – Historical and Current*

| Service Area | 2010 | 2015 | 2020 |
|---|---|---|---|
| Zone 40[22] | | ~146,000 | ~169,000 |
| Arden Park Vista[23] | | ~11,500 | ~11,500 |
| Southwest Tract | ~150 | ~150 | ~150 |
| Hood[24] | ~200 | ~300 | ~300 |
| East Walnut Grove | ~450 | ~450 | ~450 |
| Elk Grove WD Wholesale Area | | ~10,500 | ~12,000 |
| Total | | ~168,900 | ~193,400 |

### 2.3.2 Current and Projected Land Use

While the SCWA has several water service areas, Zone 40 is the predominant area that has experienced growth and is expected to continue to grow significantly. As described previously, Zone 40 is comprised of three subareas: the North Service Area (NSA), the Central Service Area (CSA) and the South Service Area (SSA). Growth in these three service areas was evaluated and documented in the SCWA's Zone 40 Water System Infrastructure Plan Update (WSIP), completed in September 2016.[25]

In addition to growth in Zone 40, the SCWA's Zone 50 (Metro Air Park) also anticipates significant growth. However, this service area only includes commercial and industrial customers and is served by a contract with the City of Sacramento. As such, the Metro Air Park area has a reliable water supply system for its future growth potential.

All other SCWA water service areas are either fully built out or nearing buildout and therefore are not described here.

#### Zone 40 Land Use and Growth Projections

The WSIP included a projection of total connections over time for each of the three subareas (see Figure 2-5). As indicated in the WSIP table, projections were made beginning in 2010 and reflected anticipated

[22] Estimated based upon residential connection data from SCWA for 2015 and 2020 multiplied by Department of Finance occupancy data for Sacramento County.

[23] 2020 APV population based on residential connection count and Sacramento County occupancy rate of 2.80 people per house according to the Department of Finance data at: https://www.dof.ca.gov/Forecasting/Demographics/Estimates/

[24] https://datacommons.org/tools/timeline#&place=geoId/0634484&statsVar=Count_Person

[25] In January 2021, the SCWA prepared a draft Zone 40 Water Supply Master Plan Amendment that repeated much of the analysis and growth projections in the WSIP. This recent draft amendment was prepared to address the proposed Elk Grove Sports Complex, located in the SSA, which would be served by the SCWA.

developments until a build-out condition was reached. For SSA, build-out was expected by 2035, while the NSA and CSA areas were expected to build-out shortly after 2050.

*Figure 2-5: Projected Connections for Zone 40*[26]

**Table 3-9. Projected Connections in 5-Year Increments**

| Service area | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 | Buildout (2052) |
|---|---|---|---|---|---|---|---|---|---|---|
| NSA | 4,600 | 5,600 | 7,500 | 10,000 | 12,500 | 16,100 | 19,800 | 23,600 | 27,300 | 28,800 |
| CSA | 15,600 | 16,600 | 18,400 | 20,900 | 23,400 | 27,000 | 30,800 | 34,500 | 38,300 | 38,300 |
| SSA | 28,900 | 30,300 | 32,800 | 35,300 | 37,800 | 38,100 | 38,100 | 38,100 | 38,100 | 38,100 |
| Total Zone 40 | 49,100 | 52,600 | 58,800 | 66,300 | 73,800 | 81,300 | 88,800 | 96,300 | 103,800 | 105,200 |

Using actual customer connection information from the SCWA for 2015 and 2020, a comparison can be made to the expected connections in 2020, and adjustments, if necessary, can be presumed for on-going growth rates for purposes of this 2020 UWMP.

*Table 2-3: Comparison of Projected Connections to Actual Connections*

| | | 2015 | 2020 |
|---|---|---|---|
| SSA | Actual Count | 28,393 | 32,929 |
| | WSIP Projection | 30,300 | 32,800 |
| | Diff. | 94% | 100% |
| CSA | Actual Count | 13,165 | 14,434 |
| | WSIP Projection | 16,600 | 18,400 |
| | Diff. | 79% | 78% |
| NSA | Actual Count | 5,344 | 6,803 |
| | WSIP Projection | 5,600 | 7,500 |
| | Diff. | 95% | 91% |

Note: The "Diff." value is the actual count divided by the WSIP projected number of connections.

As shown in Table 2-5, the SSA and the NSA actual connection count match or are reasonably consistent with the WSIP projection for 2015 and 2020 as shown in Figure 2-5. Growth in the CSA, however, has lagged from the WSIP projections. However, the SCWA anticipates the long-term growth in total CSA connections shown in Figure 2-5 to still occur such that they will match by 2045.

For purposes of the 2020 UWMP, connection forecasts for each five-year increment are evenly distributed between 2025 and 2045 for the NSA and CSA subareas, with 2045 connection estimates

[26] SCWA's 2016 WSIP, Table 3-9. The figures depicted in this Table are updated per the additional tables in this section and Chapter 4.

matching the WSIP's 2045 forecast. For SSA, which is expected to reach build-out by 2035, the remaining growth was equally spread between 2025 and 2035. Table 2-6 presents the incremental accumulated connections that are used to forecast water use for this 2020 UWMP (further described in Chapter 4) and compares them to the WSIP projections through 2045 for each subarea.

*Table 2-4: Zone 40 Forecast Connections for UWMP and Comparison to WSIP*

| | | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|
| SSA | New Connections (cumulative) | | 1,724 | 3,447 | 5,171 | 5,171 | 5,171 |
| | UWMP Forecast | 32,929 | 34,653 | 36,376 | 38,100 | 38,100 | 38,100 |
| | WSIP Projected | 32,800 | 35,300 | 37,800 | 38,100 | 38,100 | 38,100 |
| CSA | New Connections (cumulative) | | 4,013 | 8,026 | 12,040 | 16,053 | 20,066 |
| | UWMP Forecast | 14,434 | 18,447 | 22,460 | 26,474 | 30,487 | 34,500 |
| | WSIP Projected | 18,400 | 20,900 | 23,400 | 27,000 | 30,800 | 34,500 |
| NSA | New Connections (cumulative) | | 3,359 | 6,719 | 10,078 | 13,438 | 16,797 |
| | UWMP Forecast | 6,803 | 10,162 | 13,522 | 16,881 | 20,241 | 23,600 |
| | WSIP Projected | 7,500 | 10,000 | 12,500 | 16,100 | 19,800 | 23,600 |

A number of development areas were identified as part of the WSIP when projecting the future total growth in the connections. Figure 2-6 shows the projected development locations within Zone 40. Because the timing and configuration of various previously approved and proposed development is dynamic and reacts to market conditions and other growth factors, the forecast connections are not assigned to any particular named development shown in Figure 2-6.

### 2.3.3 Economic Trends & Other Social and Demographic Factors

Sacramento County has a large, diverse economy, which includes being home to the State Capitol of California, the eighth-largest economy in the world. Its economic history has been tied to California's globally significant agricultural production centered in the Sacramento Valley. Agriculture is still an important part of the economy in the county, but key industries such as transportation, agribusiness, manufacturing, clean energy, technology, health care, and a robust housing market fuel its growth.

The SCWA service area is one of the more undeveloped parts of the county, with much of the land use being dedicated to residential, commercial, retail, light industrial, and agriculture. Elk Grove is the largest city in the area and hosts a significant tech sector, including an Apple, Inc. campus which employs approximately 5,000 people. Other large employment sectors include healthcare, education, and retail. The residential population of the SCWA also has a significant number of commuters that travel outside of the area to the greater metropolitan region for work. The SCWA Zone 40 service area is continuing to grow and therefore could see significant residential and commercial growth during the UWMP planning horizon through 2045.

The coronavirus pandemic crippled the national and global economy in 2020 and Sacramento County was no exception. The County's unemployment rate spiked to almost 14% in May 2020. Since then, the County has regained some of the jobs and the reported unemployment rate has declined sharply but there remains a level of uncertainty with the pace of economic recovery due to the pandemic.

*Figure 2-6: Zone 40 Existing or New Development Project Locations [source: WSMP Amendment[27]]*

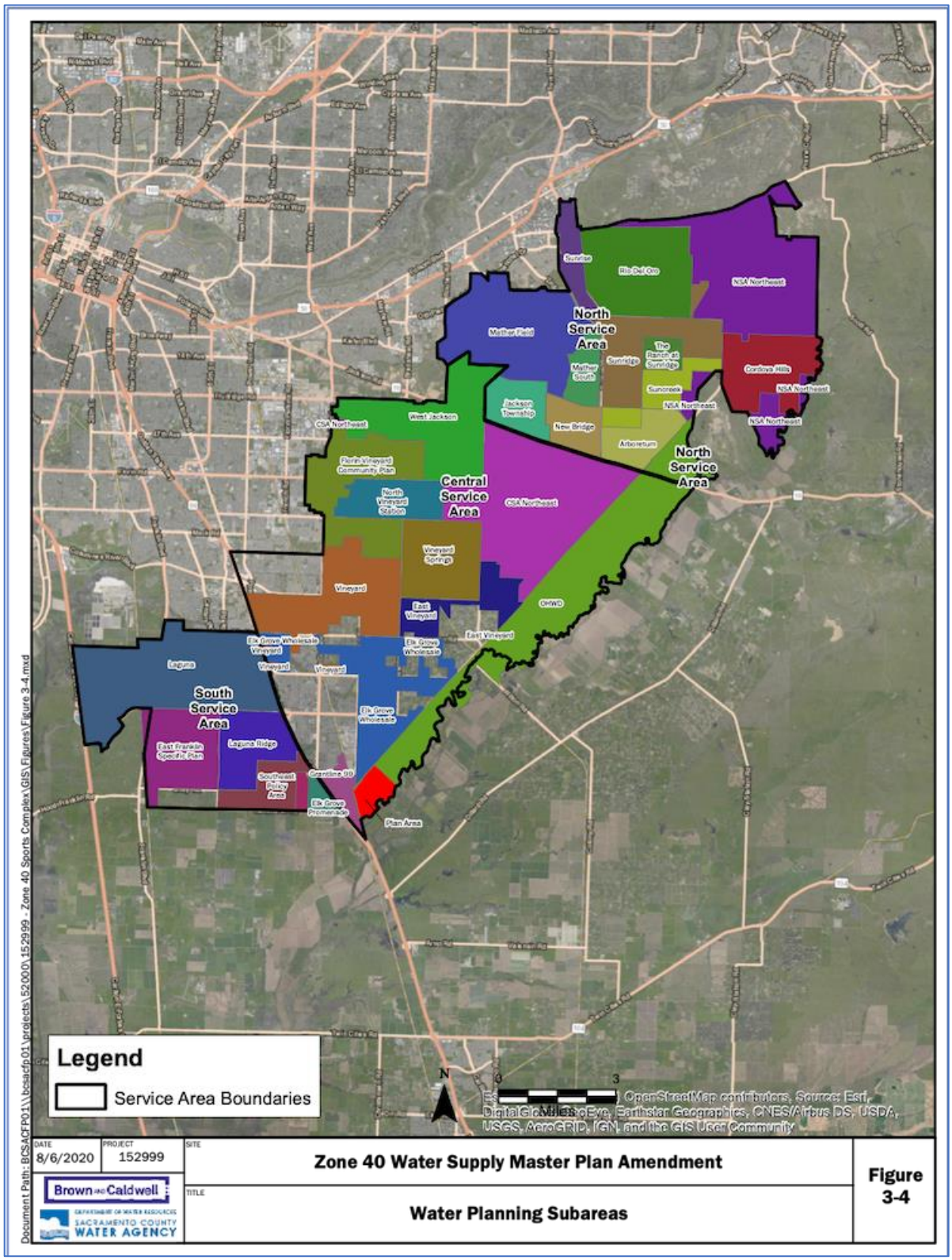
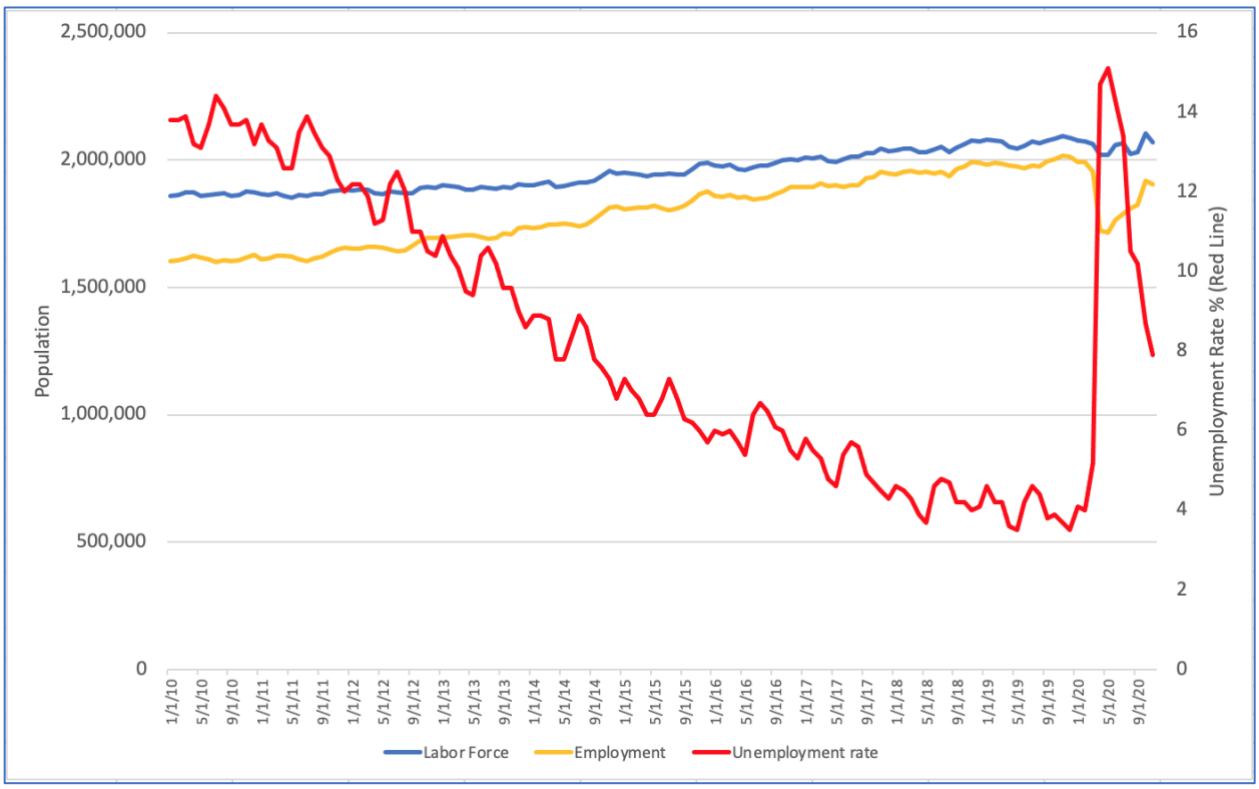


*Figure 2-7: Sacramento County Employment Data*




According to the 2010 US Census, the ethnic makeup of the census designated places within the SCWA service area is 55% White, 19% Hispanic/Latino, 15% Asian, 11% African American, and 8% other races or mixed race. The median income for Sacramento County is $77,262. Within the census designated places, the SCWA service area median income is $74,715.[28]

Using the connections methodology shown in Table 2-7, there are an estimated 56,000 households in the SCWA service area. Although Sacramento County has an average of 2.71 persons per household, the SCWA service areas have higher occupancy rates estimated to be equivalent to that listed by the Department of Finance for Elk Grove.[29]

## Expected Population Based Upon Land-Use Planning

To forecast projected service area population as accurately as possible requires consideration of the past growth rate, local economic predictions, and current and projected land uses. Importantly, one of the recent statutory updates to the UWMP Act states urban water suppliers "shall coordinate with local or regional land use authorities"[30] regarding land uses that may affect water management planning.

[27] Figure is from the SCWA's January 2021 draft Zone 40 Water Supply Master Plan Amendment, Figure 3-4.
[28] American Community Survey - Income, Poverty, Employment 2019
[29] California Department of Finance, E-5 Population and Housing Estimates for Cities, Counties
[30] CA Water Code Section 10631(a).

Since boundaries used for various population projections made by the Department of Finance do not correlate to SCWA's service areas, the projected population for this UWMP is estimated using the projections of total new connections shown in Table 2-6. Population projections are only provided for Zone 40 as the other SCWA water service areas with residential customers – Arden Park Vista, Hood, Southwest Tract and East Walnut Grove – are not expected to grow as they are already at build-out conditions.[31]

The Zone 40 projected future population is based upon estimating the mix of the total connections shown in Table 2-6 among residential and non-residential customers. While the actual mix will depend on the proposed projects within each Zone 40 subarea, using the existing mix of residential to non-residential connections can be a proxy for estimating the future mix for the incremental new connections. With an estimate of new residential connections, California Department of Finance (DoF) occupancy rates for Sacramento County can be applied to estimate future populations for each subarea. Table 2-7 provides the estimated number of new residential connections, the assumed occupancy rate, and a projected population for each subarea, as well as a total population projection for Zone 40.

*Table 2-5: Zone 40 Population Forecast tied to UWMP Connection Projections*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SSA | Residential Unit Ratio | | 2020 = | 97% | Forecast = | 96% | |
| | Occupancy Rate [using DoF estimate for Elk Grove] | | 3.27 | people per unit | | | |
| | Cumulative New Residential Units | 2025 | 2030 | 2035 | 2040 | 2045 | |
| | | 1,655 | 3,309 | 4,964 | 4,964 | 4,964 | |
| | Population Forecast | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
| | | 102,966 | 108,377 | 113,788 | 119,199 | 119,199 | 119,199 |
| CSA | Residential Unit Ratio | | 2020 = | 95% | Forecast = | 97% | |
| | Occupancy Rate [using DoF estimate for Sacramento Co.] | | 3.27 | people per unit | | | |
| | Cumulative New Residential Units | 2025 | 2030 | 2035 | 2040 | 2045 | |
| | | 3,893 | 7,786 | 11,678 | 15,571 | 19,464 | |
| | Population Forecast | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
| | | 45,819 | 58,549 | 71,278 | 84,008 | 96,737 | 109,467 |
| NSA | Residential Unit Ratio | | 2020 = | 91% | Forecast = | 90% | |
| | Occupancy Rate [using DoF estimate for Rancho Cordova] | | 3.27 | people per unit | | | |
| | Cumulative New Residential Units | 2025 | 2030 | 2035 | 2040 | 2045 | |
| | | 3,023 | 6,047 | 9,070 | 12,094 | 15,117 | |
| | Population Forecast | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
| | | 20,215 | 30,102 | 39,989 | 49,875 | 59,762 | 69,649 |
| Zone 40 Total Population | | 169,000 | 197,027 | 225,054 | 253,081 | 275,698 | 298,314 |

[31] Minor population increases may occur in these areas if occupancy rates increase. But for purposes of this 2020 UWMP, occupancy rates and total residential customer connections are expected to stay consistent over the UWMP planning horizon.

## 2.4 Delivery System Details

SCWA serves customers in all its service areas through several small- and large-scale potable infrastructure systems, as well as a recycled water system that serves the SSA.

Further discussion of these systems and the water supply used within each is included in Chapter 3, with current and future customer water use described in detail in Chapter 4.

### 2.4.1 Potable System

SCWA's primary function is delivering potable water to its customers in the previously described service areas. While a small percentage of total delivery is recycled water is delivered in the SSA, SCWA efficiently delivers more than 40,000 acre-feet of potable water annually. The following provides a brief overview of SCWA's potable water systems.

#### Zone 40 Delivery System

Zone 40, SCWA's largest customer service area, also has the most complex infrastructure. SCWA supplies a combination of groundwater and surface water into an interconnected system with multiple pressure zones. As shown in Figure 2-8, SCWA's Zone 40 distribution system is served by two primary surface water inputs and multiple groundwater inputs.[32]

SCWA surface water supplies for Zone 40 are diverted from the Sacramento River at Freeport and through the City of Sacramento's (City) Sacramento River WTP and Fairbairn WTP. Surface water diverted from the Sacramento River at the Freeport diversion structure is conveyed through the Freeport Regional Water Authority (FRWA) pipeline, treated at the Vineyard WTP (currently permitted at 60 MGD), and then delivered to customers in the CSA, SSA, and NSA.

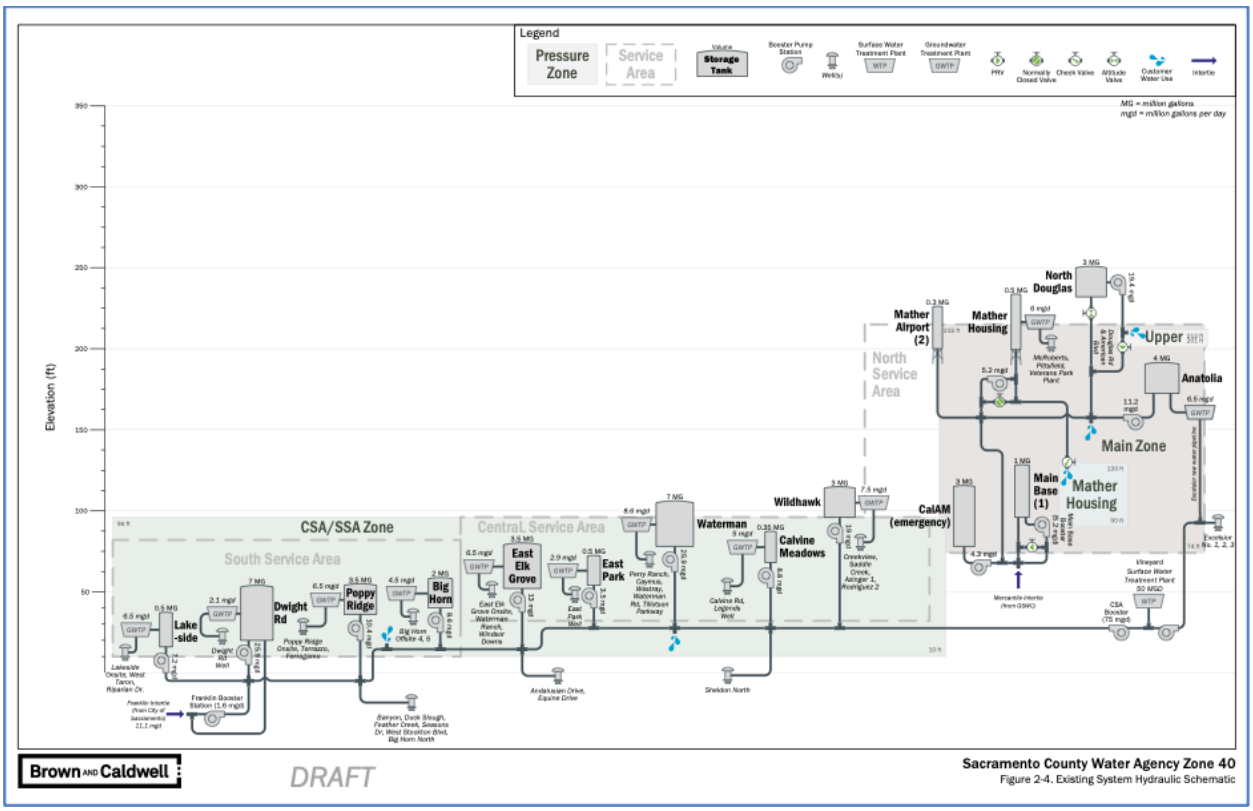
Surface water can also be provided to the SSA through the Franklin Intertie between the City's and SCWA's distribution systems. The City could divert and treat a portion of SCWA's surface water, and then wheel that water through their distribution system to the Franklin Intertie to Zone 40.

Groundwater is supplied to Zone 40 from wells that that are connected to groundwater treatment plants (GWTPs) and from wells that pump directly into the distribution system (direct feed). Most GWTP facilities consist of wells that supply raw water into a treatment plant, a ground level storage tank, and a pump station. Most GWTPs are supplied by more than one well. The direct feed wells pump directly into the distribution system and do not require treatment. Direct feed wells are located in some areas of the CSA and SSA.

In addition to the source and primary conveyance of the supplies, SCWA maintains an array of booster pumps, storage tanks, and distribution pipelines to assure continued and reliable pressurized potable water service.

[32] More detailed information regarding the Zone 40 infrastructure is available in the SCWA's January 2021 draft Zone 40 Water Supply Master Plan Amendment.

*Figure 2-8: Zone 40 Potable Water System Schematic*[33]




## Non-Zone 40 Delivery Systems

All of the other water delivery systems, with the exception of Metro Air Park, are supplied by groundwater systems that extract, and in some cases treat, then pump water into single pressure zone distribution systems. Metro Air Park is served with a combination of surface and groundwater resources (surface or groundwater is provided at the discretion of the City of Sacramento) treated and provided to the SCWA at the Metro Air Park location for SCWA management and delivery to customers in that specific service area.

## 2.4.2 Non-potable System

As described in further detail in Chapter 3, SCWA operates a recycled water system to serve non-potable needs within the SSA. In May 2003 the recycled water system officially went online and is currently delivering recycled water to the communities of Laguna West, Lakeside, and Stonelake in the Elk Grove and Laguna areas in the SSA to irrigate street medians, commercial landscaping, parks, and school sites.

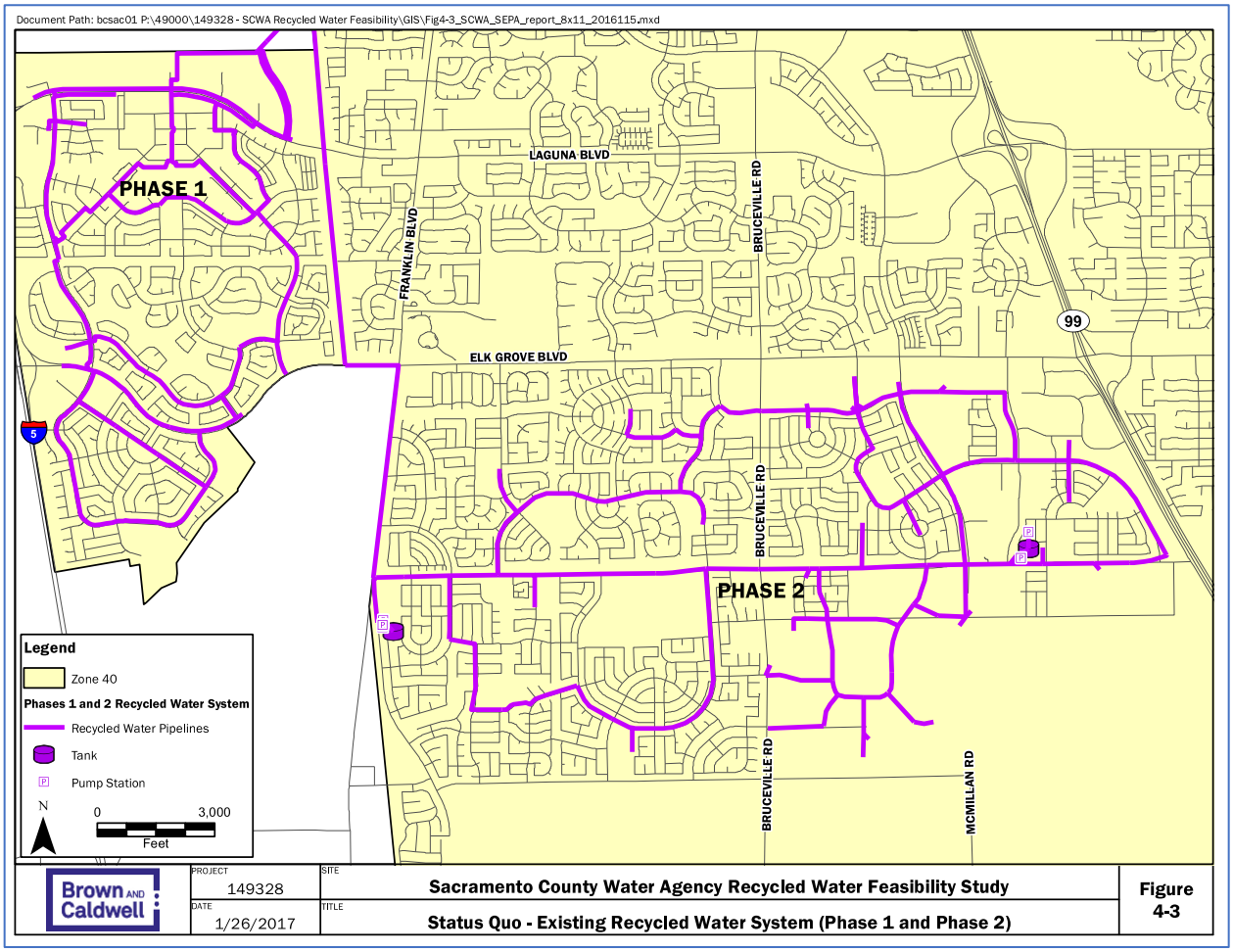
Tertiary treated wastewater is produced for SCWA at Sacramento Regional County Sanitation District's (SRCSD) 5-MGD Water Reclamation Facility (WRF) located at the Sacramento Regional Wastewater

[33] Figure is from the SCWA's January 2021 draft Zone 40 Water Supply Master Plan Amendment, Figure 2-4, modified to also show the NSA Phase A Pipeline.

Treatment Plant site. Recycled water is conveyed from the WRF via a single 24-inch transmission main that then drops to a 20-inch pipeline to SCWA's branched distribution system shown in Figure 2-9.

SCWA owns and maintains this recycled water distribution system. The Phase 1 portion of the program has 54 user sites which include parks, schoolyards, commercial landscaping, and roadway medians. All operations are conducted in accordance with the Regional Water Quality Control Board (RWQCB) and State Water Resources Control Board recycled water standards and SRCSD's Master Reclamation Permit Waste Discharge Requirement (WDR) #97-146). SCWA's Phase 2 system is currently in progress and expected to begin treated recycled water deliveries upon completion of the Harvest Water pipeline.

*Figure 2-9: SSA Non-Potable Water System Schematic [source: Recycled Water Feasibility Study[34]]*




[34] Figure is from the SCWA's July 2017 Recycled Water Feasibility Study, Figure 4-3.

## 2.5 Energy Intensity

Among the statutory changes enacted with new requirements for 2020 UMWPs, an urban supplier shall include any of the following information it can readily obtain in the 2020 UWMP:[35]

- An estimate of the amount of energy used to extract or divert water supplies.
- An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
- An estimate of the amount of energy used to treat water supplies.
- An estimate of the amount of energy used to distribute water supplies through its distribution systems.
- An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
- An estimate of the amount of energy used to place water into or withdraw from storage.
- Any other energy-related information the urban water supplier deems appropriate.

Referred to as "Energy Intensity Reporting" for urban water suppliers, energy Intensity is defined as: total amount of energy expended in kilowatt-hours (kWh) by the urban water supplier on a per acre-foot basis to take water from the location where the urban water supplier acquires the water to its point of delivery.

Due to the way that water is supplied in the various SCWA service areas, it is not currently possible to separate out extraction, treatment, storage, and distribution energy uses. This is due to the number of well head treatment facilities on a single power meter as well as wells located at tank sites with only a single power meter. Given this, SCWA uses the Total Utility Approach. This method sums the annual energy consumed for all water management processes, divided by total volume of water in acre feet. These processes include extraction, diversion, conveyance, placement into storage, treatment, and distribution. The total energy intensity is reported in Table 2-8.

*Table 2-6: Energy Intensity – Total Utility Approach*

| Sum of All Water Management Processes | |
|---|---|
| Volume of Water Entering Process (acre-feet) | 52,465 |
| Energy Consumed (kWh) | 25,829,586 |
| Energy Intensity (kWh/acre-foot) | 492 |

[35] California Water Code Section 10631.2(a).

# Chapter 3
# Water Supply

Sacramento County Water Agency (SCWA) has numerous water assets that are available to serve the separate service areas throughout its broad boundary. The water assets consist of surface water rights, groundwater rights, and surface water and groundwater supply contracts. The purpose of this section is to describe each of these water assets in detail as they relate to the various water service areas within SCWA and provide a detailed summary for SCWA water supply portfolio under normal, single dry, and five-consecutive dry year conditions through 2045.

## 3.1 Description of SCWA's Surface Water Rights and Contracts

SCWA has twelve surface water rights and water supply contracts – all with varying terms and conditions and all with varying degrees of water supply reliability. The rights and contracts are as follows:

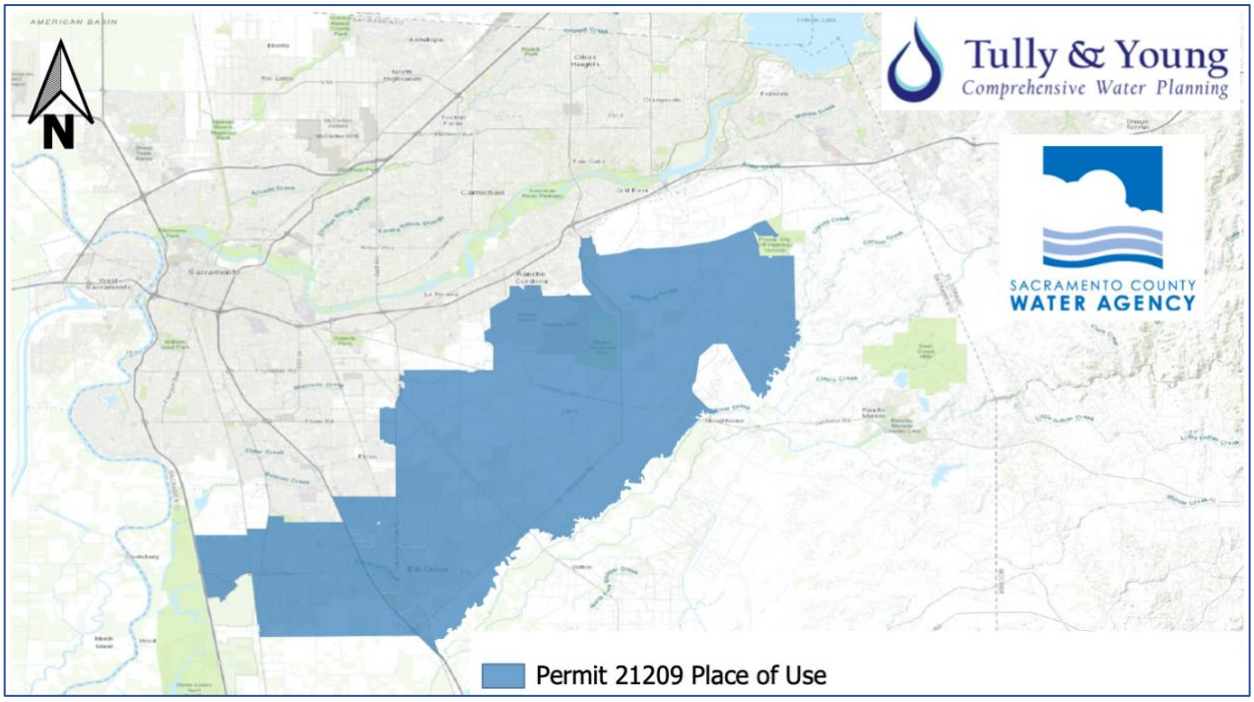
1. SWRCB Appropriative Water Right Permit 21209
2. SCWA CVP Contract 14-06-200-5198B-IR1-P (Feb 2020) ("SMUD Contract")
3. SCWA CVP Contract 6-07-20-W1372-P (Feb 2020) ("Fazio Contract")
4. Agreement Between Sacramento County, SCWA and Aerojet with respect to Transfer of GET Water
5. SWRCB Appropriative Water Right License 1062
6. SWRCB Appropriative Water Right License 4060
7. Contract Between State of California Department of Water Resources and North Delta Water Agency
8. 2002 Wholesale Agreement Between SRCSD and SCWA
9. 2004 Agreement with the City of Sacramento for Wholesaling and/or Wheeling Water Service for Sacramento International Airport and Metro Air Park
10. 2000 Agreement Between City of Sacramento and the Sacramento County Water Agency to Treat and Deliver (Wheel) Surface Water
11. 2000 Memorandum of Understanding Regarding the Operation of A Water System Interconnection at 2750 Mercantile Drive
12. Fruitridge Vista Water Company Contract now held by Cal American Water Company

Each of these water supply sources is described separately in this section with an analysis of the historic uses and future supply opportunities. Importantly, the water management actions described in this chapter as well as chapters 4 and 5, demonstrate SCWA's use of local water supplies reducing its need to import water from other regions in California.

### 3.1.1 SWRCB Appropriative Water Right Permit 21209

In 1995, SCWA filed Application 30454 and obtained Water Right Permit 21209 (Permit 21209). Permit 21209 allows SCWA to divert up to 132 cubic feet per second in all months of the year from the Sacramento River. Permit 21209 may be used anywhere in SCWA's Zone 40 for municipal uses. Figure 3-1 shows Permit 21209's place of use. The total supply potentially available under Permit 21209 is 71,000 acre-feet per year.

*Figure 3-1: Permit 21209 Place of Use*




SCWA's diversion under this water right is subject to "Term 91." The State Water Resources Control Board (SWRCB) may declare a Term 91 condition when the natural flows in the Sacramento River are insufficient to meet the various water quality and water flow requirements in the Delta. When SWRCB declares Term 91, SCWA must cease diversions under Permit 21209. In normal water years, Term 91 is usually declared on June 1 and then released on October 1. Occasionally, the normal year Term 91 declaration varies where runoff patterns and amounts deviate from anticipated conditions. For example, in 2018 (a normal water year), Term 91 was released on October 1 then reinstated on October 15. It was then re-released on November 1. It is likely that Term 91 will be declared more often in the future, reducing the diversion periods available for SCWA's Permit 21209.[36] It is important to note that the diversion limitation of 132 cfs in Permit 21209 limits the monthly availability of the water in a normal year (that includes Term 91) to 7,855 acre-feet per month.

[36] A short review of SCWA's Permit Progress Reports shows that the diversion and use reporting may deviate from the legal requirements under the water right and under-reports the conserved water, reclaimed/recycled water, and conjunctive groundwater uses in SCWA's service area.

Term 91 has significant implications for diversions in dry years and dry conditions. In 2014, one of the driest years on record, Term 91 was declared on April 1 and lasted through December. In the Fall and Winter of 2020-2021, Term 91 was in effect from October 15 through January 4. Accordingly, Term 91 will likely impact SCWA's ability to directly divert and deliver Sacramento River water supplies in the future under Permit 21209. Table 3-1 shows the last 10 years of Permit 21209's monthly supply deliveries.

*Table 3-1: Last 10 Years of SCWA Permit 21209 Monthly Water Deliveries (acre-feet per year)*[37]

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 0 | 0 | 0 | 101 | 584 | 360 | 1,061 | 1,362 | 1,458 | 1,113 | 732 | 598 |
| 2012 | 515 | 479 | 505 | 565 | 845 | 1,120 | 1,391 | 1,413 | 1,306 | 1,089 | 65 | 0 |
| 2013 | 374 | 648 | 775 | 810 | 1,521 | 1,436 | 1,533 | 1,459 | 1,345 | 1,389 | 1,267 | 437 |
| 2014 | 9 | 0 | 485 | 695 | 1,124 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2015 | 0 | 0 | 555 | 825 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2016 | 0 | 0 | 0 | 872 | 223 | 17 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2017 | 0 | 0 | 0 | 0 | 767 | 638 | 640 | 459 | 861 | 967 | 658 | 436 |
| 2018 | 0 | 238 | 949 | 1,217 | 1,732 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2019 | 667 | 728 | 917 | 371 | 460 | 594 | 570 | 761 | 702 | 947 | 993 | 690 |
| 2020 | 57 | 387 | 1,658 | 1,746 | 2,043 | 303 | 0 | 0 | 0 | 688 | 0 | 0 |

Last Permit 21209 is just that – a Permit Supply. Under California water rights law, SCWA must demonstrate full beneficial use of the water supply by December 31, 2030. In the event SCWA does not put all the water under Permit 21209 to beneficial use by that date, the SWRCB may either grant a permit extension or allow the permit to expire, which may reduce the amount of water SCWA could use. Nevertheless, for purposes of this UWMP we assume that SCWA has the capability to use the permitted water supplies for beneficial uses in its service area through 2045.

Table 3-2 shows the projected annual water supplies under Permit 21209 for normal, single dry, and five consecutive dry years through 2025. It is important to note the limitation on this supply on a monthly timestep as shown in the master supply table at the end of this chapter.

[37] Table 3-1 indicates that diversions under Permit 21209 may have occurred, or been misreported, when Term 91 was in effect.

*Table 3-2: Permit 21209 Normal Year, Single Dry Year, and Five Consecutive Year Availability*

| Year | Acre-feet per Year |
|---|---|
| Normal | 62,840 |
| Single Dry | 31,420 |
| Dry Year 1 | 47,130 |
| Dry Year 2 | 39,275 |
| Dry Year 3 | 31,420 |
| Dry Year 4 | 39,275 |
| Dry Year 5 | 47,130 |

Table 3-3 shows the anticipated annual water supply deliveries for normal, single dry, and five consecutive dry years for Permit 21209 through 2045.

*Table 3-3: Permit 21209 Annual Deliveries in Varying Year Types Through 2045 (acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Normal | | 62,840 | 62,840 | 62,840 | 62,840 | 62,840 |
| Single Dry Year | | 31,420 | 31,420 | 31,420 | 31,420 | 31,420 |
| Multi-Year Drought | Year 1 | 47,130 | 47,130 | 47,130 | 47,130 | 47,130 |
| | Year 2 | 39,275 | 39,275 | 39,275 | 39,275 | 39,275 |
| | Year 3 | 31,420 | 31,420 | 31,420 | 31,420 | 31,420 |
| | Year 4 | 39,275 | 39,275 | 39,275 | 39,275 | 39,275 |
| | Year 5 | 47,130 | 47,130 | 47,130 | 47,130 | 47,130 |

A normal year for this water right relates to the probability of Term 91 implementation. Normally, Term 91 is implemented on June 1 and lifted on October 1. Thus, we have used the historical highest supply deliveries during these time periods to show the supply availability in 2025 and then gradually increased the amount through 2045 by approximately 2,000 acre-feet per year based upon reasonable demand growth projections. The supply figures in Table 3-3 represent supplies that would likely be delivered and used through 2045. Table 3-2 shows actual supply availability.

A single dry year under this water right is defined by an extended implementation of Term 91. In this instance, 2014 and 2015 represent the most drastic water years where Term 91 was in place all or part of nine months of the year. As such, we will use three months of availability to reflect the single dry year scenario and base the condition on 2015 – the most conservative dry year representation. We increase the demand by 300 acre-feet per year into the future to represent a reasonable demand increase in each month (100 acre-feet per month) when the water supply is available.

Multiple dry years under this water right permit represent conditions where Term 91 is in effect over varying periods for the water right. In this future scenario, we anticipate conditions where Term 91 is in effect in Year 1 and Year 2 from May through October – representing an extension of two months beyond the normal Term 91 implementation. Thus, this water supply is available for six of twelve months out of the year. We increase the potential supply availability by 100 acre-feet per month of

availability into the future (still well within the total available water supply under the water right). Years 3 and 4 represent nine months of Term 91 implementation in accordance with 2014 and 2015, yet replace monthly usages with the highest usage during those periods on record. Again, we increase the supply available under these years as increasing by 100 acre-feet per month into the future. Last, Year 5 represents a reduced Term 91 extension in May and October like Years 1 and 2 and has a 100 acre-feet per month of availability increase into the future. All of these figures represent the highest historical water uses in the identified water months with reasonable water supply augmentation.

### 3.1.2 SCWA CVP Contract 14-06-200-5198B-IR1-P (Feb 2020) (SMUD Contract)

In 1970, the Sacramento Municipal Utility District (SMUD) entered a Central Valley Project (CVP) water service contract with the United States Bureau of Reclamation (Reclamation). SMUD was unable to utilize all of the water supplies under that contract and assigned a portion of its CVP contract to SCWA in 2006. SCWA received the contract and in February of 2020 converted the contract to a lasting supply under the Water Infrastructure Improvements for the Nation (WIIN) Act. These activities created the final SCWA CVP Contract 14-06-5198B-IR1-P (hereafter, "SMUD Contract") that has no expiration or renewal date. SMUD Contract has a total supply volume of 30,000 acre-feet of CVP Project Supply water. CVP Project Supply water is derived from Reclamation's SWRCB issued appropriative water rights on the American River watershed system that allow Reclamation to divert water to storage in Folsom Reservoir for delivery throughout the calendar year. SCWA's water supply under this contract may be used for Municipal and Industrial purposes and may be diverted during any month of the year. Moreover, Article 3(g) allows SCWA to "carryover" or "pre-use" water supplies made available under the contract. Table 3-4 shows the last 5 years of use for SCWA SMUD Contract.

*Table 3-4: Last Five Years of SMUD Contract Deliveries (acre-feet per year)*

| Year | Percent Allocation | CVP Supplies |
|---|---|---|
| 2015 | 25% | 0 |
| 2016 | 100% | 0 |
| 2017 | 100% | 0 |
| 2018 | 75% | 9,329 |
| 2019 | 100% | 10,671 |
| 2020 | 75% | 4,758 |

The water supplies available under SMUD Contract are subject to Reclamation's Municipal and Industrial Shortage Policy (M&I Shortage Policy).[38] The M&I Shortage Policy allocates water supplies under constrained conditions based upon Reclamation's water year percentage allocation number applied against the last three years of CVP Project Supply use in unconstrained conditions. Adjustments to the historical use numbers can be made based on alternative water supplies used in lieu of CVP Project Supply, population growth, extraordinary conservation measures, and other unique or unusual

[38] https://cawaterlibrary.net/wp-content/uploads/2017/10/miwsp-guidelines.pdf

circumstances. The primary component for obtaining larger dry year supplies, however, is that SCWA should use CVP Project Supply in unconstrained water years to access more CVP Project Supply in constrained water years.

SMUD Contract water may be used anywhere in SCWA's Zone 40 as depicted in Exhibit A to the contract. The place of use includes all of Elk Grove including service areas served by Elk Grove Water District. Figure 3-2 shows the SMUD Contract place of use. In addition, Article 9 allows transfers and exchanges of water supplied under the contract described later in this section.

Table 3-5 shows the anticipated annual water supply deliveries for normal, single dry, and five consecutive dry years for SCWA SMUD Contract through 2045.

*Table 3-5: SMUD Contract Annual Deliveries in Varying Year Types (acre-feet per year)*

| Year | | Last 3 Years of 100% Allocation* | Percent Allocation | Allocation Amount |
|---|---|---|---|---|
| Normal | | 8,253 | 100% | 30,000 |
| Single Dry | | 8,253 | 25% | 2,063 |
| Multi-Year Drought | 2021 (1st year) | 8,253 | 75% | 6,190 |
| | 2022 (2nd year) | 8,253 | 50% | 4,126 |
| | 2023 (3rd year) | 8,253 | 25% | 2,063 |
| | 2024 (4th year) | 8,253 | 25% | 2,063 |
| | 2025 (5th year) | 8,253 | 50% | 4,126 |

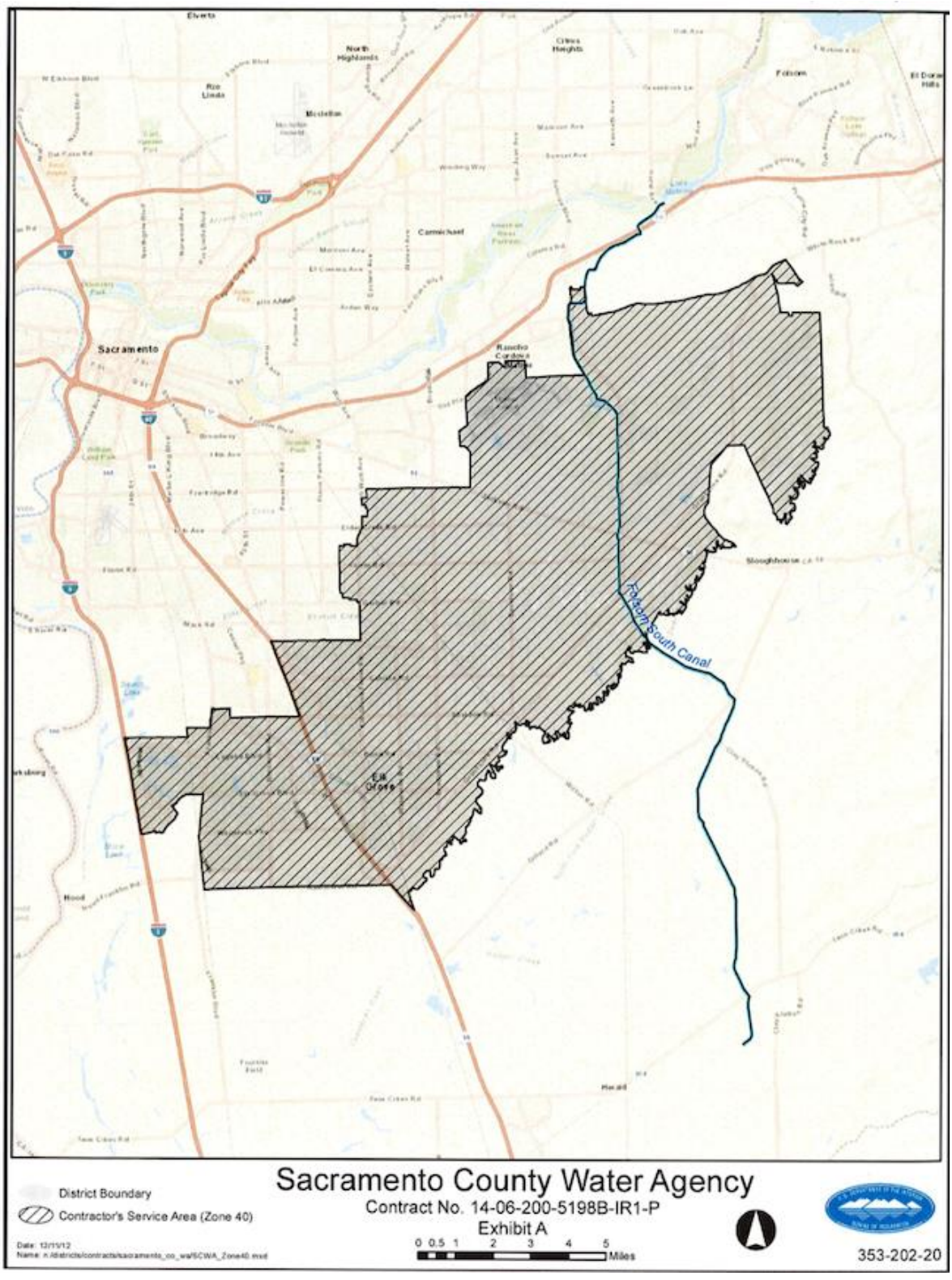
*The allocation number is based upon the M&I Shortage Policy available use adjustments

Projected water supply availability under this water supply is shown in Table 3-6.

*Table 3-6: SMUD Contract Future Projected Supply Availability Through 2045 (acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Normal | | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 |
| Single Dry Year | | 2,023 | 2,500 | 3,750 | 5,000 | 7,500 |
| Multi-Year Drought | Year 1 | 6,068 | 7,500 | 11,250 | 15,000 | 22,500 |
| | Year 2 | 4,045 | 5,000 | 7,500 | 10,000 | 15,000 |
| | Year 3 | 2,023 | 2,500 | 3,750 | 5,000 | 7,500 |
| | Year 4 | 2,023 | 2,500 | 3,750 | 5,000 | 7,500 |
| | Year 5 | 4,045 | 5,000 | 7,500 | 10,000 | 15,000 |

*Figure 3-2: Place of Use under SCWA SMUD Contract*



### 3.1.3 SCWA CVP Contract 6-07-20-W1372-P (Fazio Contract)

In 1999, the SCWA entered a Central Valley Project (CVP) water service contract with Reclamation for 22,000 acre-feet of CVP Project Supply. In 2016, SCWA assigned 7,000 acre-feet of the CVP Project Supply to the City of Folsom, leaving 15,000 acre-feet of CVP Project Supply remaining on the contract. SCWA converted the contract to a lasting supply under the Water Infrastructure Improvements for the Nation (WIIN) Act in February 2020. All of these activities created the final SCWA CVP Contract 6-07-20-W1372-P (hereafter, "Fazio Contract") that has no expiration or renewal date. Fazio Contract has a total supply volume of 15,000 acre-feet of CVP Project Supply water. CVP Project Supply water is derived from Reclamation's SWRCB issued appropriative water rights on the American River watershed system that allow Reclamation to divert water to storage in Folsom Reservoir for delivery throughout the calendar year. SCWA's water supply under this contract may be used for Municipal and Industrial purposes and may be diverted during any month of the year. Moreover, Article 3(g) allows SCWA to "reschedule" water supplies made available under the contract for use in a subsequent year. Table 3-7 shows the use for Fazio Contract since 2015.

*Table 3-7: Fazio Contract Deliveries 2015-2020 (acre-feet per year)*

| Year | Percent Allocation | CVP Supplies |
|---|---|---|
| 2015 | 25% | 125 |
| 2016 | 100% | 8,381 |
| 2017 | 100% | 9,396 |
| 2018 | 75% | 104 |
| 2019 | 100% | 0 |
| 2020 | 75% | 2,375 |

The water supplies available under Fazio Contract are subject to Reclamation's Municipal and Industrial Shortage Policy (M&I Shortage Policy).[39] The M&I Shortage Policy allocates water supplies under constrained conditions based upon Reclamation's water year percentage allocation number applied against the last three years of CVP Project Supply use in unconstrained conditions. Adjustments to the historical use numbers can be made based on alternative water supplies used in lieu of CVP Project Supply, population growth, extraordinary conservation measures, and other unique or unusual circumstances. The primary component to obtain significant supplies requires SCWA to use CVP Project Supply in unconstrained water years in order to have access to CVP Project Supply in constrained water years.

Fazio Contract water may be used anywhere in SCWA's Zone 40 as depicted in Exhibit A to the contract. The place of use includes all the City of Elk Grove including service areas served by Elk Grove Water District. Figure 3-3 shows the Fazio Contract place of use. Unlike the SMUD Contract, Article 9 restricts the transfer or exchange of this water supply to within Sacramento County.

[39] https://cawaterlibrary.net/wp-content/uploads/2017/10/miwsp-guidelines.pdf

Table 3-8 shows the anticipated annual water supply deliveries for normal, single dry, and five consecutive dry years for Fazio Contract through 2025.

*Figure 3-3: Place of Use under Fazio Contract*

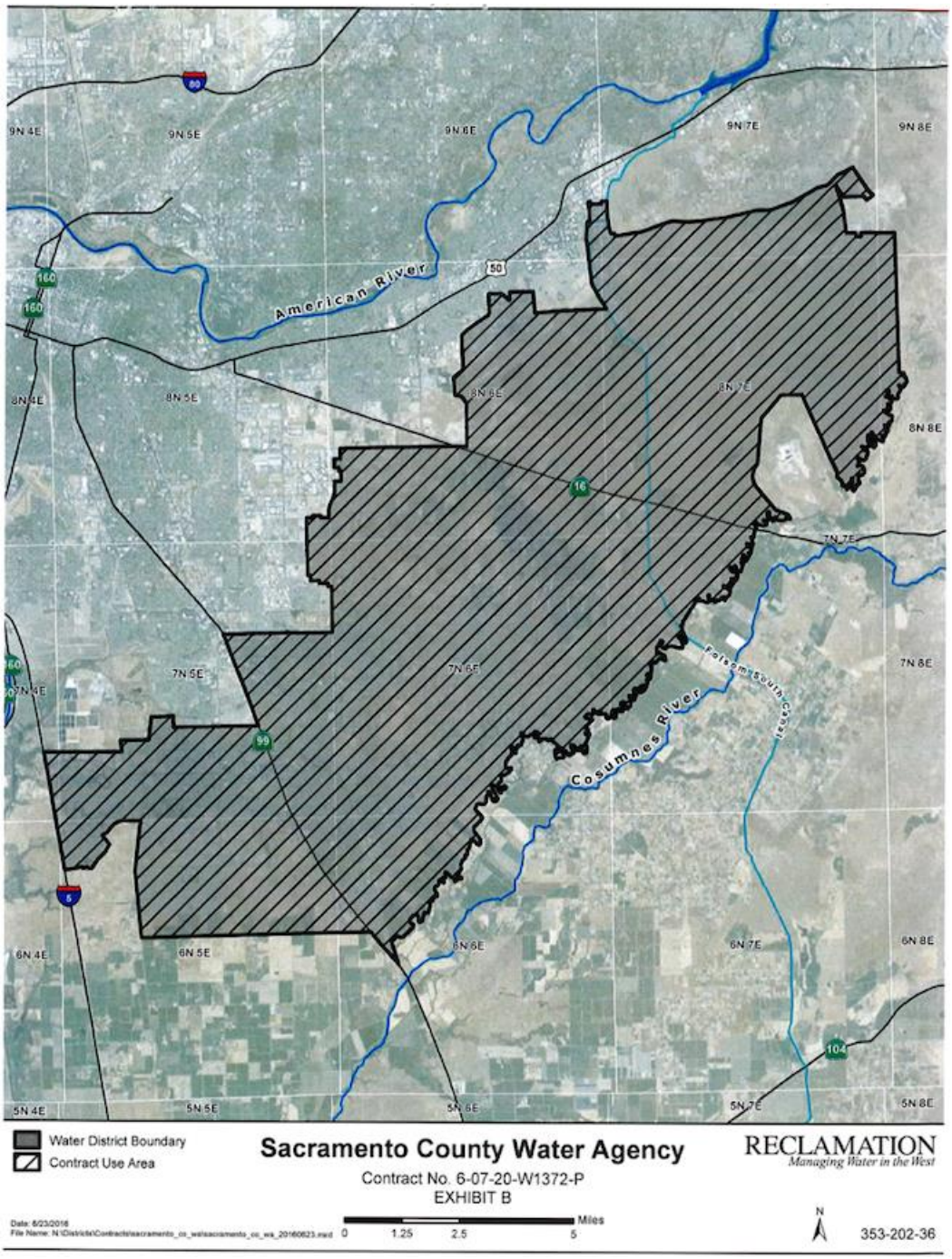


*Table 3-8: Fazio Contract Annual Deliveries in Varying Year Types (acre-feet per year)*

| Year | | Last 3 years of 100% allocation | Percent Allocation | Allocation Amount |
|---|---|---|---|---|
| Normal | | 5,926 | 100% | 15,000 |
| Single Dry | | 5,926 | 25% | 1,481 |
| Multi-Year Drought | 2021 (1st year) | 5,926 | 75% | 4,444 |
| | 2022 (2nd year) | 5,926 | 50% | 2,963 |
| | 2023 (3rd year) | 5,926 | 25% | 1,481 |
| | 2024 (4th year) | 5,926 | 25% | 1,481 |
| | 2025 (5th year) | 5,926 | 50% | 2,963 |

The total projected water supply available under the Fazio Contract through 2045 is shown in Table 3-9.

*Table 3-9: Future Projected Supply Availability Through 2045 (acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Normal | | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 |
| Single Dry Year | | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 |
| Multi-Year Drought | Year 1 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 |
| | Year 2 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| | Year 3 | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 |
| | Year 4 | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 |
| | Year 5 | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 |

### 3.1.4 SCWA Aerojet GET Water

In 2010, Aerojet General Corporation (Aerojet) and Sacramento County Water Agency entered a formal settlement agreement related to groundwater contamination issues caused by Aerojet in the SCWA service area. As part of this agreement, Aerojet agreed to deliver and SCWA agreed to receive up to 8,900 acre-feet of Aerojet Groundwater Extraction and Treatment (GET) water. Aerojet extracts and treats contaminated groundwater at its GET facilities from the American River watershed region and discharges the treated water to the American River. SCWA diverts this water at the Freeport Regional Water Project facility for use throughout its service area. Article 2.3 of the settlement agreement states that SCWA "assumes all risks concerning Aerojet's right, title, and interest in GET Transferred Water." Nevertheless, the supply availability has not diminished and SCWA uses the water in its service area. The delivery pattern available for the water may allow SCWA to take larger portions of the supply, if not all the supply, as needed and made available by Aerojet. The water supply is 100% reliable in all year types because the groundwater extraction and treatment are part of a federally mandated remediation program. Aerojet's remediation program will continue beyond the planning horizon of this SCWA's UWMP. Table 3-10 shows the total Aerojet GET water used over the last 5 years in SCWA's service area.

*Table 3-10: Last Five Years of SCWA Aerojet GET Water Deliveries (acre-feet per year)*

| Year | Total |
|---|---|
| 2015 | 4,529 |
| 2016 | 423 |
| 2017 | 0 |
| 2018 | 3,224 |
| 2019 | 0 |
| 2020 | 3,587 |

Table 3-11 shows the total Aerojet GET water available in normal, single dry, and five consecutive dry years through 2025.

*Table 3-11: Aerojet GET Water Supply Availability Through 2025 (acre-feet per year)*

| Year | | GET Contract Amount |
|---|---|---|
| Normal | | 8,900 |
| Single Dry | | 8,900 |
| Multi-Year Drought | 2021 (1st year) | 8,900 |
| | 2022 (2nd year) | 8,900 |
| | 2023 (3rd year) | 8,900 |
| | 2024 (4th year) | 8,900 |
| | 2025 (5th year) | 8,900 |

Table 3-12 shows the supply availability of the Aerojet GET water through 2045.

*Table 3-12: Aerojet GET Water Supply Availability 2025-2045 (acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Normal | | 8,900 | 8,900 | 8,900 | 8,900 | 8,900 |
| Single Dry Year | | 8,900 | 8,900 | 8,900 | 8,900 | 8,900 |
| Multi-Year Drought | Year 1 | 8,900 | 8,900 | 8,900 | 8,900 | 8,900 |
| | Year 2 | 8,900 | 8,900 | 8,900 | 8,900 | 8,900 |
| | Year 3 | 8,900 | 8,900 | 8,900 | 8,900 | 8,900 |
| | Year 4 | 8,900 | 8,900 | 8,900 | 8,900 | 8,900 |
| | Year 5 | 8,900 | 8,900 | 8,900 | 8,900 | 8,900 |

### 3.1.5 SWRCB Appropriative Water Right License 1062

SCWA holds Water Right License 1062 to divert 4.09 cubic feet per second from the Sacramento River from April 1 to October 1 each year for a maximum annual total diversion of 805 acre-feet.[40] The water right has a priority date of August 28, 1918 and is not subject to Term 91. Assuming the recent SWRCB Order is finalized, the water supply may be used for municipal uses in Zone 40 in the future. Figure 3-4

[40] Draft SWRCB Order dated January 22, 2021 for license 1062 and 4060

shows the place of use of License 4060. Table 3-13 shows the total License 1062 water available in all year types.

*Table 3-13: License 1062 Water Supply Availability (acre-feet per year)*

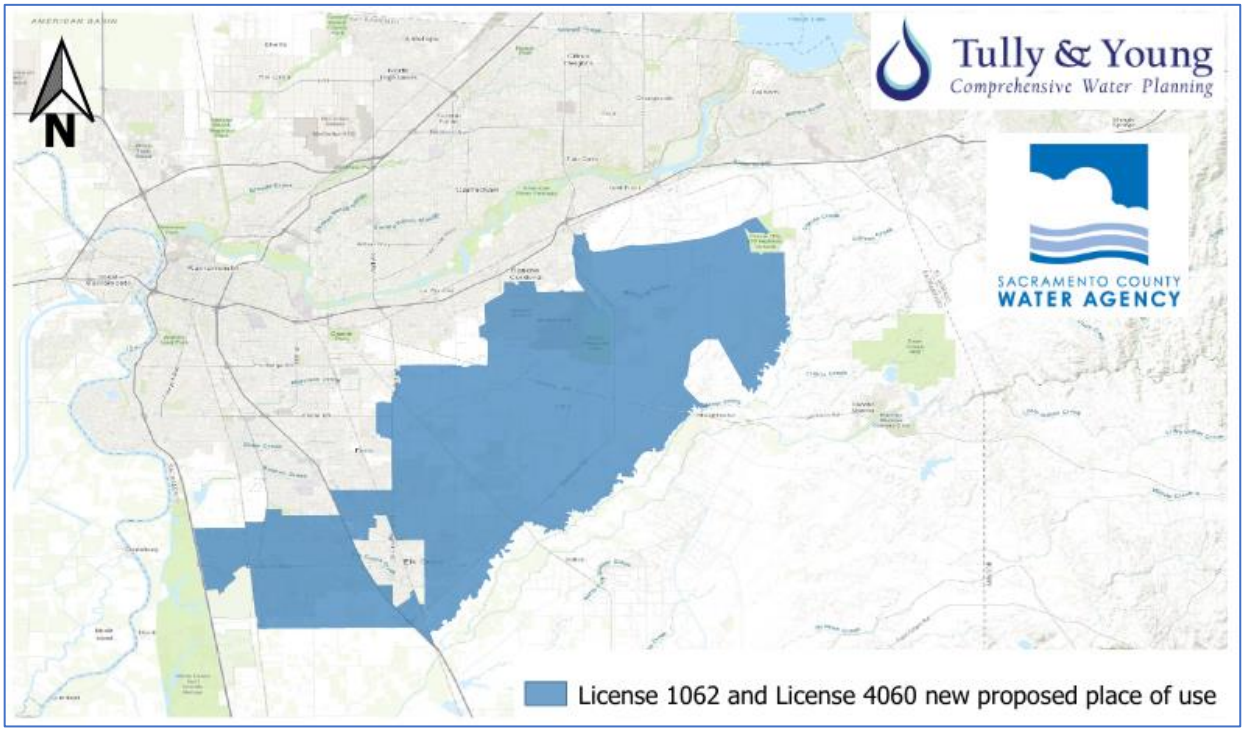
| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| | | | | | | |
| Normal | | 805 | 805 | 805 | 805 | 805 |
| Single Dry Year | | 805 | 805 | 805 | 805 | 805 |
| Multi-Year Drought | Year 1 | 805 | 805 | 805 | 805 | 805 |
| | Year 2 | 805 | 805 | 805 | 805 | 805 |
| | Year 3 | 805 | 805 | 805 | 805 | 805 |
| | Year 4 | 805 | 805 | 805 | 805 | 805 |
| | Year 5 | 805 | 805 | 805 | 805 | 805 |

## 3.1.6 SWRCB Appropriative Water Right License 4060

SCWA holds Water Right License 4060 to divert 1.48 cubic feet per second from the Sacramento River from May 1 to October 1 each year for a maximum annual total diversion of 101 acre-feet.[41] The water right has a priority date of September 20, 1951. The water supply may be used for irrigation in an area in northern Sacramento County. Figure 3-4 shows the place of use of License 4060.

Table 3-14 shows the total License 4060 water available in all year types.

*Figure 3-4: Place of Use of License 1062 and License 4060*




[41] Draft SWRCB Order dated January 22, 2021 for license 1062 and 4060

*Table 3-14: License 4060 Water Supply Availability (values in acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| | | | | | | |
| Normal | | 101 | 101 | 101 | 101 | 101 |
| Single Dry Year | | 101 | 101 | 101 | 101 | 101 |
| Multi-Year Drought | Year 1 | 101 | 101 | 101 | 101 | 101 |
| | Year 2 | 101 | 101 | 101 | 101 | 101 |
| | Year 3 | 101 | 101 | 101 | 101 | 101 |
| | Year 4 | 101 | 101 | 101 | 101 | 101 |
| | Year 5 | 101 | 101 | 101 | 101 | 101 |

### 3.1.7 Contract Between State of California DWR and North Delta Water Agency

The North Delta Water Agency was formed in 1974 to protect the water resources in specific portions of Yolo, Solano, Sacramento, and San Joaquin counties. In 1981, the NDWA executed the "*Contract Between the California Department of Water Resources for the Assurance of a Dependable Water Supply of Suitable Quality*" (NDWA Contract) as a settlement of claims related to the then-proposed "Peripheral Canal." The NDWA Contract assures that the State, through both the State Water Project (SWP) and the California Department of Water Resources' (DWR) water right permits, will maintain a dependable water supply of adequate quantity and quality for municipal, industrial, and agricultural purposes within the NDWA service area. Specifically, Article 8(a) states in relevant part "…the State shall furnish such water as may be required within the Agency to the extent not otherwise available under the water rights of water users." SCWA analyzed its service area boundary in October of 2020 and determined that a portion of its service area lies within the NDWA service area and that property owners within the NDWA boundary are paying property tax assessments to secure NDWA water supplies. Figure 3-5 shows the overlap between SCWA service area and the NDWA service area.

SCWA has never delivered the NDWA water supplies for uses within its service area boundary. NDWA water supplies are 100% reliable in all year types. SCWA plans to deliver these supplies in future years to meet a portion of its service area demands – including all current and projected future demands in the NDWA service area.

Table 3-15 shows the projected NDWA water supply availability for normal, single dry, and five consecutive dry years through 2025.

Table 3-16 shows the projected monthly future NDWA water deliveries into SCWA's service area through 2045.

*Figure 3-5: SCWA Service Area and NDWA Service Area*

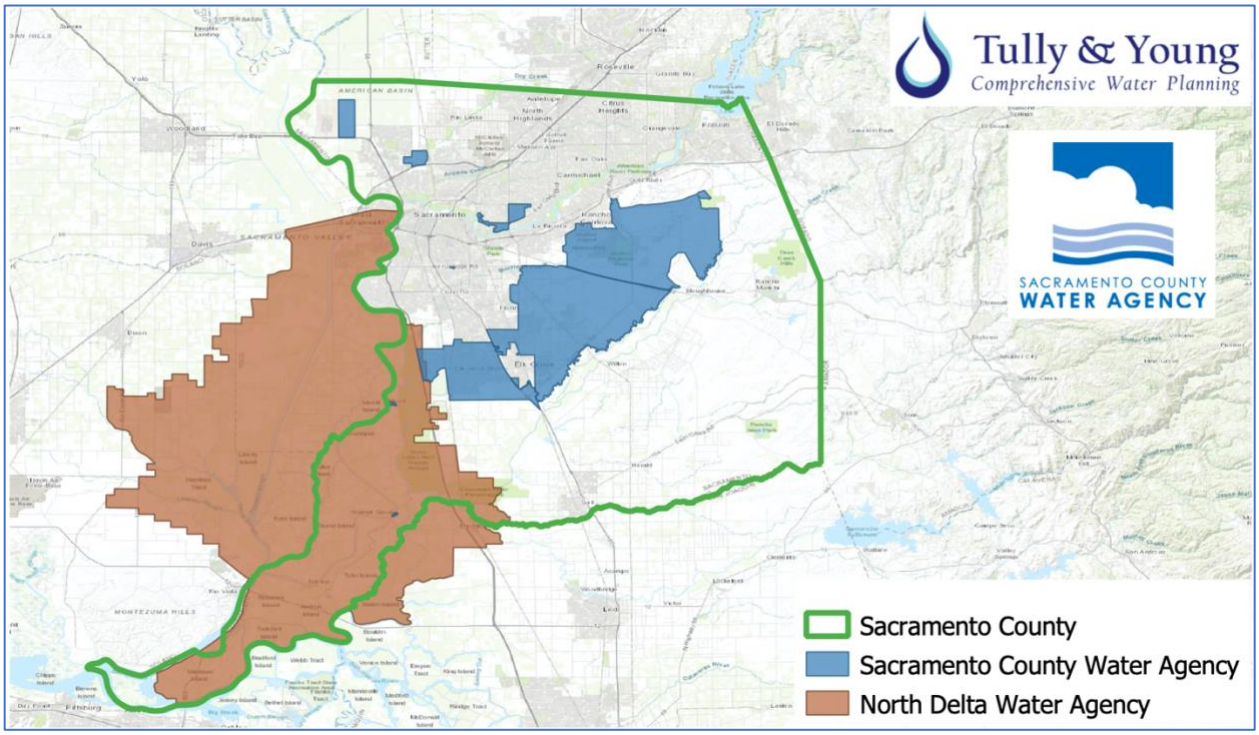



*Table 3-15: NDWA Water Supply for SCWA through 2025 (values in acre-feet per year)*

| Year | | North Delta Water Agency |
|---|---|---|
| Normal | | 450 |
| Single Dry | | 450 |
| Multi-Year Drought | 2021 (1st year) | 450 |
| | 2022 (2nd year) | 450 |
| | 2023 (3rd year) | 450 |
| | 2024 (4th year) | 450 |
| | 2025 (5th year) | 450 |

*Table 3-16: NDWA Water Supply for SCWA (values in acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| | | | | | | |
| Normal | | 450 | 450 | 450 | 450 | 450 |
| Single Dry Year | | 450 | 450 | 450 | 450 | 450 |
| Multi-Year Drought | Year 1 | 450 | 450 | 450 | 450 | 450 |
| | Year 2 | 450 | 450 | 450 | 450 | 450 |
| | Year 3 | 450 | 450 | 450 | 450 | 450 |
| | Year 4 | 450 | 450 | 450 | 450 | 450 |
| | Year 5 | 450 | 450 | 450 | 450 | 450 |

### 3.1.8 2002 Wholesale Agreement Between SRCSD and SCWA

In 2002, Sacramento Regional County Sanitation District (SRCSD) agreed to deliver up to 3.5 million gallons a day of recycled water to SCWA. Section V of the agreement allows SCWA to only take the amount of recycled water "needed to meet the recycled water demands of [its] customers." SRCSD will sell the water to SCWA at a discounted cost of 60% of SCWA's current water rate. Moreover, Section XIII requires SRCSD to provide a backup well at approximately 1500 GPM in the event that the recycled water supply does not meet the standards of Order No. 97-146 (Master Water Reclamation Permit). The agreement has no expiration date. Although no formal amendments to the agreement have occurred, SCWA recognized its maximum use was 1.98 mgd of recycled water and allowed SRCSD to deliver the remaining water to the S.P.A. Cogeneration Facility located near the Campbell Soup Plant site. To date, recycled water has only been delivered to the Phase 1 area. Nevertheless, SCWA continues to receive recycled water supplies under this agreement for use in the Elk Grove area. Figure 3-6 shows the area receiving recycled water from SRCSD.

*Figure 3-6: Place of Use of SCWA Recycled Water*

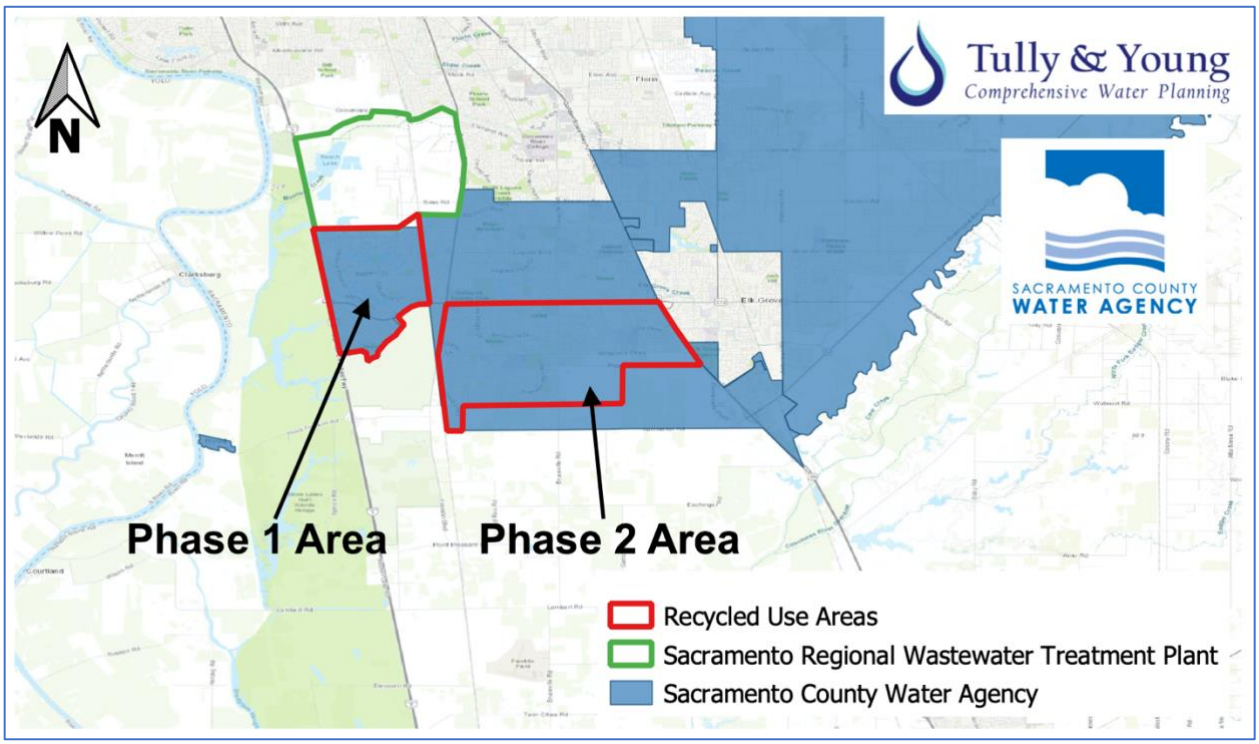


Table 3-17 shows the last five years of recycled water deliveries into SCWA's service area.

*Table 3-17: Last Five Years of SCWA Recycled Water Deliveries (values in acre-feet per year)*

| Year | Total |
|---|---|
| 2015 | 745 |
| 2016 | 720 |
| 2017 | 845 |
| 2018 | 861 |
| 2019 | 901 |
| 2020 | 962 |

The recycled water supply is derived from consumed indoor water supplies in the SRCSD service region. As such, this supply of water is 100% reliable in all year types barring some unforeseen issue impacted by the Master Water Reclamation Permit. Table 3-18 shows the projected recycled water supplies for normal, single dry, and five consecutive dry years through 2025 and Table 3-19 shows the reliability through 2045.

*Table 3-18: SCWA Recycled Water Supply (values in acre-feet per year)*

| Year | | Recycled Production |
|---|---|---|
| Normal | | 3,921 |
| Single Dry | | 3,921 |
| Multi-Year Drought | 2021 (1st year) | 3,921 |
| | 2022 (2nd year) | 3,921 |
| | 2023 (3rd year) | 3,921 |
| | 2024 (4th year) | 3,921 |
| | 2025 (5th year) | 3,921 |

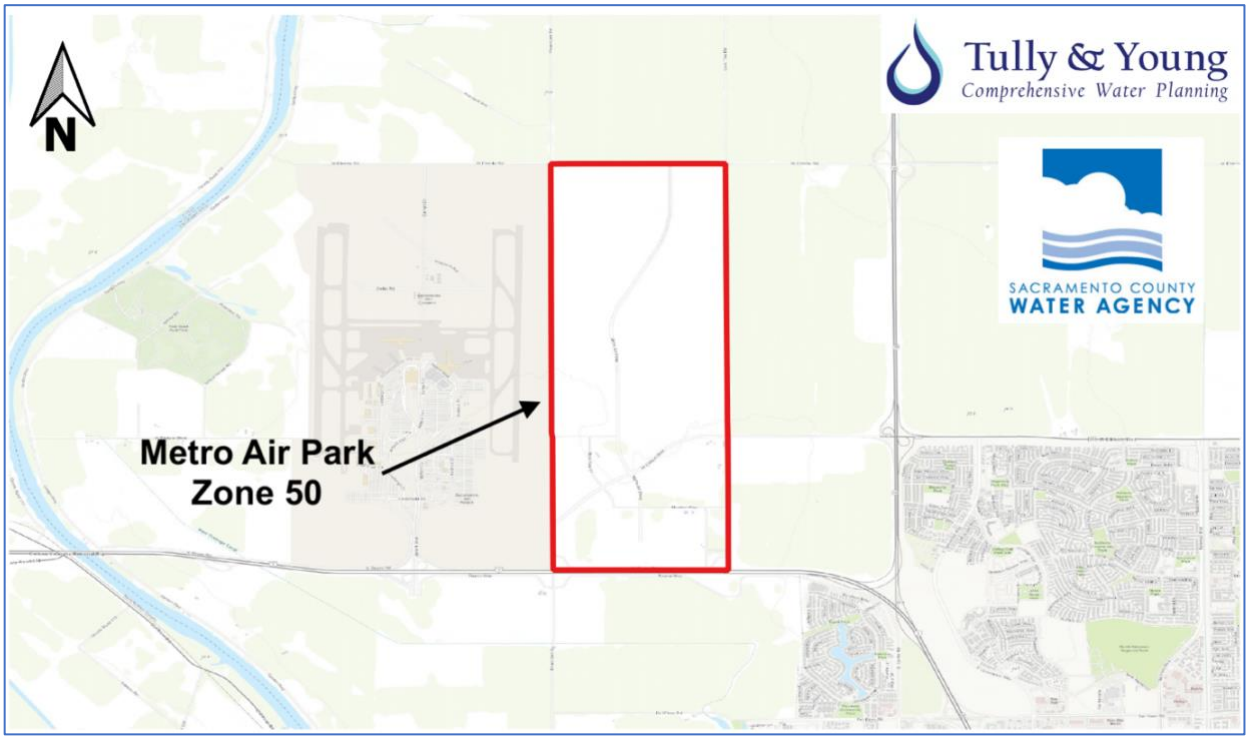
*Table 3-19: Future Projected Supply Availability Through 2045 (values in acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| | | | | | | |
| Normal | | 3,921 | 3,921 | 3,921 | 3,921 | 3,921 |
| Single Dry Year | | 3,921 | 3,921 | 3,921 | 3,921 | 3,921 |
| Multi-Year Drought | Year 1 | 3,921 | 3,921 | 3,921 | 3,921 | 3,921 |
| | Year 2 | 3,921 | 3,921 | 3,921 | 3,921 | 3,921 |
| | Year 3 | 3,921 | 3,921 | 3,921 | 3,921 | 3,921 |
| | Year 4 | 3,921 | 3,921 | 3,921 | 3,921 | 3,921 |
| | Year 5 | 3,921 | 3,921 | 3,921 | 3,921 | 3,921 |

### 3.1.9 2004 Agreement with the City of Sacramento for Wholesaling And/Or Wheeling Water Service for Sacramento International Airport and Metro Air Park

The City of Sacramento (City) and SCWA entered an agreement in October of 2004 to enable the City to provide wholesale water or wheel SCWA water to Sacramento International Airport and to SCWA Zone 50 for use at the proposed Metro Air Park (2004 Agreement). Although there have been attempts to subsume this agreement into subsequent agreements, the 2004 Agreement remains valid and enforceable. The City has delivered City water to the SCWA service areas described in the 2004 Agreement but, to date, SCWA has not wheeled any of its water supplies as allowed by the agreement. The context for this assessment is to describe the supply-side of the 2004 Agreement where the City provides a water supply to meet Airport and Metro Air Park water demands. Figure 3-7 shows the Metro Air Park service areas where City of Sacramento water could be directly delivered.

*Figure 3-7: SCWA Metro Air Park (Zone 50) Service Area*




The total water supply that the City delivers to the Airport and Metro Air Park will not exceed 11.7 million gallons per day (mgd) assuming that SCWA provides notice to the City in accordance with Article 5a that it needs more than 5 mgd. To date, SCWA has not reached the 5 mgd threshold. Moreover, the reductions in wholesale supply availability will be consistent with City reductions to its own customers and be curtailed upon "the occurrence of an emergency conditions." Thus, the future supply availability for these service areas may be adjusted on a monthly basis but may not exceed 5 mgd in the near term and 11.7 mgd in the long term. Table 3-20 shows the projected water supplies under the 2004 Agreement for normal, single dry, and five consecutive dry years through 2025. Table 3-21 shows the projected future annual deliveries under the 2004 Agreement for a normal, single dry, and five consecutive dry years through 2045.

*Table 3-20: 2004 Agreement Annual Deliveries in Varying Year Types (acre-feet per year)*

| Year | | Air Park Production |
|---|---|---|
| Normal | | 500 |
| Single Dry | | 500 |
| Multi-Year Drought | 2021 (1st year) | 500 |
| | 2022 (2nd year) | 500 |
| | 2023 (3rd year) | 500 |
| | 2024 (4th year) | 500 |
| | 2025 (5th year) | 500 |

*Table 3-21: Future Projected Supply Availability Through 2045 (acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Normal | | 1,058 | 2,088 | 3,112 | 4,142 | 5,195 |
| Single Dry Year | | 1,058 | 2,088 | 3,112 | 4,142 | 5,195 |
| Multi-Year Drought | Year 1 | 1,058 | 2,088 | 3,112 | 4,142 | 5,195 |
| | Year 2 | 1,058 | 2,088 | 3,112 | 4,142 | 5,195 |
| | Year 3 | 1,058 | 2,088 | 3,112 | 4,142 | 5,195 |
| | Year 4 | 1,058 | 2,088 | 3,112 | 4,142 | 5,195 |
| | Year 5 | 1,058 | 2,088 | 3,112 | 4,142 | 5,195 |

## 3.1.10 2000 Agreement Between City of Sacramento and the Sacramento County Water Agency to Treat and Deliver (Wheel) Surface Water

In 2000, the City and SCWA entered an agreement where the City would treat, wheel, and deliver SCWA water supplies to the lawful places of use of SCWA's water assets (2000 Agreement). The 2000 Agreement does not include additional water supply sources beyond those already possessed by SCWA but is an important component in potentially meeting water supply obligations in areas that are better connected to the City's water system. The 2020 UWMP does not incorporate the 2000 Agreement as a basis for any additional water supply reliability. SCWA does, however, have access to 11 MGD of firm capacity in the City's System.[42]

## 3.1.11 2000 Memorandum of Understanding Regarding the Operation of A Water System Interconnection at 2750 Mercantile Drive

In 2000, SCWA entered a water supply MOU with Southern California Water Company (Company) for potential water service through an interconnection at Mercantile Drive. Company could provide SCWA with 1,000 gallons per minute, or 1,613 acre-feet per year, on a maximum sustained flow rate through the eight inch system interconnection. SCWA may take the water and will be billed in accordance with Company Schedule No. AC-1, Arden-Cordova District. The dry-year reliability of this water source is less

[42] 2000 Agreement at 4.

certain as it relates directly to the reliability of the Company's overall supply system. Specifically, Article E states in relevant part that the Company "may limit supply to the County if operations of the Interconnection would adversely affect water service to Company's customers." Table 3-22 shows the last five years of Company water deliveries into SCWA's service area.

The Company water supply is derived from groundwater systems in Company's service area. As such, this supply of water is very reliable in all year types barring some unforeseen issue impacted by a significant outage or curtailment of Company's pre-1914 appropriative water right. As such, Table 3-23 shows the future planned use for Company's water in SCWA's service area.

*Table 3-22: Last Five Years of Company Water Deliveries to SCWA (acre-feet per year)*

| Retail Area | GSWC Wholesale |
|---|---|
| 2016 | 0.31 |
| 2017 | 0.49 |
| 2018 | 0.25 |
| 2019 | 0.72 |
| 2020 | 2.25 |

*Table 3-23: Company Water Supply in SCWA Through 2045 (acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Normal | | 1,613 | 1,613 | 1,613 | 1,613 | 1,613 |
| Single Dry Year | | 1,613 | 1,613 | 1,613 | 1,613 | 1,613 |
| Multi-Year Drought | Year 1 | 1,613 | 1,613 | 1,613 | 1,613 | 1,613 |
| | Year 2 | 1,613 | 1,613 | 1,613 | 1,613 | 1,613 |
| | Year 3 | 1,613 | 1,613 | 1,613 | 1,613 | 1,613 |
| | Year 4 | 1,613 | 1,613 | 1,613 | 1,613 | 1,613 |
| | Year 5 | 1,613 | 1,613 | 1,613 | 1,613 | 1,613 |

### 3.1.12 Fruitridge Vista Water Company Contract

The Southwest Tract is served by a water supply derived from the County's formation of the Southwest Water Maintenance District in 1958 and a water service agreement with Fruitridge Vista Water Company (Fruitridge) executed in 1970. Under the 1970 Agreement, Fruitridge would deliver a portion of its groundwater supplies to the Southwest Tract customers. The 1970 Agreement has no expiration. The current water supply entity assigned the obligations under the contract resides with Cal American Water Company. Nevertheless, the Southwest Tract customers still receive water supplies under the terms of the 1970 Agreement. Figure 3-8 shows the geographical location of the Southwest Tract. Table 3-24 shows the last five years of water deliveries to the Southwest Tract. Table 3-25 shows the projected water supplies for the Southwest Tract for normal, single dry, and five consecutive dry years through 2025. Table 3-26 shows the normal year, dry year, and five consecutive dry year water supply availability through 2045.

*Figure 3-8: Southwest Track Location*

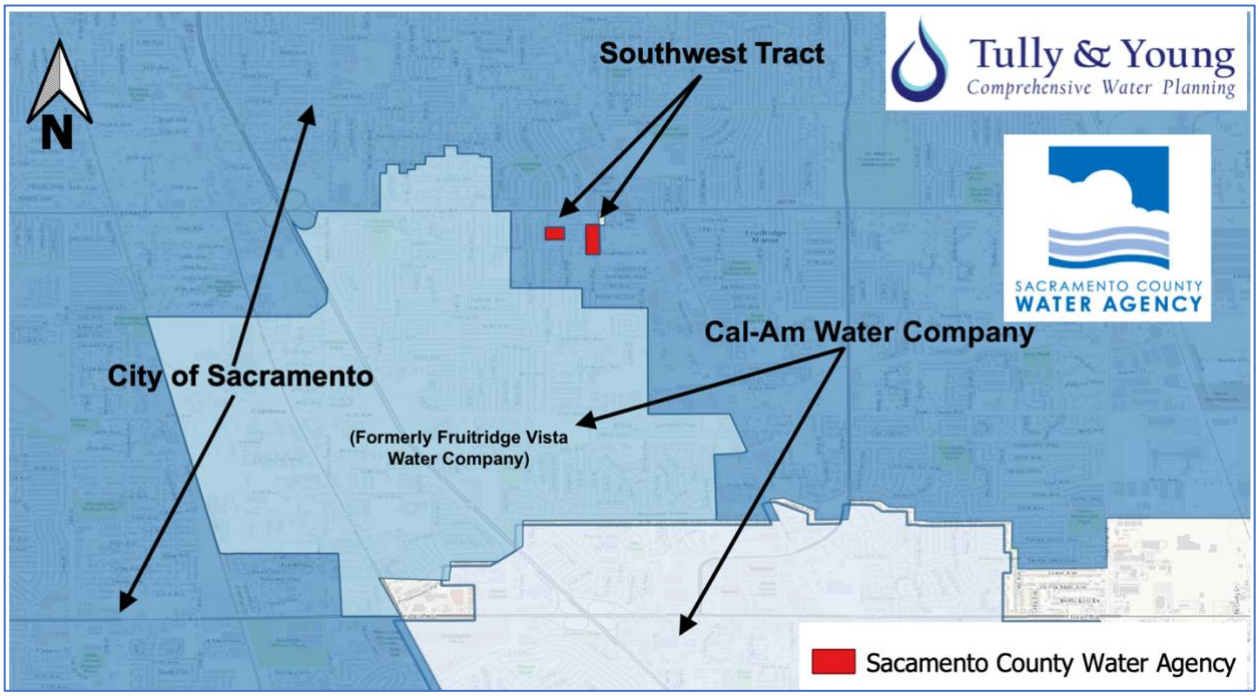



*Table 3-24: Last Five Years Southwest Tract Deliveries (acre-feet per year)*

| Year | Southwest Tract |
|---|---|
| 2016 | 26 |
| 2017 | 22 |
| 2018 | 21 |
| 2019 | 21 |
| 2020 | 23 |

*Table 3-25: Southwest Tract Water Supply for SCWA through 2025 (acre-feet per year)*

| Year | | Southwest Tract |
|---|---|---|
| Normal | | 30 |
| Single Dry | | 30 |
| Multi-Year Drought | 2021 (1st year) | 30 |
| | 2022 (2nd year) | 30 |
| | 2023 (3rd year) | 30 |
| | 2024 (4th year) | 30 |
| | 2025 (5th year) | 30 |

*Table 3-26: Future Projected Supply Availability Through 2045 (acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| | | | | | | |
| Normal | | 30 | 30 | 30 | 30 | 30 |
| Single Dry Year | | 30 | 30 | 30 | 30 | 30 |
| Multi-Year Drought | Year 1 | 30 | 30 | 30 | 30 | 30 |
| | Year 2 | 30 | 30 | 30 | 30 | 30 |
| | Year 3 | 30 | 30 | 30 | 30 | 30 |
| | Year 4 | 30 | 30 | 30 | 30 | 30 |
| | Year 5 | 30 | 30 | 30 | 30 | 30 |

## 3.2 Groundwater

Groundwater supplies constitute a major component of SCWA's water supply portfolio. In some service areas, groundwater is the sole source of supply while in other service areas groundwater is managed conjunctively with surface water supplies. This section separates the various service areas' groundwater supplies to address long-term groundwater supply management issues within those areas.

### 3.2.1 Groundwater Basin Descriptions

This section provides a description of SCWA's groundwater supplies including descriptions of the applicable groundwater basins, the status of groundwater management, overdraft conditions, historical groundwater pumping, and the remediated groundwater supply.

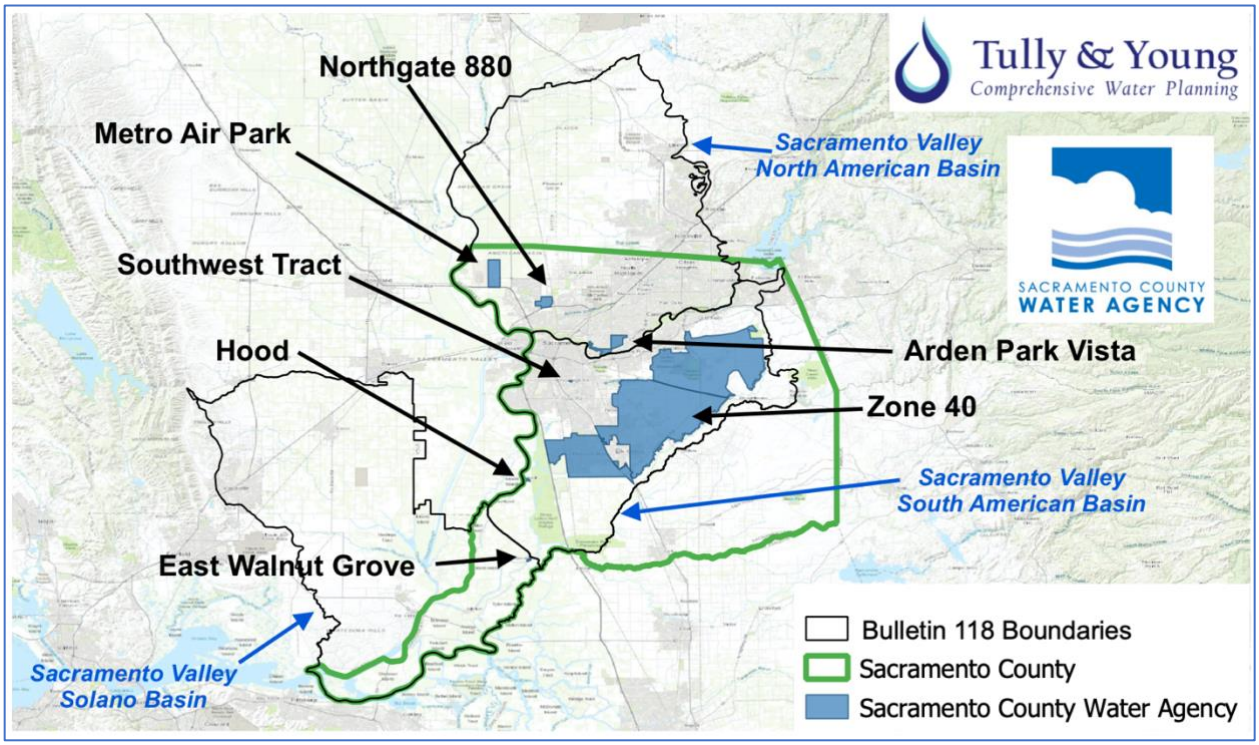
There are two primary groundwater subbasins described in the California Department of Water Resources' (DWR) Bulletin 118 that affect SCWA's groundwater extraction and use: The Sacramento Valley Basin – North American Subbasin (5-21.64) and the Sacramento Valley Basin – South American Subbasin (5-21.65). The total extent of these two groundwater subbasins are shown in Figure 3-9 below. SCWA also extracts groundwater from the Solano Subbasin in its East Walnut Grove service area. The relevant Solano Subbasin characteristics are described later in this document in the context of East Walnut Grove groundwater.

#### Sacramento Valley Basin– North American Subbasin

The North American Subbasin covers an area of approximately 548 square miles and is located under lands contained in Placer, Sutter, and Sacramento counties. The North American Subbasin is bound on the south by the American River, on the north and west by the Sacramento, Feather, and Bear Rivers, and on the east by the bedrock of the Sierra Nevada foothills. The North American Subbasin is categorized as a "high priority basin" because there is a large population overlying the basin that relies upon its supplies to meet its potable and raw water needs and other factors as determined by DWR.[43] The North American Subbasin is not in an overdraft condition and has no adjudicated areas.

[43] May 2020, Sustainable Groundwater Management Act 2019 Basin Prioritization – Process and Results Document

*Figure 3-9: North American and South American Groundwater Subbasins*




The North American Subbasin is stratified into different hydrogeological layers with regional differences in groundwater quality and transmissivity. The stratigraphic succession of geologic formations in the subbasin include, from oldest to youngest: crystalline basement rock, Miocene/Pliocene Volcanics, Older Alluvium of Pliocene and Pleistocene, and Younger Alluvium. Those formations which consist of the main freshwater-bearing aquifer system underlying the SCWA service areas include (from oldest to youngest):

- Miocene/Pliocene Volcanics (Mehrten Formation)
- Older Alluvium of Pliocene and Pleistocene (Laguna Formation)
- Younger Alluvium

The deepest deposits consist of Miocene and Pliocene Volcanic of the Mehrten Formation. It is composed of black sands, gravels, silts, and clays interbedded with tiff breccia. The thickness ranges from between 200 and 1,200 feet thick. The sand and gravel intervals are found to be highly permeable.

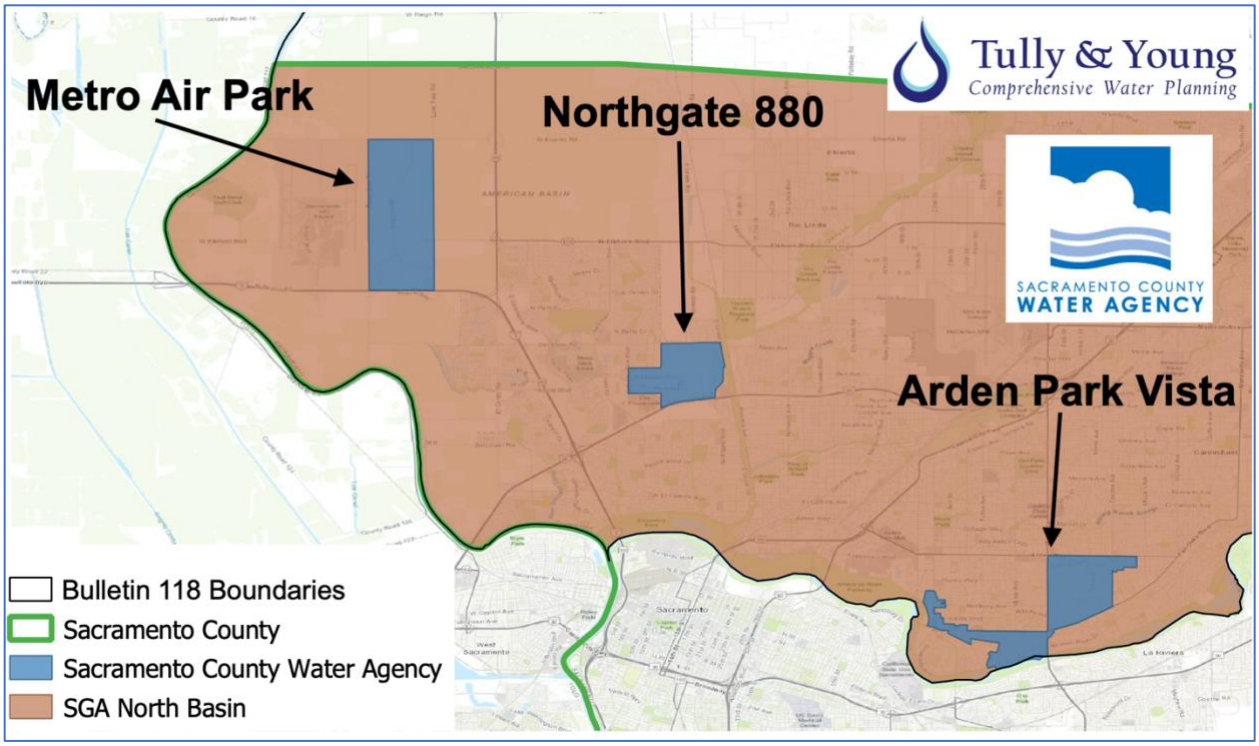
The older alluvium of Pliocene and Pleistocene age is the primary freshwater bearing formation within the North American Subbasin. The older alluvium consists of loosely compacted sands, silts, and gravels. This alluvial unit is exposed between the Sierra Nevada Foothills and the younger alluvium. Thicknesses range from 100 to 650 feet thick and is moderately permeable.

The younger alluvium is a formation of silts and clays that overlies the older alluvium. This alluvium consists of flood basin deposits and stream channel deposits from the nearby Sacramento River. The estimated thickness ranges from zero to 100 feet and may be locally interbedded with stream channel

deposits of the Sacramento River. Due to the small grain sizes of the clays and silts, this layer generally has lower permeability and low well yield. However, sand and gravel zones interbedded in the younger alluvium are highly permeable and commonly have high well yields.

The 2000 Water Forum Agreement help characterize a smaller sub-component of the North American Subbasin as the "North Basin." The North Basin is shown in Figure 3-10 below. The North Basin contains all the SCWA service areas discussed in this section. SCWA has three primary service areas that overlie the North Basin – the Airport and Metro Air Park, Northgate 880, and Arden Park Vista. Figure 3-10 shows the location of these service areas in Sacramento County.

*Figure 3-10: Location of SCWA Service Areas in North American Subbasin*




All of these service areas have extracted and delivered groundwater over the course of the last ten years. Table 3-27 shows SCWA's historic annual groundwater extractions in the North American Subbasin in each service area.

*Table 3-27: 2015-2020 Annual North American Subbasin Groundwater Use (acre-feet per year)*[44]

| North Basin Use | Arden Park Vista | Northgate 880 | Metro Air Park |
|---|---|---|---|
| 2015 | 2,803 | 1,074 | |
| 2016 | 3,096 | 968 | 47 |
| 2017 | 3,474 | 1,281 | 150 |
| 2018 | 3,430 | 1,387 | 277 |
| 2019 | 3,382 | 1,200 | 441 |
| 2020 | 3,726 | 1,365 | 460 |

## Sacramento Valley – South American Subbasin

The South American Subbasin (5-21.65) is defined as the area bounded on the west by the Sacramento River, on the north by the American River, on the south by the Cosumnes and Mokelumne rivers, and on the east by the Sierra Nevada Range covering 388 square miles. The eastern basin boundary is defined by the Sierra Nevada foothills and follows a north-south line extending from Folsom Reservoir to Rancho Murieta. Along this line, little groundwater flows into or out of the groundwater basin. The rivers that surround the South American Subbasin generally create a groundwater divide in the shallow subsurface although there is interaction between groundwater subbasins at greater depths. The western portion of the subbasin consists of nearly flat floodplain deposits from the surrounding rivers and tributaries.

Bulletin 118-3 identifies and describes various geologic formations that constitute the water-bearing deposits underlying Sacramento County. These formations include an upper, unconfined aquifer system consisting of the Victor, Fair Oaks, and Laguna Formations (now known as the Modesto Formation), and a lower, semiconfined aquifer system consisting primarily of the Mehrten Formation. These formations are typically composed of lenses of interbedded sand, silt, and clay, interlaced with coarse-grained stream channel deposits. The Mehrten formation outcrops near the Sierra Foothills along the eastern Central Basin boundary and is typically characterized as a black sandy lens.

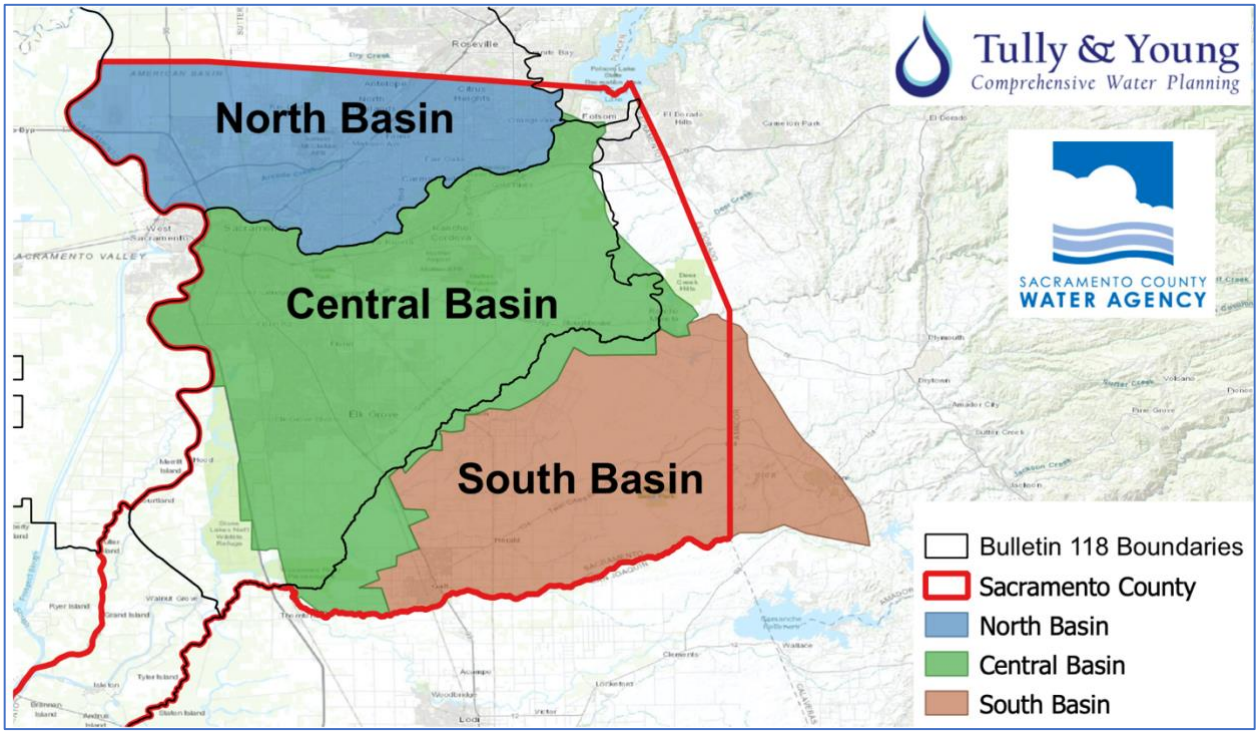
Groundwater in the South American Subbasin generally occurs in a shallow aquifer zone (Laguna or Modesto Formation) or in an underlying deeper aquifer zone (Mehrten Formation). Within the subbasin, the shallow aquifer extends approximately 200 to 300 feet below the ground surface and, in general, water quality in this zone is considered good with the exception of arsenic detections in a few locations. The shallow aquifer is typically used for private domestic wells requiring no treatment unless high arsenic values are encountered, causing owners to possibly target other water-bearing strata.

The deep aquifer is separated from the shallow aquifer by a discontinuous clay layer that serves as a semi-confining layer for the deep aquifer. The base of the potable water portion of the deep aquifer averages approximately 1,400 feet below ground surface (bgs). Water in the deep aquifer typically has higher concentrations of total dissolved solids (TDS), iron, and manganese. Groundwater used in the South American Subbasin is supplied from both the shallow and deeper aquifer systems.

[44] Metro Air Park groundwater supplies are derived from the 2004 SCWA and City of Sacramento Contract.

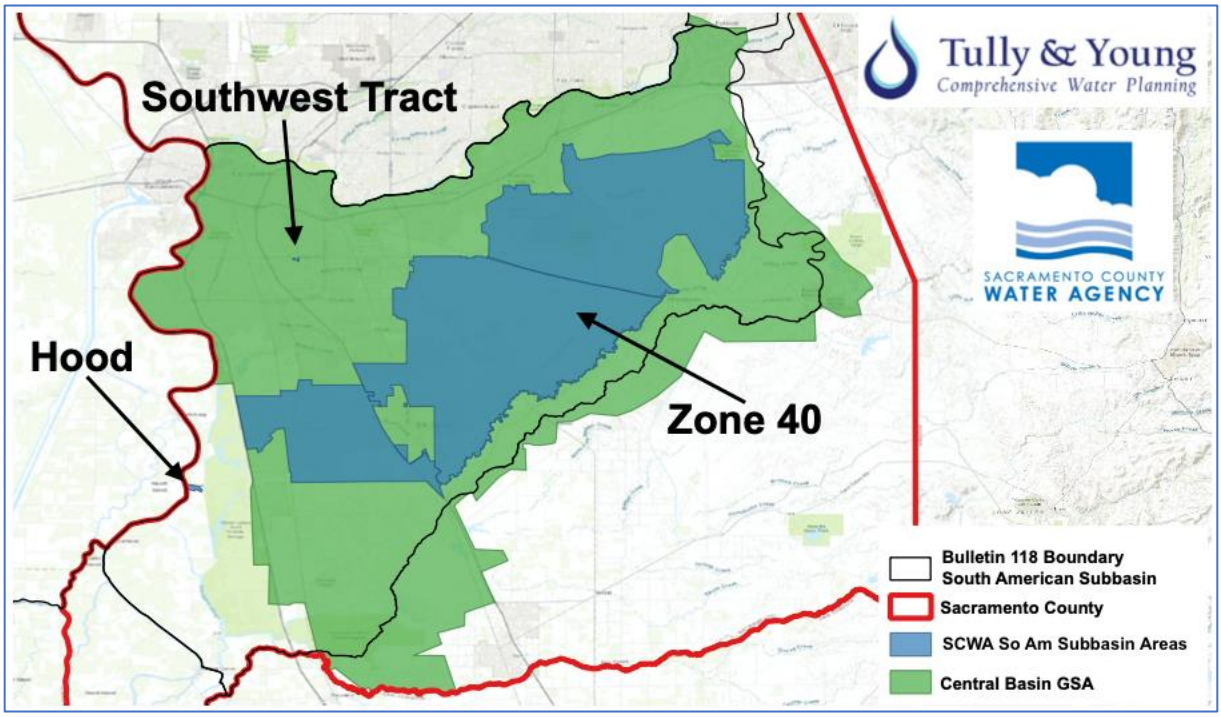
The South American Subbasin was locally referred to under the 2000 Water Forum Agreement as the "Central Basin" and its total area is a close approximation of the area comprising the South American Subbasin. Figure 3-11 below shows the North Basin, Central Basin, and South Basin as characterized in local basin management as defined by the 2000 Water Forum Agreement and will most likely be updated to the current subbasin name(s) in any future updates to the Water Forum Agreement.

*Figure 3-11: Groundwater Basin Descriptions in Sacramento County*




SCWA has two service areas that overlie the Central Basin – the Southwest Water Maintenance District and Zone 40. Figure 3-12 shows the location of these service areas in Sacramento County.

*Figure 3-12: Location of SCWA Service Areas in South American Subbasin*




All of these service areas have extracted and delivered groundwater over the course of the last 10 years. Table 3-28 shows SCWA's annual groundwater extractions in the Central Basin in each service area.

*Table 3-28: 2015-2020 Annual South American Subbasin Groundwater Use (acre-feet per year)*

| Retail Area | Zone 40 NSA | Zone 40 CSA/SSA | Hood |
|---|---|---|---|
| 2016 | 3,946 | 14,909 | 35 |
| 2017 | 1,991 | 15,165 | 44 |
| 2018 | 1,988 | 14,760 | 86 |
| 2019 | 1,553 | 13,101 | 76 |
| 2020 | 2,095 | 20,281 | 99 |

## 3.2.2 Groundwater Management in North American and South American Subbasins

The increased use of water in the North Basin and the Central Basin led to the development of governance structures and management plans aimed at stabilizing groundwater extractions and planning for future uses. These governance structures and management plans are further developing under the 2014 Sustainable Groundwater Management Act. This section will describe the groundwater management in both basins.

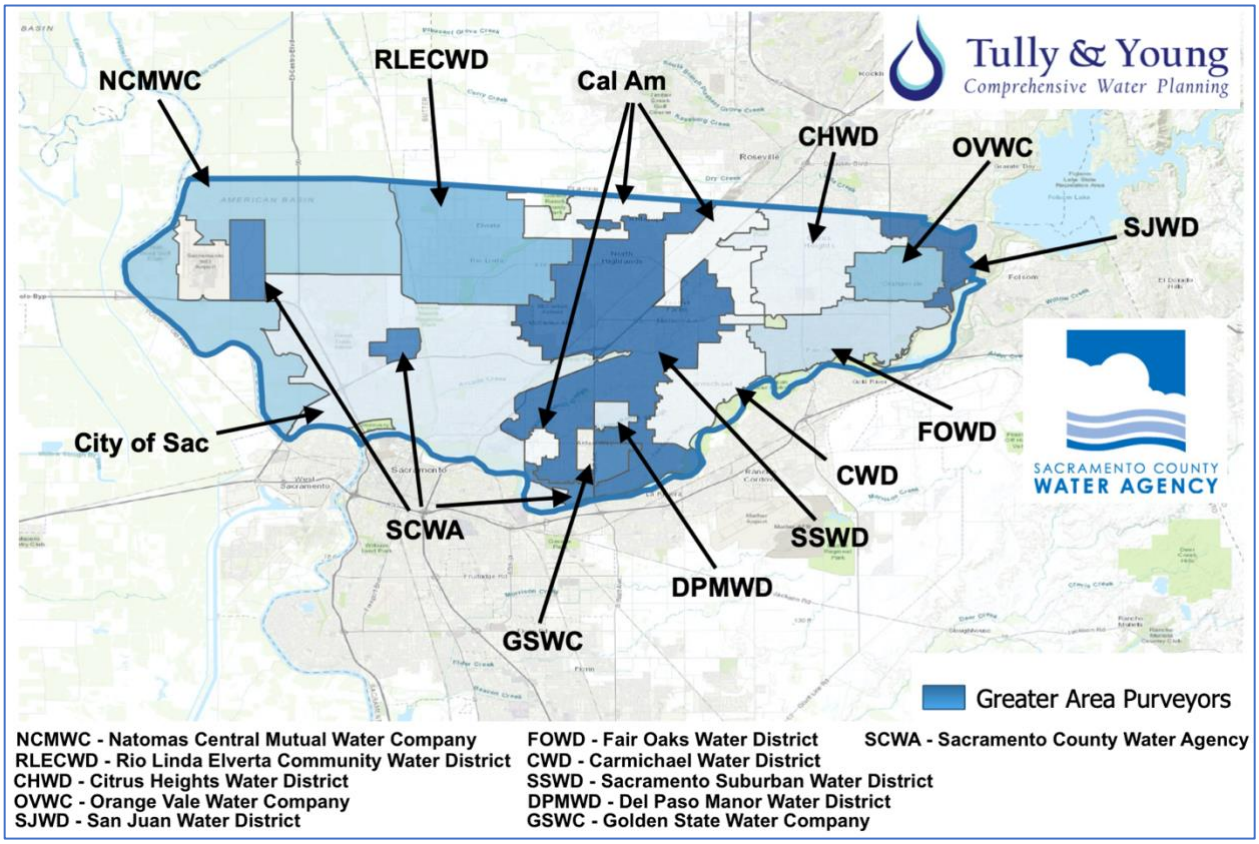
## North American Subbasin Groundwater Management

The Sacramento Groundwater Authority (SGA) was formed as a Joint Powers Authority in 1998 to manage groundwater in the Sacramento County portion of the North American Subbasin. SGA incorporates the service areas of multiple water purveyors, including SCWA. Figure 3-13 shows the SGA agencies.

In 2014, SGA developed a Groundwater Management Plan (GMP) under Assembly Bill 3030 (called an AB 3030 GMP). The 2014 GMP established parameters to maintain the long-term sustainable yield target of 131,000 acre-feet, detailed activities SGA will take to sustainably manage the North American Subbasin, and evaluated groundwater management activities and their effectiveness.

The Sustainable Groundwater Management Act (SGMA) was signed into law in September 2014. SGMA requires the formation of Groundwater Sustainability Agencies (GSA) and Groundwater Sustainability Plans (GSP) to achieve sustainability in the state's groundwater basins. In 2016, SGA became the exclusive GSA for the Sacramento County portion of the American Subbasin and by 2017 the entire Sacramento Valley – North American Subbasin had additional GSAs formed covering the entire North American Subbasin area. By January 2022, SGA and the other GSAs must prepare a comprehensive plan to sustainably manage the North American Subbasin. The primary planning document guiding sustainability in the North Basin subcomponent of the North American Subbasin is SGA's 2014 GMP. As such, the guiding principles in that document govern SCWA's groundwater planning in the Sacramento County portion of the North American Subbasin.

*Figure 3-13: SGA Agencies*




## South American Subbasin Groundwater Management (Formerly Central Basin)

The Sacramento Central Groundwater Authority (SCGA) was formed as a Joint Powers Authority in 2006 to manage groundwater in the majority of the South American Subbasin. . SCGA incorporates a number of water service providers, including SCWA. Figure 3-14 shows the SCGA participating agencies.

In 2006, SCGA developed a Groundwater Management Plan (GMP) under Assembly Bill 3030 (called an AB 3030 GMP). The 2006 GMP established parameters to maintain the long-term sustainable yield target of 273,000 acre-feet, detailed activities SCGA will take to sustainably manage the Central Basin, and evaluated groundwater management activities and their effectiveness.

The Sustainable Groundwater Management Act (SGMA) was signed into law in September 2014. The Sacramento Valley – South American Subbasin has six Groundwater Sustainability Agencies created to cover the entire subbasin area. Figure 3-15 shows the GSA's jurisdictional areas. By January 2022, the GSAs must prepare a comprehensive Groundwater Sustainability Plan to sustainably manage the South American Subbasin. The primary planning document guiding sustainability in the South American Subbasin is SCGA's 2006 GMP until the South American Subbasin GSP is submitted in January 2022. As such, the guiding in the 2006 GMP governs SCWA's groundwater planning in the South American Subbasin until the GSP is approved by DWR before January 2024.

*Figure 3-14: SCGA Participating Agencies*

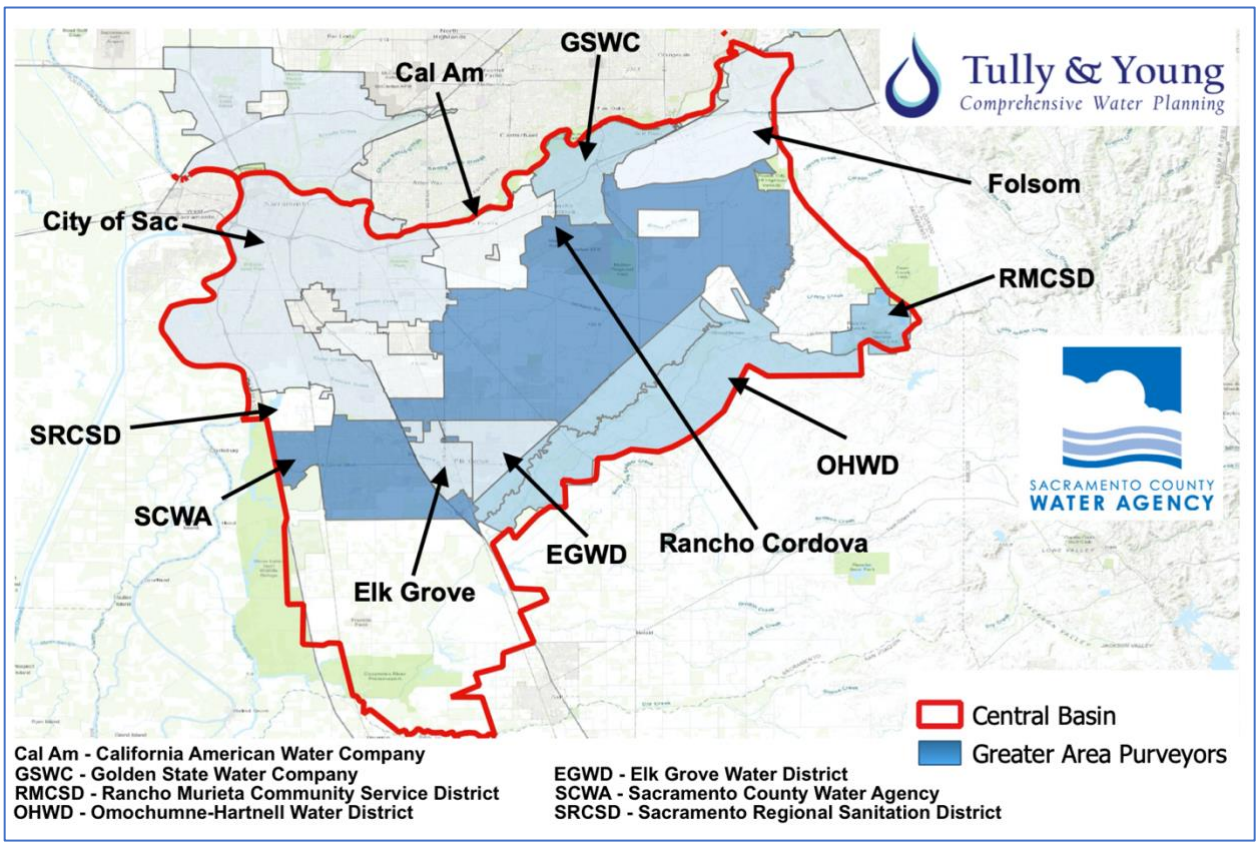
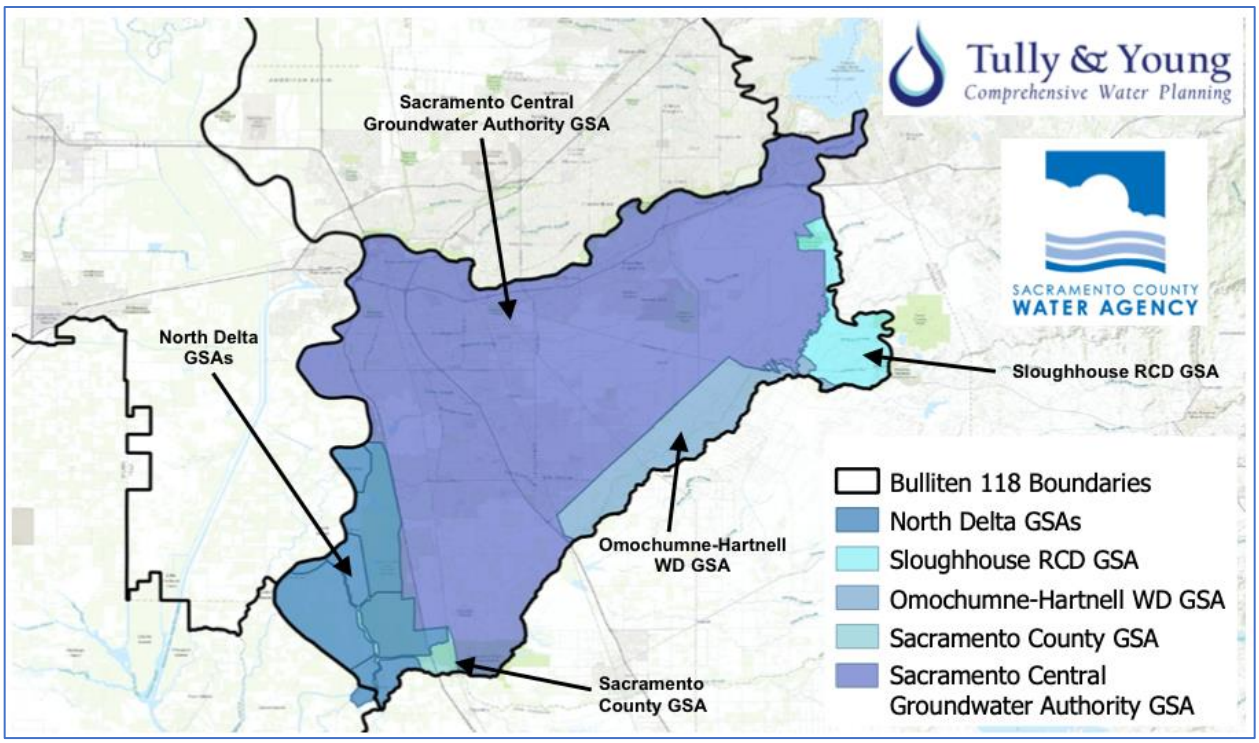



*Figure 3-15: South American Subbasin Groundwater Sustainability Agencies*



### 3.2.2 Zone 40 Groundwater

Zone 40 groundwater supplies consist of a total existing capacity of 68.17 million gallons per day (MGD) with an anticipated expansion of 63.83 MGD. Zone 40 has a total of 41 wells. Zone 40 groundwater is characterized in three sections, North Service Area (NSA), Central Service Area (CSA), and South Service Area (SSA). The Mather-Sunrise portion of the system constitutes the NSA while the CSA and SSA constitute the Laguna-Vineyard water system. The NSA system is largely independent from the intersection of the CSA and SSA systems. As such, this UWMP characterizes groundwater development and use in the Zone 40 area in two areas – the Mather-Sunrise Area (NSA) and the Laguna-Vineyard Area (CSA and SSA).

There are 41 wells in the Zone 40 system with a reasonable design capacity of 62.6 MGD. SCWA anticipates an average use of approximately 41,000 acre-feet per year with a maximum use approaching 69,900 acre-feet per year from this subbasin.[45] Table 3-28 depicts the last 10 years of water deliveries from the Mather-Sunrise groundwater system.

*Table 3-29: Zone 40 Historical Groundwater Production (acre-feet per year)*

| Year | Zone 40 Production |
|---|---|
| 2016 | 18,856 |
| 2017 | 17,157 |
| 2018 | 16,748 |
| 2019 | 14,654 |
| 2020 | 22,475 |

The groundwater system makes the supplies available in this area 100% reliable in all year types. As such, Zone 40 anticipates the following groundwater production for normal, single dry, and five consecutive dry years through 2025 in Table 3-30 and through 2045 as shown in Table 3-31.

*Table 3-30: Zone 40 Groundwater Supply for SCWA through 2025 (acre-feet per year)*

| Year | | Zone 40 Groundwater |
|---|---|---|
| Normal | | 41,000 |
| Single Dry | | 41,000 |
| Multi-Year Drought | 2021 (1st year) | 41,000 |
| | 2022 (2nd year) | 41,000 |
| | 2023 (3rd year) | 41,000 |
| | 2024 (4th year) | 41,000 |
| | 2025 (5th year) | 41,000 |

[45] WSIP at Table 5-1.

*Table 3-31: Zone 40 Projected Groundwater Production through 2045 (acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| | | | | | | |
| Normal | | 41,000 | 46,000 | 56,000 | 56,000 | 56,000 |
| Single Dry Year | | 41,000 | 46,000 | 56,000 | 56,000 | 56,000 |
| Multi-Year Drought | Year 1 | 41,000 | 46,000 | 56,000 | 56,000 | 56,000 |
| | Year 2 | 41,000 | 46,000 | 56,000 | 56,000 | 56,000 |
| | Year 3 | 41,000 | 46,000 | 56,000 | 56,000 | 56,000 |
| | Year 4 | 41,000 | 46,000 | 56,000 | 56,000 | 56,000 |
| | Year 5 | 41,000 | 46,000 | 56,000 | 56,000 | 56,000 |

### 3.2.3 Arden Park Vista Groundwater

Arden Park Vista is an independent system that is currently served wholly through groundwater deliveries. There are 10 wells in the Arden Park Vista system with a reasonable design capacity of 11.34 MGD. Table 3-32 depicts the last 5 years of water deliveries from the Arden Park Vista groundwater system.

*Table 3-32: Arden Park Vista Historical Groundwater Production (acre-feet per year)*

| Year | Arden Park Vista |
|---|---|
| 2015 | 2,803 |
| 2016 | 3,096 |
| 2017 | 3,474 |
| 2018 | 3,430 |
| 2019 | 3,382 |
| 2020 | 3,726 |

The groundwater system makes the supplies available in this area 100% reliable in all year types. As such, Arden Park Vista anticipates the following groundwater production for normal, single dry, and five consecutive dry years through 2025 in Table 3-33 and through 2045 as shown in Table 3-34.

*Table 3-33: Arden Park Vista Groundwater Supply for SCWA through 2025 (acre-feet per year)*

| Year | | Arden Park Vista |
|---|---|---|
| Normal | | 3,500 |
| Single Dry | | 3,500 |
| Multi-Year Drought | 2021 (1st year) | 3,500 |
| | 2022 (2nd year) | 3,500 |
| | 2023 (3rd year) | 3,500 |
| | 2024 (4th year) | 3,500 |
| | 2025 (5th year) | 3,500 |

*Table 3-34: Arden Park Vista Projected Groundwater Production through 2045 (acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| | | | | | | |
| Normal | | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 |
| Single Dry Year | | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 |
| Multi-Year Drought | Year 1 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 |
| | Year 2 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 |
| | Year 3 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 |
| | Year 4 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 |
| | Year 5 | 3,500 | 3,500 | 3,500 | 3,500 | 3,500 |

## 3.2.4 Northgate 880 Groundwater

Northgate 880 is an independent system that is currently served wholly through groundwater deliveries. There are 6 wells in the Northgate 880 system with a reasonable design capacity of 7.82 MGD. Table 3-35 depicts the last 5 years of water deliveries from the Northgate 880 groundwater system.

*Table 3-35: Northgate 880 Historical Groundwater Production (acre-feet per year)*

| Year | Northgate 880 |
|---|---|
| 2016 | 968 |
| 2017 | 1,281 |
| 2018 | 1,387 |
| 2019 | 1,200 |
| 2020 | 1,365 |

The groundwater system makes the supplies available in this area 100% reliable in all year types. As such, Northgate 880 anticipates the following groundwater production for normal, single dry, and five consecutive dry years through 2025 in Table 3-36 and production through 2045 as shown in Table 3-37.

*Table 3-36: Northgate 880 Groundwater Supply for SCWA through 2025 (acre-feet per year)*

| Year | | Northgate 880 |
|---|---|---|
| Normal | | 1,400 |
| Single Dry | | 1,400 |
| Multi-Year Drought | 2021 (1st year) | 1,400 |
| | 2022 (2nd year) | 1,400 |
| | 2023 (3rd year) | 1,400 |
| | 2024 (4th year) | 1,400 |
| | 2025 (5th year) | 1,400 |

*Table 3-37: Northgate 880 Projected Groundwater Production through 2045 (acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| | | | | | | |
| Normal | | 1,400 | 1,400 | 1,400 | 1,400 | 1,400 |
| Single Dry Year | | 1,400 | 1,400 | 1,400 | 1,400 | 1,400 |
| Multi-Year Drought | Year 1 | 1,400 | 1,400 | 1,400 | 1,400 | 1,400 |
| | Year 2 | 1,400 | 1,400 | 1,400 | 1,400 | 1,400 |
| | Year 3 | 1,400 | 1,400 | 1,400 | 1,400 | 1,400 |
| | Year 4 | 1,400 | 1,400 | 1,400 | 1,400 | 1,400 |
| | Year 5 | 1,400 | 1,400 | 1,400 | 1,400 | 1,400 |

### 3.2.5 Hood Water Maintenance District (Hood) Groundwater

Hood is an independent system that is currently served wholly through groundwater deliveries. There are 2 wells in the Hood system with a reasonable design capacity of 0.84 MGD. Table 3-38 depicts the last 5 years of water deliveries from the Hood groundwater system.

*Table 3-38: Hood Historical Groundwater Production (acre-feet per year)*

| Year | Hood |
|---|---|
| 2016 | 35 |
| 2017 | 44 |
| 2018 | 86 |
| 2019 | 76 |
| 2020 | 99 |

The groundwater system makes the supplies available in this area 100% reliable in all year types. As such, Hood anticipates the following groundwater production for normal, single dry, and five consecutive dry years through 2025 in Table 3-39 and production through 2045 as shown in Table 3-40.

*Table 3-39: Hood Groundwater Supply for SCWA through 2025 (acre-feet per year)*

| Year | | Hood |
|---|---|---|
| Normal | | 90 |
| Single Dry | | 90 |
| Multi-Year Drought | 2021 (1st year) | 90 |
| | 2022 (2nd year) | 90 |
| | 2023 (3rd year) | 90 |
| | 2024 (4th year) | 90 |
| | 2025 (5th year) | 90 |

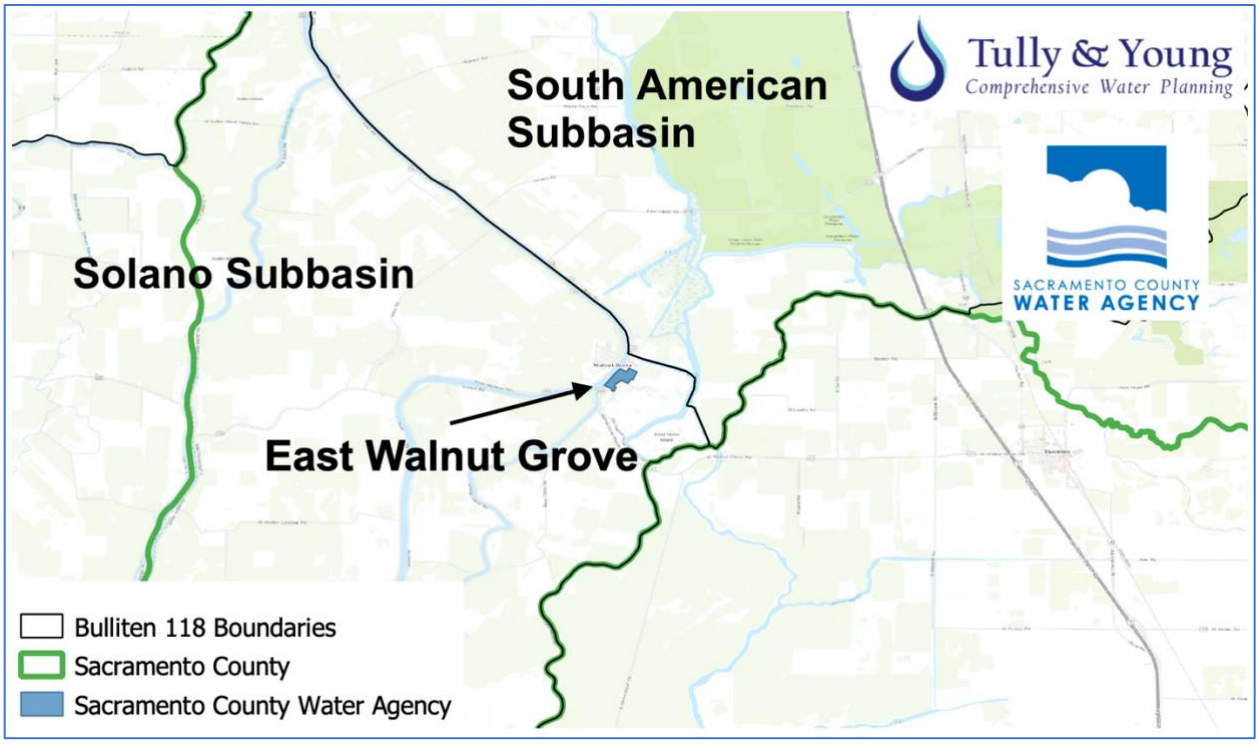
*Table 3-40: Hood Projected Groundwater Production through 2045 (acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| | | | | | | |
| Normal | | 90 | 90 | 90 | 90 | 90 |
| Single Dry Year | | 90 | 90 | 90 | 90 | 90 |
| Multi-Year Drought | Year 1 | 90 | 90 | 90 | 90 | 90 |
| | Year 2 | 90 | 90 | 90 | 90 | 90 |
| | Year 3 | 90 | 90 | 90 | 90 | 90 |
| | Year 4 | 90 | 90 | 90 | 90 | 90 |
| | Year 5 | 90 | 90 | 90 | 90 | 90 |

## 3.2.6 East Walnut Grove Groundwater

East Walnut Grove is an independent system that is currently served wholly through groundwater deliveries. There is 1 well in the Walnut Grove system with a reasonable design capacity of 0.43 MGD. East Walnut Grove is located in the Solano Subbasin (DWR Bulletin 118 Basin 5-021.66). Figure 3-16 shows the relevant portion of the Walnut Grove service area in the Solano Subbasin.

*Figure 3-16: East Walnut Grove Geographic Location in Solano Subbasin*




The Solano Subbasin is subject to the Solano Subbasin GSA Collaborative that is composed of five Groundwater Sustainability Agencies (GSA): City of Vacaville GSA, Northern Delta GSA, Sacramento County GSA, Solano GSA, and Solano Irrigation District GSA. All of these entities are collectively developing the Solano Groundwater Sustainability Plan (GSP). The Solano GSP is set for release in 2022. Nothing in the proposed Solano GSP will limit the water supplies available to SCWA's East Walnut Grove Service Area.

Table 3-41 depicts the last 5 years of water deliveries from the East Walnut Grove service area.

*Table 3-41: East Walnut Grove Historical Groundwater Production (acre-feet per year)*

| Year | Walnut Grove |
|---|---|
| 2016 | 68 |
| 2017 | 74 |
| 2018 | 64 |
| 2019 | 59 |
| 2020 | 56 |

The groundwater system makes the supplies available in this area 100% reliable in all year types. As such, East Walnut Grove anticipates the following groundwater production for normal, single dry, and five consecutive dry years through 2025 in Table 3-42 and production through 2045 as shown in Table 3-43.

*Table 3-42: Walnut Grove Groundwater Supply for SCWA through 2025 (acre-feet per year)*

| Year | | Walnut Grove |
|---|---|---|
| Normal | | 80 |
| Single Dry | | 80 |
| Multi-Year Drought | 2021 (1st year) | 80 |
| | 2022 (2nd year) | 80 |
| | 2023 (3rd year) | 80 |
| | 2024 (4th year) | 80 |
| | 2025 (5th year) | 80 |

*Table 3-43: Walnut Grove Projected Groundwater Production through 2045 (acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| | | | | | | |
| Normal | | 80 | 80 | 80 | 80 | 80 |
| Single Dry Year | | 80 | 80 | 80 | 80 | 80 |
| Multi-Year Drought | Year 1 | 80 | 80 | 80 | 80 | 80 |
| | Year 2 | 80 | 80 | 80 | 80 | 80 |
| | Year 3 | 80 | 80 | 80 | 80 | 80 |
| | Year 4 | 80 | 80 | 80 | 80 | 80 |
| | Year 5 | 80 | 80 | 80 | 80 | 80 |

## 3.3 Water Quality

SCWA carefully tracks all water quality standards associated with its water assets. These water quality standards are best addressed at the individual service area levels where water extraction, treatment, and delivery are consistent with the parameters in those locations. In general, SCWA's water quality as delivered to its end users meets and exceeds federal and state standards for drinking water. As shown in the tables below, SCWA has extensive water quality testing protocols and annually provides detailed water quality statements for public review and consideration. The SCWA consumer confidence reports website is as follows: https://waterresources.saccounty.net/ccr/Pages/default.aspx. The information incorporated into the 2020 UWMP is derived from the 2019 reports since the 2020 data has not been assembled into the final reporting format.

### 3.3.1 Zone 40 – Laguna-Vineyard (Central and South Areas)

Zone 40 water quality monitoring is disaggregated into two discrete areas – the "Central and South Areas" and the "North Area." This section addresses water quality issues in the Central and South Areas. Table 3-44 shows the Zone 40 CSA and SSA water quality report for 2019.

As shown in the table, SCWA meets and exceeds all water quality conditions for its 2019 data collection and assessments.

*Table 3-44: CSA and SSA Water Quality*

| Water Quality Standards | Goal Level | Max Level | Surface Water Measured | Groundwater Measured |
|---|---|---|---|---|
| **Primary Standards** | | | | |
| Arsenic | 0.004 | 10 | ND | ND |
| Barium | 2 | 1 | ND | ND |
| Chromium (Total Cr) | 100 | 50 | ND | ND |
| Hexavalent Chromium | 0.02 | n/a | ND | 2.3 |
| Fluoride (natural) | 1 | 2 | ND | ND |
| Nitrate (as N) | 10 | 10 | ND | 0.72 |
| TTHMs (disinfection) | n/a | 80 | ND | ND |
| Control of DBP Precursors | n/a | TT | 1.16 | NA |
| Gross Alpha Activity | 0 | 15 | ND | ND |
| Uranium | 0.43 | 20 | ND | ND |
| Chlorine Residuals | 4 | 4 | ND-2.24 | 1.28 |
| TTHMs (distribution system) | n/a | 80 | 7-60 | 41.3 |
| HAA5 | n/a | 60 | 4.4-39 | 24.8 |
| Fluoride (distribution system) | 1 | 2 | 0.55-0.78 | 0.66 |
| Total Coliform Bacteria | 0 | 1 NTU | .099 NTU | |
| Turbidity | n/a | 95%<=0.3 NTU | 100% | |
| **Secondary Standards** | | | | |
| Color | n/a | 15 | ND | 1.9 |
| Iron | n/a | 300 | ND | ND |
| Manganese | n/a | 50 | ND | ND |
| Odor | n/a | 3 | 1.9 | 1.2 |
| Turbidity | n/a | 5 | ND | 0.15 |
| TDS | n/a | 1000 | 81.5 | 214 |
| E.C. | n/a | 1600 | 125 | 295.6 |
| Chloride | n/a | 500 | 4.7 | 13.8 |
| Sulfate | n/a | 500 | 3.3 | 2.9 |
| pH | n/a | MO | 7.9 | 8 |
| Total Hardness (as CaCO3) | n/a | MO | 48 | 94 |
| Total Alkalinity (as CaCO3) | n/a | MO | 60 | 130 |
| Bicarbonate (as HCO3) | n/a | MO | 73 | 159 |
| Sodium | n/a | MO | 6.9 | 27 |
| Calcium | n/a | MO | 11 | 19 |
| Magnesium | n/a | MO | 5 | 12 |
| **Lead & Copper** | | | | |
| Lead | 0.2 | 15 | ND | |
| Copper | 0.3 | 1.3 | 0.07 | |
| **Federal Unregulated Contaminates** | | | | |
| Manganese | n/a | 0.4 | ND | 6.25 |
| Germanium | n/a | 0.3 | ND | 0.84 |
| Bromide | n/a | n/a | 5 | NA |
| TOC | n/a | n/a | 1.96 | NA |
| HAA5 | n/a | n/a | 11.6 | |
| HAA6Br | n/a | n/a | 2.73 | |
| HAA9 | n/a | n/a | 14.06 | |

### 3.3.2 Zone 40 – Mather-Sunrise (North Area)

This section addresses water quality issues in the North Area of Zone 40. Table 3-45 shows the Zone 40 NSA water quality report for 2019.

*Table 3-45: NSA Water Quality*

| Water Quality Standards | Goal Level | Max Level | Surface Water Measured | Groundwater Measured |
|---|---|---|---|---|
| **Primary Standards** | | | | |
| Hexavalent Chromium | 0.02 | n/a | ND | ND |
| Nitrate (as N) | 10 | 10 | ND | ND |
| Control of DBP Precursors | n/a | TT | 1.16 | NA |
| Chlorine Residuals | 4 | 4 | .15-2.3 | 1.36 |
| Total Trihalomethanes | n/a | 80 | 73 | 68.8 |
| Haloacetic Acids | n/a | 60 | 67 | 47.8 |
| Fluoride (distribution system) | 1 | 2 | 0.77 | 0.65 |
| Total Coliform Bacteria | 0 | 1 NTU | .099 NTU | |
| Turbidity | n/a | 95%<=0.3 NTU | 100% | |
| **Secondary Standards** | | | | |
| Color | n/a | 15 | ND | 0.83 |
| Iron | n/a | 300 | ND | ND |
| Odor | n/a | 3 | 1.9 | 1.8 |
| Turbidity | n/a | 5 | ND | 0.4 |
| TDS | n/a | 1000 | 81.5 | 127 |
| E.C. | n/a | 1600 | 125 | 164 |
| Chloride | n/a | 500 | 4.7 | 5.3 |
| Sulfate | n/a | 500 | 3.3 | 0.5 |
| pH | n/a | MO | 7.9 | 8 |
| Total Hardness (as CaCO3) | n/a | MO | 48 | 52.3 |
| Total Alkalinity (as CaCO3) | n/a | MO | 60 | 66.8 |
| Bicarbonate (as HCO3) | n/a | MO | 73 | 82 |
| Sodium | n/a | MO | 6.9 | 14 |
| Calcium | n/a | MO | 11 | 11 |
| Magnesium | n/a | MO | 5 | 5.8 |
| **Lead & Copper** | | | | |
| Lead | 0.2 | 15 | ND | |
| Copper | 0.3 | 1.3 | 0.11 | |
| **Federal Unregulated Contaminates** | | | | |
| Manganese | n/a | 0.4 | ND | 6.25 |
| TOC | n/a | n/a | 1.96 | NA |
| HAA5 | n/a | n/a | 11.6 | |
| HAA6Br | n/a | n/a | 2.73 | |
| HAA9 | n/a | n/a | 14.06 | |

As shown in the table, SCWA meets and exceeds all water quality conditions for its 2019 data collection and assessments.

### 3.3.3 Arden Park Vista, Northgate 880, and Southwest Tract

This section addresses water quality issues in the Arden Park Vista, Northgate, and Southwest Tract areas. Table 3-46 shows the water quality report for these areas.

As shown in the table, SCWA meets and exceeds all water quality conditions for its 2019 data collection and assessments.

*Table 3-46: Arden Park, Northgate 880, and Southwest Tract Water Quality*

| Water Quality Standards | Goal Level | Max Level | Arden Park | Northgate | SW Tract |
|---|---|---|---|---|---|
| **Primary Standards** | | | | | |
| Arsenic | 0.004 | 10 | ND | 4.1 | 3.6 |
| Barium | 2 | 1 | ND | 0.14 | 0.1 |
| Chromium (Total Cr) | 100 | 50 | ND | ND | ND |
| Fluoride (natural) | 1 | 2 | ND | 0.13 | ND |
| Nitrate (as N) | 10 | 10 | 1.8 | 1 | 5.6 |
| Tetrachloroethylene (PCE) | 0.06 | 5 | ND | ND | ND |
| Trichloroethylene (TCE) | 1.7 | 5 | ND | ND | NA |
| Gross Alpha Activity | 0 | 15 | ND | ND | 3.4 |
| Uranium | 0.43 | 20 | ND | ND | 4.2 |
| Chlorine Residuals | 4 | 4 | 0.91 | 1.17 | 0.77 |
| TTHMs (distribution system) | n/a | 80 | 0.2 | 0.5 | 0.5 |
| HAA5 | n/a | 60 | ND | ND | ND |
| Fluoride (distribution system) | 1 | 2 | 0.71 | NA | NA |
| Total Coliform Bacteria | 0 | 1 NTU | 0 | 0 | 0 |
| **Secondary Standards** | | | | | |
| Iron | n/a | 300 | ND | ND | ND |
| Manganese | n/a | 50 | ND | ND | ND |
| Turbidity | n/a | 5 | ND | 0.19 | 0.1 |
| TDS | n/a | 1000 | 226 | 297 | 321 |
| E.C. | n/a | 1600 | 292 | 516 | 533 |
| Chloride | n/a | 500 | 12.6 | 28 | 32 |
| Sulfate | n/a | 500 | 13.1 | 16.3 | 23 |
| pH | n/a | MO | 7.8 | 8 | 7.8 |
| Total Hardness (as CaCO3) | n/a | MO | 138.8 | 156 | 226 |
| Total Alkalinity (as CaCO3) | n/a | MO | 129.6 | 146 | NR |
| Bicarbonate (as HCO3) | n/a | MO | 156.3 | 175 | 230 |
| Sodium | n/a | MO | 11.7 | 28 | 19 |
| Calcium | n/a | MO | 29 | 31 | 51 |
| Magnesium | n/a | MO | 16.3 | 18.8 | 24 |
| **Lead & Copper** | | | | | |
| Lead | 0.2 | 15 | ND | ND | ND |
| Copper | 0.3 | 1.3 | 0.19 | 0.3 | 0.081 |
| **Federal Unregulated Contaminates** | | | | | |
| Vanadium | n/a | 50 | NR | NR | 15 |
| Molybdenum | n/a | n/a | NR | NR | 0.2 |
| Strontium | n/a | n/a | NR | NR | 493 |
| Chromium (Total Cr) | n/a | 50 | ND | ND | ND |
| Hexavalent Cr | n/a | n/a | 2.1 | 8.8 | ND |
| Chlorate | n/a | 800 | NR | NR | 236 |
| Chloroform | n/a | n/a | ND | ND | ND |
| Dichlorodifluoromethane | n/a | 1 | NR | NR | ND |
| **Per & Polyfluoralkyl Substances** | | | | | |
| Perfluorooctanoic Acid | 5.1 | 10 | ND | NR | NA |
| Perfluorooctanesulfonic Acid | 6.5 | 40 | ND | NR | NA |
| Perfluorohexane sulfonic acid | n/a | n/a | ND | NR | NA |

### 3.3.4 Hood Water Maintenance District and East Walnut Grove

This section addresses water quality issues in the Hood Water Maintenance District (Hood) and East Walnut Grove areas. Table 3-47 shows the water quality report for Hood and East Walnut Grove service areas.

*Table 3-47: Hood and East Walnut Grove Water Quality*

| Water Quality Standards | Goal Level | Max Level | Hood | East Walnut Grove |
|---|---|---|---|---|
| **Primary Standards** | | | | |
| Arsenic | 0.004 | 10 | ND | 6.2 |
| Fluoride (natural) | 1 | 2 | ND | 0.14 |
| Chlorine Residuals | 4 | 4 | 1.17 | 0.94 |
| TTHMs (distribution system) | n/a | 80 | 72.5 | 35.5 |
| HAA5 | n/a | 60 | 13.3 | 9.1 |
| Fluoride (distribution system) | 1 | 2 | 0.86 | 0.74 |
| Total Coliform Bacteria | 0 | 1 NTU | 0 | 0 |
| **Secondary Standards** | | | | |
| Color | n/a | 15 | 3 | 3 |
| Manganese | n/a | 50 | 218 | 39 |
| Odor | n/a | 3 | 2.25 | 1.8 |
| Turbidity | n/a | 5 | 0.11 | ND |
| Zinc | n/a | 5 | ND | ND |
| TDS | n/a | 1000 | 605 | 440 |
| E.C. | n/a | 1600 | 1050 | 755 |
| Chloride | n/a | 500 | 215 | 125 |
| Sulfate | n/a | 500 | 8.05 | 8.4 |
| pH | n/a | MO | 265 | 47 |
| Total Hardness (as CaCO3) | n/a | MO | 205 | 200 |
| Total Alkalinity (as CaCO3) | n/a | MO | 245 | 240 |
| Bicarbonate (as HCO3) | n/a | MO | ND | 3.8 |
| Sodium | n/a | MO | 105 | 150 |
| Calcium | n/a | MO | 73 | 11 |
| Magnesium | n/a | MO | 21 | 4.7 |
| **Lead & Copper** | | | | |
| Lead | 0.2 | 15 | ND | 8.7 |
| Copper | 0.3 | 1.3 | 0.093 | 0.73 |

As shown in the table, SCWA meets and exceeds all water quality conditions for its 2019 data collection and assessments.

## 3.4 Climate Change

While the California Water Code does not prescribe specific climate change planning and management measures for water suppliers, it does emphasize that climate change is appropriate to consider when assessing drought risk assessment, water conservation and use efficiency, and demand management and supply – both in an historical and future-projection context. SCWA's 2020 UWMP has incorporated climate change considerations into its water supply analysis, water demand analysis, water supply reliability assessment and water shortage contingency plan. The characterizations are imbedded into the characterizations of supply availability in normal, single dry, and five-consecutive dry year periods as well as the changes in demands that may result from climatological changes in those same periods. Moreover, the climate change characterizations are incorporated into future projected conditions through the 2045 planning horizon.

The Regional Water Authority (RWA) partnered with other local water purveyors and the U.S. Department of the Interior, Bureau of Reclamation on a climate change study called the American River Basin Study (ARBS) with the purpose of developing climate change adaptation strategies specific to the Basin.[46] Climate change is generally forecast to bring higher temperatures, more variability in precipitation and more frequent and prolonged droughts. Although there is a lack of a clear trend in projected annual precipitation, by the end of the 21st century the average fall and spring precipitation is expected to decrease, with winter and summer precipitation increasing. Increasing variability is also projected in winter and fall precipitation. These climate change considerations have been incorporated into the water supply forecasts for SCWA contained in this Chapter.

## 3.5 Water Transfers and Exchanges

SCWA is an active participant in regional water transfers and exchanges. SCWA has been active in developing its water supply portfolio through strategic acquisitions – like its CVP Contracts – as well as converting agricultural water rights for municipal and industrial uses – like Licenses 1060 and 4060. SCWA has also engaged in extensive water conservation actions and protected its water assets under Water Code section 1011. Moreover, SCWA has a sophisticated conjunctive use program to optimize surface and groundwater assets in order to protect those assets for the future under Water Code section 1011.5. In these ways, SCWA has anticipated future water transfers and exchanges with its available water assets.

In 2020, SCWA participated in its first groundwater substitution transfer as part of the American River Watershed Region's water transfer program. This transfer program engaged the City of Sacramento, SCWA, Sacramento Suburban Water District, Carmichael Water District, Fair Oaks Water District, and Golden State Water Company to pool water assets for a through-Delta transfer to water-short entities in central and southern California. SCWA participated by helping the region deliver surface water by providing 1,500 acre-feet of groundwater supplies to the City of Sacramento. Importantly, the region spent significant time and resources to ensure that the groundwater substitution transfer would not cause injury to any other groundwater purveyor in the region. The Regional Water Authority (RWA), the

[46] Full findings and approved ARBS study can be found at www.pcwa.net/planning/arbs

Sacramento Groundwater Authority (SGA), and the Sacramento Central Groundwater Authority (SCGA) were all notified of the transfer. The regional agencies engaged in extensive well-monitoring efforts, discounted transferable supplies to ensure groundwater recovery, and are conducting a follow-up assessment of basin recovery. In short, the regional groundwater substitution transfer was predicated on comprehensive safeguards for the region's groundwater supplies and protecting surface water assets for current and future beneficial uses.

SCWA anticipates participating in other water transfers and exchanges in the future – both to diversify the utility of the regional water asset portfolio as well as generate revenue to support its long-term water management objectives. These coordinated water transfer and exchange activities may involve delivering portions of SCWA surface supplies to other areas within the SCWA service areas, exchanging water assets with other retail providers, and developing more robust conjunctive use actions to support groundwater substitution transfers. These future water transfers will conform with all guidelines recommended in the relevant Groundwater Sustainability Plans. Moreover, SCWA will continue to fund and work with RWA in developing transfers and exchanges in the context of the proposed regional groundwater bank. Nevertheless, in each proposed water transfer and exchange, SCWA will take necessary steps to protect regional water assets and the environment.

## 3.6 Planned Water Supply Projects

At this time, SCWA is not planning to develop any additional water supply sources in its service area. SCWA's planned potable projects include improvements to its treatment and delivery systems in order to create system redundancy and protect the supply reliability for its customers. Specifically, the Vineyard Water Treatment Plant Phase 2 will provide an additional 50 MGD of capacity to the SCWA system to deliver water throughout the Zone 40 area. Phase 2 was anticipated at the time the project was conceived and is pending development based upon SCWA water demand and regional need. In addition, SCWA has a planned groundwater well program that will augment its groundwater supplies in accordance with its reasonable growth projections.

### Desalinated Water

Desalination involves removing salts and impurities from seawater or non-potable surface water or groundwater using treatment technologies such as reverse osmosis membranes or distillation methods. Desalination facilities are costly to construct and operate relative to SCWA's current supply sources. There are also significant environmental and permitting issues associated with the water intake and with disposal of brine from the treatment process. As such, SCWA does not have any plans for developing desalinated water supplies.

## 3.7 Master Supply Spreadsheets

The purpose of this section is to combine all the water supplies available to SCWA's Zone 40 into one location and show the water supplies availability in the future. Table 3-48 shows the combined monthly availability of all sources of SCWA's Zone 40 supplies in a normal, single dry, and five consecutive dry

years through 2025. The sources of supplies for the other SCWA service areas are shown elsewhere in this chapter.

*Table 3-48: Monthly Availability of Water Supply Sources in Zone 40 through 2025 (acre-feet per year)*

| Total Supply | | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Normal Year | | 14,169 | 14,181 | 14,577 | 14,673 | 15,674 | 8,748 | 9,422 | 9,659 | 9,495 | 16,489 | 15,946 | 14,706 | 157,740 |
| Single Dry Year | | 9,678 | 9,689 | 10,086 | 3,934 | 4,934 | 5,863 | 6,537 | 6,775 | 6,610 | 5,749 | 5,206 | 10,214 | 85,274 |
| Multi-Year Drought | 2021 | 9,678 | 9,689 | 10,086 | 10,182 | 6,562 | 7,491 | 8,166 | 8,403 | 8,239 | 7,377 | 11,455 | 10,214 | 107,542 |
| | 2022 | 9,678 | 9,689 | 10,086 | 10,182 | 5,664 | 6,593 | 7,267 | 7,505 | 7,340 | 6,479 | 5,936 | 10,214 | 96,633 |
| | 2023 | 9,678 | 9,689 | 10,086 | 3,934 | 4,934 | 5,863 | 6,537 | 6,775 | 6,610 | 5,749 | 5,206 | 10,214 | 85,274 |
| | 2024 | 9,678 | 9,689 | 10,086 | 10,182 | 5,163 | 6,092 | 6,767 | 7,004 | 6,840 | 5,979 | 5,436 | 10,214 | 93,129 |
| | 2025 | 9,678 | 9,689 | 10,086 | 10,182 | 6,053 | 6,982 | 7,657 | 7,894 | 7,730 | 6,868 | 11,455 | 10,214 | 104,488 |

Table 3-49(a) through (f) shows the individual monthly volume of each source of SCWA Zone 40 supplies that are available through 2025.

*Table 3-49(a): Monthly Availability of Permit 21209 in Zone 40 through 2025 (acre-feet per year)*

| Total Supply | | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Normal Year | | 7,855 | 7,855 | 7,855 | 7,855 | 7,855 | | | | | 7,855 | 7,855 | 7,855 | 62,840 |
| Single Dry Year | | 7,855 | 7,855 | 7,855 | | | | | | | | | 7,855 | 31,420 |
| Multi-Year Drought | 2021 | 7,855 | 7,855 | 7,855 | 7,855 | | | | | | | 7,855 | 7,855 | 47,130 |
| | 2022 | 7,855 | 7,855 | 7,855 | 7,855 | | | | | | | | 7,855 | 39,275 |
| | 2023 | 7,855 | 7,855 | 7,855 | | | | | | | | | 7,855 | 31,420 |
| | 2024 | 7,855 | 7,855 | 7,855 | 7,855 | | | | | | | | 7,855 | 39,275 |
| | 2025 | 7,855 | 7,855 | 7,855 | 7,855 | | | | | | | 7,855 | 7,855 | 47,130 |

*Table 3-49(b): Monthly Availability of SMUD CVP Contract in Zone 40 through 2025 (acre-feet per year)*

| Total Supply | | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Normal Year | | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 | 2,500 | 30,000 |
| Single Dry Year | | | | | 253 | 253 | 253 | 253 | 253 | 253 | 253 | 253 | | 2,023 |
| Multi-Year Drought | 2021 | | | | | 1,011 | 1,011 | 1,011 | 1,011 | 1,011 | 1,011 | | | 6,068 |
| | 2022 | | | | | 578 | 578 | 578 | 578 | 578 | 578 | 578 | | 4,045 |
| | 2023 | | | | 253 | 253 | 253 | 253 | 253 | 253 | 253 | 253 | | 2,023 |
| | 2024 | | | | | 289 | 289 | 289 | 289 | 289 | 289 | 289 | | 2,023 |
| | 2025 | | | | | 674 | 674 | 674 | 674 | 674 | 674 | | | 4,045 |

*Table 3-49(c): Monthly Availability of Fazio CVP Contract in Zone 40 through 2025 (acre-feet per year)*

| Total Supply | | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Normal Year | | 1,250 | 1,250 | 1,250 | 1,250 | 1,250 | 1,250 | 1,250 | 1,250 | 1,250 | 1,250 | 1,250 | 1,250 | 15,000 |
| Single Dry Year | | | | | 185 | 185 | 185 | 185 | 185 | 185 | 185 | 185 | | 1,481 |
| Multi-Year Drought | 2021 | | | | | 741 | 741 | 741 | 741 | 741 | 741 | | | 4,444 |
| | 2022 | | | | | 423 | 423 | 423 | 423 | 423 | 423 | 423 | | 2,963 |
| | 2023 | | | | 185 | 185 | 185 | 185 | 185 | 185 | 185 | 185 | | 1,481 |
| | 2024 | | | | | 212 | 212 | 212 | 212 | 212 | 212 | 212 | | 1,481 |
| | 2025 | | | | | 494 | 494 | 494 | 494 | 494 | 494 | | | 2,963 |

*Table 3-49(d): Monthly Availability of Aerojet GET Supply in Zone 40 through 2025 (acre-feet per year)*

| Total Supply | | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Normal Year | | 742 | 742 | 742 | 742 | 742 | 742 | 742 | 742 | 742 | 742 | 742 | 742 | 8,900 |
| Single Dry Year | | | | | 1,113 | 1,113 | 1,113 | 1,113 | 1,113 | 1,113 | 1,113 | 1,113 | | 8,900 |
| Multi-Year Drought | 2021 | | | | | 1,483 | 1,483 | 1,483 | 1,483 | 1,483 | 1,483 | | | 8,900 |
| | 2022 | | | | | 1,271 | 1,271 | 1,271 | 1,271 | 1,271 | 1,271 | 1,271 | | 8,900 |
| | 2023 | | | | 1,113 | 1,113 | 1,113 | 1,113 | 1,113 | 1,113 | 1,113 | 1,113 | | 8,900 |
| | 2024 | | | | | 1,271 | 1,271 | 1,271 | 1,271 | 1,271 | 1,271 | 1,271 | | 8,900 |
| | 2025 | | | | | 1,483 | 1,483 | 1,483 | 1,483 | 1,483 | 1,483 | | | 8,900 |

*Table 3-49(e): Monthly Availability of NDWA Supply in Zone 40 through 2025 (acre-feet per year)*

| Total Supply | | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Normal Year | | | | | | | | | | | | | | 0 |
| Single Dry Year | | | | | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 56 | | 450 |
| Multi-Year Drought | 2021 | | | | | | | | | | | | | 0 |
| | 2022 | | | | | 64 | 64 | 64 | 64 | 64 | 64 | 64 | | 450 |
| | 2023 | | | | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 56 | | 450 |
| | 2024 | | | | | 64 | 64 | 64 | 64 | 64 | 64 | 64 | | 450 |
| | 2025 | | | | | 75 | 75 | 75 | 75 | 75 | 75 | | | 450 |

*Table 3-49(f): Monthly Availability of Groundwater in Zone 40 through 2025 (acre-feet per year)*

| Total Supply | | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Normal Year | | 1,823 | 1,834 | 2,231 | 2,327 | 3,327 | 4,256 | 4,931 | 5,168 | 5,003 | 4,142 | 3,600 | 2,359 | 41,000 |
| Single Dry Year | | 1,823 | 1,834 | 2,231 | 2,327 | 3,327 | 4,256 | 4,931 | 5,168 | 5,003 | 4,142 | 3,600 | 2,359 | 41,000 |
| Multi-Year Drought | 2021 | 1,823 | 1,834 | 2,231 | 2,327 | 3,327 | 4,256 | 4,931 | 5,168 | 5,003 | 4,142 | 3,600 | 2,359 | 41,000 |
| | 2022 | 1,823 | 1,834 | 2,231 | 2,327 | 3,327 | 4,256 | 4,931 | 5,168 | 5,003 | 4,142 | 3,600 | 2,359 | 41,000 |
| | 2023 | 1,823 | 1,834 | 2,231 | 2,327 | 3,327 | 4,256 | 4,931 | 5,168 | 5,003 | 4,142 | 3,600 | 2,359 | 41,000 |
| | 2024 | 1,823 | 1,834 | 2,231 | 2,327 | 3,327 | 4,256 | 4,931 | 5,168 | 5,003 | 4,142 | 3,600 | 2,359 | 41,000 |
| | 2025 | 1,823 | 1,834 | 2,231 | 2,327 | 3,327 | 4,256 | 4,931 | 5,168 | 5,003 | 4,142 | 3,600 | 2,359 | 41,000 |

Table 3-50 shows the existing and planned water supplies in Zone 40 through 2045.

*Table 3-50: Zone 40 Supply Availability through 2045 (acre-feet per year)*

| Total Supply | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Normal Year | | 159,096 | 164,096 | 174,096 | 174,096 | 174,096 |
| Single Dry Year | | 87,199 | 92,676 | 103,926 | 105,176 | 107,676 |
| Multi-Year Drought | Year 1 | 111,954 | 118,386 | 132,136 | 135,886 | 143,386 |
| | Year 2 | 99,576 | 105,531 | 118,031 | 120,531 | 125,531 |
| | Year 3 | 87,199 | 92,676 | 103,926 | 105,176 | 107,676 |
| | Year 4 | 95,054 | 100,531 | 111,781 | 113,031 | 115,531 |
| | Year 5 | 107,431 | 113,386 | 125,886 | 128,386 | 133,386 |

# Chapter 4
# Water Use

Understanding water use characteristics is essential to enable SCWA to reliably and cost-effectively manage its water supplies to continue to meet customer needs. This section characterizes SCWA's retail and wholesale customer demands – current and forecast over the next few decades. Characteristics such as how demands vary among different land use classifications, throughout the year, and under differing hydrologic conditions, all help with that understanding.

A thorough characterization and analysis provides a realistic prediction of future water use based upon SCWA's past and current water use, in addition to considerations of anticipated growth, new regulations, changing climate conditions and trends in customer water use behaviors. A thorough analysis examines each water use sector for a variety of factors, then aggregates the information into a comprehensive projection of customer water use that becomes the foundation for integration with SCWA's water supplies (see Chapter 3) to assess long-term water system reliability (see Chapter 5).

Several legislative changes were enacted since SCWA completed its 2015 UWMP. The new requirements must be addressed in the 2020 UWMP in addition to completing requirements from the prior statutory language. While there have been many changes, the critically important items that must be addressed are highlighted below:

- Provide quantified distribution system losses for each of the 5 preceding years and whether the State standard was met. [CWC 10631(d)(3)(A) and (C)]
- Include a drought risk assessment (DRA) for a drought period that lasts five consecutive water years, starting from the year following the assessment, which would be 2021 for this round of UWMPs. The DRA requires a comparison of water supplies with total projected water use. Therefore, the SCWA must produce a projected water use for the years 2021 through 2025 as part of the water use projections up to 2045. [CWC 10635(b)]
- Conduct an annual water supply and demand assessment on or before July 1 of each year (following adoption of its 2020 UWMP) where the annual assessment includes current year unconstrained demand. The SCWA will consider "unconstrained demand" as the expected water use in the upcoming year, based on recent water use, before any projected response actions it may trigger under its Water Shortage Contingency Plan (see Chapter 6). [CWC 10632.1]

This section is organized as follows:

- Current Customer Water Use – This subsection presents data reflecting the SCWA's residential and non-residential customers for 2016 through 2019 as well as the actual 2020 water use and presents the SCWA's distribution system losses for this same period.
- Compliance with 2020 Urban Water Use Target – This subsection documents the derivation of the 2020 GPCD value and comparison to the 2020 GPCD target.
- Demand Management Measures – This subsection provides a narrative description of each water demand management measure implemented by the SCWA over the past five years and describes the planned measures for the foreseeable future.
- Forecasting Customer Use – This subsection presents the derivation and results of future water use forecasts for potable water within the SCWA's service area, including land-use classifications, unit demand factors, and estimation of distribution system losses. This subsection also estimates the variations in customer water use the SCWA should expect during years with low rainfall as well as discusses longer-term climate change considerations.
- Forecasting Water Use for DRA and Annual Assessment – This subsection focuses on the subset of the customer water use forecast that is necessary for completing the 5-year Drought Risk Assessment (DRA) and defining the "unconstrained demand" for purposes of the annual water supply and demand assessment.
- Projecting Disadvantaged Community Water Use – This subsection presents the estimated water use necessary to meet lower income households, pursuant to California Water Code 10631.1.

## 4.1 Current Customer Water Use

As described in Chapter 2, SCWA has been serving potable water to over 59,000 customer connections for the past several years as well as wholesaling water to Elk Grove Water District (EGWD). Under normal operations, water supplied by SCWA to its customers is drawn from several sources, depending on the service area, and either directly delivered (when groundwater) or treated at the Vineyard water treatment plant (when surface water). The current customers, their recent and expected water use trends, and SCWA's on-going demand management efforts targeting these customers provide a foundational basis for this UWMP's water use forecast to 2045.

Furthermore, the actual water use in 2020 is the basis for determining SCWA's compliance with its 2020 gallons per capita per day (GPCD) target established in its 2015 UWMP. This subsection presents this relevant information.

### 4.1.1 Retail Customer Water Use: 2016 to 2019

Recent retail customer water use can help SCWA understand water use trends, effects of temporary use restrictions imposed during the most recent prolonged drought and recovery from such temporary restrictions, effects of long-term demand management measures, and other pertinent water use factors relevant to its forecast of future water use. Water Code Section 10631(d)(1) also requires SCWA to quantify past customer water use.[47]

[47] California Water Code Section 10631(d)(1)

As described in Chapter 2, the SCWA provides retail potable water service to several unique service areas, as well as serving non-potable supplies to the South Service Area and wholesale potable water to EGWD. Tables 4-1(a) through 4-1(g) presents the SCWA's past retail customer water use by customer classification for 2016 through 2019 for each of its service areas. The SCWA records water use within six primary categories, though all six are not present in all service areas:

- Single-family residential
- Multi-family residential
- Commercial
- Government and Institutional
- Industrial
- Landscape Irrigation

The SCWA also records delivered water for non-potable (recycled) use as well as deliveries to EGWD and to the City of Sacramento. These demands are discussed in a subsequent section. Deliveries to the City of Sacramento are not reflected in this UWMP as they are intermittent and part of an interagency water supply sharing agreement that periodically has water moving between the City and the SCWA to facilitate a variety of activities, including facilitating recent groundwater substitution transfers.[48]

This historic data also provides insight into the relative ratio of differing retail customer classifications to each other as well as seasonal variations. For instance, the Zone 40 customer demands in most classifications have been slowly increasing from 2016 to 2019. This is likely a result of recovery in use following the recent 2013 through 2015 drought that forced the SCWA to mandate conservation measures imposed by the Governor's office as well as continued growth. And the monthly data illustrates the higher demand during summer months in most classifications, likely driven by landscape irrigation needs.

The annual historic data for the other service areas also offer useful information on trending and use. For instance, use in Arden Park Vista likely has peaked and is potentially starting to decrease as the SCWA continues its meter installation program. Metro Air Park, in contrast, is seeing increased demand, albeit much smaller total quantities, consistent with the growth in the small service area.

The Zone 40 single-family residential classification illustrates two important characteristics of the SCWA's water service: (1) it represents over 70% of the Zone 40 annual demand, and (2) it has summer demands that are two times the monthly volume needed in winter months. These seasonal variations and dominance as the highest retail water using classification, both in Zone 40 and when all service areas are considered, provide the SCWA with additional insight necessary for assessing the seasonal reliability of its water supplies and developing and quantifying successful water shortage contingency response actions, especially for the Zone 40 service area.

[48] For instance, in 2020, the SCWA pumped about 1,700 acre-feet of groundwater and served it into the City through the Franklin Intertie to facilitate the City's temporary transfer of its surface water rights to other water suppliers in the need of water. In subsequent periods, the City will push surface water to SCWA through this same intertie to offset the SCWA pumping.

*Table 4-1(a): Zone 40 Retail Customer Use 2016 to 2019 (values in acre-feet)*

| | Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single-Family Residential | 2016 | 812 | 769 | 762 | 983 | 1,304 | 1,875 | 2,083 | 2,239 | 2,102 | 1,662 | 1,087 | 877 | 16,556 |
| | 2017 | 877 | 823 | 724 | 949 | 1,371 | 2,156 | 2,294 | 2,486 | 2,303 | 1,930 | 1,494 | 992 | 18,399 |
| | 2018 | 988 | 961 | 880 | 966 | 1,487 | 1,998 | 2,250 | 2,317 | 2,271 | 1,871 | 1,710 | 1,070 | 18,770 |
| | 2019 | 950 | 843 | 773 | 929 | 1,537 | 1,874 | 2,295 | 2,440 | 2,327 | 2,017 | 1,732 | 1,242 | 18,961 |
| Multi-Family Residential | 2016 | 50 | 50 | 48 | 55 | 66 | 74 | 75 | 88 | 86 | 71 | 63 | 53 | 779 |
| | 2017 | 57 | 56 | 47 | 57 | 63 | 82 | 81 | 93 | 89 | 78 | 72 | 53 | 828 |
| | 2018 | 54 | 57 | 50 | 57 | 67 | 85 | 83 | 86 | 92 | 79 | 76 | 64 | 849 |
| | 2019 | 59 | 57 | 52 | 55 | 63 | 82 | 87 | 97 | 98 | 85 | 79 | 68 | 882 |
| Commercial | 2016 | 78 | 79 | 83 | 96 | 112 | 126 | 139 | 153 | 161 | 158 | 113 | 83 | 1,381 |
| | 2017 | 88 | 88 | 73 | 93 | 106 | 149 | 151 | 172 | 164 | 145 | 137 | 92 | 1,458 |
| | 2018 | 94 | 97 | 88 | 97 | 113 | 151 | 156 | 152 | 161 | 138 | 137 | 111 | 1,495 |
| | 2019 | 92 | 84 | 80 | 87 | 112 | 147 | 158 | 177 | 180 | 160 | 150 | 134 | 1,561 |
| Institutional | 2016 | 15 | 18 | 20 | 32 | 49 | 68 | 82 | 87 | 83 | 60 | 27 | 19 | 559 |
| | 2017 | 17 | 21 | 18 | 23 | 38 | 83 | 88 | 98 | 87 | 64 | 50 | 23 | 610 |
| | 2018 | 23 | 26 | 24 | 25 | 44 | 69 | 78 | 95 | 89 | 68 | 55 | 37 | 632 |
| | 2019 | 19 | 20 | 21 | 26 | 47 | 68 | 81 | 94 | 88 | 74 | 62 | 36 | 638 |
| Industrial | 2016 | 33 | 31 | 23 | 37 | 44 | 53 | 59 | 63 | 53 | 39 | 27 | 23 | 486 |
| | 2017 | 25 | 22 | 16 | 29 | 31 | 51 | 55 | 67 | 57 | 41 | 35 | 21 | 450 |
| | 2018 | 21 | 24 | 18 | 12 | 27 | 46 | 51 | 53 | 54 | 39 | 36 | 29 | 411 |
| | 2019 | 15 | 19 | 14 | 18 | 32 | 44 | 54 | 58 | 59 | 42 | 41 | 35 | 433 |
| Irrigation | 2016 | 21 | 21 | 23 | 96 | 257 | 422 | 556 | 630 | 557 | 365 | 93 | 30 | 3,072 |
| | 2017 | 20 | 18 | 19 | 95 | 251 | 541 | 604 | 670 | 600 | 464 | 245 | 44 | 3,571 |
| | 2018 | 43 | 44 | 42 | 70 | 294 | 532 | 652 | 656 | 610 | 452 | 357 | 100 | 3,852 |
| | 2019 | 30 | 26 | 21 | 42 | 335 | 457 | 633 | 714 | 640 | 496 | 378 | 157 | 3,929 |
| Total Metered Deliveries | 2016 | 1,008 | 967 | 959 | 1,300 | 1,833 | 2,618 | 2,994 | 3,259 | 3,044 | 2,355 | 1,410 | 1,086 | 22,833 |
| | 2017 | 1,084 | 1,028 | 897 | 1,246 | 1,860 | 3,062 | 3,273 | 3,586 | 3,300 | 2,722 | 2,033 | 1,225 | 25,316 |
| | 2018 | 1,223 | 1,209 | 1,101 | 1,227 | 2,033 | 2,882 | 3,269 | 3,358 | 3,277 | 2,648 | 2,369 | 1,411 | 26,009 |
| | 2019 | 1,165 | 1,050 | 961 | 1,158 | 2,127 | 2,672 | 3,308 | 3,580 | 3,391 | 2,875 | 2,441 | 1,674 | 26,403 |

*Table 4-1(b): Arden Park Vista Customer Use 2016 to 2019 (values in acre-feet)*

| | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|
| Single Family Residential | 9 | 15 | 17 | 153 |
| Multi-Family Residential | n/a | n/a | n/a | 11 |
| Commercial/Institutional | 72 | 83 | 89 | 115 |
| Landscape Irrigation | 36 | 63 | 37 | 45 |
| Estimated Unmetered Use [mostly residential customers] | 2,607 | 2,896 | 2,875 | 2,652 |
| Total | 2,724 | 3,057 | 3,018 | 2,976 |

*Table 4-1(c): Northgate 880 Customer Use 2016 to 2019 (values in acre-feet)*

| | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|
| Commercial/Institutional | 407 | 550 | 645 | 649 |
| Industrial | 237 | 301 | 326 | 272 |
| Landscape Irrigation | 80 | 103 | 132 | 110 |
| Total | 724 | 954 | 1,103 | 1,031 |

*Table 4-1(d): Metro Air Park Customer Use 2016 to 2019 (values in acre-feet)*

| | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|
| Commercial/Institutional | 3 | 15 | 14 | 15 |
| Landscape Irrigation | 4 | 29 | 28 | 29 |
| Total | 7 | 44 | 42 | 44 |

*Table 4-1(e): Hood Water Maintenance District Customer Use 2016 to 2019 (values in acre-feet)*

| | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|
| Single Family Residential | 18 | 17 | 20 | 19 |
| Commercial/Institutional | 5 | 7 | 4 | 4 |
| Total | 23 | 24 | 24 | 23 |

*Table 4-1(f): East Walnut Grove Customer Use 2016 to 2019 (values in acre-feet)*

| | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|
| Single Family Residential | 35 | 33 | 32 | 29 |
| Multi-Family Residential | 4 | 5 | 6 | 6 |
| Commercial/Institutional | 8 | 10 | 13 | 9 |
| Landscape Irrigation | 1 | 1 | 1 | 2 |
| Total | 48 | 49 | 52 | 46 |

*Table 4-1(g): Southwest Tract Customer Use 2016 to 2019 (values in acre-feet)*

| | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|
| Single Family Residential | 6 | 6 | 6 | 6 |
| Multi-Family Residential | 18 | 15 | 14 | 14 |
| Commercial/Institutional | 1 | 1 | 1 | 1 |
| Total | 25 | 22 | 21 | 21 |

### 4.1.2 Retail Customer Use in 2020

Retail customers served by the SCWA are metered at their connection to the distribution system, with the exception of many of the single-family residential customers in Arden Park Vista. These metered values are collected periodically for each customer account and summarized into the SCWA's annual reporting to the SWRCB Division of Drinking Water and to DWR.[49]

The 2020 actual retail customer use presented in Table 4-2(a) and Table 4-2(b) represents the summarized delivery to the retail customers in each SCWA service area. The tables do not, however, include the distribution system losses inherent in a pressurized water delivery system that occur during the efforts to treat, store and route water throughout an extensive distribution system to each customer's connection. The values also do not include wholesale deliveries to the Elk Grove Water District or within the non-potable system serving demands in the SSA.

*Table 4-2(a): Zone 40 Retail Customer Water Use 2020 Actual (values in acre-feet)*

| Use Category | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single-family Residential | 1,007 | 1,029 | 1,264 | 1,359 | 1,952 | 2,420 | 2,767 | 2,852 | 2,812 | 2,313 | 2,010 | 1,334 | 23,120 |
| Multi-family Residential | 63 | 59 | 65 | 72 | 79 | 96 | 106 | 104 | 103 | 92 | 92 | 72 | 1,002 |
| Commercial | 103 | 102 | 108 | 89 | 89 | 122 | 139 | 152 | 159 | 151 | 143 | 106 | 1,462 |
| Institutional | 19 | 23 | 32 | 28 | 37 | 63 | 81 | 96 | 84 | 62 | 55 | 27 | 607 |
| Industrial | 23 | 34 | 29 | 26 | 33 | 49 | 58 | 62 | 62 | 57 | 50 | 33 | 515 |
| Landscape Irrigation | 33 | 35 | 166 | 123 | 347 | 574 | 704 | 773 | 679 | 476 | 358 | 127 | 4,395 |
| Subtotal | 1,247 | 1,283 | 1,664 | 1,697 | 2,537 | 3,324 | 3,855 | 4,040 | 3,897 | 3,151 | 2,707 | 1,700 | 31,102 |

Comparing to the values in Table 4-1(a) the total 2020 Zone 40 annual retail customer use is nearly 5,000 acre-feet greater than 2019. Comparing the specific customer classifications, the 2020 data displays two unique circumstances: (1) single-family residential use is 27% higher than the average over the last 4 years – or about 4,000 acre-feet higher, and (2) the industrial and landscape use is also about 20% higher. The other classifications are within the variations for each over the past several years.

The significantly higher single-family residential use in 2020 when compared to 2017 through 2019, which had been reasonably stable after recovering from drought conditions, results in the majority of the higher 2020 Zone 40 value. While a portion of this increase is from new housing starts, most is likely due to the pandemic that dominated 2020 and the multiple advisories and even government-imposed restrictions that resulted in many people working from, learning from, or simply staying at home.

The SCWA's other service areas saw a mix of similar use to 2018 and 2019 conditions to vastly increased use. The most notable increase was within Metro Air Park, where significant construction and increased commercial activity are on-going. But this increase is nominal when viewed within the entire SCWA customer use in 2020. Arden Park Vista, the second highest service area to Zone 40, stayed consistent with 2018 and 2019 values. As a primary residential suburb, this area would be assumed to have seen

[49] The annual SWRCB report is referred to as the 'electronic Annual Report' or eAR, and the annual DWR report is known as the Public Water System Statistics report.

an increase in single-family use, but the area is still undergoing meter installation so comparison within a customer classification is not viable as the data does not exist in the appropriate form. Table 4-2(b) provides the annual 2020 recorded values for each of these other service areas.[50]

*Table 4-2(b): Other Service Area Customer Water Use 2020 Actual (values in acre-feet)*

| Classification | Arden Park Vista | Northgate 880 | Metro Air Park | Hood | East Walnut Grove | Southwest Tract |
|---|---|---|---|---|---|---|
| Single-family Residential | 2,446 | -- | -- | 22 | 36 | 6 |
| Multi-family Residential | 213 | -- | -- | -- | 5 | 15 |
| Commercial | 457 | 660 | 52 | 5 | 8 | -- |
| Institutional | 33 | 318 | -- | -- | 1 | 1 |
| Industrial | -- | 35 | -- | -- | -- | -- |
| Landscape Irrigation | 41 | 139 | 55 | -- | 1 | -- |
| Total | 3,191 | 1,151 | 107 | 27 | 51 | 23 |

### 4.1.3 Zone 40 Wholesale Customer Use

In addition to the significant retail customer water services in Zone 40, SCWA also provides wholesale water supply to a portion of the service area of Elk Grove Water District (EGWD), which operates a retail water system serving customers within a portion of the City of Elk Grove. Table 4-3 details the history of deliveries to EGWD as reported by SCWA. While this wholesale service area has access to both the SCWA's groundwater and surface water resources, as a matter of practice, water served is almost entirely derived from the SCWA's production wells located within the EGWD's service area.

*Table 4-3: Zone 40 Wholesale Deliveries 2016 to 2020 (values in acre-feet)*

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | 162 | 81 | 84 | 105 | 157 | 232 | 295 | 289 | 267 | 232 | 114 | 89 | 2,107 |
| 2017 | 83 | 87 | 88 | 105 | 149 | 267 | 305 | 322 | 304 | 258 | 190 | 105 | 2,262 |
| 2018 | 98 | 97 | 104 | 101 | 162 | 263 | 310 | 321 | 299 | 238 | 203 | 132 | 2,327 |
| 2019 | 92 | 93 | 89 | 96 | 190 | 223 | 296 | 313 | 306 | 254 | 214 | 139 | 2,304 |
| 2020 | 98 | 99 | 137 | 122 | 206 | 269 | 329 | 372 | 315 | 267 | 218 | 140 | 2,572 |

Similar to circumstances seen with the residential-heavy retail customer service areas, water deliveries in 2020 to this part of EGWD were about 10% higher than the same service in 2018 and 2019, which had been reasonably stable after recovering from drought conditions. While some of this increase may be attributable to growth in the EGWD service area, likely the increase relates to increased residential use

[50] Most of the Arden Park Vista water use by customer classification is estimated since most residential customers are not metered. The estimate was made by comparing the small amount of metered use to the total water quantity supplied to the service area, accounting for distribution losses, then distributing the remainder among the non-metered service connections.

due to the pandemic that dominated 2020 and the multiple advisories and even government-imposed restrictions that resulted in many people working from, learning from, or simply staying at home.

### 4.1.4 Zone 40 Non-Potable Water Needs[51]

In 2017, SCWA completed the Recycled Water Feasibility Study. This study assessed SCWA's opportunities to obtain recycled water supplies from Sacramento Regional County Sanitation District (SRCSD) to meet customer demands in SCWA's service area. Beginning in 2003, SCWA obtained tertiary treated wastewater from SRCSD to meet the Phase 1 recycled water demands in the Laguna Vineyard system. The Phase 1 program has 54 user sites, including parks, schoolyards, commercial landscaping, and roadway medians. All operations are conducted in accordance with SRCSD's Master Reclamation Permit Waste Discharge Requirement No. 97-146. Phase 2 has conveyance facilities in the East Franklin Specific Plan planning subarea. Currently, the recycled water supplies have been used only in the Phase 1 area. Table 4-4 shows the historical water deliveries from 2016 through 2020.

*Table 4-4: Zone 40 Non-Potable Deliveries 2016 to 2020 (values in acre-feet)*

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2016 | 7 | 6 | 8 | 50 | 85 | 129 | 144 | 136 | 94 | 44 | 9 | 7 | 720 |
| 2017 | 8 | 8 | 15 | 33 | 107 | 133 | 157 | 145 | 119 | 90 | 14 | 15 | 845 |
| 2018 | 14 | 14 | 13 | 36 | 106 | 143 | 156 | 143 | 110 | 82 | 31 | 14 | 861 |
| 2019 | 9 | 4 | 4 | 44 | 88 | 142 | 150 | 163 | 132 | 97 | 62 | 6 | 901 |
| 2020 | 2 | 18 | 24 | 53 | 101 | 168 | 180 | 167 | 113 | 84 | 38 | 14 | 962 |

### 4.1.5 Existing Distribution System Losses

Distribution system water losses (also known as "real losses") are the physical water losses from the SCWA's water distribution system up to the point of delivery to the customer's system (e.g. up to the residential water meter or wholesale delivery point).

Since 2016, the SCWA has been required to quantify its distribution system losses using the American Water Works Association Method (Title 23 California Code of Regulations Section 638.1 et seq.). An electronic copy of an audit in Excel format is to be submitted to the DWR by October 1 of each year for the prior year's estimated system losses, using DWR's online submittal tool pursuant to Code of Regulations Section 638.5. As represented in Table 4-5, the SCWA has estimated its losses across its systems in different ways over time. Initial reporting were for the entire Zone 41 service, then Zone 40 was separated from "non-Zone 40" areas, with more service area specific worksheets being prepared as of 2019. Copies of the SCWA's submittals for the last 5 years are available through DWR,[52] with the pertinent results shown in Table 4-5. The 2020 estimates for each service area have not been officially submitted to DWR as of the drafting of this UWMP. But Zone 40, the largest service area, is estimated to be approximately 5,300 acre-feet over the year, or about 14.6% of the water entering that

[51] Recycled Water Feasibility Report, July 2017. Information from this report was used to prepare the non-potable water needs description in this section.

[52] https://wuedata.water.ca.gov/awwa_plans

distribution system. Deliveries into the EGWD service area are assumed to be only 3%, since the accounting reflects minimal distribution systems from the SCWA owned wells to the EGWD owned distribution system.

*Table 4-5: Distribution System Loss: 2016 through 2020*[53]

| Service Area | 2016 | 2017 | 2018 | 2019 | 2020 | Average |
|---|---|---|---|---|---|---|
| Zone 41 (all) | 14.1% | [Reported separately for Zone 40 and Non-Zone 40] | | | | 14.1% |
| Zone 40 | | 12.3% | 10.0% | 19.3% | 14.6% | 14.1% |
| Non-Zone 40 | | 16.0% | 12.8% | 10.5% | 14.1% | 14.4% |
| Wholesale Delivery to Elk Grove Water District | | | | | | 3% |

As can be anticipated given the dynamic functions of a pressurized potable water distribution system, the estimated annual distribution system loss as a percentage of water entering the system will vary year-to-year and month to month. On average, however, the distribution system loss represents about 14% of the water entering the distribution system.

## 4.2 Compliance with 2020 Urban Water Use Target

Pursuant to California Water Code Section 10608.24(b)[54], the SCWA must demonstrate its 2020 water use met the GPCD target adopted in its 2015 UWMP. As set forth in the 2015 UWMP, the SCWA's 2020 GPCD target was established as 236 GPCD, derived as the "gross water use" divided by the population during a defined baseline period, and reduced pursuant to one of four methods defined under California Water Code Section 10608.20(b). The 2020 actual GPCD must use the same methodology to derive "gross water use" for 2020, then divide by the estimated 2020 population presented in Chapter 2.

As presented in the SCWA's 2015 UWMP, gross water was determined to be the total water supplied, minus water delivered to EGWD. For 2020, one added adjustment is made to account for additional water pumped and supplied to the City of Sacramento as part of the 2020 regional groundwater substitution transfer. This quantity, in addition to the quantity delivered to EGWD are both subtracted from the total as they are not used to meet the SCWA's serviceable population. The calculation, therefore, begins with the total "Potable Water" for 2020 as recorded by the SCWA, which was 50,868 acre-feet that entered the SCWA's distribution system. From this is subtracted 2,572 acre-feet wholesaled to EGWD, and 1,741 acre-feet sent to the City of Sacramento to aid with the transfer. The resulting "gross water use" for 2020 is 46,555 acre-feet. This value represents both the customer deliveries shown in Table 4-2(a) and Table 4-2(b) and the distribution system losses recorded in Table 4-5. As shown in Table 2-2, the SCWA's population in its service areas in 2020 was estimated to be 181,400 (not including the estimated population in the EGWD service area). This results in a calculated 2020 compliance value of 229 GPCD, which is less than the SCWA's established target. Thus, the SCWA is in compliance with CWC Section 10608.24(b). Table 4-6 provides a summary of this calculation.

[53] For 2016, SCWA prepared and submitted one table for all service areas. Beginning in 2017, analysis was submitted separately for Zone 40 from other service areas.

[54] 10608.24. (b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

*Table 4-6: Demonstration of Compliance with 2020 GPCD Target*

| | |
|---|---|
| 2020 Volume into Distribution System = | 50,868 acre-feet |
| Water Delivered to Others = | 4,313 acre-feet |
| 2020 Gross Water Use = | 46,555 acre-feet |
| 2020 Population = | 181,400 people |
| 2020 Actual GPCD = | 229 |
| 2020 Target GPCD = | 236 |
| Compliance Achieved? | Yes |

## 4.3 Demand Management Measures

Pursuant to California Water Code Section 10631(e), SCWA needs to provide a narrative discussion of the water demand management measures it has implemented, is currently implementing, and plans to implement. The historic and on-going measures can help SCWA understand the effectiveness of managing existing customer uses so as to help guide refinements, emphasis, or augmentation that will help position the Agency to best meet its to-be-established water use objective.[55] It should be noted that since SCWA is a retail and wholesale supplier it implements demand management measures with both its retail and wholesale customers.

The Agency's demand management measures are highlighted in this subsection.

### 4.3.1 Foundational Demand Management Measures

This section describes the foundational demand management measures (DMMs) that underpin the SCWA operations and customer deliveries. These particular DMMs represent adopted ordinances, policies, and long-standing budgeted conservation programs.

#### Water Waste Prevention Ordinances

SCWA's water code prohibits water waste by ordinance in SCWA Code Title 3 Section 3.40.120. Water use in a negligent or wasteful manner or in violation of the Water Shortage Contingency Plan of the Sacramento County Code, or state law or regulations is prohibited. Water waste can be reported by making a service request through the SCWA website or making a service call. Additionally, SCWA ordinance 3.40.130 prohibits unauthorized use of agency water by making unauthorized connection to the SCWA's water system. Full text of the ordinances can be found on SCWA's website.[56]

[55] Beginning in 2023, all urban water suppliers will be required to begin reporting their use compared to a "Water Use Objective" that is being established pursuant to the recently enacted California Water Code Section 10609.20.
[56] https://countycounsel.saccounty.net/Documents/Title3.pdf

## Metering

About 90% of SCWA's retail customers are metered. The SCWA is currently in their last phase of meter installation in the Arden Park Vista service area with completion scheduled for the end of 2025. Part of the retail service area has AMI installed which allows real-time consumption and diagnostic data analysis that can help identify water waste and system loss. Wholesale interconnections that supply Elk Grove Water District are not currently metered due to the large number of interconnections and high cost of metering all of the interconnections. SCWA is investigating how to most efficiently meter all interconnections.

## Conservation Pricing

SCWA has offered conservation pricing in accordance with California Urban Water Conservation Council's (CUWCC) 1991 MOU. The Agency continues to reward conservation by providing a conservation discount for metered residential customers in Zone 41. SCWA is also a member of the CUWCC successor organization, California Water Efficiency Partnership (CalWEP).

## Public Education and Outreach

SCWA engages its customer base with a number of conservation and demand management outreach programs. Promoting water wise activities, watering schedules, and educational programs such as protecting water supply, are part of the Agency's regular outreach efforts.

In addition to local public education and outreach programs, SCWA also participates in a regional public education and outreach program through the Regional Water Authority. The Regional Water Authority (RWA) is a joint powers authority formed in 2001 to promote collaboration on water management and water supply reliability programs in the greater Sacramento, Placer, El Dorado, Yolo and Sutter counties. In collaboration with 19 water provider members and other wastewater, stormwater and energy partners, RWA formed the Water Efficiency Program (WEP) in 2001 to bring cost effectiveness through economies of scale to public education and outreach activities. The main function of the WEP is to develop and distribute public outreach messages to customers in the region by collaborating with its water provider members. Additionally, the RWA Be Water Smart website[57] offers a comprehensive set of resources for individuals, educators and organizations. The 2020 Be Water Smart End-Year Recap report and detailed information about the regional WEP program, including a table of Regional Rebates and Installations from 2016-2020 is available on the RWA website.[58]

[57] https://bewatersmart.info/

[58] https://rwah2o.org/2019-water-efficiency-program-annual-report-available/

### Programs to Assess and Manage Distribution System Real Loss

The SCWA's water loss assessment and management program includes annual water audits and an ongoing leak detection and repair. This includes an ongoing meter calibration and replacement program for all production and distribution meters. The SCWA's activities include:

- Annual water audit and water balance
- Well production meter data collection and validation
- Proactive leak identification and repair in SCWA distribution system
- Customer leak identification and repair assistance: A consulting water auditor assists customers in locating leaks both inside and outside the home or business. Free leak detection kits for residential customers are also offered through the RWEP Be Water Smart program.

### Water Conservation Program Coordination and Staffing Support

Implementing and monitoring SCWA's water conservation activities is managed collectively across many staff positions. Ultimately, SCWA's Engineer enforces this water conservation program pursuant to the Sacramento County Code, Title 3, Section 3.40.120, however, SCWA does not have a dedicated Conservation Coordinator. In times of state declared drought, SCWA assigns the following staff to focus on necessary implementation activities:

- Public Information Officer (media/customer inquiry/website updates)
- Senior Civil Engineer (content development/enforcement)
- Associate Civil Engineer (2) (enforcement review/field inspection coordination)
- Assistant Civil Engineer (1) (enforcement processing/tracking/inspection)
- Senior Engineering Technician (3) (enforcement notification/tracking and inspection)
- Engineering Technician Level II (1) (inspection)

## 4.3.2 Recent DMM Activities

The SCWA implements other demand management measures, both within the SCWA and as a part of the RWA WEP. Table 4-7 describes DMM activities from 2016 through 2020. Program participation, costs and details can be found on SCWA's water conservation website.[59]

## 4.3.3 Planned DMM Activities

In its commitment to ongoing water conservation and proactive demand management activity, SCWA is developing a new set of programs and actions which will be used to achieve water use objectives in compliance with California Water Code Section 10609.20. Resources will be dedicated in SCWA budget for demand management activities which will help comply with these future water use objectives. Special consideration will be taken regarding changing urban water use patterns in the service area.

[59] https://waterresources.saccounty.net/scwa/Pages/WaterConservation.aspx

*Table 4-7: Recent Demand Management Measures*

| Demand Management Measure | Description |
|---|---|
| Cash for Grass | Rebate for residential and commercial customers to convert existing grass/turf to native and drought tolerant landscaping |
| High Efficiency Clothes Washer | Rebate for purchase of a new high efficiency clothes washer |
| High Efficiency Toilet Rebates | Rebate for purchase of new high efficiency toilet |
| Home Water Audits | Leak detection and water use reduction |
| Mandatory Irrigation Guidelines | Weekly watering schedules for residential customers |
| Enforcement of State Water Board Prohibited Activities | Permanent potable water use restrictions |

### 4.3.4 Wholesale Distribution System Asset Management

The SCWA's water system assets consist of pipelines, groundwater wells, pump stations, storage facilities, the surface water treatment plant, and groundwater treatment plants. The SCWA places a high priority on properly maintaining the water system assets to keep it as reliable as possible. The SCWA has a comprehensive inventory of all its infrastructure assets that is maintained on a database that can be accessed using GIS mapping tools. The SCWA actively assesses the condition of the water system and uses a computerized maintenance management system to help manage the ongoing maintenance of the water system. Asset needs are identified and included in the capital improvement plan that is updated annually.

### 4.3.5 Wholesale Supplier Assistance Programs

The SCWA and its retail agencies are members of the RWA and Sacramento Groundwater Authority. (SGA). These joint powers authorities provide mutually beneficial programs for member organizations. The SCWA's participation and financial contributions to these programs benefit the agencies to which the SCWA provides wholesale water. The SCWA collaborates on demand management measure implementation, best practices and results with its retail agencies.

## 4.4 Forecasting Customer Use

Forecasting future water demands begins with understanding existing customer demands and trends, recognizing the additional customers expected through growth, and considering the factors that will influence the water use of both existing and new customer well into the future – especially factors that directly affect the efficiency of water use.

Pursuant to California Water Code 10610.4(c), an urban water supplier "*shall be required to develop water management plans to actively pursue the efficient use of available supplies*." One challenge from this directive is reflecting how the pursuit of efficient use is best represented in the forecast water uses that are the cornerstone of good planning. As required by the Act, the future water uses of both existing customers and those added over the 25-year planning horizon should reflect the "efficient use" of water.

### 4.4.1 Representing Current Customer Water Use

Tables 4-1(a) through Table 4-1(g) and Tables 4-2(a) and Table 4-2(b) provided the actual monthly customer water use for 2016 through 2020. From this information, an estimate of the representative "current" water use by existing customers has been developed for each service area. Knowing that actual use by existing customers varies slightly year-to-year based on a variety of factors (e.g. total rainfall and the timing of spring rain events impacting when landscape irrigation may begin), the recent data provides a basis for estimating current water use. Applying a slight adjustment to the 2020 single-family customer use data, the remaining 2020 customer use data is used as a proxy for "current" water use for each customer classification, which allows a baseline from which to estimate the future use of these existing customers. Importantly, the 2020 single-family actual use was adjusted in estimating representative "current" water use, since it appears to have been skewed by pandemic conditions during 2020 (see subsection 4.1.2). For purposes of the proxy estimate, the 2020 single-family actual use was decreased by 5% for Zone 40 and for Arden Park Vista service areas.

Table 4-8(a) provides the representative monthly and annual current water use, including distribution system losses for the SCWA's Zone 40 service area. The monthly 2020 values were also rounded for each customer classification and the Zone 40 2020 distribution loss of 14.6% was applied to generate the proxy of total current gross water use.

Table 4-8(b) provides the estimated annual current water use for the remaining service areas. Values in this table were also rounded to reflect proxy values for use in customer forecasting.

*Table 4-8(a): Zone 40 Representative Current Retail Water Use (acre-feet)*

| Use Category | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Current | Single-family Residential | 960 | 980 | 1,200 | 1,290 | 1,850 | 2,300 | 2,630 | 2,710 | 2,670 | 2,200 | 1,910 | 1,270 | 21,970 |
| | Multi-family Residential | 60 | 60 | 60 | 70 | 80 | 100 | 110 | 100 | 100 | 90 | 90 | 70 | 990 |
| | Commercial | 100 | 100 | 110 | 90 | 90 | 120 | 140 | 150 | 160 | 150 | 140 | 110 | 1,460 |
| | Institutional | 20 | 20 | 30 | 30 | 40 | 60 | 80 | 100 | 80 | 60 | 50 | 30 | 600 |
| | Industrial | 20 | 30 | 30 | 30 | 30 | 50 | 60 | 60 | 60 | 60 | 50 | 30 | 510 |
| | Landscape Irrigation | 30 | 40 | 170 | 120 | 350 | 570 | 700 | 770 | 680 | 480 | 360 | 130 | 4,400 |
| | Subtotal | 1,190 | 1,230 | 1,600 | 1,630 | 2,440 | 3,200 | 3,720 | 3,890 | 3,750 | 3,040 | 2,600 | 1,640 | 29,930 |
| | Distribution System Loss | 203 | 210 | 274 | 279 | 417 | 547 | 636 | 665 | 641 | 520 | 445 | 280 | 5,118 |
| | Total Gross Water Use | 1,393 | 1,440 | 1,874 | 1,909 | 2,857 | 3,747 | 4,356 | 4,555 | 4,391 | 3,560 | 3,045 | 1,920 | 35,048 |

*Table 4-8(b): Other Service Area Representative Current Retail Water Use (acre-feet)*

| Classification | Arden Park Vista | Northgate 880 | Metro Air Park | Hood | East Walnut Grove | Southwest Tract |
|---|---|---|---|---|---|---|
| Single-family Residential | 2,320 | -- | -- | 20 | 35 | 6 |
| Multi-family Residential | 210 | -- | -- | -- | 5 | 15 |
| Commercial | 460 | 660 | 50 | 5 | 10 | -- |
| Institutional | 30 | 320 | -- | -- | 1 | 1 |
| Industrial | -- | 35 | -- | -- | -- | -- |
| Landscape Irrigation | 40 | 140 | 55 | -- | 1 | -- |
| Customer Total | 3,060 | 1,155 | 105 | 25 | 52 | 23 |
| Distribution Loss | 500 | 190 | 20 | 4 | 10 | 4 |
| System Total | 3,560 | 1,345 | 125 | 30 | 60 | 30 |

## 4.4.2 Factors Affecting Future Customer Use

There are several factors that affect the forecast of future customer use, ranging from State and local landscape regulations, building code requirements, and other water-use mandates, to changes in the types of housing products being offered. These factors are incorporated into determining appropriate per-dwelling unit or per customer connection water demand values for use in forecasting future water needs. Relevant characteristics of the factors are described here.

### Water Conservation Objectives

In 2009, Governor Arnold Schwarzenegger signed Senate Bill No. 7 (SBX7-7), which established a statewide goal of achieving a 20 percent reduction in urban per capita water use by 2020 for urban retail water suppliers.[60] As presented previously, the SCWA has met this mandated target.

Furthermore, the efforts undertaken by the SCWA and its customers to meet these targets, as well as efforts throughout the State by other urban retail suppliers, have changed the availability and use of appliances, fixtures, landscapes and other water using features, through changes or additions to ordinances and/or through a continuing "conservation ethic."

In response to the 2013 to 2015 multi-year drought conditions, Governor Brown issued Executive Order B-37-16 in May 2016 entitled "*Making Water Conservation a California Way of Life*." In May 2018, Governor Brown signed into law SB 606 and AB 1668, which imposed additional statutory requirements above and beyond the 20 percent by 2020 target reflected in the 2009 legislation. This is expected to result in continued efforts to increase water use efficiency and ultimately to reduce water demands of existing water users and continue to influence the expected demands of future water users.

[60] California Water Code § 10608.20.

## Requirements in California Code

Beginning in January 2010, the California Building Standards Commission adopted the statewide mandatory Green Building Standards Code (hereafter the "CAL Green Code") requiring the installation of water-efficient indoor and outdoor infrastructure for all new projects after January 1, 2011. The CAL Green Code was incorporated as Part 11 into Title 24 of the California Code of Regulations and was revised in 2013 and in 2016 to address changes to the State's Model Water Efficient Landscape Ordinance ("MWELO") adopted during the drought.[61] Revisions to the CAL Green Code in 2019 modified sections to direct users to MWELO regulations contained in other regulatory sections.[62]

The CAL Green Code applies to the planning, design, operation, construction, use and occupancy of every newly constructed or remodeled building or structure. All new residential and non-residential customers must meet the water use requirements of the CAL Green Code as well as the outdoor requirements described by MWELO. The CAL Green Code's requirements generally manifest through: (1) installation of plumbing fixtures and fittings that meet the 20 percent reduced flow rate specified in the CAL Green Code, or (2) by demonstrating a 20 percent reduction in water use from the building "water use baseline."[63] Future customers are expected to satisfy one of these two requirements through the use of appliances and fixtures such as high-efficiency toilets, faucet aerators, on-demand water heaters, or other fixtures as well as Energy Star and California Energy Commission-approved appliances.

## California Model Water Efficient Landscape Ordinance and County Ordinance

The Water Conservation in Landscaping Act was enacted in 2006, and has since been revised and expanded multiple times by DWR resulting in today's MWELO.[64] In response to Governor Brown's executive order dated April 1, 2015, (EO B-29-15), DWR updated the MWELO and the California Water Commission approved the adoption and incorporation of the updated State standards for MWELO on July 15, 2015. MWELO requires a retail water supplier or a county to adopt the provisions of the MWELO or to enact its own provisions equal to or more restrictive than the MWELO provisions. The changes included a reduction to 55 percent of reference evapotranspiration rates for the maximum amount of water that may be applied to residential landscapes, and non-residential projects to 45

[61] The 2016 Triennial Code Adoption Cycle consisted primarily of the MWELO updates adopted in response to the drought. Indoor infrastructure changes were limited to some minor non-residential fixture changes and changes to the voluntary Tier 1 and Tier 2 requirements. Additionally, the Code was updated to match the new Title 20 Appliance Efficiency Regulations.

[62] The 2019 updated sections to direct CAL Green code users to Title 23 of the California Code of Regulations to allow Title 23 to be the sole location of MWELO requirements.

[63] See CAL Green Code. For Residential construction, Section 4.303.1 provides the residential water conservation standard and Table 4.303.2 identifies the infrastructure requirements to meet this standard. Table 4.303.1 and Worksheets WS-1 and WS-2 are to be used in calculating the baseline and the reduced water use if Option 2 is selected. For non-residential construction, Section 5.303.2.3 provides the water conservation standard as well as the baseline and reduced flow rate infrastructure standards. Note that Worksheets WS-1 and WS-2 incorporate both residential and non-residential fixtures, yet the water use is still to be analyzed by "building or structure" as specified in Chapter 1, Section 101.3.

[64] Gov. Code §§ 65591-65599

percent, which effectively reduces the landscape area that can be planted with high water use plants, such a turf. For residential projects, the allowable maximum coverage of high-water use plants is reduced to 25% of the landscaped area (down from 33%).

The newly updated MWELO also now applies to new construction with a landscape area greater than 500 square feet (the prior MWELO only applied to landscapes greater than 2,500 square feet).[65] Sacramento County's planning department reviews all new development for conformance with these standards as they are in affect for all new developments. This outdoor landscape calculation does not apply to existing landscapes.

### Metering, Volumetric Pricing, and Water Budgets

California Water Code section 525 requires water purveyors to install meters on all new service connections after January 1, 1992. California Water Code Section 527 requires water purveyors to charge for water based upon the actual volume of water delivered if a meter has been installed. This action alone is not expected to substantially reduce water use. However, it is anticipated that the retail billing system will encourage and help maintain reasonable use (e.g., through implementation of a tiered rate structure and/or water budgets), so that individual customer water demands are reasonably not expected to increase over time.

## 4.4.3 Customer Water Use Forecast

The following subsections detail the assumptions used to forecast customer water use and gross water needs for the SCWA water service areas, separated into the needs of (a) existing customers, (b) new customers, (c) Elk Grove Water District Wholesale service, and (d) non-potable uses.

### Existing Customer Future Use - Potable

As described in the prior paragraphs, there are many direct and indirect factors that continue to effect urban water use. For the existing customers served by the SCWA, these factors are anticipated to result in some minor continued conservation savings, generally resulting in lower overall demands in the future than those same customers demand today (especially after considering some return to "normal" use as represented in the determination of the current demand values).

To be conservative however, the SCWA only applies a 5% conservation savings to the single-family residential customer classifications. While actual savings may occur in any classification, this method captures the most likely customer class to achieve additional savings through replacement of fixtures and appliances, continued adoption of a conservation ethic, and modifications of irrigated landscapes, and through continued implementation of the SCWA's DMMs. All other current customer use values are maintained into the future, with two notable exceptions:

[65] CCR Title 23, Div. 2, Ch. 27, Sec. 490.1.

- Arden Park Vista – this service area still includes numerous unmetered customer connections. The SCWA is working to meet regulatory requirements to have all of these customers fully metered by 2025. The SCWA has recognized that per-connection water use generally declines once a customer is fully metered and billed based upon the metered consumption. With over 2,000 unmetered single-family connections reflecting the majority of the current use within this service area, SCWA anticipates there will be significant savings as these customers are metered. For conservative purposes, however, this savings is estimated to result in a 15% additional savings for only the single-family residential customers.
- Metro Air Park – this service area is seeing rapid growth in its warehouse, light industrial and commercial land use. As described in the SCWA's 2005 Zone 50 Master Plan,[66] this service area is forecast to have water use of slightly more than 5,000 acre-feet annually. While current demand is only 200 acre-feet, the SCWA is conservatively maintaining the previous water use forecast.

In addition to the small conservation forecast, two additional assumptions are made within Forecast water needs of existing customers is presented in the summary table at the end of this section.

## New Customer Future Use - Potable

As described in Chapter 2, growth is primarily expected to occur within the Zone 40 service area with an associated increased demand placed upon the SCWA's water supplies. Forecasting the needs of these future customers is dependent upon the type and number of customer connections and the unit water demand factors associated with each customer connection.

As detailed in Table 2-6, the SCWA has previously defined an anticipated number of new connections at build-out within the SSA, CSA, and NSA, which will include a range of residential and non-residential uses, depending on the varied development proposals already approved (but not yet built) and to be proposed. Residential customers will include both single-family dwelling units built under a variety of densities and multi-family residential dwelling units. Non-residential uses are expected to include a blend of commercial, institutional, industrial and active landscapes, such as parks, in ratios similar to the current residential-to-non-residential connections in each of the Zone 40 subareas. Table 4-9 provides the assumed ratio of total connections spread among customer classifications for each of the Zone 40 subareas. These ratios mimic the existing ratios within each of the Zone 40 subareas.

Forecast water needs for each customer classification are based on new customer water use factors described in the following subsection.

## New Residential Customer Water Use Factors

The SCWA anticipates new residential connections will be built in accordance with all applicable building codes including the Cal Green Code discussed previously, and relevant SCWA ordinances.

Distinct demand factors are provided for the following residential uses:

[66] https://waterresources.saccounty.net/scwa/Documents/Z50_MasterPlanDraft.pdf

- Indoor Residential Use – this category identifies the generally anticipated water use for single-family and multi-family dwelling units.
- Outdoor Residential Use – this category addresses the landscape water demands commonly anticipated for the two primary dwelling unit types.

*Table 4-9: Anticipated New Zone 40 Connections by Customer Classification by Subarea*

| Sub Area Classification | | Ratio | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|
| NSA | Single-family Residential | 80% | 2,688 | 5,375 | 8,063 | 10,750 | 13,438 |
| | Multi-family Residential | 10% | 336 | 672 | 1,008 | 1,344 | 1,680 |
| | Commercial | 8% | 269 | 538 | 806 | 1,075 | 1,344 |
| | Institutional | 2% | 67 | 134 | 202 | 269 | 336 |
| | Total Connections | 100% | 3,359 | 6,719 | 10,078 | 13,438 | 16,797 |
| CSA | Single-family Residential | 95% | 3,813 | 7,625 | 11,438 | 15,250 | 19,063 |
| | Multi-family Residential | 2% | 80 | 161 | 241 | 321 | 401 |
| | Commercial | 2% | 80 | 161 | 241 | 321 | 401 |
| | Institutional | 1% | 40 | 80 | 120 | 161 | 201 |
| | Total Connections | 100% | 4,013 | 8,026 | 12,040 | 16,053 | 20,066 |
| SSA | Single-family Residential | 95% | 1,637 | 3,275 | 4,912 | 4,912 | 4,912 |
| | Multi-family Residential | 1% | 17 | 34 | 52 | 52 | 52 |
| | Commercial | 2% | 34 | 69 | 103 | 103 | 103 |
| | Institutional | 2% | 34 | 69 | 103 | 103 | 103 |
| | Total Connections | 100% | 1,724 | 3,447 | 5,171 | 5,171 | 5,171 |

For purposes of this UWMP, residential unit water demand factors are described as "the acre-feet of water use annually per dwelling unit" – or acre-feet/dwelling unit ("af/du").

Residential indoor water demands are estimated using an assumed value of 55 gallons-per person per day, multiplied by the assumed occupancy rates for anticipated residential densities for single-family or multi-family classifications in the SCWA. The assumed per-person rate of 55 gallons per day is derived from California Water Code Section 10609.4(a)(3), which states a value of 55 gallons per capita (i.e., per person) per day ("gpcd") be used for estimating indoor residential use targets.[67] If lower standards are required when the growth occurs, the forecast use would be expected to be lower than estimated in this UWMP.

Based on this per-capita assumption, the following indoor per-dwelling unit value is assumed for each new residential unit:

- Single-family residential indoor use: 0.20 acre-feet per year based upon an assumed occupancy of 3.27 people per unit (see Table 2-7).

[67] Water Code Section 10609.4(a) also establishes the indoor residential water use 'standard' to be 52.5 gpcd beginning in 2025 and as low as 50 gpcd by 2030, though the Water Code also provides provisions for the water use target to revert above 50 gpcd. For purposes of this UWMP, the higher value of 55 gpcd is assumed.

- Multi-family residential indoor use: 0.15 based on an assumed occupancy of 2.5 people per unit.

Outdoor residential water use is primarily a factor of lot size and the type and extent of landscaped area. The SCWA's anticipated growth will likely include a range of residential densities (e.g. houses per acre) and therefore an estimated "typical" lot is assumed for purposes of forecasting.

For purposes of this UWMP, each new single-family residential unit is anticipated to have a total gross area of 7,000 square-feet, with 3,500 square-feet anticipated to be irrigable (after accounting for the home footprint, driveways, other hardscapes, and non-irrigated areas). Multi-family units, which have shared common landscape areas, are assumed to have 400 square-feet of irrigable area per unit.

Outdoor demands for new residential dwelling units are calculated based on regulations defined under the MWELO. The MWELO provides for determining the Maximum Applied Water Allowance (MAWA) where the maximum is calculated as 55 percent of the reference evapotranspiration for the area for every square foot of landscaped area, resulting in the following equation:

> *MAWA = (ETo)(0.62)(0.55 x LA), where ETo is the reference evapotranspiration in inches per year, and LA is the landscape area in square-feet. 0.62 is a conversion factor to gallons. The resulting value is in "gallons per year."*

A primary factor in this calculation is evapotranspiration ("ET"). The methodology directs the use of ET from a reference crop, such as maintained grass – a value referred to as ETo. For this UWMP, the ETo is 52.6 inches per year (4.4 feet per year).[68]

Using the MAWA equation, outdoor demand factors for each residential lot category are calculated:

- Single-Family Residential – Anticipated single-family dwellings are conservatively assumed to be constructed on lots averaging 7,000 sf, with an average landscape area of 3,500 sf. The resulting outdoor demand factor is forecast to be 0.20 acre-feet per dwelling unit per year.

- Multi-Family Residential – Anticipated multi-family dwellings will have larger common areas, assumed to equate to 400 sf of landscape area per unit. The resulting outdoor demand factor is forecast to be 0.02 acre-feet per dwelling unit per year.

Combining the assumed indoor and outdoor residential demand factors results in the following estimated use for each new connection:

- Single-Family Residential – 0.20 af/du for indoor plus 0.20 af/du for outdoor combines for an annual demand factor of 0.40 af/du.
- Multi-Family Residential – 0.15 af/du for indoor plus 0.02 af/dur for outdoor combines for an annual demand factor of 0.17 af/du. However, as represented in the WSIP, each multi-family connection represents 10 to 15 dwelling units. For purposes of forecasting water use, the per-

[68] ETo is from the CIMIS Station 235 (Verona) available at: https://cimis.water.ca.gov/Default.aspx

unit value of 0.17 af/du is multiplied by 10 to reflect an annual demand factor of 1.70 af/connection.

### New Non-Residential Customer Water Use Factors

Non-residential per-connection demand factors were also estimated for purposes of forecasting the water needs of anticipated commercial, institutional, industrial and irrigated landscape customers.

For purposes of this 2020 UWMP, demand factors were developed for two categories of non-residential use: Commercial, institutional, and industrial (CII), and Irrigated Landscape.

- CII Connections – this customer classification includes a wide array of different uses from neighborhood retail centers, to large retail centers, to office and government buildings, to light and even heavy industrial uses. To reflect this variety, each CII connection is assumed to occupy 2 gross acres, including hardscapes (e.g. parking), buildings, and ornamental landscaping. An estimated use of 1 acre-foot per gross acre is assumed, resulting in a per-connection factor of 2 acre-feet/connection.
- Irrigated Landscape – this classification includes passive and active parks, streetscapes, and other dedicated landscape areas. Each landscape connection is assumed to reflect 4 gross acres, with an average annual water need of 3.5 acre-feet per acre. This results in an estimated annual demand factor of 15 acre-feet per connection.

### Elk Grove Water District Wholesale Service

The SCWA provides potable water supplies to Elk Grove Water District (EGWD) for its use in its Service Area 2. As indicated in Table 4-3, the SCWA delivers around 2,500 acre-feet for use by EGWD to directly meet customer needs. The forecast wholesale deliveries are provided in Table 4-10(a) and are based on coordination with Elk Grove Water District.

### Non-Potable Uses

SCWA is currently serving its Phase 1 non-potable demands but plans to serve the non-potable demands included in its Phase 2 recycled water development plan. Although the exact progression of these demands manifesting is not precisely known, SCWA anticipates having 3,300 acre-feet of non-potable demand in its Phase 1 and Phase 2 areas served by recycled water supplies by 2045. For purposes of this UWMP, this growth is equally distributed over the planning horizon.

## 4.4.4 Summary of Forecast Water Use

Based upon the estimated water use of the existing and new customers, SCWA anticipates a doubling of use in Zone 40. With the exception of Metro Air Park, which is anticipated to see water use grow five-fold, SCWA anticipates nominal to no changes throughout the remaining service areas. Table 4-10(a) presents the forecast customer water use in Zone 40, including wholesale deliveries to EGWD. Although the forecast is presented on an annual basis in 5-year increments through 2045, the monthly pattern is

expected to mimic the current monthly pattern detailed in prior tables. This characterization is important when evaluating the SCWA's water service reliability as detailed in Chapter 5.

*Table 4-10(a): Zone 40 Forecast Potable Water Use (acre-feet)*

| Classification | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Single-family Residential | 22,988 | 22,957 | 22,925 | 22,894 | 22,862 |
| Multi-family Residential | 1,002 | 1,002 | 1,002 | 1,002 | 1,002 |
| Commercial | 1,462 | 1,462 | 1,462 | 1,462 | 1,462 |
| Industrial | 515 | 515 | 515 | 515 | 515 |
| Institutional and Governmental | 607 | 607 | 607 | 607 | 607 |
| Landscape Irrigation | 4,395 | 4,395 | 4,395 | 4,395 | 4,395 |
| SFR Future | 3,255 | 6,510 | 9,765 | 12,365 | 14,965 |
| MFR Future | 737 | 1,474 | 2,211 | 2,918 | 3,626 |
| CII Future | 767 | 1,534 | 2,301 | 2,999 | 3,697 |
| Landscape Irrigation - Future | 2,127 | 4,254 | 6,381 | 7,991 | 9,600 |
| Elk Grove Annexation Area | 692 | 1,383 | 1,383 | 1,383 | 1,383 |
| Wholesale to EGWD | 2,568 | 2,668 | 2,768 | 2,868 | 3,072 |
| Customer Water Use Subtotal | 41,115 | 48,761 | 55,715 | 61,399 | 67,187 |
| Distribution System Water Loss | 5,120 | 5,733 | 6,290 | 6,744 | 7,201 |
| 2020 Total Gross Water Use | 46,235 | 54,494 | 62,006 | 68,143 | 74,388 |

As previously discussed, growth is not expected in the other service areas except for the Metro Air Park service area. Table 4-10(b) through Table 10(g) represents the anticipated annual forecast water use for 2025 through 2045 by each subarea reflecting the anticipated conditions in each service area.

*Table 4-10(b): Arden Park Vista Forecast Potable Water Use (acre-feet)*

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Single Family Residential | 2,221 | 2,170 | 2,102 | 2,034 | 2,017 |
| Multi-Family Residential | 213 | 213 | 213 | 213 | 213 |
| Commercial/Institutional | 491 | 491 | 491 | 491 | 491 |
| Landscape Irrigation | 43 | 43 | 43 | 43 | 43 |
| Customer Total | 2,967 | 2,916 | 2,849 | 2,781 | 2,764 |
| Distribution System Water Loss | 486 | 478 | 467 | 456 | 453 |
| Total Gross Water Use | 3,454 | 3,394 | 3,315 | 3,237 | 3,217 |

*Table 4-10(c): Northgate 880 Forecast Potable Water Use (acre-feet)*

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Commercial/Institutional | 978 | 978 | 978 | 978 | 978 |
| Industrial | 35 | 35 | 35 | 35 | 35 |
| Landscape Irrigation | 139 | 139 | 139 | 139 | 139 |
| Customer Total | 1,151 | 1,151 | 1,151 | 1,151 | 1,151 |
| Distribution System Water Loss | 214 | 214 | 214 | 214 | 214 |
| Total Gross Water Use | 1,365 | 1,365 | 1,365 | 1,365 | 1,365 |

*Table 4-10(d): Metro Air Park Forecast Potable Water Use (acre-feet)*

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Commercial/Industrial | 1,029 | 2,059 | 3,088 | 4,118 | 5,147 |
| Landscape Irrigation | 55 | 55 | 55 | 55 | 48 |
| Customer Total | 1,084 | 2,114 | 3,143 | 4,172 | 5,195 |
| Distribution System Water Loss | 108 | 211 | 314 | 417 | 520 |
| Total Gross Water Use | 1,193 | 2,325 | 3,457 | 4,590 | 5,715 |

*Table 4-10(e): Hood Water Maintenance District Forecast Potable Water Use (acre-feet)*

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Single Family Residential | 22 | 22 | 22 | 22 | 22 |
| Commercial/Institutional | 5 | 5 | 5 | 5 | 5 |
| Customer Total | 27 | 27 | 27 | 27 | 27 |
| Distribution System Water Loss | 4 | 4 | 4 | 4 | 4 |
| Total Gross Water Use | 31 | 31 | 31 | 31 | 31 |

*Table 4-10(f): East Walnut Grove Forecast Potable Water Use (acre-feet)*

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Single Family Residential | 36 | 36 | 36 | 36 | 36 |
| Multi-Family Residential | 5 | 5 | 5 | 5 | 5 |
| Commercial/Institutional | 9 | 9 | 9 | 9 | 9 |
| Landscape Irrigation | 1 | 1 | 1 | 1 | 1 |
| Customer Total | 51 | 51 | 51 | 51 | 51 |
| Distribution System Water Loss | 5 | 5 | 5 | 5 | 5 |
| Total Gross Water Use | 56 | 56 | 56 | 56 | 56 |

*Table 4-10(g): Southwest Tract Forecast Potable Water Use (acre-feet)*

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Single Family Residential | 6 | 6 | 6 | 6 | 6 |
| Multi-Family Residential | 14 | 14 | 14 | 14 | 14 |
| Commercial/Institutional | 1 | 1 | 1 | 1 | 1 |
| Customer Total | 21 | 21 | 21 | 21 | 21 |
| Distribution System Water Loss | 3 | 3 | 3 | 3 | 3 |
| Total Gross Water Use | 24 | 24 | 24 | 24 | 24 |

*Table 4-10(h): Zone 40 Non-Potable Forecast Water Use (acre-feet)*

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Recycled Water System | 1,420 | 1,890 | 2,360 | 2,830 | 3,300 |

Table 4-11 presents a complete summary of the entire customer water forecast on the SCWA water assets. This is the summation of values in Table 4-10(a) through 4-10(h).

*Table 4-11: Total SCWA Forecast Water Use (acre-feet)*

| Service Area | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Zone 40 | 46,235 | 54,494 | 62,006 | 68,143 | 74,388 |
| Arden Park Vista | 3,454 | 3,394 | 3,315 | 3,237 | 3,217 |
| Northgate 880 | 1,365 | 1,365 | 1,365 | 1,365 | 1,365 |
| Metro Air Park | 1,193 | 2,325 | 3,457 | 4,590 | 5,715 |
| Hood | 31 | 31 | 31 | 31 | 31 |
| East Walnut Grove | 56 | 56 | 56 | 56 | 56 |
| Southwest Tract | 24 | 24 | 24 | 24 | 24 |
| Total Potable Water Use | 52,358 | 61,690 | 70,254 | 77,446 | 84,796 |
| Non-Potable Water Use | 1,420 | 1,890 | 2,360 | 2,830 | 3,300 |
| Total Water Use | 53,778 | 63,580 | 72,614 | 80,276 | 88,096 |

### 4.4.5 Adjusting Water Use Forecasts for Single-Dry and Multiple Dry Conditions

The demand forecasts presented in the prior subsections represent expected water needs under normal hydrologic conditions. To credibly forecast potential maximum future water use, the forecasted normal-year water uses must be modified to reflect anticipated increases in demand during drier conditions.

Conservative modifications to the forecasted normal year water use to more likely reflect use conditions during drier and dry years are warranted to help adequately address water service reliability in Chapter 5. For purposes of this UWMP, the following adjustment is made:

- Single dry year: Landscape irrigation needs would increase to reflect the generalized earlier start of the landscape irrigation season due to limited rainfall in the single driest year. Since this

increase only applies to the outdoor portion of a customer's forecast use, an adjustment factor of 5% is applied to the total normal-year forecasts to conservatively reflect the expected increase in demand for water for landscaping.

- Multiple dry years: During multiple dry years, demands are also expected to increase similar to the single dry year. For multiple dry year conditions, the single dry year increase of 5% is held in each of the subsequent years such that each is 5% greater than the normal year condition. This is representative of an "unconstrained demand" as should be represented when evaluating whether Water Shortage Contingency Plan actions may be warranted.[69]

These values are reflected in tables provided for the Drought Risk Assessment and Annual Reliability Assessment presented in later subsections.

### 4.4.6 Climate Change Considerations

Including climate change into a water use analysis aids in understanding the potential effects on long-term reliability, which in turn, allows the SCWA to proactively begin planning appropriate responses. For example, hotter and drier weather may lead to an increased demand in landscape irrigation, especially during spring and fall months, increasing the pressure on water supplies that may have availability restrictions during these periods.

This potential is reflected in the consideration of the single dry year increase of 5% that is used for the water service reliability analysis, as discussed previously. Whether the elevated single dry year water forecast becomes more akin to the "normal" demand will become more apparent as SCWA continues to assess monthly water use trends throughout all of its service areas.

## 4.5 Forecasting Water Use for the DRA and Annual Assessment

The California Legislature created two new UWMP requirements to help suppliers assess and prepare for drought conditions: the Drought Risk Assessment,[70] and the Annual Water Supply and Demand Assessment.[71] These new planning requirements were established in part because of the significant duration of recent California droughts and the predictions about hydrological variability attributable to climate change.

The Drought Risk Assessment (DRA) requires assessing water supply reliability over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability under a reasonable prediction for five consecutive dry years.

As a slight variant, the Annual Water Supply and Demand Assessment (Annual Assessment) undertakes a similar analytical exercise as the DRA but is to focus on actual, and not hypothetical, conditions

[69] California Water Code Section 10632(a)(2) states water suppliers should use "unconstrained demand" when performing their annual water supply and demand assessment.
[70] California Water Code Section 10635(b)
[71] California Water Code Section 10632.1

anticipated for the upcoming water year. The previously presented water use forecasts facilitate both of these planning exercises as described in the following subsections.

### 4.5.1 Projecting Water Use for 5-year Drought Risk Assessment

A critical component of new statutory language for the 2020 UWMP cycle is the requirement to prepare a five-year DRA using a supplier-defined hypothetical drought conditions expected to occur from 2021 through 2025. This drought condition is meant to allow suppliers to test the resiliency of their water supply portfolio and their Water Shortage Contingency Plan actions to meet severe conditions.

DWR recommends that suppliers first estimate expected water use for the next five years without drought conditions (also known as unconstrained demand). In other words, unconstrained demand is water demand absent any water supply restrictions and prior to implementing any short-term WSCP demand reduction actions. These estimates would then be adjusted to estimate the five-years' cumulative drought effects. If normal water use includes water conservation programs, either currently implemented or planned for implementation, estimated water use values would incorporate the effect of those conservation programs when reporting projected water use.

Total water use for 2021, for example, is developed by modifying the water use representation for "current" conditions (see Table 4-8(a) and Table 4-8(b)) taking into consideration the anticipated factors affecting water use, with each subsequent year further adjusted, as appropriate. Year-to-year adjustments reflect several factors SCWA anticipates may occur, including increases from growth and decreases from long-term conservation savings. To make these adjustments, the difference in annual water use between the "current" condition and the forecast use in 2025 is prorated equally across each of the years 2021 through 2025, so that the same 2025 forecast water use is matched.

With an initial annual estimate, each year is further adjusted to reflect anticipated increases in the "unconstrained demand" during a single dry year. As noted previously, this is reflected by applying a 5% increase to the total estimated demand.

*Table 4-12(a): Zone 40 Forecast DRA Water Use for 2021 through 2025 (acre-feet)*

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2021 | 1,696 | 1,744 | 2,271 | 2,296 | 3,458 | 4,530 | 5,273 | 5,556 | 5,311 | 4,309 | 3,689 | 2,319 | 42,452 |
| 2022 | 1,757 | 1,806 | 2,352 | 2,378 | 3,582 | 4,693 | 5,462 | 5,755 | 5,502 | 4,463 | 3,822 | 2,403 | 43,976 |
| 2023 | 1,818 | 1,869 | 2,434 | 2,460 | 3,706 | 4,856 | 5,652 | 5,955 | 5,692 | 4,618 | 3,954 | 2,486 | 45,499 |
| 2024 | 1,879 | 1,931 | 2,516 | 2,543 | 3,831 | 5,018 | 5,841 | 6,154 | 5,883 | 4,772 | 4,086 | 2,569 | 47,023 |
| 2025 | 1,939 | 1,994 | 2,597 | 2,625 | 3,955 | 5,181 | 6,030 | 6,354 | 6,074 | 4,927 | 4,219 | 2,652 | 48,547 |

*Table 4-12(b): Other Service Areas Forecast DRA Water Use for 2021 through 2025 (acre-feet)*

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2021 | 216 | 273 | 319 | 348 | 521 | 643 | 744 | 739 | 655 | 590 | 414 | 275 | 5,738 |
| 2022 | 218 | 273 | 319 | 351 | 523 | 648 | 753 | 752 | 677 | 623 | 449 | 291 | 5,877 |
| 2023 | 220 | 273 | 320 | 354 | 524 | 654 | 762 | 764 | 699 | 655 | 484 | 307 | 6,016 |
| 2024 | 222 | 273 | 320 | 357 | 526 | 659 | 771 | 776 | 720 | 688 | 518 | 324 | 6,155 |
| 2025 | 224 | 273 | 321 | 360 | 528 | 664 | 780 | 789 | 742 | 720 | 553 | 340 | 6,293 |

### 4.5.2 Projecting Water Use for Annual Reliability Assessments

SCWA will need to perform an Annual Assessment and submit the findings to DWR beginning in 2022. To evaluate the plausible water service reliability conditions for 2021 or 2022, described in Chapter 5, requires two separate representative "current" water use conditions to be developed. The first condition uses the "current" water use characterization included in Table 4-8(a) and 4-8(b). These demands represent the water use under a normal condition. Alternatively, a "single-dry year current" forecast is also calculated to provide SCWA with representative current unconstrained demands. This second characterization of current water use applies the same single-dry year adjustment described previously, represented by a 5% increase in the current water use values. Table 13(a) provides the Normal Year and Single Dry Year current water use for the Zone 40 water service area. Table 13(b) provides these same values for the other six water service areas. These values are used in Chapter 5.

*Table 4-13(a): Zone 40 Normal and Single Dry Year "Current" Water Use (acre-feet)*

| Year Type | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Normal | 1,557 | 1,601 | 2,085 | 2,108 | 3,175 | 4,160 | 4,842 | 5,101 | 4,876 | 3,956 | 3,387 | 2,130 | 38,979 |
| Single Dry | 1,635 | 1,681 | 2,189 | 2,213 | 3,334 | 4,368 | 5,084 | 5,357 | 5,120 | 4,154 | 3,557 | 2,236 | 40,928 |

*Table 4-13(b): Other Service Areas Normal and Single Dry Year "Current" Water Use (acre-feet)*

| Year Type | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Normal | 208 | 265 | 309 | 334 | 500 | 614 | 708 | 701 | 612 | 539 | 368 | 251 | 5,408 |
| Single Dry | 218 | 278 | 324 | 351 | 525 | 645 | 743 | 736 | 642 | 566 | 386 | 264 | 5,678 |

## 4.6 Projecting Disadvantaged Community Water Use

Pursuant to CWC Section 10631.1, retail suppliers are required to include the projected water use for lower income households in 2020 UWMPs. Per California Health and Safety Code Section 50079.5, a lower income household has an income below 80 percent of area median income, adjusted for family size. For purposes of this UWMP, annual median income was derived from 2019 U.S. Census Bureau and determined to be $72,017 for Sacramento County for approximately 560,000 county earners.[72]

[72] This data is from the Household Income in the Past 12 Months (In 2019 Inflation-adjusted Dollars) American Community Survey 1-year estimates. https://censusreporter.org/profiles/05000US06067-sacramento-county-ca/#income

Therefore, 80% of this is estimated to be about $57,600 per year. Based upon the median income dataset, approximately 40% of the earning population is at or below this earning level.

Absent more specific data correlating to SCWA's water service areas, this low-income percentage is applied to the total number of households within SCWA, resulting in an estimated number of existing and future new connections attributed to low-income households. As detailed previously, SCWA anticipates a total number of new residential connections over the planning horizon – representing both single-family and multiple family. The vast majority of new residential connections are expected within the Zone 40 service area. Therefore, for purposes of estimating the number of new low-income households, this County's overall low-income household percentage is applied to the expected new Zone 40 residential connections shown in Table 4-9 – resulting in an estimate of low-income households for each 5-year period to 2045. Using the demand factors presented in subsection 4.4.3, a demand for the new single-family to multiple family low-income households can be estimated. The resulting estimate is presented in Table 4-14.

*Table 4-14: Estimated Low-Income Water Use Forecast (acre-feet)*

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Low-income Water Use Forecast | 10,119 | 11,451 | 12,782 | 13,857 | 14,931 |
| % of Zone 40 Water Use Forecast | 25% | 23% | 23% | 23% | 22% |

# Chapter 5
# Water System Reliability

This chapter provides the Sacramento County Water Agency's (SCWA) water system reliability findings as required under Water Code Section 10635 and provides reliability information the SCWA could use in completing an annual supply and demand assessment pursuant to Water Code Section 10632.1.

Assessing water service reliability is the fundamental purpose for SCWA in preparing its 2020 UWMP. Water service reliability reflects SCWA's ability to meet the water needs of its customers, including end-use customers and retail urban suppliers, with water supplies under varying conditions. SCWA's UWMP considers the reliability of meeting customer water use by analyzing plausible hydrological variability, regulatory variability, climate conditions, and other factors that impact SCWA's water supply and its customers' water uses. The reliability assessment looks beyond SCWA's past experience and considers what could be reasonably foreseen in the future. This chapter synthesizes the details imbedded in the Chapters 3 and 4 and provides a rational basis for future decision-making related to supply management, demand management, and project development. This chapter presents three system reliability findings:

- Five Year Drought Risk Assessment: The 2021 through 2025 Drought Risk Assessment (DRA) for all of SCWA's service areas
- Long-Term Service Reliability: The reliability findings for a Normal Year, Single Dry Year, and Five Consecutive Drought Years in five-year increments through 2045
- Annual Reliability Assessment: The reliability findings for an existing condition for both a Normal Year and Single Dry Year that can inform an annual supply and demand assessment for 2021 or 2022.

In short, SCWA has reliable water supplies available in all of its service areas.

## 5.1 Five Year Drought Risk Assessment

The Drought Risk Assessment is a new requirement for the 2020 UWMP cycle. The DRA requires a methodical assessment of water supplies and water uses under an assumed drought period that lasts five consecutive years. SCWA has prepared an independent monthly assessment of the water supplies and demands for its Zone 40 system because of the monthly variability associated with the surface water supplies that are used to serve that system. Moreover, SCWA has incorporated other constraints in its Zone 40 system, like infrastructure constraints at its pumping and treatment facilities, which may also influence the near-term management of Zone 40's water asset portfolio.

In SCWA's other service areas, the sources of water are less susceptible to hydrological and regulatory conditions. As such, the SCWA service areas beyond Zone 40 analyze their drought risks on a yearly basis. The following details the Zone 40 DRA as well as a combined DRA for SCWA's other service areas.

### 5.1.1 Zone 40 Drought Risk Assessment

Zone 40 has a unique water supply portfolio and system operations. Zone 40 currently has access to six sources of supply and anticipates access to two additional sources of supply by 2025. This diverse water supply portfolio creates a water management structure that requires careful consideration of hydrological, regulatory, and institutional variability. Specifically, some water assets are particularly susceptible to drought while other water assets have varying degrees of reliability based upon regulatory constraints and historical water use. Nevertheless, SCWA has organized and coordinated its Zone 40 water portfolio management to ensure water supply reliability in the event of a severe drought. The Zone 40 DRA represents a consolidation of its surface and groundwater water supplies into an organized monthly management action.

Table 5-1 below shows SCWA's Zone 40 DRA that integrates all of its supplies for 2021 through 2025 as described in Chapter 3 and reflects the dry year unconstrained water uses described in Chapter 4. As the table shows, SCWA has surplus water assets available in all months under its prescribed water management protocol.

*Table 5-1: Zone 40 Five Year Drought Risk Assessment*

| Five Year Drought | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2021 | Supply | 9,678 | 9,689 | 10,086 | 10,182 | 6,562 | 7,491 | 8,166 | 8,403 | 8,239 | 7,377 | 11,455 | 10,214 | 107,542 |
| | Demand | 1,696 | 1,744 | 2,271 | 2,296 | 3,458 | 4,530 | 5,273 | 5,556 | 5,311 | 4,309 | 3,689 | 2,319 | 42,452 |
| | Difference | 7,982 | 7,946 | 7,815 | 7,886 | 3,104 | 2,961 | 2,893 | 2,847 | 2,928 | 3,069 | 7,765 | 7,895 | 65,090 |
| 2022 | Supply | 9,678 | 9,689 | 10,086 | 10,182 | 5,664 | 6,593 | 7,267 | 7,505 | 7,340 | 6,479 | 5,936 | 10,214 | 96,633 |
| | Demand | 1,757 | 1,806 | 2,352 | 2,378 | 3,582 | 4,693 | 5,462 | 5,755 | 5,502 | 4,463 | 3,822 | 2,403 | 43,976 |
| | Difference | 7,921 | 7,883 | 7,733 | 7,804 | 2,081 | 1,900 | 1,805 | 1,749 | 1,838 | 2,016 | 2,115 | 7,812 | 52,657 |
| 2023 | Supply | 9,678 | 9,689 | 10,086 | 3,934 | 4,934 | 5,863 | 6,537 | 6,775 | 6,610 | 5,749 | 5,206 | 10,214 | 85,274 |
| | Demand | 1,818 | 1,869 | 2,434 | 2,460 | 3,706 | 4,856 | 5,652 | 5,955 | 5,692 | 4,618 | 3,954 | 2,486 | 45,499 |
| | Difference | 7,860 | 7,820 | 7,652 | 1,473 | 1,227 | 1,007 | 886 | 820 | 918 | 1,131 | 1,252 | 7,728 | 39,775 |
| 2024 | Supply | 9,678 | 9,689 | 10,086 | 10,182 | 5,163 | 6,092 | 6,767 | 7,004 | 6,840 | 5,979 | 5,436 | 10,214 | 93,129 |
| | Demand | 1,879 | 1,931 | 2,516 | 2,543 | 3,831 | 5,018 | 5,841 | 6,154 | 5,883 | 4,772 | 4,086 | 2,569 | 47,023 |
| | Difference | 7,799 | 7,758 | 7,570 | 7,639 | 1,333 | 1,074 | 926 | 850 | 957 | 1,206 | 1,350 | 7,645 | 46,106 |
| 2025 | Supply | 9,678 | 9,689 | 10,086 | 10,182 | 6,053 | 6,982 | 7,657 | 7,894 | 7,730 | 6,868 | 11,455 | 10,214 | 104,488 |
| | Demand | 1,939 | 1,994 | 2,597 | 2,625 | 3,955 | 5,181 | 6,030 | 6,354 | 6,074 | 4,927 | 4,219 | 2,652 | 48,547 |
| | Difference | 7,738 | 7,695 | 7,489 | 7,557 | 2,098 | 1,801 | 1,627 | 1,540 | 1,656 | 1,941 | 7,236 | 7,562 | 55,940 |

## 5.1.2 Drought Risk Assessment for Other Service Areas

SCWA operates water systems in the other six service areas that are wholly independent from the surface and groundwater supplies that are used to serve Zone 40. As described in detail in other chapters of this 2020 UWMP, these service areas are: Arden Park Vista, Northgate 880, Metro Air Park, Southwest Tract, Hood Water Maintenance District (Hood), and East Walnut Grove. These six systems have independent water supplies. The supplies in these systems are mostly generated from groundwater assets. These groundwater assets are generally surplus to the needs of the individual water systems as discussed in Chapter 3. The Metro Air Park area is served through a contract with the City of Sacramento and has sufficient reliability to meet its long-term demands. Water use for the DRA condition reflects the dry year unconstrained demands anticipated necessary to meet the forecast water needs of customers in each of these service areas, as described in Chapter 4.

Table 5-2 below shows SCWA's DRA for 2021 through 2025 for the six service areas that are outside of Zone 40. The table combines the water supplies and demands from all six of these service areas because none of them demonstrate a monthly water deficiency. As such, combining the supplies and demands provides a more succinct assessment of each system's drought risk. Importantly, however, each system's supplies and demands are independently characterized in separate sections of this chapter as well as Chapters 3 and 4.

*Table 5-2: Six Service Areas Five Year Drought Risk Assessment*

| Five Year Drought | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2021 | Supply | 216 | 273 | 319 | 348 | 521 | 643 | 744 | 739 | 655 | 590 | 414 | 275 | 5,738 |
| | Demand | 216 | 273 | 319 | 348 | 521 | 643 | 744 | 739 | 655 | 590 | 414 | 275 | 5,738 |
| | Difference | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2022 | Supply | 218 | 273 | 319 | 351 | 523 | 648 | 753 | 752 | 677 | 623 | 449 | 291 | 5,877 |
| | Demand | 218 | 273 | 319 | 351 | 523 | 648 | 753 | 752 | 677 | 623 | 449 | 291 | 5,877 |
| | Difference | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2023 | Supply | 220 | 273 | 320 | 354 | 524 | 654 | 762 | 764 | 699 | 655 | 484 | 307 | 6,016 |
| | Demand | 220 | 273 | 320 | 354 | 524 | 654 | 762 | 764 | 699 | 655 | 484 | 307 | 6,016 |
| | Difference | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2024 | Supply | 222 | 273 | 320 | 357 | 526 | 659 | 771 | 776 | 720 | 688 | 518 | 324 | 6,155 |
| | Demand | 222 | 273 | 320 | 357 | 526 | 659 | 771 | 776 | 720 | 688 | 518 | 324 | 6,155 |
| | Difference | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2025 | Supply | 224 | 273 | 321 | 360 | 528 | 664 | 780 | 789 | 742 | 720 | 553 | 340 | 6,293 |
| | Demand | 224 | 273 | 321 | 360 | 528 | 664 | 780 | 789 | 742 | 720 | 553 | 340 | 6,293 |
| | Difference | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 5.2 Long Term Service Reliability

The Urban Water Management Planning Act directs urban water purveyors to analyze water supply reliability in a normal, single dry, and five consecutive dry years over a 20-year planning horizon. The 2020 UWMP Guidebook recommends extending that period to 25 years to provide a guiding document for future land use and water supply planning through the next UWMP cycle. The following subsections describe the long-term water service reliability for Zone 40 and for the SCWA's other service areas through a 25 year planning horizon.

### 5.2.1 Zone 40 Long Term Potable Service Reliability

SCWA's long term service reliability for Zone 40 reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years from 2020 through 2045.

#### Zone 40 Normal and Single Dry Conditions 2025-2045

Zone 40 future water supplies in normal and single dry conditions reflect the same hydrological, regulatory, and institutional criteria described in previous sections. In normal years, supplies are generally constrained only by their express limiting features. In dry years, additional hydrological, regulatory, and institutional issues will constrain the availability of water. However, future water supplies tend to grow in annualized volumes as annualized demands grow in parallel. All of this information is described in detail in Chapter 3 and is reflected in the tables below.

Zone 40 future water demands in normal and single dry conditions through 2045 reflect the same considerations described in previous sections of this chapter. In normal conditions, demands tend to reflect anticipated uses based upon normal hydrological conditions. But in dry conditions, demands increase to reflect dry conditions and additional application of water for outdoor irrigation. Future water demands are generally predicted to increase as land uses and populations within SCWA's Zone 40 area grow. All of this information is detailed in Chapter 4 and reflected in the numbers shown in the tables below.

Table 5-3 shows the normal year supplies and demands on an annual timestep from 2025 through 2045.

*Table 5-3: Normal and Single Dry Year Water Supply and Demand in SCWA's Zone 40 through 2045*

| Normal Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 159,096 | 164,096 | 174,096 | 174,096 | 174,096 |
| Demand | 46,235 | 54,494 | 62,006 | 68,143 | 74,388 |
| Difference | 112,861 | 109,602 | 112,090 | 105,953 | 99,708 |

| Single Dry Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 87,199 | 92,676 | 103,926 | 105,176 | 107,676 |
| Demand | 48,547 | 57,219 | 65,106 | 71,551 | 78,107 |
| Difference | 38,652 | 35,457 | 38,820 | 33,625 | 29,569 |

## Zone 40 Multiple Dry Years Reliability 2025 – 2045

SCWA defines drought condition lasting five consecutive years as one that constrains SCWA from obtaining some of its water supplies in its Zone 40 water supply portfolio due to hydrological, regulatory, and institutional constraints. These conditions include more restrictive regulatory constraints on its water rights, constrained conditions for its water supply contracts, yet no limitations on its ability to access groundwater resources. The restrictive conditions manifest in changes to the availability of SCWA's water assets on a monthly timestep. Moreover, these restrictive conditions also impact the increased uses of available supplies in the future that are associated with land use and population growth. These conditions are described in significant detail in Chapter 3 and reflected in the monthly tables below.

Five consecutive dry year demands include the anticipated demands based upon historical trends in water usage in drought conditions by SCWA's customers. Demands in extended dry conditions may increase as hydrological conditions generate additional customer uses for outdoor irrigation. As droughts persist, however, demands may decline as the realistic constraints on supply availability are realized at the customer level. Out of an abundance of caution to ensure supplies are available to meet projected demands, the fluctuating demand pattern is not reflected in this future reliability assessment. The gradual increase in demands also account for reasonable water conservation measures derived from improved efficiencies in indoor fixtures, improved management of outdoor landscape irrigation, and a general awareness of the value of long-term water conservation at the consumer level. In addition, the future dry conditions reflect increased land use and populations that would rely upon available supplies. These variable monthly conditions are described in significant detail in Chapter 4 and reflected in the tables below.

Table 5-4 below shows the water supply and demand conditions for SCWA's Zone 40 service area in five consecutive dry years from 2025 through 2045.

*Table 5-4: Zone 40 Multiple Dry Year Reliability through 2045*

| Five Year Drought | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Year 1 | Supply | 111,954 | 118,386 | 132,136 | 135,886 | 143,386 |
| | Demand | 48,547 | 57,219 | 65,106 | 71,551 | 78,107 |
| | Difference | 63,407 | 61,167 | 67,030 | 64,335 | 65,279 |
| Year 2 | Supply | 99,576 | 105,531 | 118,031 | 120,531 | 125,531 |
| | Demand | 48,547 | 57,219 | 65,106 | 71,551 | 78,107 |
| | Difference | 51,029 | 48,312 | 52,925 | 48,980 | 47,424 |
| Year 3 | Supply | 87,199 | 92,676 | 103,926 | 105,176 | 107,676 |
| | Demand | 48,547 | 57,219 | 65,106 | 71,551 | 78,107 |
| | Difference | 38,652 | 35,457 | 38,820 | 33,625 | 29,569 |
| Year 4 | Supply | 95,054 | 100,531 | 111,781 | 113,031 | 115,531 |
| | Demand | 48,547 | 57,219 | 65,106 | 71,551 | 78,107 |
| | Difference | 46,507 | 43,312 | 46,675 | 41,480 | 37,424 |
| Year 5 | Supply | 107,431 | 113,386 | 125,886 | 128,386 | 133,386 |
| | Demand | 48,547 | 57,219 | 65,106 | 71,551 | 78,107 |
| | Difference | 58,884 | 56,167 | 60,780 | 56,835 | 55,279 |

### 5.2.2 Long Term Non-Potable Water Service in Zone 40

As described in Chapter 3, SCWA has a contract to obtain non-potable water supplies from Sacramento Regional County Sanitation District (SRCSD) to meet demands in a portion of SCWA's Zone 40 service area. These water supplies are wholly derived from indoor water uses throughout SRCSD's service area. This area includes significant areas that are beyond SCWA's Zone 40. As such, these non-potable water supplies are 100% reliable in normal, single dry, and five consecutive dry years from the 2020 through the 2045 planning horizon. Tables 5-5, 5-6, 5-7, and 5-8 shows the water supply reliability of SCWA's Zone 40 non-potable supply through 2045.

*Table 5-5: Normal and Single Dry Non-Potable Water Supply and Demand in SCWA's Zone 40*

| Normal Year | Current |
|---|---|
| Supply | 3,921 |
| Demand | 962 |
| Difference | 2,959 |

| Single Dry Year | Current |
|---|---|
| Supply | 3,921 |
| Demand | 1,010 |
| Difference | 2,911 |

*Table 5-6: Five Consecutive Dry Non-Potable Water Supply and Demand in SCWA's Zone 40 through 2025*

| Five Year Drought | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|
| Supply | 3,921 | 3,921 | 3,921 | 3,921 | 3,921 |
| Demand | 1,010 | 1,010 | 1,010 | 1,010 | 1,010 |
| Difference | 2,911 | 2,911 | 2,911 | 2,911 | 2,911 |

*Table 5-7: Normal and Single Dry Year Non-Potable Water Supply and Demand in SCWA's Zone 40 through 2045*

| Normal Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 3,921 | 3,921 | 3,921 | 3,921 | 3,921 |
| Demand | 1,420 | 1,890 | 2,360 | 2,830 | 3,300 |
| Difference | 2,501 | 2,031 | 1,561 | 1,091 | 621 |

| Single Dry Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 3,921 | 3,921 | 3,921 | 3,921 | 3,921 |
| Demand | 1,420 | 1,890 | 2,360 | 2,830 | 3,300 |
| Difference | 2,501 | 2,031 | 1,561 | 1,091 | 621 |

*Table 5-8: Five Consecutive Dry Years Non-Potable Water Supply and Demand in SCWA's Zone 40 through 2045*

| Five Year Drought | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Year 1 | Supply | 3,921 | 3,921 | 3,921 | 3,921 | 3,921 |
| | Demand | 1,420 | 1,890 | 2,360 | 2,830 | 3,300 |
| | Difference | 2,501 | 2,031 | 1,561 | 1,091 | 621 |
| Year 2 | Supply | 3,921 | 3,921 | 3,921 | 3,921 | 3,921 |
| | Demand | 1,420 | 1,890 | 2,360 | 2,830 | 3,300 |
| | Difference | 2,501 | 2,031 | 1,561 | 1,091 | 621 |
| Year 3 | Supply | 3,921 | 3,921 | 3,921 | 3,921 | 3,921 |
| | Demand | 1,420 | 1,890 | 2,360 | 2,830 | 3,300 |
| | Difference | 2,501 | 2,031 | 1,561 | 1,091 | 621 |
| Year 4 | Supply | 3,921 | 3,921 | 3,921 | 3,921 | 3,921 |
| | Demand | 1,420 | 1,890 | 2,360 | 2,830 | 3,300 |
| | Difference | 2,501 | 2,031 | 1,561 | 1,091 | 621 |
| Year 5 | Supply | 3,921 | 3,921 | 3,921 | 3,921 | 3,921 |
| | Demand | 1,420 | 1,890 | 2,360 | 2,830 | 3,300 |
| | Difference | 2,501 | 2,031 | 1,561 | 1,091 | 621 |

### 5.2.3 Long Term Water Supply Reliability in Remaining Service Areas

SCWA operates water systems in other six service areas that are wholly independent from the surface and groundwater supplies that are used to serve Zone 40 described in the previous section. These service areas are: Arden Park Vista, Northgate 880, Metro Air Park, Southwest Tract, Hood, and East Walnut Grove. These six systems have independent water supplies. The supplies in these systems are mostly generated from groundwater assets. These groundwater assets are generally surplus to the needs of the individual water systems. The Metro Air Park area is served through a contract with the City of Sacramento and has sufficient reliability to meet its long-term demands. The following is a summary of the six service areas water supply reliability for a normal, single dry year, and for five consecutive dry years from 2025 through 2045.

## Metro Air Park

The Metro Air Park area is wholly served by the City of Sacramento through the 2004 water supply contract as described in Chapter 3. This contract could provide up to 11.7 mgd of supply to the Metro Air Park under varying conditions to meet demands. The water supplies under this contract are available to meet the Metro Air Park demands under all conditions through 2045. Tables 5-9 and 5-10 show the long-term supply reliability for the Metro Air Park.

*Table 5-9: Normal and Single Dry Year Water Supply and Demand in SCWA's Metro Air Park through 2045*

| Normal Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 1,193 | 2,325 | 3,457 | 4,590 | 5,715 |
| Demand | 1,193 | 2,325 | 3,457 | 4,590 | 5,715 |
| Difference | 0 | 0 | 0 | 0 | 0 |

| Single Dry Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 1,252 | 2,441 | 3,630 | 4,819 | 6,000 |
| Demand | 1,252 | 2,441 | 3,630 | 4,819 | 6,000 |
| Difference | 0 | 0 | 0 | 0 | 0 |

*Table 5-10: Five Consecutive Dry Years Water Supply and Demand in SCWA's Metro Air Park through 2045*

| 5-Yr Drought | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Year 1 | Supply | 1,252 | 2,441 | 3,630 | 4,819 | 6,000 |
| | Demand | 1,252 | 2,441 | 3,630 | 4,819 | 6,000 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 2 | Supply | 1,252 | 2,441 | 3,630 | 4,819 | 6,000 |
| | Demand | 1,252 | 2,441 | 3,630 | 4,819 | 6,000 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 3 | Supply | 1,252 | 2,441 | 3,630 | 4,819 | 6,000 |
| | Demand | 1,252 | 2,441 | 3,630 | 4,819 | 6,000 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 4 | Supply | 1,252 | 2,441 | 3,630 | 4,819 | 6,000 |
| | Demand | 1,252 | 2,441 | 3,630 | 4,819 | 6,000 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 5 | Supply | 1,252 | 2,441 | 3,630 | 4,819 | 6,000 |
| | Demand | 1,252 | 2,441 | 3,630 | 4,819 | 6,000 |
| | Difference | 0 | 0 | 0 | 0 | 0 |

## Southwest Tract

The Southwest Tract service area is wholly served by groundwater derived from a contract signed in 1970 with Fruitridge Vista Water Company. The contract has no constraints on reliability for the Southwest Tract and there have never been curtailments in supply reliability to the Southwest Tract. Accordingly, the groundwater supplies that are delivered under this agreement are available to meet the Southwest Tract demands under all conditions through 2045. Tables 5-11 and 5-12 show the long-term supply reliability for the Southwest Tract.

*Table 5-11: Normal and Single Dry Year Water Supply and Demand in SCWA's Southwest Tract through 2045*

| Normal Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 23 | 23 | 23 | 23 | 23 |
| Demand | 23 | 23 | 23 | 23 | 23 |
| Difference | 0 | 0 | 0 | 0 | 0 |

| Single Dry Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 24 | 24 | 24 | 24 | 24 |
| Demand | 24 | 24 | 24 | 24 | 24 |
| Difference | 0 | 0 | 0 | 0 | 0 |

*Table 5-12: 5 Consecutive Dry Year Water Supply and Demand in SCWA's Southwest Tract through 2045*

| 5-Yr Drought | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Year 1 | Supply | 24 | 24 | 24 | 24 | 24 |
| | Demand | 24 | 24 | 24 | 24 | 24 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 2 | Supply | 24 | 24 | 24 | 24 | 24 |
| | Demand | 24 | 24 | 24 | 24 | 24 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 3 | Supply | 24 | 24 | 24 | 24 | 24 |
| | Demand | 24 | 24 | 24 | 24 | 24 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 4 | Supply | 24 | 24 | 24 | 24 | 24 |
| | Demand | 24 | 24 | 24 | 24 | 24 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 5 | Supply | 24 | 24 | 24 | 24 | 24 |
| | Demand | 24 | 24 | 24 | 24 | 24 |
| | Difference | 0 | 0 | 0 | 0 | 0 |

## Arden Park Vista

The Arden Park Vista service area is wholly served by groundwater derived from numerous wells in the service area boundary. The groundwater supplies are not constrained and there have never been supply curtailments affecting the Arden Park Vista service area. Accordingly, the groundwater supplies are available to meet the Arden Park Vista demands under all conditions through 2045. Tables 5-13 and 5-14 show the long-term supply reliability for Arden Park Vista service area.

*Table 5-13: Normal and Single Dry Year Water Supply and Demand in SCWA's Arden Park Vista through 2045*

| Normal Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 3,454 | 3,395 | 3,316 | 3,237 | 3,217 |
| Demand | 3,454 | 3,395 | 3,316 | 3,237 | 3,217 |
| Difference | 0 | 0 | 0 | 0 | 0 |

| Single Dry Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 3,627 | 3,564 | 3,482 | 3,399 | 3,378 |
| Demand | 3,627 | 3,564 | 3,482 | 3,399 | 3,378 |
| Difference | 0 | 0 | 0 | 0 | 0 |

*Table 5-14: Five Consecutive Dry Year Water Supply and Demands in SCWA's Arden Park Vista through 2045*

| 5-Yr Drought | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Year 1 | Supply | 3,627 | 3,564 | 3,482 | 3,399 | 3,378 |
| | Demand | 3,627 | 3,564 | 3,482 | 3,399 | 3,378 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 2 | Supply | 3,627 | 3,564 | 3,482 | 3,399 | 3,378 |
| | Demand | 3,627 | 3,564 | 3,482 | 3,399 | 3,378 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 3 | Supply | 3,627 | 3,564 | 3,482 | 3,399 | 3,378 |
| | Demand | 3,627 | 3,564 | 3,482 | 3,399 | 3,378 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 4 | Supply | 3,627 | 3,564 | 3,482 | 3,399 | 3,378 |
| | Demand | 3,627 | 3,564 | 3,482 | 3,399 | 3,378 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 5 | Supply | 3,627 | 3,564 | 3,482 | 3,399 | 3,378 |
| | Demand | 3,627 | 3,564 | 3,482 | 3,399 | 3,378 |
| | Difference | 0 | 0 | 0 | 0 | 0 |

## Northgate 880

The Northgate 880 service area is wholly served by groundwater derived from numerous wells in the service area boundary. The groundwater supplies are not constrained and there have never been supply curtailments affecting the Northgate 880 service area. Accordingly, the groundwater supplies are available to meet the Northgate 880 demands under all conditions through 2045. Tables 5-15 and 5-16 show the long-term supply reliability for Northgate 880 service area.

*Table 5-15: Normal and Single Dry Year Water Supply and Demand in SCWA's Northgate 880 through 2045*

| Normal Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 1,365 | 1,365 | 1,365 | 1,365 | 1,365 |
| Demand | 1,365 | 1,365 | 1,365 | 1,365 | 1,365 |
| Difference | 0 | 0 | 0 | 0 | 0 |

| Single Dry Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 |
| Demand | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 |
| Difference | 0 | 0 | 0 | 0 | 0 |

*Table 5-16: Five Consecutive Dry Year Water Supply and Demands in SCWA's Northgate 880 through 2045*

| 5-Yr Drought | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Year 1 | Supply | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 |
| | Demand | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 2 | Supply | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 |
| | Demand | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 3 | Supply | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 |
| | Demand | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 4 | Supply | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 |
| | Demand | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 5 | Supply | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 |
| | Demand | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 |
| | Difference | 0 | 0 | 0 | 0 | 0 |

## Hood Water Maintenance District (Hood)

The Hood service area is wholly served by groundwater derived from numerous wells in the service area boundary. The groundwater supplies are not constrained and there have never been supply curtailments affecting the Hood service area. Accordingly, the groundwater supplies are available to meet the Hood demands under all conditions through 2045. Tables 5-17 and 5-18 show the long-term supply reliability for Hood service area.

*Table 5-17: Normal and Single Dry Year Water Supply and Demand in SCWA's Hood through 2045*

| Normal Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 31 | 31 | 31 | 31 | 31 |
| Demand | 31 | 31 | 31 | 31 | 31 |
| Difference | 0 | 0 | 0 | 0 | 0 |

| Single Dry Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 33 | 33 | 33 | 33 | 33 |
| Demand | 33 | 33 | 33 | 33 | 33 |
| Difference | 0 | 0 | 0 | 0 | 0 |

*Table 5-18: Five Consecutive Dry Year Water Supply and Demand in SCWA's Hood through 2045*

| 5-Yr Drought | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Year 1 | Supply | 33 | 33 | 33 | 33 | 33 |
| | Demand | 33 | 33 | 33 | 33 | 33 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 2 | Supply | 33 | 33 | 33 | 33 | 33 |
| | Demand | 33 | 33 | 33 | 33 | 33 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 3 | Supply | 33 | 33 | 33 | 33 | 33 |
| | Demand | 33 | 33 | 33 | 33 | 33 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 4 | Supply | 33 | 33 | 33 | 33 | 33 |
| | Demand | 33 | 33 | 33 | 33 | 33 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 5 | Supply | 33 | 33 | 33 | 33 | 33 |
| | Demand | 33 | 33 | 33 | 33 | 33 |
| | Difference | 0 | 0 | 0 | 0 | 0 |

## East Walnut Grove

The East Walnut Grove service area is wholly served by groundwater derived from numerous wells in the service area boundary. The groundwater supplies are not constrained and there have never been supply curtailments affecting the East Walnut Grove service area. Accordingly, the groundwater supplies are available to meet the East Walnut Grove demands under all conditions through 2045. Tables 5-19 and 5-20 show the long-term supply reliability for East Walnut Grove service area.

*Table 5-19: Normal and Single Dry Year Water Supply and Demand in SCWA's East Walnut Grove through 2045*

| Normal Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 53 | 53 | 53 | 53 | 53 |
| Demand | 53 | 53 | 53 | 53 | 53 |
| Difference | 0 | 0 | 0 | 0 | 0 |

| Single Dry Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 56 | 56 | 56 | 56 | 56 |
| Demand | 56 | 56 | 56 | 56 | 56 |
| Difference | 0 | 0 | 0 | 0 | 0 |

*Table 5-20: Five Consecutive Dry Year Water Supply and Demands in SCWA's East Walnut Grove through 2045*

| 5-Yr Drought | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Year 1 | Supply | 56 | 56 | 56 | 56 | 56 |
| | Demand | 56 | 56 | 56 | 56 | 56 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 2 | Supply | 56 | 56 | 56 | 56 | 56 |
| | Demand | 56 | 56 | 56 | 56 | 56 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 3 | Supply | 56 | 56 | 56 | 56 | 56 |
| | Demand | 56 | 56 | 56 | 56 | 56 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 4 | Supply | 56 | 56 | 56 | 56 | 56 |
| | Demand | 56 | 56 | 56 | 56 | 56 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Year 5 | Supply | 56 | 56 | 56 | 56 | 56 |
| | Demand | 56 | 56 | 56 | 56 | 56 |
| | Difference | 0 | 0 | 0 | 0 | 0 |

## 5.3 Annual Reliability Assessment

The SCWA may consider current supply and demand conditions and perform an annual water supply and demand assessment (Annual Assessment) pursuant to Water Code Section 10632.1 to evaluate real-time or near-term circumstances that are different than the DRA scenario. This assessment would evaluate actual current water supply and use conditions. For purposes of this UWMP, the "current" water use conditions as described in Chapter 4 are compared to the availability of SCWA's existing water supplies as described in Chapter 3. Two scenarios are illustrated for both the Zone 40 service area and the other services areas (combined):

- Normal Year condition: reflecting the availability of supplies under normal conditions and the "current" water uses
- Single-Dry Year condition: reflecting the availability of supplies under a severe, single-dry year and elevated "current" water uses reflecting increased demands expected in a single dry year.

### 5.3.1 Zone 40 Normal Year Supply and Current Water Use

SCWA defines a normal year condition as one that allows the agency to obtain water supplies from all sources under its Zone 40 water supply portfolio under normalized conditions. These conditions include normally anticipated regulatory constraints on its water rights, unconstrained conditions for its water supply contracts, and no limitations on its ability to access groundwater resources. These conditions are described in significant detail in Chapter 3 and reflected in the monthly supply determinations shown below.

Normal year demands include the anticipated demands based upon historical trends in water usage in non-drought conditions by SCWA's customers. Demands in normal conditions generally are lower in the wetter months and higher in the drier months. These demands may fluctuate over time as land uses and populations change within the Zone 40 service area. The monthly demands also account for reasonable water conservation measures derived from improved efficiencies in indoor fixtures, improved management of outdoor landscape irrigation, and a general awareness of the value of long-term water conservation at the consumer level. These demand conditions are described in significant detail in Chapter 4 and reflected in the monthly demand assessments shown below.

Table 5-21 below shows the normal year water supply and demand conditions for SCWA's Zone 40 service area on a monthly timestep.

*Table 5-21: Normal Year Water Supply and Demand in SCWA's Zone 40*

| Normal Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Supply | 14,169 | 14,181 | 14,577 | 14,673 | 15,674 | 8,748 | 9,422 | 9,659 | 9,495 | 16,489 | 15,946 | 14,706 | 157,740 |
| Demand | 1,557 | 1,601 | 2,085 | 2,108 | 3,175 | 4,160 | 4,842 | 5,101 | 4,876 | 3,956 | 3,387 | 2,130 | 38,979 |
| Difference | 12,612 | 12,580 | 12,492 | 12,566 | 12,498 | 4,588 | 4,580 | 4,558 | 4,618 | 12,533 | 12,559 | 12,577 | 118,761 |

### 5.3.2 Zone 40 Single Dry Year Supply and Dry-Year Current Demand

SCWA defines a single dry year condition as one that constrains SCWA from obtaining some of its water supplies in its Zone 40 water supply portfolio due to hydrological, regulatory, and institutional constraints. These conditions include more restrictive regulatory constraints on its water rights, constrained conditions for its water supply contracts, yet no limitations on its ability to access groundwater resources. The restrictive conditions manifest in changed availability of some Zone 40 water assets in various months depicted in the tables below. These changed monthly water supply conditions are described in significant detail in Chapter 3.

Single dry year demands include the anticipated demands based upon historical trends in water usage in drought conditions by SCWA's customers. Demands in dry conditions may increase in the normally wetter months as denuded hydrological conditions generate additional customer uses for outdoor irrigation. These conditions are described in significant detail in Chapter 4 and reflected in the monthly demand tables below. The analysis uses the "current" water use, adjusted as described in Chapter 4.

Table 5-22 below shows the single dry year water supply and demand conditions for SCWA's Zone 40 service area.

*Table 5-22: Single Dry Year Water Supply and Demand in SCWA's Zone 40*

| Single Dry Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Supply | 9,678 | 9,689 | 10,086 | 3,934 | 4,934 | 5,863 | 6,537 | 6,775 | 6,610 | 5,749 | 5,206 | 10,214 | 85,274 |
| Demand | 1,635 | 1,681 | 2,189 | 2,213 | 3,334 | 4,368 | 5,084 | 5,357 | 5,120 | 4,154 | 3,557 | 2,236 | 40,928 |
| Difference | 8,043 | 8,008 | 7,896 | 1,720 | 1,600 | 1,495 | 1,453 | 1,418 | 1,490 | 1,595 | 1,650 | 7,978 | 44,346 |

### 5.3.3 Other Service Areas Normal Year Supply and Current Demand

Similar to the Zone 40 predicted condition for current reliability, an analysis was completed for the six other water service areas considering this year or next reflect normal supply and water use conditions. This analysis uses the normal supply conditions described in Chapter 3 for these areas, as well as the "current" water use presented in Chapter 4.

*Table 5-23: Normal Year Water Supply and Demand in SCWA's Non-Zone 40*

| Normal Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Supply | 208 | 265 | 309 | 334 | 500 | 614 | 708 | 701 | 612 | 539 | 368 | 251 | 5,408 |
| Demand | 208 | 265 | 309 | 334 | 500 | 614 | 708 | 701 | 612 | 539 | 368 | 251 | 5,408 |
| Difference | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

### 5.3.4 Other Service Areas Single Dry Year Supply and Dry-Year Current Demand

If conditions in 2021 or 2022 are considered to match a single dry year condition, the following assessment is provided. Supplies available to these other service areas are not expected to be constrained, as described in Chapter 3. The water use in the table reflects an increased "current" water use as described in Chapter 4.

*Table 5-24: Single Dry Year Water Supply and Demand in SCWA's Non-Zone 40*

| Single Dry Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Supply | 218 | 278 | 324 | 351 | 525 | 645 | 743 | 736 | 642 | 566 | 386 | 264 | 5,678 |
| Demand | 218 | 278 | 324 | 351 | 525 | 645 | 743 | 736 | 642 | 566 | 386 | 264 | 5,678 |
| Difference | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## 5.4 Water Supply Reliability Summary

Sacramento County Water Agency has a diverse and robust water supply portfolio capable of meeting the water demands in all of its service areas in normal, single dry, and five consecutive dry years from 2020 through 2045. Zone 40's diverse water supply portfolio coupled with the system's flexible operations render the supply reliable in all year types including reasonable planned growth through 2045. The six other independent service areas have minimal constraints on system operations and have planned supply conditions to handle reasonably expected urban and population growth through this 2020 UWMPs planning horizon.

# Chapter 6
# Water Shortage Contingency Plan

The Sacramento County Water Agency (SCWA) is reconstituting its Water Shortage Contingency Plan (WSCP) in a separate but parallel process. SCWA's 2020 WSCP will be adopted before or contemporaneously with SCWA's 2020 Urban Water Management Plan. SCWA's new WSCP will address all mandated requirements in of the Urban Water Management Planning Act and will identify specific water shortage actions in all seven of its service areas to meet staged water use reduction targets of up to 10%, 10-20%, 20-30%, 30-40%, 40-50% and greater than 50%. Accordingly, the revised WSCP is incorporated in its entirety as Appendix A to SCWA's 2020 UWMP.

# *Appendix A*
# *Water Shortage Contingency Plan*

This Sacramento County Water Agency's Water Shortage Contingency Plan is provided on the following pages.

# *Sacramento County Water Agency Water Shortage Contingency Plan (ver 4-19-21)*

## Water Shortage Contingency Plan Overview

This Water Shortage Contingency Plan (WSCP) addresses the requirements in Water Code Section 10632 of the Urban Water Management Planning Act (The Act). The WSCP is incorporated into the 2020 Urban Water Management Plan (UWMP) and used by Sacramento County Water Agency (SCWA) to respond to water shortage contingencies as they may arise. This WSCP consists of the following required elements:

1. An analysis of water supply reliability
2. Procedures for conducting an annual water supply and demand assessment
3. Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage, including Triggers and Actions aligned with defined shortage levels.
4. Supply Augmentation Actions
5. Water Supply Operational Changes, Water Use Evaluation, Catastrophic Events, Local Hazard Mitigation Plan, and Oher Shortage Response Actions
6. Communication protocols and procedures
7. Compliance and Enforcement Procedures
8. Legal Authorities
9. Financial consequences of the WSCP
10. Monitoring and reporting requirements
11. Reevaluation and improvement procedures
12. Special Water Feature Distinction
13. Plan Adoption, Submittal, and Availability

This WSCP is included as an Appendix in the UWMP as a stand alone plan, that may be amended or refined and readopted as needed over coming months and years independently from the UWMP..

# 1. Water Supply Reliability Analysis

See Section 5 of the UWMP.

# 2. Annual Water Supply and Demand Assessment Procedures

SCWA's procedural methodology for managing shortages is developing its Annual Water Supply and Demand Assessment (WSDA). The WSDA will include an annual analysis of anticipated water reliability for the current year and one additional dry year. The WSDA is to be submitted to DWR by July 1 each year with the first WSDA due July 1, 2022.

The WSDA will be prepared at the beginning of each calendar year to evaluate near-term water supply reliability and determine what, if any, water shortages stages may be triggered during the required period. The WSDA will be used by SCWA decision-makers to prepare for and initiate implementation of any needed response actions, as well as to inform customers, the general public, interested parties, and local, regional, and state governments entities to prepare for such required actions, if necessary.

## Analytical and Decision-making Processes

SCWA plans to conduct its WSDA according to the following timeline and process:

| | |
|---|---|
| **By February 1** | Initial data collection and analysis |
| **By March 1** | Preliminary Draft WSDA subject to internal review and revisions |
| **By April 1** | Draft WSDA and results briefing for SCWA decision-makers |
| **By May 1** | Approval of WSDA SCWA Decision-makers |
| **By June 1** | Public Release of WSDA, and Public Notifications |
| **By June 15** | Submit WSDA to DWR in advance of July 1 deadline |

SCWA will submit its WSDA to DWR no later than July 1 each year.

## 3. Six Standard Water Shortage Stages, Triggers, Actions and Watering Schedule

| Stage | Recommended Conservation (Water Use Reduction) | Suggested Actions | Water Savings Estimate Range |
|---|---|---|---|
| 1 | Up to 10% | Fix leaks or faulty sprinklers in a timely manner. | 0-1% |
| | | Decorative water features (water fountains, etc.) must recirculate water and shall be leak proof. | 0-1% |
| | | Landscape watering shall be confined to a user's property and shall not runoff onto adjacent properties, roadsides or gutters. | 0-5% |
| | | No landscape watering shall occur while it is raining or snowing. | 0-5% |
| | | Use a shutoff nozzle on hoses. | 0-1% |
| | | Washing down impervious surfaces such as driveways and sidewalks is prohibited unless for public health and safety purposes. | 0-1% |
| | | Unauthorized use of hydrants is prohibited. Authorization for use must be obtained from water supplier. | 0-1% |
| | | Encourage customers to wash only full loads when washing dishes or clothes. | 0-1% |
| | | Encourage customers to use pool covers to minimize evaporation. | 0-1% |
| | | Encourage restaurants to only serve water to customers on request. | |
| | | Irrigation is allowed based on the Stage 1 watering schedule. Plant containers, trees, shrubs, and vegetable gardens may be watered additional days using only drip irrigation or hand watering. | 5-10% |
| 2 | Up to 20% | Fix leaks or faulty sprinklers in a timely manner. | 0-1% |
| | | ~~Require~~ Request restaurants to only serve water to customers on request. | 0-1% |
| | | No restrictions on landscape watering with non-potable water. | Not applicable |
| | | Irrigation is allowed based on the Stage 2 watering schedule using potable water. Plant containers, trees, shrubs, and vegetable gardens may be watered additional days using only drip irrigation or hand watering. | 5-10% |
| 3 | Up to 30% | Fix leaks or faulty sprinklers in a timely manner. | 0-1% |
| | | Decorative water features that use potable water must be drained and kept dry. | 0-1% |
| | | Car washing is only permitted using a commercial carwash that recirculates water or by high pressure/low volume wash systems. | 0-1% |
| | | **Warm/Dry Season** | |
| | | Irrigation is allowed on the Stage 3 watering schedule using potable water. | 5-20% |
| | | Plant containers, trees, shrubs and vegetable gardens may be watered additional days using only drip irrigation or hand watering. | Not applicable |
| | | **Cool/Wet Season** | |
| | | Turf shall not be watered unless utilizing non-potable water during extended dry spells. | 1-5% |
| | | Plant containers, trees, shrubs and vegetable gardens shall be watered only by drip irrigation or hand watering. | 0-1% |
| 4 | Up to 40% | Fix leaks or faulty sprinklers in a timely manner. | 0-1% |
| | | Existing pools shall not be emptied and refilled using potable water unless required for public health and safety purposes. | 0-1% |
| | | **Warm/Dry Season** | |
| | | Irrigation is allowed on the Stage 4 watering schedule using potable water. | 10-30% |
| | | Plant containers, trees, shrubs and vegetable gardens may be watered additional days using only drip irrigation or hand watering. | Not applicable |
| | | **Cool/Wet Season** | |
| | | Turf shall not be watered unless utilizing non-potable water during extended dry spells. | 1-5% |
| | | Plant containers, trees, shrubs and vegetable gardens shall be watered only by drip irrigation or hand watering. | 0-1% |
| 5 | Up to 50% | Water use for public health and safety purposes only. | |
| 6 | Greater than 50% | Water use for public health and safety purposes only. Customer rationing may be implemented. | |

### Stage 1 and Stage 2 Watering Schedule:

The following watering schedule is in effect within areas served by the Water Agency. Failure thereto constitutes 'water waste', and is an unauthorized use of Agency water pursuant to Water Agency Code Sections 3.40.120 and 3.40.130.

- **Residential and Commercial Irrigation Schedule** - Irrigation is permitted based on the last digit of customer addresses, in accordance with the schedule below:

**Stage 1 and Stage 2 - Irrigation Schedule**

| Addresses Ending In | Watering Days | Time of Day |
|---|---|---|
| Even Number (0, 2, 4, 6, 8) | Wednesday Friday, Sunday | Between 8 p.m. and 8 a.m. |
| Odd Number (1, 3, 5, 7, 9) | Tuesday Thursday Saturday | |

**Stage 3 Water Schedule:**

The following regulations are in effect during Stage 2, and are in addition to, or supersede where conflicting, t-Irrigation is permitted **2 days per week** based on the last digit of customer addresses, in accordance with the below schedule: **STAGE 3 - Irrigation Schedule** hose in effect during the Stages 1-2:

**Irrigation Restrictions**

| Addresses Ending In | Watering Days | Time of Day |
|---|---|---|
| Even Number (0, 2, 4, 6, 8) | Wednesday Sunday | Between 8 p.m. and 8 a.m. |
| Odd Number (1, 3, 5, 7, 9) | Tuesday, Saturday | |

**Stage 4 Irrigation Schedule:**

During Stage 4 conditions the following regulations go into effect during Stage 4, which are either in addition to, or supersede, those in effect during Stages 1-3.

- **Irrigation Restrictions** - Irrigation is permitted **1 day per week** based on the last digit of customer addresses, in accordance with the below schedule:

| Addresses Ending In | Watering Days | Time of Day |
|---|---|---|
| Even Number (0, 2, 4, 6, 8) | Sunday | Between 8 p.m. and 6 a.m. |
| Odd Number (1, 3, 5, 7, 9) | Saturday | |

**Stage 5 and Stage 6 Irrigation Schedule:**

During Stages 5 and Stage 6 conditions a Water Emergency will be issued by the Agency to its customers. The following regulations go into effect during Stage 4and Stage 6, which are either in addition to, or supersede where conflicting, those in effect during the Stages 1-4:

- **Irrigation Restrictions** -All residential and commercial outdoor irrigation is **prohibited**.

## 4. Supply Augmentation Actions

The following water supply augmentation actions may be used as response actions for the appropriate Water Shortage Stage. SCWA has access to 6,000 acre-ft per year from a remediated water sources that is not subject to Term 91. This water source is available when other water supply contracts are subject to cutbacks.

## 5. Operational Changes

As a response to water system operational changes may be used for appropriate Water Shortage Stages, SCWA may reduce system pressures.

### Landscape Irrigation

Landscape irrigation reductions focus on less watering and reducing or avoiding water waste during irrigation. Landscape irrigation reductions may vary by user class or customer type depending on water shortage conditions and ability to meet overall water use reduction targets. Water allocation or budget concepts may be applied by SCWA to equitably reduce landscape water use while minimizing customer impact.

## Commercial, Industrial, and Institutional (CII)

The CII category of customers is diversified and may require a tailored approach for meeting specified water use reduction targets. This could include focusing on large landscape irrigation, or other means to meet CII water use reduction targets. The ability of CII customers to conserve water during a water shortage condition would be considered depending on which stage has been triggered and how much water use has already been reduced during previous stages. SCWA would work collaboratively with CII customers so water use cutbacks will not impact business operations and solvency.

## Emergency Response Plan for Catastrophic Water Shortages

This section identifies actions to be undertaken by SCWA to prepare for, and implement during, a catastrophic interruption of water supplies. A catastrophic interruption could result from any event (either natural or man-made) that causes a water shortage severe enough to trigger a Stage 4-6 water supply shortage condition.

In order to prepare for catastrophic events, SCWA has prepared an Emergency Response Plan (ERP) in accordance with other state and federal regulations. The purpose of the ERP is to design actions necessary to minimize the impacts of supply interruptions due to catastrophic events.

The ERP coordinates overall company response to a disaster in any and all of its districts. In addition, the ERP requires each district to have a local disaster plan that coordinates emergency responses with other agencies in the area. The ERP also provides details on actions to be undertaken during specific catastrophic events. The following is a summary of actions cross-referenced against specific catastrophes for three of the most common possible catastrophic events: regional power outage (such as Public Safety Power Shutoff or "PSPS" events), natural disasters (such as earthquake, flood or storm damage, or fire), and malevolent acts.

| **Summary of Actions for Catastrophic Events** | |
|---|---|
| **Possible Catastrophe** | **Summary of Actions** |

| | |
|---|---|
| Regional Power Outage | • Isolate areas that will take the longest to repair and/or present a public health threat. Arrange to provide emergency water.<br>• Establish water distribution points and ration water if necessary.<br>• If water service is restricted, attempt to provide potable water tankers or bottled water to the area.<br>• Make arrangements to conduct bacteriological tests, in order to determine possible contamination.<br>• Utilize backup power supply to operate pumps in conjunction with elevated storage. |
| Natural Disaster | • Assess the condition of the water supply system.<br>• Complete the damage assessment checklist for reservoirs, water treatment plants, wells and boosters, system transmission and distribution.<br>• Coordinate with Cal EMA utilities group or fire district to identify immediate firefighting needs.<br>• Isolate areas that will take the longest to repair and/or present a public health threat. Arrange to provide emergency water.<br>• Prepare report of findings, report assessed damages, advise as to materials of immediate need and identify priorities including hospitals, schools and other emergency operation centers.<br>• Take actions to preserve storage.<br>• Determine any health hazard of the water supply and issue any "Boil Water Order" or "Unsafe Water Alert" notification to the customers.<br>• Cancel the order or alert information after completing comprehensive water quality testing.<br>• Make arrangements to conduct bacteriological tests, in order to determine possible contamination. |
| Malevolent acts | • Assess threat or actual intentional contamination of the water system.<br>• Notify local law enforcement to investigate the validity of the threat.<br>• Get notification from public health officials if potential water contamination<br>• Determine any health hazard of the water supply and issue any "Boil Water Order" or "Unsafe Water Alert" notification to the customers, if necessary.<br>• Assess any structural damage from an intentional act.<br>• Isolate areas that will take the longest to repair and or present a public health threat. Arrange to provide emergency water. |

In addition to specific actions to be undertaken during a catastrophic event, SCWA performs maintenance activities, such as annual inspections for earthquake safety,

and budgets for emergency items, such as auxiliary generators, to prepare for potential events.

### Seismic Risk Assessment and Mitigation Plan

SCWA intends to submit a copy of the Sacramento County Local Hazardous Mitigation Plan.

### Other Shortage Response Actions

Other shortage response actions may be considered by SCWA as required to meet specific water shortage conditions. Before these actions can be implemented, an amendment to this WSCP may be required.

## 6. Communication Protocols

SCWA will communicate when the WSCP is implemented and inform SCWA's customers. The intendent of the communication is to inform SCWA's customers and wholesale customers of the voluntary and mandatory water conservation activities.

SCWA will seek to engage customers and provide notice on the voluntary or mandatory water conservation actions. These locally-relevant actions may include:

- Publishing information on SCWA's website.
- Providing bill inserts and direct mailings above and beyond those legally required.
- Developing materials for non-English speaking customers.
- Preparing social media posts to communicate SCWA actions.
- Advertising actions on other media.

Taken together, all of these communication actions will result in an effectively implemented SCWA's WSCP.

## 7. Compliance and Enforcement Procedures

See attached Sacramento County Water Agency Code, Title 1, Chapter 1.25, and Enforcement. The SCWA Code, as it may be amended from time to time, is located at the following web page: https://countycounsel.saccounty.net/Pages/WaterAgencyCode.aspx.

## 8. Legal Authorities

SCWA is empowered to implement and enforce its shortage response actions specified in this section through its enabling legislation, see attached Sacramento County Water Agency Code, Title 1, Chapter 1.30.020, Agency Act.

# 9. Financial Consequences of WSCP

Implementation of this WSCP will likely have financial impacts to SCWA. Specifically, SCWA has established water rates that support its capital projects as well as its operation and maintenance activities. The rates are tied to SCWA's customers' normal water consumption activities that may be reduced through voluntary or mandatory water conservation activities. In this way, there may be revenue reductions to SCWA. In addition to the revenue reductions, SCWA may also see an increase in expenses resulting from augmented communication actions, increased enforcement activities, and overall water shortage management actions. This section addresses aspects of revenue reduction, expense increases, and additional costs that may arise during implementation of this WSCP.

## Revenue and Expenditure Impacts

There may be a revenue impact during a shortage condition as customers are required to utilize less water. Under this case, SCWA may need to reprioritize spending priorities, develop reserves to compensate for decreased revenue, consider rate increases, or a drought surcharge during the water shortage.

# 10. Monitoring and Reporting

SCWA is committed to monitoring and reporting updates in implementing the WSCP. In order to determine the effectiveness of water management actions, SCWA will aggregate metered data and assess SCWA monitoring actions. Moreover, SCWA will update its customers in its communication protocols.

SCWA's monitoring and reporting actions may include the following, as locally necessary:

- Gathering customer water use data
- Assessments of customer water use
- Review trends in water supply availability
- Assess water conservation activities and enforcement actions, as applicable to achieving conservation objectives.
- Preparing written reports and presentations, as necessary, for SCWA management

## 11. Re-evaluation and Improvement Procedures

SCWA will review and assess its procedures for implementing the WSCP. Improvement procedures will include developing reports, memoranda, and presentations that assess the effectiveness of water conservation actions and the WSCP.

## 12. Special Water Feature Distinction

For purposes of water shortage contingency planning and implementation within the Laguna-Vineyard, Sunrise-Mather, and County Creek Estates, SCWA defines as "special water features" those that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains. Such special water features are considered distinct from swimming pools and spas (as defined in subdivision (a) of Section 115921 of the Health and Safety Code).

Water shortage response actions would focus on health and safety issues and tempering these uses based on the severity of the water shortage condition. The relative total water use from these sources would be a consideration for how special water features and swimming pool uses could be curtailed during specific water shortage conditions. Generally swimming pool filling and refilling would be impacted in the later stages of a water shortage condition. SCWA has determined that special water features are a relatively small discretionary use but would be restricted during a Stage 3 or higher water shortage condition.

## 13. Plan Adoption, Submittal, and Availability

The WSCP has been adopted, submitted, and is available as required by the Urban Water Management Planning Act. As a stand-alone document, the WSCP is also subject to the following separate adoption, submittal, and availability processes, and whenever it is separately amended or revised in the future. SCWA may refine each service area's WSCP through SCWA's governing procedures in altering each service area's WSCP. SCWA has followed all applicable law in adopting the WSCPs. The current adopted WSCP for the Zone 40 System shall be available to its customers at www.SCWA.net. Alternately, a copy of the WSCP can be obtained by calling (916) 874-4517.