



Public Draft – June 2021

San Juan Water District: Retail & Wholesale 2020 Urban Water Management Plan



Prepared by:



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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 environment. To strengthen local and regional water management and drought planning, the Urban Water Management Planning Act (UWMPA) was signed into law in 1983.¹ Since then, the Legislature has amended the UWMPA to require additional detail in Urban Water Management Plans (UWMP), including addressing resilience to drought and climate change.

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 UWMP 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

At a practical level, the UWMP provides the water management planning foundation for urban water suppliers throughout California. A UWMP will provide the supplier's elected officials, management, staff, and customers with an understanding of the agency's past and current, as well as projected future, water supply and demand conditions. The UWMP integrates local and regional land use planning, regional water supply, infrastructure, and demand management projects, and also identifies challenges that may result from climate change and evolving regulations. Urban water management planning provides an opportunity for the supplier to evaluate supplies and demands using a balanced and methodical planning platform that addresses short-term and long-term planning conditions. In brief, the UWMP gathers, characterizes, and synthesizes water supply related information from numerous sources - to inform the agency's planning, while also providing interested local, regional, and statewide stakeholders with access to the same information.

¹ California Water Code Section 10610 *et seq.* (Chapter 1 added by Stats. 1983, Ch. 1009, Sec. 1).

² California Water Code Section 10610 *et seq.*

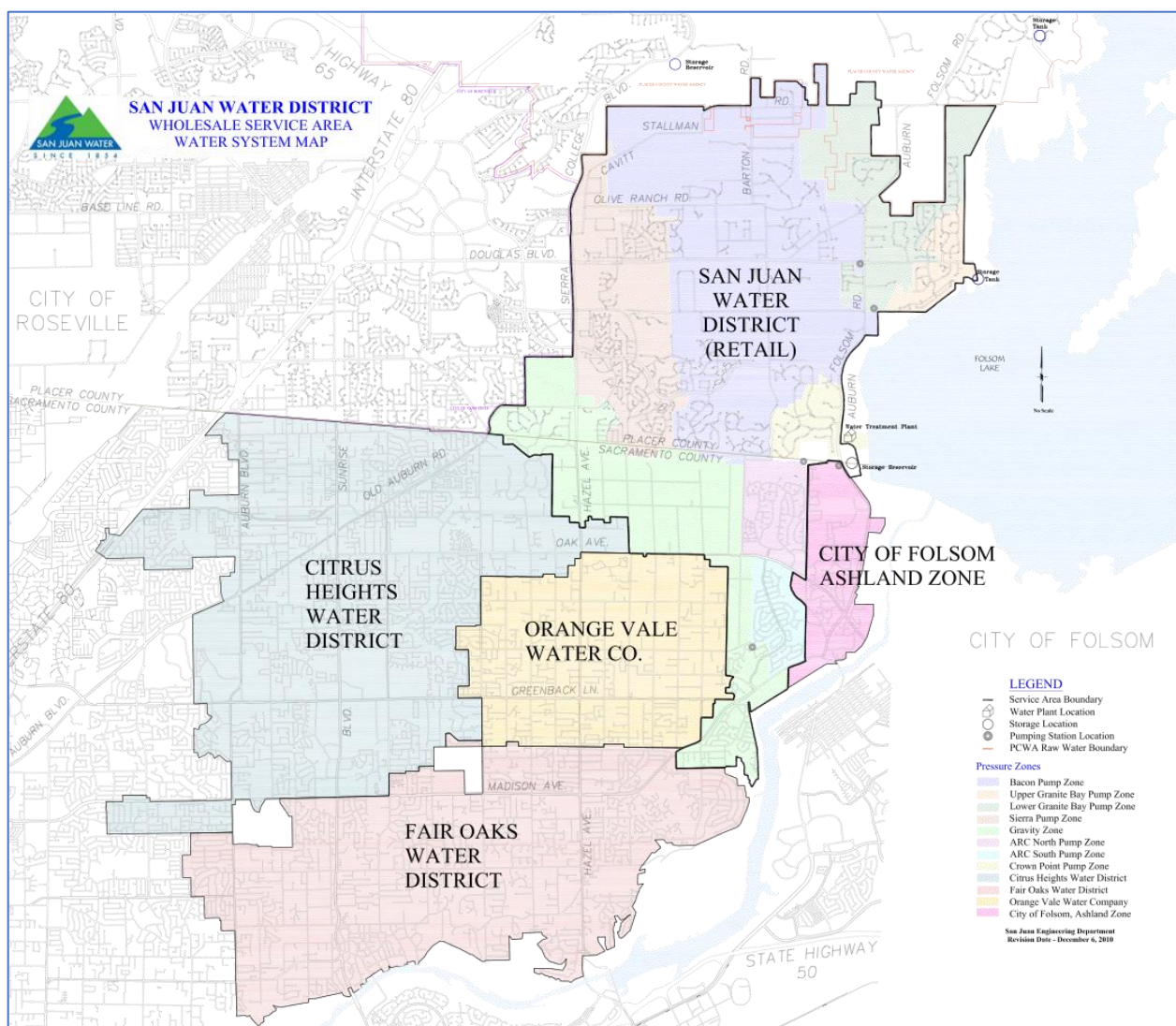
³ California Water Code Sections 10631-10635

⁴ California Water Code Section 10632

ES-1 San Juan Water District

San Juan Water District (SJWD or District) provides water service to retail customers and wholesale customer agencies (WCAs) in northeastern Sacramento and southeastern Placer Counties. The District's retail service area is roughly seventeen square miles, mostly rural in character with large parcel sizes, east of Roseville and west of Folsom Lake in both Placer and Sacramento counties. The WCAs served by the District include Citrus Heights Water District (CHWD), Fair Oaks Water District (FOWD), Orange Vale Water Company (OVWC), and a portion of the City of Folsom referred to as the Ashland area (Folsom). Figure ES-1 shows the entire wholesale service area in relation to the retail service and WCA service areas.

Figure ES-1: San Juan Water District Wholesale and Retail Water Service Areas



The retail service currently meets the needs of nearly 30,000 residents and a variety of non-residential customers, with a current annual water use of about 11,000 acre-feet. The retail service area is projected to have only modest growth, adding less than 3,000 new residents by 2045, with only nominal

changes to total water use as a result of on-going reductions in per-capita water use. With the addition of the WCAs, the population served grows to over 150,000, projected to increase to over 180,000 by 2045. Current use by the WCAs is about 26,000 acre-feet annually and is forecast to increase only slightly, even with the added population. Overall, the District anticipates a future water use of just over 43,000 acre-feet per year.

The District’s water supplies include an array of surface water rights and contracts that provide access to over 80,000 acre-feet during normal hydrologic conditions. These supplies are constrained to about 46,500 acre-feet during dry conditions.

ES-2 Water Service Reliability

The District has ample water supplies to meet current and growing customer demand. Specifically, with an array of surface water assets that can be flexibly managed in a single year, the District can maintain reliability during drought conditions. Nevertheless, the District continues to encourage its customers to use water efficiently and continues to see declining per-capita water use.

The District’s current normal year water supply and demand conditions represent the expected water supply and demand conditions that would likely occur based upon a reasonable assessment of regional and statewide hydrology and limited regulatory constraints. Under these conditions, the District anticipates that it would maintain full access to its current surface water supplies. The District’s characterization of current water use conditions represents an historical assessment of water use within the District, which supports the characterization of growth and potential customer use patterns.

A representative example of the District’s water system reliability if the next five years were to be consecutively dry is illustrated in Table ES-1. As demonstrated in this representation, the District is able to reliably meet all unconstrained demands based upon the characterization of the District’s supplies as detailed in this 2020 UWMP.

Table ES-1: Five Year Drought Risk Assessment: Wholesale System (values in acre-feet)

	2021	2022	2023	2024	2025
Supply	45,500	45,500	45,500	45,500	45,500
Demand	40,510	40,780	41,050	41,320	41,590
Difference	4,990	4,720	4,450	4,180	3,910

Although the District has sufficient supplies to meet its needs during single-dry years and extended droughts as evaluated in this 2020 UWMP, other regulatory constraints, like the declaration of a drought emergency by the Governor of the State of California potentially including urban water use reduction mandates, or State-ordered curtailment of water rights, could constrain the District’s water service to its customers.

Overall, as documented in this 2020 UWMP, the District’s water supply portfolio can meet the water uses in its service area in normal, single dry, and five consecutive dry years from 2020 through 2045.

Chapter 1

Introduction

Formed in 1954, the District provides retail and wholesale water supplies to customers in northeastern Sacramento County and southeastern Placer County. However, its roots go back as far as 1853 and the gold rush era when the North Fork American River and Mining Company was founded, later becoming the North Fork Ditch Company, and then SJWD. The District is a community services district which was established by citizen vote,⁵ and is governed by a five member, publicly elected Board of Directors, each serving four-year terms.

As described in more detail in Chapter 2, the District provides direct potable retail water service to a portion of its wholesale service area-- San Juan Water District Retail (Retail) – and treats and distributes surface water supplies to Citrus Heights Water District (CHWD), Fair Oaks Water District (FOWD), Orange Vale Water Company (OVWD) and the City of Folsom (Ashland area) (i.e., the Wholesale Customer Agencies (WCAs)) – within the area referred to as San Juan Water District Wholesale (Wholesale). This Urban Water Management Plan (UWMP) provides the required detailed information for both SJWD’s Retail and Wholesale operations.

The District also contracts with City of Roseville (Roseville) and Sacramento Suburban Water District (SSWD) to provide water to them from its water supplies on an as-available basis. These demands for District water supplies are addressed differently than the demands of SJWD’s retail customers and the WCAs.

Ensuring that an adequate supply of water is available to serve the existing and future needs of the District’s retail customers and the WCAs is central to the District’s mission. This UWMP draws on local, regional and statewide inputs to synthesize information from numerous sources into a foundational report designed to be referred to as management and Board level decisions arise and conditions change.

1.1 Background and Purpose

The District has prepared this 2020 UWMP to comply with the UWMPA requirements for urban water suppliers. This 2020 UWMP addresses the District’s water management planning efforts to assure adequate water supplies to meet forecast demands over the next 25 years. As required by the UWMPA, the District’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 for both its Retail and

⁵ Formed in 1954 under the Community Services District Law, Government Code sections 61000 et seq., and originally named the San Juan Suburban Water District.

Wholesale systems. A primary purpose of this UWMP is verification that future demands will not exceed supplies and assurance of the availability of sufficient supplies under various dry-year conditions.

The 2020 UWMP is an update to the District’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 District’s managers, its retail customers and WCAs, and the State of California about its water management practices. It reflects the District’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. Such forward planning is an important outcome of the 2020 UWMP.

1.2 Basis for Plan Preparation

The District operates a Public Water System as described in California Health and Safety Code Section 116275. The District qualifies as both a Wholesale Urban Water Supplier, and Retail Urban Water Supplier as described in CWC Section 10617, providing water for municipal purposes to more than 3,000 customers or 3,000 acre-feet of water per year. These qualifications require the preparation of a UWMP every five years. Details regarding the District’s Retail system are listed in Table 1-1.

Table 1-1: Public Water System Information⁶

Public Water System Number	Public Water System Name	Number of Retail Connections 2020
CA3410021	San Juan Water District	10,670

The State Legislature passed numerous new requirements since the 2015 UMWP which are detailed throughout this 2020 UWMP.⁷ 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”. 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 requirement is addressed in Chapter 3 – Water Supply, Chapter 4 – Water Use, and Chapter 5 – Water Service Reliability Assessment.

⁶ As provided at <https://sdwis.waterboards.ca.gov/PDWW/>

⁷ California Water Code Sections 10608 to 10608.44; Sections 10609 to 10609.38; Sections 10610 to 10657

Drought Risk Assessment (DRA): Due to the extensiveness of recent California droughts and the variability associated with climate change predictions, the California Legislature added 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 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 CWC. Incorporating the water system into regional or county hazard mitigation planning is an important aspect of this new statute. Seismic risk is addressed in Appendix B.

Water Shortage Contingency Plan: In 2018 the Legislature modified the UWMPA to require a Water Shortage Contingency Plans (WSCP) with specific elements. The WSCP is a supplier’s action plan for responding as necessary to drought or a catastrophic water supply shortage. The District’s Wholesale and Retail WSCPs are included as appendices to Chapter 6 of this UWMP.

Groundwater Supplies Coordination: 2020 UWMPs are required to be consistent with Groundwater Sustainability Plans, which were mandated by the 2014 Sustainable Groundwater Management Act (SGMA). The reliance on groundwater is described in Chapter 3 – Water Supply.

Lay Description: A synopsis of the fundamental determinations of the UWMP is a new statutory requirement in 2020. This section of the UWMP, incorporated within the Executive Summary, is intended for new staff, new Board members, customers, and the media, and it can ensure a consistent representation of the UWMP’s detailed analysis.

1.3 Coordination and Outreach

As required by the UWMPA, the District has coordinated with its WCAs and other nearby agencies while developing this UWMP in order to ensure consistency with other related planning efforts such as 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 the District’s water assets, and (c) relevant public agencies that may have land use or other regulatory relationships with the District. The District 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.

CWC Section 10621(b) states every urban water supplier shall seek active involvement from diverse elements of the community. The District sought public participation with its notice and hearing 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 District 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				
Citrus Heights Water District	X	X	X	X
City of Citrus Heights		X	X	X
City of Folsom	X	X	X	X
City of Roseville	X	X	X	X
Fair Oaks Water District	X	X	X	X
Orange Vale Water Company	X	X	X	X
Sacramento Suburban Water District	X	X	X	X
Placer County		X	X	X
Placer County Water Agency		X	X	X
Sacramento County Water Agency		X	X	X
Sacramento County (Dept. of Planning & Environmental Review)		X	X	X
Sacramento Regional County Sanitation District		X	X	X
Sacramento Area Council of Governments		X	X	X
Regional Water Authority / Sacramento Groundwater Authority	X	X	X	X
General Public				X

SJWD is a member of the Regional Water Authority (RWA), a joint powers authority created by water purveyors in the Sacramento region to promote and support a coordinated approach to regional water issues. The District is also a member of the Sacramento Groundwater Authority (SGA). SGA is also a joint powers authority. SGA was created to manage the Sacramento region's North Area Groundwater Sub-Basin, which includes all of Sacramento County north of the American River.

1.3.1 Water Supplier Information Exchange

CWC Section 10631 requires wholesale and retail water agencies to provide each other with information regarding water supply and demand. As a wholesale supplier, the District has provided information regarding water supply and demand, as required by the UWMPA Water Supplier Information Exchange, to each of its WCAs. This information has been projected in increments of five years, from 2020 through 2045, and for normal, single, and five consecutive dry years. Further Retail system and Wholesale system discussion is included in each appropriate Chapter and related sections of this UWMP as described in Section 1.5 – Document Organization.

1.4 UWMP Adoption

The District held a public hearing regarding its 2020 UWMP on June 23, 2021. Before the hearing, a draft was made available for public inspection at the District's administration building located at 9935 Auburn Folsom Road, Granite Bay, CA 95746, and posted on the District's website on June 8, 2021. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication

of the hearing date and time and posting of the hearing at the District's office. In addition, the entities in Table 1-2, as well as members of the public who had requested that they be kept apprised of progress, were emailed the link to the draft UWMP as soon as the draft was available.

The District's Board of Directors adopted this 2020 UWMP on June 23, 2021. A copy of the adopted 2020 UWMP will be submitted to DWR, provided to local cities and counties and the California State Library, and posted on the SJWD website within 30 days after its adoption.

The District's draft Water Shortage Contingency Plans were posted to the District's website on May 25, 2021.

The District will submit all required documentation related to the UWMPA through the DWR submittal website soon after adoption. This will 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"

1.5 Document Organization

This UWMP addresses water-planning fundamentals, statutory requirements, and enhancements for the District's retail and wholesale operations. Each chapter includes Retail system and Wholesale system discussions, as appropriate and as required by the UWMPA.

This UWMP is organized as follows:

Chapter 2 provides a description of the District's service area, demographic characteristics and climate, and describes the future population SJWD anticipates needing to serve.

Chapter 3 describes the District's current and future water supplies and the availability of those supplies through 2045.

Chapter 4 details customer uses, including past and future estimated uses, and describes SJWD's past and on-going demand management measures.

Chapter 5 presents SJWD's water system service reliability into the future, including an assessment of reliability if drought conditions occurred over the next five consecutive years.

Chapter 6 describes SJWD's retail and wholesale WSCPs; incorporated as two appendices to this UWMP to allow them to be shared and utilized separate from the UWMP.

NOTE TO DWR:

The District has written this UWMP primarily as a water resources planning tool to more effectively manage water supply, reliability and demand. This UWMP satisfies all the requirements of the UWMPA.

The body of the document provides narratives, analysis and data that DWR requests in its 2020 UWMP Guidebook, including addressing 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 have been 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

2.1 General Water Service Area Description

Governed by an elected Board of Directors, the District provides water service to retail customers and WCAs in northeastern Sacramento and southeastern Placer Counties.

The District covers forty-five square miles, geographically incorporating its retail service area along with the service areas of its WCAs.⁸

The District’s retail service area is roughly seventeen square miles, mostly rural in character with large parcel sizes, east of Roseville and west of Folsom Lake in both Placer and Sacramento counties. Approximately 75 percent of the District’s retail service area is in Placer County. According to the revised Placer County 2012 Granite Bay Community Plan, population, housing and employment in the Granite Bay area are projected to grow at a minimal rate.

Figure 2-1 displays the District’s Wholesale and Retail system service areas.

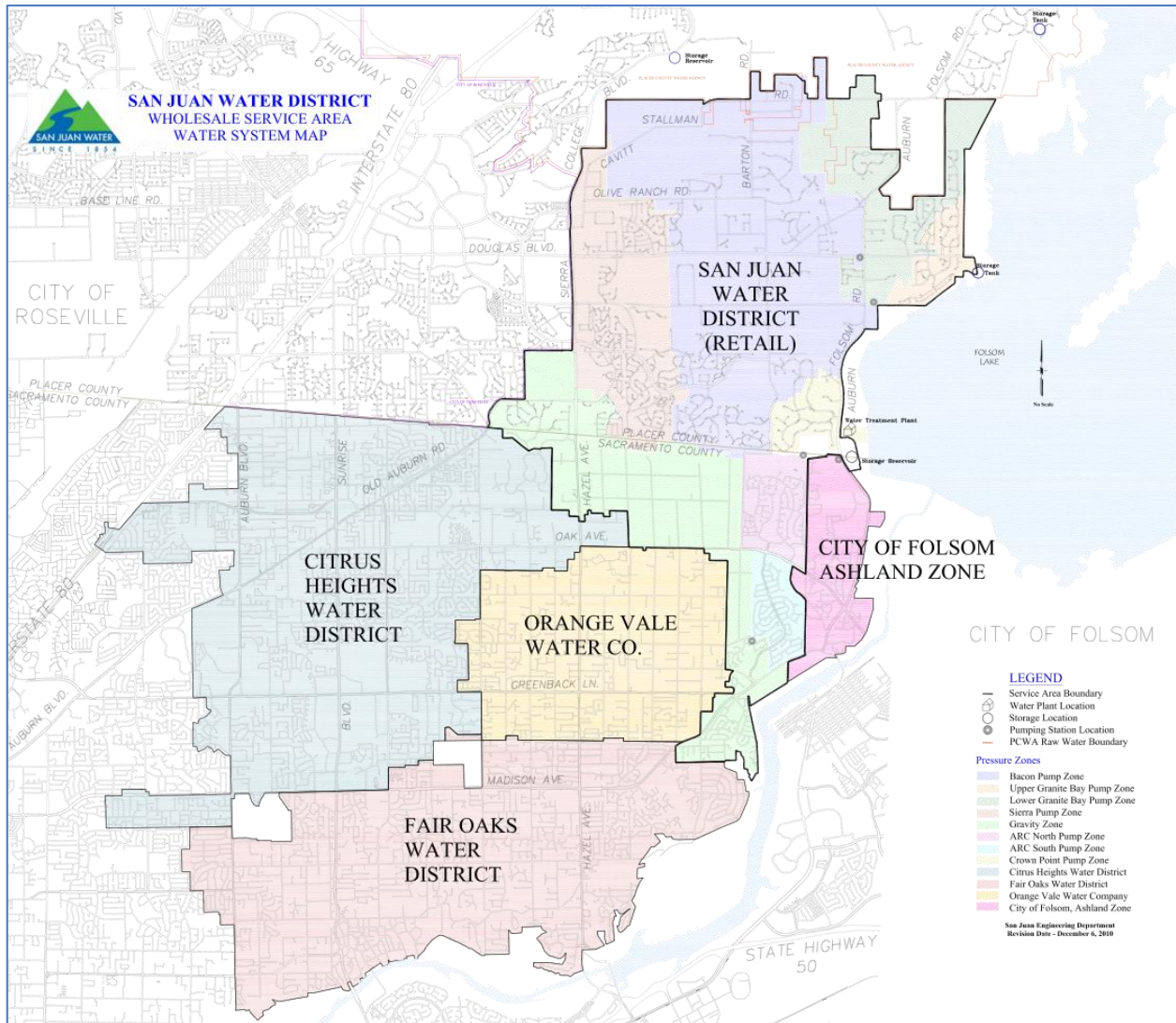
2.1.1 Service Area Climate

SJWD has cool winters and hot, dry summers. The Western Regional Climate Center (WRCC) maintains 30 years of historic climate data for select cities only. WRCC does not have a station within the SJWD service area boundary and therefore the WRCC’s Folsom Dam station, less than one mile from the SJWD boundary, was utilized for the climate data analysis. The WRCC’s website (www.wrcc.dri.edu) maintains historical climate records for its Folsom Dam station, with monthly temperature reporting ranges from an average low of 38.3 degrees Fahrenheit (°F) in January to an average high of 94.4 °F in July.

Precipitation data is also documented on the WRCC website with data from its Folsom Dam station. For the period 1981-2010, 25.80 inches of average annual rainfall was measured. The wettest months are January, February, and March while the driest months are typically July and August.

⁸ The District’s retail service area is also essentially a wholesale customer of the District, sharing in the District’s water supplies with the WCAs. But the retail service area does not have a separate contractual agreement as exists between the District and each WCA, so is therefore not considered a WCA for purposes of this 2020 UWMP. The retail system future water use, however, is additive to the WCA’s future water use for purposes of assessing the Wholesale system’s water service reliability (see Chapter 5).

Figure 2-1. San Juan Water District Wholesale and Retail System Water Service Area



Evapotranspiration (ET_o) varies seasonally, and during dry years the significance of evapotranspiration is magnified because it continues to deplete surface water supplies and reduce soil moisture. The District monitors ET_o closely. Standard monthly average ET_o data was obtained from the California Irrigation Management Information System (CIMIS) Station 131 located in Fair Oaks, California, which is about 5 miles southwest of the District’s campus, within its Wholesale system service area. Average annual ET_o for the period 1998-2020 measured 50.54 inches.

California Model Water Efficient Landscape Ordinance (MWELO) ET_o values for Roseville are also reported in Table 2-1. Local agencies are to use the MWELO ET_o values as the standard for approval of landscape plans associated with specific development projects.

Figure 2-2 and Table 2-1 present monthly average climate figures based on historical data.

Figure 2-2: Monthly Average Climate for the San Juan Water District

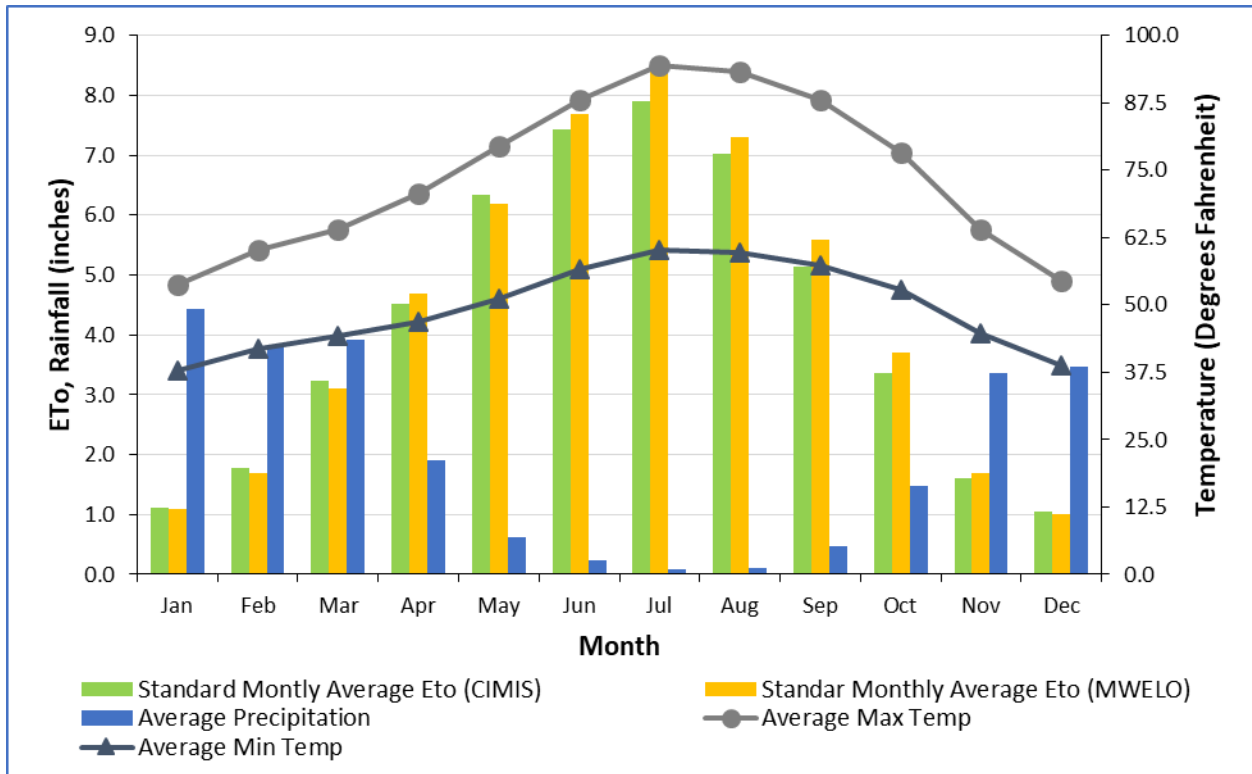


Table 2-1: San Juan Water District Climate Information

Month	MWEL0 Appendix A ETo (inches)	CIMIS Standard Monthly Average ETo (inches)	Average Precipitation (inches)	Average Temperature (°F)	Average Maximum Temperature (°F)	Average Minimum Temperature (°F)
January	1.1	1.12	3.70	46.1	53.9	38.3
February	1.7	1.78	4.63	51.9	61.3	42.5
March	3.1	3.24	4.65	55.4	65.1	45.6
April	4.7	4.52	1.74	60.4	72.4	48.4
May	6.2	6.35	0.67	66.5	80.8	52.2
June	7.7	7.44	0.38	73.2	88.8	57.5
July	8.5	7.91	0.06	77.6	94.4	60.7
August	7.3	7.03	0.11	76.8	93.5	60.0
September	5.6	5.14	0.62	72.7	87.7	57.7
October	3.7	3.36	1.46	66.1	78.6	53.5
November	1.7	1.61	3.96	53.1	61.9	44.2
December	1.0	1.04	3.83	46.7	54.2	39.1
Annual:	52.2	50.54	25.80	62.4	74.6	50.1

Totals may not add due to rounding.
 MWEL0 Appendix A data from Roseville, CA.
 ETo data from DWR CIMIS Data, Fair Oaks Station 131, 1998-2020.
 Precipitation and Temperature data from WRCC, Folsom Dam (043113) 1981-2010.

2.1.2 Service Population and Demographics

The District’s service area population is estimated for both the Retail and Wholesale system service areas. Population figures (historic and projected) were obtained from the WCAs, and combined with SJWD Retail data, to calculate SJWD’s Wholesale system service area population.

The District’s WCAs and Retail system service area are within Sacramento and Placer counties. Additional demographic information for these counties was obtained from the American Community Survey (ACS)⁹. Table 2-2 summarizes demographics associated with the District.

Table 2-2: 2019 Sacramento and Placer County Demographics

Metric	Sacramento County	Placer County
Median Household Income (\$)	67,151	89,691
Average Household Size	2.76	2.67
Median Age	36.2	42.0
Unemployment Rate	4.1	2.6
Sources: ACS 5-Year Estimates (Sacramento and Placer counties) https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/2019/ , accessed March 2, 2021.		

Retail System Population

The population served by SJWD retail includes a mix of users and user classes. The District’s retail customer base is comprised of single-family residential (94.3 percent), commercial and institutional (2.3 percent), landscape irrigation (2.0 percent), and multi-family residential (1.1 percent), with agricultural and other (sewer lift/pump stations) making up the remaining 0.3 percent of customer connections¹⁰. The build out of the service area will consist of mainly residential, multi-family, and commercial land uses.

2020 retail service area population estimates were generated using DWR’s population tool. The population tool estimates the person per connection ratio based on 2010 census data, service area boundary, and the number of 2020 residential (single-family and multi-family) connections. DWR’s population tool estimated SJWD’s person per connection ratio as 2.91. The number of 2020 connections were multiplied by the person per connection ratio to estimate the 2020 retail population.

Retail population projections utilized information from Sacramento Area Council of Governments (SACOG). SACOG 2016 and 2020 Metropolitan Transportation Plan and Sustainable Community Strategy (MTP/SCS)¹¹ growth projections were utilized for projecting SJWD’s future retail service area population.

⁹ 2019: ACS 5-Year Estimates Data Profiles, accessed March 2, 2021.

¹⁰ Percentages are based on 2020 customer connections.

¹¹ The 2020 MTP/SCS was adopted by SACOG in November of 2019 and provides more recent analysis, however the data was not broken down to the same detail as the 2016 Model. As such, the 2020 data was used to modify the more detailed 2016 data.

The modeling utilized small, multi-block sections (approximately 400-acre) to increase accuracy of projections for population, dwelling units, and growth rates. Results from the 2016 MTP/SCS indicate an approximate growth rate of 0.4%, for a total of 1,100 new residential units by 2045.¹² The person per connection ratio of 2.91 was applied to this population growth estimate to project the future retail service area population over time.

Table 2-3: Retail: Population – Current and Projected

Population Served	2020	2025	2030	2035	2040	2045
SJWD – Retail ¹	29,680	29,840	30,379	31,107	31,851	32,885
NOTES: ¹ SJWD retail service area population for 2020 estimated using United States Census Bureau data and projections based on SACOG 2016 and 2020 MTP/SCS growth rates for the District’s retail service area.						

Wholesale System Population

Population projections for the Wholesale system service area include the SJWD retail population, CHWD, FOWD, OVWC, and the City of Folsom (Ashland). Population projections were provided to the District by the WCAs to calculate population figures for inclusion in this UWMP. Current and projected population for the District’s wholesale service area are presented below in Table 2-4.

Table 2-4: Wholesale: Population – Current and Projected

Population Served	2020	2025	2030	2035	2040	2045
SJWD – Wholesale ¹	151,341	154,173	159,221	166,473	173,842	181,577
NOTES: ¹ Current and projected populations were provided by CHWD, OVWC, and the City of Folsom. Populations for FOWD were obtained from FOWD’s 2015 UWMP for the period 2020 through 2035. FOWD 2040 and 2045 populations have been estimated based on the present historic growth rate applied to the 2035 population as a baseline.						

Comparison with Prior Population Projections

Comparing SJWD’s 2020-2040 population projections developed for this 2020 UWMP with the same projections in its 2015 UWMP indicate less projected growth for the period. Table 2-5 displays the comparison of SJWD’s retail population projections for the 2015 and 2020 UWMPs, while Table 2-6 displays the comparison for the Wholesale system service area.

Table 2-5: Comparison of SJWD’s Retail System Population Projections with 2015 UWMP

Source	2020	2025	2030	2035	2040
2015 UWMP	30,083	30,728	31,386	32,058	32,745
2020 UWMP	29,680	29,840	30,379	31,107	31,851
% Difference	-1.3%	-2.9%	-3.2%	-3.0%	-2.7%

As seen from the comparison table above, the projected populations for SJWD’s Retail system service area are slightly lower than projections developed for the 2015 UWMP. The 2015 UWMP projected SJWD’s Retail system service area population based on the 2012 Granite Bay Community Plan and the

¹² 25-Year Demand Forecast and Capacity Analysis, June 2020, Tully & Young, p. 2-24;
<https://www.sjwd.org/files/35d17be85/SJWD+25+Year+Study+-+Final.pdf>

2012 SACOG growth rate projections. 2020 UWMP projected populations incorporate SACOG’s 2016 and 2020 MTP/SCS growth projections, which were updated from previous versions.

Table 2-6: Comparison of SJWD’s Wholesale System Population Projections with 2015 UWMP

Source	2020	2025	2030	2035	2040
2015 UWMP	156,948	160,644	164,373	168,139	171,996
2020 UWMP	151,341	154,173	159,221	166,473	173,842
% Difference	-3.6%	-4.0%	-3.1%	-1.0%	1.1%

Table 2-6 compares SJWD’s Wholesale system population projections developed for this 2020 UWMP with the District’s 2015 UWMP. The 2020 Wholesale system population comparison is congruent with the 2020 retail population comparison (Table 2-5) as both indicate lower population growth than projected in the 2015 UWMP, for the 2020-35 time period. The 2040 Wholesale system population comparison differs from the retail population projection, as it indicates a 1.1% higher estimate of population than was projected in the 2015 UWMP.

2.1.3 Economic Outlook

The economic outlook in the region can inform the potential for changes in the end uses of water. During 2011-2020, the greater Sacramento Region’s annual job growth rate was approximately 1.7%.¹³ As of 2020, the largest job sectors for the Sacramento Region were Government¹⁴ (24%), Education and Health (16%), and Professional and Business Services (13%).

The South Placer County Employment Profile identifies Health Care, Natural Resources and Construction, Administrative Support, and Retail Trade as the sectors experiencing the largest growth during 2009-2016, with Financial Services and Real Estate, Wholesale Trade, Health Care, and Government industries experiencing the largest wage growth for the same period.¹⁵

In the years prior to the COVID pandemic, some areas within the greater Sacramento Region experienced comparatively much lower unemployment rates. Figure 2-3 displays the Sacramento metropolitan area Labor Force and Employed populations as well as the resulting Unemployment Rate for the period 1990 through 2020. As seen on the figure, in September 2019, the region experienced the lowest unemployment rate for the period (3.1 percent). Commensurate with impacts on the labor market due to the pandemic, 2020 saw the largest increase in the unemployment rate for the period, resulting in a high of 14 percent (April 2020).

The unemployment rate has significantly decreased from the historic highs of 2020, but it remains approximately double the rate from prior to the pandemic. The ultimate rate of economic recovery for the region remains to be seen, indicating a high level of uncertainty with respect to pace and type of future economic job growth for the greater Sacramento region.

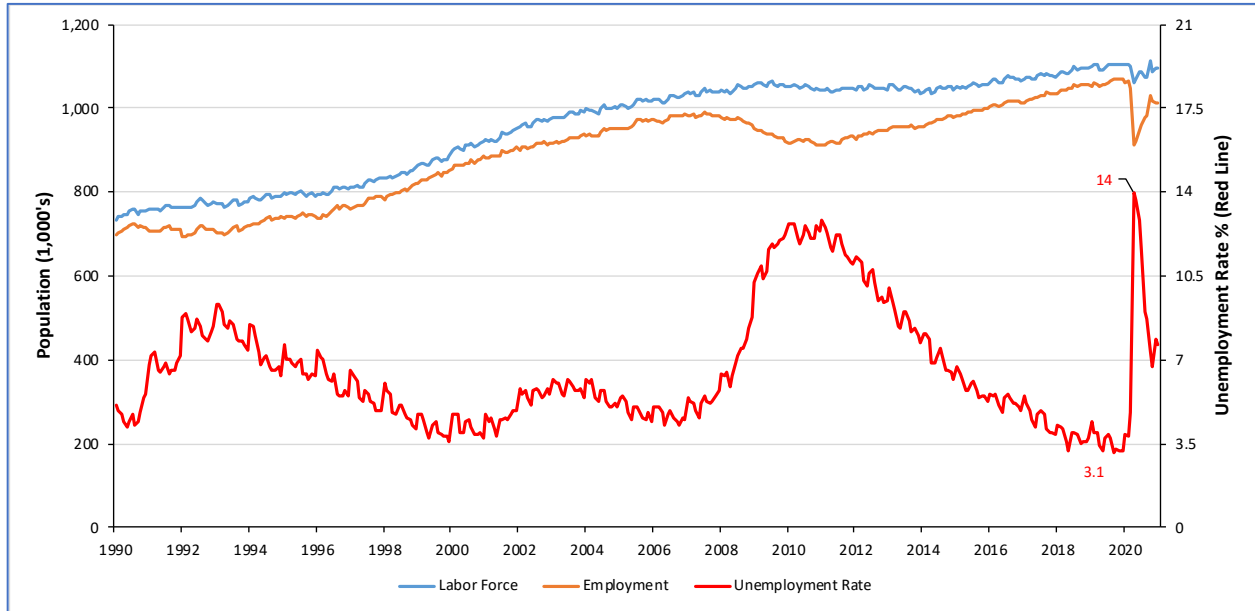
¹³ Sacramento Area Council of Governments (SACOG), 2021 Regional Progress Report. February 2021.

¹⁴ Federal, State, and Local governments.

¹⁵ Beacon Economics. South Placer County Employment Profile. December 2017.

No portions of the District’s Wholesale or Retail system service areas are identifiable as comprising a “Disadvantaged Community” when applying DWR’s DAC Mapping Tool.

Figure 2-3: Sacramento Region Labor Statistics



2.1.4 Current and Projected Land Use

The retail and wholesale population projections are based upon an analysis completed by the District in 2020 to estimate future water demands – the *25-Year Demand Forecast and Capacity Analysis* (Analysis).¹⁶ As part of the Analysis, projections of future growth within various land-use classifications were made. The following summarizes the growth estimates documented in the Analysis for the Retail and Wholesale systems.

Future Customer Connections – Retail System

Growth in SJWD’s retail residential and non-residential connections was based upon the latest growth projections from SACOG, specifically the SACOG 2016 and 2020 MTP/SCS reports. The modeling separated the retail area into small multi-block sections, referred to as Traffic Analysis Zones (TAZs), to increase the accuracy of projections.¹⁷ The 2016 MTP/SCS included modeled population and dwelling unit projections used to develop approximate growth baselines and trends.

¹⁶ *25-Year Demand Forecast and Capacity Analysis*, June 2020, Tully & Young, <https://www.sjwd.org/files/35d17be85/SJWD+25+Year+Study+-+Final.pdf>

¹⁷ The Traffic Analysis Zones (TAZs) are the most detailed sections, at approximately 400-acres for each TAZ. Regional Analysis Districts (RADs), Census Designated Places (CDPs), and Zip Code Tabulation Areas (ZCTAs) are all larger.

For TAZs that approximately cover the District’s retail service area, the 2016 MTP/SCS projects a growth rate of approximately 0.4 % and approximately 600 new residential units by 2036.¹⁸ Extending this to 2045 would add another 500 units for a total of approximately 1,100 new units by 2045. This estimated additional number of residential customers is reasonable and is consistent with the previous analysis completed as part of the 2015 UWMP.¹⁹

The Analysis conservatively allocated these new residential connections as 950 new single-family homes, 25 new rural estate homes, and 125 new multi-family homes. Nominal additional commercial and public landscaping are assumed to also be in place by 2045 to support the additional housing, i.e., 30 acres of new commercial development and 15 acres of new public landscaped areas. Table 2-7 details the forecast new retail customer connections over the 25-year UWMP planning horizon.

Future Customer Connections – Wholesale System

Similar to the Retail system, the Analysis also projected new customer connections for each WCA service area. The following summarizes the new connections for each WCA served by the Wholesale system:

Citrus Heights Water District: The City of Citrus Heights and CHWD do not share boundaries, however a significant portion of the City is served by CHWD. New customers will reflect only a scattering of infill projects, including some corridor developments, but will also include anticipated redevelopment of the Sunrise Mall property. The SACOG 2016 MTP/SCS projects a growth rate of approximately 0.4% from current conditions to 2036 which translates to approximately 2,500 new residential units by 2036. The SACOG projections were revised for the 2020 MTP/SCS update and maintain the previous projections but add approximately 100 units per year after 2036 – or approximately another 1,000 new units by 2045 for a total of 3,500 new units. This range of development was discussed with CHWD staff and was accepted as a reasonable assumption for planning purposes. New residential connections were split as 2,000 new single-family homes and 1,500 new multi-family homes. Nominal additional commercial and public landscaping are assumed to be in place by 2045 to support the additional housing, represented as 50 acres of new commercial development and 30 acres of new public landscaped areas.

The large Sunrise Mall property is anticipated to be redeveloped during the 2020 UWMP planning horizon, but was not factored into the SACOG projections. While there is no specific plan available, the Analysis assumed the property would transition to the equivalent of 800 new medium density single-family homes, 10 acres of commercial development, and 5 acres of public landscaping.²⁰

¹⁸ Note that the 2016 Model starts with a population and housing count that exceeds the actual District population by about 10% so these estimates are already high without consideration of actual growth in the area.

¹⁹ The 2015 UWMP projected about 3,300 new people by 2040. The District’s eAR reports a current population of about 29,500, equivalent to the 2015 population presented in the 2015 UWMP. The District’s eAR also indicates an occupancy rate of 2.9 people per dwelling unit; thus 3,300 additional people would need approximately 1,100 new dwelling units.

²⁰ During preparation of its retail UWMP, CHWD has obtained additional information from the City of Citrus Heights regarding the Sunrise Mall property resulting in some minor adjustments compared to the Analysis. For purposes of this 2020 UWMP, these changes were assumed non-consequential, allowing results of the Analysis to be used by the District for estimating future water needs of CHWD.

City of Folsom (Ashland): The portion of Folsom receiving District water service (known as the Ashland service area) is predominantly built out. The Analysis reflected only a few remaining buildable lots expected to be constructed upon during the 25-year 2020 UWMP planning horizon. Specifically, there are less than 10 acres of commercially zoned properties and 9 acres of residentially zoned land still vacant. No new parks are expected as the developments are mostly on small lot-splits that likely will rely on existing public park space. The residentially zoned land includes both single-family and multi-family zoning. The Analysis assumed 5 acres for single-family homes, with a density of 6 houses per acre. The remaining 4 acres are assumed to house multi-family dwellings at 15 units per acre, resulting in 30 single family homes and 60 multi-family units.

Fair Oaks Water District: The FOWD service area covers a portion of Sacramento County which consists of mostly moderate and large-lot single family homes. The community covers a range of housing ages but is largely considered to be built out. Infill developments have occurred and are expected to continue (e.g., larger legacy properties are subdivided, and multiple single-family homes are constructed). Unlike the other WCAs, FOWD asserted the SACOG projected growth determination was higher than reasonably likely as there were limited empty lots for development. Consequently, the Analysis developed a growth estimate of approximately 500 new dwelling units within the 25-year UWMP planning horizon, which was considered reasonable. The primary growth in FOWD is expected from the Gum Ranch Subdivisions, approximately 100 units in other identified smaller subdivisions, and 5-10 smaller lot split projects per year. The Analysis split the new residential connections as 400 new single-family homes and 100 new multi-family homes. Nominal additional commercial and public landscaping were also assumed, represented as 10 acres of new commercial development and 6 acres of new public landscaped areas

Orangevale Water Company: The OVWC service area covers a portion of Sacramento County which consists of mostly moderate and large-lot single family homes. Similar to parts of FOWD and the District's retail area, the community covers a range of housing ages but is largely considered to be built out. Infill developments have occurred and are expected to continue (e.g., larger legacy properties are subdivided, and multiple single-family homes are constructed), with very few of these larger parcels expected to remain vacant.

The Analysis projected a growth rate for OVWC of approximately 0.6% from current conditions until 2036, resulting in approximately 35 new housing units per year. Extending this rate for 25 years results in 875 new housing units (single-family and multi-family) by 2045. The Analysis split the new residential connections as 650 new single-family homes and 225 new multi-family homes. Nominal additional commercial and public landscaping were assumed, represented as 10 acres of new commercial development and 6 acres of new public landscaped areas.

Combined, these additional future connections have the potential to increase the WCAs' need for the District's Wholesale system water supplies. The forecast water use for the existing and new WCA customers is detailed in Chapter 4.

Summary of Existing and Future Connections

The Analysis combined the existing and projected connection information to derive future estimated water needs for the District. Table 2-7 provides the summary of current and estimated future connections for the Retail and Wholesale systems as represented in the Analysis. This information informs the water use forecast described in Chapter 4.

Table 2-7: Summary of Future Connection Growth within Retail and Wholesale Systems

Customer Class	Current	2025	2030	2035	2040	2045
Retail Service Area						
Single Family Residential	10,039	10,094	10,259	10,479	10,709	11,014
Multi-Family Residential	119	119	139	169	194	244
Commercial / Institutional	263	268	273	278	288	293
Landscape	213	213	218	223	228	228
Agricultural	8	8	8	8	8	8
Total Retail	10,642	10,702	10,897	11,157	11,427	11,787
Wholesale Customer Agencies (CHWD, City of Folsom, FOWD, OVWC)						
Single Family Residential	35,352	35,857	36,612	37,442	38,447	39,232
Multi-Family Residential	2,867	3,019	3,272	3,787	4,277	4,752
Commercial / Institutional	1,345	1,354	1,370	1,399	1,412	1,425
Industrial	111	111	111	111	111	111
Landscape	714	720	730	746	756	761
Other	211	211	211	211	211	211
Agricultural	3	3	3	3	3	3
Total WCAs	40,603	41,275	42,309	43,699	45,217	46,495
Total District Connections	51,245	51,977	53,206	54,856	56,644	58,282

2.1.5 Other Relevant Service Area Descriptors

SJWD’s service area relies on local water resources, including American River inflows to Folsom Reservoir and groundwater from the North American Sub-Basin. With a capacity of 975,000 acre-feet, Folsom Reservoir is operated by the United States Bureau of Reclamation (Reclamation). Surface water diversions and releases from the reservoir serve many entities in the region, including SJWD. In addition to SJWD, other water purveyors that rely on the reservoir for supplies, directly or indirectly, include:

Placer County Water Agency (PCWA)	Golden State Water Company
El Dorado Irrigation District (EID)	Sacramento Municipal Utility District (SMUD)
City of Roseville	Cal American Water Company
City of Folsom	Sacramento County
City of Sacramento	South Sutter Water District
Carmichael Water District	

Operational issues related to regional dependence on Folsom Reservoir are collaboratively coordinated through the Sacramento Water Forum (WF). As signatories to the WF Agreement the District and other water purveyors agreed to meet and consult when projected March through November unimpaired inflow into Folsom Reservoir is projected to be less than 400,000 acre-feet, to develop a regional approach to meeting water supply demands along with environmental flow and temperature management needs in the Lower American River.

Some of the District’s WCAs pump groundwater from the North American Sub-Basin, which is managed through the SGA, to partially meet their supply needs.

In response to decreasing groundwater levels, SGA developed a Groundwater Management Plan (GMP) in 2003, with several updates since. The current GMP was completed in 2014 and identified four basin management objectives²¹:

1. Maintain groundwater elevations in the SGA area that provide for sustainable use of the groundwater basin.
2. Maintain or improve groundwater quality in the SGA area to ensure sustainable use of the groundwater basin.
3. Maintain groundwater levels to prevent inelastic land surface subsidence that would damage infrastructure or exacerbate flooding.
4. Protect against adverse impacts to surface water or groundwater resulting from interaction between groundwater in the basin and surface water in the American River, the Sacramento River, and other surface water bodies within the SGA area.

SGA has implemented a groundwater accounting framework that tracks SGA member agencies’ groundwater banking and conjunctive use efforts, with ongoing monitoring of groundwater levels. This

²¹ Sacramento Groundwater Authority, Groundwater Management Plan, Section 3.2. Full document can be accessed at, <https://www.sgah2o.org/management/>.

information is used to proactively manage the basin’s storage capacity and available yield to support a regionally optimized surface-groundwater use strategy.

2.2 Delivery System Details

SJWD receives raw water, either by gravity or pumped (depending on lake levels), from Reclamation’s pumping plant at Folsom Reservoir. It then flows to the District’s Sidney N. Peterson Water Treatment Plant (WTP). Treated water is sent to Hinkle Reservoir, a 62 million gallon (MG) storage reservoir on SJWD’s campus, which provides capacity for peaking and emergencies in excess of the WTP’s production capacity.

The District’s retail service area is divided into eight separate pressure (i.e., service) zones based on variations in elevation. SJWD provides retail water service to unincorporated areas of Granite Bay, portions of northeast Sacramento County, a portion of the City of Roseville, and a portion of North Folsom (i.e., Ashland). Treated water is delivered on-demand by gravity and a pressure distribution system that includes storage, pump stations, reservoirs, and interconnections.

The District’s wholesale deliveries are gravity fed to CHWD, FOWD, OVWC, and the City of Folsom (Ashland).

In addition, the District has a contract with Sacramento Suburban Water District (SSWD) to treat water SSWD purchases from Placer County Water Agency (PCWA) in wetter years²² if WTP capacity is available.

The District maintains intertie connections with neighboring water agencies, including PCWA, City of Folsom, City of Roseville, CHWD, FOWD and OVWC. Based on elevations of each specific agency’s interties, the District can receive water from PCWA and the City of Roseville. The District can also receive water from SSWD through the Cooperative and Antelope Transmission Pipelines and the Antelope Pump Station.

2.2.1 Energy Intensity

Among the new statutory requirements for 2020 UMWPs is “Energy Intensity Reporting”. An urban supplier shall include information it can readily obtain related to the energy used to produce, treat and deliver water.²³ “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.

For purposes of reporting in this UWMP, the District is using the Total Utility Approach to calculating energy usage as described in DWR’s 2020 UWMP Guidebook. This method sums the annual net energy consumed for all water management processes, divided by total volume of water delivered in acre feet.

²² SSWD only has access to PCWA water when Folsom unimpaired inflow is greater than 1.6 million acre-feet.

²³ California Water Code Section 10631.2(a).

These processes include diversion, conveyance, placement into storage, treatment, and distribution. The total energy intensity is reported in Table 2-8.

Table 2-8: Energy Intensity – Total Utility Approach

Customer Type	Energy Consumed (kWh)	Volume of Water Entering Process (AF)	Energy Intensity (kWh/AF)
Retail	3,429,078	13,541	253
Wholesale	1,201,780	29,743	40
Total	4,630,858	43,284	107

2.3 Future Climate Change Impacts for Consideration

The Regional Water Authority (RWA), of which the District 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 Basin²⁴. 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.

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, 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.

Water supplies in the 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 century²⁵. This will place strain on summer and fall water supply in the region and throughout the state due to earlier runoff. Peak runoff is

²⁴ Full findings and approved ARBS study can be found at www.pcwa.net/planning/arbs

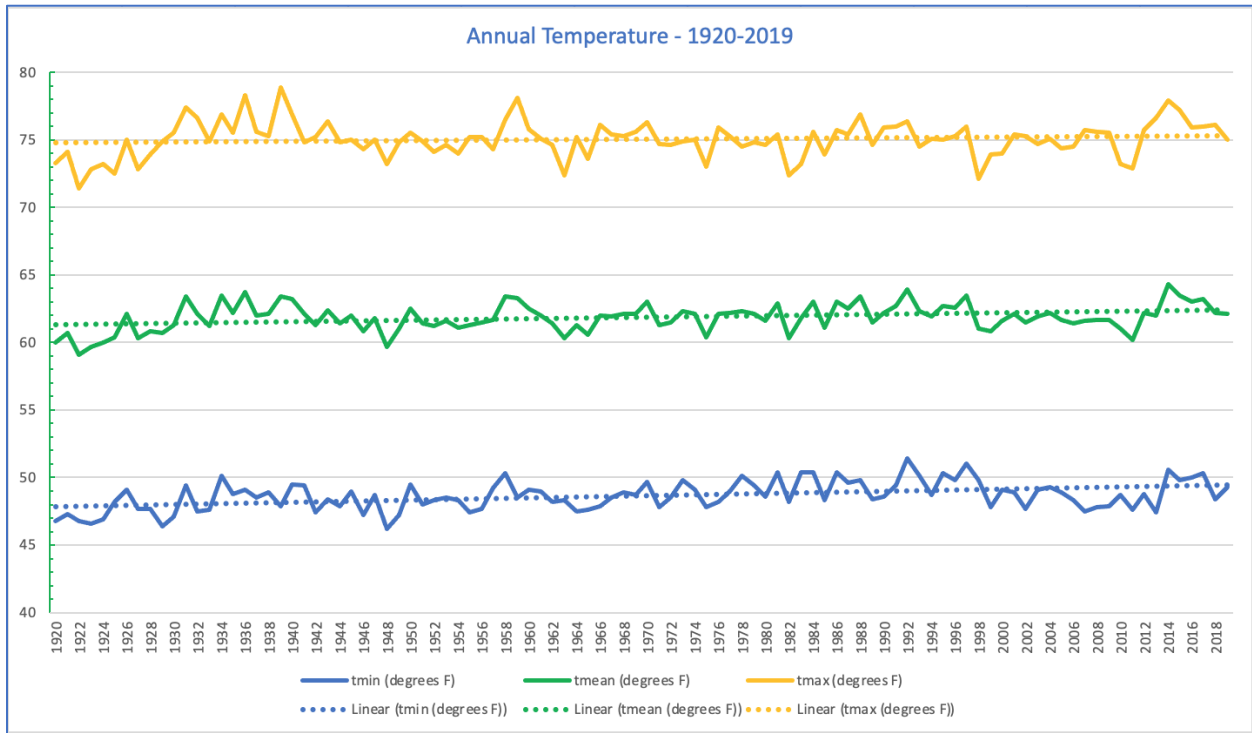
²⁵ American River Basin Study

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.

For purposes of this UWMP, however, these changes will occur beyond the planning horizon of this analysis and thus are noted for consideration during future UWMP updates.

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

Figure 2-4: Historical Annual Temperature (1920-2019)²⁶



²⁶ 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

Chapter 3

Water Supply

The District has access to multiple water supply sources. The District’s surface water supplies – derived from water rights and contracts – provide significant annual volumes of water that can be used to meet wholesale and retail demands. In addition, SJWD has access to groundwater from the North American Sub-Basin through a contract with SSWD.²⁷ These water assets are collectively managed to meet SJWD’s wholesale and retail demands. Notably, the District’s surface water supply portfolio is subject to potential physical constraints related to operating levels and diversion structures at Folsom Reservoir that may impact long-term reliability projections. SJWD receives all of its surface water assets from Folsom Reservoir as diverted by Reclamation.

Figure 3-1 shows the District’s Wholesale and Retail system water service areas.

3.1 Wholesale System Water Supply Sources

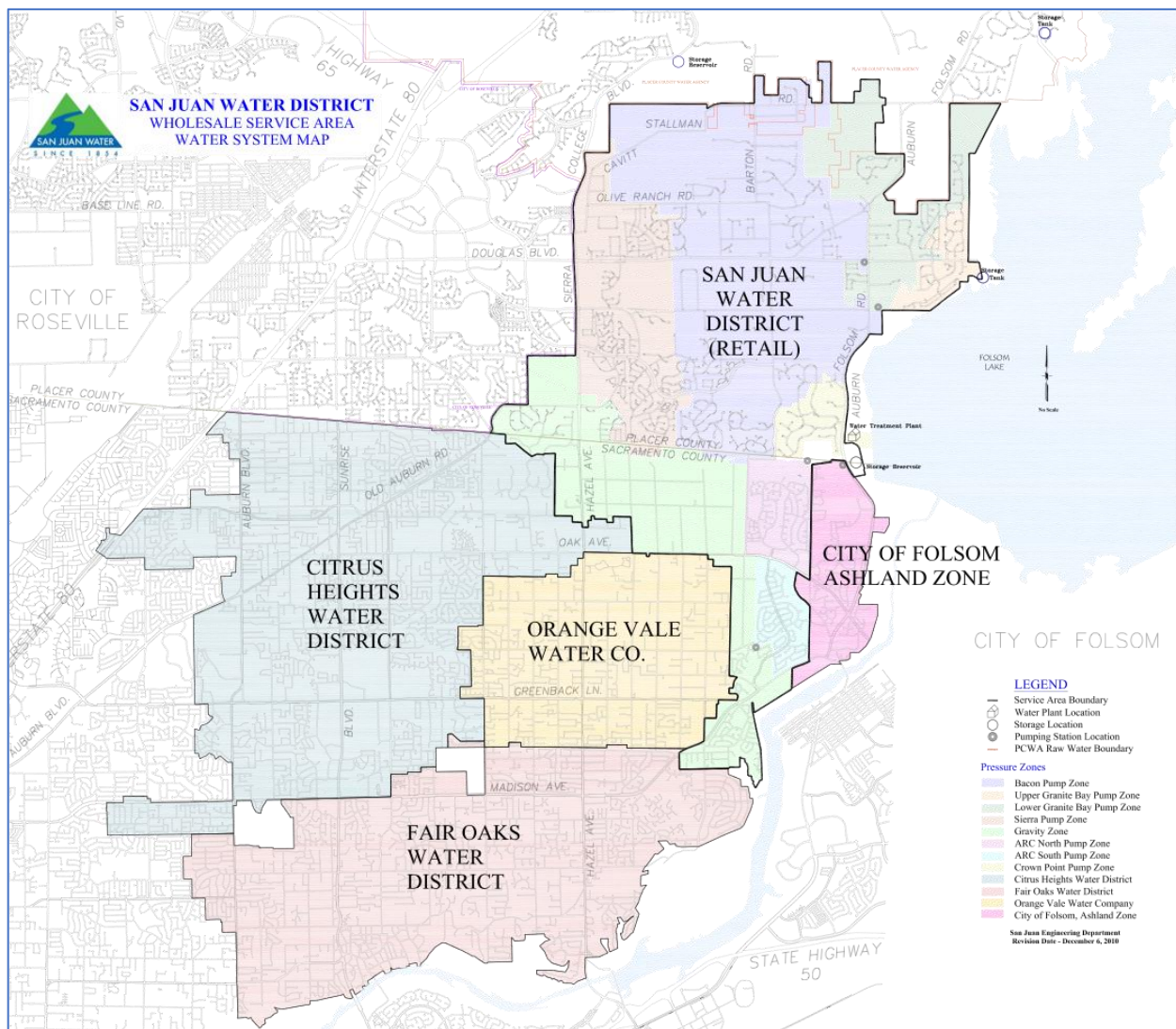
The District’s water supplies are diverted, treated, and delivered under two water rights and three contracts relying on the same surface water source, the American River watershed. The District manages all of its water supplies to best meet its wholesale and retail customers’ demands in different year types, to control costs, and to be prepared to effectively respond to emergencies.

The District’s two water rights to divert water from the North Fork American River are: (1) a pre-1914 appropriative water right from the American River with a priority date of 1853; and, (2) a State-issued appropriative water right license (License No. 6324) to divert water from the American River with a priority date of 1928.

The District’s three contracts are: (1) Contract No. DA-04-167-eng-610 with the United States for delivery of the District’s two water rights as a settlement with the District’s predecessor accommodating the construction and operation of Folsom Dam and Reservoir (Settlement Contract – with operational responsibility ultimately assumed by the United States Bureau of Reclamation (Reclamation)); (2) Contract No. 6-07-20-W1373-LTR1-P with Reclamation for delivery of Central Valley Project (CVP) Project Supply water (CVP Contract); and, (3) Contract Between Placer County Water Agency and San Juan Water District for a Water Supply from PCWA’s Middle Fork Project (PCWA Contract).

²⁷ FOWD and CHWD also have access to this groundwater sub-basin supply.

Figure 3-1: San Juan Water District Wholesale and Retail System Service Areas



3.1.1 San Juan Water District’s Pre-1914 Appropriative Water Right (S000656)

The District possesses a pre-1914 appropriative water right from the American River with a priority date of 1853.²⁸ This water right was perfected by the North Fork Ditch Company (Company) delivering water for beneficial uses in a broad area incorporating portions of Sacramento County and Placer County. The Company diverted up to 60 cubic feet per second under this right. The water under this water right can be diverted from January through December of each year. The Company’s water supply served numerous areas in Sacramento and Placer counties that were both within and outside of the District’s current service area boundary, including Fair Oaks, Citrus Heights, Orangevale and Carmichael. The

²⁸ Although the 1898 Superior Court Ruling in *Sacramento Electric, Gas and Railway Company v. C.W. Clarke, H.G. Smith, and A.N. Buchanan* states that the water right priority date was 1854, the initiation of the water right occurred in 1853 which is the accurate priority date.

original water right provided supplies for domestic and irrigation purposes but has since been augmented to supply municipal uses as well.

In 1954, the District acquired this water right when it purchased the Company. The District has continually used the water under this water right since its acquisition. Moreover, the District’s rights to this surface water supply are further secured through the Settlement Contract executed with the United States mentioned above and discussed further below. Table 3-1 below shows the last ten years of the District’s use of this water asset.

Table 3-1: Pre-1914 Appropriative Water Right Annual Use 2010-2020 (values in acre-feet)

Year	S000656
2010	28,418
2011	28,418
2012	28,418
2013	28,418
2014	21,726
2015	26,656
2016	18,840
2017	28,418
2018	26,822
2019	27,915
2020	28,418

The 1853 priority date of this water supply, coupled with Reclamation’s obligation to make the water available to the District pursuant to the Settlement Contract, make this right reasonably expected to be 100 percent reliable in all year types. However, if storage in Folsom Reservoir dropped to a level that made the municipal intake non-functional, Reclamation currently would install emergency pumps on other outlets at lower elevations, which could not deliver 60 cfs to SJWD. If water demands during such an occurrence were higher than the flow rate provided by the emergency pump, the District would potentially need to rely on supplemental supplies from other sources as discussed elsewhere in this plan. This scenario has never occurred during the years since construction of Folsom Dam, but storage levels in the late autumn of 2015 did begin to approach this level. Since that time, Reclamation has committed to maintaining water storage levels in Folsom Reservoir sufficient to avoid daylighting the municipal intake and requiring the need to initiate emergency pumping operations. Accordingly, the reasonable projected normal and multiple drought year availability to the District of the water supply under the pre-1914 appropriative water right from 2021 through 2025 is deemed to be sufficient reliable to provide full deliveries of this supply as shown in Table 3-2 and the long-term supply availability of this water right water through 2045 is shown in Table 3-3.

Table 3-2 Pre-14 Availability for Five Consecutive Dry Years from 2021-2025 (values in acre-feet)

Year		S000656
Normal		28,418
Single Dry		28,418
Multi-Year Drought	2021 (1st year)	28,418
	2022 (2nd year)	28,418
	2023 (3rd year)	28,418
	2024 (4th year)	28,418
	2025 (5th year)	28,418

Table 3-3: Pre-14 Availability by Year Type Through 2045 (values in acre-feet)

S000656		2025	2030	2035	2040	2045
Normal		28,418	28,418	28,418	28,418	28,418
Single Dry Year		28,418	28,418	28,418	28,418	28,418
Multi-Year Drought	Year 1	28,418	28,418	28,418	28,418	28,418
	Year 2	28,418	28,418	28,418	28,418	28,418
	Year 3	28,418	28,418	28,418	28,418	28,418
	Year 4	28,418	28,418	28,418	28,418	28,418
	Year 5	28,418	28,418	28,418	28,418	28,418

Nevertheless, the potential delivery constraints described above may result in Reclamation being unable to deliver 100 percent of the District’s pre-1914 water supplies under an historically unlikely drought scenario involving successive extremely severe dry years.

3.1.2 Water Right License 6324

The North Fork Ditch Company also acquired a State-issued appropriative water right. Water Right License 6324 has a priority date of February 11, 1928, and allows the District to divert up to 15 cubic feet per second of flow from the American River from June 1 through November 1 each year. The total annual volume of water available under License 6324 is 4,582 acre-feet.

In 1954, the water right permit was assigned to the District as part of its purchase of the Company. As such, License 6324 is part of the District’s water supply portfolio. Table 3-4 shows the last 10 years of the District’s use of License 6324 water.

Table 3-4: License 6324 Annual Use 2010-2020 (values in acre-feet)

Year	License 6324 Use
2010	4,582
2011	4,582
2012	4,582
2013	4,582
2014	4,582
2015	4,582
2016	4,582
2017	4,038
2018	3,128
2019	4,582
2020	4,582

The Company also incorporated this water right into the quantification of its water rights and use under the 1954 Settlement Contract with the United States. With a 1928 priority date, this water right can be subject in the driest years to State Water Resources Control Board (SWRCB) curtailment orders – like the SWRCB order issued in 2015 curtailing water rights with priority dates as old as 1905 in the Sacramento River watershed. However, the inclusion of the right as part of the water supplies quantified in the Settlement Contract requires the Reclamation to deliver the water supply in all year types using stored water to the extent necessary. Reclamation generally diverts sufficient water to storage to meet its commitment to the District early in the year, which would be expected to be prior to the effective date of a curtailment should it occur. Accordingly, Water Right License 6324 is reasonably expected to be 100 percent reliable in all year types. As noted above, there could be periods when Reclamation would need to deliver water supplies to the District via other methods than use of the municipal intake, which could impact the flowrate of deliveries. In this unlikely situation, the District would need to rely on supplemental supplies from other sources as discussed elsewhere in this plan.

Table 3-5: License 6324 Availability for Five Dry Years from 2021-2025 (values in acre-feet)

Year		License 006324
Normal		4,582
Single Dry		4,582
Multi-Year Drought	2021 (1st year)	4,582
	2022 (2nd year)	4,582
	2023 (3rd year)	4,582
	2024 (4th year)	4,582
	2025 (5th year)	4,582

Table 3-6 License 6324 Availability by Year Type Through 2045 (values in acre-feet)

License 006324		2025	2030	2035	2040	2045
Normal		4,582	4,582	4,582	4,582	4,582
Single Dry Year		4,582	4,582	4,582	4,582	4,582
Multi-Year Drought	Year 1	4,582	4,582	4,582	4,582	4,582
	Year 2	4,582	4,582	4,582	4,582	4,582
	Year 3	4,582	4,582	4,582	4,582	4,582
	Year 4	4,582	4,582	4,582	4,582	4,582
	Year 5	4,582	4,582	4,582	4,582	4,582

3.1.3 San Juan Water District’s Settlement Contract No. DA-04-167-eng-610

The Company entered into Settlement Contract No. DA-04-167-eng-610 with the United States in 1954 to resolve issues associated with the United States’ proposed junior water rights diversions from the American River watershed and construction of Folsom Dam and Reservoir as part of the Central Valley Project (CVP). This Settlement Contract identified the rights and obligations of the Company and United States related to the preservation of the Company’s senior water rights from the American River, construction of new infrastructure delivering those water rights from the American River, and the obligations of the United States to provide the supplies under the Company’s senior water rights. The Settlement Contract quantifies the District’s total water rights supply as 33,000 acre-feet per year delivered at a maximum diversion rate of 75 cfs. The Settlement Contract’s term is perpetual and does not contain any provisions that permit Reclamation to reduce deliveries of water right supplies to the District for any reason.

3.1.4 CVP WIIN Act Repayment Contract No. 6-07-20-W1373-LTR1-P

In 2020 the District executed Contract No. 6-07-20-W1373-LTR1-P (CVP Contract) with Reclamation under terms directed by the Water Infrastructure Improvements for the Nation Act (WIIN Act).²⁹ The WIIN Act allowed Central Valley Project contractors to modify their long-term CVP renewal contracts to make the term perpetual and eliminate any need to negotiate future renewals and clarify reimbursement provisions for project construction. The District converted its 2006 CVP Long-Term Renewal Contract into the CVP Contract to take advantage of establishing contractual permanency and related financial benefits. The CVP Contract also clarified provisions of the District’s 2006 contract and reinforces the validity of the Settlement Contract.

The District’s CVP Contract allocates 24,200 acre-feet of CVP Project Supply water to the District. CVP Project Supply water is water diverted and stored in Folsom Reservoir by Reclamation under its State-issued appropriative water rights.³⁰ Reclamation enters contracts with purveyors allocating portions of the supplies derived from its water rights for each purveyor’s use. The CVP Project Supply is subject to

²⁹ Public Law 114-322, December 16, 2016.

³⁰ Reclamation holds SWRCB issued appropriative water rights on other water systems in California, but the American River water rights are the only ones relevant to this supply assessment.

annual allocations issued by Reclamation. Depending upon hydrological conditions and flow requirements in the watershed and Delta, Reclamation determines a percentage of contract supplies that may be available in each year. In a 100% allocation year, the District could take all 24,200 acre-feet of its CVP Project Supply water. In years where the allocation is less than 100%, the District’s allocation is subject to reductions that are generally based upon historical water use (as described below). Historically, the District has not taken its full CVP Project Supply allocation. Table 3-7 shows the last 10 years of CVP Project Supply allocations and the District’s use of those allocations.

Table 3-7: CVP Contract Annual Use 2010-2020 (values in acre-feet)

Year	Allocation	CVP
2010	100%	1,210
2011	100%	555
2012	100%	3,013
2013	75%	3,174
2014	50%	0
2015	25%	0
2016	100%	1,230
2017	100%	0
2018	100%	0
2019	100%	0
2020	75%	0

Reclamation’s Municipal and Industrial Shortage Policy (Shortage Policy) governs the amount of water supplies available to the District when Reclamation’s CVP allocation to the District is less than 100%.³¹ Under the Shortage Policy, an average of the District’s last three unconstrained years of CVP Project Supply water use is the primary determinant of the supply available under the Shortage Policy. For example, if the District used an average of 10,000 acre-feet in the last three 100% allocation years (unconstrained years), then in a 75% of historic use allocation year, the Shortage Policy allocation would be 75% of 10,000 acre-feet or 7,500 acre-feet of available CVP Supply. Similarly, in a 25% allocation year, the District’s available supply would be 25% of 10,000 acre-feet of prior average use or 2,500 acre-feet of CVP Project Supply. Thus, the District’s use of CVP Project Supply allocation in unconstrained years is the primary determining factor for the availability of the CVP Project Supply in dry years. The Shortage Policy allocation may be adjusted for public health and safety or other reasons, including population growth, extraordinary conservation measures, use of Non-CVP water, or other unique or unusual circumstances.³²

³¹ <https://cawaterlibrary.net/wp-content/uploads/2017/10/miwsp-guidelines.pdf>

³² <https://cawaterlibrary.net/wp-content/uploads/2017/10/miwsp-guidelines.pdf> at 3.

Table 3-8 shows the District’s CVP Project Supply availability through 2025 based on no CVP Project Supply use in the last three unconstrained years (2018-2020). If the District’s other water supplies were insufficient to meet public health and safety demands in 2021 through 2025, then the District would be able to acquire supplemental supplies from the CVP Project Supply after consultation with Reclamation. Table 3-9 shows the maximum CVP Project Supply availability through 2045. The figures in Table 3-9 assume that the District will use at least three years of use of 2,000 acre feet of CVP Project Supply in unconstrained years and a 50% historic use allocation under the Shortage Policy.

Table 3-8: CVP Contract Availability for Five Dry Years from 2021-2025³³

Year		CVP
Normal		24,200
Single Dry		Health & Safety
Multi-Year Drought	2021 (1st year)	Health & Safety
	2022 (2nd year)	Health & Safety
	2023 (3rd year)	Health & Safety
	2024 (4th year)	Health & Safety
	2025 (5th year)	Health & Safety

Table 3-9: CVP Contract Availability by Year Type Through 2045 (values in acre-feet)

CVP		2025	2030	2035	2040	2045
Normal		24,200	24,200	24,200	24,200	24,200
Single Dry Year		1,000	1,000	1,000	1,000	1,000
Multi-Year Drought	Year 1	1,000	1,000	1,000	1,000	1,000
	Year 2	1,000	1,000	1,000	1,000	1,000
	Year 3	1,000	1,000	1,000	1,000	1,000
	Year 4	1,000	1,000	1,000	1,000	1,000
	Year 5	1,000	1,000	1,000	1,000	1,000

3.1.5 PCWA Contract

On July 25, 1972, the District entered into a water supply contract with Placer County Water Agency (PCWA Contract). PCWA and the District entered a new supply contract on December 7, 2000, which supplanted the 1972 contract. Since that time, PCWA and the District have amended the 2000 contract three times. The second amendment, effective December 31, 2017, reduced the “take or pay” obligation on the District from 25,000 acre-feet per year to 12,500 acre-feet per year, while maintaining the availability of up to 25,000 acre-feet upon District request (subject to specific shortage provisions). PCWA delivers this water to Folsom Reservoir and the District receives the water from Reclamation under its Warren Act Contract No. 6-07-20-W1315 for wheeling the PCWA supplies through the reservoir (Warren Act Contract). The third amendment, approved in November 2020, extended the

³³ The M&I Shortage Policy allows for Health and Safety CVP Project Supply delivery in extreme circumstances.

PCWA Contract into 2041. Table 3-10 shows the PCWA supplies used by the District from 2010 through 2020.

Table 3-10: PCWA Contract Annual Use 2010-2020 (values in acre-feet)

Year	PCWA
2010	7,815
2011	7,947
2012	10,768
2013	11,686
2014	8,729
2015	0
2016	8,923
2017	2,645
2018	5,077
2019	4,250
2020	9,623

The PCWA Contract allows the District to use this supply to serve wholesale and retail customer demands in both Placer County and Sacramento County. The distinction between the two counties is important in the availability of water during shortage conditions. When shortages of water occur, the areas receiving water under this contract in Placer County will be reduced proportionately with other users of this water supply in PCWA’s service area and elsewhere in Placer County. However, shortages in Placer County may result in a complete cessation of deliveries of the contract supply for use in the District’s Sacramento County service area. Importantly, however, the water supplies available under this contract have not been curtailed in any year to date – including 1977, 2014, and 2015 – three of the driest years on record. Table 3-11 shows the supply available under this contract through 2025 reflecting a conservative approach assuming just half of the maximum supply would be available in critically dry conditions. Table 3-12 shows the supply available through 2045 with the same conservative assumptions. It is important to note that the same constraints on water pumping from Folsom Reservoir noted in previous sections of this plan may apply to this water supply as well.

Table 3-11: PCWA Contract Availability for Five Dry Years from 2021-2025 (values in acre-feet)

Year		PCWA
Normal		25,000
Single Dry		12,500
Multi-Year Drought	2021 (1st year)	12,500
	2022 (2nd year)	12,500
	2023 (3rd year)	12,500
	2024 (4th year)	12,500
	2025 (5th year)	12,500

Table 3-12: PCWA P Contract Availability by Year Type Through 2045 (values in acre-feet)

PCWA		2025	2030	2035	2040	2045
Normal		25,000	25,000	25,000	25,000	25,000
Single Dry Year		12,500	12,500	12,500	12,500	12,500
Multi-Year Drought	Year 1	12,500	12,500	12,500	12,500	12,500
	Year 2	12,500	12,500	12,500	12,500	12,500
	Year 3	12,500	12,500	12,500	12,500	12,500
	Year 4	12,500	12,500	12,500	12,500	12,500
	Year 5	12,500	12,500	12,500	12,500	12,500

3.2 Retail Dry Year Water Supply

In 2015, SJWD entered an agreement with SSWD (SSWD Agreement) to access groundwater supplies.³⁴ Although the SSWD Agreement was signed by SJWD and SSWD, accessed groundwater may be used in the SJWD, OVWC, and Ashland retail service areas. The SSWD Agreement provides these retail agencies additional security against surface water shortages by potentially delivering SSWD groundwater supplies through the Antelope Pump-Back Booster Pump Station (Station). The Station has a capacity of 10,000 gpm to deliver water to SJWD, but this volume of water is allocated proportionally to SJWD, Folsom, and OVWC, the three agencies that paid for the Station. The total water supply that could be made available is approximately 16,000 acre-feet per year. However, SJWD plans to capture a maximum of 7 million gallons per day (7,846 acre-feet per year) under the Agreement.³⁵ Last, and perhaps most importantly, the SSWD Agreement may not provide additional direct water supply reliability benefits to the other SJWD WCAs, i.e., CHWD and FOWD. Although this water supply would be available to the SJWD Retail service area under potential water shortage conditions, it is not incorporated into the total retail water

³⁴ Agreement Between Sacramento Suburban Water District and San Juan Water District for the Ownership, Operation, and Maintenance of the Antelope Pump-Back Booster Pump Station, June 23, 2015, and Amendment No. 1, dated March 26, 2020 (Agreement).

³⁵ Wholesale Dry-Year and Emergency Operations Guidance Plan (Draft), March 4, 2015, at page 2.

supply numbers at the end of this chapter. For purposes of this UWMP analysis, this supply would be used as a replacement supply in the event that SJWD’s surface water supplies were not available.

Table 3-13 shows the water supply availability under the SSWD Agreement from 2021 through 2025 and Table 3-14 shows the water supply availability under the SSWD Agreement from 2025 through 2045.

Table 3-13: SSWD Agreement Water Supply 2021 Through 2045 (values in acre-feet)

Year		SSWD Contract
Normal		7,846
Single Dry		7,846
Multi-Year Drought	2021 (1st year)	7,846
	2022 (2nd year)	7,846
	2023 (3rd year)	7,846
	2024 (4th year)	7,846
	2025 (5th year)	7,846

Table 3-14: SSWD Agreement Water Supply 2025 Through 2045 (values in acre-feet)

SSWD Contract		2025	2030	2035	2040	2045
Normal		7,846	7,846	7,846	7,846	7,846
Single Dry Year		7,846	7,846	7,846	7,846	7,846
Multi-Year Drought	Year 1	7,846	7,846	7,846	7,846	7,846
	Year 2	7,846	7,846	7,846	7,846	7,846
	Year 3	7,846	7,846	7,846	7,846	7,846
	Year 4	7,846	7,846	7,846	7,846	7,846
	Year 5	7,846	7,846	7,846	7,846	7,846

3.3 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 conducting a drought risk assessment, developing water conservation and use efficiency programs, and projecting demand management needs and supply – both in an historical and future-projection context. SJWD’s 2020 UWMP has incorporated climate change considerations into its retail and wholesale water supply analyses, water demand analyses, water supply reliability assessments and water shortage contingency plans. These considerations are embedded in the characterizations of supply availability in normal, single dry, and five-consecutive dry year periods as well as the estimated demand alterations 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.

As noted in Chapter 2, the RWA partnered with other local water purveyors and Reclamation on the American River Basin [Climate Change] Study (ARBS) to develop climate change scenarios and resulting

adaptation strategies specific to the American River Basin.³⁶ Climate change is generally forecast by the ARBS 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 with the potential that more precipitation falls as rain rather than snow, altering the runoff patterns from the Sierra Nevada mountains.

3.4 Desalination Opportunities

Desalination of ocean water is not physically or financially viable for the District at this time and it has no future plans to develop water supplies derived from desalination activities.

3.5 Recycled Water Supplies

The District does not currently receive any recycled water. SJWD's and other regional purveyors' customers' wastewater is conveyed to the Sacramento Regional County Sanitation District (SRCSD) for treatment. SRCSD has used some recycled water assets for deliveries in other parts of Sacramento County outside SJWD's service area. Obtaining SRCSD's recycled water assets for use in SJWD's service area is not considered feasible for the foreseeable future because the costs to build the infrastructure necessary to pump recycled water back uphill into SJWD's service area would be prohibitive. Accordingly, it is not anticipated that the District will use any recycled water within its service area throughout the planning horizon contemplated in this UWMP.

3.6 Water Transfers and Exchanges

SJWD is an active participant in regional water transfers and exchanges. SJWD has been active in developing its water supply portfolio and works closely with partners to develop water transfer opportunities. SJWD has also engaged in extensive water conservation actions and has protected its water assets under Water Code section 1011, making those assets available for transfer. Moreover, SJWD works closely with its WCAs, as well as neighboring agencies, to facilitate conjunctive use of surface and groundwater assets in order to protect those assets for the future under CWC section 1011.5. In these ways, SJWD has improved its capability to pursue future water transfers and exchanges with its available water assets.

In 2018, SJWD participated in a groundwater substitution transfer as part of an American River Watershed Region water transfer program. This transfer program involved the District, along with the City of Sacramento, SSWD, Carmichael Water District, CHWD, and FOWD, pooling water assets for a through-Delta transfer to water-short entities in central and southern California. Importantly, the region spent significant time and resources to ensure the groundwater substitution transfer would not cause injury to any other groundwater purveyor in the region. RWA, SGA, and the Sacramento Central Groundwater Authority (SCGA) were all notified of the transfer. The regional agencies engaged in

³⁶ Full findings and approved ARBS study can be found at www.pcwa.net/planning/arbs

extensive well-monitoring efforts, discounted transferable supplies to ensure groundwater recovery, and conducted follow-up assessments of basin recovery. In short, the regional groundwater substitution transfer was predicated on comprehensive protection of the region’s groundwater and surface water supplies for current and future beneficial uses.

SJWD has undertaken other water transfers based upon its conserved water supplies. In 2020, SJWD delivered conserved water supplies to SSWD through the Cooperative Transmission Pipeline and anticipates continuing these sorts of transfers in the future. SJWD is also actively engaged with federal and state regulatory agencies to further develop water conservation transfer principles that would be used in characterizing future conserved water transfers.

SJWD anticipates actively engaging 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 SJWD surface supplies to other areas within the SJWD wholesale boundary, exchanging water assets with other retail providers, and developing more robust conjunctive use actions to support groundwater levels and groundwater substitution transfers through water banking activities. In each instance, SJWD will take reasonable steps to protect regional water assets and the environment.

3.7 Water Quality

The quality of the water supplied by the District after treatment at its water treatment plant meets or exceeds drinking water standards. Table 3-15 shows water quality data from the District’s consumer confidence report.

3.8 Planned Water Supply Projects

Currently, SJWD Retail is not planning to develop any additional water supply sources in its service area. Opportunities may arise soon that allow SJWD to access additional groundwater supplies either through direct deliveries from a regional purveyor or through groundwater banking opportunities.

Table 3-15: San Juan Water District Water Quality Report (2019 Consumer Confidence)

Water Quality Standards	Goal Level	Max Level	Range	Average
Primary Standards				
Arsenic	0.004	10	ND	ND
Barium	2	1	ND	ND
Fluoride (natural)	1	2	ND	ND
Nitrate (as N)	10	10	ND	0.72
Uranium	0.43	20	NR	N/A
Chlorine Residuals	4	4	.35-.09	0.68
TTHMs (distribution system)	n/a	80	37-60	47
HAA5	n/a	60	20-36	27
Disinfection By-Product Precursors	1	2	.81-1.67	1.13
Turbidity	n/a	95%≤0.3 NTU	100%	
Secondary Standards				
TDS	n/a	1000	30	30
E.C.	n/a	1600	50-98	64.8
Chloride	n/a	500	1.8	1.8
Sulfate	n/a	500	3.8	3.8
Lead & Copper				
Lead	0.2	15	ND	
Copper	0.3	1.3	0.067	
Federal Unregulated Contaminates				
Bicarbonate (as HCO ₃)	n/a	MO	13	13
Total Hardness (as CaCO ₃)	n/a	MO	12	12
Sodium	n/a	MO	1.6	1.6
Calcium	n/a	MO	3.3	3.3
Magnesium	n/a	MO	1	1

3.9 Total Wholesale System Supply Availability

The total Wholesale system supply available under all of the District’s water assets are shown in the tables below. Table 3-16 shows the total volume of supplies available from 2021-2025 and Table 3-17 shows the total volume of supplies available from 2025 through 2045.

Table 3-16: Total Wholesale System Supply Availability for Five Dry Years from 2021-2025 (values in acre-feet)

Year		Total
Normal		82,200
Single Dry		45,500
Multi-Year Drought	2021 (1st year)	45,500
	2022 (2nd year)	45,500
	2023 (3rd year)	45,500
	2024 (4th year)	45,500
	2025 (5th year)	45,500

Table 3-17: Total Wholesale System Supply Availability by Year Type Through 2045 (values in acre-feet)³⁷

Total		2025	2030	2035	2040	2045
Normal		82,200	82,200	82,200	82,200	82,200
Single Dry Year		46,500	46,500	46,500	46,500	46,500
Multi-Year Drought	Year 1	46,500	46,500	46,500	46,500	46,500
	Year 2	46,500	46,500	46,500	46,500	46,500
	Year 3	46,500	46,500	46,500	46,500	46,500
	Year 4	46,500	46,500	46,500	46,500	46,500
	Year 5	46,500	46,500	46,500	46,500	46,500

³⁷ Table 3-16 does not include the 1,000 AF per year expected from the District’s CVP contract in multiple dry years.

Chapter 4

Water Use

Understanding how water uses vary among different land use classifications, throughout the year, and under differing hydrologic conditions, i.e., water use characteristics, is essential to enable the District to reliably and cost-effectively manage its water supplies to continue to meet retail customer and WCA demands. This chapter characterizes the District's current Retail and Wholesale system customer water demands, and forecasts what they are projected to be over the next few decades.

A thorough characterization and analysis provide a realistic forecast of future Retail and Wholesale system water use based upon the District's past and current retail customer water use as well as past and current use by the WCAs. Considerations of anticipated growth described in Chapter 2, new regulations, changing climate conditions and trends in customer water use behaviors all factor into a comprehensive projection of customer water use that becomes the foundation for an integrated assessment, incorporating the District's water supplies (see Chapter 3), of SJWD's long-term water system reliability (see Chapter 5).

Several legislative changes to UWMP requirements were enacted since the District completed its 2015 UWMP. Among these many changes, the important items the District must address are highlighted below:

- ◆ Provide quantified distribution system losses for each of the 5 preceding years. [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 District must estimate projected water use for its retail service area and WCAs for the years 2021 through 2025. [CWC 10635(b)]
- ◆ Conduct an annual water supply and demand assessment for the Retail and Wholesale system service areas on or before July 1 of each year (following adoption of its 2020 UWMP) where the annual assessment includes current year unconstrained demand. The District will consider "unconstrained demand" for retail and WCA customers to be the expected water use in the upcoming year, based on historical unconstrained water use and other factors, calculated before implementing any projected response actions triggered under its Water Shortage Contingency Plans (see Chapter 6). [CWC 10632.1]

This Chapter is organized as follows:

- ◆ **Current Retail System Customer and WCA Water Use** – This subsection presents the District’s recent and current water use data for its retail customers and WCAs.
- ◆ **Retail Compliance with 2020 Urban Water Use Target** – This subsection documents the calculation of the Retail service area’s actual 2020 gallons per capita per day (GPCD) value and comparison to the 2015 UWMP’s estimated 2020 GPCD target that was established per state requirements to reflect a 20% reduction in per-capita water use by 2020.
- ◆ **Demand Management Measures (DMM)** – This subsection provides a narrative description of each water demand management measure implemented by the District over the past five years, and describes the District’s planned measures for the foreseeable future.
- ◆ **Forecasting Customer Use** – This subsection presents the calculation and results of future water use forecasts within the District’s Retail and Wholesale system service areas, including land-use classifications, unit demand factors, and estimation of distribution system losses. This subsection also estimates variations in customer water use the District could expect during years with low precipitation, and 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 necessary for completing the 5-year DRA and defining “unconstrained demand” for purposes of the District’s annual supply and demand assessment.
- ◆ **Projecting Disadvantaged Community Water Use** – This subsection presents the estimated water use necessary to meet the needs of lower income households, pursuant to California Water Code 10631.1.

4.1 Current Retail Customer and WCA Water Use

As described in Chapter 2, the District serves potable water to about 10,680 customer connections within its Retail system and the WCAs collectively serve approximately 40,600 connections. Water supplied to the retail customers and the WCAs is drawn from the District’s multiple surface water sources (see Chapter 3), treated at its water treatment plant, and delivered through an array of transmission and distribution pipelines to the retail customer’s meter or the WCA connection points. Recent and expected water use trends, along with the District’s on-going demand management efforts targeting its retail customers, provide the foundation for this UWMP’s water use forecast to 2045 for both the Retail and Wholesale systems.

Actual water use in 2020 is the basis for determining the District’s compliance with its 2020 GPCD retail water use target established in its 2015 UWMP, as described below.

4.1.1 Retail Customer and WCA Water Use: 2016 to 2019

Recent customer water use data can help the District 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 forecasts of future water use. The District is also required to quantify past customer water use.

Table 4-1 presents the District’s past Retail water use by customer classification for 2016 through 2020. The District tracks connections and use under five primary categories:

- ◆ Single-Family Residential
- ◆ Multi-Family Residential
- ◆ Commercial/Institutional (CII)
- ◆ Landscape Irrigation
- ◆ Agriculture

Table 4-1: Retail Customer Water Use: 2016 to 2020 (values in acre-feet)

	2016	2017	2018	2019	2020
Single Family	8,061	8,914	9,135	8,993	10,141
Multi-Family	136	136	149	144	150
Comm./Inst.	497	405	570	559	590
Landscape	679	184	798	762	862
Agriculture	23	79	64	59	63
Total	9,396	9,718	10,716	10,517	11,806

This historic data also provides insight into the relative ratio of water use among differing customer classifications, as well as seasonal variations. For instance, use across nearly all classifications continued to recover after conservation mandates imposed in 2014 and 2015 began to be eased in 2016. Additionally, from 2016 to 2017 the Landscape classification had a significant drop, while Agriculture increased use. Single Family consistently accounts for about 85% of the annual Retail system water use over this period.

Historic use data for the WCAs is presented in Table 4-2. These values, however, only reflect metered deliveries to the WCA’s various connections with the District’s wholesale distribution system. Thus, unlike the values in Table 4-1, these values reflect SJWD wholesale supplies of “gross water” entering each WCAs’ system before it is conveyed and delivered to each WCA’s retail customers and any system losses are accounted for.

Table 4-2: Wholesale Customer Agency Water Use: 2016 to 2020 (values in acre-feet)

	2016	2017	2018	2019	2020
CHWD	9,640	10,910	9,941	11,068	11,012
Folsom	1,060	1,118	1,114	1,113	1,210
FOWD	7,703	6,187	6,539	7,260	8,259
OVWC	3,407	3,847	3,974	3,602	3,981

Notably, the reported use of District water supplies by CHWD and FOWD vary year-to-year more than Folsom or OVWC. This variance reflects the use of groundwater by CHWD and FOWD to help meet their demands, thus reducing demand on the District’s wholesale water assets. Consequently, the values in Table 4-2 represent less than CHWD’s and FOWD’s total actual retail customer water use.

4.1.2 Retail Customer and WCA Water Use in 2020

The District's retail customers are metered at their connection to the Retail system while the WCAs are metered at various connections to the Wholesale system.

Retail metered values are collected periodically for each customer account and summarized into annual reports prepared by the District and for reporting to the SWRCB Division of Drinking Water and to DWR.³⁸

Table 4-3 represents the delivery to all the District's Retail service area customers for 2020. It does not, however, include the distribution system losses inherent in a pressurized water delivery system that occur during the District's efforts to treat, store and convey the water throughout the extensive distribution system to each retail customer's connection.

Table 4-3: Retail Customer Use: 2020 (values in acre-feet)

Use Category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Single-family Residential	289	270	377	456	773	1,031	1,391	1,500	1,411	1,234	826	582	10,141
Multi-family Residential	9	9	8	9	13	14	18	18	16	15	11	10	150
Commercial/ Institutional	20	20	28	28	49	58	79	83	75	69	45	37	590
Landscape Irrigation	15	15	25	38	72	103	128	140	126	105	64	30	862
Agriculture	0	1	2	2	6	7	10	10	9	9	4	3	63
Other	0	0	0	0	0	0	1	1	1	1	1	1	5
Customer Total	334	315	440	534	913	1,214	1,627	1,751	1,640	1,432	950	662	11,811

Further, comparing to the annual values in Table 4-1, the 2020 annual Retail system customer use is about 10% higher than the average use during 2018 and 2019. Comparing the specific customer classifications, the 2020 data indicates the increase was primarily in the single-family residential sector.

While new customers in 2020 could account for some of the increase, the District added very few accounts between 2019 and 2020. Rather, the higher-than-average use in the single-family classification was 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.

³⁸ 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 or PWSS report. The District prepares the eAR and PWSS reports for the Retail system.

The WCAs’ use in 2020 is derived from the District’s water treatment plant flow summary report that records monthly deliveries to each of the WCA connection points to the District’s Wholesale distribution system. Table 4-4 shows monthly deliveries to each WCA during 2020.

Table 4-4: Wholesale Customer Agency Use: 2020 (values in acre-feet)

WCA	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
CHWD	425	488	570	679	1,103	1,350	1,572	1,543	1,159	1,010	624	489	11,012
Folsom	40	55	60	74	115	142	167	171	144	119	70	53	1,210
FOWD	231	310	385	533	870	878	1,162	1,286	1,100	745	444	315	8,259
OVWC	125	158	181	226	376	502	584	580	464	395	230	160	3,981
WCA Total	821	1,011	1,195	1,511	2,464	2,872	3,486	3,580	2,867	2,269	1,367	1,018	24,462

4.1.3 Existing Retail Distribution System Losses

Distribution system water losses (also known as “real and apparent losses”) are the water losses from the District’s Retail water distribution system up to the point of delivery to the customer’s system (e.g., up to the residential water meter).

Since 2016, the District has been required to quantify its distribution system losses using the American Water Works Association (AWWA) Method (Title 23 California Code of Regulations Section 638.1 et seq.). An electronic copy of the audit in Excel format is to be submitted to 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.

The 2020 estimate has not been submitted to DWR as of the drafting of this UWMP but is currently estimated to be approximately 730 acre-feet over the year, or about 6% of the water entering the retail distribution system. This value reflects real losses as well as apparent losses, such as from meter inaccuracies. Table 4-5 presents the District’s retail AWWA Method distribution loss values for 2016 through 2019, as well as an estimate for 2020.

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. The District is actively working to reduce transmission and distribution system real losses through pipeline and conveyance replacement, and apparent losses through meter replacement, and anticipates this value may drop further over the planning horizon.³⁹ For purposes of this 2020 UWMP, the District is using a distribution loss factor of 7% for future connections.

³⁹ The District is tracking the State Water Resource Control Board’s efforts to set a new distribution system loss standard and will comply with future regulations.

https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/water_loss_control.html

Table 4-5: Distribution System Loss: 2016-2019 (AWWA Method) and 2020 Estimated

2016	2017	2018	2019	2020
16.6%	12.4%	11.3%	8.0%	6.2%

4.2 Retail Compliance with 2020 Urban Water Use Target

Pursuant to CWC Section 10608.24(b),⁴⁰ the District must demonstrate its Retail system 2020 water use met the GPCD target adopted in its 2015 UWMP. As set forth in the 2015 UWMP, the District’s 2020 GPCD target was established as 413 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 CWC Section 10608.20(b). The District’s 2020 actual GPCD was calculated using the same methodology: 2020 “gross water use” divided by the estimated 2020 retail population, as outlined below.

As presented in the District’s 2015 UWMP, “gross water use” was determined to be the total retail water produced by the District’s water treatment plant. This value was 12,454 acre-feet.⁴¹ This value represents both the customer deliveries shown in Table 4-3 and the distribution system losses recorded in Table 4-5. As shown in Table 2-3, the District’s population in 2020 was estimated to be 29,680. This results in a calculated 2020 Retail system compliance value of 377 GPCD, which is less than the District’s established 2020 target of 413 GPCD adopted in its 2015 UWMP. Thus, the District is in compliance with CWC Section 10608.24(b). The compliance calculation parameters are summarized in Table 4-6.

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

2020 Volume into Distribution System =	12,545 acre-feet
Allowable Adjustments	0 acre-feet
2020 Gross Water Use =	12,545 acre-feet
2020 Population =	29,680 people
2020 Actual GPCD =	377
2020 Target GPCD =	413
Compliance Achieved?	Yes

4.3 Demand Management Measures (DMM)

DWR requires urban water suppliers to describe both wholesale and retail Demand Management Measures (DMMs) implemented over the planning period in UWMPs. This section includes descriptions of the nature and extent of existing DMMs implemented by SJWD. DMMs utilized by the District assist in promoting conservation of supplies while reducing customer demands. Because the level of control

⁴⁰ 10608.24. “(b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.” A target is not required for wholesale urban suppliers, thus the District’s water service to WCAs is excluded from this analysis.

⁴¹ Total deliveries to the District’s retail service area for 2020 includes 9,239 acre-feet for retail customers within Placer County plus 3,306 acre-feet for retail customers within Sacramento County.

on end uses varies between wholesale and retail suppliers, this section presents separate DMMs associated with each. The District has relied upon these DMMs to meet water use targets and objectives, including GPCD targets and mandatory conservation targets imposed during the 2014-2017 drought. It is anticipated that the DMMs presented in this section, combined with other programs, will be relied upon to meet future water use objectives developed, regulated by, and reported to the State of California, including residential and multi-family, water loss, and commercial, industrial, and institutional water use objectives.

The California Urban Water Conservation Council (CUWCC) was created to increase efficient water use through urban water agencies partnerships, public interest organizations, and private entities. As a signatory to the CUWCC MOU for Best Management Practices (BMP), SJWD committed to implementing BMPs that were designed to achieve water conservation across demand sectors. The CUWCC required annual reporting of compliance with and implementation of the BMPs. The CUWCC has recently restructured itself into the California Water Efficiency Partnership (CalWEP) focusing more on implementation assistance. The original utility-based (foundational) DMMs described in this chapter represent standard practices in most utilities, and SJWD has been implementing them for many years.

4.3.1 Demand Management Measures for Wholesale Suppliers

The wholesale DMMs presented below have been utilized by SJWD and are considered standard for urban wholesale suppliers. The following subsections describe the District's past and current implementation of these wholesale DMMs.

Metering

The District's CVP contract with Reclamation requires all water connections using CVP contract water to be metered by 2025. 100 percent of the District's wholesale deliveries are currently metered. Monthly readings and internal quality control analysis are regularly conducted. A software program is annually employed to confirm proper operation of wholesale meters.

Public Education and Outreach

As part of its water conservation and efficiency program, the District implements a public information program through active participation in the RWA Regional Water Efficiency Program (WEP or Program). In collaboration with 19 water provider members and other wastewater, stormwater and energy partners, RWA formed the WEP in 2001 to increase cost effectiveness through economies of scale to public education and outreach activities.

The WEP operates on an average annual budget of \$530,000 and is supplemented by grant funding. Grants are an important funding resource for the Program. Since 2003, the Program has been awarded \$13.2 million in grant funding for public outreach and education as well as a variety of rebate programs, fixture direct installation programs, system water loss, individualized customer usage reports, large landscape budgets and more. Of those funds, \$3.8 million was awarded between 2016 and 2020.

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. The Program distributes these messages on a regional scale through regional media and advertising buys and was honored with the United States Environmental Protection Agency WaterSense Excellence in Education and Outreach Award in 2016. From 2016-2020, the WEP created a series of public outreach campaigns. Below is a summary of each campaign and highlighted achievements.

Following the historic 2015 California drought, the WEP launched the “Rethink Your Yard” campaign in 2016 with a focus on prioritizing landscape watering, putting trees first and transitioning from thirsty lawn and landscaping to beautiful, low water use, and River-Friendly landscapes. The Program advertised the campaign through online ads, social media, commercial radio, Raley Field (local baseball stadium) and local billboards. The campaign featured local homeowners with their newly redesigned yards on billboards throughout the region.

The campaign launched in 2017 focused on encouraging customers to understand and deliver only the amount of water their landscape really needs and to make permanent equipment changes to improve efficiency such as installing weather-based irrigation controllers, more efficient sprinklers and drip irrigation. The Program partnered on this messaging with local nurseries through a “Get Growing this Fall” initiative to encourage residents to plant in the fall when days are cooler and plants don’t need as much water to establish roots.

From 2018 through 2020, the regional campaign focused on tackling the landscape overwatering problem with a “Check and Save” message encouraging residents to check the soil moisture with a moisture meter before turning on sprinklers. To support this message, the Program provided free moisture meters via an online request form and at events. In 2019, WEP distributed 3,000 moisture meters to customers throughout the region.

These campaigns are implemented through both paid advertising buys and earned media from public service announcements (PSAs). Every year the campaigns can be heard on local radio stations such as Capital Public Radio and online through Google, Facebook and YouTube advertisements. From 2016-2020, the WEP public outreach campaigns produced:

- ◆ Radio Advertising (2016-2020)
 - 3,443 radio advertisements ran
 - 17.2 million impressions
- ◆ Digital Advertising (Facebook, Google Display Network and Spotify) (2016-2020)
 - 24.3 million impressions
 - 262,900 clicks
- ◆ Additional advertising (billboards in 2016)
 - 1.8 million digital advertisements ran
 - 51.6 million impressions
- ◆ Public Service Announcements (Television and Radio) (2016-2020)
 - 20 million impressions
 - \$570,000 in value had they been purchased as advertising

The Program also continues messaging through its own Facebook page. From 2016-2020, the Program created about 60 Facebook posts a year featuring water saving tips and other relevant information. The WEP hosted several Facebook sweepstake contests including: (1) “Tree Hugger” in 2016, where participants submitted pictures hugging a tree to raise awareness about the importance of healthy trees; and, (2) “Under/Over Debate” in 2020, where participants were asked to weigh in on what is the proper way to hang toilet paper to raise awareness of toilet leaks. The winner of the Under/Over Debate sweepstakes received a case of toilet paper delivered via mail and a gift card to a local hardware store.

The Program continues to utilize the public outreach website bewatersmart.info to reach customers throughout the region. The website contains regional and local water provider information on rebates and services, top ways to save, an interactive watering and water waste information map, a water-wise gardening database, recent press releases, the Sacramento Smart Irrigation Scheduler tool, and more. Educational information and customer services were modified to address the COVID pandemic in 2020, including online water efficiency lessons for kids, a list of nurseries that offered curbside pick-up, virtual water wise house calls, and numerous virtual educational customer workshops. Between 2016 and 2020, the website averaged 96,000 unique visitors per year.

For more targeted outreach, the Program distributed quarterly e-newsletters to participating residents. The e-newsletters are filled with water savings tips, upcoming events and other interesting articles. They are usually timed around changes in the weather to help signal the need for residents to adjust their irrigation systems, such as day light savings coupled with a message to dial back sprinkler systems. The e-newsletter reaches 6,300 households.

Every year the WEP selects 3 public events to attend for the public to interact with local water efficiency staff. This provides opportunities for the region to communicate its messages in person. Events have included the Sacramento Home & Landscape Show at Cal Expo, Creek Week, Harvest Day, Farm-to-Fork Festival and several Earth Day events. Additionally, RWA, in coordination with participating local water providers, hosts an annual Mulch Mayhem event in which customers can pick up a truck load of free mulch from selected locations throughout the region. All in-person regional events were canceled in 2020 due to the COVID pandemic.

The Program is also very active in communicating to local media outlets such as The Sacramento Bee. Between 2016 and 2020, RWA issued 50 press releases on WEP activities and regionally significant news and participated in nearly 30 radio public affairs interviews. The RWA and the WEP were mentioned in dozens of news articles published by local and regional media outlets both within and outside of the Sacramento region during the same time frame.

To support public outreach messaging and water savings tips, the Program also coordinated several regional rebate programs, which were partially funded by state and federal grants. A variety of rebate options were provided including for toilets, clothes washers, and irrigation controllers (full summary in Table 4-7). Collectively these rebates and installations will produce an estimated lifetime (10 years) savings of 6 billion gallons (over 18,000 AF) of water and 6.4 million kilowatt hours of energy.

Table 4-7. Regional Rebates and Installations from 2016-2020

Rebate/Installation Type	2016	2017	2018	2019	2020	Lifetime Water Savings per Type 2016-2020 (AF)	Lifetime Energy Savings per Type 2016-2020 (kWh) ²
High Efficiency Clothes Washer Rebates	491	480	453	366	518	341.3	118,094
High Efficiency Toilets Rebates	4,494	3,124	2,255	4,868	904	1,572.2	544,076
Smart Irrigation Controllers Rebates	245	358	801	556	1,298	2,049.7	709,299
Irrigation Efficiencies Rebates ¹	21,271	5,879	5,548	1,724	NA	11,620.0	4,021,178
Turn Replacement Rebates (square feet)	376,613	584,535	236,064	85,375	NA	1,456.5	503,980
Toilet Direct Installation	1,943	4,542	968	NA	NA	728.6	252,066
Showerhead Direct Installation	1,141	2,512	704	NA	NA	683.1	236,447
Faucet Aerators Direct Installation	1,162	4,314	317	NA	NA	56.8	19,648
Urinal Direct Installation	NA	403	79	NA	NA	31.3	10,878
Total Water Savings per year/Lifetime (AF)	874.6	424.1	320.4	131.7	100.7	18,539.5	--
Total Energy savings per year/Lifetime (kwh)	303,626	146,717	110,915	45,509	34,799	--	6,415,666
¹ Includes: pressure regulator equipment, pipe and pipe fittings, drip or low volume equipment, and sprinkler heads or nozzles. ² Regional average of 346 kWh/AF (AB 32 Water Energy Assessment and Savings Demonstration Project, prepared for Sacramento Municipal Utility District (SMUD) and Regional Water Authority (RWA). October 2014. GEI Consultants NA = No funding available Lifetime = 10 years							

In addition to public outreach, the Program also coordinates school education activities. Since 2012, the Program has hosted the Water Spots Video Contest for high school and middle school students. The WEP provides a new contest theme each year and provides the region’s teachers and students with relevant facts and images to help develop 30 second video PSAs. Students submit their videos to RWA who hosts a panel of local celebrities to decide on a first, second and third place winner. The top 10 scoring videos are then posted online for public voting to select a “people’s choice” winner as well. Both teachers and students receive cash prizes, and the winning videos are played at Raley Field during River Cats games and in select movie theaters throughout the region. The winning PSAs are incorporated into the WEP’s media activities as well. Past themes include *WATER MYTHS BUSTED!*, *H2o Hero*, and *Show Off Your Water Smarts*. Between 2016 and 2019, 450 videos were submitted. The 2020 Water Spots Video Contest was canceled due to the COVID pandemic.

Water Conservation Program Coordination and Staffing Support

The Wholesale Water Conservation Program is staffed by the RWA, with a Program Manager and research assistant to manage the water efficiency program. In addition, the District's Customer Service Manager serves on various RWA committees to help develop and implement the regional water efficiency programs.

Wholesale Supplier Assistance Programs

SJWD provides technical support to wholesale customers through workshops on irrigation technologies, landscape maintenance and plantings. The District also serves as a technical resource to wholesale agencies for BMP/DMM implementation and compliance, provides technical resources, and maintains and promotes a water efficient demonstration garden accessible to the public.

Enhancing the District's commitment to water use efficiency, membership in the RWA provides the District with additional tools to be more effective in planning, implementing, communicating, and advocating for successful and sustainable water management strategies. The WCAs are all members of the RWA.

Asset Management

The District tracks and manages its Wholesale system assets using a computer maintenance management system (CMMS). The system enables the District to track maintenance, safety inspections, service calls, and reporting requirements. Tracking the District's wholesale assets allows for streamlined identification of maintenance needs, including factors such as asset end-of-life and efficiency, which facilitates the District's ability to identify assets that need replacement. A similar asset management program exists for the Retail system and is maintained by Field Services and Water Treatment Plant staff, with oversight provided by respective department managers.

4.3.2 Demand Management Measures for Retail Suppliers

The District implements a comprehensive DMM program as a retail water agency in the service area where it directly supplies water to customers. The following narratives present past and current DMM programs the District has implemented for its customers. During its longstanding membership in CUWCC, the District satisfied the BMP implementation and reporting requirements. Subsequently, the District focused efforts on reducing GPCD as prioritized by California Law.

Water Waste Prevention Ordinances

The District has a water waste prohibition that prohibits gutter flooding, non-recirculating systems in decorative fountains and evaporative coolers, and unnecessary/wasteful uses of water. District water efficiency staff respond to all water waste complaints and requests for assistance from customers. Customers are informed how to improve system performance and water efficiency. The water waste prohibition is part of the SJWD's Code of Ordinance. Additionally, SJWD utilizes a "Report Water Waste"

link on its website to facilitate the identification of water waste and promotes active urban conservation.

Metering

The Reclamation contract under which the District operates requires all water connections using CVP contract water to be metered by 2025. As of 2004, SJWD's retail customers were fully metered. The District has a meter testing, repair, and replacement program managed through the District's Asset Management Program. This program is updated periodically to reflect aging meter inventory, meter repairs and replacements, and new metering technology.

SJWD is currently completing a Residential Meter Retrofit strategy. The plan is to update aging meters over a 20-year period and update all endpoints over a 5-year period, making all meters radio read.

Conservation Pricing

SJWD employs a rate structure comprised of a fixed charge (based on meter size) plus a single tier consumption charge. The rate structure promotes conservation because the customer is charged based on the quantity of water used. In addition, the District may implement a drought rate structure (tiered pricing) during a declared shortage condition.⁴² The drought rate structure allows the District to recover costs associated with implementation of drought response measures and decreased revenues from reduced consumption, while encouraging increased conservation. When drought conditions are no longer prevalent, the drought surcharge is halted.

Public Education and Outreach

SJWD Retail undertakes public education and outreach in conjunction with its Wholesale programs, described above. The District participates with other water agencies in a water awareness poster contest each year and invites students in grades 4-6 to participate. In addition, the District sends out monthly e-blasts, newsletters, and bill messages to its retail customers with water conservation messaging. Social media posts throughout the month promote water conservation tips. The website is updated regularly with water conservation related topics and features.

Programs to Assess and Manage Distribution System Real Loss

The District conducts annual Distribution System Water Audits (consistent with American Water Works Association (AWWA) M36 methodology using software analysis) to characterize water system losses. A copy of the District's recent water audit is available electronically.⁴³ The 2019 Audit indicated the District has an Infrastructure Leakage Index⁴⁴ of 1.45 (1.0-3.0 is an acceptable range). Leak detection methods utilized by the District include monitoring of zone usage, zone pressure, and surface conditions. Detected leaks are repaired on an economic basis. The District has a long-term Capital

⁴² See the District's current Retail WSCP for more information.

⁴³ https://wuedata.water.ca.gov/awwa_plans

⁴⁴ AWWA defines the Infrastructure Leakage Index as the ratio of the Current Annual Real Losses to the Unavoidable Annual Real Losses.

Improvement Program (CIP) that involves an annual main line replacement and leak detection survey program. The District validates its water audit data annually to improve the accuracy of actual measured water losses occurring in the system using the AWWA M36 methodology.

The District has an active leak detection program. The District annually contracts with a qualified electronic leak detection service to survey large sections of the service area infrastructure. Leaks are also detected by field crews and meter readers, customers, and other utilities and public works departments. All leaks are repaired immediately. In 2019, a total of 3.73 miles were surveyed and 8 leaks were pinpointed and repaired for an estimated annual savings of approximately 12 AF.

Retail Water Efficiency Department Coordination and Staffing Support

The District has the equivalent of 3.5 full-time staff working on its retail DMM planning and implementation efforts within their Water Efficiency Department. Distribution field services staff, customer service and administrative staff also provide support. Duties and responsibilities of the Water Efficiency Department include the following:

- Coordination and oversight of conservation program and water efficiency measures.
- Tracking, planning, and reporting program implementation.
- Coordination of water conservation and efficiency efforts and programs with District executive team, other staff, and other agencies.
- Preparation of annual program budgets.
- Preparation of conservation elements in the District's Urban Water Management Plan.
- Monthly conservation reporting required by the State Water Resource Control Board.

In general, the Water Efficiency Department is responsible for generating and executing programs and services aimed at reducing water use to address federal, state, and local commitments.

Other Demand Management Measures

SJWD also undertakes various programs and provides rebates aimed at increasing water use efficiency and reducing waste. Information on each program is presented below.

Hot Water Demand Rebate

SJWD customers who install a District approved on demand or timed hot water recirculation system may qualify for a rebate, subject to funding availability. This rebate is available to all qualifying District retail customers.

Smart Irrigation Timer Rebate

SJWD offers rebates to customers who install a weather-based irrigation (or "Smart") controller. The smart controller automatically adjusts irrigation based on changing weather conditions. This rebate is available to the District's customers who purchase an approved product.

High Efficiency Clothes Washing Machine Rebate

SJWD customers who purchase and install a high-efficiency washing machine are eligible to receive a rebate of up to \$100. Eligible washing machines include machines with a water factor of 4.0 or less.

Landscape Irrigation Reviews

The District offers free landscape irrigation reviews to customers. Customer irrigation systems are assessed by trained District staff. The assessments are aimed at identifying opportunities for system improvements, including identification of leaks, misdirected sprinklers, excessive irrigation times, and poor irrigation coverage. Landscape irrigation reviews are available to all District retail customers.

High Usage Courtesy Calls

District staff reviews customer meter readings for abnormalities in patterns of use. Past usage is compared to current use and customers are contacted when abnormalities indicated an abnormal use pattern. The review can lead to identification of leaks or irrigation equipment problems.

4.3.3 Implementation over the Past Five Years

SJWD has been actively implementing DMMs over the past five years through both local and regional programs in collaboration with the RWA. The DMM budget is established on an annual basis as part of the District's overall annual budget review and adoption process. The DMM budget can vary from year to year depending on program grant funding availability, water savings goals, DMM program approvals, regional DMM program participation levels, and local response to District DMM programs. The District also has DMM expenditures related to RWA membership dues and participation of approximately \$16,000 per year.

The District's DMM program is designed to meet local, regional and state water use efficiency objectives, satisfy Water Forum Agreement provisions, and achieve future water use targets. The DMM budget and expenditures reflect the challenge in meeting these multiple water use objectives while providing cost-effective service to customers. The District works collaboratively with other agencies to optimize its water use efficiency investments and pursues outside funding sources when available to deliver DMM programs at the lowest possible cost. Over time, the District's DMM budget may change due to program effectiveness, emerging water saving technologies and devices, and/or saturation of specific DMM programs.

Table 4-8 summarizes the District's other DMM programs implemented over the past five years, including local DMM programs in the District service area and regional DMM programs offered in collaboration with RWA.

DMMs implemented over the past five years have helped the District meet its SBX7-7 2020 water use target. In addition, implementation of DMMs also assisted in achieving the State's mandatory water conservation orders from 2014-2017. It is anticipated that implementation of DMMs will be relied upon to meet future water use targets.

The DMM program water savings achieved over the past five years has enabled the District to reliably meet its established water use targets and improve its overall water use efficiency.

Table 4-8. Past DMM Program Narrative Summary (2016-2020)

Program/Item	2016	2017	2018	2019	2020
Hot Water on Demand Rebate Program	YES	YES	YES	YES	YES
Landscape Irrigation Review Program	YES	YES	YES	YES	YES
High Usage Courtesy Call Program	YES	YES	YES	YES	YES
Toilet Rebate Program (1.28 GPF)	YES	NO	NO	NO	NO
Irrigation Efficiency Rebate Program ¹	YES	YES	YES	YES	YES
HECW Rebate Program	YES	YES	YES	YES	YES
School Education/Public Information	YES	YES	YES	YES	YES
NOTES: ¹ Offered to Residential and Commercial customers.					

4.3.4 Planned Implementation

In planning for future DMM programs, the District considers the following factors: current efficiency level of the customer base, cost-effective program design and implementation, sustainability of water savings, emerging technologies and devices, and ability to meet future water use targets. DMM programs are an important long-term strategy to enable the District to provide affordable reliable water service to customers during normal and dry years. While meeting water use targets is important, it is not the only consideration in planning future DMM programs. The District will also consider the provisions of the Water Forum Agreement.

Maintaining recent program activities has allowed the District to meet applicable water use targets. Future water use targets may require further implementation of DMMs that maintain an efficient customer base and water system. The planned 2021-2025 DMM programs would be tailored to meet this goal. Some of the current DMM programs would be continued during this period, and some new programs could be instituted.

Planned DMM Budget

The planned DMM budget over the next five years would be influenced by the level of District participation in regional DMM programs, the ability of the District to secure outside funding sources to defray the future cost of DMM programs, actual participation levels in District DMM programs, and ability to meet future water use targets during the period. The District will monitor the aggregate water use budget and respond with specific DMMs aimed at addressing compliance with upcoming State regulatory requirements should that be necessary.

In planning future DMM programs, evaluating how water is currently used in the District provides insights in assessing where to target future DMM programs. Table 4-9 indicates the predominant District water user classes based on percent of total demands:

Table 4-9. Planned DMM Programs – Focusing on Largest User Classes (2020)

User Class	% Total Demand	% Indoor	% Outdoor
Single Family Residential (SFR)	86%	32%	68%
Irrigation (IRR)	7%	0%	100%

During 2020, about 93% of the District’s total water demands were used by the SFR and IRR user classes, with most of the use occurring for outdoor (irrigation) purposes. Meeting future water use targets would require these user classes to achieve commensurate outdoor water use reduction. Based on District water use patterns, Table 4-10 summarizes the District’s priority and optional DMMs that could be employed to meet future water use targets.

Table 4-10: DMM Narrative Summary (2021-2025)

Priority DMMs	2021	2022	2023	2024	2025
Public Information/Outreach	YES	YES	YES	YES	YES
School Education Program	YES	YES	YES	YES	YES
Landscape Programs – manage outdoor use	YES	YES	YES	YES	YES
Water Audits – SFR and IRR accounts ¹	YES	YES	YES	YES	YES
Water Loss Control Program – audits/repairs	YES	YES	YES	YES	YES
Optional DMMs	2021	2022	2023	2024	2025
Hot Water On Demand Rebate Program	YES	YES	YES	YES	YES
Landscape Irrigation Review Program	YES	YES	YES	YES	YES
High Usage Courtesy Calls Program	YES	YES	YES	YES	YES
HECW Rebate Program	YES	YES	YES	YES	YES
NOTES: ¹ Offered to high users only					

Priority DMM Programs

Narrative descriptions of planned DMMs are presented in the following subsections.

Public Information/Outreach

DMM literature is provided to all customers via bill inserts, newspaper ad/notices, direct mail, electronic mail, District website and handouts available in District offices. Hold workshops throughout the year on irrigation repair, irrigation controller programming, and landscape maintenance including efficient and effective watering.

School Education

The school education program targets elementary age students and teachers for the student art calendar contest with material consistent with California curriculum standards. The District also benefits from participation in the regional program with RWA.

Landscape Programs (including Irrigation Efficiency Rebate Program)

Continue the Smart Irrigation Controller Rebate Program. The program reimburses participants 50 percent of total material costs as a bill credit issued after verification of installation.

Water Audits

Offer Single-Family Residential and Irrigation accounts water audits, targeting the top 10 percent of users in each user class. Check for leaks, collect meter data for demand use profile (timing and duration

of irrigations, quantify leak losses), conduct irrigation system audits, and recommend irrigation schedule changes. Monitor accounts post-audit to assess effectiveness.

High Use Notifications

Contact customers immediately after receiving an abnormally high meter read to notify of a possible leak. Contact is made via email, telephone or in written form.

Water Loss Control Program

Continue to conduct annual distribution system water audits using AWWA M36 methodology, conduct system annual leak detection surveys, repair identified leaks, and quantify loss reduction savings. Integrate program with 10-year Capital Investment Plan main replacement schedule and other asset management program elements. Consider periodic condition assessments to determine the condition and reliability of older infrastructure. Identify locations of concern as sources for future leak losses. System leak repairs may require special budgeting depending on magnitude of activities.

Additional Programs for Consideration:

- ◆ Continually update demonstration sites
- ◆ Optional water budget program – rates matching use (target Irrigation Accounts)
- ◆ Turf replacement program

Optional DMM Programs

The optional DMM programs listed in Table 4-10 may be offered to high users, offered on a limited basis, continued in their current form, or terminated in lieu of other DMM programs depending in effectiveness and funding. It is anticipated that optional DMMs that would be implemented over the 2021-2025 period will help the District reliably meet future water use targets.

Planning for Future DMM Programs

The District may consider the following projects to refine its planning for future DMMs.

1. Conduct a DMM Baseline Study to quantify market saturation of DMMs to date, assess the effectiveness of current DMM programs, identify emerging DMM opportunities and technologies, and identify cost-effective DMM programs that can be implemented during the 2021-2025 period.
2. Evaluate water use of DMM program participants, especially those who have participated in more than one DMM program, to determine actual water savings and cost-effectiveness of DMM programs.
3. Evaluate the benefits of an Automated Metering Infrastructure metering system and assess the impact the technology would have on District business practices, DMM programs, and ability to meet future water use targets.
4. Refine landscape reduction measures and policies that would be incorporated into the District's WSCP to assure demand reduction targets are achieved for a given stage.
5. Pursue outside sources to fund District DMM programs.

The District will need continued implementation of DMM programs to reliably meet future water use targets. Therefore, optimizing future DMM programs is an important District objective, and the District is committed to continuing to devote the necessary staffing and funding necessary to ensure that DMMs remain an important part of its demand reduction strategy.

4.4 Forecasting Customer Use

Forecasting future water demands begins with an understanding of 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 customers well into the future – especially factors that directly affect the efficiency of water use.

Pursuant to CWC 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.

The District’s 25-Year Demand Forecast and Capacity Analysis (Analysis) completed in June 2020 was focused on developing forecasts of future water use by the Retail system and WCAs, including a detailed representation of its methodology and assumptions.

This 2020 UWMP uses the forecast presented in the Analysis. The results are presented in Table 4-11 for the Retail System and Table 4-12 for the Wholesale System.

Table 4-11: Retail System Water Use Forecast (values in acre-feet per year)⁴⁵

Land Class		2025	2030	2035	2040	2045
Existing Customers	Single Family	9,035	9,035	8,724	8,724	8,724
	Multi-family	137	137	137	137	137
	Commercial	395	395	395	395	395
	Landscape	852	852	852	852	852
	Agriculture	40	40	40	40	40
	Subtotal	10,458	10,458	10,147	10,147	10,147
	Non-revenue water	868	868	842	842	842
	Total Existing Customers	11,300	11,300	11,000	11,000	11,000
New Customers	Single Family	18	76	154	234	342
	Rural Estate	5	10	15	20	26
	Multi-family	0	3	8	11	19
	Commercial/Inst.	6	13	19	31	38
	Public Landscape	0	21	43	64	64
	Agriculture	--	--	--	--	--
	Subtotal	29	123	239	360	489
	Non-revenue water	2	9	17	25	34
Total Future Customers	31	132	256	385	523	
Total Water Demand		11,300	11,400	11,300	11,400	11,500

Table 4-12: Wholesale System Water Use Forecast (values in acre-feet per year)⁴⁶

Land Class		2025	2030	2035	2040	2045
Existing Customers	Single Family	26,672	26,672	25,864	25,864	25,864
	Multi-family	3,261	3,261	3,261	3,261	3,261
	Commercial	2,043	2,043	2,043	2,043	2,043
	Industrial	502	502	502	502	502
	Landscape	2,366	2,366	2,366	2,366	2,366
	Agriculture/Other	162	162	162	162	162
	Subtotal	35,006	35,006	34,197	34,197	34,197
	Non-revenue water	2,372	2,372	2,315	2,315	2,315
	Total Existing Customers	37,400	37,400	36,500	36,500	36,500
New Customers	Single Family	200	458	762	1,132	1,451
	Rural Estate	5	10	15	20	26
	Multi-family	23	64	146	223	302
	Commercial/Inst.	17	44	82	106	126
	Public Landscape	26	89	157	221	243
	Sunrise Mall Redev.	--	50	150	250	350
	Subtotal	270	715	1,312	1,952	2,496
	Non-revenue water	20	50	92	136	174
Total Future Customers	290	765	1,405	2,088	2,670	
Total Water Use		37,700	38,200	37,900	38,600	39,200

⁴⁵ This is Table 2-21 from the District's 25-year Demand Forecast and Capacity Analysis. <https://www.sjwd.org/files/35d17be85/SJWD+25+Year+Study+--+Final.pdf>

⁴⁶ This is Table 2-39 from the District's 25-year Demand Forecast and Capacity Analysis. <https://www.sjwd.org/files/35d17be85/SJWD+25+Year+Study+--+Final.pdf>

4.4.1 City of Roseville Water Use

The District and the City of Roseville have two agreements for the District to provide treated water to the City from water supplied to the District under its PCWA contract (see Chapter 3). Together, these agreements allow the City to request up to 4,000 acre-feet annually. However, the agreements also allow the District to restrict delivery if the District’s underlying PCWA water supply is constrained. For purposes of the District’s water system reliability planning, up to 2,000 acre-feet will be available to the City during single dry and multiple dry year conditions.⁴⁷

While not a WCA, the City’s agreement does constitute a wholesale demand on the District. For purposes of this 2020 UWMP, the City’s demand is characterized as detailed in Table 4-13.

Table 4-13: City of Roseville Water Demand (values in acre-feet per year)

	2025	2030	2035	2040	2045
Normal Year	4,000	4,000	4,000	4,000	4,000
Single and Multi-Dry Years	2,000	2,000	2,000	2,000	2,000

4.4.3 Summary of Forecast Water Use

Based upon the estimated water use of the existing and new customers, the District anticipates a continued increase in potable water use over the planning horizon. Table 4-14 presents the resulting customer water use forecast. Values in the table have been rounded to the nearest 10 acre-feet to recognize the approximate nature of this forecast. This information will be used to evaluate the District’s water system reliability in Chapter 5.

Table 4-14: Forecast Future Water Use (values in acre-feet per year)

	2025	2030	2035	2040	2045
Retail and WCAs	37,700	38,200	37,900	38,600	39,200
City of Roseville	4,000	4,000	4,000	4,000	4,000
Total Water Use	41,700	42,200	41,900	42,600	43,200

4.4.4 Adjusting Water Use Forecasts for Single Dry Year and Multiple Dry Year Conditions

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

⁴⁷ Actual availability during dry years will depend on PCWA’s determination of water supply available to the District and the District’s assessment of its other water supplies and demands.

The Analysis also provided this modified forecast. Conservative modifications to the normal year water use forecast to more likely reflect use conditions during drier and dry years are warranted to help adequately address water service reliability in Chapter 5. The Analysis made the following single-dry year adjustment, which is also used for this 2020 UWMP:

- 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. This adjustment reflects rudimentary relationships between historic use variances and other conditions, and is meant only to highlight the anticipated increase in demands for purposes of District planning.

The Analysis did not provide a multiple dry year adjustment. For purposes of this 2020 UWMP, the following adjustment is made for a 5-year drought:

- 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. This is representative of an “unconstrained demand” as should be represented when evaluating whether WSCP actions may be warranted.⁴⁸

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

4.4.6 Climate Change Considerations

Incorporating climate change analysis into a water use analysis will assist the District in understanding potential effects on long-term reliability, which in turn, allows the District 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 those 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 “normal” demand will become more apparent in the future as the District continues to assess monthly water use trends throughout its service area.

⁴⁸ California Water Code Section 10632(a)(2) states water suppliers should use “unconstrained demand” when performing their annual water supply and demand assessment.

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,⁴⁹ and the Annual Water Supply and Demand Assessment.⁵⁰ These new planning requirements were established in part because of the significant duration of recent California droughts and 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 of conditions occurring over 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 designed to focus on actual, and not hypothetical, conditions 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 (DRA)

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 condition occurring from 2021 through 2025. This drought condition is meant to allow suppliers to test the resiliency of their water supply portfolio and their WSCP 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. 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 during this period.

Total estimated water use for 2021, for example, is developed by modifying the water use representation for 2020 conditions (see Table 4-3 and Table 4-4) taking into consideration the anticipated factors affecting water use, with each subsequent year further adjusted, as appropriate. Adjustments year-to-year reflect several factors the District anticipates may occur, including increases from growth. To make these adjustments, the difference in annual water use between the 2020 condition and the forecast potable 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 potable water use forecast. The City of Roseville water use is included, but it is not

⁴⁹ California Water Code Section 10635(b)

⁵⁰ California Water Code Section 10632.1

increased, since it represents an amount fixed by contract. For instance, the normal year 2021 estimated Retail and WCA use is increased by 5% to represent an unconstrained demand during a dry year, then the 2,000 AF dry year demand for the City of Roseville is added. The resulting forecast use for 2021 through 2025 is shown in Table 4-15.

Table 4-15: Forecast DRA Water Use for 2021 through 2025 (acre-feet per year)

	2021	2022	2023	2024	2025
Total Water Use	40,510	40,780	41,050	41,320	41,590

4.5.2 Projecting Water Use for Annual Assessments

The District 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 as described in Chapter 5, requires two separate representative “current” water use conditions to be developed. The first condition uses the 2020 water use characterization included in Table 4-3 and Table 4-4, plus the City of Roseville demand. These demands represent the water use under a normal condition. Alternatively, a “single-dry year current” forecast is also calculated to provide the District 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 2020 Retail and WCA water use values, then adds the City of Roseville’s reduced 2,000 AF demand for dry year conditions. Table 4-16 provides the Normal Year and Single Dry Year current water use for the District’s water service area. These are used in Chapter 5.

Table 4-16: Normal and Single Dry Year “Current” Water Use (acre-feet)

	Normal	Single-Dry
Total Water Use	41,010	40,860

4.6 Projecting Disadvantaged Community Water Use: Retail System

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 data and determined to be about \$143,000 for the District.⁵¹ Therefore, 80% of this is estimated to be about \$114,400 per year. According to the detailed data, approximately 40% of the households in the District’s service area earn at or below this 80-percentile income.

For purposes of estimating their future water needs, 40% of the total single-family and multi-family connections are presumed to represent disadvantaged households by this definition. However, according to the State of California’s designations, there are no disadvantaged communities within the

⁵¹ <https://censusreporter.org/profiles/16000US0630693-granite-bay-ca/>

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District's Retail system service area.⁵² Nevertheless, applying this condition to the forecast retail water use for the entire District results in the estimates provided in Table 4-17.

Table 4-17: Estimated Low-Income Water Use Forecast (values in acre-feet)

	2025	2030	2035	2040	2045
Total Retail Demand	11,300	11,400	11,300	11,400	11,500
Low Income	3,678	3,704	3,615	3,650	3,699
% of treated	32.5%	32.5%	32.0%	32.0%	32.2%

⁵² <https://gis.water.ca.gov/app/dacs/>

Chapter 5

Water System Reliability

This chapter provides the District's water system reliability findings as required under CWC Section 10635 and provides reliability information that the District may use in completing an annual supply and demand assessment pursuant to CWC Section 10632.1.

Assessing water service reliability is a fundamental purpose of the District's 2020 UWMP. Water service reliability reflects the District's ability to meet the water needs of its customers under varying conditions. The District's 2020 UWMP considers the reliability of meeting Retail system customer water use and potential WCA needs by analyzing plausible hydrological variability, regulatory variability, climate conditions, and other factors that impact the District's water supply and its customers' water uses. The reliability assessment looks beyond past experience and considers what could be reasonably foreseen in the future. This chapter synthesizes the detailed data included in 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 the District's service area.

Long-Term Service Reliability: The reliability findings for a normal year, single dry year, and five consecutive dry 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.

The analysis demonstrates the District has reliable water supplies available to meet projected Retail and Wholesale system demands in its service area through 2045.

5.1 Five Year Drought Risk Assessment

The Drought Risk Assessment (DRA) 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.

The District has ample water supplies to meet current and future Retail system customer and WCA water needs. With an array of highly reliable surface water assets that can be flexibly managed in a single year and across multiple years (see Chapter 3), the District can maintain high levels of service during drought conditions. Nevertheless, the District continues to encourage its Retail system customers and the WCAs to use water efficiently and continues to see lowering per-capita water use (see Chapter 4).

Although the District has sufficient supplies to meet its five consecutive dry year demands, other regulatory constraints, like a declaration of a drought emergency by the Governor of the State of California, State mandated water use reductions, or State-ordered curtailment of water rights, could constrain the District’s water service to its customers.

Table 5-1 below shows the District’s DRA that integrates its supplies for 2021 through 2025 as described in Chapter 3, and reflects the dry year unconstrained Retail system and WCA water uses described in Chapter 4. As the table shows, the District has sufficient water assets available in all years to meet its wholesale water needs.

Table 5-1: Five Year Drought Risk Assessment: Wholesale System (values in acre-feet)

	2021	2022	2023	2024	2025
Supply	45,500	45,500	45,500	45,500	45,500
Demand	40,510	40,780	41,050	41,320	41,590
Difference	4,990	4,720	4,450	4,180	3,910

While Table 5-1 demonstrates sufficient water to meet wholesale needs if there was an extended drought over the next 5 years, Table 5-2 demonstrates the retail equivalent DRA. However, because the District’s overall water supplies are not explicitly earmarked for retail needs, the retail DRA simply indicates a supply that matches the forecast water use presented in Table 4-11. Also note that retail demands are included in the totals shown in Table 5-1.

Table 5-2: Five Year Drought Risk Assessment: Retail System (values in acre-feet)

	2021	2022	2023	2024	2025
Supply	12,420	12,280	12,140	12,000	11,870
Demand	12,420	12,280	12,140	12,000	11,870
Difference	0	0	0	0	0

5.2 Long Term Service Reliability

The UWMPA 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 twenty-five (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 through a 25-year planning horizon for the Wholesale and Retail systems.

5.2.1 Long Term Service Reliability

The District’s long term service reliability reflects the recommended 25-year planning horizon anticipating a normal, single dry, and five consecutive dry years from 2020 through 2045.

Normal and Single Dry Conditions 2025-2045

The District’s future Wholesale water supplies in normal and single dry conditions reflect the same conditions described for the DRA and as detailed in Chapter 3. Specifically, the District has sufficient and reliable water supplies to meet forecasted Retail customer and WCA water needs through 2045 considering water use forecasts for both normal and dry conditions. The customer use information is detailed in Chapter 4 and reflected in the numbers shown in the tables below.

Table 5-3 shows the normal year and single dry year supplies and demands from 2025 through 2045 for the Wholesale System. Table 5-4 displays the data for the Retail system. Similar to the DRA, the Retail system’s supplies are set equal to the forecast Retail customer forecast water use.

Table 5-3: Wholesale System Normal and Single Dry Year Water Supply and Demand through 2045 (values in acre-feet)

Normal Year	2025	2030	2035	2040	2045
Supply	82,200	82,200	82,200	82,200	82,200
Demand	41,700	42,200	41,900	42,600	43,200
Difference	40,500	40,000	40,300	39,600	39,000

Single Dry Year	2025	2030	2035	2040	2045
Supply	46,500	46,500	46,500	46,500	46,500
Demand	41,585	42,110	41,795	42,530	43,160
Difference	4,915	4,390	4,705	3,970	3,340

Table 5-4: Retail System Normal and Single Dry Year Water Supply and Demand through 2045 (values in acre-feet)

Normal Year	2025	2030	2035	2040	2045
Supply	11,300	11,400	11,300	11,400	11,500
Demand	11,300	11,400	11,300	11,400	11,500
Difference	0	0	0	0	0

Single Dry Year	2025	2030	2035	2040	2045
Supply	11,865	11,970	11,865	11,970	12,075
Demand	11,865	11,970	11,865	11,970	12,075
Difference	0	0	0	0	0

Five Consecutive Dry Years 2025 – 2045

As described in Chapter 3, some of the District’s surface water supplies may have constraints in dry years, but are manageable over time such that, overall, the District’s supplies are considered reliable. However, although the District has sufficient supplies to meet its five consecutive dry year demands, other regulatory constraints, like the declaration of a drought emergency by the Governor of the State

of California, State mandated water use reductions, or State-ordered curtailment of the District’s water rights, could require the District to reduce water service to its customers.

The District also assumes that dry year Retail and WCA water use conditions would remain unconstrained during the dry years, causing a slight increase in the actual water need of the District’s retail customers. The City of Roseville demands also decrease, as detailed in Chapter 4. This characterization of water demands provides a conservative estimation of demand conditions in a five-year drought scenario. Together, the supply availability as paired against the slightly increased demand conditions demonstrate that the District has sufficient supplies to meet five consecutive dry year conditions through 2045.

Table 5-5 below shows the annual water supply and demand conditions in five consecutive dry years from 2025 through 2045 for the Wholesale system. Table 5-6 displays the results for the Retail system. Similar to the DRA, the Retail system’s supplies are set equal to the forecast Retail customer forecast water use.

Table 5-5: Wholesale System Five Consecutive Dry Years Water Supply and Demand through 2045 (values in acre-feet)

		2025	2030	2035	2040	2045
Year 1	Supply	46,500	46,500	46,500	46,500	46,500
	Demand	41,590	42,110	41,800	42,530	43,160
	Difference	4,910	4,390	4,700	3,970	3,340
Year 2	Supply	46,500	46,500	46,500	46,500	46,500
	Demand	41,846	42,210	41,740	42,670	43,280
	Difference	4,654	4,290	4,760	3,830	3,220
Year 3	Supply	46,500	46,500	46,500	46,500	46,500
	Demand	42,101	42,310	41,680	42,810	43,400
	Difference	4,399	4,190	4,820	3,690	3,100
Year 4	Supply	46,500	46,500	46,500	46,500	46,500
	Demand	42,357	42,410	41,620	42,950	43,520
	Difference	4,143	4,090	4,880	3,550	2,980
Year 5	Supply	46,500	46,500	46,500	46,500	46,500
	Demand	42,612	42,510	41,560	43,090	43,640
	Difference	3,888	3,990	4,940	3,410	2,860

Table 5-6: Retail System Five Consecutive Dry Years Water Supply and Demand through 2045 (values in acre-feet)

		2025	2030	2035	2040	2045
Year 1	Supply	11,870	11,970	11,870	11,970	12,080
	Demand	11,870	11,970	11,870	11,970	12,080
	Difference	0	0	0	0	0
Year 2	Supply	11,738	11,990	11,850	11,990	12,100
	Demand	11,738	11,990	11,850	11,990	12,100
	Difference	0	0	0	0	0
Year 3	Supply	11,606	12,010	11,830	12,010	12,120
	Demand	11,606	12,010	11,830	12,010	12,120
	Difference	0	0	0	0	0
Year 4	Supply	11,474	12,030	11,810	12,030	12,140
	Demand	11,474	12,030	11,810	12,030	12,140
	Difference	0	0	0	0	0
Year 5	Supply	11,342	12,050	11,790	12,050	12,160
	Demand	11,342	12,050	11,790	12,050	12,160
	Difference	0	0	0	0	0

5.3 Annual Reliability Assessment

The District will consider current supply and demand conditions and perform an annual water supply and demand assessment (Annual Assessment) for the Wholesale and Retail systems pursuant to Water Code Section 10632.1 to evaluate real-time or near-term circumstances that are different than the DRA scenario. This assessment will 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 the District’s existing water supplies as described in Chapter 3. Two scenarios are illustrated:

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 Normal Year Supply and Current Water Use

The District’s current normal year water supply and demand conditions represent the expected water supply and demand conditions for the Wholesale and Retail systems that would likely occur based upon a reasonable assessment of regional and statewide hydrology and limited regulatory constraints. Under these conditions, the District anticipates that its access to its current surface water supplies would be fully available.

The District’s characterization of current water use conditions represents an historical assessment of water use within the District, as well as providing the basis for reasonable characterizations of growth and potential customer use patterns. The combination of these considerations presents a normal water year use assessment that is incorporated into this reliability determination. Water use in normal conditions is generally lower in wetter months and higher in drier months. The demands also account for reasonable water conservation measures for existing and future customers 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 water use conditions are described in significant detail in Chapter 4.

Table 5-7 below shows the 2021 normal year water supply and demand conditions for the District’s service area. Table 5-8 displays the results for the Retail system. Similar to the DRA, the Retail system’s supplies are set equal to the forecasted Retail customer water use.

Table 5-7: Wholesale System Current Normal Year Water Supply and Demand (values in acre-feet)

Normal Year	Current
Supply	82,200
Demand	40,420
Difference	41,780

Table 5-8: Retail System Current Normal Year Water Supply and Demand (values in acre-feet)

Normal Year	Current
Supply	11,960
Demand	11,960
Difference	0

5.3.2 Single Dry Year Supply and Dry-Year Current Demand

The District defines a single dry year condition as one that may result in reduced water supply availability depending on each source. Nevertheless, the District’s water supplies are considered reliable in single dry year conditions based upon the District’s flexible management as described in Chapter 3.

Single dry year demands include the anticipated demands based upon historical trends in water usage during drought conditions by the District’s customers. Water use in dry conditions may increase in the normally wetter months as limited rainfall could increase customer uses for outdoor irrigation. These conditions are described in Chapter 4 and reflected in the tables below. The analysis uses the “current” water use, adjusted as described in Chapter 4.

Table 5-9 below shows the single dry year water supply and demand conditions. Table 5-10 displays the results for the Retail system. Similar to the DRA, the Retail system’s supplies are set equal to the forecast Retail customer forecast water use.

Table 5-9: Wholesale System Current Single Dry Year Water Supply and Demand (values in acre-feet)

Single Dry Year	Current
Supply	45,500
Demand	40,240
Difference	5,260

Table 5-10: Retail System Current Single Dry Year Water Supply and Demand (values in acre-feet)

Single Dry Year	Current
Supply	12,560
Demand	12,560
Difference	0

5.4 Water Supply Reliability Summary

The District’s water supply portfolio is capable of meeting the water uses in its Wholesale and Retail service areas in normal, single dry, and five consecutive dry years from 2020 through 2045.

Chapter 6

Water Shortage Contingency Plan

SJWD’s Wholesale System Water Shortage Contingency Plan (WSCP) is provided in Appendix A. SJWD’s Retail System WSCP is provided in Appendix B.

The WSCPs have been updated to address new requirements⁵³ of the CWC.

The Retail System WSCP presents the District’s response actions, as well as regulations on end uses that, when taken together, facilitate reduction in a retail supply-demand shortage condition.

The Wholesale System WSCP provides the District’s guidance on appropriate actions to be taken during various supply shortage conditions.

Key components of the WSCPs include:

Legal Authorities – Explains the legal authorities relied on by SJWD to employ the WSCPs.

Water Supply Reliability Analysis – Presents results from SJWD’s near- and long-term reliability assessments included in this 2020 UWMP.

Water Supply and Demand Assessment Procedures – Outlines the data and annual procedures SJWD will rely on to identify shortage conditions.

Water Shortage Stages – Presents the shortage response actions to be employed during the four water shortage stages.

Communication Protocols – Provides communication protocols SJWD will utilize for conveying WSCP messaging.

Financial Consequences of Enacting WSCP – Presents the potential financial consequences and mitigation actions resulting from enactment of the WSCP.

⁵³ In 2018, Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman) (collectively referred to as the 2018 Water Conservation and Drought Planning Legislation) were enacted, which included new requirements for water shortage contingency planning.

Appendix A

Wholesale System

Water Shortage Contingency Plan

A.1 Wholesale System Water Shortage Contingency Plan

This Wholesale Water Shortage Contingency Plan (Wholesale WSCP) presents San Juan Water District’s (SJWD or District) plan and approach for identifying and mitigating various wholesale water shortage conditions should they arise. This Wholesale WSCP satisfies the requirements of California Water Code (CWC) §10632 and has been produced as part of SJWD’s 2020 Urban Water Management Plan (UWMP) update, although SJWD’s Wholesale WSCP and Retail WSCP can be amended, as needed, without the need to amend the UWMP. It is noted, the CWC does not exclude the District from taking actions not specifically contained in its WSCPs in response to supply shortage conditions.

The District maintains a companion Wholesale Surface Water Supply and Water Shortage Management Plan (WSMP) that provides additional detail specific to the District’s implementation of its responsibilities to allocate water supplies pursuant to the Wholesale Water Supply Agreement with the Wholesale Customer Agencies (WCAs) – City of Folsom, Citrus Heights Water District, Fair Oaks Water District and Orangevale Water Company. The WSMP is included for reference as Attachment A.

A.1.1 Legal Authorities

SJWD is organized under the Community Services District Law (California Government Code (CGC) §§61000-61250)⁵⁴ and is authorized to acquire and control waters for beneficial uses (CGC §61100 and CWC §71610). This authorization is, and has been, carried out consistent with Article X, Section 2, of the California Constitution, which declares and requires that water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use of water be prevented.

SJWD’s power to enact and enforce water shortage contingency plans is found in CWC §71640, which authorizes SJWD to restrict the use of water it supplies during any threatened or existing water shortage, and to prohibit wastage of water during such periods. SJWD is authorized to prescribe and define by ordinance such restrictions, prohibitions and exclusions as SJWD determines to be necessary (CWC §71641). SJWD’s findings as related to its adopted restrictions, prohibitions and exclusions

⁵⁴ The Community Services District Law states at §61100, “Within its boundaries, a district may,...Supply water for any beneficial uses, in the same manner as a municipal water district, formed pursuant to the Municipal Water District Law of 1911, Division 20 (commencing with Section 71000) of the Water Code.”

continue unchanged unless and until a contrary finding is made by the SJWD Board by resolution or ordinance (CWC §71642).

The aforementioned powers derived from SJWD’s organizing statutes are in addition to general powers granted to water distributors in CWC §§350-359 and §§375-378. CWC §350 authorizes the governing body of a distributor of a public water supply to declare a water shortage emergency whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent there would be insufficient water for human consumption, sanitation, and fire protection. Upon a finding of such an emergency condition, the distributor can adopt such regulations and restrictions on the delivery and consumption of water as will conserve the water supply for the greatest public benefit, with particular regard to domestic use, sanitation, and fire protection (CWC §353). The regulations and restrictions remain in force and effect until the supply of water available for distribution within such area has been replenished or augmented, and restrictions may include the right to deny new service connections and discontinue service for willful violations (CWC §355 and §356).

SJWD’s Board of Directors (Board) has also ratified other policies, rules, and plans to identify and manage supply-shortage conditions and initiate appropriate response actions. SJWD’s WSMP aims to address situations when available wholesale supplies are insufficient to meet all WCA wholesale demands, including those of SJWD’s Retail customers. The WSMP was originally developed in 2008, recently updated, and the revised WSMP was adopted by the District’s Board of Directors on April 28, 2021.

If conditions warrant, SJWD will coordinate with any city or county within which it provides water supply services for the possible proclamation of a “local emergency” pursuant to the California Emergency Services Act (see CGC §8558).

A.1.2 Water Supply Reliability Analysis

As part of SJWD’s UWMP, reliability planning was conducted to evaluate the SJWD’s ability to meet wholesale demands. Two separate efforts were conducted to characterize both long- and near-term reliability scenarios. A *Water Reliability Assessment* incorporating analyses of a normal water year, a single dry year, and a drought lasting five consecutive years, has been conducted to evaluate the District’s long-term supply/demand balance over the next 25 years, in five-year increments. A *Drought Risk Assessment* has also been conducted which assumes the occurrence of a drought over the next five years, and provides an assessment of the District’s near-term reliability.

Results of both *Assessments* identified above are presented in detail in the District’s 2020 UWMP and conclude SJWD has sufficient wholesale supplies through 2045 to meet demands under the normal, single dry year, and five-year drought conditions. Similarly, the District’s *Drought Risk Assessment* demonstrated SJWD would be able to access and deliver sufficient supplies to meet expected wholesale demands during a drought occurring over the next five consecutive years (2021-2025). It is noted that regulatory and/or State emergency declarations have in the past required the District to conserve significant amounts of water notwithstanding having sufficient supplies available to meet higher customer demands. This could occur again in the future, with SJWD having to make a supply shortage

stage declaration pursuant to this WSCP, triggered by external regulatory requirements rather than its actual water supply availability.

A.1.3 Annual Wholesale Water Supply and Demand Assessment Procedures

The District conducts an *Annual Wholesale Supply and Demand Assessment* to help inform water resources management decisions for the coming year. The analysis incorporates numerous data sources and evaluation criteria to project probable demands and supply availability, as well as coordination with the WCAs. The detailed procedures and data analysis are presented in the WSMP -- Attachment A to this Wholesale WSMP.

The *Annual Wholesale Water Supply and Demand Assessment* process is a collaborative effort conducted in consultation with the WCAs. The District may modify this process based on available data, significant events, process restrictions, or other external factors that may impact the process. Pursuant to the WSMP, and this WSCP, the Board maintains exclusive purview to make a shortage declaration.

The general procedure for developing the annual wholesale water supply/demand assessment is as follows:

1. Compile existing weather data and available forecasts.
2. The projected dry year supply availability is based on 2015 conditions, with a corresponding supply availability that totaled 54,200 AF⁵⁵. SJWD may modify this supply availability based on conditions at the time of the assessment.
3. Receive and review unconstrained demand projections for SJWD Retail and the WCAs.
4. Assess available wholesale supply based on projections for current year and dry year scenarios.
5. Identify and incorporate any applicable constraints (infrastructure, regulatory, etc.) regarding accessibility of supply, as well as delivery thereof.
6. Compare projected wholesale supplies with anticipated wholesale demands.
7. Develop, analyze, and propose water resource management strategies to address the projected demand to supply comparison, including reference to the water shortage stages identified in the District's Retail WSCP as well as coordination with the WCA's respective WSCPs.
8. *Annual Wholesale Water Supply and Demand Assessment* (and proposed conservation stage declaration, if applicable) presented to the SJWD Board of Directors.

The general proposed timeline is as follows:

⁵⁵ Based on the limitation of diversions defined for conference years in the District's Purveyor-Specific Agreement in the Water Forum Agreement. 2015 was a conference year.

- Begin assessment by District staff and WCAs – February
- Present assessment to Board of Directors – April
- Submit to State per CWC §10632.1 – No later than July 1

A.1.4 Water Shortage Stages

The District’s WSCP includes operational criteria for a “Normal Water Supply” condition as well as for four water shortage stages. Results from the *Annual Wholesale Water Supply and Demand Assessment* are presented to the Board to determine if a respective shortage stage needs to be declared. The WSMP provides procedures and process for SJWD actions and supply delivery reductions based on each respective WCA’s past supply deliveries and other factors. The percent reduction of supply deliveries will be determined for each respective WCA and under each respective declared shortage condition. The five supply stages are:

Normal Water Supply: no restrictions on supply availability

Stage 1 – Alert: up to 10 percent supply shortage

Stage 2 – Warning: up to 25 percent supply shortage

Stage 3 – Crisis: up to 50 percent supply shortage

Stage 4 – Emergency: over 50 percent supply shortage

The stages presented in this Wholesale WSCP differ from the State-identified shortage levels of 10, 20, 30, 40, 50, and greater than 50 percent shortage. Pursuant to CWC §10632(a)(3)(B), Table A-1 cross-references this Wholesale WSCP’s shortage levels to the State-identified levels. SJWD supply characteristics and reliability are better suited for the existing four drought stages identifying 10, 25, 50, and >50 percent supply shortages.

Table A-1. Corresponding Shortage Levels

State Mandated Shortage Levels	SJWD WSCP Stages	
Stage 1: 0 – 10%	Stage 1 – Alert	0 – 10%
Stage 2: 10 – 20%	Stage 2 – Warning	10 – 25%
Stage 3: 20 – 30%	Stage 2 – Warning Stage 3 – Crisis	10 – 25% 25 – 50%
Stage 4: 30 – 40%	Stage 3 – Crisis	25 – 50%
Stage 5: 40 – 50%	Stage 3 - Crisis	25 – 50%
Stage 6: >50%	Stage 4 - Emergency	>50%

A.1.5 Communication Protocols

Communication protocols for the Wholesale WSCP include outreach and notification to the WCAs and customers and entities within the District upon a change in stage declaration. Such communication will be delivered by direct-mail, electronic mail, District website, and media outlets. Other regional agencies, including the Regional Water Authority (RWA), will be notified of the initiation of the identified shortage stage and subsequent Wholesale WSCP stage declarations.

SJWD will coordinate with its WCAs, Placer County Water Agency (PCWA), Sacramento Suburban Water District (SSWD), the cities of Roseville and Folsom, as well as the counties of Placer and Sacramento, if anticipated water supplies and demands necessitate the declaration of a local emergency.

A.1.6 Financial Consequences of WSCP

Decreased revenues and increased costs are expected during water shortage conditions. Approximately 27 percent of the District's wholesale operating revenues are normally derived from volumetric charges. Assuming a reduction in sales commensurate with a particular WSCP stage declaration, a decrease in total revenues in the range of 2.7 to 11 percent may be expected.

Public outreach and regional coordination efforts are expected to increase total costs to the District when operating under a water shortage condition. These additional efforts become prioritized for current staff, and other normal work efforts and projects are likely to be delayed or reassigned. If conditions warrant, the District may need to hire additional staff or seek assistance through third-party service providers.

Although wholesale water deliveries fell more than 40 percent during the last drought (FY 2012-13 through FY 2015-16), various factors and actions resulted in water rate revenue only declining in FY 2014-2015.

First, water rates were increased significantly during the drought as follows:

FY 2014-15: Rates restructured – volumetric rate reduced, OM&R fixed rate increased and capital facility charges assessed on three of five wholesale customer agencies. Effective 15.3% increase.

FY 2015-16: 5% rate increase.

Second, the District used approximately \$132,700 of its wholesale capital reserves to fund wholesale operations in FY 2015-16.

Expenses affected by a drought include the cost of purchased water, power costs to pump water, and water efficiency program costs. Water purchase costs can fluctuate significantly depending on the year. Power costs will decrease with less pumping and treatment. Water efficiency program costs increase due to the need to amplify conservation messaging throughout the Wholesale system service area.

Historically, savings resulting from reduced costs of purchased water and energy have been greater than the costs associated with increasing the District’s conservation program efforts. For example, during the last drought the cost of purchased water fell 67% (due in large part to a restructuring of the take or pay agreement with PCWA), power costs fell 49%, chemical costs fell 22% and water efficiency program costs increased 68%. Taken together, reflecting the different scales of these four expense categories, the District experienced a net 48.7% decrease in their combined costs. Ultimately, these savings partially mitigated the impact of the rate revenue reduction over the same period.

Most of the District’s operating expenses are fixed, meaning the costs of maintaining and operating the system do not change much based upon more or less water flowing through the distribution system for delivery. Variable costs, which are closely related to the amount of water delivered, include power for the water treatment plant, chemicals for water treatment, as well as the actual cost of water. Operating expenses decreased approximately 3% from FY 2012-13 (pre-drought) to FY 2015-16 (end of drought), although not all of that decrease is solely attributable to the drought.

As a consequence of the District applying the last five rate increases to only the fixed component of the rate, future droughts should have less of an impact on revenues than that seen in the last drought.

SJWD maintains financial reserves that can be used to buffer potential revenue impacts of reduced wholesale and retail water sales during a WSCP stage declaration, should it be prudent to do so. These reserves are a tool that can be used by the District to maintain more stable rates during times of imbalanced revenues and expenses that may be caused by reduced water usage during dry periods. In addition to utilizing financial reserves, the District may enact a range of financial management actions depending on the specific situation that could include:

- Enact Drought Rate structure (Stage 2 and higher)
- Capital project deferment
- Operational and maintenance expense deferment

A.1.7 Plan Adoption, Submittal, and Availability

The Wholesale and Retail WSCPs (including subsequent updates) shall be adopted in accordance with standard District procedures, including requirements for public participation (public hearing), and approval by the SJWD Board of Directors. Upon adoption, the WSCPs will be submitted to DWR within 30 days. The adopted WSCPs will be available on the District’s website, as well as at the District office.

Attachment A – Surface Water Supply and Water Shortage Management Plan

SAN JUAN WATER DISTRICT SURFACE WATER SUPPLY AND WATER SHORTAGE MANAGEMENT PLAN Adopted April 28, 2021

BACKGROUND

The Wholesale Water Agreement(s) ("Agreement(s)") between San Juan Water District ("San Juan") and each of the Member Agencies, include the section "Water Shortages and Interruptions in Water Deliveries", which specifies shortages of surface water supplied by San Juan Wholesale to the Member Agencies will be allocated in accordance with a "Surface Water Supply and Water Shortage Management Plan" ("Plan").

This Plan provides the framework and guidance for managing and distributing San Juan's available surface water supplies during times of shortage arising from drought, regulatory mandates, or system outage.

Citrus Heights Water District ("CHWD") and Fair Oaks Water District ("FOWD") possess and regularly operate groundwater extraction facilities to supplement their purchase and delivery of surface water supplies from San Juan, and to support conjunctive use operations undertaken in collaboration with San Juan. Orange Vale Water Company ("OVWC") currently does not utilize groundwater resources, but this may change in the future.

San Juan's retail enterprise, the City of Folsom ("Folsom") and OVWC, in partnership with the Sacramento Suburban Water District (SSWD), funded the construction of a "Pump Back Project" to provide for the potential delivery of groundwater extracted by SSWD to San Juan, Folsom and OVWC.

PRINCIPLES

This Plan is based on the following principles:

1. All conditions and limitations related to the disposition of surface water delivered by San Juan to the Member Agencies, as delineated in their individual Agreements, remain in force and are in no way modified by this Plan.
2. This Plan is intended to provide a framework for the allocation of San Juan's surface water supplies when those supplies are determined to be insufficient to meet demands throughout its wholesale service area under regular operations.

3. San Juan and the Member Agencies are committed to the coequal objectives of the Water Forum Agreement to: (a) provide a reliable and safe water supply for the Sacramento region's economic health and planned

development through the year 2030; and (b) preserve the fishery, wildlife, recreational and aesthetic values of the Lower American River. San Juan's purveyor-specific Water Forum Agreement includes specified reductions in the amount of surface water that San Juan will divert from Folsom Reservoir during specified dry-year conditions. This Plan, and operations pursuant to it, will be consistent with the terms of the Water Forum Agreement.

4. San Juan will consult with the Member Agencies prior to making a surface water Shortage Year declaration initiating implementation of the Plan. The decision to make such a declaration, or not, however, is within the exclusive purview of the San Juan Board of Directors.

5. San Juan Retail and the Member Agencies will equitably share available surface supplies during times of shortage. A proportional allocation, based upon average surface water deliveries to San Juan Retail and each of the Member Agencies over the five (5) non-shortage years prior to the Shortage Year shall be used to determine the amount of surface water available to each entity during the Shortage Year. This calculation will incorporate necessary accounting for additional groundwater pumping undertaken in support of a groundwater substitution transfers should one or more have occurred during the prior five (5) non-shortage years, i.e. under such a circumstance an appropriate baseline of average pumping plus the associated surface water supply foregone will be applied in the proportional allocation calculation.

6. This Plan will be implemented in a manner that protects the water supplies and financial interests of affected ratepayers, including investments in existing facilities.

DEFINED TERMS

In addition to the terms defined in the Agreement, the following terms are defined as set forth in this section:

7. **"Emergency Shortage"** means a situation in which water supplies are temporarily interrupted due to equipment failure, power outage, or other incident not related to dry hydrology.

8. **"Member Agencies"** means, collectively, CHWD, FOWD, Folsom and OVWC.

9. **"Shortage Year"** means a timeframe during which available

surface water supplies are inadequate to meet projected demands, due to dry hydrologic conditions.

10. **"San Juan's Water Treatment and Conveyance Facilities"** means the water diversion, pumping, treatment and conveyance facilities that are used by San Juan to make surface water available to the Member Agencies.

11. **"Water Forum Agreement"** means the Memorandum of Understanding dated January 2000 among various signatories that includes a purveyor-specific agreement for San Juan's wholesale service area.

SURFACE WATER SUPPLY SHORTAGE

Surface Water Supplies Generally Available To San Juan

12. San Juan delivers to the Member Agencies, pursuant to individual Agreements, and its retail enterprise, surface water from supplies that are available to San Juan from time to time, as described in the Agreements.

13. The total amounts of water delivered to San Juan by Reclamation under its pre-1914 water right and its appropriative water right permit is 33,000 acre-feet per year. San Juan's 1954 settlement agreement with Reclamation requires this water to be delivered to San Juan in perpetuity without diminution. These water rights are subject to potential curtailment by the State Water Resources Control Board (SWRCB).

14. The amount of water available annually under San Juan's Central Valley Project (CVP) Water Service and Facilities Repayment contract and San Juan's water supply agreement with Placer County Water Agency (PCWA) are subject to reduction during times of shortage in accordance with the terms of those agreements. In addition, under the Water Forum Agreement, San Juan is expected to reduce surface water diversions as specified during certain dry years.

15. San Juan's ability to deliver water supplies to meet Member Agency demands is subject to interruption as a result of damage to and/or maintenance of the water storage and conveyance facilities used by Reclamation to deliver San Juan's water supplies, or as a result of damage to and/or maintenance of San Juan's Water Treatment and Conveyance Facilities. Should this occur, an Emergency Shortage may be declared by San Juan and the Mutual Aid and Assistance Agreement entered into by San Juan and the Member Agencies on November 3, 2011 will be implemented.

Process for Determining and Invoking a Shortage Year Declaration

16. San Juan will inform the Member Agencies of interim and final CVP allocations when received from Reclamation, as well as whether there is concern regarding potential SWRCB curtailment of either of San Juan's water rights and/or a shortage imposed by PCWA on San Juan's PCWA contract entitlement. San Juan will convene a meeting with the Member Agencies each February to discuss estimated wholesale surface supply availability, based on then current information regarding access to water rights, its CVP allocation, and availability of PCWA entitlement water, as well as data related to snowpack, reservoir levels, precipitation and weather forecasts: including, but not limited to; the Department of Water Resources' (DWR) California Snow Water Content, Percent of April 1 Average graph; DWR's North Sierra Precipitation 8 Station Index graph; the Water Forum's Unimpaired Inflow to Folsom Reservoir reports; and American River Group Monthly Folsom Storage Forecasts. San Juan and the Member Agencies will also review demand projections from each Member Agency and then jointly and collaboratively evaluate whether or not a Shortage Year declaration recommendation may be necessary.

17. Should a Shortage Year declaration appear to be necessary, or should conditions change subsequent to the February meeting, San Juan will timely convene subsequent meetings/conference calls with the Member Agencies to refine the analysis and consider potential response actions.

18. The decision to make a Shortage Year declaration, or not, resides within the exclusive purview of the San Juan Board of Directors.

19. If a Shortage Year is declared, San Juan Wholesale will deliver a percentage of the total surface water available to San Juan Retail and each of the Member Agencies equivalent to the average of each agency's total deliveries divided by the average of total surface water deliveries to San Juan Retail and the Member Agencies by San Juan Wholesale during the five (5) non-shortage years prior to that Shortage Year, taking into account additional groundwater pumping undertaken in support of groundwater substitution transfers as described in Article 5 above.

20. If a Shortage Year is declared, San Juan and the Member Agencies will work collaboratively to develop a monthly delivery schedule, whereby aggregate deliveries to San Juan Retail or any Member Agency in that water year will not exceed its proportional share of the total supply of surface water available to San Juan Wholesale.

Annual Review

21. San Juan and the Member Agencies will have an opportunity to review and discuss potential amendments to this Plan annually as part of the

consultations described in Article 17 above. Any revisions, if adopted by the San Juan Board of Directors, will go into effect no later than the following July 1st.

Appendix B

Retail System

Water Shortage Contingency Plan

B.1 Retail System Water Shortage Contingency Plan

This Water Shortage Contingency Plan (WSCP) presents San Juan Water District’s (SJWD or District) plan and approach for identifying and mitigating various water shortage conditions should they arise. This WSCP satisfies the requirements of California Water Code (CWC) §10632 and has been produced as part of SJWD’s 2020 Urban Water Management Plan (UWMP) update, although the WSCP can be amended, as needed, without the need to amend the UWMP. It is noted, the CWC does not exclude the District from taking actions not specifically contained in its WSCP in response to supply shortage conditions.

B.1.1 Legal Authorities

SJWD is organized under the Community Services District Law (California Government Code (CGC) §§61000-61250)⁵⁶ and is authorized to acquire and control waters for beneficial uses (CGC §61100 and California Water Code (CWC) §71610). This authorization is, and has been, carried out consistent with Article X, Section 2, of the California Constitution, which declares and requires that water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use of water be prevented.

SJWD’s power to enact and enforce water shortage contingency plans is found in CWC §71640, which authorizes SJWD to restrict the use of water it supplies during any threatened or existing water shortage, and to prohibit wastage of water during such periods. SJWD is authorized to prescribe and define by ordinance such restrictions, prohibitions and exclusions as SJWD determines to be necessary (CWC §71641). SJWD’s findings as related to its adopted restrictions, prohibitions and exclusions continue unchanged unless and until a contrary finding is made by the SJWD Board by resolution or ordinance (CWC §71642).

The aforementioned powers derived from SJWD’s organizing statutes are in addition to general powers granted to water distributors in CWC §§350-359. CWC §350 authorizes the governing body of a distributor of a public water supply to declare a water shortage emergency whenever it finds and

⁵⁶ The Community Services District Law states at §61100, “Within its boundaries, a district may,...Supply water for any beneficial uses, in the same manner as a municipal water district, formed pursuant to the Municipal Water District Law of 1911, Division 20 (commencing with Section 71000) of the Water Code.”

determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent there would be insufficient water for human consumption, sanitation, and fire protection. Upon a finding of such an emergency condition, the distributor can adopt such regulations and restrictions on the delivery and consumption of water as will conserve the water supply for the greatest public benefit, with particular regard to domestic use, sanitation, and fire protection (CWC §353). The regulations and restrictions remain in force and effect until the supply of water available for distribution within such area has been replenished or augmented, and restrictions may include the right to deny new service connections and discontinue service for willful violations (CWC §355 and §356).

The District’s Board has adopted its UWMP and WSCP in Resolutions XXXX and XXXX, respectively. The two Resolutions authorize the implementation and enforcement of this WSCP, which is included in the 2020 UWMP. The District will also revise its Ordinances that incorporate the WSCPs (Ordinances 23000 and 23000.03).

SJWD also coordinates with any city or county within which it provides water supply services for the possible proclamation of a “local emergency” pursuant to the California Emergency Services Act (see CGC §8558).

B.1.2 Water Supply Reliability Analysis

As part of SJWD’s UWMP, reliability planning was conducted to evaluate the District’s ability to meet demands. Two separate efforts were conducted to characterize both long- and near-term reliability scenarios. The Water Reliability Assessment is conducted for a normal year, single dry year, and a drought lasting five consecutive years, and is used to evaluate long-term supplies with demands over the next 25 years, in five-year increments. The Drought Risk Assessment assumes the occurrence of a drought over the next five years, and aims to assess the District’s near-term reliability.

Results from the Water Reliability Assessment indicate SJWD has ample supplies through 2045 to meet demands under the normal, single dry year, and five-year drought conditions. Similarly, the District’s Drought Risk Assessment indicates sufficient supplies to meet expected demands during an assumed drought occurring in the next five consecutive years (2021-2025).

B.1.3 Annual Water Supply and Demand Assessment Procedures

The District conducts an annual analysis of supply and demand projections to help inform water resources management decisions for the coming year. The analysis incorporates numerous data sources and evaluation criteria to project probable demands and supply availability for the coming year, including:

- Projected weather conditions
 - Precipitation versus historical
 - Snow survey results
- Projected Unconstrained Demand

- Production versus historic on monthly basis
- New customer growth
- Identify artificially supplied water features separate from swimming pools and parks
- Water Use Objective Reports

- Projected Supply Availability
 - Folsom Lake level
 - Folsom Lake projected inflow
 - USBR forecasts
 - SJWD supply projections
 - Antelope pump back availability
 - PCWA supply availability

- Regulatory conditions and mandates

The general procedure for developing the annual water supply/demand assessment is listed below. The District may modify this process based on available data, significant events, process restrictions, or other external factors that may impact the process.

1. Compile existing weather data and available forecasts.
2. The projected dry year supply availability is based on 2015 conditions, with a corresponding supply availability that totaled 54,200 AF⁵⁷. The District may modify this supply availability based on conditions as the time of the assessment.
3. Estimate unconstrained District demands based on recent and representative customer use data. Development of unconstrained demand will incorporate recent use patterns (unit factors for each customer type) and anticipated customer growth.
4. Assess available supply based on projections for current year and dry year scenarios.
5. Identify and incorporate any applicable constraints (infrastructure, regulatory, etc.) regarding accessibility of supply.
6. Compare projected supplies with anticipated District demands.
7. Develop, analyze, and propose water resource management strategies to address the projected demand to supply comparison, including reference to the water shortage stages identified in this WSCP.
8. Annual Water Supply and Demand Assessment (and proposed conservation stage declaration, if applicable) presented to the SJWD Board of Directors for concurrence.

⁵⁷ Based on the limitation of diversions defined for conference years in the District's Purveyor-Specific Agreement in the Water Forum Agreement. 2015 was a conference year.

The general proposed timeline is as follows:

- Begin assessment by District staff – March/April
- Present assessment to Board of Directors – May
- Submit to State per CWC §10632.1 – No later than July 1

B.1.4 Water Shortage Stages

The following subsections and tables present information on the District’s supply scenarios, including Normal Water Supply and four water shortage stages. Results from the Annual Water Supply and Demand Assessment are used to determine if a respective shortage stage needs to be declared.

No provisions of this WSCP shall apply to fire hydrants, fire mains, fire sprinkler lines or other equipment used solely for fire protection purposes. Nor shall any provisions apply to any hospital, health care or convalescent facility or any other type of facility where the health and welfare would be affected by restrictions on water used, nor shall it apply to veterinary hospitals. Such facilities are encouraged to conserve water to the extent possible. However, this WSCP does apply to the outdoor grounds, yards, and parking areas of these facilities.

Normal Water Supply

Under Normal Water Supply conditions, the District’s water supply and distribution system is expected to be able to meet all the water demands of its customers in the immediate future. Regulations for Normal Water Supply are applicable to all stages and include the following:

1. Water shall be used for beneficial purposes only; all unnecessary and wasteful uses of water are prohibited.
2. Water shall be confined to the customer’s property and shall not be allowed to run off to adjoining properties or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.
3. Free-flowing hoses for all uses are prohibited. Automatic shut-off devices shall be attached on any hose or filling apparatus in use.
4. Leaking customer pipes or faulty sprinklers shall be repaired within five working days or less if warranted by the severity of the problem.
5. All pools, spas, and ornamental fountains/ponds shall be equipped with a recirculation pump and shall be constructed to be leak-proof.
6. Washing streets, parking lots, driveways, sidewalks, or buildings, except as necessary for health, esthetic or sanitary purposes, is prohibited.

Appendix B – Retail Water Shortage Contingency Plan

7. Customers are encouraged to take advantage of the District’s water conservation programs and rebates.

Stage 1 – Alert (10% Supply Shortage)
<p>Actions and regulations in place under Normal Water Supply conditions, plus those listed below. When implemented as a whole program, these actions together are expected to eliminate up to a 10 percent gap between supplies and demands.</p>
<p>District Actions</p> <ul style="list-style-type: none"> • Increase drought awareness through additional public outreach measures that notify public and customers of declared stage, requirements, and available conservation program support. • Leak repair on District mains and laterals receives higher priority. • Standard rates in effect. • Increased monitoring of customer use. • Accelerate applicable infrastructure repairs and improvements.
<p>Customer Actions</p> <ul style="list-style-type: none"> • Reduce total water use by 10% compared to normal use. Contact the District or visit sjwd.org for tips and techniques to reduce indoor and outdoor water use. • Leaking customer pipes or faulty sprinklers shall be repaired within two working days or less if warranted by the severity of the problem. • Outdoor irrigation is limited to three days per week. Odd addresses, streetscapes, and medians shall limit watering to Tuesdays, Thursdays, and Saturdays; even addresses shall limit watering to Wednesdays, Fridays, and Sundays. • Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations. • Users of construction meters and fire hydrant meters will be monitored for efficient water use.

Stage 2 – Warning (25% Supply Shortage)
<p>Actions and regulations in place under preceding stages, plus those listed below. When implemented as a whole program, these actions together are expected to eliminate up to a 25 percent gap between supplies and demands.</p>
<p>District Actions</p> <ul style="list-style-type: none"> • Increase drought awareness through additional public outreach measures that notify public and customers of declared stage, requirements, and available conservation program support. • Decrease system flushing frequency. • Implement Drought Rates consistent with Proposition 218 and California law. • Implement water waste/use patrols.
<p>Customer Actions</p> <ul style="list-style-type: none"> • Reduce total water use by 25% compared to normal use. Contact the District or visit sjwd.org for tips and techniques to reduce indoor and outdoor water use. • Leaking customer pipes or faulty sprinklers shall be repaired within 24 hours or less if warranted by the severity of the problem. • Outdoor irrigation is limited to two days per week on the assigned day, and shall be confined to customer’s property. Odd addresses, streetscapes, and medians shall limit watering to Tuesdays and Saturdays; even addresses shall limit watering to Wednesdays and Sundays. No irrigation is permitted on Mondays, Thursdays and Fridays. Irrigation should be limited to the minimal amount of water necessary to keep plants and trees alive. • Application of potable water to outdoor landscapes during and within 24 hours after measurable rainfall is prohibited.

Appendix B – Retail Water Shortage Contingency Plan

- Restaurants shall serve water only upon request.

**Stage 3 – Crisis
(50% Supply Shortage)**

Actions and regulations in place under preceding stages, plus those listed below. When implemented as a whole program, these actions together are expected to eliminate up to a 50 percent gap between supplies and demands.

District Actions

- Increase drought awareness through additional public outreach measures that notify public and customers of declared stage, requirements, and available conservation program support.
- No commitments will be made to provide service for new water service connections.
- Increase water waste/use patrols.

Customer Actions

- Reduce total water use by 50% compared to normal use. Contact the District or visit sjwd.org for tips and techniques to reduce indoor and outdoor water use.
- Leaking customer pipes or faulty sprinklers shall be repaired immediately. Water service will be suspended until repairs are made.
- Outdoor irrigation is limited to one day per week on the assigned day, and shall be confined to customer’s property. Even number addresses may irrigate only on Tuesdays and odd number addresses may irrigate only on Wednesdays.
- Application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall is prohibited.
- Water for flow testing and construction purposes from fire hydrants and blow-offs using District water supplies is prohibited. Prohibited uses include, but not limited to, dust control, compaction, or trench jetting. Use of regulatory compliant reclaimed water for construction purposes is encouraged. Reclaimed water is not currently available within the District’s service area and would need to be obtained elsewhere.
- Flushing of sewers or fire hydrants is prohibited except in case of emergency and for essential operations or unless specifically authorized by the District.
- Installation of new turf, lawn, and/or landscaping is prohibited until the District moves to a Stage 2 or less.
- Automobiles or equipment shall be washed only at commercial establishments that use recycled or reclaimed water.
- Special Water Feature Distinction – No potable water from the District’s system shall be used to fill or refill swimming pools, artificial lakes, ponds or streams. Water use for ornamental ponds, artificial lakes, and/or fountains is prohibited.

Stage 4 – Emergency (Over 50% Supply Shortage)
Actions and regulations from preceding stages plus those listed below. Actions will be identified to address each specific shortage situation to eliminate the gap between supplies and demands.
District Actions <ul style="list-style-type: none"> • Increase drought awareness through additional public outreach measures that notify public and customers of declared stage, requirements, and available conservation program support. • Health and safety use of water only. • Declare Water Shortage Emergency in accordance with Section 350 of Division 1, Chapter 3 Water Shortage Emergencies of the California Water Code.
Customer Actions <ul style="list-style-type: none"> • Health and safety use of water only. • No outdoor irrigation is allowed.

B.1.5 Cross-reference to State Mandated Water Shortage Levels

The stages presented in this WSCP differ, consistent with DWR guidance, from the State identified shortage levels of 10, 20, 30, 40, 50, and greater than 50 percent shortage. Pursuant to CWC §10632(a)(3)(B), Table B-1 cross-references this WSCP’s shortage levels to the State identified levels above. SJWD supply characteristics and reliability are better suited for the existing four drought stages identifying 10, 25, 50, and >50 percent supply shortages.

Table B-1. Corresponding Shortage Levels

State Mandated Shortage Levels	SJWD WSCP Stages	
Stage 1: 0 – 10%	Stage 1 – Alert	0 – 10%
Stage 2: 10 – 20%	Stage 2 – Warning	10 – 25%
Stage 3: 20 – 30%	Stage 2 – Warning Stage 3 – Crisis	10 – 25% 25 – 50%
Stage 4: 30 – 40%	Stage 3 – Crisis	25 – 50%
Stage 5: 40 – 50%	Stage 3 - Crisis	25 – 50%
Stage 6: >50%	Stage 4 - Emergency	>50%

B.1.6 Enforcement and Variances

Water conservation enforcement measures for all stages, including Normal Water Supply, are outlined in District Ordinance 23000 (District Water Conservation Program), found at the following link: <https://www.sjwd.org/files/050d9fccf/23000+District+Water+Conservation+Program.pdf>. The sequence of notification, discontinuance of service and progressive reconnect fees are as follows:

- A. Notify Customer of water waste condition in writing offering District “irrigation auditor” and/or Master Gardener service, use of resource library, etc., to help correct the situation, and follow up with one-on-one contact over a two-week period.
- B. After the two-week period, if the correction is not made a second letter will be sent giving specific date for correction and notice that the District will, after that date, terminate service until a reconnection fee is paid and the correction is made.

The reconnect fee shall be progressive by violation (failure to correct or eliminate water waste condition). See the District’s Schedule of Rates, Charges, Fees, and Deposits for the progressive reconnect fee amounts.

The District may issue a variance pursuant to Ordinance Number 7000 (Modification of Code Requirements), found at the following link: <https://www.sjwd.org/files/8d58dfb7e/7000+Modification+of+Code+Requirements.pdf>. Upon a customer’s filing of a petition for variance, the Board of Directors will review the petition, and may grant or deny such petition. Any variance shall be effective only upon such Board approval, which shall set forth the terms and condition thereof. Each waiver or modification provided by the variance shall be limited to the Person and property identified in the petition.

B.1.7 Communication Protocols

Communication protocols for the WSCP include public outreach and notification to customers and entities within the District upon a change in stage declaration. Information shall include and describe the appropriate shortage response actions for the declared stage. Such communication will be delivered by direct-mail, District website, and media outlets. Other regional agencies, including the District’s Wholesale Customer Agencies (City of Folsom, Citrus Heights Water District, Fair Oaks Water District and Orangevale Water Company) and the Regional Water Authority (RWA), will be notified of the initiation of the identified shortage stage and subsequent WSCP stage declarations.

SJWD will coordinate with its WCAs, Placer County Water Agency (PCWA), Sacramento Suburban Water District (SSWD), the cities of Roseville and Folsom, as well as the counties of Placer and Sacramento, if anticipated water supplies and demands necessitate the declaration of a local emergency.

B.1.8 Financial Consequences of WSCP

Decreased revenues and increased costs are expected during water shortage conditions and enhanced enforcement of excessive residential water use during a drought (compliance with Chapter 3.3, Division 1 of the CWC). Approximately 35 percent of the District’s retail revenues are normally derived from volumetric charges⁵⁸. Assuming a reduction in sales commensurate with the particular WSCP stage declaration, a decrease in total revenues in the range of 3.5 – 17.5 percent may be expected.

Additional monitoring, public outreach, and enforcement is expected to increase total costs to the District when operating under a water shortage condition. These additional efforts become prioritized for current staff, and other normal work efforts and projects are likely to be delayed or reassigned. If conditions warrant, the District may need to hire additional staff or seek assistance through third-party service providers.

Although retail water deliveries fell more than 40% during the last drought (FY 2012-13 through FY 2015-16), various factors and actions resulted in water rate revenue only declining in FY 2014-2015.

⁵⁸ SJWD’s adopted budget for FY 2020-21.

First, water rates were increased almost every year of the drought as follows:

FY 2013-14: Mid-year rate increase of 2%.

FY 2014-15: Rates restructured – drought surcharge implemented in June 2015.

FY 2015-16: January 2016 15% rate increase.

Second, the District used approximately \$889,000 of its capital reserves to fund operations in FY 2015-16.

Expenses affected by a drought include the cost of purchased water, power costs to pump water, and water efficiency program costs. Water purchase and power costs decrease during a drought as there is simply less water purchased and pumped. Water efficiency program costs increase due to the need to amplify conservation messaging to our customers, and incentivizing increased conservation by providing additional rebates.

Historically, savings resulting from reduced costs of purchased water and energy have been greater than the costs associated with increasing our conservation program efforts. For example, during the last drought the cost of purchased water fell 3% (despite wholesale rate increases), power costs fell 46% and water efficiency program costs increased 108%. Taken together, reflecting the different scales of these three expense categories, the District experienced a net 4% decrease in their combined costs.

Ultimately, these savings partially mitigated the impact of the rate revenue reduction over the same period.

Most of the District's operating expenses are fixed, meaning the costs of maintaining and operating the system do not change much based upon more or less water flowing through the distribution system for delivery. Variable costs, which are closely related to the amount of water delivered, include power for the pump stations as well as the actual cost of water. Operating expenses increased approximately 14% from FY 2012-13 (pre-drought) to FY 2015-16 (end of drought), although not all of that increase is solely attributable to the drought.

As a consequence of the District applying the last five rate increases to only the fixed component of the rate, future droughts should have less of an impact on revenues than that seen in the last drought.

SJWD maintains financial reserves that can be used to buffer potential revenue impacts of reduced water sales during a WSCP stage declaration, should it be prudent to do so. These reserves are a tool that can be used by the District to maintain more stable rates during times of imbalanced revenues and expenses that may be caused by reduced water usage during dry periods. In addition to utilizing financial reserves, the District may enact a range of financial management actions depending on the specific situation that could include:

- Enact Drought Rate structure (Stage 2 and higher)
- Capital project deferment

- Operational and maintenance expense deferment

B.1.9 Monitoring and Reporting

The District will monitor customer use through real-time metering. Data collected from the real-time meters allows close tracking of water demands during a declared shortage stage. The ability to track performance metrics allows refinement and enhancement of the WSCP by providing valuable data, including information on customer use and system loss. Real-time monitoring also offers insight regarding the efficacy of a declared shortage stage and associated shortage response actions.

Reporting on the implementation of the WSCP will be provided by District staff at regularly scheduled Board meetings. District staff will update the Board (and public) on the Water Conservation Program, including information on the performance of the declared shortage stage.

The District will also report information to the State regarding implementation of this WSCP as required.

B.1.10 Response Action Estimates

The following table presents the individual estimated demand savings of each response action. Actual savings will likely vary greatly based on external influences, shortage stage level, and general customer understanding of drought severity. It is assumed the savings estimates are not necessarily additive, but when implemented together as a program with all the actions in each respective stage, they are intended and estimated to eliminate each stage's identified supply to demand shortage gap.

Table B-2: Shortage Response Action Measures Estimates

Stage	Shortage Response Action	Potential Shortage Gap Reduction
1+	District – Increase drought awareness through additional public outreach measures that notify public and customers of declared stage, requirements, and available conservation program support.	3 – 5%
1+	District – Leak repair on District mains and laterals receives higher priority.	0 – 2%
1+	District – Increased monitoring of customer use.	0 – 3%
1+	District – Accelerate applicable infrastructure repairs and improvements.	0 – 3%
1	Customer – Reduce total water use by 10%.	up to 10%
1	Customer – Leaking pipes or faulty sprinklers shall be repaired within two working days or less if warranted by the severity of the problem.	0 – 1%
1	Customer – Outdoor irrigation is limited to three times per week. Odd addresses, streetscapes, and medians shall limit watering to Tuesdays, Thursdays, and Saturdays; even addresses shall limit watering to Wednesdays, Fridays, and Sundays.	3 – 5%
1+	Customer – Pool draining and refilling shall be allowed only for health, maintenance, or structural considerations.	0 – 1%
1+	Customer – Users of construction meters and fire hydrant meters will be monitored for efficient water use.	0 – 2%
2+	District – Decrease system flushing frequency.	1 – 2%
2+	District – Implement Drought Rate consistent with Proposition 218 and California law.	8 – 12%
2+	District – Implement water waste/use patrols.	0 – 2%
2	Customer – Reduce total water use by 25%.	up to 25%
2	Customer – Leaking customer pipes or faulty sprinklers shall be repaired within 24 hours or less if warranted by the severity of the problem.	0 – 1%
2	Customer – Outdoor irrigation is limited to two days per week. Odd addresses, streetscapes, and medians shall limit watering to Tuesday, and Saturday; even addresses shall limit watering to Wednesdays and Sundays. No irrigation is permitted on Mondays, Thursdays, and Fridays. Irrigation should be limited to the minimal amount of water to keep plants and trees alive.	5 – 20%
2	Customer – Application of potable water to outdoor landscapes during and within 24 hours after measurable rainfall is prohibited.	1 – 2%
2+	Customer – Restaurants shall serve water only upon request.	0 – 1%
3+	District – No commitments will be made to provide service for new water service connections.	1 – 2%
3+	District – Increase water waste/use patrols.	0 – 2%
3	Customer – Reduce total water use by 50%.	up to 50%
3+	Customer – Leaking customer pipes or faulty sprinklers shall be repaired immediately. Water service will be suspended until repairs are made.	0 – 1%
3	Customer – Outdoor irrigation is limited to one day per week on the assigned day, and shall be confined to customer’s property. Even number addresses may irrigate only on Tuesdays and odd number addresses may irrigate only on Wednesdays.	20 – 40%
3	Customer – Application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall is prohibited.	1 – 2%
3	Customer – Water for flow testing and construction purposes from fire hydrants and blow-offs using District water supplies is prohibited.	0 – 1%

Stage	Shortage Response Action	Potential Shortage Gap Reduction
3	Customer – Flushing of sewers or fire hydrants is prohibited except in case of emergency and for essential operations or unless specifically authorized by the District.	0 – 2%
3+	Customer – Installation of new turf, lawn, and/or landscaping is prohibited until the District moves to a Stage 2 or less.	0 – 3%
3+	Customer – Automobiles or equipment shall be washed only at commercial establishments that use recycled or reclaimed water.	0 – 1%
3+	Customer – No potable water from the District’s system shall be used to fill or refill swimming pools, artificial lakes, ponds or streams. Water use for ornamental ponds, artificial lakes, and/or fountains is prohibited.	0 – 1%
4	District – Health and safety use of water only.	2 – 4%
4	District – Declare Water Shortage Emergency in accordance with Section 350 of Division 1, Chapter 3 Water Shortage Emergencies of the California Water Code.	varies
4	Customer – Health and safety use of water only.	at least 50%
4	Customer – No outdoor irrigation is allowed.	15 – 25%

B.1.11 WSCP Refinement Procedures

The District’s WSCP is an adaptive plan that allows for active refinement to respond to particular shortage conditions. The general procedures for refinement are presented below.

1. For each shortage response action, compare expected results with actual shortage response and identify any shortfall or over achievement.
2. Revise expected reduction for a specific shortage response action based on updated information.
3. Assess the aggregate expected reductions (from revised shortage response actions) for each shortage stage.
4. Revise stage declaration or modify stage shortage response actions to better balance demands with supplies.

The procedures presented above aim ensure an adaptive WSCP that is able to be relied upon under various and changing circumstances.

B.1.12 Plan Adoption, Submittal, and Availability

The WSCP (including subsequent updates) shall be adopted in accordance with standard District procedures, including requirements for public participation (public hearing), and approval by the SJWD Board of Directors. Upon adoption, the WSCP will be provided to the cities of Roseville and Folsom, Placer and Sacramento counties, and submitted to DWR within 30 days. The adopted WSCP will be available on the District’s website, as well as at the District office.

B.1.13 Seismic Risk Assessment and Mitigation Plan

Sacramento and Placer counties have completed Local Hazard Mitigation Plans under the federal Disaster Mitigation Act of 2000 (Public Law 106-390). Per DWR requirements, a copy of the most recent adopted plan by each County is included by way of electronic reference at the following locations:

- Sacramento County (2016): <https://waterresources.saccounty.net/stormready/Pages/Local-Hazard-Mititagtion-Report.aspx>
- Placer County (2016): <https://www.placer.ca.gov/DocumentCenter/View/397/Complete2016-LHMP--Including-ChaptersAnnexes-and-Appendices-PDF>

Sacramento County is currently in the process of updating the LHMP 2016. The update includes participation with other entities, including Cities of Sacramento, Citrus Heights, Elk Grove, Folsom, Galt, Isleton, Rancho Cordova, and other special districts. The update is anticipated to be completed and finalized during 2021.