SCOTTS VALLEY WATER DISTRICT

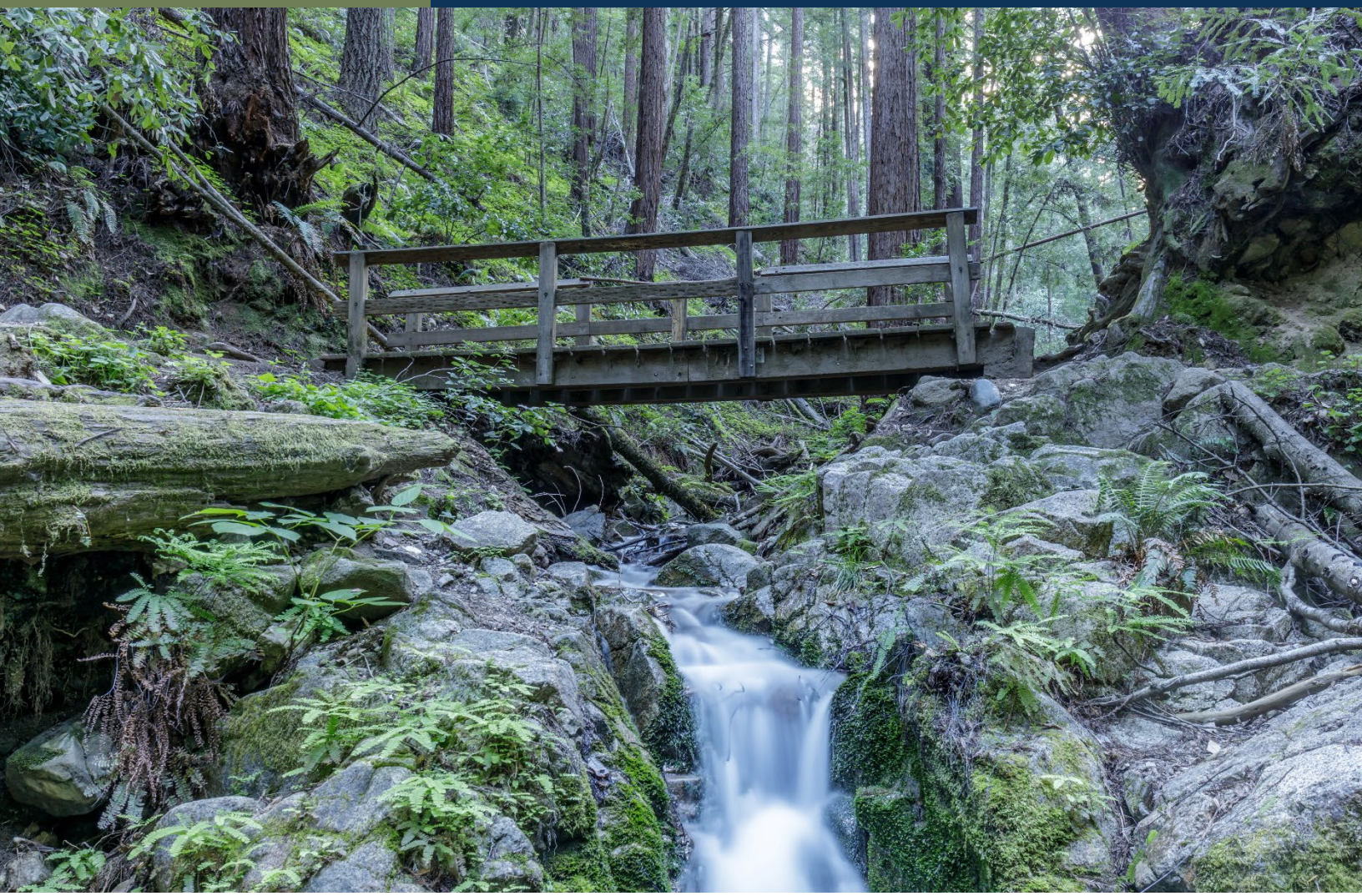
San Lorenzo Valley WATER DISTRICT

2020 Urban Water Management Plan

Final

JUNE 2021

SCOTTS VALLEY WATER DISTRICT & SAN LORENZO VALLEY WATER DISTRICT



MONTGOMERY & ASSOCIATES

WSC

SCOTTS VALLEY WATER DISTRICT &
SAN LORENZO VALLEY WATER DISTRICT

2020 Urban Water Management Plan

JUNE 2021

Prepared by Water Systems Consulting, Inc. & Montgomery & Associates

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ACKNOWLEDGMENTS

This document was prepared in partnership between Water Systems Consulting Inc. (WSC), Scotts Valley Water District (SVWD), and San Lorenzo Valley Water District (SLVWD). In addition, Montgomery & Associates (M&A) assisted with development of Chapters 4-10 and Chapter 13. WSC thanks the following people for their contributions:

SVWD Staff

Piret Harmon, General Manager

Nick Kurns, Finance & Customer Service Manager

SVWD Board of Directors

Bill Ekwall, President

Ruth Stiles, Vice President

Wade Leishman, Director

Chris Perri, Director

Danny Reber, Director

SLVWD Staff

Rick Rogers, General Manager

Carly Blanchard, Environmental Planner

Stephanie Hill, Director of Finance & Business Services

Nate Gillespie, Water Treatment and System Supervisor

SLVWD Board of Directors

Gail Mahood, President

Lois Henry, Vice President

Bob Fultz, Director

Mark Smolley, Director

Jayme Ackemann, Director

Montgomery & Associates Staff

Georgina King, Senior Hydrogeologist

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ACRONYMS & ABBREVIATIONS

°F	Degrees Fahrenheit
AB	Assembly Bill
AF	Acre Foot
AFY	Acre Feet per Year
AMBAG	Association of Monterey Bay Area Governments
AMI	Advanced Metering Infrastructure
AWWA	American Water Works Association
Cal-Am	California American Water
CAW	California American Water
CCF	Hundred Cubic Feet
CCR	California Code of Regulations
CII	Commercial, Industrial, and Institutional
CIMIS	California Irrigation Management Information System
CWC	California Water Code
DMM	Demand Management Measure
DWR	California Department of Water Resources
EPA	United States Environmental Protection Agency
ERP	Emergency Response Plan
ETo	Reference Evapotranspiration
GIS	Geographical Information System
GPCD	Gallons per Capita per Day
gpf	Gallons per Flush
GPM	Gallons per Minute
GSA	Groundwater Sustainability Agencies
GSP	Groundwater Sustainability Plan
GWMP	Groundwater Management Plan
HOA	Homeowners Association
kwh	Kilowatt-hours
LAFCO	Local Agency Formation Commission
LHMP	Local Hazard Mitigation Plan
LID	Low Impact Development

MF	Multi-family
MG	Million Gallons
MGD	Million Gallons per Day
MGY	Million Gallons per Year
MHA	Mount Hermon Association
MHP	Mobile Home Park
NRW	Non-revenue Water
PGC	Pasatiempo Golf Course
RGF	Regional Growth Forecast
RHNA	Regional Housing Needs Allocation
RMP	Representative Monitoring Point
RRA	Risk and Resiliency Assessment
SB X7-7	Senate Bill 7 of Special Extended Session 7
SCCWD	Santa Cruz City Water Department
SF	Single Family
SLVWD	San Lorenzo Valley Water District
SMGB	Santa Margarita Groundwater Basin
SMGWA	Santa Margarita Groundwater Agency
SVWD	Scotts Valley Water District
USGS	United States Geological Survey
UV	Ultraviolet
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act
WEWAC	Water Education-Water Awareness Committee
WRF	Water Reclamation Facility
WSCP	Water Shortage Contingency Plan
WTP	Water Treatment Plant
WUE	Water Use Efficiency
WWTP	Wastewater Treatment Plant
WY	Water Year

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URBAN WATER MANAGEMENT PLAN

1 Introduction and Lay Description

This chapter provides a brief overview of the Scotts Valley Water District (SVWD) and San Lorenzo Valley Water District (SLVWD) and the purpose of this 2020 Urban Water Management Plan (UWMP). It also describes how the UWMP is organized and how it relates to other local and regional planning efforts that SVWD and SLVWD are involved in.

This document presents the regional 2020 Urban Water Management Plan (UWMP) for SVWD and SLVWD (collectively referred to as the Districts). The Districts completed individual UWMPs in prior years; however, they decided to prepare a regional UWMP in 2020 because they are adjacent water districts that share groundwater and have a long history of partnering on various projects and activities.

IN THIS SECTION

- About SVWD and SLVWD
- Purpose
- UWMP Organization
- Relationship to other documents

About Scotts Valley Water District

SVWD was established in 1961 and served approximately 10,600 people in its service area in 2020.

SVWD service area boundaries include most of the City of Scotts Valley (City) as well as some unincorporated areas north of the City. Groundwater from the Santa Margarita Basin is the source of potable water supply for SVWD.

SVWD's sewer service in the Scotts Valley area is provided by the City, and the City produces recycled water for SVWD to be distributed primarily for irrigation use.

About San Lorenzo Valley Water District

SLVWD was established in 1941 and served approximately 23,000 people in its service area in 2020.

SLVWD service area boundaries include the unincorporated communities of Boulder Creek, Brookdale, Ben Lomond, Lompico, Manana Woods subdivision, the town of Felton and portions of the City and adjacent unincorporated areas. SLVWD relies on surface water and groundwater supplies from the Santa Margarita Groundwater Basin.

SLVWD's service area is primarily on septic sewage systems; however, a portion of the south service area is served by the City. SLVWD does not supply recycled water, but SVWD does provide recycled water to the Spring Lakes Mobile Home Park within SLVWDs' service area.

1.1 Urban Water Management Plan Purpose and Overview

In 1983, the State of California Legislature (Legislature) enacted the Urban Water Management Planning Act (UWMP Act). The law required an urban water supplier, providing water for municipal purposes to more than 3,000 customers or serving more than 3,000 acre-feet per year (AFY), to adopt an UWMP every five years demonstrating water supply reliability under normal as well as drought conditions. The UWMP Act applies to wholesale and retail suppliers.

Since the original UWMP Act was passed, it has undergone significant expansion, particularly since the Districts' previous individual UWMPs were prepared in 2015. Prolonged droughts, groundwater overdraft, regulatory revisions, and changing climatic conditions affect the reliability of local water supply as well as the statewide water resource's reliability overseen by California Department of Water Resources (DWR), the State Water Resources Control Board (State Water Board), and the Legislature. Accordingly, the UWMP Act has grown to address changing conditions and the current requirements are found in Sections 10610-10656 and 10608 of the California Water Code (CWC).

DWR provides guidance for urban water suppliers by developing an Urban Water Management Plan Guidebook 2020 (Guidebook) (California Department of Water Resources, 2021), conducting workshops, developing tools, and providing program staff to help water suppliers prepare comprehensive and useful water management plans, implement water conservation programs, and understand the requirements in the CWC. Suppliers prepare their own UWMPs in accordance with the requirements and submit them to DWR. DWR then reviews the plans to make sure they have addressed the requirements identified in the CWC and submits a report to the Legislature summarizing the status of the plans for each five-year cycle. The Guidebook, finalized in April 2021, was used to complete this UWMP.

The purpose of this UWMP is for the Districts to conduct long-term resource planning and establish management measures to ensure adequate water supplies are available to meet existing and future demands. The UWMP provides a framework to help water suppliers maintain efficient use of urban water supplies, promote conservation programs and policies, ensure that sufficient water supplies are available for future beneficial use, and provide a response mechanism during drought conditions or other water supply shortages.

The UWMP is a valuable planning tool used for multiple purposes including:

- Provides a standardized methodology for water utilities to assess their water resource needs and availability.
- Serves as a resource to the community and other interested parties regarding water supply and demand, conservation and other water related information.
- Provides a key source of information for cities and counties when considering approval of proposed new developments and preparing regional long-range planning documents such as city and county General Plans.
- Informs other regional and Statewide water planning efforts, such as Integrated Regional Water Management Plans and the California Water Plan.

CWC Section 10632 also includes updated requirements for suppliers to prepare a Water Shortage Contingency Plan (WSCP). The WSCP documents a supplier's plans to manage and mitigate an actual water shortage condition, should one occur because of drought or other impacts on water supplies. In the 2015 UWMP cycle, the WSCP was part of the UWMP. For the 2020 cycle, the WSCP is required to be a standalone document so that it can be updated independently of the UWMP but must be referenced in and attached to the UWMP. The WSCP is provided in **Chapter 13** of this UWMP.

1.2 UWMP Organization

This UWMP was prepared in compliance with the CWC and generally followed DWR's recommended organizational outline. New requirements to include lay descriptions are accounted for in this section and at the beginning of each Chapter.

Below is a summary of the information included in this UWMP:

Chapter 1 – Introduction.

This chapter provides background information on the UWMP process, new regulatory requirements, and an overview of the information covered throughout the remaining chapters. The UWMP was prepared to maintain compliance with CWC and DWR requirements. SVWD and SLVWD will maintain eligibility for DWR and other grants with submission of the UWMP by July 1, 2021, subject to final review and approval by DWR.

Chapter 2 – UWMP Preparation & UWMP Adoption.

This chapter provides information on the processes used for developing the UWMP, including efforts in coordination and outreach, the steps taken to prepare the UWMP, hold a public hearing, adopt, and submit the UWMP, and implementation of the adopted UWMP. The UWMP was prepared to efficiently coordinate water supply planning and management efforts in the region. The UWMP was also prepared in a transparent manner and various stakeholders were engaged to seek and distribute relevant information. All public noticing, UWMP adoption, and UWMP submittal requirements were conducted as outlined by DWR's 2020 Guidebook.

Chapter 3 – System Description.

This chapter describes the Districts' water systems, service areas, population demographics, climate, and land uses. SVWD's service area includes most of the City as well as some unincorporated areas north of the City. Groundwater is SVWD's source of potable water and SVWD is a distributor of recycled water to permitted uses. SLVWD owns, operates, and maintains two separately managed water systems, which are the North/South System (or San Lorenzo Valley System) and the Felton System. The San Lorenzo Valley System service area includes the unincorporated communities of Boulder Creek, Brookdale, Ben Lomond, Mañana Woods, Lompico and portions of the City of Scotts Valley and adjacent unincorporated neighborhoods. The Felton Service Area includes the town of Felton and adjacent unincorporated areas. Local groundwater and surface water are the only sources of supply for SLVWD.

Chapter 4 – SVWD Water Use Characterization.

This chapter describes and quantifies the current and projected water uses through 2045 within the water service area of SVWD by customer category. In 2020, residential customers used approximately 72% of the total water distributed in SVWD's service area.

Chapter 5 – SLVWD Water Use Characterization.

This chapter describes and quantifies the current and projected water uses through 2045 within the water service areas of SLVWD by customer category. In 2020, residential customers used approximately 90% of the total water distributed in the SLVWD service area.

Chapter 6 – SVWD SBX7-7 Baseline and Targets.

This chapter describes the Water Conservation Act of 2009, also known as SB X7-7, Baseline, Targets, and 2020 Compliance. The calculated GPCD for 2020 is 96 GPCD, which meets SVWD's 2020 SB X7-7 target of 154 GPCD.

Chapter 7– SLVWD SBX7-7 Baseline and Targets.

This chapter describes the Water Conservation Act of 2009, also known as SB X7-7, Baseline, Targets, and 2020 Compliance. Due to the annexation of the Lompico service area in 2016, updated baseline and target calculations were prepared. The calculated GPCD for 2020 is 80

GPCD, which meets SLVWD's updated 2020 SB X7-7 target of 82 GPCD.

Chapter 8 – Groundwater Supply Characterization.

This chapter describes the Santa Margarita Groundwater Basin and quantifies the current and projected groundwater supply source utilized by both Districts.

Chapter 9 – SVWD Water Supply Characterization.

This chapter describes and quantifies the current and projected potable and non-potable water supplies for SVWD. Each water source is characterized with information needed to manage water resources, assess supply reliability, perform the Drought Risk Assessment, and prepare and implement the WSCP. SVWD anticipates meeting customer demands through 2045.

Chapter 10 – SLVWD Water Supply Characterization.

This chapter describes and quantifies the current and projected potable and non-potable water supplies for SLVWD. Each water source is characterized with information needed to manage water resources, assess supply reliability, perform the Drought Risk Assessment, and prepare and implement the WSCP. SLVWD anticipates meeting customer demands through 2045.

Chapter 11 – SVWD Water Service Reliability.

This chapter describes SVWD's water supply reliability during normal, single dry, and multiple dry water years through 2045. A Drought Risk Assessment (DRA) for the next five years is also included. The water service reliability assessment and DRA results indicate that no water shortages are anticipated within the next 25-years under normal, single dry water years, and multiple dry water years.

Chapter 12 – SLVWD Water Service Reliability.

This chapter describes SLVWD's water supply reliability during normal, single dry, and multiple dry water years through 2045. A DRA for the next five years is also included. The water service reliability assessment and DRA results indicate that no water shortages are anticipated within the next 25-years under normal, single dry water years, and multiple dry water years.

Chapter 13 – Water Shortage Contingency Plan.

This chapter includes the standalone WSCP which is a detailed plan for how SVWD and SLVWD will identify and respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the water supply is reduced to a level that cannot support demand at any given time or when reduction in demand is required for various reasons.

Chapter 14 – SVWD Demand Management Measures.

This chapter describes SVWD's efforts to promote efficient use of water, reduce water demand and minimize water waste. SVWD recognizes that using water efficiently is an integral component of a responsible water management strategy and is committed to providing education, tools, and incentives to help its customers manage the amount of water they use. Water demand has already shown significant decline in SVWD's service area in recent years, which can be attributed to ongoing water use efficiency activities, expansion of the recycled water distribution network, deployment of advanced metering infrastructure and efforts to reduce water waste.

Chapter 15 – SLVWD Demand Management Measures.

This chapter describes SLVWD's efforts to promote conservation and reduce water demand, including discussions of specific demand management measures. SLVWD actively promotes public awareness and education about SLVWD's water supply sources, the San Lorenzo River watershed, and the public's role in conserving water and protecting shared resources. SLVWD is committed to implementing cost effective programs that will increase water efficiency throughout the service area.

1.3 UWMPs in Relation to Other Efforts

In addition to jointly preparing the UWMP, the Districts are involved in several other partnerships and collaborate with a variety of stakeholders to ensure alignment and consistency of various planning documents. Other planning processes that integrate with the UWMP include the City of Scotts Valley General Plan, County of Santa Cruz General Plan, recycled water facilities planning reports, groundwater management program annual reports, water and recycled water master plans, the Santa Cruz Integrated Regional Water Management Plan, and the Santa Margarita Basin Groundwater Sustainability Plan. These documents have been considered in development of this UWMP to allow for consistency and integration of water management planning and to optimize the use of water resources within the Districts' service areas and the greater Santa Cruz region. SVWD and SLVWD are signatories to the Memorandum of Agreement for the Santa Cruz Integrated Regional Water Management Plan; and signatories to the Memorandum of Agreement among the City of Santa Cruz, SLVWD, SVWD, and the County of Santa Cruz Exploring Potential Projects for the Conjunctive Use of Surface and Groundwater Resources. The Districts also both actively participate in Conservation Coalition of Santa Cruz County. In addition, the Districts are members of the Santa Margarita Groundwater Agency and are involved with current efforts to prepare the Santa Margarita Groundwater Sustainability Plan (GSP). The GSP is being developed to ensure groundwater compliance is maintained and supplies remain sustainable in the region. This UWMP has been prepared in coordination with ongoing GSP efforts.

1.4 UWMPs and Grant or Loan Eligibility

In order for a water supplier to be eligible for a grant or loan administered by DWR, and potentially other agencies, the supplier must have a current UWMP on file that meets the requirements set forth by the CWC. A current UWMP must also be maintained by the supplier throughout the term of any grants or loans received.

SVWD and SLVWD have prepared this UWMP under guidance from DWR's 2020 UWMP Guidebook.

1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions

The Districts rely solely upon local water supplies and do not anticipate participating in or receiving water supply benefits from the Delta. Therefore, this section is not applicable.

URBAN WATER MANAGEMENT PLAN

2 Plan Preparation

This chapter of the UWMP provides information on the processes used for developing the UWMP, including efforts in coordination and outreach.

IN THIS SECTION

- UWMP Preparation
- Coordination and Outreach
- UWMP Adoption and Notification
- UWMP Submittal to the State

This UWMP was prepared following guidance from DWR's Guidebook (California Department of Water Resources, 2021), DWR Urban Water Management Plans Public Workshops and Webinars, Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (SB X7-7 Guidebook) (California Department of Water Resources, 2016), and the 2020 DWR Review Sheet Checklist (**Appendix A**).

The UWMP was prepared in a transparent manner and the Districts engaged neighboring agencies, the City of Scotts Valley, County of Santa Cruz, and the public to seek and distribute information to strengthen the ability to assess and plan for the region's water future. Details regarding the Districts' UWMP preparation, coordination, adoption, and outreach efforts are provided in this chapter.

DWR's 2020 UWMP schedule is summarized in **Table 2-1** below.

Table 2-1. DWR 2020 UWMP Schedule

DATE	EVENT
December 2020	Draft Guidebook released
December 2020-January 2021	DWR Workshops
March 2021	Draft Final Guidebook released
April 2021	Final Guidebook released
July 1, 2021	UWMPs due to DWR

2.1 UWMP Preparation

The Districts prepared this UWMP in accordance with CWC Section 10617, which requires water supplier with 3,000 or more service connections, or water deliveries in excess of 3,000 AFY to prepare an UWMP. Suppliers are required to update UWMPs at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update. The UWMP must be submitted to DWR by July 1, 2021. The Districts have included all requisite data in the development of this UWMP.

2.2 Basis for Preparing an UWMP

The Districts' UWMP was prepared to efficiently coordinate water planning and management efforts within the region. SVWD served approximately 10,600 people in its service area, through 4,306 metered connections, and supplied 1,135 AFY of potable water in 2020. SLVWD served approximately 23,000 people in its service area, through 7,908 metered connections, and supplied 2,049 AFY of potable water in 2020. **Table 2-2** and **Table 2-3** provide a summary of SVWD and SLVWD potable public water systems.

Throughout this UWMP, water volume is represented in units of AFY. Data is presented on a water year basis (October 1st - September 30th) for SVWD and on a calendar year basis for SLVWD for consistency with each agency's 2015 UWMP and individual tracking systems.

Table 2-2. DWR 2-1R Public Water Systems - SVWD

PUBLIC WATER SYSTEM NUMBER	PUBLIC WATER SYSTEM NAME	NUMBER OF POTABLE CONNECTIONS 2020	VOLUME OF POTABLE WATER SUPPLIED 2020 (AFY)
CA4410013	SCOTTS VALLEY WATER DISTRICT	4,306	1,135

Table 2-3. DWR 2-1R Public Water Systems - SLVWD

PUBLIC WATER SYSTEM NUMBER	PUBLIC WATER SYSTEM NAME	NUMBER OF POTABLE CONNECTIONS 2020	VOLUME OF POTABLE WATER SUPPLIED 2020 (AFY)
CA4410014	SAN LORENZO VALLEY WATER DIST	7,908	2,049

2.3 Coordination and Outreach

To prepare this UWMP, the Districts coordinated with a variety of agencies in their service areas, which include the City of Scotts Valley, County of Santa Cruz, and other water agencies. The efforts were conducted to 1) inform the agencies of the Districts' efforts and activities; 2) gather high quality data for use in developing this UWMP; and 3) coordinate planning activities with other related regional plans and initiatives.

The Districts welcome community participation in water planning. Stakeholders were informed about the development of the UWMP along with the schedule of activities. The activities conducted by the Districts are summarized in **Table 2-4**. Copies of the 60-day notification letters and public hearing notice are provided in **Appendix B**.

Table 2-4. Agency Coordination

AGENCY/ORGANIZATION	WAS CONTACTED FOR ASSISTANCE	WAS NOTIFIED OF PLAN AVAILABILITY[1]	WAS SENT A NOTICE OF INTENTION TO ADOPT 60 DAYS PRIOR TO PUBLIC HEARING
WATER SUPPLIERS			
Big Basin Water Company		x	x
City of Santa Cruz Water Department		x	x
County of Santa Cruz-Water Resources Division		x	x
Soquel Creek Water District		x	x
PUBLIC AGENCIES			
City of Scotts Valley	x	x	x
Scotts Valley Fire District		x	x
Santa Cruz LAFCO		x	x
Mt. Hermon Association		x	x
City of Santa Cruz – Watershed Compliance Manager		x	x
City of Santa Cruz – Planning Department		x	x
Association of Monterey Bay Area Governments	x		

[1] Was notified of availability of Draft UWMP and directed to an electronic copy of the draft plan on the Districts' websites.

2.4 UWMP Adoption, Submittal, and Implementation

This section describes the steps taken to adopt and submit the UWMP and to make it publicly available and includes a discussion of the Districts plan to implement the UWMP.

2.4.1 Notice of UWMP and WSCP Preparation and Adoption

CWC Section 10621(b) requires that suppliers notify cities and counties in which they serve water that the UWMP and WSCP are being updated and reviewed at least 60 days prior to the public hearing. To fulfill this requirement, the Districts sent a joint letter of notification of preparation to the City of Scotts Valley and the County of Santa Cruz as identified in **Table 2-4**, within 60 days prior to the public hearing.

The Districts also made the UWMP and WSCP available for public review on June 2, 2021 and held public hearings on June 10, 2021 (SVWD) and on June 17, 2021 (SLVWD). The notice to the public was made once a week for two successive weeks. The public hearing was first noticed in the Sentinel on May 27, 2021, and in the Press Banner on May 28, 2021, and noticed again on June 3, 2021, and June 4, 2021, respectively. Public hearing notifications were also sent to the same distribution list as the 60 day notifications via email. The hearing notices are attached as **Appendix B**. SVWD and

SLVWD maintained a copy of the UWMP and WSCP in their offices prior to the public hearing for review and on both Districts websites at www.svwd.org and www.slvwd.com.

2.4.2 Public Hearing and Adoption

The UWMP and WSCP were included as separate agenda items, noticed, and reviewed in a Public Hearing at the regularly scheduled Board of Directors meeting for SVWD on June 10, 2021, and for SLVWD on June 30, 2021. This hearing provided agencies and members of the public a chance to comment on the Draft UWMP and WSCP. The public hearing took place before the adoption allowing opportunity for the report to be modified in response to public input. The UWMP and WSCP were adopted by SVWD Board of Directors on June 10, 2021, and by SLVWD Board of Directors on June 30, 2021. Copies of each Boards' resolutions of UWMP and WSCP adoption are included as **Appendix C**.

2.4.3 Submittal of the UWMP and WSCP

The UWMP and WSCP were submitted to DWR by July 1, 2021 (within 30 days of adoption) using the DWR WUE Data Portal. The documents were also submitted to the California State Library, the City, and County of Santa Cruz within 30 days of adoption.

2.4.4 Public Availability

Commencing no later than within 30 days of adoption, the Districts will have a copy of the UWMP and WSCP available for public review at the Districts' offices (see addresses below) during normal business hours. The documents will also be posted on each Districts' website as noted below.

Scotts Valley Water District
2 Civic Center Drive
Scotts Valley, CA 95066
www.svwd.org

San Lorenzo Valley Water District
13060 CA-9
Boulder Creek, CA 95006
www.slvwd.com

2.4.5 Amending and Adopting an UWMP or WSCP

Implementation of this UWMP will be carried out as described unless significant changes occur between the adoption of this UWMP and the 2025 UWMP. If such significant changes do occur, the Districts will amend and readopt the UWMP as required by the CWC. The same applies to the WSCP.

Amendments to the Districts' UWMP and WSCP will be on an as needed basis. Should the Districts need to amend the adopted UWMP or WSCP in the future, a public hearing for review of the proposed amendments to the documents will be required. The Districts will need to send a 60-day notification letter to the City and the County of Santa Cruz and notify the public in the same manner as set forth earlier in this chapter. Once the amended documents are adopted, a copy of the final version will be sent to the California State Library, DWR (electronically using the WUEdata reporting tool), the City, and County of Santa Cruz within 30 days of adoption. The finalized version will also be made available to the public both online and on the Districts' websites and in person at the Districts' offices during normal business hours.

URBAN WATER MANAGEMENT PLAN

3 System Description

This chapter describes the Districts' service area boundaries, customer types, land uses, climate, population, and demographics.

IN THIS SECTION

- Service Area
- Service Area Climate, Population and Land Uses

Both Districts are located in the San Lorenzo River watershed in the Santa Cruz Mountains, approximately five miles north of Monterey Bay. The San Lorenzo River watershed extends 21 miles from the river's mouth at Monterey Bay in Santa Cruz to the river's headwaters along Santa Cruz County's northern boundary.

The valley is framed by the crest of the Santa Cruz Mountains along the north and northeast (maximum elevation 3,200 feet above mean sea level [ft msl]), and Ben Lomond Mountain along the west (2,600 ft msl). The climate of the Districts' service areas is mild and occupies a coastal valley climate zone. For both Districts, water service is provided primarily to residential customers with some commercial, industrial, institutional, recreational, and landscape customers and for other uses, such as fire protection and pipeline cleaning; however, SVWD provides considerably more water to commercial, industrial, and institutional customers than SLVWD. Together, the Districts served a total population of approximately 33,510 people in 2020.

3.1 General Description

3.1.1 Scotts Valley Water District

SVWD was formed under County Water District Law, specifically CWC Section (CWC§) 30321 and received certification from the California Secretary of State in 1961. Its boundaries include most of the City of Scotts Valley (City) as well as some unincorporated areas north of the City. It is approximately five miles from north to south and one mile east to west with an approximate area of 4.8 square miles (3,045 acres). **Figure 3-2** shows the location of SVWD's service area and City limits. No changes to SVWD's service area have occurred since the 2015 UWMP was prepared; however, an amendment to the Sphere of Influence occurred in 2016 and a subsequent annexation occurred in 2019. Changes to the Sphere of Influence did not result in a change to SVWD's water service area that would impact information provided in the 2015 UWMP.

SVWD overlies a large portion of the Santa Margarita Basin (DWR Basin 3-027), as further discussed in the water supply characterization chapters. Groundwater is the only source of potable water supply for SVWD. Sewer service in the Scotts Valley area is provided by the City. SVWD partners with the City to provide recycled water to SVWD customers and the Spring Lakes Mobile Home Park in the SLVWD service area as described in **Chapter 4**.

3.1.2 San Lorenzo Valley Water District

Established in 1941, SLVWD serves several communities within the 136 square-mile San Lorenzo River watershed. SLVWD service area ranges in elevation from approximately 200 ft msl near Felton to as high as 1,400 ft msl along the eastern flank of Ben Lomond Mountain. SLVWD serves a combined area of approximately 98 square miles (62,749 acres). **Figure 3-3** shows the location of SLVWD's service area. **Figure 3-1** shows the location of the SVWD and SLVWD service areas in relation to each other.

SLVWD owns, operates, and maintains two separately managed water systems, which are the North/South System (or San Lorenzo Valley System) and the Felton System. SLVWD's 2015 UWMP characterized different North, South, and Felton systems and service areas. However, since the 2015 UWMP, SLVWD acquired and connected the Lompico system, connected the North and South systems, and now serves these systems as one San Lorenzo Valley System. The North/South service area includes the unincorporated communities of Boulder Creek, Brookdale, Ben Lomond, Mañana Woods, Lompico and portions of the City of Scotts Valley and adjacent unincorporated neighborhoods. The Felton Service Area was acquired by SLVWD from California American Water (CAW or Cal-Am) in September 2008 and includes the town of Felton and adjacent unincorporated areas. It was owned and operated by Citizen Utilities Company of California prior to 2002.

On June 1, 2016, the Lompico service area was annexed into the San Lorenzo Valley System. The Lompico County Water District was formed in 1963 by the community of Lompico Canyon, adjacent to the SLVWD service area boundary. In 1964, the 70 registered voters in Lompico approved a 1.5-million-dollar water infrastructure bond. In 1974 the State of California set a moratorium limiting customer hookups to no more than 500, based on a limited water supply. The system was completed in 1978, and the last of the four series of 40- year bonds paid off in 2018. In 2015, the Lompico County Water District was named by the State as one of 17 small water systems in danger of running out of water resources during the drought. With funding through an emergency grant from the State of California, an intertie was installed connecting the Lompico County Water District service area (Lompico) to the SLVWD service area. The emergency intertie has been converted to a full-time water supply for Lompico Canyon residents (Lompico Assessment District Oversight Committee, 2019).

In 2016, SLVWD completed the process with the State Water Resources Control Board and obtained a consolidation permit for the entire service area. SLVWD is designated as Public Water System (ID # CA4410014) as defined by the California Health and Safety Code. SLVWD's sources of water are solely from local groundwater and surface water.

SLVWD service area is primarily on individual septic sewage systems. However, SLVWD owns, operates, and maintains a wastewater system in Boulder Creek's Bear Creek Estates, which serves 56 homes. The system collects and treats domestic wastewater which is discharged to a subsurface 2.3 acre leach field. In addition, a portion of the SLVWD south service area is served by the City. SLVWD does not supply recycled water to its service area.

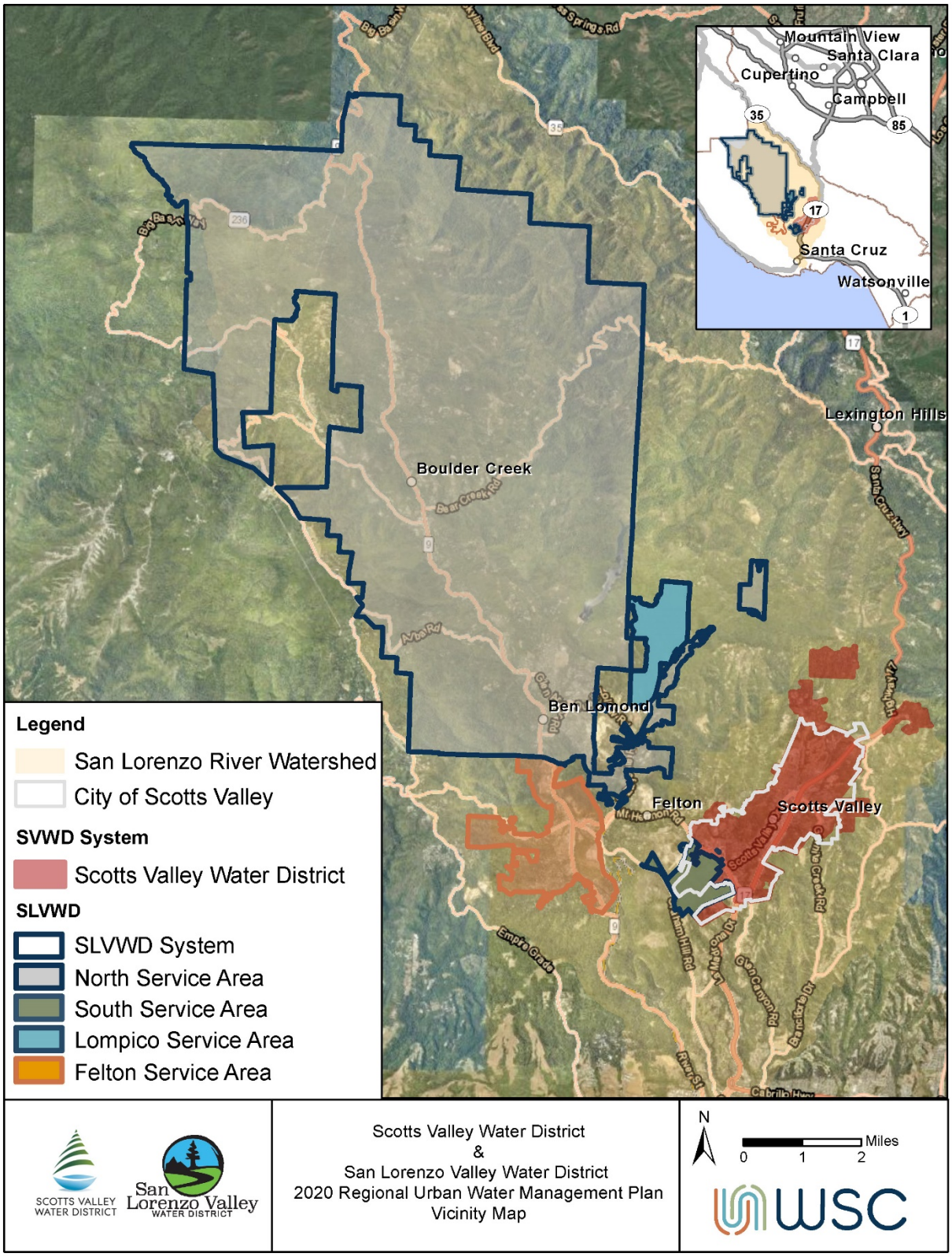

Figure 3-1. SVWD & SLVWD Service Areas

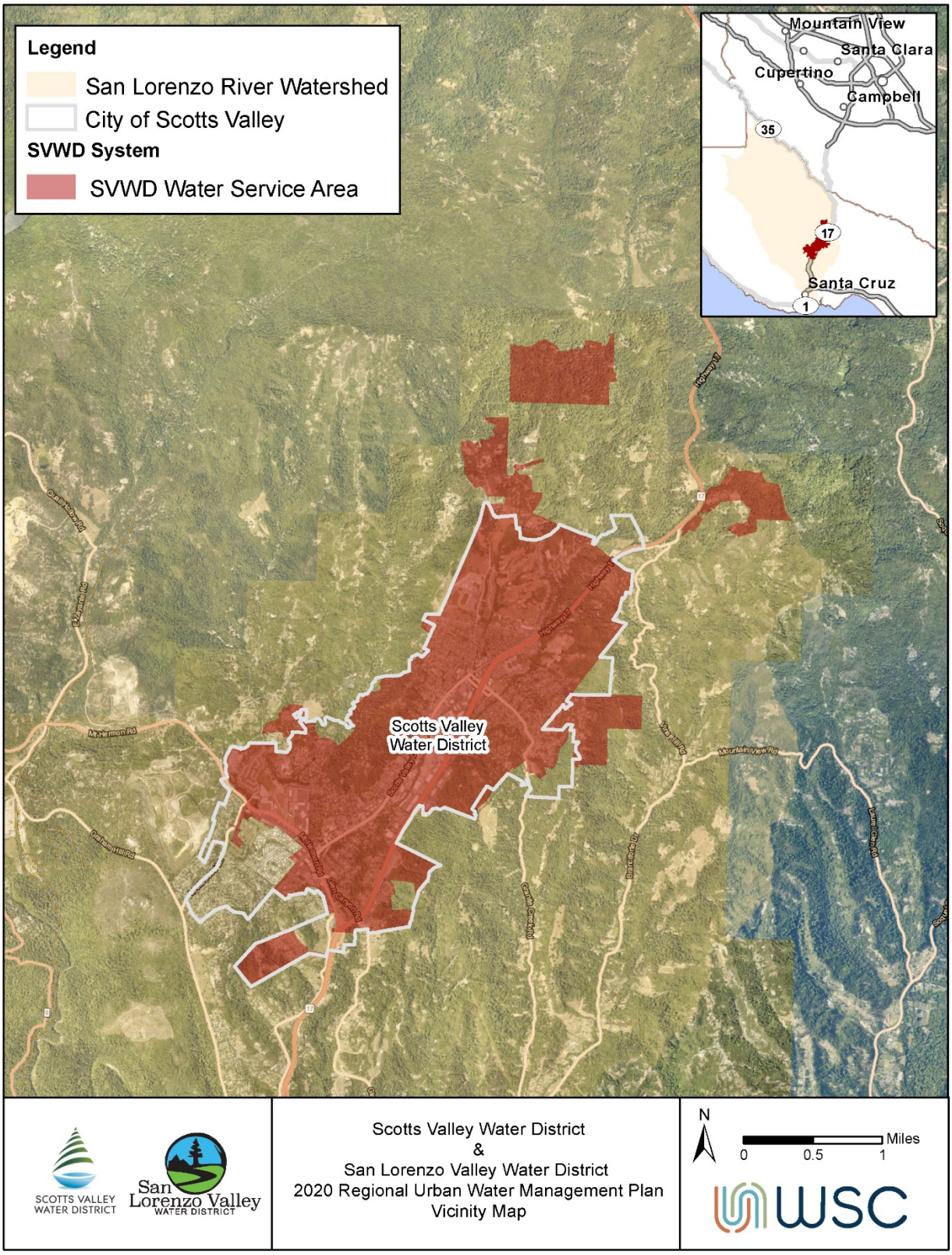

Figure 3-2. Scotts Valley Water District Service Area Boundary

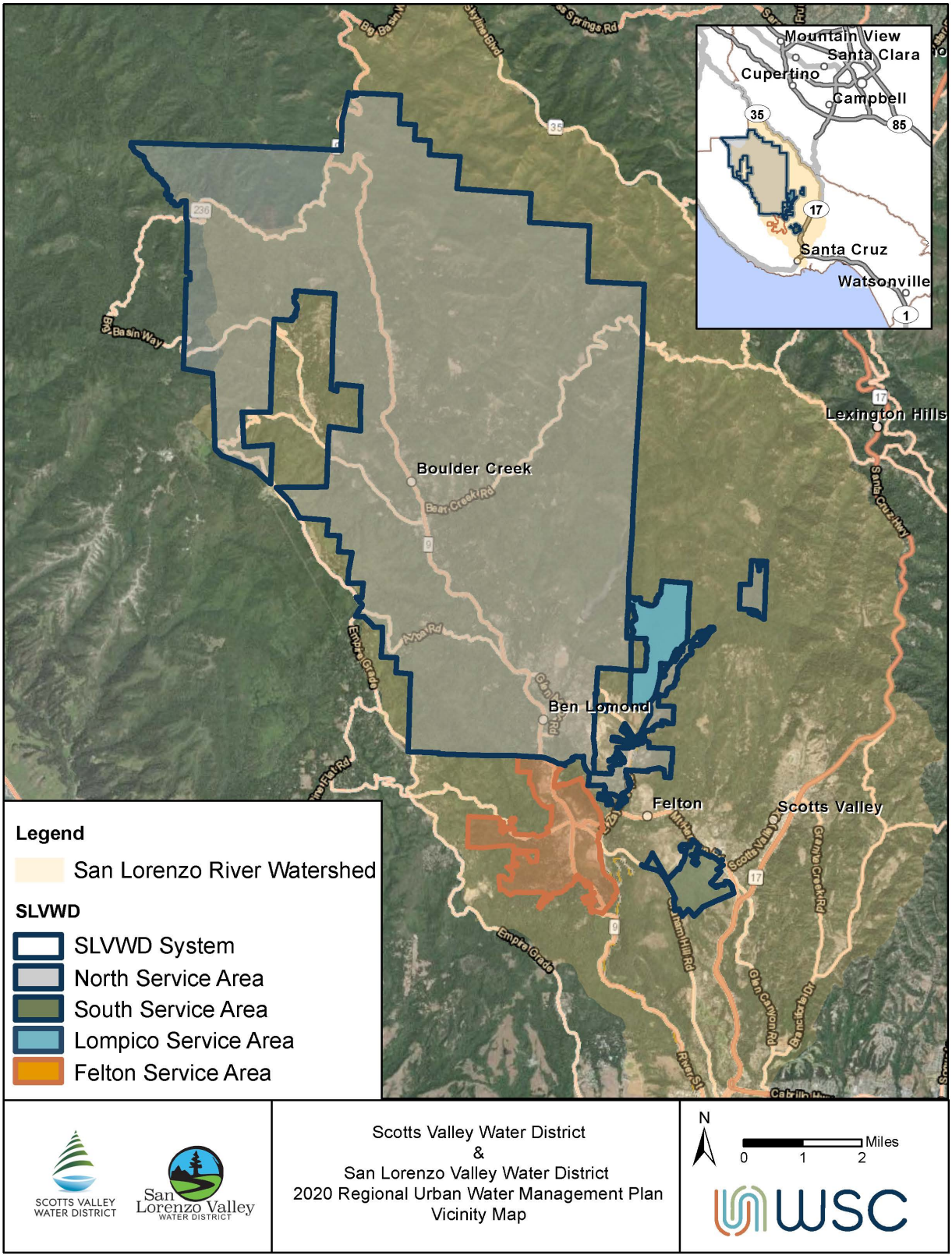

Figure 3-3. San Lorenzo Valley Water District Service Area Boundary

3.2 Service Area Climate

The climate of the Districts' service areas is mild. The area is cooled in the summer by early morning and evening coastal fog. The Districts occupy a coastal valley climate zone that receives significant winter precipitation and relatively little summer coastal fog. **Table 3-1** presents average climate data for the Districts' service areas, including temperature, rainfall, and reference evapotranspiration (ETo). As shown in **Table 3-1**, the warmest month of the year is typically September with an average temperature of 67.7 degrees Fahrenheit (°F), while the coldest month of the year is December with an average temperature of 54.3°F.

SVWD and SLVWD closely monitor rainfall within their service areas using their own rain gauges and precipitation can vary significantly in the different microclimates in the valley. The annual average precipitation within SVWD's service areas is 41.63 inches and 48.3 inches in SLVWD's service area. The majority of rainfall occurs in the months of November through March with January typically being the wettest month.

Evapotranspiration from plants is variable, differing with the type of vegetation cover and with weather and soil conditions. Evaporation in the area is generally low in the winter months and peaks in the summer. Comparison of the monthly rainfall and evaporation amounts reveal that winter is characterized by a surplus of rainfall over ETo. This rainfall is then available for runoff and natural groundwater recharge. Native vegetation ETo is reduced substantially in summer when rainfall is minimal and soil moisture is depleted. At this time, however, landscape irrigation demands become greatest. This contributes to high water demands in the late summer creating a time lag between periods of high demand and high supply.

Table 3-1. Average Climate for SVWD and SLVWD

MONTH	AVERAGE TEMPERATURE (°F)[1]	AVERAGE STANDARD ETO (INCH)[1]	SVWD MONTHLY AVERAGE RAINFALL (INCH)[2]	SLVWD MONTHLY AVERAGE RAINFALL (INCH)[3]
January	55.1	1.9	8.27	10.02
February	55.4	2.6	8.08	9.48
March	57.8	3.9	6.50	7.31
April	60.1	4.9	2.50	2.93
May	62.2	5.8	1.00	1.15
June	65.3	6.2	0.24	0.24
July	66.2	5.8	0.01	0.01
August	67.1	5.1	0.04	0.06
September	67.7	4.5	0.26	0.17
October	65.4	3.5	1.92	1.98
November	58.7	2.1	4.83	5.63
December	54.3	1.6	7.98	9.31
ANNUAL AVERAGE/TOTAL	**66.8**	**47.9**	**41.63**	**48.30**

1) Data based on CIMIS weather station 104 De Laveaga; https://cimis.water.ca.gov/. Averages calculated from 2010-2020 data.

2) Data provided by SVWD (El Pueblo Yard weather station) and represents average rainfall from water year 1981-1982 through water year 2019-2020.

3) Data provided by SLVWD (gauge located at 13060 Highway 9) and from water year 1981-1982 through water year 2019-2020.

3.3 Service Area Population and Demographics

This section describes the population in the Districts' service areas, including current and projected population, and demographic information.

3.3.1 Service Area Population

The 2020 population estimate for the Districts' separate service areas were calculated using DWR's Population Tool, which utilizes Geographical Information Systems (GIS) service area boundaries, Districts' service connection data, and Census data. The DWR Population Tool overlaps GIS shapefiles with Census populations by Census block. The tool calculates the 2020 persons-per-connection by creating a trend line of the persons-per-connection from the year 2000 to the year 2010 and continuing that trend to the year 2020. However, the persons-per-connection from the year 2010 was used to estimate 2020 population. SVWD population projections were developed in conjunction with the City Planning Department's known and estimated development projects though 2030 as well as the General Plan buildout population of 15,000. It was assumed that SVWD's water service area would grow at the same rate as the City from its 2020 population to the buildout population of 15,000 in 2060, which resulted in an annual growth of 0.87% from 2020 to 2045. SLVWD utilized the Association of Monterey Bay Area Governments (AMBAG) 2018 Regional Growth Forecast (RGF) (Association of Monterey Bay Area Governments, 2018) Transportation Analysis Zone GIS data to determine an annual growth rate of 0.15% from 2020 through 2040, which was assumed to continue to 2045. **Table 3-2** provides an estimate of population projection through 2045 in the Districts' service areas.

Table 3-2. DWR 3-1R SVWD and SLVWD Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
Scotts Valley Water District	10,582	11,082	11,582	12,082	12,582	13,082
San Lorenzo Valley Water District	22,928	23,101	23,276	23,452	23,630	23,809
TOTAL	**33,510**	**34,183**	**34,858**	**35,534**	**36,212**	**36,891**

3.3.2 Other Social, Economic, and Demographic Factors

SVWD and SLVWD provide water service primarily to residential customers with some commercial, industrial, institutional, recreational, and landscape customers. Water is also supplied for fire protection and temporary construction uses. SVWD provides more water to commercial, industrial, and institutional customers than SLVWD. The Districts' service areas continue to experience modest increases in single family residential construction. Although the population has increased somewhat, the demand for potable water has trended downward, which is most likely linked to permanent water savings achieved during the recent drought, the implementation of water use efficiency programs, continued use of recycled water and focus on reducing water losses and minimizing water waste. The region expects to see some continuing modest development activity in the near-term.

Based on 2015-2019 data, the U.S. Census Bureau estimates that households within Santa Cruz County are composed of 2.72 people per household. Approximately 48.5% of households are comprised of married-couples with families. The median age of a resident in Santa Cruz County is 37 years old. Based on 2015-2019 Census data, 86% of people 25 years or older has at least graduated from high school and 40% obtained a bachelor's degree or higher. It was estimated that 13.7% of people did not complete high school.

Throughout Santa Cruz County, approximately 60% of the working population (ages 16 and over) were employed. A majority held a private wage or salary position (74%), while 16% were employed by the

federal, state, or local government. Educational services and health care (24.7%) is the most common industry that Santa Cruz County residents work in, followed collectively by professional, scientific, management, and administrative and waste management services (12.6%). The median household income is $82,234.

The U.S. Census Bureau reported that of the people of Santa Cruz County that identify as one race alone, 74.8% were White. Approximately 4.8% identified as two or more races. Of the total population, an estimated 57.3% identified as White non-Hispanic and 33.6% as Hispanic. The U.S. Census Bureau clarifies that people of Hispanic origin may be of any race (United States Census Bureau).

3.4 Land Uses within Service Area

Land use planning in the valley is the responsibility of the County of Santa Cruz and the City of Scotts Valley. Boulder Creek, Felton, Lompico, and Ben Lomond are all census-designated areas within the county but are not incorporated towns (Santa Margarita Groundwater Agency, 2020). **Figure 3-4** shows the distribution of various land use types within the Districts' service areas and the surrounding area. Land uses include timber, State, and regional parks, rural residential, low-density urban residential and commercial, quarries, agriculture, and other open space. The majority of the Districts' customers are low density and rural residential customers within areas zoned primarily as rural (1 residence or less per acre).

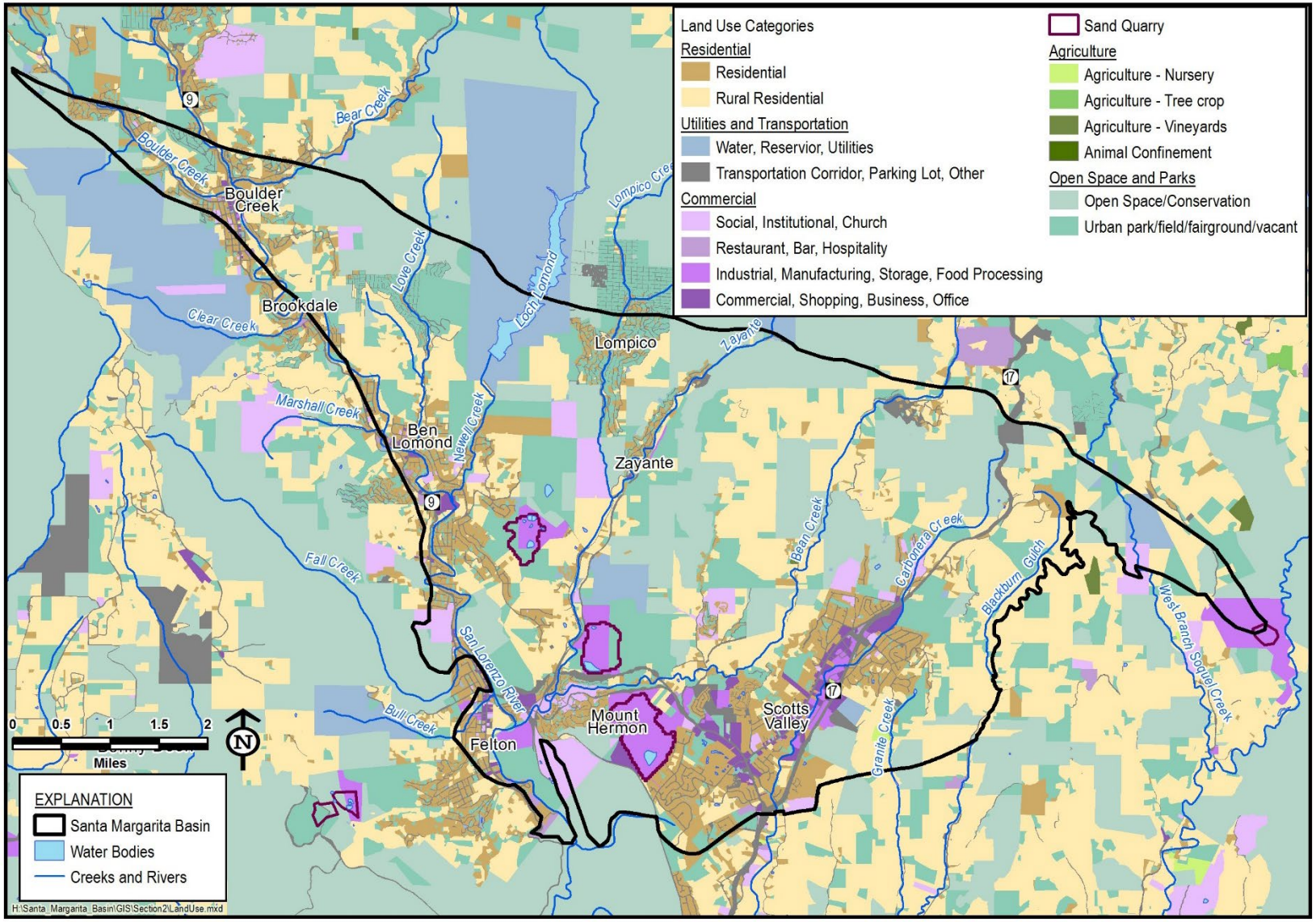

Figure 3-4. Land Use in the Santa Margarita Basin (Santa Margarita Groundwater Agency, 2020)

URBAN WATER MANAGEMENT PLAN

4 SVWD Water Use Characterization

Residential customers consume the majority of water served by SVWD. In 2020, single-family and multi-family customers used approximately 72% of the total water consumed in the service area. This chapter summarizes past and current water uses and projected demands through 2045.

This chapter describes and quantifies SVWD's current and projected water use through the year 2045. Accurately tracking and reporting water use allows SVWD to properly analyze the use of their resources to conduct diligent resource planning. Estimating future water use as accurately as possible allows SVWD to manage its water supply and appropriately and plan for infrastructure investments. Assessments of future growth and related water use provides essential information for developing water use projections to manage resources for the service area needs.

IN THIS SECTION

- Non-Potable vs. Potable Water Use
- Water Use by Sector
- Projected Demand

4.1 Non-Potable Versus Potable Water Use

Groundwater is the source of potable water in SVWD's service area. Recycled water is supplied to a limited number of customers and is primarily used for irrigation. Recycled water is an important supplemental supply source for SVWD. Potable and recycled water demands, and supplies cannot be used interchangeably when preparing reliability assessments and as such they have been separated and are described separately. Additional information regarding the potable water supply as well as the treatment and distribution of recycled water within SVWD's service area is provided in **Chapter 9** of this UWMP.

4.2 Past, Current, and Projected Water Use by Sector

Water suppliers have the option to track water use by the categories that are applicable to their systems.

SVWD uses the following customer categories:

- Single-family residential
- Multi-family residential
- Commercial, industrial, and institutional (CII)
- Landscape
- Fire service
- Other (Bulk temporary)

The categories above are used to present past, current, and projected water uses for SVWD in this chapter.

4.2.1 Past Water Use

Table 4-1 and **Figure 4-1** show the volume and percentage of water used by each customer category in 2020 rounded to the nearest percent and includes losses. Water losses were calculated as the difference between billed consumption and water entering the distribution system.

Table 4-1. Past Water Use, Acre-Feet Per Year (AFY).

TYPE	2020
Single-Family	661
Multi-Family	67
CII	226
Landscape	59
Fire Service	1
Bulk/Temp	4
Losses	118
TOTAL USE	**1,135**

Data from SVWD metered accounts

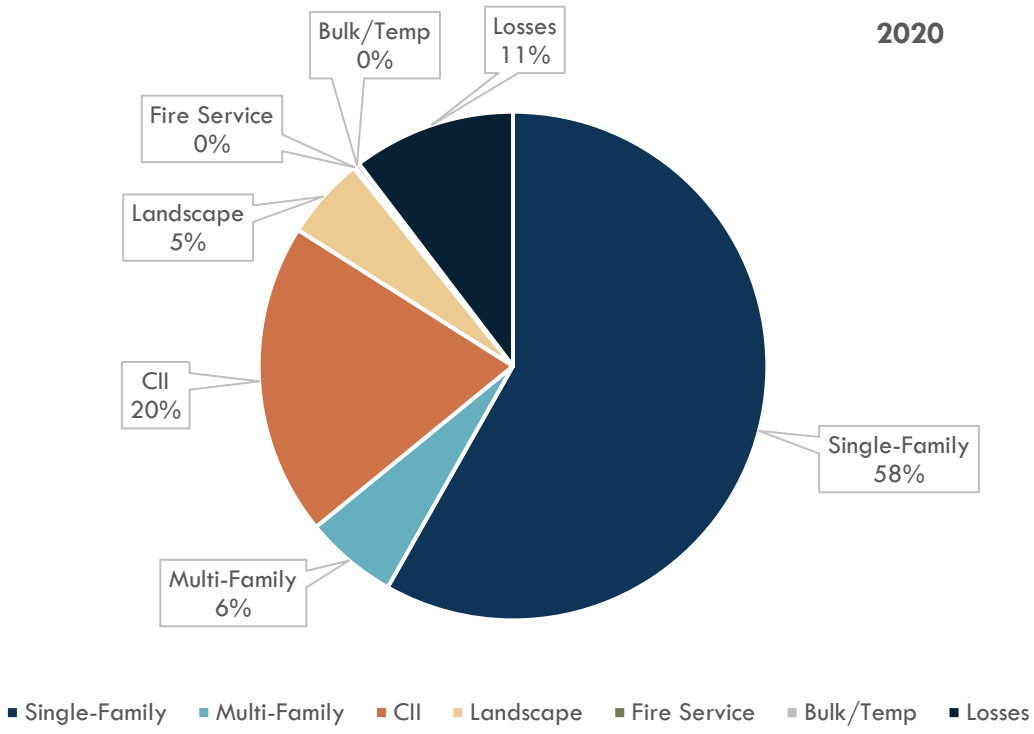

Figure 4-1. 2020 Percentage of Water Use by Customer Category

4.2.2 Potable Distribution System Water Losses

Water losses can include "real losses", which are physical losses from the water distribution system (and the supplier's storage facilities) as well as "apparent losses", which represent losses due to metering inaccuracies, data handling errors and/or unauthorized consumption. Non-revenue water (NRW) is defined as the water losses plus authorized unbilled (metered and unmetered) water consumption. Suppliers are required to report their distribution system water loss for each of the five years preceding the UWMP update [Water Code Section 10631(d)(3)] in accordance with the rules adopted pursuant to Water Code Section 10608.34. In addition, suppliers are required to provide data demonstrating whether the supplier will meet its State Water Board water loss performance standard. Although the standard has not yet been implemented and may not go into effect until the future, the data needs to be in 2020 UWMPs per the Water Code.

Water loss over the last five years has ranged from 96 AFY to 129 AFY. Water loss assessments completed since 2015 using American Water Works Association (AWWA) Water Audit Software are provided in **Appendix D** and summarized in **Table 4-2**. AWWA Water Audits are reported in calendar years.

Table 4-2. DWR 4-4R 12 Month Water Loss Audit Reporting

REPORT PERIOD START DATE		
MM	YYYY	VOLUME OF WATER LOSS, AFY*
1	2015	114
1	2016	129
1	2017	100
1	2018	96
1	2019	98

* Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet. Note that AWWA reporting is conducted by calendar year. Data for 2015 obtained from 2015 UWMP, which provided water loss for 2015 with the reporting period between July 2014 and June 2015.

4.2.3 Projected Water Use

Demands were estimated for residential, CII, and landscape utilizing the best available growth data from the City's Planning Department, population data, historical growth trends, and anticipated reductions in water losses to comply with the State's water loss standards.

Residential demands were estimated using a Gallons Per Capita Per Day (GPCD) method. Demand was estimated by multiplying the GPCD by projected populations. Projected populations are described in **Chapter 3**. It is assumed that residential GPCD will reduce from 61 GPCD in 2020 to 52 GPCD in 2040 and 49 GPCD in 2060. Residential GPCD is assumed to reduce because of water use efficiency achieved through technological improvements and regulatory compliance as well as customer conservation. Five-year increment values were calculated using interpolation between 2020, 2040 and 2060.

Commercial demands were estimated to grow at a rate of 10%, based on historical proportionality of CII to Residential customers, between 2020, 2040 and 2060. Five-year increment values were calculated using interpolation between 2020, 2040 and 2060.

Landscape demands were assumed to stay relatively constant through the planning horizon due to a balance of slightly increased irrigation demand for new development and savings achieved through outdoor water use efficiency rebates and activities.

Water losses were assumed to decrease at a rate of 10% between 2020, 2040 and 2060. Water losses are assumed to experience a downward trend due to increased efforts on pressure control, leak detection and innovative data analytics and management. Five-year increment values were calculated using interpolation between 2020, 2040 and 2060.

SVWD is aware that future water use standards are under development by DWR, which will supersede SB X7-7 standards, and will likely require demands to be lower than the SB X7-7 target. Therefore, SVWD plans to continue implementing water use efficiency activities to meet future water use standards and to enhance resiliency for drought and other water shortage conditions as described in **Chapter 11**, **Chapter 13**, and **Chapter 14**. **Table 4-1** presents actual water demands in 2020 and **Table 4-3** (DWR Table 4-2R) presents projected water demands through 2045. It is important to note that demands are expected to reduce from 2020 to 2025 due to assumed increased water use efficiencies described in the previous paragraphs, especially GPCD and water loss reductions. Water use reductions from 2025-2045 from water use efficiencies are estimated to occur at a lower rate than 2020-2025. Increased demand from population growth slightly outpaces water use reductions from water use efficiency, resulting in slightly increasing demands from 2025-2045.

Demand projections for the UWMP were developed with consideration of ongoing efforts to prepare the GSP. The UWMP and GSP used different demand projection methodologies, but demand projections between the two plans are very similar with UWMP demands in 2045 projected to be 2% more than the GSP. The GSP assumes a linear demand increase between 2020 and 2072. The UWMP methodology described previously in this section incorporates available information for future water use efficiency standards currently under development by DWR. The UWMP methodology was used to conservatively project demand in order to proactively develop water resources management strategies for these potential demands.

Table 4-3. DWR 4-2R Projected Demands for Water (AFY)

		PROJECTED WATER USE				
USE TYPE	ADDITIONAL DESCRIPTION	2025	2030	2035	2040	2045
Single Family		646	649	658	661	673
Multi-Family		64	64	65	65	66
Other	Commercial, Industrial, Institutional	249	250	254	255	259
Landscape		56	56	57	57	58
Other	Fire Service	1	1	1	1	1
Other	Bulk / Temporary	6	6	6	6	6
Losses		89	89	78	79	80
	TOTAL:	**1,111**	**1,115**	**1,119**	**1,123**	**1,144**

DWR advises suppliers to include anticipated water conservation savings when developing future demand projections and must identify in the UWMP if conservation savings were considered and included in developing demand estimates for the next 20 years. **Table 4-4** satisfies the requirement and details on various sources used to project demand are discussed in this section.

Table 4-4. DWR 4-5R Inclusion in Water Use Projections

Are Future Water Savings Included in Projections? Refer to Appendix K of UWMP Guidebook.	Yes
Section or page number where the citations utilized in the demand projects can it be found:	Section 4.2.3
Are Lower Income Residential Demands Included in Projections?	Yes

4.2.4 Characteristic Five-Year Water Use

In addition to past and projected uses, the UWMP more closely analyzes anticipated conditions for the next five years (2021 – 2025). In the next five years, SVWD anticipates that demands remain fairly constant. Details on an analysis for the next five years are discussed in **Chapter 11**.

4.3 Water Use for Lower Income Households

The California Water Code section 10631.1 requires demand projections to include projected water use for single-family and multi-family residential housing needed for lower income households. Low-income households are defined as households making less than 80% of median household income.

The AMBAG Regional Housing Needs Allocation (RHNA) Plan: 2014-2023 (Association of Monterey Bay Area Governments, 2013) determines the housing needs in its service area over the planning period of 2014-2023. For this planning period, 2,515 new very low-income units and 1,640 new low-income units are projected to be needed by 2023 in the AMBAG region, which includes the counties of Monterey, Santa Cruz, and San Benito. The allocation of these units throughout the region is based on the 2014 Regional Growth Forecast housing needs and employment growth over the planning period. It was assumed that SVWD will accommodate the RHNA for the City of Scotts Valley which totals 34 new very low-income units and 22 new low-income units. Assuming SVWDs' 2020 average water usage of 0.197 AFY/single family residential connection, the projected demand for the low-income residential units within SVWD's service area is shown in **Table 4-5**. The low-income deliveries projections are included in SVWDs' total projected water deliveries shown in **Table 4-5**.

Table 4-5. Low Income Housing Units and Demand Estimate

	2020	2021	2022	2023	TOTAL
New Low-Income Residential Housing Units – AMBAG Area	416	416	416	416	1,664
New Low-Income Residential Housing Units – SVWD Service Area	6	6	6	6	24
2020 SVWD Residential Demand Factor, AFY/single family connection	0.197	0.197	0.197	0.197	0
New Low-Income Residential Housing Demand, AFY – SVWD Service Area	1	1	1	1	4

4.4 Climate Change Considerations

Future water use may be affected by climate change.

"Projections of climate change in California indicate a further intensification of wet and dry extremes and shifting temperatures that can…affect both water use and supplies. Extreme and higher temperatures can lead to increases in water use…Projections of more frequent, severe, and prolonged droughts could lead to not only less surface water available, but also exacerbating ongoing stressors in groundwater basins across the state"
(California Department of Water Resources, March 2021).

Higher temperatures decrease the amount of precipitation available for groundwater recharge and from surface water sources while increasing water use, especially for outdoor use. Reductions in future supply due to impacts associated with climate change were considered as part of the projected groundwater supply discussed in **Chapter 9** and **Chapter 11**. Increases in future water use patterns due to climate change factors were considered as part of the demand projection provided in this chapter.

URBAN WATER MANAGEMENT PLAN

5 SLVWD Water Use Characterization

Residential customers consume the majority of water served by SLVWD. In 2020, single-family and multi-family customers used approximately 90% of the total water consumed in the service area. This chapter summarizes past and current water uses and projected demands through 2045.

This chapter describes and quantifies SLVWD's current and projected water use through the year 2045. Accurately tracking and reporting water use allows SLVWD to properly analyze the use of their resources in order to conduct diligent resource planning. Estimating future water use as accurately as possible allows SLVWD to manage its water supply and appropriately plan for infrastructure investments. Assessments of future growth and related water use provides essential information for developing water use projections to manage resources for the service area needs.

IN THIS SECTION

- Non-Potable vs. Potable Water Use
- Water Use by Sector
- Projected Demand

5.1 Non-Potable Versus Potable Water Use

A combination of surface water and groundwater sources are used by SLVWD to meet customer potable water needs. Non potable water in the form of recycled water is distributed to one multi-residential customer in SLVWDs' service area by SVWD. Potable and recycled water demands, and supplies cannot be used interchangeably when preparing reliability assessments and as such they have been separated and are described separately. Additional information regarding the potable water supply as well as the treatment and distribution of recycled water within SLVWD's service area is provided in **Chapter 10** of this UWMP.

5.2 Past, Current, and Projected Water Use by Sector

Water suppliers have the option to track water use for the sectors that are applicable to their systems.

SLVWD tracks water use by the following sectors.

- Single-family residential
- Multi-family residential
- Commercial, industrial, and institutional (CII)
- Landscape
- Surplus

The sectors above are used to present past, current, and projected water uses for SLVWD. Note that SLVWD tracks CII water uses as a single category because there is not a large number of industrial and institutional customers in the service area and these sectors have similar water usage. SLVWD does not have industrial users that require significant volumes of process water which would make it more important to track this use sector separately.

5.2.1 Past Water Use

Table 5-1 and **Figure 5-1** show the volume and percentage of water used by each customer sector in 2020 and includes losses. Water losses were calculated as the difference between billed consumption and water entering the distribution system.

Table 5-1. Past Water Use, Acre-Feet Per Year (AFY).

TYPE	2020
Single-Family	1,179
Multi-Family	252
CII	141
Landscape	9
Surplus	6
Losses	463
TOTAL USE	**2,049**

Data from SLVWD metered accounts. The Lompico System was annexed in 2016.

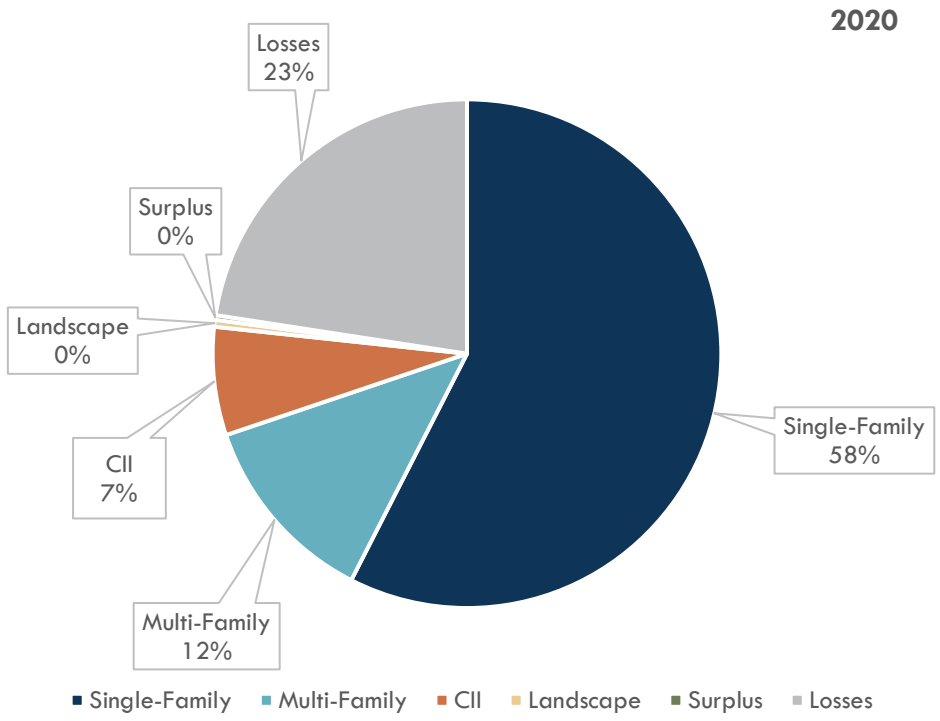

Figure 5-1. 2020 Percentage of Water Use by Customer Sector

5.2.2 Distribution System Water Losses

Water losses can include “real losses”, which are physical losses from the water distribution system (and the supplier’s storage facilities) as well as “apparent losses”, which represent losses due to metering inaccuracies, data handling errors and/or unauthorized consumption. Non-revenue water (NRW) is defined as the water losses plus authorized unbilled (metered and unmetered) water consumption. Suppliers are required to report their distribution system water loss for each of the five years preceding the UWMP update [Water Code Section 10631(d)(3)] in accordance with the rules adopted pursuant to Water Code Section 10608.34. In addition, suppliers are required to provide data demonstrating whether the supplier will meet its State Water Board water loss performance standard. Although the standard has not yet been implemented and may not go into effect until the future, the data needs to be in 2020 UWMPs per the Water Code. Information regarding water loss reduction programs is provided in **Section 15.1.5**.

Water loss over the last five years has ranged from 298 AFY to 516 AFY. Water loss assessments completed since 2015 using American Water Works Association (AWWA) Water Audit Software are provided in **Appendix E** and summarized in **Table 5-2**. AWWA Water Audits are reported in calendar years.

Table 5-2. DWR 4-4R 12 Month Water Loss Audit Reporting

REPORT PERIOD START DATE		
MM	YYYY	VOLUME OF WATER LOSS, AFY*
1	2015	298
1	2016	378
1	2017	516
1	2018	505
1	2019	433

* Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet. Note that AWWA reporting is conducted by calendar year.

5.2.3 Projected Water Use

Demands were estimated using a Gallons Per Capita Per Day (GPCD) method. This method uses "produced" water demand, which includes NRW and billed customer consumption for all water use types as described in **Section 5.2.2**. It is important to note that GPCD is different than residential indoor (RI) GPCD (RI-GPCD), which only accounts for a portion of total water use. To align with DWR requirements, "produced" water demand was used to estimate GPCD and how much supply is needed to meet all demand including billed customer consumption for all use types and the amount of NRW that is associated with delivering water to all customers. This helps inform water loss improvement programs and quantify the potential for reducing NRW. Information regarding water loss reduction programs is provided in **Section 15.1.5**.

The total demand was estimated by multiplying the GPCD by the projected populations for 2025, 2030, 2035, 2040, and 2045. Projected populations are described in **Chapter 3**. **Table 5-3** presents projected demands through 2045.

Table 5-3. DWR 4-2R Projected Demands for Water (AFY)

-		PROJECTED WATER USE				
USE TYPE	ADDITIONAL DESCRIPTION	2025	2030	2035	2040	2045
Single Family		1,207	1,216	1,225	1,235	1,244
Multi-Family		258	259	261	263	265
Other	Commercial, Industrial, Institutional	141	143	144	145	146
Landscape		9	9	9	9	9
Other	Surplus	6	6	6	6	6
Losses		589	594	598	603	607
	TOTAL:	**2,210**	**2,227**	**2,243**	**2,260**	**2,277**

Demand projections are based on the assumption that the current GPCD will rebound to the selected target of 85 GPCD in 2025 and stay constant thereafter. **Chapter 7** describes the methodology used to develop SB X7-7 baseline and targets in detail. Since 1995, per capita water usage varied from a high of 104 GPCD in 2006 to a low of 70 GPCD in 2015. Overall, per capita consumption has decreased, which is most likely due to the recent drought, state mandated water use reduction targets, more efficient appliances and plumbing, and conservation efforts made by SLVWD and its customers (**Figure**

5-2). While the 2020 GPCD was below the SB X7-7 target, future demand could increase due to a variety of factors as experienced as recently as 2017 and 2018, and this UWMP conservatively projects demand to proactively develop water resources management strategies for these potential increased demands. However, SLVWD is aware that future water use standards are under development by DWR, which will supersede SB X7-7 standards, and will likely require demands to be lower than the SB X7-7 target. **Figure 5-2** and **Figure 5-3** show demand scenarios analyzed, including a scenario estimating impacts from DWR water use efficiency standards that are currently under development. The State has proposed standards for residential indoor use, measured as RI-GPCD, which reduces from 55 RI-GPCD in 2020 to 47 RI-GPCD in 2025 and 42 RI-GPCD in 2030. In recognition of the proposed standards, SLVWD plans to continue encouraging efficient water use and implementing water use efficiency measures to support meeting future water use standards and to enhance resiliency for drought and other water shortage conditions as described in **Chapter 12**, **Chapter 13**, and **Chapter 15.**

Demand projections for the UWMP were developed with consideration of ongoing efforts to prepare the GSP. The UWMP and GSP used different demand projection methodologies, but demand projections between the two plans are similar with UWMP demands in 2045 projected to be 7% higher than the GSP. Demand projections between the two plans differ due to different assumptions made in each plan which are primarily evident in year 2025. As previously noted, the UWMP assumes the current GPCD will rebound to the selected target of 85 GPCD in 2025 and stays constant thereafter. The GSP assumes a linear demand increase between 2020 and 2072 without any rebound. The UWMP assumption was made to conservatively project demand in order to proactively develop water resources management strategies for these potential increased demands similar to 2017 and 2018 after the 2012-2016 drought. Between 2025 and 2045 the UWMP projects an increase in demand of approximately 3% and the GSP projects an increase of approximately 4%. Because of the rebound assumptions for 2025, the total demand in the UWMP is between 149 AFY and 172 AFY greater than the demand assumed in the GSP during projected years between 2025 and 2045.

DWR advises suppliers to include anticipated water conservation savings when developing future demand projections and must identify in the UWMP if conservation savings were considered and included in developing demand estimates for the next 20 years. **Table 5-4** satisfies the requirement and details on various sources used to project demand are discussed in this section. Conservation savings were considered and included in developing demand estimates for the next 20 years by using the selected SB X7-7 target of 85 GPCD, which is assumed to include conservation savings.

Table 5-4. DWR 4-5R Inclusion in Water Use Projections

Are Future Water Savings Included in Projections? Refer to Appendix K of UWMP Guidebook.	Yes
Section or page number where the citations utilized in the demand projects can it be found:	Section 5.2.3
Are Lower Income Residential Demands Included in Projections?	Yes

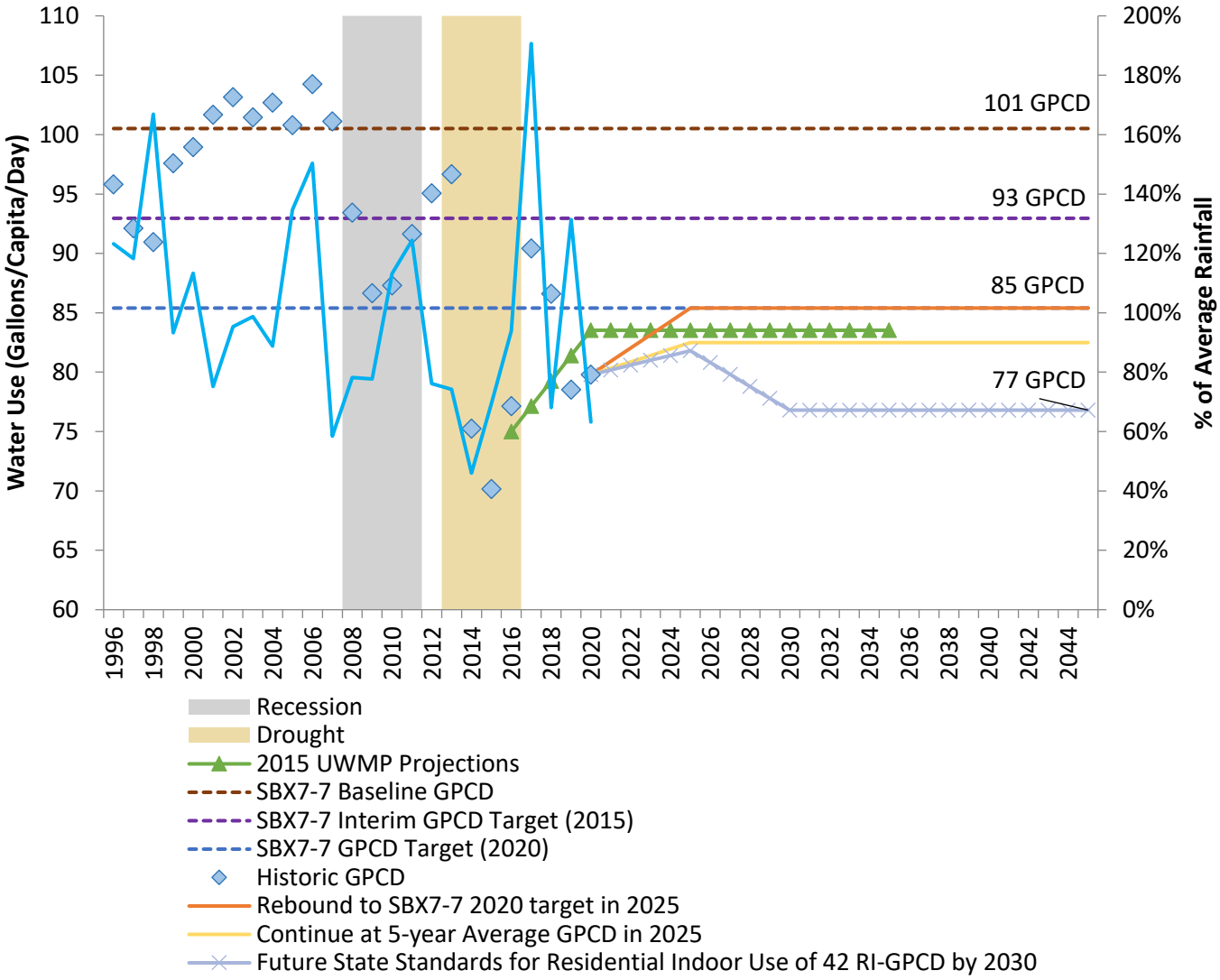

Figure 5-2. SLVWD Past, Current, and Projected Per Capita Water Use (GPCD)

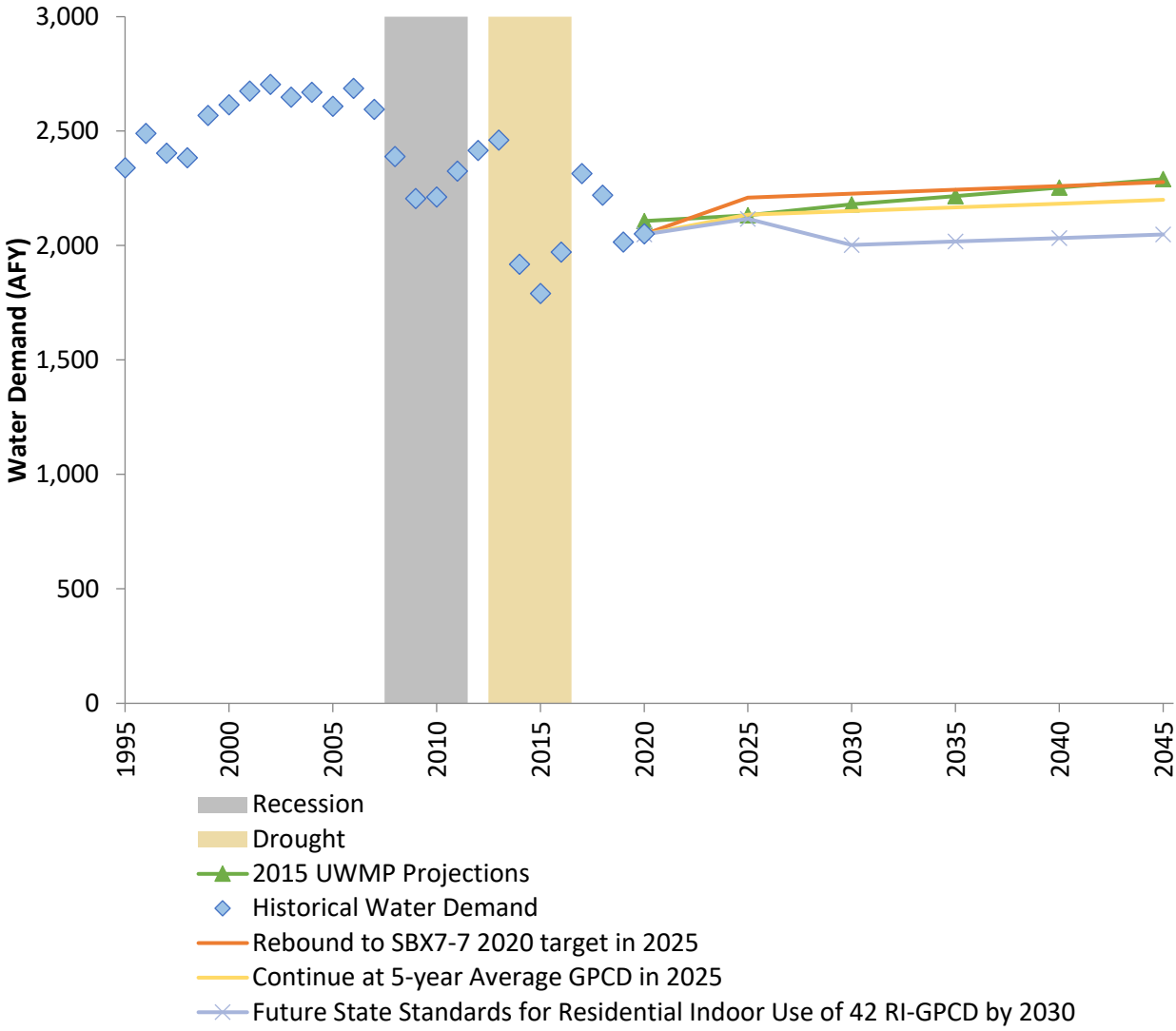

Figure 5-3. SLVWD Past, Current, and Projected Water Demand (AFY)

5.2.4 Characteristic Five-Year Water Use

In addition to past and projected uses, the UWMP more closely analyzes anticipated conditions for the next five years (2021 – 2025). In the next five years, SLVWD anticipates that demands may increase by approximately 161 AFY from 2020. This increase is based on normal year conditions representing a "rebound" from current 2020 use, which is likely lower than typical unconstrained demand as many of the City's residents continue to conserve water after the most recent drought that ended in 2016. Details on an analysis for the next five years are discussed in **Chapter 12**.

5.3 Water Use for Lower Income Households

The California Water Code section 10631.1 requires demand projections to include projected water use for single-family and multi-family residential housing needed for lower income households. Low-income households are defined as households making less than 80% of median household income.

The AMBAG Regional Housing Needs Allocation Plan: 2014-2023 (Association of Monterey Bay Area Governments, October 2013) determines the housing needs in its service area over the planning period of 2014-2023. For this planning period, 2,515 new very low-income units and 1,640 new low-income units are projected to be needed by 2023 in the AMBAG region, which includes the counties of Monterey, Santa Cruz, and San Benito. The allocation of these units throughout the region is based on the 2014 RGF housing needs and employment growth over the planning period. It was assumed that SLVWD will accommodate 3% of the population within AMBAG's service area based on the derived SLVWD population in 2023 (23,032) and projected AMBAG total population in 2023 updated under the 2018 RGF (806,684). Assuming SLVWDs' 2020 average water usage of 0.165 AFY/single-family residential connection, the projected demand for the low-income residential units within SLVWD's service area is shown in **Table 5-5**. The low-income deliveries projections are included in SLVWD total projected water deliveries shown in **Table 5-3.**

Table 5-5. Low Income Housing Units and Demand Estimate

	2020	2021	2022	2023	TOTAL
New Low-Income Residential Housing Units – AMBAG Area	416	416	416	416	1,664
New Low-Income Residential Housing Units – SLVWD Service Area	12	12	12	12	48
2020 SLVWD Residential Demand Factor, AFY/single-family connection	0.165	0.165	0.165	0.165	0
New Low-Income Residential Housing Demand, AFY – SLVWD Service Area	2	2	2	2	8

5.4 Climate Change Considerations

Future water use may be affected by climate change.

"Projections of climate change in California indicate a further intensification of wet and dry extremes and shifting temperatures that can…affect both water use and supplies. Extreme and higher temperatures can lead to increases in water use…Projections of more frequent, severe, and prolonged droughts could lead to not only less surface water available, but also exacerbating ongoing stressors in groundwater basins across the state"
(California Department of Water Resources, March 2021).

Higher temperatures decrease the amount of precipitation available for groundwater recharge and from surface water sources while increasing water use, especially for outdoor use. Reductions in future supply due to impacts associated with climate change were considered as part of the projected groundwater supply discussed in **Chapter 8**, **Chapter 10,** and **Chapter 12**. Increases in future water use patterns due to climate change factors were considered as part of the conservative demand projection provided in this chapter.

URBAN WATER MANAGEMENT PLAN

6 SVWD SB X7-7 Baseline, Targets and 2020 Compliance

This chapter describes SVWD compliance with the Water Conservation Act of 2009 Baseline, Targets, and 2020 Compliance. The goal of this chapter is to demonstrate compliance with the 2020 targeted water-use reduction of 20 percent

Senate Bill X7-7 (SB X7-7), which was incorporated into the UWMP Act in 2009, requires all water suppliers to increase water use efficiency with the overall goal to decrease per-capita water consumption within the state by 20 percent by the year 2020. SB X7-7 required DWR to develop certain criteria, methods, and standard reporting forms through a public process that could be used by water suppliers to establish baseline water use and determine water conservation targets.

IN THIS SECTION

- Target and Baseline Method Summary
- Baselines & Targets
- SB X7-7 Forms and Tables
- 2020 Compliance

This chapter describes SVWD's methods for calculating baseline and target water consumption in accordance with DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (California Department of Water Resources, 2016). The SB X7-7 Verification Forms and Compliance Forms, which are required to be submitted to DWR to demonstrate compliance with the SB X7-7 requirements, are presented in **Appendix F**. This chapter also shows that SVWD achieved the 2020 water use target of 154 GPCD, with a calculated GPCD for 2020 of 96 GPCD.

6.1 SB X7-7 Forms and Tables

The SB X7-7 Verification Form was submitted as part of SVWD's 2015 UWMP to establish the baseline and 2020 water use target. Since the 2015 UWMP there have been no changes to SVWD's service area. However, the 2015 UWMP baseline and 2020 targets have been revised in this UWMP to account for more accurate population data. The updated baseline and 2020 water use target are summarized in **Table 6-1**.

SVWD selected SB X7-7 Method 1, which uses water conservation target defined as a 20 percent reduction of average per-capita use from the 10-year continuous baseline period. Method 1 results in the 2020 target of 154 gallons per capita per day GPCD. Regardless of the target calculation method, each agency must confirm that the calculated 2020 target meets the minimum reduction required. This minimum reduction amount is defined as 5 percent of the 5-year baseline per capita water use of 177 GPCD shown in **Table 6-1**. The 2020 target must be less than 95% of the 5-year baseline. Since the 2020 Target of 154 GPCD is less than 95% of 177, or 168 GPCD, the 2020 target meets the minimum required reduction and does not need to be adjusted. A copy of the completed SB X7-7 Verification Forms is included in **Appendix F**.

Table 6-1. DWR 5-1R Baselines and Targets Summary

BASELINE PERIOD	START YEAR	END YEAR	AVERAGE BASELINE GPCD*	CONFIRMED 2020 TARGET *
10-15 Year	1995	2004	193	154
5 Year	2003	2007	177	

*All values are in Gallons per Capita per Day (GPCD)
* All cells in this table are populated manually from the supplier's SB X7-7 Verification Form.

6.2 2020 Compliance Daily Per-Capita Water Use (GPCD)

SVWD must demonstrate compliance with its 2020 water use target by completing the SB X7-7 2020 Compliance Form. This Form is an abbreviated version of the SB X7-7 Verification Form solely for 2020 compliance calculations. A summary of the 2020 SB X7-7 2020 compliance table is shown in **Table 6-2**. There were no extreme cases that warranted an adjustment to the GPCD compliance calculation. The calculated GPCD for 2020 is 96 GPCD, which meets SVWD's 2020 SB X7-7 target of 154 GPCD. A copy of the completed SB X7-7 Compliance Forms is included in **Appendix F**.

Table 6-2. DWR 5-2R 2020 Compliance

	OPTIONAL ADJUSTMENTS TO 2020 GPCD						
ACTUAL 2020 GPCD*	EXTRAORDINARY EVENTS*	ECONOMIC ADJUSTMENT*	WEATHER NORMALIZATION*	TOTAL ADJUSTMENTS*	ADJUSTED 2020 GPCD*	2020 CONFIRMED TARGET GPCD*	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020
96	0	0	0	0	96	154	Yes

*All values are in Gallons per Capita per Day (GPCD)
*All cells in this table are populated manually from the supplier's SB X7-7 Verification Form.

URBAN WATER MANAGEMENT PLAN

7 SLVWD SB X7-7 Baseline, Targets and 2020 Compliance

This chapter describes SLVWD compliance with the Water Conservation Act of 2009 Baseline, Targets, and 2020 Compliance. The goal of this chapter is to demonstrate compliance with the 2020 targeted water-use reduction of 20 percent.

IN THIS SECTION

- Target and Baseline Method Summary
- Baselines & Targets
- SB X7-7 Forms and Tables
- 2020 Compliance

Senate Bill X7-7 (SB X7-7), which was incorporated into the UWMP Act in 2009, requires all water suppliers to increase water use efficiency with the overall goal to decrease per-capita water consumption within the state by 20 percent by the year 2020. SB X7-7 required DWR to develop certain criteria, methods, and standard reporting forms through a public process that could be used by water suppliers to establish baseline water use and determine water conservation targets.

This chapter describes SLVWD's methods for calculating baseline and target water consumption, as presented in the 2015 UWMP, in accordance with DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (California Department of Water Resources, 2016). In addition, due to annexation of the Lompico Service area in 2016, updated baseline and target calculations are presented. The SB X7-7 Verification Forms and Compliance Forms, which are required to be submitted to DWR to demonstrate compliance with the SB X7-7 requirements, are presented in **Appendix G**. This chapter also shows that SLVWD achieved the 2020 water use target of 82 GPCD, with a calculated GPCD for 2020 of 80 GPCD.

7.1 Updated Calculations from 2015 UWMP to the 2020 UWMP

SLVWD is required to update calculations from the 2015 UWMP because the Lompico service area was annexed on June 1, 2016. **Appendix P** of the 2020 Guidebook provides that service areas that have expanded need to account for the newly annexed areas in one of three ways. SLVWD selected the second method described in **Appendix P**, which includes calculating and reporting baselines and targets separately for the original and annexed service areas, but then calculating and reporting only one combined 2020 target. SLVWD's 2020 compliance is analyzed as one entity for all service areas.

Below is a summary of the calculations required for the method selected.

STEP 1 - Calculate baselines and targets separately for both areas. When calculating the target for the newly merged/annexed area, prorate the target

STEP 2 - Calculate a single 2020 target by creating a population weighted average of each system's target.

STEP 3 - Complete and submit separate SB X7-7 Verification Forms for each separate area.

SLVWD's service area prior to annexation of Lompico had a baseline per capita water use of 104 gallons per capita per day (GPCD) and a 2020 water use target of 84 GPCD in 2020. The Lompico service area has a baseline per capita water use of 50 GPCD and a 2020 prorated water use target of 117 GPCD. Using a population weighted average of SLVWD's service area (prior to Lompico annexation) and the Lompico service area, a single 2020 target of 85 GPCD was calculated.

7.1.1 Update of the Baseline and Target Method

In 2015, SLVWD selected SB X7-7 Method 1, which uses a water conservation target defined as a 20 percent reduction of average per-capita use from the 10-year continuous baseline period. The target method used in the 2015 UWMP may not be changed in the 2020 UWMP. In addition, suppliers may not change the years selected for the baseline periods in the 2015 UWMP. However, no data was available for the Lompico service area prior to the annexation, so SLVWD used data starting in January 2017, the first calendar year after the annexation occurred (June 1, 2016). This approach is consistent with DWR's guidance in **Appendix P** of the 2020 Guidebook.

7.2 SB X7-7 Forms and Tables

To comply with SB X7-7, SLVWD was required in the 2015 UWMP to calculate and report its baseline per capita water use and its 2020 water use target. The SB X7-7 Verification Form was submitted as part of the 2015 UWMP for SLVWD's service prior to the annexation of Lompico. A summary of the SB X7-7 Verification Form is presented in **Table 7-1**. The baseline per capita water uses and 2020 water use target for Lompico was calculated using data available starting in 2017. A summary of the SB X7-7 Verification Form for Lompico is presented in **Table 7-2**. The single 2020 target calculated using the weighted average of SLVWD and Lompico service areas is provided in **Table 7-3**. A copy of the completed SB X7-7 Verification Forms is included in **Appendix G**.

Table 7-1. DWR 5-1R SLVWD Service Area Prior to Lompico Annexation Baselines and Target Summary

BASELINE PERIOD	START YEAR	END YEAR	AVERAGE BASELINE GPCD*	CONFIRMED 2020 TARGET *
10-15 Year	1999	2008	104	84
5 Year	2003	2007	106	

*All values are in Gallons per Capita per Day (GPCD)
* All cells in this table are populated manually from the supplier's SB X7-7 Verification Form.

Table 7-2. DWR 5-1R Lompico Service Area Baselines and Target Summary

BASELINE PERIOD	START YEAR	END YEAR	AVERAGE BASELINE GPCD*	CONFIRMED PRORATED 2020 TARGET *
10-15 Year	2017	2017	50	117
5 Year	2017	2017	50	

*All values are in Gallons per Capita per Day (GPCD)
*All cells in this table are populated manually from the supplier's SB X7-7 Verification Form.
* 5-year baseline per capita water use is less than 100 gpcd therefore the 5 year baseline check does not apply (California Department of Water Resources, 2016).

Table 7-3. Revised 2020 Target After Annexation

	SLVWD (WITHOUT LOMPICO)	LOMPICO
Target GPCD	84	117
2020 Population	21,957	971
Population Weight	0.96	0.04
Population Weighted GPCD	85	

7.3 2020 Compliance Daily Per-Capita Water Use (GPCD)

SLVWD must demonstrate compliance with its 2020 water use target by completing the SB X7-7 2020 Compliance Form. This Form is an abbreviated version of the SB X7-7 Verification Form solely for 2020 compliance calculations. A summary of the 2020 SB X7-7 2020 compliance table is shown in **Table 7-4.** In August 2020, the CZU Lightning Complex Fire impacted much of SLVWD's service area resulting in temporary increases in water usage from sprinklers being left on during the fire and impacts to SLVWD's supply infrastructure. Impacts from the fire were not included as an optional adjustment to the 2020 GPCD. The calculated GPCD for 2020 is 80 GPCD, which meets SLVWD's 2020 SB X7-7 target of 85 GPCD. A copy of the completed SB X7-7 Compliance Form is included in **Appendix G**.

Table 7-4. DWR 5-2R Compliance – SLVWD

	OPTIONAL ADJUSTMENTS TO 2020 GPCD						
ACTUAL 2020 GPCD*	EXTRAORDINARY EVENTS*	ECONOMIC ADJUSTMENT*	WEATHER NORMALIZATION*	TOTAL ADJUSTMENTS*	ADJUSTED 2020 GPCD*	2020 CONFIRMED TARGET GPCD*	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020
80	0	0	0	0	80	85	Yes

*All values are in Gallons per Capita per Day (GPCD)
*All cells in this table are populated manually from the supplier's SB X7-7 Verification Form.

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URBAN WATER MANAGEMENT PLAN

8 Groundwater Supply Characterization

This chapter summarizes SVWD and SLVWD shared groundwater resources and provides the basis for normal, single year, and multiple dry year supply reliability.

IN THIS SECTION

- Groundwater Supply Characterization
- Basin Setting
- SVWD & SLVWD Wells
- Available Groundwater Supplies

The Santa Margarita Groundwater Basin (SMGB) is the source of groundwater supplies for SVWD and SLVWD. SVWD relies on groundwater from the SMGB to meet the potable supply needs of its customers and SLVWD relies on groundwater from the SMGB and surface water to serve its customers. Prudent management of the groundwater resource is essential for maintaining a sustainable supply for the Districts. The shared groundwater resource is also overseen by the Santa Margarita Groundwater Agency (SMGWA), which is preparing a Groundwater Sustainability Plan (GSP).

Shared management of the supply source and enhanced collaborative planning efforts were driving factors for SVWD and SLVWD to develop a regional UWMP rather than individual UWMPs. An overview of the SMGB along with information regarding the SMGB setting in relation to SVWD and SLVWD is provided upfront in this chapter. Details regarding the overall current and projected water supplies for SVWD and SLVWD are discussed separately in **Chapter 9** and **Chapter 10**.

8.1 UWMP Water Supply Characterization - Groundwater

The SMGB is a main source of water supply for Scotts Valley, San Lorenzo Valley, and the. The SMGB covers over 34 square miles (21,760 acres) in the Santa Cruz Mountains foothill forming a triangular area that extends from Scotts Valley to the east, Boulder Creek to the northwest and Felton to the southwest. The SMGB is a geologically complex area that was formed by the same tectonic forces that created the Santa Cruz Mountains. SMGB is bounded by two regional faults, the Ben Lomond Fault to the west and the Zayante Fault to the north. The SMGB is completely within the County and there are no adjudicated areas within the SMGB. To the southeast of the SMGB is the Santa Cruz Mid-County Basin, and to the south the West Santa Cruz Terrace Basin. The SMGB contains the City of Scotts Valley, and the communities of Boulder Creek, Brookdale, Ben Lomond, Lompico, Zayante, Felton, and Mount Hermon. The SMGB and neighboring basins are shown in **Figure 8-1**.

The larger water purveyors that directly rely on the supply from the SMGB are SVWD, SLVWD, and Mount Hermon Association (MHA). The SMGB is also the sole supply source for 11 small water systems and over 777 private well owners. Soquel Creek Water District has a small portion of their service area overlying the SMGB; however, the Soquel Creek Water District extracts groundwater from the adjacent Santa Cruz Mid-County Basin and does not have any active service connections or extract groundwater in the SMGB (Santa Margarita Groundwater Agency, 2021). **Figure 8-2** provides the jurisdictional areas within the SMGB.

Under the Sustainable Groundwater Management Act (SGMA) of 2014, most groundwater basins need to be managed by newly formed Groundwater Sustainability Agencies (GSA) through the development of GSP's for non-overdraft high and medium priority basins. For SMGB, the GSP must be completed by January 31, 2022, and the basin must reach sustainability by 2042. The SMGB is classified as a medium-priority basin because groundwater is a primary source of supply for many residents and because there has been a historical decline in groundwater levels in Scotts Valley. The SMGWA is the GSA for the SMGB. The SMGWA was formed as a joint power's authority by SVWD, SLVWD and the County in June 2017. The Board of Directors of the SMGWA is comprised of two members from each of the Districts, one from the County, one from the City of Scotts Valley, one from the City of Santa Cruz, one from the MHA, and two private well owner representatives. Development of this UWMP was coordinated closely and in parallel with development of the SMGB GSP.

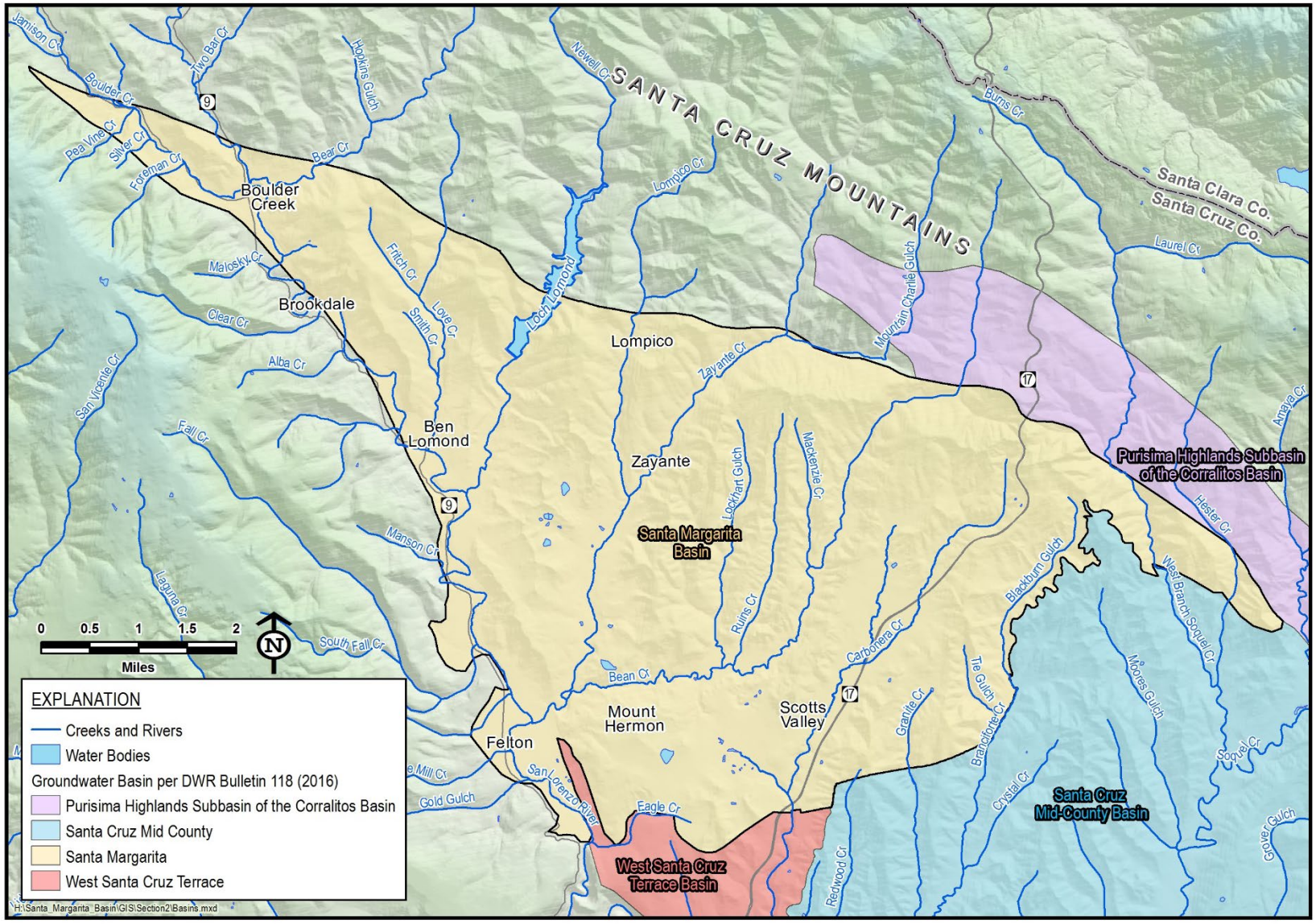

Figure 8-1. SMGB and Adjacent Basins (Santa Margarita Groundwater Agency, 2021)

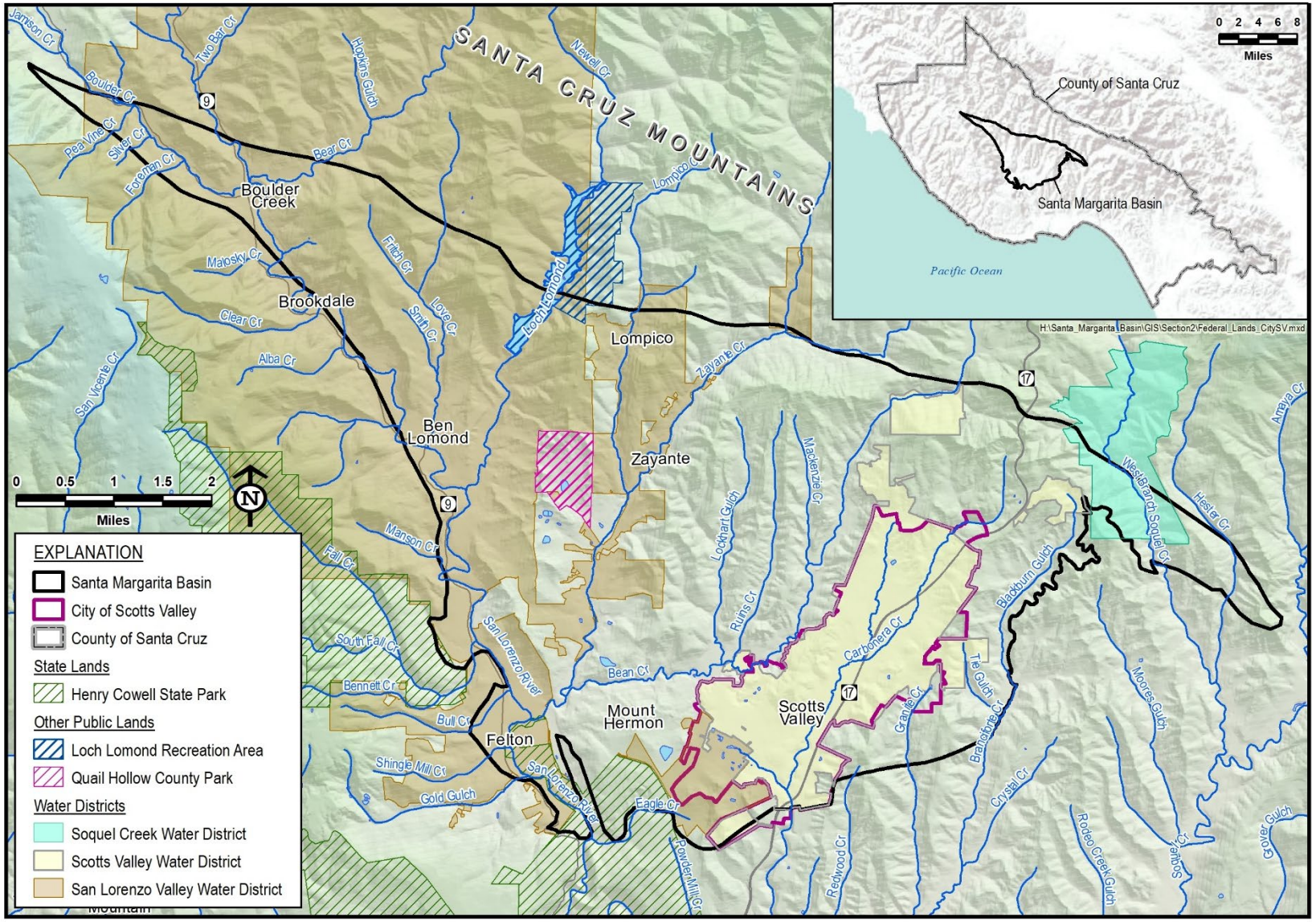

Figure 8-2. Jurisdictional Areas within the SMGB (Santa Margarita Groundwater Agency, 2021)

8.1.1 Basin Setting

Previously, DWR Bulletin 118 (DWR 2003) did not identify the SMGB as a groundwater basin but rather recognized three smaller basins in the vicinity: Scotts Valley Basin, Felton Area Basin, and Santa Cruz Purisima Formation. These basins did not accurately reflect the hydrogeologic makeup of the groundwater resources in the North Santa Cruz County. SVWD with support from SLVWD and the County prepared a boundary modification request that was submitted to DWR in January 2016. In March of 2016, DWR approved the basin modification request.

The SMGB (DWR Basin 3-027) as defined in DWR Bulletin 118 (2018) consists of a sequence of sandstone, siltstone, and shale that is underlain by granite. This sequence of sedimentary rocks is divided into several geologic formations that are defined on the basis of the type of rock and their relative geologic age. Sandstone units serve as the principal aquifers pumped to supply much of the SMGB water demand (Santa Margarita Groundwater Agency, 2021).

The SMGB principal aquifers are:

- Santa Margarita Sandstone (Santa Margarita aquifer)
- Monterey Formation
- Lompico Sandstone (Lompico aquifer)
- Butano Formation (Butano aquifer)

The Santa Margarita and Lompico aquifers have long been recognized as principal water supply aquifers. The Santa Margarita aquifer demonstrates rapid response to climatic conditions and recharges quickly, although it also appears to drain quickly to streams and creeks without holding much long-term storage.

The Lompico aquifer is currently the principal groundwater producing unit in the Scotts Valley area (Santa Margarita Groundwater Agency, 2021). Besides some outcrops in the north and east of the SMGB, the Lompico aquifer is primarily recharged by water percolating through the Santa Margarita Sandstone in areas where the two are in direct contact (Kennedy/Jenks Consultants, 2015b). There are two locations where the Lompico aquifer outcrops in the San Lorenzo River that are discharge points (Santa Margarita Groundwater Agency, 2021). The relatively small area of the Lompico Sandstone's outcrop in the SMGB and its confined location beneath the Santa Margarita aquifer and Monterey Formation limits its natural recharge and thus it is known to be relatively slow to respond to recharge events (Kennedy/Jenks Consultants, 2015b).

The Butano aquifer has been recognized as a deep aquifer underlying most of the basin (ETIC Engineering, Inc., 2007). The production history of wells in the Butano aquifer indicate that it is capable of producing significant volumes of groundwater. The Butano aquifer is recharged in the extreme northern portions of the SMGB by direct infiltration of precipitation and streambed infiltration where streams cut across surface exposures of the Butano aquifer. Review of groundwater elevation data indicate that the Butano aquifer groundwater elevations recover more quickly than the Lompico aquifer, suggesting the Butano aquifer is a more actively recharged aquifer (Kennedy/Jenks Consultants, 2015b).

The Monterey Formation contains sandstone interbeds, especially closer to the base of the formation, that are used for water supply. In general, the sandstone interbeds of the Monterey Formation are more hydrogeological connected to the underlying Lompico Sandstone than the overlying Santa Margarita Sandstone (Kennedy/Jenks Consultants, 2015b). The sandstone interbeds and the fractured siltstones in the Monterey Formation can locally produce groundwater; however, the Monterey Formation has limited water supply potential that is typically used for private domestic wells rather than for municipal supply (Santa Margarita Groundwater Agency, 2021).

8.1.1.1 Climate

Precipitation is the only source of groundwater recharge in the SMGB and can enter the SMGB's shallowest aquifers either as direct infiltration through the soil or indirectly as streamflow that infiltrates through stream and creek beds. Most streams are fed by groundwater that is recharged by precipitation. Reductions in groundwater recharge can occur either naturally through reduced precipitation during a drought, or as a result of anthropogenic impermeable surfaces that intercept potential groundwater recharge water.

The climate in the SMGB is classified as Mediterranean, characterized by distinct rainy and dry seasons, warm summers, and mild winters. Almost all the SMGB's precipitation is rainfall, though occasionally snow does fall on the higher elevations. In an average year, almost all of the precipitation occurs from November through April. Precipitation increases to the north and west of the SMGB, due to increased elevation and the orographic effect of the Ben Lomond Mountain to the west. Overall, conditions are typically warmer and drier to areas southeast of the SMGB and in the SMGB's valley floor. During the wet season between November and April, the average minimum, and maximum monthly temperatures of around 32ºF and 77ºF, respectively. In the warmer dry season, from May to October, average minimum and maximum monthly temperatures are around 41ºF and 95ºF, respectively.

8.1.1.2 Groundwater Quality

Groundwater in the SMGB is generally of good quality and does not regularly exceed primary drinking water standards prior to treatment. However, both naturally occurring and anthropogenic constituents are present in some aquifers and areas (Santa Margarita Groundwater Agency, 2021).

SVWD and SLVWD monitor the production wells for constituents with a frequency that complies with the Safe Drinking Water Act requirements as outlined in the California Code of Regulations, Title 22 requirements. The Districts incorporate new constituents into the monitoring program as a result of new regulatory mandates. The water quality testing results are reported to the California State Water Resources Control Board Division of Drinking Water.

SVWD annually prepares and distributes the "Scotts Valley Water District Water Quality Report" and SLVWD annually prepares and distributes "Consumer Confidence Reports (CCRs)" to keep customers informed about their drinking water quality. These reports provide the public with detailed results of water-quality testing, a description of the water source, answers to common questions about water quality, and other useful water quality information. SVWD's CCRs (Water Quality Reports) are available at svwd.org and SLVWD's CCRs are available at https://www.slvwd.com/water-quality/pages/consumer-confidence-reports-ccrs. These reports include detailed information about the source water quality and treated water quality.

The esthetic characteristics of water delivered to customers may vary depending on the groundwater source and necessary level of treatment. The source of supply in any single point in the Districts' distribution systems may vary over the course of a day, a week, or a year.

8.1.1.3 Groundwater Levels and Monitoring

Groundwater has been a main source of water in the SMGB for domestic, municipal, and sand mining users since the early part of the 20th century. Due to dry climatic events and growth in the region, the SMGB experienced a decline in groundwater elevations particularly in the Lompico aquifer. Starting in the 2000s, focused groundwater management and water use efficiency programs by SVWD and SLVWD have largely stabilized groundwater levels although levels are still well below 1980's levels. The total pumping from SMGB has decreased by 45% since 1997. For the last 10 years, groundwater levels in the SMGB have stabilized.

Groundwater elevations have been recorded by SLVWD in active pumping areas since the 1960's. In 1984, SVWD formally adopted a Groundwater Management Plan (GWMP) to monitor and manage

groundwater in the Scotts Valley area. As part of the GWMP, SVWD has been preparing annual groundwater reports since 1994. Starting in 2013, the reports began following a two-year cycle with a more comprehensive regional report prepared in even years and odd year reports being more concise summaries focused on SVWD operations. As of 2020, all SVWD extraction and monitoring wells are equipped with pressure transducers to continuously record groundwater levels. MHA measures groundwater levels and extraction data from its two active wells. These data are reported to SVWD as part of the GWMP (Santa Margarita Groundwater Agency, 2021). Annual reports from the past several years are available from SVWD's website. Additional information regarding historic groundwater levels and trends within each aquifer in the SMGB is available in the Draft SMGB GSP and at https://smgwa.org/.

8.1.2 SVWD & SLVWD Wells

SVWD produces groundwater from five active wells. SVWD wells primarily extract groundwater from the Lompico aquifer with well #3B and Orchard well also extracting water from the Butano aquifer. SVWD's wells are listed in **Table 8-1**, and shown in **Figure 8-3**. Additional details regarding each SVWD well are available in the draft **Chapter 2** of the SMGB GSP.

Table 8-1. SVWD Wells

WELL NAME	WELL STATUS	SMGB AQUIFER
SVWD Well #3B	Active	Lompico, Butano
SVWD Orchard Well	Active	Lompico, Butano
SVWD Well #9	Standby	Monterey
SVWD Well #10A	Active	Lompico
SVWD Well #11A	Active	Lompico
SVWD Well #11B	Active	Lompico

Source: (Santa Margarita Groundwater Agency, 2021)

SLVWD pumps groundwater from three wellfields. The Quail Hollow and Olympia wellfields extract groundwater from the Santa Margarita aquifer and the Pasatiempo wellfield extracts from the Lompico aquifer in the south Scotts Valley area. SLVWD active and inactive wells are summarized in **Table 8-2** and shown in **Figure 8-3**. Note that wells used by the Lompico County Water District prior to annexation into SLVWD's system have been abandoned due to water quality and quantity issues and are not part of SLVWD groundwater supply. In addition, the Mañana Woods wells were taken offline for rehabilitation and were not brought back into service due to sufficient production from the system's other active wells. All groundwater extracted by SLVWD wells is used within the San Lorenzo Valley System. Additional details regarding each SLVWD well are available in the draft **Chapter 2** of the SMGB GSP.

Table 8-2. SLVWD Wells

WELL NAME	WELL STATUS	SMGB AQUIFER
SAN LORENZO VALLEY SYSTEM – NORTHERN PORTION		
Quail Hollow #4A	Active	Santa Margarita
Quail Hollow #5A	Active	Santa Margarita
Olympia #2	Active	Santa Margarita
Olympia #3	Active	Santa Margarita
SAN LORENZO VALLEY SYSTEM – SOUTHERN PORTION		
Pasatiempo #5A	Active	Lompico
Pasatiempo #7	Active	Lompico
Pasatiempo #8	Active	Lompico
Mañana Woods #1	Inactive	Santa Margarita / Lompico
Mañana Woods #2	Inactive	Santa Margarita / Lompico

Source: (Santa Margarita Groundwater Agency, 2021)

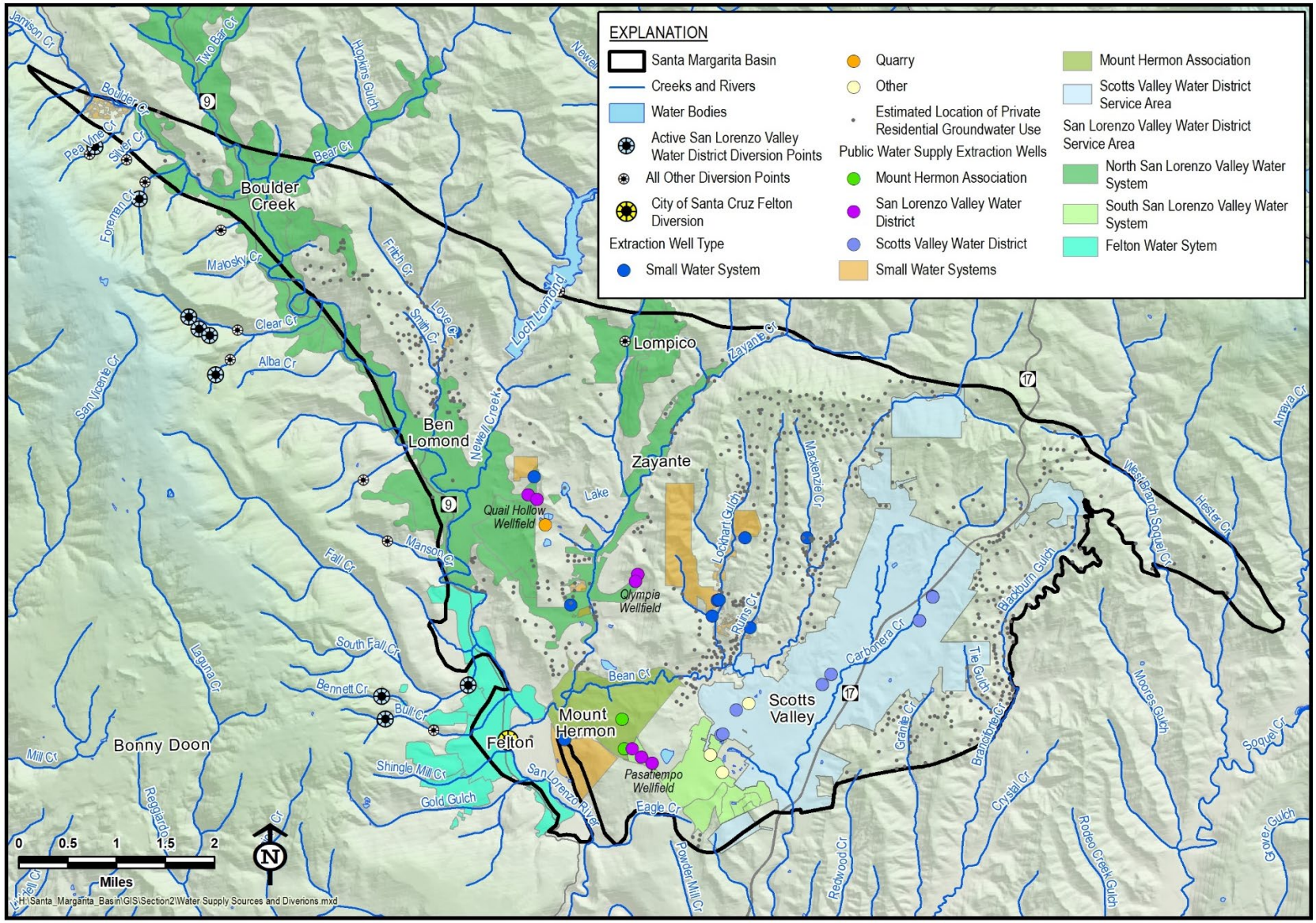

Figure 8-3. SVWD and SLVWD Well Locations (Santa Margarita Groundwater Agency, 2021)

8.1.3 Available Groundwater Supplies

Drought and possible other water shortage conditions impact the purveyors that rely on the local water supplies. Reduced recharge in times of extended droughts presents a concern for supply reliability. Since groundwater is shared by all pumpers in the SMGB, pumping within the sustainable yield is the collective responsibility of all SMGB pumpers. The GSP does not apportion the sustainable yield by purveyor as this is more like an adjudication of groundwater use, which is not the intent of the GSP. For purposes of the UWMP, the assessment of groundwater conditions by SVWD and SLVWD includes comparing each Districts' average pumping by aquifer over the last five-years to projected long-term average annual pumping (Baseline Pumping) under groundwater model simulated baseline conditions.

Groundwater conditions are assessed based on the following data:

- Total well pumping data from both Districts totaled by aquifer; and
- Five-year pumping average for each of the Districts to compare against the Districts' Baseline Pumping (**Table 8-3**).

Table 8-3. SVWD and SLVWD Baseline Pumping (AFY)

BASELINE PUMPING	SANTA MARGARITA AQUIFER	LOMPICO AQUIFER	BUTANO AQUIFER	TOTAL
Scotts Valley Water District	0	950	350	**1,300**
San Lorenzo Valley Water District	620	300	0	**920**

Baseline Pumping is based on groundwater model simulations developed for the SMGB GSP (Santa Margarita Groundwater Agency, 2021).

URBAN WATER MANAGEMENT PLAN

9 SVWD Water Supply Characterization

This chapter describes and quantifies the current and projected SVWD water supplies. Each water source is characterized with information needed to manage water resources, assess supply reliability, perform the Drought Risk Assessment, and prepare and implement the WSCP.

The following chapter provide an overview of SVWD current and projected water supplies through 2045. SVWD uses groundwater and recycled water as described in more detail in the following chapter. SVWD anticipates meeting customer demands through 2045.

IN THIS SECTION

- Water Supply Characterization
- Future Water Projects
- Climate Change Effects
- Energy Intensity

9.1 SVWD Water Supply Overview

This section describes and quantifies the current and projected sources of water available to SVWD for the 25-year period covered by the UWMP. **Table 9-1** and **Table 9-2** provide a summary of the existing and planned SVWD potable and non-potable water supply volumes from 2020 to 2045 in five-year increments.

Table 9-1. Summary of SVWD Current and Projected Potable Water Supplies (AFY) (DWR Tables 6-8 and 6-9)

WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	2020	2025	2030	2035	2040	2045
Groundwater	Santa Margarita Groundwater Basin	1,300	1,300	1,300	1,300	1,300	1,300

Table 9-2. Summary of SVWD Current and Projected Non-Potable Water Supplies (AFY) (DWR Tables 6-8 and 6-9)

WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	2020	2025	2030	2035	2040	2045
Recycled Water	Non-potable	130	136	140	145	149	154

Recycled water totals do not include recycled water delivered, or projected to be delivered, by SVWD to SLVWD's service area.

9.2 SVWD Water Supply Characterization

SVWD relies on groundwater to meet potable water demands. Recycled water distributed by SVWD reduces the pumping in the basin. Water sources used to supply SVWD customers are described below.

9.2.1 Purchased or Imported Water

SVWD does not purchase water from any wholesale water suppliers and has no current or future plans to acquire imported water supplies.

9.2.2 Groundwater

Information regarding the SMGB setting, water suppliers that extract groundwater from the SMGB, and estimated available supplies is provided in **Chapter 8**. This section focuses on SVWD's historical and projected groundwater supplies.

Table 9-3 presents SVWD annual production from 2016 to 2020. Historical groundwater pumping data dating back to 1976 shows that prior to 2003, groundwater extraction increased linearly with increasing population in Scotts Valley. From 1977 through 2003, groundwater extraction rose steadily from about 500 AFY to 2,100 AFY in 1997. However, since 2004 SVWD has actively worked on reducing the system demand through introduction of a recycled water supply, implementation of water use efficiency programs, and minimizing water waste. use efficiency

Table 9-3. Groundwater Volume Production by SVWD (AFY) (DWR 6-1R)

GROUNDWATER TYPE	LOCATION OR BASIN NAME	2016	2017	2018	2019	2020
Alluvial Basin	Santa Margarita Groundwater Basin 3-027	1,104	1,164	1,130	1,113	1,135

Groundwater production provided by SVWD based on metered data.

SVWD operates wells that vary in depth from 450 feet to 1,750 feet. Pumped water is filtered through a pressurized system of sand, gravel, and anthracite to remove iron, manganese, and hydrogen sulfide from the water. Chemicals are introduced before and after filtration to oxidize the iron and disinfect the water. This treatment enables SVWD to meet Federal and State drinking water standards.

There are three treatment plants that SVWD uses to produce potable water for customers:

- Orchard Run Water Treatment Plant treats water from Orchard well and well 3B and has a capacity of 1,100 gallons per minute.
- El Pueblo Water Treatment Plant treats water from wells 11A and 11B and has a capacity of 1,000 gallons per minute.
- Well 10 Treatment Plant treats water from well 10A and has a capacity of 800 gallons per minute.

Although there have been a significant number of dry years in the recent past, the groundwater in storage in the SMGB is adequate to meet current and anticipated future demand (**Chapter 4** and **Chapter 11**). The long-term resiliency and reliability of the supply may be bolstered by expanding conjunctive use opportunities, the introduction of supplemental supply, and reduction in groundwater pumping through continued water use efficiency efforts. **Chapter 4** of the SMGWA Draft GSP identifies a list of projects that are ongoing, planned, being studied and conceptual which are intended to strengthen local groundwater supplies.

The very nature of groundwater alleviates the short-term impact of drought years because of the availability of stored supply, but long-term impacts need to be addressed through appropriate projects and management actions.

9.2.3 Surface Water

SVWD does not have surface water rights but is defined as a place of use for specific surface water sources of the neighboring water agencies. Surface water could be used in the future as a supplemental supply through conjunctive use projects. Due to the uncertainty of this supply as a future resource it is not currently included in the supply summaries in this UWMP.

9.2.4 Stormwater

Low impact development (LID) projects consist of applying stormwater best management practices – such as infiltration basins, vegetated swales, bio-retention and/or tree box filters – to retain and infiltrate stormwater that is currently being diverted into the storm drain system. The infiltrated stormwater recharges the shallow aquifers in a manner similar to natural processes. The infiltration helps augment groundwater levels and sustains groundwater contributions to stream baseflow that supports local fishery habitats. A complicating factor in implementing LID projects in the Scotts Valley area is that there is no centralized stormwater collection system, which limits the ability to do large scale projects to direct groundwater augmentation to the most beneficial areas.

SVWD has implemented 3 LID facilities which all overlie the Santa Margarita aquifer. The Transit Center LID is a retrofit at the Scotts Valley Transit Center to construct a vegetated swale, below ground infiltration basin, and pervious pavement. In WY 2020 a total of 1.5 AF was infiltrated at this location. The Woodside HOA LID is a stormwater recharge facility at the Woodside HOA along Scotts Valley Drive. The facility includes a large below ground infiltration basin and in WY 2020 a total of 14.97 AF was infiltrated at this location. The Scotts Valley Library LID includes a below ground infiltration basin at the Scotts Valley Library. In WY 2020 a total of 2.94 AF was infiltrated at this location (Montgomery & Associates, 2021).

9.2.5 Wastewater and Recycled Water

Municipal recycled water is wastewater that has been treated to a specified quality to allow its use for certain permitted purposes. The term recycled water is defined in the CWC more broadly than municipal recycled water. For the purposes of the UWMP, recycled water means only water that has been treated and conveyed from a municipal wastewater facility.

This section of the UWMP describes the existing and future recycled water opportunities available to SVWD and SLVWD service areas with estimates of potential supply and demand for 2025 to 2045 in five-year increments.

9.2.5.1 Recycled Water Partnerships

The City of Scotts Valley is responsible for the collection and safe disposal of wastewater generated within SVWD's service area. The City's sanitary sewer collection system is made up of approximately 40 miles of pipeline. Wastewater is treated to both secondary and tertiary levels at the City's Water Reclamation Facility (Scotts Valley WRF). The portion of the wastewater generated in Scotts Valley that is treated to Title 22 standards for tertiary disinfected recycled water, suitable for unrestricted non-potable use is stored and delivered to customers by SVWD.

Recycled water has been available in Scotts Valley since 2002 and its availability has increased steadily through expansion of the distribution system and the addition of service connections. The City and SVWD had an agreement that the City would provide up to one million gallons of recycled water per day. The agreement was amended in 2017 by SVWD reducing its entitlement and enabling the City to enter into an agreement with the Pasatiempo Golf Course (PGC) for providing disinfected secondary effluent to PGC where it is further treated by the PGC Tertiary Plant and used on the course. The City has agreed to deliver up to 35 million gallons per year to PCG for 30 years and PGC has the option to purchase more if SVWD has no need for it. Use of recycled water for PGC irrigation reduces the demand for Santa Cruz Water District potable water during the summer months as it replaces and offsets PGC's potable water supply that would be required without recycled water.

9.2.5.2 Wastewater Collection, Treatment and Disposal

The Scotts Valley WRF is a conventional activated sludge wastewater treatment facility with a design dry weather treatment capacity of 1.5 million gallons per day (MGD) and a design peak wet weather treatment capacity of 5.0 MGD. The Scotts Valley WRF has sufficient capacity to support the City through planned build-out.

Major facilities include an influent pump station, a flow equalization structure with 0.9 million gallons (MG) of storage capacity, two aeration basins with fine-bubble diffuser panels, two secondary clarifiers, a chlorine contact tank, and an effluent pump station. As previously noted, disinfected secondary effluent is either conveyed to Santa Cruz where it is discharged into the Monterey Bay or delivered to PGC. A portion of the wastewater treated at the Scott Valley WRF receives tertiary treatment and is used by recycled water customers primarily in SVWD's service area.

The Scotts Valley WRF tertiary recycled water treatment facility has a design treatment capacity of 1.0 MGD. The facility is used to treat secondary effluent to a tertiary level using chemical coagulation and flocculation, filtration, denitrification, and ultraviolet (UV) disinfection. The treated effluent meets California Department of Public Health Title 22 recycled water standards for unrestricted use. In 2001, the City received a permit from the Regional Water Quality Control Board to produce recycled water for unrestricted irrigation use. The recycled water is used primarily for irrigation at local parks, schools, residences, landscape medians, and businesses. Recycled water from the Scotts Valley WRF is purchased by SVWD, the only tertiary treated recycled water purveyor in the Scotts Valley area.

The existing recycled water system includes approximately 6 miles of distribution main, a pump station and 0.6MG storage tank. **Figure 9-1** shows SVWD recycled water distribution system.

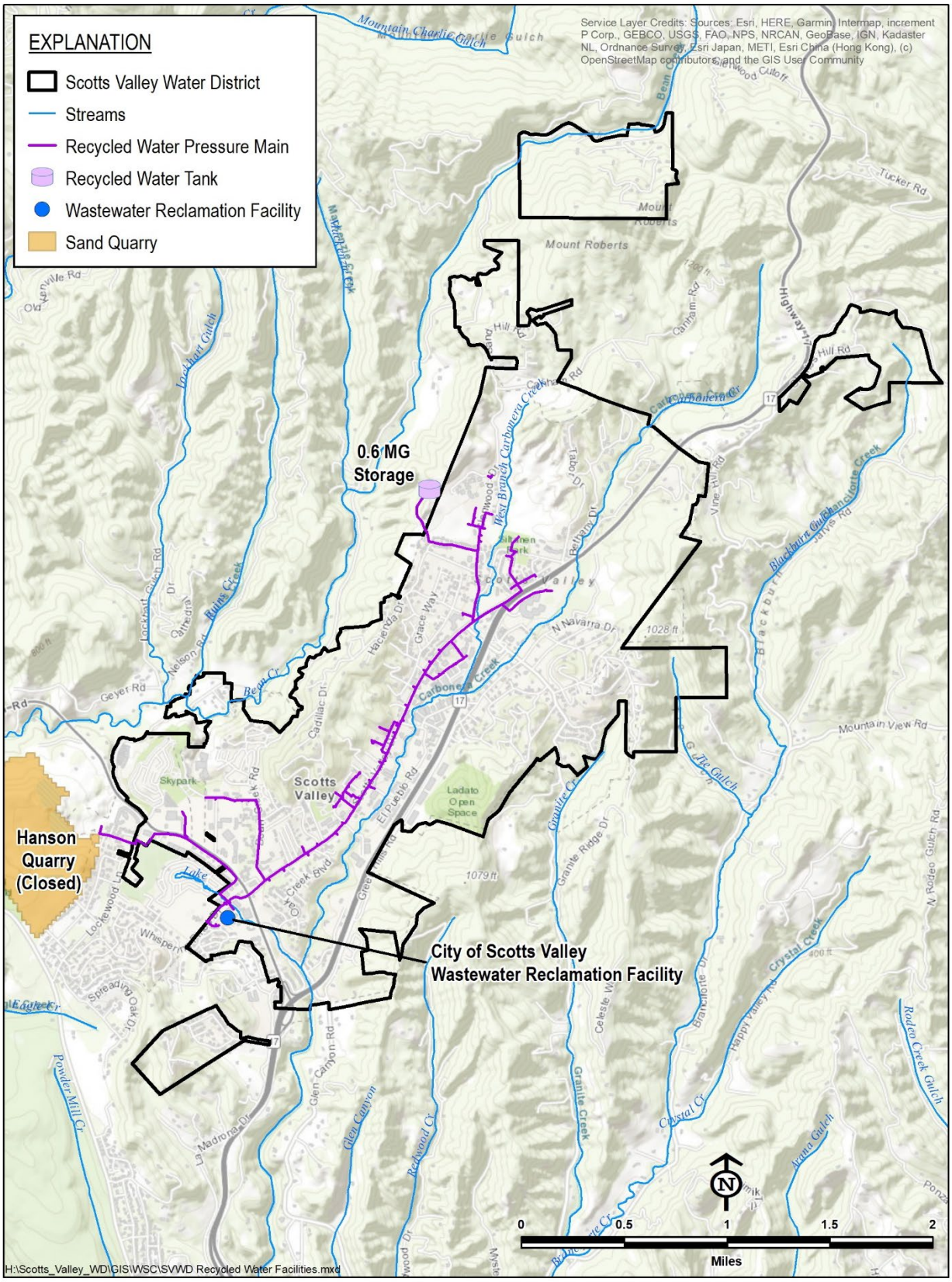

Figure 9-1. SVWD Recycled Water Facilities

9.2.5.3 Recycled Water Use

In Water Year 2020 (WY20) SVWD supplied a total of 178 AF of tertiary treated water to 71 connections. Recycled water demand primarily occurs in the summer months for irrigation. SVWD provides recycled water for irrigation at parks, schools, homeowners associations, landscaped medians, and businesses. The two largest SVWD recycled water customers within SVWD's service area are the City and the School District, which make up approximately 33% of the total consumption. SVWD primarily serves customers within SVWD's service area; however, it also provides recycled water to the Spring Lakes Mobile Home Park (Spring Lakes MHP), which is located withing SLVWD's service area, to fill decorative ponds. The average demand for the Spring Lakes MHP over the last three years has been approximately 48 AFY.

Recycled water demand has been relatively flat for the last 9 years and it typically fluctuates based on the precipitation amount received in any given year. There has been an increase in recycled water customers over the years; however, the total demand has not increased significantly which is likely due to recycled water customers becoming more efficient like potable water customers.

Secondary treated water from the WRF that is not treated for recycled water or provided to the PGC Tertiary Treatment Plant is discharged to the Pacific Ocean through the Santa Cruz ocean outfall. **Table 9-4** and **Table 9-5** present 2020 wastewater collection, treatment, and discharge information. In 2020, 845 AF of wastewater was collected from SVWD and SLVWD service areas and treated, and 178 AF was tertiary treated and distributed by SVWD within SVWD's and SLVWD's service area.

SVWD recognizes that recycled water continues to be an important and reliable source of supplemental supply for the region as the population increases and climate change negatively impacts the natural recharge in the watershed. SVWD has completed evaluations of existing and future recycled water demands throughout the service area and region. SVWD's unique situation where groundwater is limited, and imported water is not available indicate that recycled water is an important element of SVWD's water portfolio. The reliability of the recycled water resource of SVWD is unaffected by climactic conditions given that the source of recycled water is wastewater.

The Santa Margarita Groundwater Basin Regional Groundwater Replenishment Program Draft Facilities Planning Report (Kennedy/Jenks Consultants, 2016b) indicated that up to 286 AFY of additional recycled water demand for irrigation exists in SVWD's service area. However, much of that demand is not likely to be served due to distance from recycled water infrastructure. Based on recent trends SVWD has established a planning-level assumption that recycled water use within SVWD's service area will moderately increase through 2045.

9.2.5.3.1 Planned versus Actual Use of Recycled Water

The 2015 UWMP projected 210 AF would be delivered in 2020. As summarized in **Table 9-7**, for WY20, SVWD reports that there was a total of 130 AFY of recycled water delivered within its service area. The actual demand in 2020 did not meet the projected demand from 2015. As previously noted, total demand is likely impacted by recycled water customers becoming more efficient like potable water customers.

Table 9-4. Wastewater Collected within UWMP Service Area in 2020 (DWR 6-2R)

WASTEWATER COLLECTION			RECIPIENT OF COLLECTED WASTEWATER			
NAME OF WASTEWATER COLLECTION AGENCY	WASTEWATER VOLUME METERED OR ESTIMATED	WASTEWATER VOLUME COLLECTED FROM UWMP SERVICE AREA IN 2020 (AFY)	NAME OF WASTEWATER AGENCY RECEIVING COLLECTED WASTEWATER	WASTEWATER TREATMENT PLANT NAME	WASTEWATER TREATMENT PLANT LOCATED WITHIN UWMP AREA	WWTP OPERATION CONTRACTED TO A THIRD PARTY
City of Scotts Valley	Metered	717	City of Scotts Valley	Scotts Valley Water Reclamation Facility	Yes	No

Note - Wastewater volume does not include a portion of wastewater collected from SLVWD's service area which is collected and treated at the Scotts Valley WRF. The estimated volume of wastewater from SLVWD's service area is 128 AFY. In WY20, the total volume of wastewater collected and treated at the Scotts Valley WRF was 845 AF.

Table 9-5. Wastewater Treatment and Discharge within UWMP Service Area in 2020 (DWR 6-3R)

						2020 VOLUMES (AFY)				
WASTEWATER TREATMENT PLANT NAME	DISCHARGE LOCATION NAME OR IDENTIFIER	DISCHARGE LOCATION DESCRIPTION	METHOD OF DISPOSAL	PLANT TREATS WASTEWATER GENERATED OUTSIDE THE SERVICE AREA	TREATMENT LEVEL	WASTEWATER TREATED	DISCHARGED TREATED WASTEWATER	RECYCLED WITHIN SERVICE AREA	RECYCLED OUTSIDE OF SERVICE AREA	INSTREAM FLOW PERMIT REQUIREMENT
Scotts Valley Water Reclamation Facility	Pacific Ocean in Joint Outfall with City of Santa Cruz	36° 56' 08" N; 122° 04' 08" W	Ocean outfall	Yes	Secondary, Disinfected - 23	845	557	0	0	0
Scotts Valley Water Reclamation Facility	Recycled Water Customers	SVWD Service Area	Land disposal	Yes	Tertiary	0	0	130	0	0
Scotts Valley Water Reclamation Facility	Recycled Water Customers	SLVWD Service Area	Land disposal	Yes	Tertiary	0	0	0	48	0
Scotts Valley Water Reclamation Facility	Pasatiempo Golf Course Tertiary Plant	20 Clubhouse Rd, Santa Cruz, CA 95060	Land disposal	Yes	Secondary, Disinfected - 23	0	0	0	110	0
					TOTAL:	**845**	**557**	**130**	**158**	**0**

Note: A small portion of the City of Scotts Valley is not in SVWD's service area. In addition, a portion of SLVWD wastewater is collected and treated at the Scotts Valley WRF. This table includes all wastewater treated within SVWD's service area.

Table 9-6. Recycled Water Beneficial Use within Service Area (AFY) (DWR 6-4R)

BENEFICIAL USE TYPE	POTENTIAL BENEFICIAL USES OF RECYCLED WATER	LEVEL OF TREATMENT	2020	2025	2030	2035	2040	2045
Landscape irrigation (ex: golf courses)	Local Parks, Schools, Residences, landscaped medians, and businesses	Tertiary	130	136	140	145	149	154

Note: figures shown exclude the estimated 48 AFY of recycled water that SVWD anticipates delivering outside of the SVWD service area to the Spring Lakes MHP in the SLVWD service area.

Table 9-7. DWR 6-5R 2015 Recycled Water Use Projection Compared to 2020 Actual (AFY)

BENEFICIAL USE TYPE	2015 PROJECTION FOR 2020	2020 ACTUAL USE
Landscape Irrigation (excludes golf courses)	210	130

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9.2.5.4 Actions to Optimize Future Recycled Water Use

SVWD has been involved in coordinating with local water and wastewater agencies to explore the feasibility of using excess recycled water to supplement groundwater and surface water.

SVWD has completed evaluations of potential project alternatives for expanding the use of recycled water, but implementation of such alternatives, at this time, is dependent on establishing partnerships in the region. Based on the evaluations done by SVWD, the most likely projects that provide higher return on investment are regional indirect potable reuse projects. Exploratory conversations with regional partners are taking place; however, detailed studies need to be completed before future projects can be implemented.

9.2.6 Desalinated Water Opportunities

SVWD has limited opportunities for the development of desalinated water, given its geographical location relative to the ocean and lack of a brackish groundwater resource. It has no current plans to pursue groundwater or seawater desalination. Therefore, these water supply options are not included in the supply summaries in this UWMP.

9.2.7 Water Exchanges and Transfers

An important element to enhancing the long-term reliability of the overall water supply to meet the needs of the region is the use of transfers and exchanges. A description of an existing intertie which allows for the transfer of water between SVWD and SLVWD is provided below and potential future opportunities for transfers is discussed in **Section 9.2.8**. An intertie connecting SLVWD's service area with SVWD's service area was completed in 2016. It was permitted as an emergency intertie and is not used for regular water transfers between the Districts.

The intertie has been used three times since it was brought online as shown below.

- **Water to SLVWD**
  - 11,338 gallons on June 22, 2016
- **Water to SVWD**
  - 1,770,249 gallons between October 28, 2018, and November 8, 2018.
  - 2,969,031 gallons between June 10, 2020, and June 23, 2020

Prior to the completion of this intertie, a smaller intertie had been used several times, each time for flow from SVWD to SLVWD.

9.2.8 Future Water Projects

SVWD and regional partners are currently developing a list of projects that are ongoing, planned, being studied, and conceptual for inclusion in the SMGWA GSP.

9.2.9 Climate Change Effects

Future water use may be affected by climate change.

"Projections of climate change in California indicate a further intensification of wet and dry extremes and shifting temperatures that can…affect both water use and supplies. Extreme and higher temperatures can lead to increases in water use.

Projections of more frequent, severe, and prolonged droughts could lead to not only less surface water available, but also exacerbating ongoing stressors in groundwater basins across the state" (California Department of Water Resources, March 2021).

Higher temperatures decrease the amount of precipitation available for groundwater recharge and from surface water sources while increasing water use, especially for outdoor use. Reductions in future supply due to impacts associated with climate change were considered as part of the projected groundwater supply discussed in **Chapter 8** and **Chapter 11**. Increases in future water use patterns due to climate change factors were considered as part of the conservative demand projection provided in **Chapter 4**.

Because of these changes to climate, the projected GSP groundwater budget estimates that future inflows into the groundwater basin will be less than historical inflows, but due to decreased pumping and water use efficiency efforts, the proportion of inflows to outflows should be similar to the current ratio of inflows/outflows.

9.3 Energy Intensity

On average, SVWD uses 4,794 kilowatt-hours (kwh) for every MG of water produced (4,794 kwh/MG). Energy usage includes potable and non-potable deliveries.

A summary of energy used to extract and divert, place into storage, convey, treat, and distribute SVWD's supplies for May 2017-April 2018 is provided in **Table 9-8**.

Table 9-8. DWR O-1B Recommended Energy Reporting – Total Utility Approach

Start Date for Reporting Period: 05/01/2017
End Date for Reporting Period: 04/30/2018

	URBAN WATER SUPPLIER OPERATIONAL CONTROL		
	SUM OF ALL WATER MANAGEMENT PRACTICES	NON-CONSEQUENTIAL HYDROPOWER	
	TOTAL UTILITY	HYDROPOWER	NET UTILITY
Total Volume of Water Entering Process (AF)	1,135	N/A	1,135
Energy Consumed (kWh)	1,772,807	N/A	1,772,807
ENERGY INTENSITY (KWH/VOL)	**1,562**	**N/A**	**1,562**

Energy data obtained from the PG&E Energy Analysis Report prepared for SVWD dated 7/18/2018. (Pacific Gas and Electric Company, 2018)

10 SLVWD Water Supply Characterization

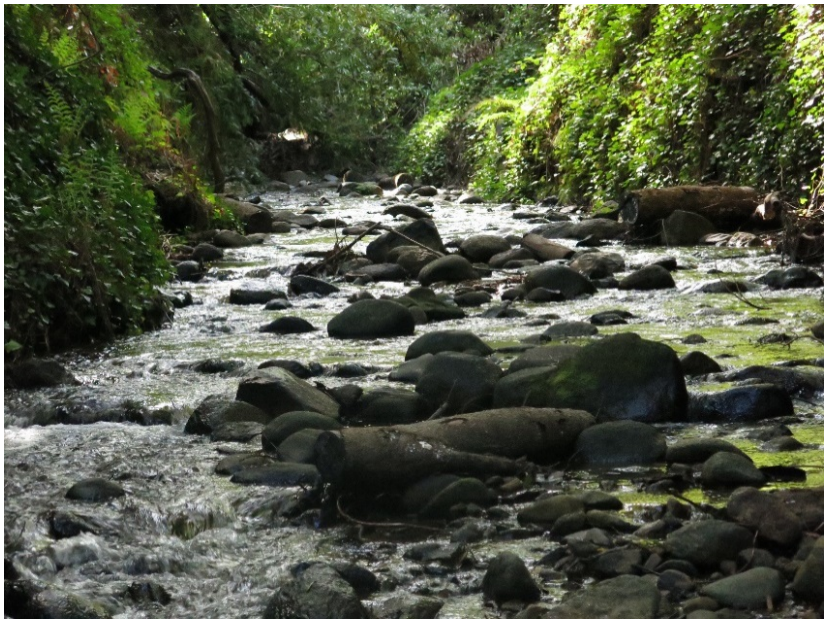
URBAN WATER MANAGEMENT PLAN

This chapter describes and quantifies the current and projected SLVWD water supplies. Each water source is characterized with information needed to manage water resources, assess supply reliability, perform the Drought Risk Assessment, and prepare and implement the WSCP.

The following chapter provide an overview of SLVWD's current and projected water supplies through 2045. SLVWD uses a combination of groundwater and surface water through conjunctive use as described in more detail in the following chapter. SLVWD anticipates meeting customer demands through 2045.

IN THIS SECTION

- Water Supply Characterization
- Future Water Projects
- Climate Change Effects
- Energy Intensity



10.1 SLVWD Water Supply Overview

This section describes and quantifies the current and projected sources of water available to SLVWD for the 25-year period covered by the UWMP. **Table 10-1** and **Table 10-2** provide a summary of the existing and planned SLVWD water supply volumes from 2020 to 2045 in five-year increments.

Table 10-1. Summary of SLVWD Current and Projected Potable Water Supplies (AFY) (DWR Tables 6-8 and 6-9)

WATER SUPPLY	ADDITIONAL DETAIL	2020	2025	2030	2035	2040	2045
SAN LORENZO VALLEY SYSTEM[1]							
Surface Water	Stream Diversions	417	972	987	1,001	1,016	1,031
Groundwater	Santa Margarita Groundwater Basin	1,258	920	920	920	920	920
FELTON SYSTEM							
Surface Water	Stream Diversions	366	310	312	315	317	319
Groundwater[2]	Bennett Spring	8	8	8	8	8	8
SLVWD Service Area							
TOTAL POTABLE WATER SUPPLY	**SURFACE & GROUNDWATER**	**2,049**	**2,210**	**2,227**	**2,243**	**2,260**	**2,277**

(1) Available supplies assume that SLVWD will target using the Baseline Pumping volume developed under groundwater model simulated baseline conditions for the GSP. The remainder of supply is assumed to come from stream diversions to meet demand. These values are estimates for potential supplies available and are subject to consideration of conditions and constraints discussed in detail in the WSCP.

(2) 2025-2045 Bennett Spring supply is based on the 5-year historical average of the Bennett Spring supply between 2016-2020.

Table 10-2. Summary of SLVWD Current and Projected Non-Potable Water Supplies (AFY) (DWR Tables 6-8 and 6-9)

WATER SUPPLY	ADDITIONAL DETAIL	2020	2025	2030	2035	2040	2045
SAN LORENZO VALLEY SYSTEM							
Recycled Water[1]	SVWD – Spring Lakes Mobile Home Park	48	48	48	48	48	48

(1) Recycled Water projection based on the last 3 year average provided by SVWD

10.2 SLVWD UWMP Water Supply Characterization

SLVWD practices conjunctive use to provide a reliable water supply to their customers. Conjunctive use refers to the optimized, sustainable use of multiple sources of water throughout repeated climatic cycles. SLVWD relies on groundwater and surface water diversions to meet all customer needs. Production from stream diversions occurs whenever possible which allows groundwater to remain stored for use during dry periods. Recycled water distributed by SVWD to one multi-residential customer in SLVWD's service area helps offset potable water demands; however, recycled water does not provide a substantial water supply for SLVWD. Water sources used to supply SLVWD customers are described below.

10.2.1 Purchased or Imported Water

SLVWD does not purchase water from any wholesale water suppliers and has no current or future plans to acquire imported water supplies.

10.2.2 Groundwater

Groundwater from the SMGB provides a portion of the potable water for SLVWD customers. Information regarding the SMGB setting, water suppliers that extract groundwater from the SMGB, and estimated available supplies is provided in **Chapter 8**. This section focuses on SLVWDs' historical and projected groundwater supplies. **Table 10-3** presents SLVWD historical and current total annual groundwater production from 2016 to 2020.

Table 10-3. Groundwater Volume Production by SLVWD (AFY) (DWR 6-1R)

GROUNDWATER TYPE	LOCATION OR BASIN NAME	2016	2017	2018	2019	2020
Alluvial Basin	San Lorenzo Valley System - Santa Margarita Groundwater Basin 3-027	647	821	1,100	654	1,258
Alluvial Basin	Felton System - Bennett Spring (GW)	7	9	8	6	8
TOTAL GROUNDWATER PUMPED	**SLVWD SERVICE AREA**	**654**	**830**	**1,109**	**660**	**1,266**

Groundwater production provided by SLVWD based on metered data. Production data for the Lompico Water System was not available until 2017 after the annexation.

SLVWD extraction wells operate regularly throughout the year, but especially in the dry season, beginning when stream diversions fall below the amount required to meet San Lorenzo Valley System water demand. As shown in **Table 8-2**, SLVWD has four active wells in the northern portion of the San Lorenzo Valley System, and three active wells in the southern portion of the San Lorenzo Valley System. In addition, the Felton System includes the Bennett Spring diversion which is a designated groundwater source with regard to required treatment. Bennett Spring is designated by the California Department of Drinking Water as a groundwater source, and thus does not require Water Treatment Plant filtration. The Bennett Spring diversion serves as the sole water supply for one of the systems six pressure zones. On average 8 AFY of the spring diversion is delivered as groundwater to SLVWD customers.

As noted in **Table 8-3**, 2025-2045 supplies assume that SLVWD will target using the Baseline Pumping volume developed under groundwater model simulated baseline conditions for the GSP. SLVWD will annually compare average pumping by aquifer over the last five-years to Baseline Pumping and may produce more or less than is currently estimated, which is 920 AFY. Due to the recent CZU Complex Fire, SLVWD anticipates that groundwater supplies may need to provide an additional 2% per year for the next 2-3 years compared to the annual average to account for impacts to surface water infrastructure from the fire. Additional details regarding the impact from the CZU Complex Fire to SLVWD surface water supplies is provided in **Section 10.2.3**.

10.2.3 Spring and Stream Diversions

SLVWD appropriative water rights are exercised through the active diversions shown in **Table 10-4**.

Table 10-4. SLVWD Active Diversions

SAN LORENZO VALLEY SYSTEM (NORTH)	POINTS OF DIVERSION	FELTON SYSTEM	POINTS OF DIVERSION
Peavine Creek	1	Fall Creek	1
Foreman Creek	1	Bennett Spring	1
Clear Creek	3	Bull Creek	2
Sweetwater Creek	1		

SLVWD diversion watersheds are shown in **Figure 8-3** and described in detail below. **Table 10-5** presents the historic spring diversion records for SLVWD and **Table 10-1** presents projected surface water supplies.

Table 10-5. Surface Water Diversions by SLVWD (AFY)

SLVWD SYSTEM	2016	2017	2018	2019	2020
San Lorenzo Valley System	894	1,031	727	1,010	417
Felton System	423	452	382	343	366
TOTAL SURFACE WATER DIVERSION	**1,317**	**1,483**	**1,109**	**1,353**	**783**

The diversion watersheds are located outside of the SMGB along the steep eastern slopes of Ben Lomond Mountain and are underlain by granitic and metamorphic rock. SLVWDs' diversion watersheds have a combined area of approximately 4,310 acres, or 7.1 square miles, equal to 6.3 percent of the San Lorenzo River watershed above the USGS Big Trees gauge near Felton. Diversions on Peavine and Foreman creeks supply the San Lorenzo Valley System and have a combined watershed area of 710 acres, or about 10 percent of the Boulder Creek watershed above its confluence with the San Lorenzo River. Diversions on Clear and Sweetwater creeks also supply the San Lorenzo Valley System and have a combined watershed area of 660 acres, or about 2 percent of the San Lorenzo River watershed above its confluence with Clear Creek.

Diversions on Fall and Bull creeks and Bennett Spring supply the Felton System. The Fall Creek diversion has a watershed area of approximately 2,770 acres (4.3 square miles), including the 225-acre watershed above the Bennett Spring diversion. The two Bull Creek diversions have a combined watershed area of 175 acres. Bennett Spring and the springs supplying the Bull Creek diversions may have contributing groundwater recharge areas that differ from their respective drainage areas. Together, the Felton System diversion watersheds comprise 4.3 percent of the San Lorenzo River watershed above the Big Trees gage. Surface diversions make up the entire supply for the Felton System, while a combination of groundwater and surface water supply the San Lorenzo Valley System.

San Lorenzo Valley System raw water diversions are conveyed by pipeline to the Lyon Water Treatment Plant (Lyon WTP). The Lyon WTP has a maximum operating capacity of about 155 AF/month (51 MG/month), equivalent to a continuous rate of 1,150 GPM. Peak production is limited by various constraints associated with stormflow, conveyance, and treatment (e.g., high-flow bypass, turbidity, aeration, pipeline capacity), as well as generally lower water demand during wet periods.

Raw water diversions from the Felton System are conveyed by pipeline to the Kirby Water Treatment Plant (Kirby WTP). the Kirby WTP was constructed and became operational in 1997. It controls the

occurrence of water-borne pathogenic microorganisms through disinfection, filtration, and limitations on finished-water turbidity. It has a design and permitted capacity of 1 MG/day (93 AF/month) and a typical operational capacity of approximately 0.5 MG/day (47AF/month). Production is sometimes limited during stormflow periods of elevated raw-water turbidity, during which the system relies on finished-water storage.

Additional details regarding the stream and spring diversions utilized by SLVWD are available in the 2015 UWMP.

In 2020, SLVWD lost a majority of its northern intake and raw waterline infrastructure to the CZU Complex Fire. Reconstruction of the approximately 7 miles of raw water line and 4 diversion intake structures are planned for reconstruction within the next 2-3 years. In the meantime, SLVWD is managing its remaining surface water diversions and groundwater well sites conjunctively. This involves moving water from SLVWD online systems to the damaged offline parts of the northern system. During the period of construction, SLVWD believes it will use 48% of groundwater well supply compared to its annual average of 46% groundwater & 54% surface water supply.

10.2.4 Stormwater

Stormwater is not intentionally diverted for beneficial reuse by SLVWD.

10.2.5 Wastewater and Recycled Water

The UWMP Act requires that the UWMP address the opportunities for development of recycled water, including the description of existing recycled water applications, quantities of wastewater currently being treated to recycled water standards, limitations on the use of available recycled water, an estimate of projected recycled water use, the feasibility of projected uses, and practices to encourage the use of recycled water.

SLVWD service areas primarily rely on on-site wastewater disposal (i.e., septic tanks and leach fields), which effectively recycles water within the watershed. Planning studies conducted in the 1980s determined that converting these areas to a sewer system would result in unacceptable environmental impacts. Because of these conditions, SLVWD is not considering the use of recycled water at this time for wastewater generated in the majority of the San Lorenzo Valley system service area or the Felton service area.

SLVWD owns, operates, and maintains a wastewater system in Boulder Creek's Bear Creek Estates, which serves approximately 56 homes. The system collects and treats domestic wastewater which is discharged to a subsurface 2.3 acre leach field. The Bear Creek Estates collection system is not included in the recycled water analysis because the wastewater is disposed on-site within the watershed.

Customers in the southern portion of the San Lorenzo Valley system service area have their wastewater treated by the City of Scotts Valley outside of SLVWD's service area at the Scotts Valley Water Reclamation Facility (WRF). Recycled water is used by SVWD to augment water supplies and to offset groundwater extraction for non-potable uses within their service area. In addition, the Spring Lakes Mobile Home Park (MHP), which is located within SLVWD's service area, is supplied with recycled water from SVWD to fill decorative ponds. The average demand for the Spring Lakes MHP over the last three years has been approximately 48 AFY. **Table 10-6** and **Table 10-7** present 2020 wastewater collection, treatment, and discharge information. In 2020 it is estimated that 128 AF of wastewater was collected and treated and approximately 48 AFY was tertiary treated and distributed within SLVWD's service area. It is assumed that the remaining treated wastewater from SLVWD's service area is discharged to the ocean outfall.

Projected recycled water demand is assumed to remain the same within SLVWD's service area with the Spring Lakes MHP being the only customer. SLVWD is not considering use of recycled water at additional locations within their service area at this time. Projected recycled water use is presented in **Table 10-2**. The 2015 UWMP projected 81 AFY of recycled water would be used in 2020 and the actual amount of recycled water used in 2020 was approximately 48 AFY. As previously noted, 48 AFY is estimated based on the average demand for recycled water in SLVWD's service area at the Spring Lakes MHP over the last three years. Total demand is likely impacted by recycled water customers becoming more efficient like potable water customers and the difficulty to provide infrastructure to customers within SLVWD's service area.

Table 10-6. Wastewater Collected within UWMP Service Area in 2020 (DWR 6-2R)

WASTEWATER COLLECTION			RECIPIENT OF COLLECTED WASTEWATER			
NAME OF WASTEWATER COLLECTION AGENCY	WASTEWATER VOLUME METERED OR ESTIMATED	WASTEWATER VOLUME COLLECTED FROM UWMP SERVICE AREA IN 2020 (AFY)	NAME OF WASTEWATER AGENCY RECEIVING COLLECTED WASTEWATER	WASTEWATER TREATMENT PLANT NAME	WASTEWATER TREATMENT PLANT LOCATED WITHIN UWMP AREA	WWTP OPERATION CONTRACTED TO A THIRD PARTY
City of Scotts Valley	Estimated	128	City of Scotts Valley	Scotts Valley Water Reclamation Facility	No	No

Note - Wastewater volume generated in a portion of SLVWD's South System which is collected and treated at the Scotts Valley WRF. GIS boundary layers provided by SLVWD and the City were used to determine the area of the service area that lies within wastewater collection area. From the GIS data, it was determined that 15.2% of Scotts Valley WRF's wastewater is generated by SLVWD's service area. Scotts Valley WRF collected 845 AF of wastewater in 2020, of which 15.2 %, or 128 AF, is assumed to have come from SLVWD. The remaining SLVWD wastewater is treated onsite through septic systems and is discharged to the groundwater basin.

Table 10-7 Wastewater Treatment and Discharge within UWMP Service Area in 2020 (DWR 6-3R)

						2020 VOLUMES (AFY)				
WASTEWATER TREATMENT PLANT NAME	DISCHARGE LOCATION NAME OR IDENTIFIER	DISCHARGE LOCATION DESCRIPTION	METHOD OF DISPOSAL	PLANT TREATS WASTEWATER GENERATED OUTSIDE THE SERVICE AREA	TREATMENT LEVEL	WASTEWATER TREATED	DISCHARGED TREATED WASTEWATER	RECYCLED WITHIN SERVICE AREA	RECYCLED OUTSIDE OF SERVICE AREA	INSTREAM FLOW PERMIT REQUIREMENT
Scotts Valley Water Reclamation Facility	Pacific Ocean in Joint Outfall with City of Santa Cruz	36° 56' 08" N; 122° 04' 08" W	Ocean outfall	Yes	Secondary, Disinfected - 23	128	80	0	0	0
Scotts Valley Water Reclamation Facility	Recycled Water Customers	SLVWD Service Area	Land disposal	Yes	Tertiary	0	0	48	0	0
-					**TOTAL:**	**128**	**80**	**48**	**0**	**0**

Note: It is assumed that the portion of SLVWD wastewater collected and not distributed to the Spring Lakes Mobile Home Park is discharged to the ocean outfall. This table does not include wastewater collected and discharged in SVWD's service area.

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10.2.6 Desalinated Water Opportunities

Development of desalinated water is not being considered for the current planning period, due to the availability of groundwater and surface water to meet the current and projected demand, and SLVWD's proximity (distance) to the ocean, which makes it cost prohibitive to consider desalination as a viable water supply alternative.

10.2.7 Water Exchanges and Transfers

An intertie connecting SLVWD's service area with SVWD's service area was completed in 2016. It was permitted as an emergency intertie and is not used for regular water transfers between the Districts.

The intertie has been used three times since it was brought online as shown below.

- **Water to SLVWD**
  - 11,338 gallons on June 22, 2016
- **Water to SVWD**
  - 1,770,249 gallons between October 28, 2018, and November 8, 2018.
  - 2,969,031 gallons between June 10, 2020, and June 23, 2020

Prior to the completion of this intertie, a smaller intertie had been used several times, each time for flow from SVWD to SLVWD.

10.2.8 Adequacy of SLVWD Water Supply

Stream diversions provide the primary water supply for SLVWD's service area during winter and early spring months of non-drought years. During dry-season months, elevated demand and limited divertible stream flows necessitate groundwater extraction to meet demands. The actual and potential supply provided by these sources depends on their conjunctive use within the constraints of the annual and long-term climatic cycle, existing and planned infrastructure, SLVWD water rights, and customer demands.

The conjunctive use of these sources has met annual production demands since 1984; however, declines in groundwater elevations were observed in the Pasatiempo wellfield (Lompico aquifer) resulting from too much groundwater being extracted by pumpers during the drought in the 1990's. The combined effects of drought, increased demand, modified water rights, and/or climate change could necessitate increased levels of conservation and/or further infrastructure improvements.

Although droughts may occur and for a longer duration and/or severity due to climate change, overall groundwater in storage in the SMGB is sufficient to provide adequate resources for SLVWD given the past, current, and anticipated future demand. The long-term adequacy of the supply may be bolstered by the reduction in groundwater pumping through improved water use efficiency and continued conjunctive use with surface water supplies. In addition, the long-term resiliency and reliability of the supply may be bolstered by expanding conjunctive use opportunities and the introduction of supplemental supply. **Chapter 4** of the SMGWA Draft GSP identifies a list of projects that are ongoing, planned, being studied and conceptual which are intended to strengthen local groundwater supplies and help achieve groundwater sustainability.

The very nature of groundwater reduces the short-term impact of drought years because of the availability of stored supply, but long-term impacts need to be addressed through appropriate projects and management actions.

10.2.9 Future Water Projects

Other sources of water potentially available to SLVWD include diversions from Loch Lomond reservoir and water transfers from neighboring water purveyors.

10.2.9.1 Loch Lomond Water

In 1958 SLVWD sold approximately 2,500 acres of property in the vicinity of the Newell Creek watershed to the City of Santa Cruz. As a condition to said sale, SLVWD obtained a water service agreement to purchase up to 500 AFY of raw water at a price to be determined by the City of Santa Cruz as the actual cost of production and transmission of water along Santa Cruz's Newell Creek pipeline to the point of diversion SLVWD. The purchase agreement maximum of 500 AFY was approximately 12.5% of the original estimated annual safe yield from a future Newell Creek reservoir. This percentage was roughly equivalent to the portion of the reservoir project area owned by SLVWD.

The City of Santa Cruz created Loch Lomond Reservoir with completion of the Newell Creek Dam in 1960. Based on the 1958 agreement, SLVWD began receiving deliveries of Loch Lomond water from the City of Santa Cruz in 1963. In 1965 SLVWD constructed the Glen Arbor Treatment Plant for treating its Loch Lomond deliveries. Toward the end of the 1976-77 drought, the City of Santa Cruz stipulated that SLVWD was not entitled to an allocation of 500 AFY, merely 12.5% of the safe yield. This decision, based on a reduction to the estimated annual safe from the Newell Creek Reservoir, reduced SLVWD's contractual allocation. This determination led to several years of water disputes between the City of Santa Cruz and SLVWD. On June 7, 1977, SLVWD filed a Complaint for Declaratory Relief, which requested the Court to make a judicial determination of the respective parties' duties and rights. In June 1980, a court order fixed the estimated annual safe yield from Newell Creek Reservoir at reduced quantity, which resulted in a reduction to SLVWD's contractual allocation. SLVWD can currently purchase up to 313 AF/yr.

At one time, SLVWD owned and operated a small water filtration facility known as the Glen Arbor Water Treatment Plant that treated water from Loch Lomond Reservoir. This plant, which was obsolete, and of limited capacity, was decommissioned and dismantled in 1998 and the property which had insufficient space for a new treatment plant was sold by SLVWD in 2001. In 1981 SLVWD acquired and developed an alternative ground water supply source (Olympic well field) and ceased utilization of Loch Lomond water. Currently, SLVWD has no other infrastructure to treat and deliver Loch Lomond water in compliance with current federal standards.

SLVWD is entitled to purchase 313 acre-ft per year available on a year-around 24/7 schedule if taken as raw water from the Loch Lomond reservoir pipeline. According to City of Santa Cruz staff, diversion of 313 AFY at the annual average rate of 300,000 gpd (208 gpm) would present no pipeline operating difficulties. It is anticipated that diversions from the pipeline of up to 0.5 million gpd (350 gpm instantaneous flow) could be tolerated without impacting supply availability to the Graham Hill WTP. Optionally, treated water purchased from the City of Santa Cruz's Graham Hill plant would only be available when the treatment plant is processing water from the reservoir. In contrast, utilization of treated water from the City of Santa Cruz would be subject to curtailment pursuant to drought restrictions with less of the allotment being available for SLVWD use, depending upon the drought severity.

SLVWD has discussed with the City of Santa Cruz the option to exercise their allotment to Loch Lomond Reservoir by purchasing treated water. Loch Lomond water is treated seasonally typically June-November in the Graham Hill WTP located at 715 Graham Hill Road. At that time, it was understood that the City of Santa Cruz would consider supplying treated water to SLVWD through this connection to their system only when raw water is being acquired from Loch Lomond Reservoir due to water rights restrictions. This condition generally prevails only during about 6 months of the year. The source would be also subject to supply restrictions in periods of drought. Discussion ended with no conclusion.

10.2.9.2 Additional Water Reliability Efforts

SLVWD is actively working to ensure water reliability during extended dry periods through the following efforts:

San Lorenzo Conjunctive Use and Baseflow Enhancement Plan

SLVWD is collaborating with the County Water Resources Division to develop a San Lorenzo Watershed Conjunctive Use and Baseflow Enhancement Plan (Plan) to improve water resource efficiency, thereby benefiting essential local fisheries, wildlife, and the community. The Plan will provide guidance for diverting excess winter surface flow in the San Lorenzo River Watershed to meet water supply needs, resting groundwater wells, and providing active, passive, and/or in-lieu groundwater recharge. During the dry season, the augmented groundwater will be used to meet demands and reduce stream diversions. SLVWD anticipates that conjunctive use of surface and groundwater will lead to increased stream baseflow during summer and other critical times benefitting fisheries, and will also contribute to increased storage, recovery, and sustainable management of the SMGB.

Felton Water System Infrastructure Improvement, Micro-Hydro Energy Efficiency Project, and streamflow Enhancement on Fall Creek

SLVWDs' Capital Improvement Plan has identified the Felton System as a priority for the next capital improvement project. The project will improve efficiencies in the Felton system by increasing the use of Bull and Bennett Creeks, increasing the bypass flows in Fall Creek, improving baseflow in the San Lorenzo River, and incorporating a micro-hydro energy plant adjacent to the surface water treatment plant in Felton. This project will have multiple benefits including decreasing SLVWDs' carbon footprint.

Zayante Creek Large Wood Project

SLVWD is collaborating with the Santa Cruz County Health Services Agency, Environmental Health Services, Water Resources Division, the City of Santa Cruz, State and Federal agencies, and the Resource Conservation District of Santa Cruz County to install large wood into the creek bed on SLVWD property in the Upper Zayante Watershed. In addition to the many benefits to riparian and instream fish habitat, this project will build up the streambed, slow the water in the creek and allow for more percolation into the groundwater aquifer adding to aquifer storage and improving baseflow in the San Lorenzo Watershed.

Santa Margarita Aquifer Injection or In-lieu Recharge Project

SLVWD is partnering with both the City of Santa Cruz Water Department and SVWD to evaluate options to actively recharge the SMGB. This could include utilizing stormwater runoff to actively inject water into the aquifer and/or to serve customers in groundwater areas to allow wells to rest and recover.

Chapter 4 of the SMGWA Draft GSP identifies a list of projects that are ongoing, planned, being studied and conceptual which are intended to strengthen local groundwater supplies.

10.2.10 Climate Change Effects

Future water uses and supplies may be affected by climate change.

"Projections of climate change in California indicate a further intensification of wet and dry extremes and shifting temperatures that can…affect both water use and supplies. Extreme and higher temperatures can lead to increases in water use…Projections of more frequent, severe, and prolonged droughts could lead to not only less surface water available, but also exacerbating

ongoing stressors in groundwater basins across the state" (California Department of Water Resources, March 2021).

Higher temperatures decrease the amount of precipitation available for groundwater recharge and from surface water sources while increasing water use, especially for outdoor use. Reductions in future supply due to impacts associated with climate change were considered as part of the projected groundwater supply discussed in **Chapter 8** and **Chapter 12**. Increases in future water use patterns due to climate change factors were considered as part of the conservative demand projection provided in **Chapter 5**.

Because of these changes to climate, the projected GSP groundwater budget estimates that future inflows into the groundwater basin will be less than historical inflows, but due to decreased pumping and water conservation efforts, the proportion of inflows to outflows should be similar to the current ratio of inflows/outflows.

10.3 Energy Intensity

SLVWD relies primarily on gravity fed distribution in its system. Energy uses include pump stations, treatment processes, well pumping, administration office facilities and SCADA control. On average, SLVWD uses 1569 kilowatt-hours (kwh) for every MG of water produced (1569 kwh/MG). A summary of energy used in 2020 is provided in **Table 10-8**. Due to the CZU Fires at the end of 2020, SLVWD had to rely on its wells to meet water demands, increasing its pumping and energy consumption from August 2020 to December 2020. Estimates used for self-generated renewable energy quantities. The volume of water and energy consumed are compiled from production data and PG&E billing spreadsheets.

Table 10-8. DWR O-1B Voluntary Energy Intensity - Total Utility Approach

Start Date for Reporting Period: 1/1/2020
End Date for Reporting Period: 12/30/2020

	URBAN WATER SUPPLIER OPERATIONAL CONTROL		
	SUM OF ALL WATER MANAGEMENT PROCESSES	NON-CONSEQUENTIAL HYDROPOWER	
	TOTAL UTILITY	HYDROPOWER	NET UTILITY
Volume of Water Entering Process (AF)	2,404	0	2,404
Energy Consumed (kWh)	1,228,641	0	1,228,641
ENERGY INTENSITY (KWH/VOL)	**511**	**0.0**	**511**

1. Information source is a combination of estimates and metered data.
2. Quantity of self-generated renewable energy: 136,408.92 kWh.

11 URBAN WATER MANAGEMENT PLAN
SVWD Water Service Reliability and DRA

This chapter considers SVWD's water supply reliability during normal, single dry, and multiple dry water years over the planning horizon. A Drought Risk Assessment of the next five years is also included

IN THIS SECTION

- Water Service Reliability Assessment
- Drought Risk Assessment

Water service reliability corresponds to an urban water supplier's ability to meet projected future customer demand under a variety of reasonably expected conditions. The supply reliability assessment discusses factors (i.e., climatic, environmental, water quality and legal) that could potentially limit the projected volume of water available from SVWD's current and future sources of supply through 2045.

Different climate conditions are considered and the quantitative impacts of the aforementioned factors on water supply and demand are discussed, as well as possible methods for addressing these issues. This chapter also includes the drought risk assessment (DRA), which provides a quick snapshot of the anticipated surplus or deficit if a drought were to occur in the next five years.

Evaluating the water service reliability is critical for water management as it can help identify potential problems before these happen. Water managers can then take proactive steps to mitigate shortages by encouraging water use efficiency, securing new water supplies and/or investing in infrastructure.

This chapter presents an evaluation of SVWD's water supply reliability under normal, dry, and multiple dry year conditions. The water service reliability assessment and DRA results indicate that no water shortages are anticipated within the next 25-years under normal, single dry water years, and multiple dry water years.

11.1 Water Service Reliability Assessment

SVWD's water service reliability assessment compares total projected water supply and demand over the next 25 years in five-year increments under normal, single dry water year, and five-year consecutive dry period. This section presents the reliability assessment for SVWD's service area.

11.1.1 Constraints on Water Sources

Climactic factors are the main constraint on SVWDs' groundwater supply. Precipitation is the only source of groundwater recharge in the SMGB. As described in **Chapter 9**, the projected GSP groundwater budget estimates that future inflows into the groundwater basin will be less than historical inflows, but due to decreased pumping and water use efficiency efforts, the proportion of inflows to outflows should be similar to the current ratio of inflows/outflows. **Table 11-1** shows the precipitation record results used to determine the normal, single dry, and multiple dry years based on the period of record of 1982- 2020 in order to assess SVWD's supply during varying climate conditions.

Additional potential constraints on the water supply include water quality and legal factors:

Water Quality

As noted in **Chapter 8**, groundwater in the SMGB is generally of good quality. SVWD regularly monitors the water quality of their supply and treats water before it is delivered to customers meeting or exceeding all drinking water standards. Annual Consumer Confidence Reports (CCRs) (water quality reports) are available on SVWD's website.

Legal Factors

The SMGB is not an adjudicated basin; however, SVWD works closely with regional partners through the SMGWA to ensure that groundwater sustainability criteria are met.

Table 11-1. SVWD Precipitation Record

			MULTIPLE-DRY WATER YEARS				
	NORMAL WATER YEAR	SINGLE DRY YEAR	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Year	2002	2014	1987	1988	1989	1990	1991
Inches of Rain	41.30	20.32	23.15	23.81	30.67	20.58	26.64

Annual groundwater reports prepared by SVWD indicate that changes in Lompico and Butano aquifer groundwater levels are not always as immediate as the aquifers are confined by overlying formations which causes groundwater responses to change in precipitation and lag by several years. SVWD closely monitors groundwater levels and precipitation and works with customers to reduce demand in periods of low precipitation to preserve groundwater in storage. SVWD also coordinates closely with SLVWD and SMGWA to monitor and avoid undesirable results in the SMGB.

11.1.2 Year Type Characterization

DWR defines three year types that must be included in the water service reliability assessment. These include:

- **Average Year.** This condition represents a single year or averaged range of years that most closely represents the average water supply available. DWR uses the terms average and normal interchangeably when addressing the water year type.
- **Single Dry Year.** The single dry year is recommended to be the year that represents the lowest water supply available to the Supplier.
- **Five-Consecutive-Year Drought.** The driest five-year historical sequence for the supplier, which may be the lowest average water supply available for five years in a row.

Average year supply is assumed to equal Baseline Pumping developed under GSP groundwater model simulated conditions. Pumping groundwater in excess of recharge in a single year or multiple years may not show up immediately as a decline in groundwater level but has detrimental impacts over the long-term. Therefore, it is assumed that pumping to meet demand will vary annually; however, the groundwater supply will balance out over the long-term. Short-term supply constraints are discussed in detail in the Water Shortage Contingency Plan (WSCP). **Table 11-2** provides the basis for each water year type.

Table 11-2. DWR 7-1R Basis for Water Year Data (Reliability Assessment)

		AVAILABLE SUPPLY IF YEAR TYPE REPEATS	
YEAR TYPE	BASE YEAR	VOLUME AVAILABLE (AFY)[1]	PERCENT OF AVERAGE SUPPLY
Average Year	2002	1,300	100%
Single-Dry Year	2014	1,300	100%
Consecutive Dry Years 1st Year	1987	1,300	100%
Consecutive Dry Years 2nd Year	1988	1,300	100%
Consecutive Dry Years 3rd Year	1989	1,300	100%
Consecutive Dry Years 4th Year	1990	1,300	100%
Consecutive Dry Years 5th Year	1991	1,300	100%

(1) Supply is assumed to equal Baseline Pumping under GSP groundwater model simulated conditions. Pumping groundwater in excess of recharge in a single year or multiple years may not show up immediately as a decline in water level but has detrimental impacts over the long-term. Therefore, it is assumed supply may exceed the average supply for a given year or for a few years but will ultimately balance out to the long-term average annual supply available over the long-term. Short-term supply constraints are discussed in detail in the WSCP.

11.1.3 Water Service Reliability

Results of the water supply and demand analysis for normal, single dry, and five-year consecutive droughts are shown in the following tables. SVWD anticipates meeting demands under all water year scenarios, continues to evaluate options to diversify supply, encourages use of recycled water, and promotes water use efficiency measures.

As discussed in **Chapter 8** the assessment of groundwater conditions by SVWD and SLVWD includes comparing each Districts' average pumping by aquifer over the last five-years to Baseline Pumping under groundwater model simulated conditions. The Baseline Pumping for SVWD is estimated at 1,300 AFY, which is sufficient to meet demand as shown in **Table 11-3.**

Table 11-3. DWR 7-2R Normal Year Potable Water Supply and Demand Comparison (AFY)

	2025	2030	2035	2040	2045
Supply Totals (From Table 6-9R[1])	1,300	1,300	1,300	1,300	1,300
Demand Totals (From Table 4-3R)	1,111	1,115	1,119	1,123	1,144
DIFFERENCE:	**189**	**185**	**181**	**177**	**156**

(1) Supply is assumed to equal Baseline Pumping under GSP groundwater model simulated conditions. Pumping groundwater in excess of recharge in a single year or multiple years may not show up immediately as a decline in water level but has detrimental impacts over the long-term.

Table 11-4. DWR 7-3R Single Dry Year Potable Water Supply and Demand Comparison (AFY)

	2025	2030	2035	2040	2045
Supply Totals[1]	1,300	1,300	1,300	1,300	1,300
Demand Totals[2]	1,123	1,127	1,131	1,136	1,156
DIFFERENCE:	**177**	**173**	**169**	**164**	**144**

(1) Supply is assumed to equal Baseline Pumping under GSP groundwater model simulated conditions. Pumping groundwater in excess of recharge in a single year or multiple years may not show up immediately as a decline in water level but has detrimental impacts over the long-term. Therefore, it is assumed supply may exceed the average supply for a given year or for a few years but will ultimately balance out to the long-term average annual supply available over the long-term. Short-term supply constraints are discussed in detail in the WSCP.

(2) Analysis of the dry year in 2014 indicates a demand increase in a single dry year of 1%.

Table 11-5. DWR 7-4R Multiple Dry Years Potable Water Supply and Demand Comparison (AFY)

		2025	2030	2035	2040	2045
First Year[1,2]	Supply Totals	1,300	1,300	1,300	1,300	1,300
	Demand Totals	1,111	1,115	1,119	1,123	1,144
-	**DIFFERENCE:**	**189**	**185**	**181**	**177**	**156**
Second Year[1,2]	Supply Totals	1,300	1,300	1,300	1,300	N/A
	Demand Totals	1,112	1,116	1,120	1,128	N/A
-	**DIFFERENCE:**	**188**	**184**	**180**	**172**	**N/A**
Third Year[1,2]	Supply Totals	1,300	1,300	1,300	1,300	N/A
	Demand Totals	1,113	1,117	1,121	1,132	N/A
-	**DIFFERENCE:**	**187**	**183**	**179**	**168**	**N/A**
Fourth Year[1,2]	Supply Totals	1,300	1,300	1,300	1,300	N/A
	Demand Totals	1,114	1,118	1,122	1,136	N/A
-	**DIFFERENCE:**	**186**	**182**	**178**	**164**	**N/A**
Fifth Year[1,2]	Supply Totals	1,300	1,300	1,300	1,300	N/A
	Demand Totals	1,114	1,119	1,123	1,140	N/A
-	**DIFFERENCE:**	**186**	**181**	**177**	**160**	**N/A**

(1) Supply is assumed to equal Baseline Pumping under GSP groundwater model simulated conditions. Pumping groundwater in excess of recharge in a single year or multiple years may not show up immediately as a decline in water level but has detrimental impacts over the long-term. Therefore, it is assumed supply may exceed the average supply for a given year or for a few years but will ultimately balance out to the long-term average annual supply available over the long-term. Short-term supply constraints are discussed in detail in the WSCP.

(2) Analysis of the five-year consecutive drought from 2012-2016 indicates 100% of normal demand in year 1, 103% in year 2, 101% in year 3, 83% in year 4, and 81% in year 5.

11.1.4 Descriptions of Management Tools and Options

As discussed previously, SVWD relies on groundwater from the SMGB to meet potable demands and continues to implement water use efficiency measures, recycled water use, and actively explores opportunities for regional projects and collaborative activities to increase supply resiliency. SVWD maximizes its local supply by implementing operational strategies and demand management measures that will keep the SMGB in balance. Details on SVWD's groundwater management efforts are provided in **Chapter 8**, the response plan for short- and long-term shortages is provided in **Chapter 13**, and conservation programs are provided in **Chapter 14**. SVWD is committed to ensuring safe and reliable water is provided to both current customers and future generations.

11.2 Drought Risk Assessment

New to 2020 UWMPs, CWC Section 10635 (b) now requires a drought risk assessment (DRA). The DRA provides a quick snapshot of the anticipated surplus or deficit if a five-consecutive year drought were to occur in the next five years. The DRA can be modified or updated outside of the UWMP five-year plan cycle, so a description of the data, methodology, and basis for shortage conditions must be included in this UWMP. The DRA evaluates each water supply's reliability and compares available water supplies and projected demands during a five-consecutive dry years scenario. This short-term analysis can help water suppliers foresee undesired risks, such as upcoming shortages, and provide time to evaluate and implement the necessary response actions needed to mitigate shortages in a less impactful manner to the community and environment. If demands cannot be met by the expected available supply, shortage response actions from SVWD's WSCP may be implemented. Details on SVWD's WSCP are provided in **Chapter 13**.

11.2.1 Data, Methods, and Basis for Water Shortage Condition

The DRA builds on the water service reliability analysis, which incorporated assessment of historical consumption data by customer class, populated from billing records, and historical supply data by source from production reports. Based on this data, historical demand has never exceeded available supply. For this DRA analysis, normal year demand conditions and five-consecutive year drought supply conditions were considered for 2021-2025.

11.2.2 DRA Water Source Reliability

As described previously, SVWD's groundwater supply is assumed to equal Baseline Pumping under GSP groundwater model simulated conditions. SVWD, SLVWD and other local agencies are working with the SMGWA to make the SMGB sustainable by improving basin management, implementing recycled water use, developing supplemental supplies, and promoting continued conservation. To support SVWD's supply management and water use efficiency efforts, SVWD will monitor precipitation, groundwater conditions in relation to GSP efforts, well production capacity, and State standards for efficient water use. More details are provided in the WSCP in **Chapter 13** about how these factors are established, monitored, and used to make water resources management decisions. If certain criteria are met for these factors, shortage response actions from SVWD's WSCP may be activated.

As discussed in **Chapter 9**, an emergency intertie between SVWD and SLVWD is available to transfer water during emergencies. The intertie improves regional supply reliability by allowing SVWD and SLVWD access to each other's sources in an emergency.

11.2.3 Total Water Supply and Use Comparison

SVWD does not anticipate any supply shortages within the next five years as shown in **Table 11-6**.

Table 11-6. DWR 7-5 Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b) (AFY)

2021	Gross Water Use	1,131
	Total Supplies[1]	1,300
	Surplus/Shortfall without WSCP Action	169
	PLANNED WSCP ACTIONS (USE REDUCTION AND SUPPLY AUGMENTATION)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	169
	Resulting Percent Use Reduction from WSCP Action	0%
2022	Gross Water Use	1,126
	Total Supplies[1]	1,300
	Surplus/Shortfall without WSCP Action	174
	PLANNED WSCP ACTIONS (USE REDUCTION AND SUPPLY AUGMENTATION)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	174
	Resulting Percent Use Reduction from WSCP Action	0%
2023	Gross Water Use	1,121
	Total Supplies[1]	1,300
	Surplus/Shortfall without WSCP Action	179
	PLANNED WSCP ACTIONS (USE REDUCTION AND SUPPLY AUGMENTATION)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	179
	Resulting Percent Use Reduction from WSCP Action	0%

*Table continues on the next page.

2024	Gross Water Use	1,116
	Total Supplies[1]	1,300
	Surplus/Shortfall without WSCP Action	184
	PLANNED WSCP ACTIONS (USE REDUCTION AND SUPPLY AUGMENTATION)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	184
	Resulting Percent Use Reduction from WSCP Action	0%
2025	Gross Water Use	1,111
	Total Supplies[1]	1,300
	Surplus/Shortfall without WSCP Action	189
	PLANNED WSCP ACTIONS (USE REDUCTION AND SUPPLY AUGMENTATION)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	189
	Resulting Percent Use Reduction from WSCP Action	0%

(1) Supply is assumed to equal Baseline Pumping under GSP groundwater model simulated conditions. Pumping groundwater in excess of recharge in a single year or multiple years may not show up immediately as a decline in water level but has detrimental impacts over the long-term. Therefore, it is assumed supply may exceed the average supply for a given year or for a few years but will ultimately balance out to the long-term average annual supply available over the long-term. Short-term supply constraints are discussed in detail in the WSCP.

12

URBAN WATER MANAGEMENT PLAN

SLVWD Water Service Reliability and DRA

This chapter considers SLVWD's water supply reliability during normal, single dry, and multiple dry water years over the planning horizon. A Drought Risk Assessment of the next five years is also included.

IN THIS SECTION

- Water Service Reliability Assessment
- Drought Risk Assessment

Water service reliability corresponds to an urban water supplier's ability to meet projected future customer demand under a variety of reasonably expected conditions. The supply reliability assessment discusses factors (i.e., climatic, environmental, water quality and legal) that could potentially limit the projected volume of water available from SLVWD's current and future sources of supply through 2045.

Different climate conditions are considered and the quantitative impacts of the aforementioned factors on water supply and demand are discussed, as well as possible methods for addressing these issues. This chapter also includes the drought risk assessment (DRA), which provides a quick snapshot of the anticipated surplus or deficit if a drought were to occur in the next five years.

Evaluating the water service reliability is critical for water management as it can help identify potential problems before these happen. Water managers can then take proactive steps to mitigate shortages by encouraging water use efficiency, securing new water supplies and/or investing in infrastructure.

This chapter presents an evaluation of SLVWD's water supply reliability under normal, dry, and multiple dry year conditions. The water service reliability assessment and DRA results indicate that no water shortages are anticipated within the next 25-years under normal, single dry water years, and multiple dry water years.

12.1 Water Service Reliability Assessment

SLVWD's water service reliability assessment compares total projected water supply and demands over the next 25 years in five-year increments under normal, single dry water year, and five-year consecutive dry period. This section presents the reliability assessment for SLVWD's service area.

12.1.1 Constraints on Water Sources

As detailed in **Chapter 8** and **Chapter 10**, SLVWD relies on surface and groundwater to meet customer demands. Climactic factors are the main constraint on SLVWDs' supplies, with precipitation being the only source for surface flows and groundwater recharge. SLVWD's water supply during normal, dry, and multiple dry year conditions is best defined in the context of the climatic cycle that drives SLVWD's conjunctive use of surface water and groundwater supplies. SLVWD closely monitors precipitation and groundwater conditions to inform management of their supply portfolio.

Additional potential constraints on the water supply include environmental, water quality, and legal factors.

Environmental Factors

In 2020 SLVWD lost a majority of its northern intake and raw waterline infrastructure to the CZU Complex Fire. Reconstruction of the approximately 7 miles of raw water line and 4 diversion intake structures are planned for reconstruction within the next 2-3 years. In the meantime, SLVWD is managing its remaining surface water diversions and groundwater well sites conjunctively. This involves moving water from SLVWD online systems to the damaged offline parts of the northern system. During the period of construction, SLVWD believes it will use 48% of groundwater well supply compared to its annual average of 46% groundwater & 54% surface water supply.

Water Quality

As noted in **Chapter 8**, groundwater in the SMGB is generally of good quality. Surface water supplies are also generally of good quality. SLVWD regularly monitors the water quality of their supplies and treats water before it is delivered to customers meeting or exceeding all drinking water standards. Annual Consumer Confidence Reports (CCRs) (water quality reports) are available on SLVWD's website.

Legal Factors

The SMGB is not an adjudicated basin; however, SLVWD works closely with regional partners through the SMGWA to ensure that groundwater sustainability criteria are met. Legal factors also impact SLVWD surface water supplies as SLVWD's northern diversion sites are all pre-1914 water rights and water obtained from Fall Creek has a limit of 1,059 AFY.

12.1.2 Year Type Characterization

DWR defines three year types that must be included in the water service reliability assessment. These include:

- **Average Year.** This condition represents a single year or averaged range of years that most closely represents the average water supply available. DWR uses the terms average and normal interchangeably when addressing the water year type.
- **Single Dry Year.** The single dry year is recommended to be the year that represents the lowest water supply available to the Supplier.
- **Five-Consecutive-Year Drought.** The driest five-year historical sequence for the supplier, which may be the lowest average water supply available for five years in a row.

The in-depth analysis in SLVWD's 2010 UWMP demonstrated that "rainfall is a suitable indicator for streamflow, diversions, and groundwater recharge" (Nicholas M. Johnson, Ph.D., R.G., C.Hg., August 2015). The 43-year design climatic cycle in the 2010 UWMP was based on WYs 1970-2012 and indicated the average for 1970-2012 as the average year, a single-dry year as 1977, and the multiple dry-year period as 1987-94. Updated rainfall for 2013-2020 was added to the 1970-2012 rainfall record and analyzed to determine that the normal, single dry, and multiple dry year periods analysis from the 2010 UWMP is still appropriate for characterizing supply reliability. **Table 12-1** provides the basis for each water year type.

Table 12-1. DWR 7-1R Basis for Water Year Data (Reliability Assessment)

	SAN LORENZO VALLEY SYSTEM GROUNDWATER FROM SMGB			SAN LORENZO VALLEY SYSTEM STREAM DIVERSIONS		FELTON SYSTEM STREAM/SPRING DIVERSIONS	
YEAR TYPE[1]	BASE YEAR	VOLUME AVAILABLE[2]	PERCENT OF AVERAGE SUPPLY	VOLUME AVAILABLE	PERCENT OF AVERAGE SUPPLY	VOLUME AVAILABLE	PERCENT OF AVERAGE SUPPLY
Average Year	1970-2020	920	100%	950	100%	450	100%
Single-Dry Year	1977	920	100%	400	42%	425	94%
Consecutive Dry Years 1st Year	1987-1994	920	100%	675	71%	435	97%
Consecutive Dry Years 2nd Year	1987-1994	920	100%	675	71%	435	97%
Consecutive Dry Years 3rd Year	1987-1994	920	100%	675	71%	435	97%
Consecutive Dry Years 4th Year	1987-1994	920	100%	675	71%	435	97%
Consecutive Dry Years 5th Year	1987-1994	920	100%	675	71%	435	97%

(1) Available volumes are from the 2010 UWMP (Nicholas M. Johnson, Ph.D., R.G., C.Hg., August 2015), which were determined based on application of a range of demands from 2,295-2,415 AFY to supplies modeled under the 1970-2012 design climactic cycle. These values are estimates for potential supplies available and are subject to consideration of conditions and constraints discussed in detail in the WSCP.
(2) SMGB supply is assumed to equal Baseline Pumping under GSP groundwater model simulated conditions. Pumping groundwater in excess of recharge in a single year or multiple years may not show up immediately as a decline in water level but has detrimental impacts over the long-term. Therefore, it is assumed supply may exceed the average supply for a given year or for a few years but will ultimately balance out to the long-term average annual supply available over the long-term. Short-term supply constraints are discussed in detail in the WSCP.

12.1.3 Water Service Reliability

Results of the water supply and demand analysis for normal, single dry, and five-year consecutive droughts are shown in the following tables. SLVWD expects to meet demands under all water year scenarios, continue to evaluate options to diversify supply, and promote continued water conservation to ensure reliability for the SMGB and stream diversions.

Projected supplies are sufficient to meet normal year demand as shown in **Table 12-2** and **Table 12-3** as well as total single dry year and total five year dry scenarios in **Table 12-5** and **Table 12-7**. However, supply from the SMGB in the San Lorenzo Valley System exceeds the 2010 UWMP's estimated available supplies (**Table 12-1**) in all single dry years (**Table 12-4**) and in five dry year scenarios for 2040 and 2045 (**Table 12-6**). It is anticipated that groundwater will be used in dry years in coordination with provisions of the GSP and WSCP. As described in **Sections 10.2.8** and **10.2.9**, the combined effects of drought, increased demand, modified water rights, and/or climate change could necessitate increased levels of conservation and/or further infrastructure improvements. In addition, the long-term resiliency and reliability of the supply may be bolstered by expanding conjunctive use opportunities and the introduction of supplemental supply. **Chapter 4** of the SMGWA Draft GSP identifies a list of projects that are ongoing, planned, being studied and conceptual which are intended to strengthen local groundwater supplies as described in **Section 10.2.9** and help achieve groundwater sustainability.

Table 12-2. Normal Year Potable Water Supply and Demand Comparison by System & Source (AFY)

TYPE	ADDITIONAL DETAIL	2025	2030	2035	2040	2045
SAN LORENZO VALLEY SYSTEM						
Surface Water	Stream Diversions	972	1,001	1,001	1,016	1,031
Groundwater	Santa Margarita Groundwater Basin[1]	920	920	920	920	920
SAN LORENZO VALLEY SUPPLY SUBTOTAL		**1,892**	**1,892**	**1,921**	**1,936**	**1,951**
SAN LORENZO VALLEY DEMAND		**1,892**	**1,892**	**1,921**	**1,936**	**1,951**
SAN LORENZO VALLEY SURPLUS/DEFICIT		**0**	**0**	**0**	**0**	**0**
FELTON SYSTEM						
Surface Water	Stream Diversions	310	312	315	317	319
Groundwater	Bennett Spring	8	8	8	8	8
FELTON SUPPLY SUBTOTAL		**317**	**320**	**322**	**324**	**327**
FELTON DEMAND		**317**	**320**	**322**	**324**	**327**
FELTON SURPLUS/DEFICIT		**0**	**0**	**0**	**0**	**0**

(1) SMGB supply is assumed to equal Baseline Pumping under GSP groundwater model simulated conditions. Pumping groundwater in excess of recharge in a single year or multiple years may not show up immediately as a decline in water level but has detrimental impacts over the long-term. Therefore, it is assumed supply may exceed the average supply for a given year or for a few years but will ultimately balance out to the long-term average annual supply available over the long-term. Short-term supply constraints are discussed in detail in the WSCP.

Table 12-3. DWR 7-2R Normal Year Potable Water Supply and Demand Comparison (AFY)

	2025	2030	2035	2040	2045
Supply Totals (From Table 6-9R)	2,210	2,227	2,243	2,260	2,277
Demand Totals (From Table 4-3R)	2,210	2,227	2,243	2,260	2,277
DIFFERENCE:	**0**	**0**	**0**	**0**	**0**

Table 12-4. Single Dry Year Potable Water Supply and Demand Comparison by System & Source (AFY)

TYPE	ADDITIONAL DETAIL	2025	2030	2035	2040	2045
SAN LORENZO VALLEY SYSTEM						
Surface Water	Stream Diversions	972	1,001	1,001	1,016	1,031
Groundwater	Santa Margarita Groundwater Basin[1]	920	920	920	920	920
SAN LORENZO VALLEY SUPPLY SUBTOTAL		**1,892**	**1,892**	**1,921**	**1,936**	**1,951**
SAN LORENZO VALLEY DEMAND		**1,892**	**1,892**	**1,921**	**1,936**	**1,951**
SAN LORENZO VALLEY SURPLUS/DEFICIT		**0**	**0**	**0**	**0**	**0**
FELTON SYSTEM						
Surface Water	Stream Diversions	310	312	315	317	319
Groundwater	Bennett Spring	8	8	8	8	8
FELTON SUPPLY SUBTOTAL		**317**	**320**	**322**	**324**	**327**
FELTON DEMAND		**317**	**320**	**322**	**324**	**327**
FELTON SURPLUS/DEFICIT		**0**	**0**	**0**	**0**	**0**

(1) SMGB supply is assumed to equal Baseline Pumping under GSP groundwater model simulated conditions. Pumping groundwater in excess of recharge in a single year or multiple years may not show up immediately as a decline in water level but has detrimental impacts over the long-term. Therefore, it is assumed supply may exceed the average supply for a given year or for a few years but will ultimately balance out to the long-term average annual supply available over the long-term. Short-term supply constraints are discussed in detail in the WSCP.

Table 12-5. DWR 7-3R Single Dry Year Potable Water Supply and Demand Comparison (AFY)

	2025	2030	2035	2040	2045
Supply Totals (From Table 6-9R)	2,210	2,227	2,243	2,260	2,277
Demand Totals (From Table 4-3R)	2,210	2,227	2,243	2,260	2,277
DIFFERENCE:	**0**	**0**	**0**	**0**	**0**

Table 12-6. Multiple Dry Years Potable Water Supply and Demand Comparison by System & Source (AFY)

TYPE	ADDITIONAL DETAIL	2025	2030	2035	2040	2045
SAN LORENZO VALLEY SYSTEM						
Surface Water	Stream Diversions	972	1,001	1,001	1,016	1,031
Groundwater	Santa Margarita Groundwater Basin[1]	920	920	920	920	920
SAN LORENZO VALLEY SUPPLY SUBTOTAL		**1,892**	**1,892**	**1,921**	**1,936**	**1,951**
SAN LORENZO VALLEY DEMAND		**1,892**	**1,892**	**1,921**	**1,936**	**1,951**
SAN LORENZO VALLEY SURPLUS/DEFICIT		**0**	**0**	**0**	**0**	**0**
FELTON SYSTEM						
Surface Water	Stream Diversions	310	312	315	317	319
Groundwater	Bennett Spring	8	8	8	8	8
FELTON SUPPLY SUBTOTAL		**317**	**320**	**322**	**324**	**327**
FELTON DEMAND		**317**	**320**	**322**	**324**	**327**
FELTON SURPLUS/DEFICIT		**0**	**0**	**0**	**0**	**0**

(1) SMGB supply is assumed to equal Baseline Pumping under GSP groundwater model simulated conditions. Pumping groundwater in excess of recharge in a single year or multiple years may not show up immediately as a decline in water level but has detrimental impacts over the long-term. Therefore, it is assumed supply may exceed the average supply for a given year or for a few years but will ultimately balance out to the long-term average annual supply available over the long-term. Short-term supply constraints are discussed in detail in the WSCP.

Table 12-7. DWR 7-4R Multiple Dry Years Potable Water Supply and Demand Comparison (AFY)

		2025	2030	2035	2040	2045
First	Supply Totals	2,210	2,227	2,243	2,260	2,277
Year	Demand Totals	2,210	2,227	2,243	2,260	2,277
-	**DIFFERENCE:**	**0**	**0**	**0**	**0**	**0**
Second	Supply Totals	2,213	2,230	2,247	2,264	N/A
Year	Demand Totals	2,213	2,230	2,247	2,264	N/A
-	**DIFFERENCE:**	**0**	**0**	**0**	**0**	**N/A**
Third	Supply Totals	2,216	2,233	2,250	2,267	N/A
Year	Demand Totals	2,216	2,233	2,250	2,267	N/A
-	**DIFFERENCE:**	**0**	**0**	**0**	**0**	**N/A**
Fourth	Supply Totals	2,220	2,237	2,254	2,271	N/A
Year	Demand Totals	2,220	2,237	2,254	2,271	N/A
-	**DIFFERENCE:**	**0**	**0**	**0**	**0**	**N/A**
Fifth	Supply Totals	2,223	2,240	2,257	2,274	N/A
Year	Demand Totals	2,223	2,240	2,257	2,274	N/A
-	**DIFFERENCE:**	**0**	**0**	**0**	**0**	**N/A**

(1) SMGB supply is assumed to equal Baseline Pumping under GSP groundwater model simulated conditions. Pumping groundwater in excess of recharge in a single year or multiple years may not show up immediately as a decline in water level but has detrimental impacts over the long-term. Therefore, it is assumed supply may exceed the average supply for a given year or for a few years but will ultimately balance out to the long-term average annual supply available over the long-term. Short-term supply constraints are discussed in detail in the WSCP.

12.1.4 Descriptions of Management Tools and Options

As discussed previously, SLVWD relies on surface water and groundwater from the SMGB to meet demands and intends to continue to promote conservation, recycled water use, and continue to evaluate other opportunities to ensure reliability for SLVWD's supply resources. SLVWD will maximize its local supply by implementing operational strategies and shortage response actions that will keep water resources in balance. Details on SLVWD's groundwater management efforts are provided in **Chapter 8** and **Chapter 10**, the response plan for short-term shortages is provided in **Chapter 13**, and conservation programs to address long-term shortage are provided in **Chapter 15**. SLVWD is committed to ensuring safe and reliable water is provided to both current customers and future generations.

12.2 Drought Risk Assessment

New to 2020 UWMPs, CWC Section 10635 (b) now requires a DRA. The DRA provides a quick snapshot of the anticipated surplus or deficit if a five-consecutive year drought were to occur in the next five years. The DRA can be modified or updated outside of the UWMP five-year plan cycle, so a description of the data, methodology, and basis for shortage conditions must be included in this UWMP. The DRA evaluates each water supply's reliability and compares available water supplies and projected demands during a five-consecutive dry years scenario. This short-term analysis can help water suppliers foresee undesired risks, such as upcoming shortages, and provide time to evaluate and implement the necessary response actions needed to mitigate shortages in a less impactful manner to the community and environment. If demands cannot be met by the expected available supply, shortage response actions from SLVWD's WSCP may be implemented. Details on SLVWD's WSCP are provided in **Chapter 13**.

12.2.1 Data, Methods, and Basis for Water Shortage Condition

The DRA builds on the water service reliability analysis from **Section 11.1,** which incorporated assessment of historical consumption data by customer class, populated from billing records, and historical supply data by source from production reports. Based on this data, historical demand has never exceeded available supply. For this DRA analysis, normal year demand conditions and five-consecutive year drought supply conditions were considered for 2021-2025.

12.2.2 DRA Water Source Reliability

As described previously, SLVWD conjunctively uses its surface water and groundwater sources. SVWD, SLVWD, and other local agencies are working with the SMGWA to make the SMGB sustainable by improving basin management, developing supplemental supplies, and promoting continued conservation. To support SLVWD's supply management and conservation efforts, SLVWD will monitor precipitation, groundwater conditions in relation to GSP efforts, well production capacity, and State standards for efficient water use. More details are provided in the WSCP in **Chapter 13** about how these factors are established, monitored, and used to make water resources management decisions. If certain criteria are met for these factors, shortage response actions from SLVWD's WSCP may be activated.

As discussed in **Chapter 10**, an emergency intertie between SVWD and SLVWD is available to transfer water during emergencies. The intertie improves regional supply reliability by allowing SVWD and SLVWD access to each other's sources in an emergency.

12.2.3 Total Water Supply and Use Comparison

SLVWD does not anticipate any supply shortages within the next five years as shown in **Table 12-8**. As discussed in **Chapter 10**, due to the recent CZU Complex Fire, SLVWD anticipates that groundwater supplies may need to provide an additional 2% per year for the next 2-3 years compared to the annual average to account for impacts to surface water infrastructure from the fire. Additional details regarding the impact from the CZU Complex Fire to SLVWD surface water supplies is provided in **Section 10.2.3**.

Table 12-8. DWR 7-5 Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b) (AFY)

2021	Gross Water Use	1,650
	Total Supplies	1,650
	Surplus/Shortfall without WSCP Action	0
	PLANNED WSCP ACTIONS (USE REDUCTION AND SUPPLY AUGMENTATION)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	0%
2022	Gross Water Use	1,687
	Total Supplies	1,687
	Surplus/Shortfall without WSCP Action	0
	PLANNED WSCP ACTIONS (USE REDUCTION AND SUPPLY AUGMENTATION)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	0%
2023	Gross Water Use	1,725
	Total Supplies	1,725
	Surplus/Shortfall without WSCP Action	0
	PLANNED WSCP ACTIONS (USE REDUCTION AND SUPPLY AUGMENTATION)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	0%

*Table continues on the next page.

2024	Gross Water Use	1,762
	Total Supplies	1,762
	Surplus/Shortfall without WSCP Action	0
	PLANNED WSCP ACTIONS (USE REDUCTION AND SUPPLY AUGMENTATION)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	0%
2025	Gross Water Use	1,799
	Total Supplies	1,799
	Surplus/Shortfall without WSCP Action	0
	PLANNED WSCP ACTIONS (USE REDUCTION AND SUPPLY AUGMENTATION)	
	WSCP (Supply Augmentation Benefit)	0
	WSCP (Use Reduction Savings Benefit)	0
	Revised Surplus/Shortfall	0
	Resulting Percent Use Reduction from WSCP Action	0%

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URBAN WATER MANAGEMENT PLAN

13 Water Shortage Contingency Plan

This Water Shortage Contingency Plan (WSCP) is a detailed plan for how San Lorenzo Valley Water District (SLVWD) and Scotts Valley Water District (SVWD) will identify and respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the water supply is reduced to a level that cannot support demand at any given time or when reduction in demand is required for various reasons.

SLVWD and SVWD are collectively referred to as the "Districts" in this WSCP. The WSCP is used to provide guidance to SLVWD's Board of Directors (SLVWD Board) and SVWD's Board of Directors (SVWD Board), staff, and the public by identifying anticipated water shortages and response actions to allow for efficient management of any water shortage with predictability and accountability.

IN THIS SECTION

The purpose of the WSCP is to conserve the available water supply and protect the integrity of the water supply, with particular regard for domestic water use, sanitation, and fire protection; and to protect and preserve public health, welfare, and safety. Preparation provides the tools to maintain reliable supplies and reduce the impacts of supply interruptions due to a range of conditions including extended drought, production capacity limitations, catastrophic supply interruptions, or other unforeseen shortages.

The WSCP describes the following:

Water Supply Reliability Analysis

Summarizes the water supply reliability analysis and identifies any key issues that may trigger a shortage condition.

Annual Water Supply and Demand Assessment Procedures

Describes the key data inputs, evaluation criteria, and methodology for assessing the system's reliability for the coming year and the steps to formally declare any water shortage levels and response actions.

Six Shortage Stages

Establishes water shortage levels to clearly identify and prepare for shortages.

Shortage Response Actions

Describes the response actions that may be implemented or considered for each stage to reduce gaps between supply and demand.

Communication Protocols

Describes communication protocols under each stage to ensure customers, the public, and local government agencies are informed of shortage conditions and requirements.

Compliance and Enforcement

Defines compliance and enforcement actions available to administer demand reductions.

Legal Authority

Lists the legal documents that grant the authority to declare a water shortage and implement and enforce response actions.

Financial Consequences of WSCP Implementation

Describes the anticipated financial impact of water shortage stages and identifies mitigation strategies to offset financial burdens.

Monitoring and Reporting

Summarizes the monitoring and reporting techniques to evaluate the effectiveness of shortage response actions and overall WSCP implementation. Results are used to determine if additional shortage response actions should be activated, if efforts are successful, and if response actions should be adjusted.

WSCP Refinement Procedures

Describes factors that may trigger updates to the WSCP and outlines how to complete an update.

Special Water Features Distinctions

Defines considerations and definitions for water use for decorative features versus pools and spas. Decorative features include ornamental fountains, ponds, and other aesthetic features.

Plan Adoption, Submittal, and Availability

Describes the process for the WSCP adoption, submittal, and availability after each revision.

This WSCP was prepared in conjunction with the SVWD & SLVWD 2020 Urban Water Management Plan (UWMP). This document is compliant with the California Water Code (CWC) Section 10632 and incorporated guidance from the State of California Department of Water Resources (DWR) UWMP Guidebook (California Department of Water Resources, 2021).

13.1 Water Supply Reliability Analysis

As part of the 2020 UWMP requirements, **Chapter 11** and **Chapter 12** include a supply reliability analysis for the following scenarios: normal year, single-dry year, and five-year consecutive dry years. The Districts expect to meet demands under all water year scenarios while protecting the SMGB.

Chapter 11 and **Chapter 12** also include required Drought Risk Assessments (DRA) to analyze supply reliability for 2021-2025. The DRA analyzes historical data to allow the Districts to view patterns and more reliably determine if there could be any water shortages within a given time frame. The DRA looks at historical consumption data by customer class, populated from billing records, and historical supply data by source from production reports. Next, future demand and supply estimates for the planning period are analyzed to determine if there are any gaps between supply and demand. As mentioned above, the Districts do not anticipate a supply shortage.

Since SVWD's only potable supply source is the SMGB and the SMGB is an important part of SLVWD's supply portfolio, the Districts are committed to water use efficiency and pursuing opportunities to enhance their supply portfolios and subsequent reliability as described in **Chapter 11** and **Chapter 12** of the UWMP.

13.2 Annual Water Supply and Demand Assessment

The Districts plan to perform Annual Water Supply and Demand Assessments (Annual Assessment) in April of each year to determine if there is a need to implement the WSCP, and if so, the level of water shortage. Key data inputs, evaluation criteria, and procedures for performing the Annual Assessments are described in this section. Starting in 2022, the Annual Assessments must be sent to DWR by July 1st of each year.

13.2.1 Key Data Inputs

The WSCP addresses several types of water supply shortages that could potentially impact the Districts and their customers:

- Long-term supply shortages due to prolonged drought, contamination, destruction of critical water supply facilities, etc.
- Short-term water supply shortages due to natural or man-made catastrophic emergencies or production capacity limitations.
- Supply shortages due to compliance with Sustainable Management Criteria for the Santa Margarita Groundwater Basin (SMGB) as defined in the SMGB Groundwater Sustainability Plan (GSP) and summarized in this WSCP.

Key data inputs and their sources for the Annual Assessments are summarized in **Table 13-1** and described in detail in **Section 13.2.2**.

Evaluation criteria that can be used to determine and declare severity of supply shortages may include any, or combinations, of the following:

- **Rainfall.** Reflects reduction to supply due to decreased groundwater recharge and surface water flows.
- **SMGB Sustainable Management Criteria.** Reflects status of groundwater conditions such as groundwater levels, groundwater quality, depletion of interconnected surface water, or reduction of groundwater in storage.

- **Production Capacity.** Reflects limited production and distribution capacity due to a variety of factors potentially including, but not limited to man-made or natural catastrophic events
- **State Mandates.** Reflects State orders and mandatory compliance with water use efficiency standards

Supply shortages affect all users of the SMGB and surrounding region, not just the Districts' customers. A water shortage emergency may be declared when it is demonstrated that groundwater conditions and/or surface water conditions threaten the ability to provide water for public health, safety, and welfare of the community. Furthermore, compliance with State mandates for water use efficiency can be declared during drought or in preparation for future droughts, such as in response to the Governor's drought declarations in the 2012-2016 drought with a subsequent Executive Order B-37-16 and related legislation for Making Conservation a California Way of Life.

Short-term and long-term supply shortages may be caused by constrained production capacity or natural or man-made catastrophic emergencies and include, but are not limited to, the following events: power outages, winter storms, wildfires, earthquakes, structural failures, contamination, and bomb threats. These types of emergencies may limit the Districts' immediate ability to provide adequate water service to meet the requirements for human consumption, sanitation, and fire protection. Impacts of such emergencies vary in duration; thus, shortage response actions and prohibitions may differ for short-term and long-term shortages.

Table 13-1. Key Data Inputs for the Annual Assessment.

KEY DATA INPUT	SOURCE
Rainfall	Monthly rainfall available. Rainfall sources for SLVWD include rain gauges located at the SLVWD Operations Building (Boulder Creek), Lewis Tank (Lompico), Riverside Grove (Northern Boulder Creek), and Felton (Kirby WTP). Rainfall data for SVWD are from a weather station at SVWD's El Pueblo Yard.
Production Shortfall	SLVWD's production data and input from Operations Manager, Water Availability Analysis and synthesized tables created by SLVWD's hydrologist. SVWD's production data and input from Operations Manager.
Undesirable Results Defined by Minimum Threshold Exceedances at RMPs per the SMGB GSP	Groundwater level in any RMP falls below the Minimum Threshold in two or more consecutive non-drought years. If a RMP groundwater level below its minimum threshold is caused by emergency operational issues or extended droughts, it is not considered an undesirable result.
Anticipated Demands	Staff annually review usage trends, estimate reductions savings based on current curtailment stage (if any) and historical demand, and solicit input from the Operations and Finance Managers.

RMP = Representative Monitoring Point.

13.2.2 Evaluation Criteria

Staff uses the key data inputs, evaluation criteria, and Annual Assessment procedures to evaluate supply reliability at the time of the Annual Assessment and into the upcoming summer and fall. Various trigger conditions, which summarize specific evaluation criteria for each shortage stage, that can be used to determine a water shortage stage are described in the following sections. Triggers are based on current conditions and the Districts evaluate these triggers and may modify as needed.

13.2.2.1 Rainfall

The SMGB aquifers and surface water sources are vulnerable to drought due to the reliance on rainfall for recharge and flows. Rainfall varies based on the hydrologic conditions of a given year. During the Annual Assessment, rainfall totals can be compared to the rainfall trigger levels identified in **Table 13-2**.

Table 13-2. Rainfall Trigger Levels.

STAGE	RAINFALL TRIGGER[1]
1	Cumulative rainfall over 2 years < 80% of average and/or Single year rainfall < 75% of average
2	Cumulative rainfall over 2 years < 70% of average and/or Single year rainfall < 60% of average
3	Cumulative rainfall over 3 years < 50% of average and/or Single year rainfall < 50% of average
4	Same or worse than Stage 3
5	Same or worse than Stage 3

The Districts' Boards may adjust stages up or down based on annual review and other WSCP shortage stage evaluation criteria.

[1] Single year rainfall < 50% of average is representative of water shortage of 50%.

13.2.2.2 Groundwater Conditions

The SMGWA's implementation of the SMGB GSP has the goal of avoiding undesirable groundwater conditions in the SMGB and achieving groundwater sustainability by January 2042. Reducing groundwater demand by implementing recycled water and water use efficiency programs has stabilized historic long-term declines in groundwater levels in the Scotts Valley area. To prevent continuing chronic lowering of groundwater levels, the GSP identifies groundwater level Minimum Thresholds associated with what types of exceedances of Minimum Thresholds cause Undesirable Results. Measurable Objectives reflecting the SMGWA's goals for groundwater level improvements are also included in the suite of sustainable management criteria.

It is important to note that the SMGWA has until January 2042 to reach its sustainability goal. Therefore, groundwater conditions that exceed the criteria of Undesirable Results are not formally considered Undesirable Results by DWR until after January 2042. It is expected that sustainable management criteria will be revised over the 20-year implementation period of the GSP as monitoring and further studies improve understanding of the SMGB. Future WSCPs will use the sustainable management criteria that apply at the time they are prepared. For purposes of the WSCP, the criteria to determine water shortage stages will rely on current chronic lowering of groundwater levels and depletion of interconnected surface water Minimum Threshold and Undesirable Results.

Groundwater conditions, as described below, may be considered in conjunction with other criteria to determine water shortage stages.

Minimum Thresholds and Undesirable Results from GSP

- Minimum Thresholds for Representative Monitoring Points (RMPs) are the average of the five lowest groundwater elevations historically measured at the RMPs.
- Santa Margarita aquifer groundwater levels are influenced by rainfall that directly recharges it. Although levels in drought years may fall below RMP Minimum Thresholds, the highly permeable aquifer rebounds levels quickly in above-average rainfall years.
- The deeper confined aquifers are more susceptible to prolonged low groundwater levels because of their limited surface exposure to recharge. This characteristic makes them sensitive to increased pumping in dry years and warrants limiting their pumping to close to the sustainable yield for that aquifer. Since groundwater levels in the Lompico aquifer are lowered, it is the target of recharge projects to improve groundwater levels and to increase water supply reliability by using the aquifer for water storage. When recharge projects of around 700 AFY are implemented in the Scotts Valley area, groundwater modeling has indicated that Lompico aquifer groundwater levels will increase at least 20 feet above current levels.

- Based on the characteristics described above, the SMGWA defines Undesirable Results occurring when groundwater levels fall below Minimum Thresholds in two or more consecutive non-drought years. If the lowered levels are caused by emergency operational issues or extended drought those levels are not considered Undesirable Results.

Groundwater Level Trends

- Groundwater level trends will be compiled and considered with the Districts' hydrogeologist(s) to determine if conditions trigger water shortage conditions based on the following:
  - Hydrographs of groundwater levels to determine trends for both extraction and monitoring wells, and
  - Comparison of groundwater levels against Minimum Thresholds for RMPs.

Five-Year District Pumping Average

- Drought and possible other water shortage conditions impact the purveyors that rely on the SMGB. Reduced recharge in times of extended droughts presents a concern for supply reliability. Since groundwater is shared by all pumpers in the SMGB, pumping within the sustainable yield is the collective responsibility of all SMGB pumpers. The GSP does not apportion the sustainable yield by purveyor as this is more like an adjudication of groundwater use, which is not the intent of the GSP. For purposes of the UWMP, the assessment of groundwater conditions by each of the Districts includes comparing each Districts' average pumping by aquifer over the last five-years to projected long-term average annual pumping (Baseline Pumping) under groundwater model simulated baseline conditions shown in **Table 13-3**.

Table 13-3. SLVWD and SVWD Baseline Pumping (AFY)

BASELINE PUMPING (AFY)	SANTA MARGARITA AQUIFER	LOMPICO AQUIFER	BUTANO AQUIFER	TOTAL
San Lorenzo Valley Water District	620	300	0	920
Scotts Valley Water District	0	950	350	1,300

Baseline Pumping is based on groundwater model simulations developed for the SMGB GSP (Santa Margarita Groundwater Agency, 2021).

During the Annual Assessment, the Districts may consider any of, or combinations of, the groundwater trigger levels identified in **Table 13-4**.

Table 13-4. SMGB Groundwater Conditions Trigger Levels

STAGE	SLVWD TRIGGER	SVWD TRIGGER
1	• Only rainfall trigger applies	• Only rainfall trigger applies
2	• Groundwater level RMP Minimum Threshold levels are within: • 5 feet of Minimum Threshold for Santa Margarita Aquifer RMPs, or • 10 feet of Minimum Threshold for Monterey Formation or Lompico Aquifer RMPs • Last 5-year SLVWD extraction average exceeds SLVWD projected long-term average baseline pumping by 20% for Santa Margarita Aquifer or 20% for Lompico Aquifer	• Groundwater level RMP Minimum Threshold levels are within 10 feet of Minimum Threshold for Monterey Formation, Lompico or Butano Aquifer RMPs • Last 5-year SVWD extraction average exceeds SVWD projected long-term average baseline pumping by 20% for Lompico Aquifer or 20% for Butano Aquifer

STAGE	SLVWD TRIGGER	SVWD TRIGGER
3	• One RMP in any of the Santa Margarita Aquifer, Monterey Formation, and Lompico Aquifer has a Minimum Threshold exceedance • Overall groundwater level trend over 5 years is declining in 25% of RMPs • Last 5-year SLVWD extraction average exceeds SLVWD projected long-term average baseline pumping by 20% for Santa Margarita Aquifer or 20% for Lompico Aquifer	• One RMP in any of the Monterey Formation, Lompico Aquifer or Butano Aquifer has a Minimum Threshold exceedance • Overall groundwater level trend over 5 years is declining in 25% of RMPs • Last 5-year SVWD extraction average exceeds SVWD projected long-term average baseline pumping by 20% for Lompico Aquifer or 20% for Butano Aquifer
4	• Three RMP in any of the Santa Margarita Aquifer, Monterey Formation, and Lompico Aquifer have Minimum Threshold exceedances • Overall groundwater level trend over 5 years is declining in 50% of RMPs • Last 5-year SLVWD extraction average exceeds SLVWD projected long-term average baseline pumping by 30% for Santa Margarita Aquifer or 30% for Lompico Aquifer	• Three RMP in any of the Lompico, Monterey & Butano aquifers have Minimum Threshold exceedances • Overall groundwater level trend over 5 years is declining in 50% of RMPs • Last 5-year SVWD extraction average exceeds SVWD projected long-term average baseline pumping by 30% for Lompico Aquifer or 30% for Butano Aquifer
5	• Five RMP in any of the Santa Margarita Aquifer, Monterey Formation, and Lompico Aquifer have a Minimum Threshold exceedance • Overall groundwater level trend over 5 years is declining in 75% of RMPs • Last 5-year SLVWD extraction average exceeds SLVWD projected long-term average baseline pumping by 40% for Santa Margarita Aquifer or 40% for Lompico Aquifer	• Lompico, Monterey & Butano aquifers have up to 5 RMP exceedances • Santa Margarita aquifer has up to 5 RMP Minimum Threshold exceedances • Overall groundwater level trend over 5 years is declining in 75% of RMPs • Last 5-year SVWD extraction average exceeds SVWD projected long-term average baseline pumping by 40% for Lompico Aquifer or 40% for Butano Aquifer

The Districts' Boards may adjust stages up or down based on annual review and other WSCP shortage stage evaluation criteria.

13.2.2.3 Production Capacity

Infrastructure capabilities and overall production are analyzed to determine if a possible outage or deficiency may occur or continue in the coming year due to a variety of factors potentially including, but not limited to man-made or natural catastrophic events. Man-made event may include well maintenance, well replacement, evaluation of wells for possible contamination, and others. If the Districts determine there are limitations to production capacity, a shortage stage declaration and subsequent demand reductions may be required.

13.2.2.4 State Mandates

The Districts have historically been required by the State to reduce demand regardless of their supply reliability at the given time. As described previously, compliance with State mandates for water use efficiency can be declared during drought or in preparation for future droughts, such as in response to the Governor's drought declarations in the 2012-2016 drought with a subsequent Executive Order B-37-16 and related legislation for Making Conservation a California Way of Life. The Districts may consider State mandates and mandatory compliance with water use efficiency standards in determining water shortage stages.

13.2.3 Annual Assessment Procedures

Districts staff will perform the Annual Assessment in April of each year.

Steps to conduct the Annual Assessment are as follows:

- **The Annual Assessment Team consists of staff performing the following roles:**
  - Districts staff gather the key inputs, compile historical data, and analyze potential supply and demand gaps.
  - Staff provides insight on demand trends and future production capacity, respectively.
  - The Districts' hydrogeologist consultant(s) provides groundwater condition information.
  - Staff presents the information to the respective Boards and/or Board committees and receives their feedback.
- **Each spring evaluate rainfall for the first part of the water year plus the four prior water years.**
  - For SLVWD use SLVWD's various rainfall stations data.
  - For SVWD use SVWD's El Pueblo Yard rainfall data.
- **Obtain and review the SMGB Annual Report from the previous water year and consult with Districts' hydrogeologist(s) to determine if spring conditions trigger water shortage conditions:**
  - Hydrographs of groundwater levels to determine trends for both extraction and monitoring wells,
  - Compare groundwater levels against Minimum Thresholds for RMPs, and
  - Total well pumping data from both Districts aggregated by aquifer and District.
- **Determine the type of water shortage and corresponding stage.**
- **Develop a recommendation to present to the respective Boards.**
- **The Districts' Boards make a final determination on which water shortage stage to declare and implement.**
- **Develop and implement appropriate communication protocols and implement applicable response actions.**
- **The Annual Assessment starts in 2022 with the first Annual Assessment Report due to DWR by July 1, 2022.**

13.3 Water Shortage Levels

The Districts utilize five water shortage stages to identify and respond to water shortages. The Districts encourage water use efficiency efforts year-round, regardless of a shortage stage. The shortage levels for the Districts' WSCP stages are provided in **Table 13-5**

Table 13-5. DWR 8-1 Water Shortage Contingency Plan Levels

STAGE	SHORTAGE LEVEL
1	Up to 10%
2	10%-20%
3	20%-30%
4	30%-50%
5	Greater than 50%

The CWC outlines six standard water shortage levels that correspond to a gap in supply compared to normal year availability. The six standard water shortage levels correspond to progressively increasing estimated shortage conditions (up to 10-, 20-, 30-, 40-, 50-percent, and greater than 50-percent shortage compared to the normal reliability condition) and align with the shortage response actions that a water supplier would implement to meet the severity of the impending shortages.

The CWC allows suppliers with an existing water shortage contingency plan that uses different water shortage levels to comply with the six standard levels by developing and including a cross-reference relating its existing shortage categories to the six standard water shortage levels. The Districts are using a five-shortage stage approach for this WSCP. A cross reference to the six standard stages is shown in **Figure 13-1**.

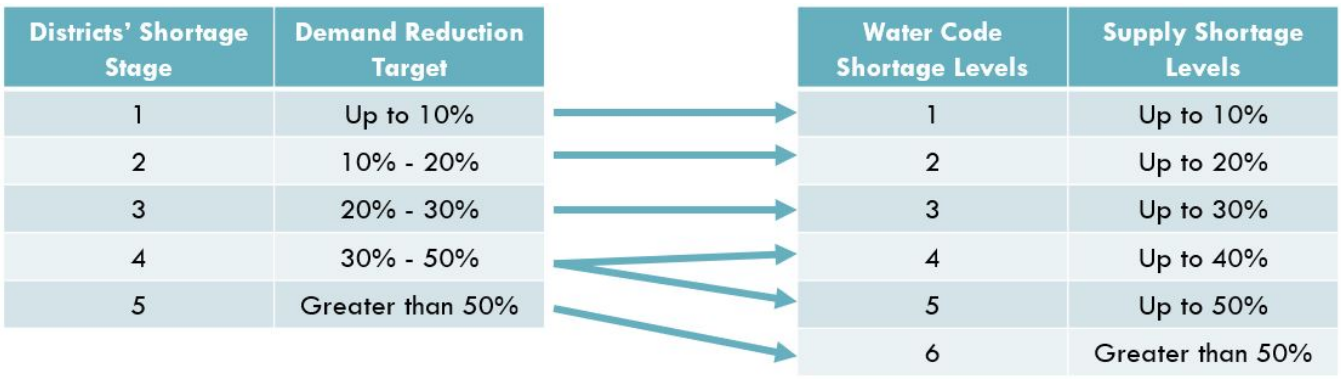

Figure 13-1. SVWD & SLVWD Shortage Stages Crosswalk to Six Standard Shortage Stages

13.4 Shortage Response Actions

There are long-term and short-term water supply shortages with significant overlap in regard to stages, mandatory prohibitions, and consumption reduction methods as described in the following sections. **Table 13-7** summarizes the possible actions identified by the Districts to implement during a water shortage, by stage. This table of actions is designed as a menu of options; the Districts are not

required to implement each action for each stage. Actions identified in earlier stages may also be used in later stages (e.g., actions identified in Stages 1-3 may be implemented in Stage 4 as well as other Stage 4 actions, etc.).

13.4.1 Demand Reduction

In accordance with the new UWMP requirements for the 2020 reporting cycle, the Districts have identified a variety of demand reduction actions (and their estimated water savings potential) that could be used (but are not required) to offset supply shortages as shown in **Table 13-6** and **Table 13-7**. These actions include, but are not limited to conservation and rebate programs, leak detection and repair, and the prohibitions of using potable water for certain applications such as no exterior washing of structures (except for health and safety reasons) or for turf irrigation. Although it is difficult to estimate the volume of savings for each action, the Districts expect to meet required reductions through a combination of response actions and outreach and communication efforts. The estimated water savings potential summarized in **Table 13-6** and **Table 13-7** represent a range from published industry references. As shown in **Table 13-6**, the Districts will implement various demand reduction actions in conjunction with outreach and communication efforts to the extent necessary to mitigate any impacts from a water shortage. **Table 13-7** summarizes the various actions and estimated maximum potential savings required to be submitted to DWR as part of the UWMP.

Per DWR's recommendations for the DRA and the WSCP, the normal year demand projections in **Chapter 4**, **Chapter 5**, **Chapter 11,** and **Chapter 12** reflect potential future demands that are not impacted by disruptive factors (e.g., groundwater emergencies, economic recessions, drought, etc.) that can be met with normal year supplies. While variable projected demands will be considered in the Annual Assessment, **Table 13-6** and **Table 13-7** conservatively assesses the Districts' ability to reduce from approximately the highest projected demand in the next five years for 2025.

Table 13-6. Estimated Savings by Shortage Stage

	SLVWD				SVWD			
STAGE	NORMAL SUPPLY, AFY	REQUIRED SAVINGS[1] AFY	ESTIMATED SAVINGS FROM QUANTIFIABLE ACTIONS[2], AFY	ESTIMATED SAVINGS FROM UNQUANTIFIABLE ACTIONS[3], AFY	NORMAL SUPPLY, AFY	REQUIRED SAVINGS[1] AFY	ESTIMATED SAVINGS FROM QUANTIFIABLE ACTIONS[2], AFY	ESTIMATED SAVINGS FROM UNQUANTIFIABLE ACTIONS[3], AFY
1	2,210	221	206	-	1,111	111	43	68
2	2,210	442	216	226	1,111	222	60	162
3	2,210	663	334	329	1,111	333	160	173
4 & up	2,210	1105	334	771	1,111	556	160	395

[1] Required savings may be met through a combination of quantifiable and unquantifiable actions. SLVWD and SVWD will only implement measures to the extent necessary to mitigate a water shortage, although estimates may indicate a greater savings is obtainable. It is anticipated that some of the required savings will be met through quantifiable shortage response actions and the remaining amount savings will be met through other actions, including communication and outreach efforts.

[2] Quantifiable savings are estimated based on various published sources and are provided as a guide. The degree of implementation of actions can vary in each stage and can result in a wide range of savings. For a list of all SLVWD and SVWD specific shortage response actions and their potential savings, refer to Table 13-7.

[3] The remaining savings not achieved by quantifiable actions are anticipated to be achieved through unquantifiable communication and outreach efforts.

Table 13-7. DWR 8-2 Demand Reduction Actions

SHORTAGE LEVEL	DWR DEMAND REDUCTION ACTION CATEGORY[1]	RESPONSE ACTION	ESTIMATED SHORTAGE GP REDUCTION BASED ON ACTION, AFY		ADDITIONAL EXPLANATION OR REFERENCE	PENALTY, CHARGE, OR OTHER ENFORCEMENT
			SLVWD	SVWD		
All	Other water feature or swimming pool restriction	All decorative water features must re-circulate water or users must secure a waiver from the supplier.				
All	Other	Washing or hosing down vehicles is prohibited except by use of a hand-held container, hose with an automatic shut off device, or at a commercial car wash.				
All	Other - Prohibit use of portable water for washing hard surfaces	Washing hard or paved surfaces is prohibited except to alleviate safety or sanitary hazards using a hand-held container, hose with an automatic shut off device, or a low-volume high pressure cleaning machine that recycles used water				
All	Landscape - Restrict or prohibit runoff from landscape irrigation	Watering vegetated areas in a manner that causes excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter, or ditch is prohibited				
All	Landscape - Other landscape restriction or prohibition	Irrigating ornamental turf on public street medians is prohibited				
All	Landscape - Other landscape restriction or prohibition	No landscape watering shall occur within 48 hours after measurable precipitation.				
Stage 1 and up	Other - Require automatic shutoff hoses	Use a shutoff nozzle on hoses	1.22 AF	0.709 AF	Maryland Department of the Environment; Water Conservation and Washing Vehicles (Maryland Department of the Environment, n.d.)	
Stage 1 and up	CII - Lodging establishment must offer opt out of linen service	Lodging establishments must offer opt out of linen service				
Stage 1 and up	CII - Other CII restriction or prohibition	Display by restaurants and hotels of water conservation signs				
Stage 1 and up	Other	Unauthorized use of hydrants is prohibited. Authorization for use must be obtained from water supplier				
Stage 1 and up	Other - Prohibit use of potable water for construction and dust control	If recycled water is available, require recycled water use for construction water use and dust control. If recycled water is not available, consult with water supplier on ways to reduce water use and/or use bulk water	N/A			
Stage 1 and up	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Fix leaks or faulty sprinklers promptly/within the amount of time determined by the water supplier	204.5 AF (50% of Water Loss due to Leaks)	42 AF (50% of Water Loss due to Leaks)	2019 AWWA Report	
Stage 1 and up	Increase water waste patrols	Increase water waste education, investigation, and enforcement				
Stage 2 and up	CII - Restaurants may only serve water upon request	Restaurants may only serve water upon request	7.4 AF	0.58 AF	Southwest Florida Water Management; (Southwest Florida Water Management District, n.d.)	
Stage 2 and up	Pools and Spas - Require covers for pools and spas	Require covers for pools and spas	0.38 AF (90% of water loss due to evaporation from uncovered pools)	0.27 AF (90% of water loss due to evaporation from uncovered pools)	Arlington, Virginia, Water & Utilities (Arlington, Virginia Water & Utilities, n.d.)	
Stage 2 and up	Landscape - Limit landscape irrigation to specific times	Watering or irrigation with a device that is not continuously attended to is limited to fifteen (15) minutes per day per valve. Low flow drip type systems, water efficient stream rotor systems, and sensor/weather-controlled systems are exempt	0.84 AF (10% of Irrigation demand)	5.28 AF (10% of Irrigation demand)	Texas Living Waters,(Texas Living Waters Project, 2018); Resources Magazine, (Texas Living Waters Project, n.d.)	

SHORTAGE LEVEL	DWR DEMAND REDUCTION ACTION CATEGORY[1]	RESPONSE ACTION	ESTIMATED SHORTAGE GP REDUCTION BASED ON ACTION, AFY		ADDITIONAL EXPLANATION OR REFERENCE	PENALTY, CHARGE, OR OTHER ENFORCEMENT
			SLVWD	SVWD		
Stage 2 and up	Landscape - Limit landscape irrigation to specific days	Irrigation for turf watering using potable water shall be limited to a specified number of days per week determined by the supplier depending on the shortage severity. Plant containers, trees, shrubs, and vegetable gardens may be watered additional days using only drip irrigation or hand watering as determined by the supplier depending on the shortage severity	1.8 AF (20% of Landscape Irrigation Consumption)	11.1 AF (20% of Landscape Irrigation Consumption)	CalWep WSCP Toolkit 2021; City of Sacramento and City of Clovis (California Water Efficiency Partnership, 2021)	
Stage 2 and up	Implement or Modify Drought Rate Structure or Surcharge	Drought Rates and Surcharges may be utilized by supplier				Yes
Stage 3 and up	Other water feature or swimming pool restriction	Existing pools shall not be emptied and refilled using potable water unless required for public health and safety purposes	0.0017 AF	0.001 AF	CalWep WSCP Toolkit 2021; City of Sacramento and City of Clovis (California Water Efficiency Partnership, 2021)	
Stage 3 and up	Landscape - Other landscape restriction or prohibition	With the exception of landscapes watered with non-potable water, limit the installation of new landscaping to drought tolerant trees, shrubs, and groundcover. Prohibit installation of new turf or hydroseed. Customers may apply for a waiver to irrigate during an establishment period for the installation of new turf or hydroseed	7.07 AF (80% of Landscape Irrigation Consumption)	44.4 AF (80% of Landscape Irrigation Consumption)	Model Water Efficient Landscape Ordinance (California Department of Water)	
Stage 3 and up	CII - Commercial kitchens required to use pre-rinse spray valves	Food preparation establishments must use water efficient kitchen spray valves	110.5 AF (25% of Commercial Demand)	56 AF (25% of Commercial Demand)	EPA, Saving Water in Restaurants (Environmental Protection Agency, WaterSence, 2012); EPA, Restaurants Install Water-Efficient Commercial Kitchen Equipment (Environmental Protection Agency, WaterSense, 2014)	
Stage 4 and up	Other	The supplier may set or adjust water allocations in all categories to meet the available water supply				

1 The actions identified in this table represent allowable entries by DWR in submittal Table DWR 8-2 for the UWMP.

13.4.2 Supply Augmentation

SVWD relies only on groundwater and SLVWD relies on a combination of surface water and groundwater as their source of potable water supply. The Districts plan to address water shortages through extensive communication and outreach efforts and demand reduction actions.

13.4.3 Emergency Response Plan

The Districts plan to coordinate responses to catastrophic water shortages and develop plans in response to the specific cause of the event. To inform these decisions, SVWD utilizes the City of Scotts Valley Emergency Operation Plan, which is compliant with the State's policies on Emergency Response and Planning, the Standardized Emergency Management System Operational Area response, National Incident Management System, and defines the primary and support roles of City personnel and departments in post incident damage assessment and After Action reporting requirements. SLVWD also has a San Lorenzo Valley Water District Water System Emergency Response Plan, which informs decision making in the event of a catastrophic water shortage. These plans address the Districts' response to extraordinary emergency situations associated with natural disasters, human-caused emergencies, technological, and catastrophic events, which cause widespread damage, loss, or destruction. The plans provide operational concepts relating to the various emergency situations, identifies components of the Emergency Management Organization, and describe the overall responsibilities of the organization for protecting life and property, and assuring the overall well-being of the population. The plans also identify the sources of outside support that might be provided. The plans detail the Districts' response, personnel, and assistance, which will be provided during a disaster and emergency.

13.4.4 Seismic Risk Assessment and Mitigation Plan

Disasters, such as earthquakes, can and will occur without notice. Given the Districts' proximity to potentially active faults, the Districts recognize the necessity to have active Mitigation Plans. Seismic risks and mitigation plans are published in Local Hazard Mitigation Plans (LHMP). The County of Santa Cruz LHMP (County LHMP) identifies seismic risks and mitigation actions that the Districts could implement to alleviate seismic risks and increase reliability (UWMP **Appendix H**). Actions include upgrades of water infrastructure, emergency and critical structures and continued preparedness coordination with other local agencies (County of Santa Cruz, 2015).

In addition, SVWD and SLVWD are each in the process of completing their Risk and Resiliency Assessment (RRA) and Emergency Response Plan (ERP) in accordance with America's Water Infrastructure Act and J-100 standards. The RRA and ERP analyze all SVWD and SLVWD critical facilities for a seismic event and address mitigation strategies.

13.4.5 Shortage Response Action Effectiveness

Under normal water supply conditions, water production data is recorded daily. From this information, month to month and year to year statistics are calculated. This data allows the Districts to determine the effectiveness of the implemented actions. If reduction goals are not being met, the Districts can make the necessary decisions for corrective action to be taken. Since the Districts have daily production records available during a drought or other water emergency, more frequent reporting could be provided. In addition, SVWD has implemented Advanced Metering Infrastructure (AMI) and SLVWD is in the process of converting to AMI, which provides the Districts additional data and opportunities to effectively monitor and coordinate with customers in near real-time.

During water shortage conditions, savings are measured in comparison to what is considered to be normal year demand (i.e., current customer base with approximately average rainfall), or in reference to a specific base year as may be dictated by Statewide requirements. Estimates of the effectiveness for actions has been included in **Table 13-6**. It is assumed that a given required shortage addressed in each level can be met by quantifiable measures and the remainder of shortage can be addressed by unquantifiable measures. It is expected that response actions effectiveness is also a result of successful communication and outreach efforts.

13.5 Communication Protocols

This section is in accordance with CWC Section 10632(a)(5) and describes the communication protocols and procedures to inform customers, the public, and state and local officials of any current or predicted water shortages. When a shortage level is enacted or changed, a notice is published in the local the newspaper and on SVWD and SLVWD websites. Based on the severity of the shortage condition, the Districts may also advertise on the local radio, publish special publications, or send mail notifications to all its customers. In the case of an emergency, the Districts coordinate with the City of Scotts Valley and County of Santa Cruz for the possible proclamation of a local emergency. SVWD also assigns a Public Information Officer who is responsible for monitoring and controlling the release of information about the event and also serves as a point of contact for news media and other appropriate agencies and organizations. This WSCP relies on existing SVWD and SLVWD communication plans to provide guidance for efficient communication of declaration of a shortage level, inform restrictions, and provide updates during a water shortage emergency. The Districts prioritize effective communication, especially in times of a water shortage emergency. The Districts routinely communicate to customers about details on when a stage is announced. Communication actions include bill inserts, electronic blasts, newsletters, website and social media postings, customer portal notifications, and other additional methods. The Districts continue to provide reminders about shortage levels and encourage water use efficiency at all times.

13.6 Compliance and Enforcement

This section is in accordance with CWC Section 10632(a)(6) and describes the compliance and enforcement provisions.

SVWD has established a Water Waste Policy P500-15-1 (Policy) which outlines the following consequences for violations:

- **Initial Notification:** Verbal or written explanation of the violation will be communicated to the customer, along with required remediation, and the requirement to respond by the next business day.
- **Second Notification:** If no response has been received by the next business day, SVWD shall issue a Second Notification in writing.
- **Final Notification:** If a) no response to the Second Notification has been received, b) satisfactory arrangements have not been made for correction or c) timely verification of correction has not occurred, the customer's potable water service may be disconnected and/or a fine of $100 (or other amount set by State regulations) may be charged for each calendar day in which the violation occurs. All fines must be paid prior to re-connection of service.

SLVWD enforces Ordinance Number 106 (Ordinance) commencing with Stage 1. The Ordinance outlines the following consequences for violations:

- **First Offense:** Written notice of violation and opportunity to correct violation.
- **Second Offense:** A second violation within the preceding twelve calendar months is punishable by a fine not to exceed one hundred dollars.
- **Third Offense:** A third violation within the preceding twelve calendar months is punishable by a fine not to exceed two hundred fifty dollars.
- **Fourth Offense:** A fourth violation within the preceding twelve calendar months is punishable by a fine not to exceed five hundred dollars. In addition to any fines, the District Manager may order a water flow restrictor device be installed.

Discontinuing Service. In addition to any fines and the installation of a water flow restrictor, the District Manager may disconnect a customer's water service for willful violations of mandatory restrictions and regulations in the Ordinance. Upon disconnection of water service, a written notice shall be served upon the customer which shall state the time, place, and general description of the prohibited or restricted activity and the method by which reconnection can be made.

SVWD Policy and SLVWD Ordinance provide the Districts with the power to perform all acts necessary to ensure water resources are put to beneficial use and that waste or unreasonable use of water is prevented.

13.7 Legal Authorities

Each of the Districts' Boards have the legal authority to declare a water shortage stage, associated curtailment target, and set emergency water rates. As noted above, SVWD Water Waste Policy P500-15-1, Think Twice Program and SLVWD Ordinance Number 106 establish the rules and regulations for efficient water use and minimizing water waste. In addition, the WSCP was developed in conjunction with the Districts' UWMP. Resolutions adopting the WSCP, and resolutions enacting selected components of the WSCP, further provide the Districts with the authority to implement water efficiency efforts.

13.8 Financial Consequences of WSCP

Significantly reduced demands in response to water shortage conditions often trigger revenue shortfalls. To mitigate the financial impact , SVWD may implement add-on drought rates during a Stage 2 or Stage 3 water shortage, as provided in **Table 13-8**.

Table 13-8. SVWD Add-On Bi-Monthly Drought Rates

RESIDENTIAL TIERED RATES (PER 1,000 GAL)	STAGE 2	STAGE 3
Tier 1 - 0 – 6,000	$0.00	$0.00
Tier 2 – 6,001 to 12,000	$5.72	$9.19
Tier 3 – 12,001 to 16,000	$5.72	$9.19
Over 16,000	$5.72	$9.19

https://www.svwd.org/rates-fees

SLVWD may implement Revenue Stabilization Rates if revenue from water consumption sales is below the percentages indicated in **Table 13-9**.

Table 13-9 SLVWD Revenue Stabilization Rates

PERCENTAGE	FISCAL YEAR 2020-21 RATE
10%	$13.27
15%	$13.87
20%	$14.47

Revenue stabilization rates would be implemented if current revenue from water consumption sales is below the percentages indicated. (https://www.slvwd.com/sites/g/files/vyhlif1176/f/uploads/2017_2022_water_rate_increase_schedule.pdf)

SLVWD also may also assess excessive water use penalties that shall be assessed where the customer, during any given billing cycle, uses more than the customer's water allotment per SLVWD's water rationing regulations issued commencing with Stage 3.

Excess use penalties shall be in addition to ordinary water consumption charges, as follows:

- One percent to ten percent over customer rationing allotment: twenty-five dollars/CCF.
- More than ten percent over customer rationing allotment: fifty dollars/CCF.

In addition to any excess use penalties, the District Manager may order a water flow restrictor device be installed and/or may disconnect a customer's water service for willful violations of the water rationing regulations in the Ordinance. Upon disconnection of water service, a written notice shall be served upon the customer which shall state the time, place, and general description of the prohibited or restricted activity and the method by which reconnection can be made.

The Districts could also use reserves to minimize the need for additional rate increases while also implementing expense reduction measures in an attempt to match the revenue gap. A full analysis of the water rates based on the financial conditions at the time water reduction would occur and would be presented to the respective Districts' Boards for their approval.

13.9 Monitoring and Reporting

This section is in accordance with CWC Section 10632(a)(9) and describes the reporting requirements and monitoring procedures to implement the WSCP and track and evaluate the response actions effectives.

The Districts intend to monitor their supply and project demand on an annual basis in April of each year and, if triggers identified in **Table 13-2** and/or **Table 13-4** are met, then the Districts determine if they enact components of the WSCP. Monitoring demands is essential to ensure the WSCP response actions are adequately meeting reductions and decreasing the supply/demand gap. This helps to analyze the effectiveness of the WSCP or identify the need to activate additional response actions.

The water savings from implementation of the WSCP are determined based on monthly consumption data which will be compared to the consumption data from prior months, the same period of the prior year, and/ or the allocation. At first, the cumulative consumption for the various sectors (e.g., residential, commercial, etc.) will be evaluated for reaching the target demand reduction level. Then if needed, individual accounts will be monitored. Weather and other possible influences may be accounted for in the evaluation.

13.10 WSCP Refinement Procedures

The WSCP is best prepared and implemented as an adaptive management plan. The Districts use results obtained from the monitoring and reporting program to evaluate any needs for revisions. The WSCP is used to provide guidance to both Boards, staff, and the public by identifying response actions to allow for efficient management of any water shortage with predictability and accountability.

To maintain a useful and efficient standard of practice in water shortage conditions, the requirements, criteria, and response actions need to be continually evaluated and improved upon to ensure that its shortage risk tolerance is adequate, and the shortage response actions are effective and up to date based on lessons learned from implementing the WSCP. Potential changes to the WSCP that would warrant an update include, but are not limited to, any changes to shortage level triggers, changes to the shortage level structure, and/or changes to the response actions. Any prospective changes to the WSCP would need to be presented at a public hearing, staff would obtain any comments and adopt the updated WSCP. The steps to formally amend the WSCP are discussed below.

> Potential refinements will be documented and integrated in the next WSCP update. If new response actions are identified by staff or public, these could be advertised as voluntary actions until these are formally adopted as mandatory.

13.11 Special Water Feature Distinction

The CWC Section 10623 (b) now requires that suppliers analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code. Non-pool or non-spa water features may use or be able to use recycled water, whereas pools and spas must use potable water for health and safety considerations, so limitations to pools and spas may require different considerations compared to non-pool or non-spa water features.

13.12 Plan Adoption, Submittal, and Availability

The WSCP is a standalone document that can be updated as needed. **Table 13-9** describes the general steps to adopt and submit an updated or amended WSCP.

This 2020 WSCP was presented for adoption to the SLVWD Board at the June 30, 2021, Board meeting and the SVWD Board on the June 10, 2021, meeting. Notifications were sent to the City of Scotts Valley, County of Santa Cruz, water agencies, and members of the public 60 days prior to the public board meetings. To comply with the notice to the public, the Districts published notices in the local newspaper once a week for two successive weeks. Copies of the 60-day notices and public hearing newspaper notices are provided in UWMP **Appendix B**. The WSCP was also made available for public review in advance of the public hearing.

The WSCP was formally adopted on June 30, 2021, by the SLVWD Board **(Appendix C)**, and on June 10, 2021, by the SVWD Board **(Appendix C)**. Commencing within 30 days of adoption, the Districts will have a copy of the UWMP and WSCP available for public review at the Districts' offices (see addresses below) during normal business hours.

The documents will also be posted on each of the Districts' website as noted below.

Scotts Valley Water District
2 Civic Center Drive
Scotts Valley, CA 95066
www.svwd.org

San Lorenzo Valley Water District
13060 CA-9
Boulder Creek, CA 95006
www.slvwd.com

The WSCP was submitted to DWR by July 1, 2021 (within 30 days of adoption) using the DWR WUE Data Portal. The documents were also submitted to the California State Library, to the City of Scotts Valley, and County of Santa Cruz within 30 days of adoption**. Table 13-10** provides the processes and steps to adopt, submit, and implement the WSCP.

Table 13-10. Steps to Adopt, Submit, and Implement the WSCP

STEP	TASK	DESCRIPTION	TIMEFRAME
1	Notice to cities and counties	Notify cities and counties within the service area that the WSCP is being updated. It is recommended that the notice includes: • Time and place of public hearing. • Location of the draft Plan, latest revision schedule, and contact information of the Plan preparer.	At least 60 days before public hearing. * If desired, advance notices can be issued without providing time and place of public hearing.
2	Publish Plan	Publish the draft WSCP in advance of public hearing meeting (www.svwd.org and www.slvwd.org)	At least 2 weeks before public hearing.
3	Notice to the public	Publish two notifications of the public hearing in a local newspaper notice at least once a week for two consecutive weeks, with at least 5 days between publications. This notice must include: • Time and place of hearing. • Location of the draft WSCP.	At least 2 weeks before public hearing. * Include a copy of public notices in plan.
4	Public hearing and optional adoption	Host at least one public hearing before adopting the WSCP to: • Allow for community input. • Consider the economic impacts for complying with the Plan.	Public hearing date * Adoption can be combined as long as public hearing is on the agenda before adoption
5	Adoption	Before submitting the WSCP to DWR, the governing body must formally adopt it. An adoption resolution must be included, as an Appendix or as a web address indicating where the adoption resolution can be found online.	At public hearing or at a later meeting. *The WSCP can be adopted as prepared or as modified after the hearing.
6	Plan submittal	Submit the adopted or amended WSCP via the WUE Data Portal within 30 days of adoption or by July 1, if updated with the UWMP five-year cycle.	Within 30 days of adoption or by July 1st, whichever comes first.

STEP	TASK	DESCRIPTION	TIMEFRAME
7	Plan availability	Submit a CD or hardcopy of the adopted WSCP to the California State Library within 30 days of adoption. California State Library Government Publications Section Attention: Coordinator, Urban Water Management Plans P.O. Box 942837 Sacramento, CA 94237-0001 Provide a copy (hardcopy or electronic) of the adopted WSCP to any cities and counties within the service area. Make the WSCP available to the public by posting the Plan on website or making a hardcopy available for public review during normal business hours.	Within 30 days after adoption
8	Other - Notification to Public Utilities Commission	For water suppliers regulated by the California Public Utilities Commission submit UWMP and WSCP as part of the general rate case filing.	

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URBAN WATER MANAGEMENT PLAN

14 SVWD Demand Management Measures

The Demand Management Measures (DMM) chapter provides a comprehensive description of the water conservation programs that SVWD has implemented for the past five years, is currently implementing, and plans to implement to reduce future demand.

IN THIS SECTION

- Water Waste Prevention
- Metering and Rates
- Public Outreach
- Water Losses
- Water Conservation Efforts

The Demand Management Measures (DMM) chapter provides a comprehensive description of the water use efficiency activities that SVWD has implemented for the past five years, is currently implementing, and plans to implement to be good stewards of the local shared resource and to meet water use reduction targets. The CWC section addressing DMMs was significantly modified in 2014, to simplify, clarify, and update the DMM reporting requirements. The legislative changes enacted streamlined the Retail Supplier requirements to six general requirements plus an "other" category.

The required measures are summarized in **Table 14-1**. SVWD recognizes that using water efficiently and minimizing water waste is an integral component of an effective water management strategy and is committed to providing education, tools, and incentives to help its customers understand and manage their water use. Water demand has already shown significant decline in SVWD's service area in recent years, which can be attributed to ongoing water use efficiency activities, expansion of recycled water distribution network, deployment of advance metering infrastructure and efforts to reduce water waste.

Table 14-1. Demand Management Measures

	MEASURE
1	Water waste prevention ordinances
2	Metering
3	Conservation pricing
4	Public education and outreach
5	Programs to assess and manage distribution system real loss
6	Water conservation program coordination and staffing
7	Other demand management measures

14.1 Existing Demand Management Measures for Retail

Demand management is an integral part of sustainably managing water resources in California. Implementing water use DMMs that help lower demands can improve the water service reliability and help meet state and regional water conservation goals. Consistent with the requirements of the CWC for retail water suppliers, this section describes the required DMMs that have been implemented by SLVWD in the past five years and will continue to be implemented into the future. SVWD water demand in 2020 was 96 GPCD which far exceeded the 2020 SB X7-7 target of 154 GPCD. This section details SVWD efforts to promote efficient use of water and minimize water waste.

14.1.1 Water Waste Prevention Ordinances

According to the 2020 Guidebook, a water waste ordinance explicitly states the waste of water is to be prohibited. The ordinance may prohibit specific actions that waste water, such as excessive runoff from landscape irrigation, or use of a hose outdoors without a shut off nozzle. A water waste prevention ordinance is in place at all times and is not dependent on a water shortage for implementation.

Executive Order B-37-16 “Making Water Conservation a California Way of Life” directed State agencies to update temporary emergency water restrictions and transition to permanent, long-term improvements in water use by taking actions and included using water more wisely and eliminating water waste. SVWD actively pursues incidents of water waste by investigating, recommending corrective action, providing follow-up documentation of resolution, and administering penalties. Fines and water service disconnection can be enforced per the Water Waste Policy (P500-15-1) if excessive and unabated leaks and/or water waste occur.

SVWD water waste regulations were first established in 2012 and have evolved over time. Most recently the Water Waste Policy (May 2015) was updated and approved by the Board in June 2020. The policy also incorporates State mandates.

SVWD has also updated its Water Shortage Contingency Plan as previously described. The plan is designed to facilitate implementation of water shortage response measures.

14.1.2 Metering

All potable water use in SVWD’s service area is metered and customers are billed by volume of usage on a bi-monthly basis. An increasing block rate structure has been in place for several decades but has

undergone periodic reviews and changes as appropriate. Recycled water is also metered and billed by volume of usage on a monthly basis, at rates that correspond to the cost of service.

SVWD's billing system keeps record of the following meter data: size, type, year installed, customer class served. An abnormal meter read automatically creates a work order for meter testing and repair or replacement when necessary. An abnormal read would include exceptionally high or low reads, zero reads, or non-reads.

In 2017, the SVWD Board of Directors approved a project to replace all meters installed before 2012 and deploy Advanced Metering Infrastructure (AMI) meter-reading technology for all SVWD meters. AMI is an integrated system of intelligent meters (i-Meters) as well as communication network and data management system that enables more frequent and up-to-date access to customers water use. Previously, customer water use information was collected once every two months by SVWD staff, making it challenging to track and understand water use patterns, notice leaks in a timely manner and motivate customers to manage their water consumption.

SVWD customers with i-Meters can access their data on the WaterSmart customer engagement portal. The WaterSmart platform helps customers monitor water usage to be more water efficient and save money on water bills. Customers can:

- View usage history and set alerts for unusual usage and high bills
- Compare their consumption to similar households
- Explore water and money-saving actions
- Sign up to receive personalized tips on how to save water
- Access billing statements
- Apply for SVWD rebates

As of May 2021, SVWD has completed the i-Meter installation in the whole system and WaterSmart is available to all customers.

14.1.3 Conservation Pricing

According to the 2020 Guidebook, a conservation pricing structure is always in place and is not dependent on a water shortage for implementation. In addition, rates cannot be seen as penalties for excessive water use. Conservation pricing is designed to discourage wasteful water habits and encourage conservation.

SVWD utilizes a four-tier rate structure for the single family and multifamily residential customer categories which make up approximately 72% of the customer base. Rates based on volume of use support more efficient use of water. SVWD deploys a uniform rate structure for the remaining customer classes. Water consumption is measured in "units" where 1 unit equals 1,000 gallons of water. All customers are charged fixed amount basic service charge based on the meter size. Residential potable water bi-monthly rates and recycled water monthly rates effective as of December 13, 2020, are shown in **Table 14-2** and **Table 14-3**.

Table 14-2. SVWD Potable Water Bi-Monthly Rates

WATER METER SIZE	BASIC SERVICE CHARGE (PER METER)
5/8"	$85.90
5/8" Rate Assistance (Residential)	$60.14
5/8" Fire Service (Residential/Commercial)	$23.38
3/4" (Multi-Residential, incl Fire Service)	$109.27
3/4"	$135.16
1"	$145.39
1.5"	$341.68
2"	$463.93
3"	$827.11
4"	$1,446.19
6"	$3,089.28
RESIDENTIAL TIERED RATES (PER 1,000 GAL)	**MONTHLY CONSUMPTION CHARGE (PER 1,000 GAL)**
Tier 1 - 0 – 6,000	$7.03
Tier 2 – 6,001 to 12,000	$12.20
Tier 3 – 12,001 to 16,000	$19.56
Over 16,000	$23.64

https://www.svwd.org/rates-fees

Table 14-3. SVWD Recycled Water Monthly Rates

WATER METER SIZE	BASIC SERVICE CHARGE (PER METER)
5/8"	$45.88
3/4"	$72.18
1"	$77.64
1.5"	$182.46
2"	$247.74
3"	$441.67
4"	$772.25
6"	$1,649.63
WATER UNITS (PER 1,000 GAL)	**MONTHLY CONSUMPTION CHARGE (PER 1,000 GAL)**
Landscape Recycled	$13.64

https://www.svwd.org/rates-fees

Bulk water permits are issued for the purchase of both potable and recycled water. Recycled bulk water may only be used for construction and irrigation purposes and is also made available for use outside of SVWD service area boundaries.

In addition to regular rates, during a Stage 2 or Stage 3 drought, SVWD has add-on drought rates as provided in **Table 14-4**.

Table 14-4. SVWD Add-On Bi-Monthly Drought Rates

RESIDENTIAL TIERED RATES (PER 1,000 GAL)	STAGE 2	STAGE 3
Tier 1 - 0 – 6,000	$0.00	$0.00
Tier 2 – 6,001 to 12,000	$5.72	$9.19
Tier 3 – 12,001 to 16,000	$5.72	$9.19
Over 16,000	$5.72	$9.19

https://www.svwd.org/rates-fees

14.1.4 Public Education and Outreach

SVWD developed the Think Twice Water Use Efficiency program which outlines the activities that support SVWD's long-term sustainable water supply planning efforts. The program establishes a multi-pronged approach that increases awareness about indoor and outdoor water use efficiencies, promotes water efficient behaviors, and continuously reduces water waste. A key Think Twice program component is education and outreach.

SVWD actively promotes public awareness and education of SVWD water supply sources, the San Lorenzo River watershed, and the public's role in conserving water and protecting shared resources. SVWD has conducted a variety of public education activities over the years. Several activities aimed to motivate customers to respond to a drought situation, while others were more general in scope. Activities that SVWD has undertaken are provided below.

14.1.4.1 Website, eNewsletter and Email Notifications

SVWD's website (https://www.svwd.org/) provides water-use efficiency tips, informs customers when the drought contingency plan is in effect, posts restrictions or prohibitions for outdoor water use, provides rebate and landscape waterwise assistance and provides contacts for other resources that support efficient water use. SVWD also coordinates its outreach with other websites and media platforms, such as the Scotts Valley Chamber of Commerce, My Scotts Valley, the Santa Cruz County Water Conservation Coalition, and Facebook.

Staff also utilizes an email distribution application (Mail Chimp) that allows email notifications to be sent out to interested customers and stakeholders. Notifications such as SVWD e-Newsletter, Board Meetings, Events/Workshops, Media/Press, Santa Margarita Groundwater Basin Advisory Committee, and Recycle Fill Station News, all include water use efficiency and conservation-related news.

14.1.4.2 Print Advertising

SVWD prints bi-weekly advertisements in the Press Banner newspaper and monthly advertisements in Scotts Valley Times, conducting outreach, informing the community about SVWD activities, and promoting water use efficiency.

14.1.4.3 Bill Messages and Inserts

Frequently, the bill inserts are designed featuring water efficiency measures and tools that are available to customers.

14.1.4.4 Signage

Fleet signage, bumper stickers, lawn signs and SVWD office signs have also been used to educate customers about drought mandates, the Monterey Bay Friendly Landscape Certification and Recycled Water Programs, and the SVWD low-water demonstration garden.

14.1.4.5 Staff Presentations & Community Engagement:

Presentations to the general public and professional organizations regarding water supply and water use efficiency include:

- Informational tours of the SVWD Water-Smart Demonstration Garden
- Scotts Valley City Council regarding Retrofit Upon Resale
- California Landscape Contractors Association
- Resource Conservation District & the Coastal Watershed Council
- Monterey Bay Master Gardeners
- Watsonville Regional Water Quality Conference
- Local HOAs: Country Terrace, Granite Creek Estates, Scotts Valley and Monte Valle Mobile Home Parks.

Additional activities and events that SVWD has participated in to promote and educate the public about water conservation include:

- Sponsoring the Scotts Valley Garden Faire
- Promoting and sponsoring the Monterey Bay Green Gardner Program
- Coordinating the Scotts Valley Green Business Certification program
- Conducting greywater installation trainings

14.1.4.6 Cooperative Agency Program

SVWD participates in the Water Conservation Coalition of Santa Cruz County, consisting of Santa Cruz County Water Resources, Ecology Action, Soquel Creek Water District, Pajaro Valley Water Management Agency, the Cities of Watsonville and Santa Cruz Water Departments, Central Water District and SLVWD. This committee contributes funds for community awareness campaigns to better inform the public about conservation methods and practices.

14.1.4.7 School Education Programs

SVWD has water conservation promotional materials for grades K-8. Additionally, a booklet was created by the Water Conservation Coalition of Santa Cruz County that promotes water awareness, specifically in the local region. This booklet is appropriate for middle school grades and is available upon teacher request or during visits to classrooms.

SVWD has provided educational talks for Scotts Valley High School freshmen biology classes each spring. These talks last for two days and have been done collaboratively with either the Green Schools Program or the Coastal Watershed Council staff. SVWD staff cover the water cycle, local water sources and challenges, and conservation and water use efficiency, whereas other agency staff discuss water quality and pollution prevention.

14.1.5 Programs to Assess and Manage Distribution System Real Loss

SVWD estimates the amount of water losses on a bi-monthly basis. Water loss volume was calculated to be in the range of 7 percent to 15 percent for water years 2017-2020. SVWD uses AWWA water audit software and conducts required audits to help monitor and reduce water loss. The AWWA water

audits are described in the Water Use Characterization section of this UWMP, and audit documents are provided in **Appendix D**.

SVWD has undertaken significant efforts that aimed to reduce the amount of water loss. These included conducting a system-wide water audit, performing a leak detection, and running the AWWA M36 software. In 2016, SVWD staff began using AWWA M36 software to calculate an updated Water Audit Data Validity Score. Priority areas that were identified for attention included meter data from own sources, estimation of variable production cost and customer metering inaccuracies. SVWD efforts in reducing water loss in the past have been effective and will be continued. SVWD has had improved water loss audit scores each year since 2016.

Full system leak detection was completed in 2015. The leak detection consultant, M.E. Simpson, report indicated some minor distribution leaks that were repaired immediately. A significant percentage of SVWD losses are potentially the result of meters that are under reporting deliveries. As discussed in **Section 14.1.2**, in response SVWD initiated a meter change out program to implement an AMI system for the service area.

In addition, SVWD has operated a leak detection program for customers since 1996. Customers who submit proof of repair are eligible for a 75% credit of the difference of the tiered portion of their bill, as compared to the year prior. Leak adjustments are granted once every five years on a case-by-case basis and must be made in a timely manner.

14.1.6 Water Conservation Program Coordination and Staffing Support

SVWD has a full time Water Use Efficiency (WUE) Coordinator. The WUE Coordinator develops and implements various water use efficiency programs and activities; performs residential, commercial and landscape water audits; assists with SVWD recycled water program; coordinates and organizes public education and outreach programs; writes articles for media, website, and newsletter; provides data analysis; assist customer service staff as needed; and performs other related duties.

14.1.7 Other Demand Management Measures

SVWD administers several other demand management programs that benefit both residential and commercial customers.

14.1.7.1 Rebate Programs

SVWD has developed a rebate program that is offered to potable water customers in good standing who meet specific guidelines. Annual budget appropriations are used as default program funding limits unless Board approves maximum allowances for specific rebates or for the overall program.

> Before purchasing any materials or labor for rebates, the customers are advised to contact SVWD for specific eligibility requirements. SVWD carried out 133 rebates with approximate water savings of 923,000 per year in WY 2020 and 103 rebates resulting in estimated water savings of 950,000 per year in WY 2019.

Lawn or Impervious Hardscape (including Pools) Replacement

Rebate of $1.00 per square foot is offered for the replacement of existing lawn or impervious hardscape (i.e., concrete, asphalt and in-ground pools or spas) with any combination of low water use plants, mulch, artificial turf, or pervious hardscape. Existing high-volume irrigation must be permanently disabled or converted to low volume or sub-surface irrigation. SVWD also considers low water turf blends or low water groundcover if paired with subsurface or rotary small-stream spray irrigation. One hardscape replacement and 31 lawn replacement rebates were provided in the 2020 water year.

Spray Irrigation Replacement

Rebate of $0.50 per square foot is offered for the replacement of existing high-volume sprinkler system with low-volume irrigation such as drip, micro-spray, or bubbler emitters. Sprinkler valves and heads no longer in use must be removed and capped. In the 2020 water year, SVWD provided 17 rebates.

Spray Rotator Nozzle Replacement

Rebate of $10 per device is offered for the replacement of existing high-volume overhead sprayers with small stream rotary/rotator nozzles. The existing spray head body must be the same manufacturer as the new rotator nozzle and the zone cannot mix high and low volume nozzles. In the 2020 water year, SVWD provided 1 rebate.

Greywater Irrigation

Rebate of up to $150 per fixture is offered for showers, bathtubs, and washing machines if installed to current California Universal Plumbing Code standards

Rainwater Cistern

Rebate of $0.25 per gallon of cistern for up to $750 per account is offered for cisterns capturing rainwater. These cisterns may not be connected to a potable water supply, including irrigation lines. All systems must follow current CA Universal Plumbing code, local zoning and permitting laws.

Downspout Diversion

Rebate of $75 is offered per downspout for up to 4 devices per account. Overflow must be directed to an on-site landscape feature such as rain garden, swale, dry well, dry creek bed, infiltration basin, etc. in order to qualify for the rebate. In the 2020 water year, 1 rebate was provided

Pressure Regulator

Rebate of $50 per pressure regulator for up to 2 devices per account every five (5) years is offered. 48 rebates were provided in the 2020 water year.

Toilets and Urinals

SVWD offers several rebates for replacing toilets. All rebates are for replacing a toilet that flushes 1.6 gallons per flush (gpf) or higher with a more efficient toilet. The rebate options are as follows: $125 for replacing a higher than 1.6 gpf with a lower than 1.28 gpf, $100 for replacing a higher than 1.6 gpf with a 1.28 gpf, $50 for replacing a 1.6 gpf with a lower than 1.28 gpf, and $25 for replacing a 1.6 gpf with a 1.28 gpf. All new toilets must be EPA WaterSense Certified. Additionally, SVWD offers a $75 rebate for replacing any urinal requiring water with a waterless urinal. In the 2020 water year, 36 rebates were provided.

14.1.7.2 Additional Water Conservation Efforts

SVWD first introduced its Water-Wise House Call program in the spring of 2008. Between May 1, 2020, and October 31, 2020, SVWD conducted 97 house calls/leak checks. SVWD Water-Wise House Call program is available upon customer request or in response to identified high use. House Calls include toilet testing, pressure, and meter checks, testing of aerator flow and distribution of free replacement aerators for sinks and showers and water budgeting upon request.

SVWD also makes specific efforts to work with high water users by providing education and consultation, using a water waste violation notice as the last resort. This activity is quite time consuming, involving “layers of players”- from property managers, facility managers, landscapers, and owners. Efficient use of water is rarely a goal/incentive for large agencies or corporations as there is no

accountability for it. There is also a lack of education about how to find or repair leaks and irrigate efficiently.

In July of 2007, SVWD began offering low-flow aerators (.5 and 1.0 gpm) and (1.5 gpm) showerheads free of charge to SVWD customers. These are also distributed during Water Wise House (or Business) Calls.

Water Use Efficiency for New Residential Development

The City of Scotts Valley Planning and Building Department enforces the CA Green Building Code for new and retrofit construction. New landscape construction in California is also subject to the Model Water Efficient Landscape Ordinance and all agencies are required to enforce it even if they do not formally adopt it. SVWD only provides a fixture review for meter sizing, it does not review indoor fixture flow rates or irrigation plans.

SVWD does offer reduced connection and impact fees for new high density residential units that are outfitted with water efficient plumbing fixtures and use not potable water for irrigation.

14.1.7.3 Recycled Water

SVWD's primary goal for large landscape customers is utilization of recycled water.

The largest irrigators in SVWD's service area are the Enterprise Technology Center, Scotts Valley High School and City parks – all of which have been converted to recycled water. New development is also utilizing recycled water as access to mains are possible.

The primary incentive for customers to consider recycled water for their landscape needs is the lower connection fees and monthly charges. In addition, recycled water use site permits mandate periodic checks and assurances that no water is running offsite.

14.1.7.4 Commercial, Industrial, and Institutional (CII) Accounts

SVWD has had a CII customer category for almost 25 years. CII customers are eligible for the most rebates, similarly to the residential customers. SVWD conducts Water Wise Business Calls and water audits through the Monterey Bay Area Green Business Program.

14.1.8 Reporting Implementation

A water use efficiency report is produced and presented to the SVWD Board on a biannual basis. The report highlights ongoing activities such as regional planning and collaboration, professional development, working with high water users, and the WaterSmart program. In addition, the report provides performance statistics for leak adjustments, house calls/leak checks, waste violations/consultations, pre-rebate inspections, post rebate inspections, customer contacts and the number of rebates processed along with the total cost. Where possible, SVWD provides an estimate of expected water savings and anticipates being able to track savings as the AMI and WaterSmart are fully deployed

14.1.9 Implementation Efforts to Achieve Water Use Targets

The following water use efficiency activities have and are planned to continue to maintain demand reductions:

- Financial incentives such as rebates and free fixtures
- Social media postings that appeal to community norms
- Water Waste Policy and any drought mandates
- Water Wise House (Business) Calls, and leak alert investigations
- AMI and WaterSmart customer engagement portal
- Community education and outreach
- Tiered rate structure

14.2 Water Use Objectives (Future Requirements)

SVWD customers are efficient and have reduced their per capita water use to less than the State target. SVWD continues to promote efficient water use and will consider any additional measures that support the desired outcomes.

15

URBAN WATER MANAGEMENT PLAN

SLVWD Demand Management Measures

The Demand Management Measures (DMM) chapter provides a comprehensive description of the water conservation programs that SLVWD has implemented for the past five years, is currently implementing, and plans to implement to reduce future demand.

The Demand Management Measures (DMM) chapter provides a comprehensive description of the water conservation programs that SLVWD has implemented for the past five years, is currently implementing, and plans to implement in order to meet water use reduction targets. The CWC section addressing DMMs was significantly modified in 2014, to simplify, clarify, and update the DMM reporting requirements. The legislative changes enacted streamlined the Retail Supplier requirements to six general requirements plus an "other" category.

IN THIS SECTION

- Water Waste Prevention
- Metering and Rates
- Public Outreach
- Water Losses
- Water Conservation Efforts

The required measures are summarized in **Table 15-1**. SLVWD actively promotes public awareness and education of the SLVWD water supply sources, the San Lorenzo River watershed, and the public's role in conserving water and protecting shared resources. SLVWD is committed to implementing cost effective programs that will increase water efficiency throughout the service area.

Table 15-1 Demand Management Measures

	MEASURE
1	Water waste prevention ordinances
2	Metering
3	Conservation pricing
4	Public education and outreach
5	Programs to assess and manage distribution system real loss
6	Water conservation program coordination and staffing
7	Other demand management measures

15.1 Existing Demand Management Measures for Retail

Demand management is an integral part of sustainably managing water resources in California. Implementing water use DMMs that help lower demands can improve the water service reliability and help meet state and regional water conservation goals. Consistent with the requirements of the CWC for retail water suppliers, this section describes the required DMMs that have been implemented by SLVWD in the past five years and will continue to be implemented into the future.

15.1.1 Water Waste Prevention Ordinances

According to the 2020 Guidebook, a water waste ordinance explicitly states the waste of water is to be prohibited. The ordinance may prohibit specific actions that waste water, such as excessive runoff from landscape irrigation, or use of a hose outdoors without a shut off nozzle. A water waste prevention ordinance is in place at all times and is not dependent on a water shortage for implementation.

Executive Order B-37-16 “Making Water Conservation a California Way of Life” directed State agencies to update temporary emergency water restrictions and transition to permanent, long-term improvements in water use by taking actions and included using water more wisely and eliminating water waste. SLVWD is dedicated to water conservation and informs customers of prohibitions on water waste and other water-use restrictions by making announcements in water bill inserts, annual water quality reports mailed to customers, the SLVWD website, and in press releases to local newspapers. SLVWD’s Ordinance 106 “Restating and Amending Regulations Responding to Water Shortage Emergency” lists the prohibited uses of water supplied by SLVWD and defines water waste. These prohibitions are in effect during declared water shortage emergencies, and violations are punishable by fines levied on customer water utility bills.

15.1.2 Metering

All SLVWD service connections are currently metered, and water meters are required for all new connections. Meters are read approximately every 30 days and the majority of the meters are read by the SLVWD meter reader. SLVWD provides information about customer meters on their website to help educate the public. Information presented includes: the meter location, how to read a meter and how to detect a leak. SLVWD is in the process of changing out customer meters and replacing with AMI. This technology helps customers monitor water usage and identify leaks when they occur. As of Spring 2021, SLVWD has updated 20% of the meters in its service area.

15.1.3 Conservation Pricing

According to the 2020 Guidebook, a conservation pricing structure is always in place and is not dependent on a water shortage for implementation. In addition, rates cannot be seen as penalties for excessive water use. Conservation pricing is designed to discourage wasteful water habits and encourage conservation. Rates based on volume of use encourage water conservation by customers. SLVWD water rates are available for customer review on the SLVWD website (https://www.slvwd.com/customer-service/pages/rates-fees).

SLVWD switched from a bi-monthly to a monthly billing cycle in May 2014 to help customers more closely track their water usage and conservation efforts. The redesigned monthly bills include information about each connection's daily usage compared to average daily usage the previous year.

Water consumption is measured in "units," where 1 unit equals 100 cubic feet (CCF) or 748 gallons of water. The monthly water rate schedule for fiscal year 202-21 is shown in **Table 15-2**.

Table 15-2 Monthly Rates and Charges – Fiscal Year 2020-21

WATER BASIC RATES (METER SIZE)	MONTHLY BASE CHARGE (PER METER)
5/8", 3/4"	$33.66
1"	$50.45
1.5"	$92.43
2"	$142.80
3"	$277.12
4"	$428.23
Bulk Water (1.5")	$92.43
WATER RATES	**MONTHLY CONSUMPTION CHARGE (PER UNIT)**
Flat Rate per CCF	$12.06

https://www.slvwd.com/customer-service/pages/rates-fees

15.1.4 Public Education and Outreach

SLVWD actively promotes public awareness and education of the SLVWD water supply sources, the San Lorenzo River watershed, and the public's role in conserving water and protecting shared resources. The SLVWD website, (https://www.slvwd.com/conservation/pages/drought-information), provides seasonal water-use efficiency tips, informs customers when the drought contingency plan is in effect, posts restrictions or prohibitions for outdoor water use, and provides contacts for other partner organizations supporting water conservation. One of these organizations is the Water Conservation Coalition of Santa Cruz County, whose goal is to provide the community with effective tools to help make water conservation easy and fun. As a member of the Water Conservation Coalition of Santa Cruz County, SLVWD provides customers with access to the Water Saving Tips website www.watersavingtips.org to provide water saving tips, information on County-wide rebate programs, and educational materials (e.g., drought-tolerant plants suitable for local conditions). The Water Conservation Coalition of Santa Cruz County also works collaboratively to produce press releases, newspaper ads, radio ads, and informational booths at local events.

SLVWD disseminates public information regarding water conservation via the following methods and media:

- The SLVWD website, https://www.slvwd.com/conservation/pages/drought-information.
- Water utility bill inserts, and other direct mailings as needed.
- Customer bills that show the amount of water used in gallons per month and average gallons per day, compared to the amount used for the same period the prior year, and cumulative rainfall for the current water year.
- Paid advertising in local newspapers (e.g., Press Banner, Santa Cruz Sentinel)
- Weather information, including SLVWD rainfall records, posted on-line (https://www.slvwd.com/about-us/pages/local-weather-rainfall) and via links from local, state, and national websites.
- Hosting a booth at local events to distribute water conservation devices, informational materials, and expert in-person advice.
- Monthly newsletter
- Social Media – The SLVWD Facebook and Nextdoor page are updated regularly (2-3 times per week) with water conservation information.

15.1.5 Programs to Assess and Manage Distribution System Real Loss

SLVWD quantifies non-revenue water (NRW, or "losses") on a monthly basis by comparing produced and delivered water and prepares quarterly water loss and water audit status reports. SLVWD uses AWWA Water Audit Software and conducts required audits to help monitor and reduce water loss. The AWWA water audits are described in the Water Use Characterization section of this UWMP and SLVWD audit documents are provided in **Appendix E**. To reduce NRW, SLVWD replaces faulty water meters and locates and repairs leaks throughout its entire system. SLVWD has historically conducted meter replacement programs every 15 to 20 years. In addition, SLVWD is in the process of aggressively reducing distribution system loss by replacing leaking redwood tanks and mainlines and conducting contract leak detection. SLVWD performs system wide contract leak detection every three years and is now moving to annual leak detection in older areas of the distribution system (approximately 1/3 of the distribution system) that is prone to leakage.

SLVWD consults a number of resources and methods for estimating system water losses consistent with best practices advocated by the American Water Works Association (AWWA) and the International Water Association, including the Water Audit and Leak Detection Guidebook (California Department of Water Resources (DWR) and American Water Works Association (AWWA), June 1992) and Water Loss Control (Thorton, J., Sturm, R., Kunkel, G. , 2008).

SLVWD notifies customers to report leaks and informs customers on how to read their meter and how to test for leaks. In the case of a leak on the customer's side of the meter, SLVWD provides opportunity and incentive for customers to review their bills and promptly repair leaks through leak adjustment requests. SLVWD reviews leak adjustment requests for evidence of leak repairs and applies a credit to the water usage portion of a customer's bill. When customers experience a sudden spike in water use compared to previous years, staff will reach out and help customers identify the reason for the spike and assist in reducing water consumption. An emergency on-call service is available to report leaks outside normal business hours.

15.1.6 Water Conservation Program Coordination and Staffing Support

SLVWD's Environmental Planner organizes, coordinates, and supervises the water conservation programs and activities and reports directly to the District Manager, as shown on the SLVWD organization chart (https://www.slvwd.com/sites/g/files/vyhlif1176/f/uploads/external_slvwd_organization_chart_2019.pdf).

15.1.7 Other Demand Management Measures

SLVWD is committed to implementing cost effective programs that will increase water efficiency throughout the service area. Though not required, SLVWD has implemented the following DMMs during the past five years and will continue implementation into the future to increase the overall water efficiency of SLVWD customers. The following is a brief description of each program.

15.1.7.1 Schools and Public Education

The Water Conservation Coalition of Santa Cruz County has developed an activity book about the water resources of Santa Cruz County. The educational material is targeted to middle schools and covers basic concepts of the hydrologic cycle, specific sources of water available to communities within Santa Cruz County, measuring and reducing personal indoor water use, and how the County is planning to help address future water needs under a growing population and potentially decreasing water supplies. SLVWD is a member of the State's Water Education–Water Awareness Committee (WEWAC) whose mission is to promote the efficient use of water. SLVWD provides a link to the WEWAC website (www.usewaterwisely.com), which presents a water saving topic each month. WEWAC members staff booths at local resource and educational fairs to promote water awareness.

SLVWDs' website also links to the Water Tech Advice simple guide to indoor and outdoor water conservation website and Water Smart Gardening in Santa Cruz County website to provide customers with additional water conservation resources.

In addition, SLVWD, in partnership with other County groups regularly places informational material in local newspapers.

15.1.7.2 Residential Programs

The majority of SLVWD customer accounts are residential; therefore, SLVWD targets indoor and outdoor water savings programs toward these customers. Residential water conservation is promoted by disseminating technical information on methods to reduce indoor and outdoor water use and by offering credits on customer bills for installation and/or replacement of appliances and lawns with approved water saving appliances and plantings.

The average annual program cost is about $5,000.

15.1.7.2.1 Residential Water Survey Assistance

SLVWD provides technical instruction to help customers manage their water use and performs on-site residential surveys. The SLVWD website provides a menu of customer services that include instruction and assistance on how to locate and read a water meter, how to conduct a leak test, and assistance in finding a leak once one is suspected. The SLVWD website provides a checklist of suggested water saving tips for inside the home and outdoors and provides a contact phone number for customer questions. Water saving tips include how to: water landscaping more efficiently; check nozzles and connectors for leaks; install aerators in sink faucets; install low-flow showerheads; and limit the amount of time that water runs during showers and washing. Water audits can also be scheduled by contacting SLVWD by phone.

15.1.7.2.2 Residential Plumbing Retrofit

SLVWD began to provide free low-flow shower heads, faucet-aerators, leak detection tablets, and hose nozzles to residential customers in 2014. These retrofit opportunities are low cost, and easy to self-install. The SLVWD website provides tips for saving water indoors, including these simple plumbing retrofits.

SLVWD spends approximate $3,000 annually to provide water saving devices.

15.1.7.2.3 Residential Credit Programs

SLVWD offers credits on customer bills for the purchase and installation of high efficiency washing machines, greywater irrigation system credit and weather-based irrigation controllers. These programs were initiated in 2003 and offered customers credits ranging from $75 to $750 per installation for replacing appliances with low-water-use alternatives.

As of 2020, SLVWD had processed a total of 2,306 customer credits for high efficiency toilets, washing machines, greywater irrigation systems, weather-based irrigation controllers, and turf replacement.

15.2 Reporting Implementation

SLVWD tracks the number of retrofits and the associated costs as part of its rebate program. **Table 15-3** provides a summary of SLVWDs' rebate program between fiscal year 2015 and 2020.

Table 15-3. Summary of SLVWD Rebate Program by Fiscal Year

	FY 2015-16		FY 2016-17		FY 2017-18		FY 2018-19		FY 2019-20	
REBATE TYPE	NO.	AMOUNT	NO.	AMOUNT	NO.	AMOUNT	NO.	AMOUNT	NO.	AMOUNT
Drip	14	$4,729								
Greywater Irrigation	1	$83			1	$150			1	$150
Clothes Washers	27	$2,700	27	$2,778	9	$900	12	$1,200	1	$100
Recirculation System	7	$700								
Lawn	42	$24,975								
Toilet 1.6	5	$525	3	$225	7	$802	3	$375	4	$300
Toilet 3.5	77	$19,441	28	$5,411	28	$7,405	15	$3,079	13	$2,113
Weather Based Sensor	3	$200								
Irrigation Controller	3	$308	2	$369	1	$125	1	$99	1	$125
TOTALS	**179**	**$53,661**	**60**	**$8,784Q**	**46**	**$9,382**	**31**	**$4,753**	**20**	**$2,788**

15.2.1 Implementation Efforts to Achieve Water Use Targets

For decades, SLVWD has valued and promoted conservation and will continue to do so. As a result, SLVWD water use is below target objectives set by the State of California. Despite meeting the targets, SLVWD will continue to implement existing conservation programs and explore additional programs to avoid substantial increases in demands.

15.3 Water Use Objectives (Future Requirements)

SLVWD customers are efficient and have reduced their GPCD consumption to less than the State target. SLVWD continues to promote conservation and will evaluate additional measures if and when future requirements are established.

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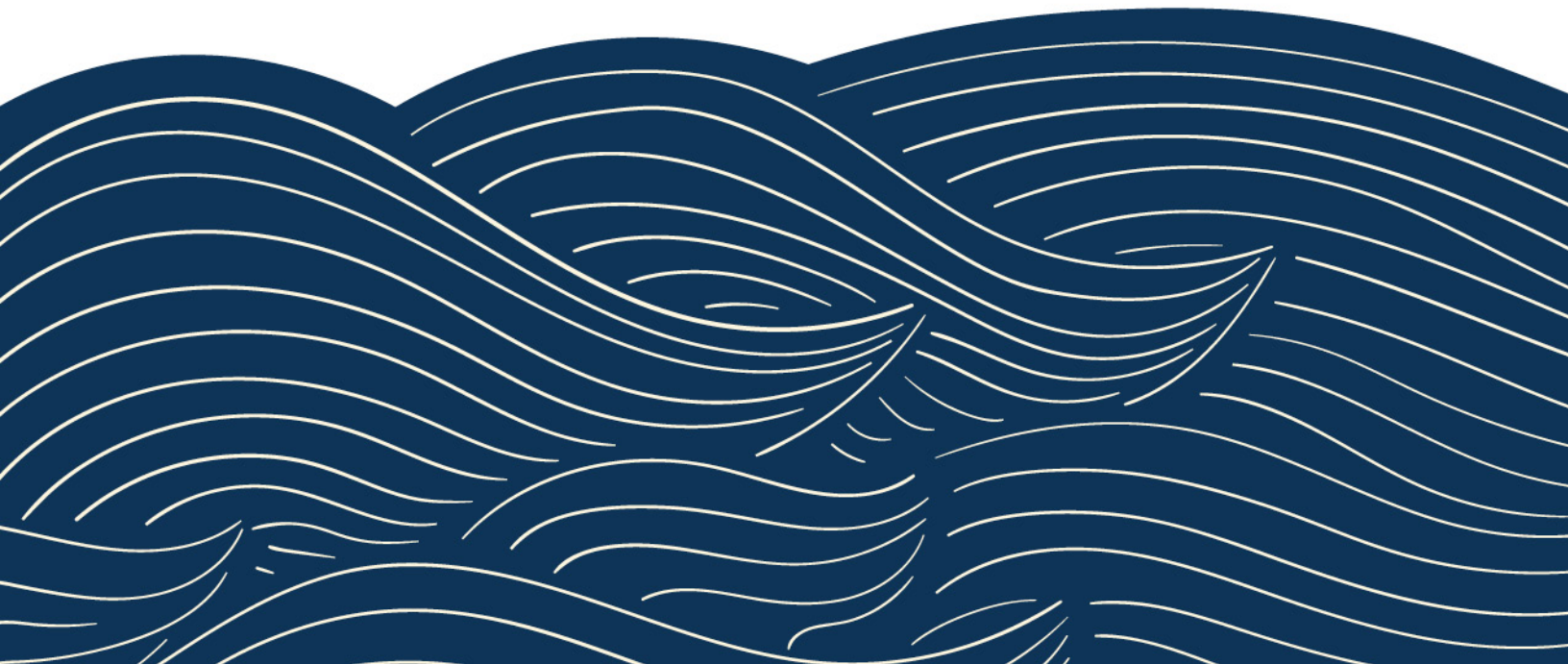
A

Appendix A. DWR Checklist



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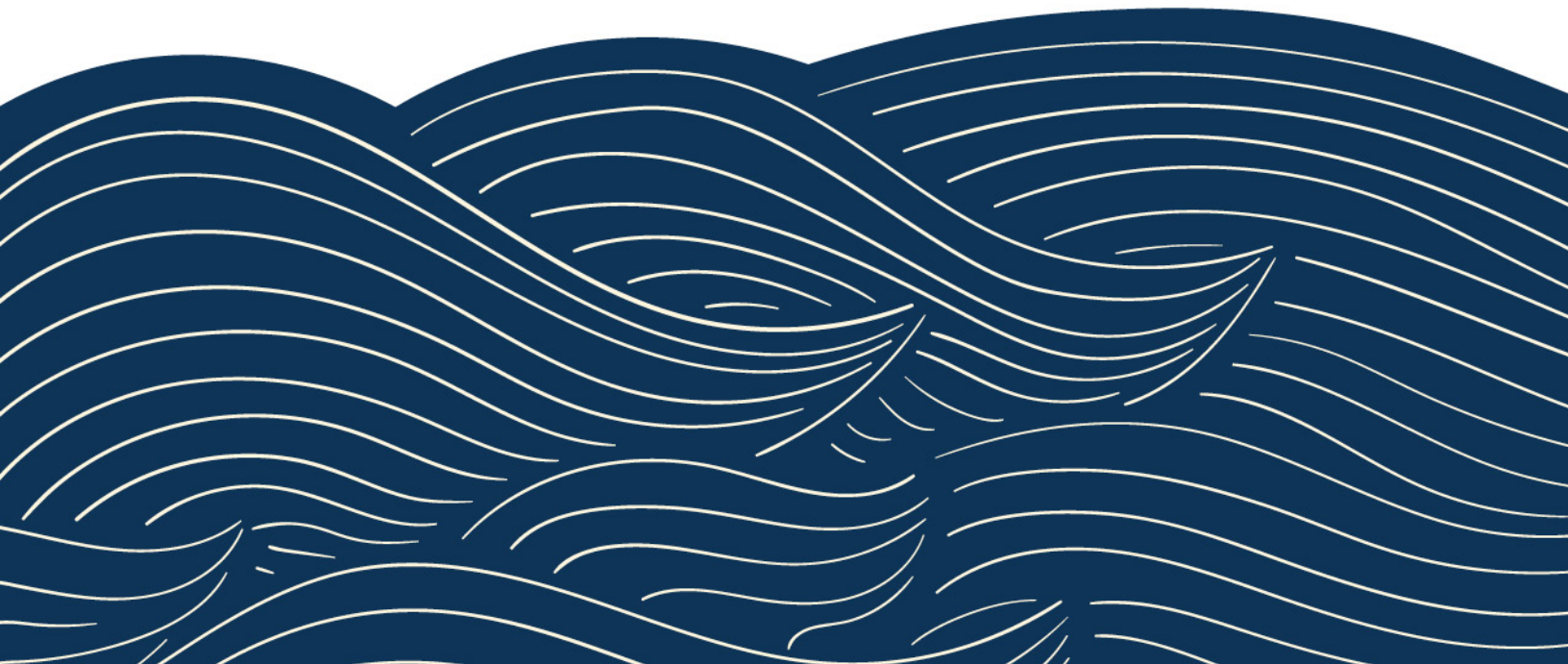
B

Appendix B. Notification and Outreach



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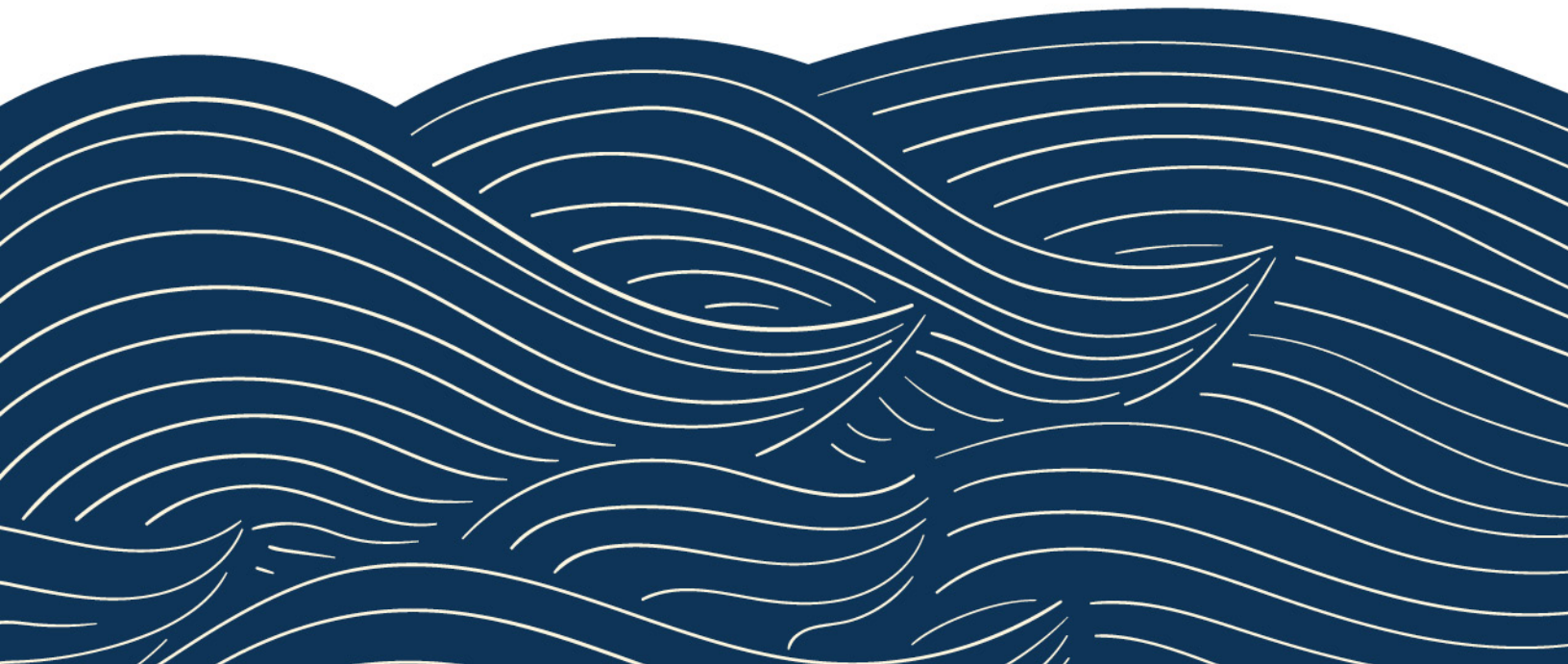
Appendix C. Resolution of Adoption



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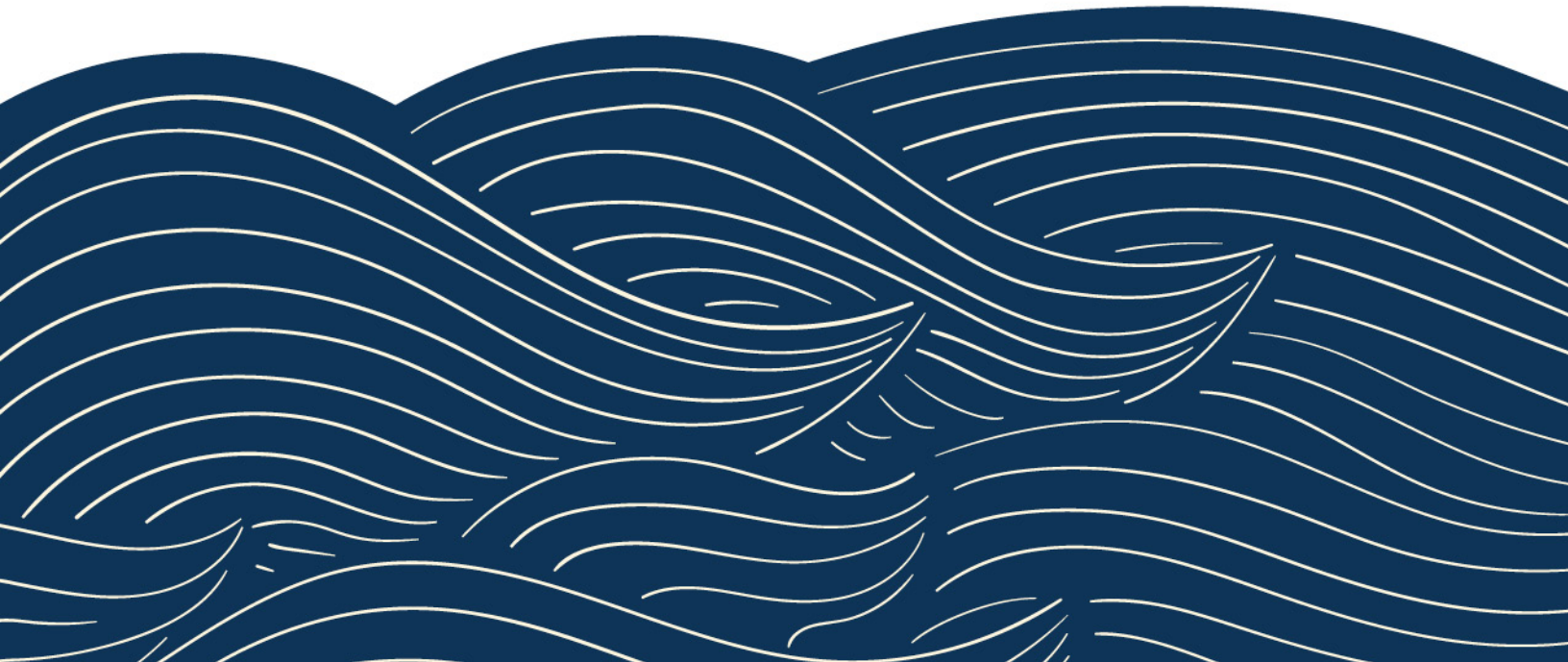
Appendix D. SVWD AWWA Water Loss Audit



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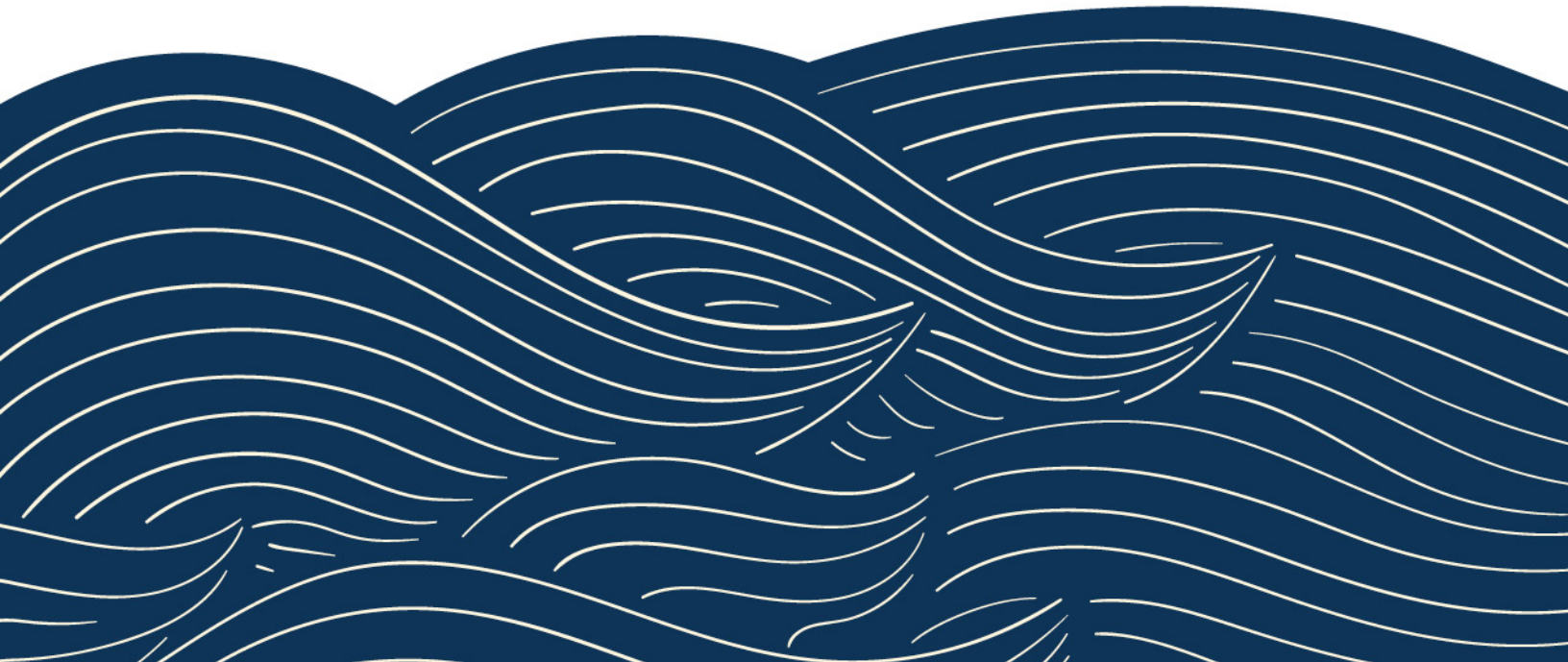
Appendix E. SLVWD AWWA Water Loss Audit



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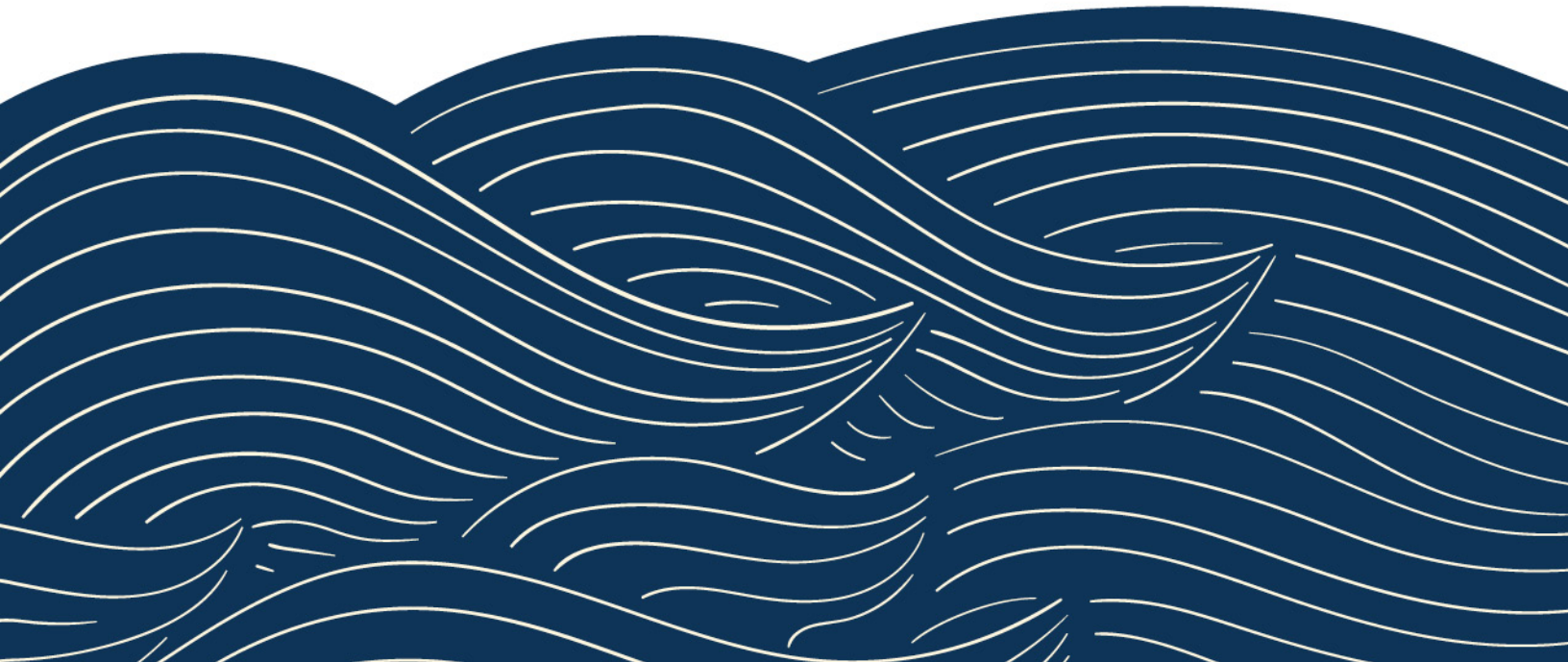
Appendix F. SVWD SB X7-7 Verification and Compliance Forms



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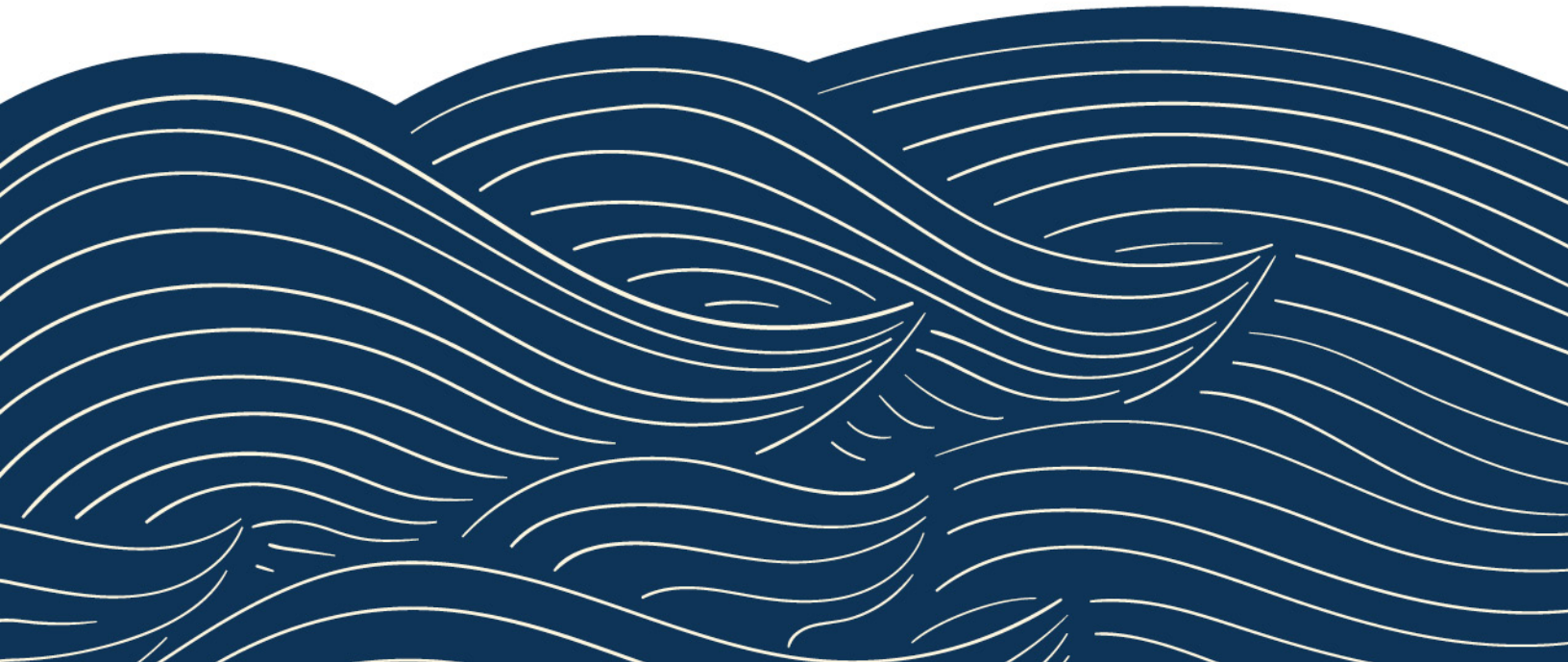
Appendix G. SLVWD SB X7-7 Verification and Compliance Forms



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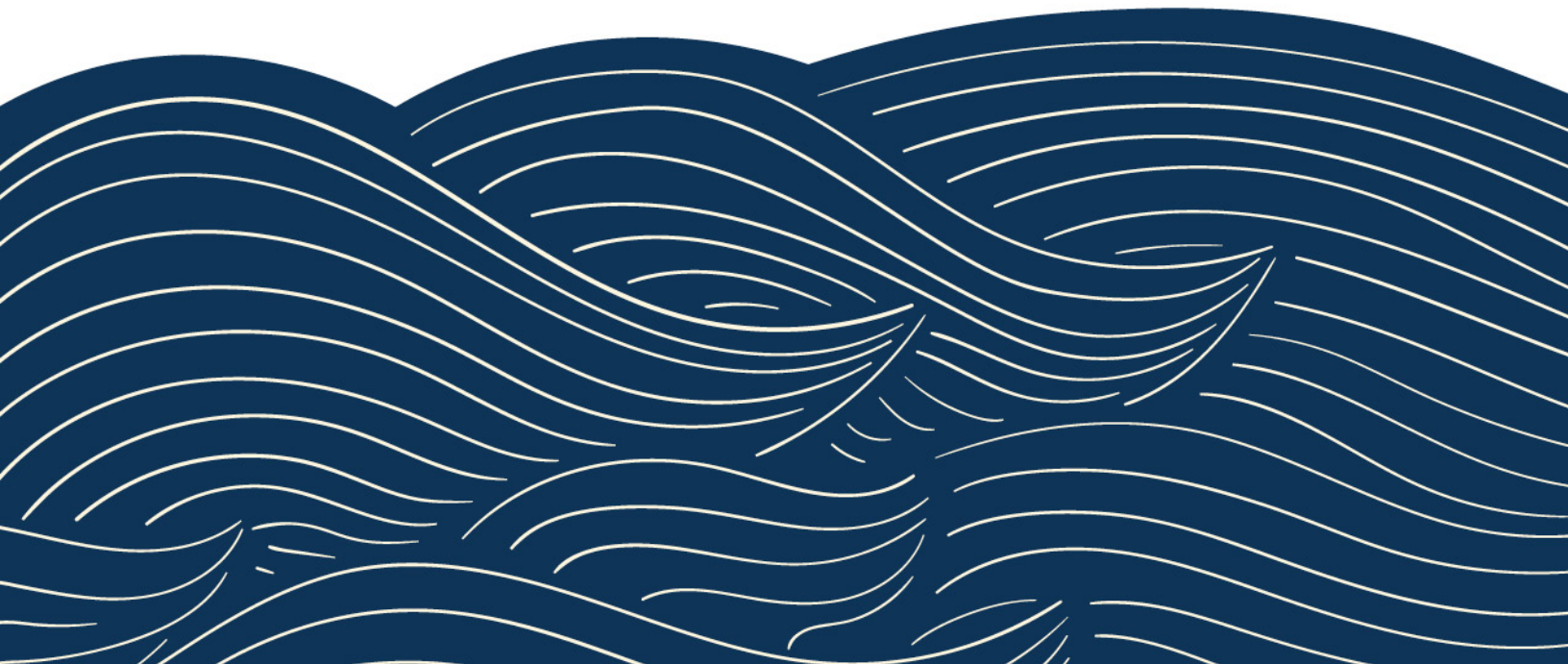
H

Appendix H. County of Santa Cruz Local Hazard Mitigation Plan



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