San Andreas Sanitary District

Local Hazard Mitigation Plan

Public Review Draft

801 T Street
Sacramento, California 95811
800.426.4262

woodardcurran.com

0012878.00
San Andreas Sanitary District
March 2026

TABLE OF CONTENTS (WILL BE COMPLETED AT END OF PLAN)

TABLE OF CONTENTS

SECTION **PAGE NO.**

TABLE OF CONTENTS (WILL BE COMPLETED AT END OF PLAN) I

1. INTRODUCTION 1-1

1.1 Purpose of the Plan 1-1
1.2 Plan Organization 1-2

2. PLANNING PROCESS 2-1

2.1 Overview (A1) 2-1
2.2 Stakeholder Involvement (A2) 2-1
2.3 Public Engagement (A3) 2-2
2.3.1 How Public Input was Incorporated into the Plan 2-3
2.4 Review and Incorporation of Existing Plans (A4) 2-3

3. SASD PROFILE 3-1

3.1 Overview and History 3-1
3.2 Service Area 3-1
3.2.1 Geography, Topography, and Climate 3-2
3.3 Governance and Management 3-3
3.4 Financing 3-4
3.5 Critical Facilities and Infrastructure 3-4
3.5.1 Wastewater Treatment Facility 3-5
3.5.2 Sewer Collection System 3-7
3.5.3 Lift Stations 3-7
3.5.4 Other Assets 3-7

4. HAZARD IDENTIFICATION AND RISK ASSESSMENT 4-1

4.1 Hazard Identification (B1) 4-1
4.2 Risk Assessment (B2) 4-2
4.2.1 Landslides 4-3
4.2.2 Wildfire 4-4
4.2.3 Drought 4-5
4.2.4 Heat Waves 4-6
4.2.5 Low Risk Hazards 4-7
4.3 Conclusion 4-14
4.4 Future Trends and Vulnerabilities 4-15

5. MITIGATION GOALS, OBJECTIVES, AND ACTIONS (C3) 5-1

6. PLAN IMPLEMENTATION 6-1

6.1 Implementation Strategy (C5) 6-1

6.2 Responsible Party....6-2
6.3 Integration of the LHMP into Other Planning Mechanisms....6-2
6.4 Implementation Tiers....6-2
6.5 Priority Actions [NEW]....6-3

7. PLAN MAINTENANCE....7-1

7.1 Monitoring, Evaluating, and Updating the Plan....7-1
7.1.1 Monitoring the Plan....7-1
7.1.2 Evaluating the Plan....7-1
7.1.3 Updating the Plan....7-2
7.2 Continued Public Involvement....7-2

8. WORKS CITED....8-1

APPENDIX A: PUBLIC OUTREACH DOCUMENTATION....A-1

APPENDIX B: EXISTING PLANS SUMMARIES....A-2

APPENDIX C: TABLE 6-1 SCORING MATRIX....A-3

TABLES

Table 2-1: Stakeholders Engaged in Review of the LHMP....2-2
Table 3-1: Critical SASD Assets and Operational Dependencies....3-8
Table 4-1: Hazard Identification Table....4-1
Table 5-1: Hazards Addressed by Mitigation Actions (C4)....5-1
Table 6-1: 2025 SASD LHMP Actions....6-4

FIGURES

Figure 1: SASD Location....3-2
Figure 2: SASD Elevation....3-3
Figure 3: SASD Assets....3-5
Figure 4: SASD WWTF....**Error! Bookmark not defined.**

LIST OF ABBREVIATIONS

BOD	Biochemical Oxygen Demand
BRIC	Building Resilient Infrastructure and Communities
CAL FIRE	California Department of Forestry and Fire Protection
CEC	California Energy Commission
CEIC	Clean Energy Investment Center
CIP	Capital Improvement Plan

CVRWCB	Central Valley Regional Water Quality Control Board
CWSRF	Clean Water State Revolving Fund
DHS	Department of Homeland Security
DWR	California Department of Water Resources
ECWAG	Emergency Community Water Assistance Grants
EDA	United States Economic Development Administration
EMPG	Emergency Management Performance Grant
FEMA	Federal Emergency Management Agency
GIS	Graphical Information Systems
HMGP	Hazard Mitigation Grant Program
HVAC	Heating, Ventilation, and Air Conditioning
IRWM	Integrated Regional Water Management
ITC	Investment Tax Credit
LHMP	Local Hazard Mitigation Plan
MAC	Mokelumne, Amador, and Calaveras
MGD	Million Gallons Per Day
NPDES	National Pollutant Discharge Elimination System
CalOES	California Office of Emergency Services
PHWWF	Peak Hour Wet Weather Flow
PPE	Personal Protective Equipment
RAS	Return Activated Sludge
REAP	Rural Energy for America Program
SASD	San Andreas Sanitary District
SASDSOI	San Andreas Sanitary District Sphere of Influence
SCADA	Supervisory Control and Data Acquisition
SGIP	Self-Generation Incentive Program
SOI	Sphere of Influence
USDA	United States Department of Agriculture
UV	Ultraviolet
VHFHSZ	Very High Fire Hazard Severity Zone
WAS	Waste Activated Sludge
WUI	Wildland-Urban Interface
WWTF	Wastewater Treatment Facility
WWTP	Wastewater Treatment Plant

1. INTRODUCTION

Situated in Calaveras County, California, the San Andreas Sanitary District (SASD or "the District") provides wastewater treatment services to the unincorporated community of San Andreas. The SASD is responsible for approximately 18.6 miles of sanitary sewer lines, four pump stations, and the SASD Wastewater Treatment Facility (WWTF), located at 675 Gold Oak Road in San Andreas, California.

Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts determined, mitigation goals set, and appropriate strategies determined, prioritized, and implemented. The creation of an LHMP is a proactive strategy designed to reduce the long-term risk to life, property, and the environment from natural and human-caused hazards. For SASD, hazard mitigation is essential to maintaining public health and wastewater services for the San Andreas community as well as protecting wastewater infrastructure and ensuring operational resilience.

The SASD recognizes the critical importance of maintaining uninterrupted sanitary services, even in the face of natural disasters and other emergencies. To proactively safeguard public health, infrastructure, and the environment, SASD has developed this comprehensive Local Hazard Mitigation Plan (LHMP) in accordance with the California Office of Emergency Services (CalOES) and the Federal Emergency Management Agency (FEMA) requirements as outlined in 44 CFR Part 201. This plan identifies potential hazards such as landslides, wildfires, drought, heat, earthquakes, riverine flooding, lightning, and strong winds and outlines strategic mitigation actions to reduce risks and enhance community resilience. By implementing the LHMP, SASD not only strengthens its emergency preparedness but also becomes eligible for vital funding opportunities that support long-term infrastructure protection and rapid disaster recovery.

On [**DATE**], the Board of Directors of the SASD adopted this LHMP with the vision to incrementally reduce its exposure to natural hazards and improve the reliability of its services to the public. The plan was subsequently approved by FEMA on [**DATE**]. A FEMA-approved LHMP is a prerequisite for receiving pre-disaster mitigation grant funds and other federal assistance during declared emergencies.

1.1 Purpose of the Plan

"Hazard mitigation means any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards (FEMA, 2025)." Hazard mitigation planning is the basis for directing investments, both short- and long-term, that target reducing risk and building a community's resilience to future natural hazard events. Hazard mitigation plans help to establish a program that addresses potential hazards and initiates projects to mitigate the potential impacts of identified hazards to infrastructure and facilities. Through the LHMP process, hazards are analyzed, and projects are identified that aim to minimize risk and build more disaster resilient systems.

The goal of this LHMP is to reduce the District's risks to hazards. SASD's objectives for the LHMP are to:

1. **Achieve Compliance and Excellence** by ensuring the LHMP plan meets California Office of Emergency Services (Cal OES) and FEMA's requirements and sets a benchmark for excellence in hazard mitigation planning;

2. **Amplify Risk Protection** by providing a comprehensive LHMP that not only complies with federal and state regulations but also effectively mitigates risks; and

3. **Advance Community Resilience** by developing and adopting an LHMP that will fortify the District against natural disasters and safeguard the community and its assets.

With an adopted LHMP, SASD would be eligible for federal disaster mitigation funds/grants (Hazard Mitigation Grant Program, Pre-Disaster Mitigation, and Flood Management Assistance) that would fund resilience projects aimed to reduce the District's risk to hazards.

1.2 Plan Organization

The 2025 SASD LHMP is organized into six core chapters and two supportive chapters. This plan's organization includes all documentation required to meet the necessary criteria for Cal OES and FEMA approval. Each chapter is briefly described below.

- **Chapter 1, Introduction** introduces the plan and describes the purpose of the plan and the plan's organization.
- **Chapter 2, Planning Process** describes the LHMP planning process and includes a list of meetings and public outreach activities that occurred to engage stakeholders and the public.
- **Chapter 3, SASD Profile** describes the SASD's history, geography, and topography.
- **Chapter 4, Hazard Identification and Risk Assessment** identifies and prioritizes natural hazards affecting SASD and assesses the SASD's vulnerability to these hazards.
- **Chapter 5, Mitigation Goals, Objectives, and Actions** identifies mitigation goals, objectives and actions and prioritizes the actions.
- **Chapter 6, Plan Implementation** discusses the LHMP's adoption and implementation.
- **Chapter 7, Plan Maintenance** discusses the SASD's plan to monitor, evaluate, update, and maintain the LHMP.
- **Chapter 8, Works Cited** lists the references cited.

2. PLANNING PROCESS

2.1 Overview (A1)

To support the development of this LHMP, the SASD secured funding through FEMA's Hazard Mitigation Grant Program (HMGP), administered by the Cal OES (FEMA-4683-DR-CA; $199,650.00). This funding enabled SASD to engage professional planning support to ensure the plan meets all federal and state requirements. Following a competitive procurement process in accordance with local and state contracting guidelines, SASD selected Woodard & Curran (W&C) at its February 20, 2025 public meeting to lead the planning effort. W&C worked closely with SASD staff, stakeholders, and the public to facilitate the planning process, conduct the risk assessment, and develop mitigation strategies tailored to the District's unique needs.

In the development of this plan, W&C reviewed available information on natural hazards from online sources, including but not limited to FEMA's National Risk Index for Calaveras County, Flood Insurance Rate Maps (FIRMs), and Cal OES MyHazards. Graphical Information Systems (GIS) databases, historic aerial photographs, and available geotechnical and geologic data both from SASD and outside sources were also reviewed (See Chapter 8, Works Cited).Throughout the course of the planning process, key W&C staff participated in meetings with the SASD; identified the District's hazards and vulnerabilities; and evaluated recently completed plans and priority projects for their hazard mitigation and resilience potential. W&C held biweekly meetings with key staff to review their progress and findings.

2.2 Stakeholder Involvement (A2)

Stakeholders had an opportunity to be involved in the LHMP planning process in several ways. The stakeholder process began by developing a comprehensive list of potential stakeholders (Appendix X). This list included names of organizations, types of representatives and key interests, and names and contact information for points of contacts.

The entire stakeholder list was contacted via email in April 2025 as the project kicked off. The email was to alert them of the effort and requested that stakeholder share any hazard mitigation or emergency response plans or documents that the SASD should review during the planning process.

Updates to the planning effort were then provided monthly during SASD Board of Directors meetings, which are open to the public.

Following the plan development, a technical review draft of the LHMP was prepared and shared with stakeholders who had specific technical expertise in this effort. The stakeholders that were identified and were provided with an opportunity to review and provide feedback on the administrative draft LHMP prior to release of the public draft and public review period. Those stakeholders are listed in **Table 2-1.**

Refer to Appendix X for the comprehensive list of potential stakeholders, and stakeholder involvement and public engagement documentation.

TABLE 2-1: STAKEHOLDERS ENGAGED IN REVIEW OF THE LHMP

Local and Regional Agencies involved in Hazard Mitigation Activities
Calaveras County Water District
Calaveras County Office of Emergency Services (OES)
Agencies that have the Authority to Regulate Development
Calaveras County Planning Department
Calaveras County Board of Supervisors
Calaveras County District 2 Supervisor – Autumn Andahl
California Regional Water Quality Control Board (Central Valley Region)
California Department of Water Resources (DWR)
Neighboring Communities
Angels Camp
Valley Springs
Mokelumne Hill
California Valley Miwok Tribe
Tuolumne Band of Me-Wuk Indians
Nonprofit Organizations
Calaveras Community Foundation
Calaveras Humane Society
Habitat for Humanity Calaveras
Calaveras County Food Bank
Businesses, Academia, and other Private Organizations
Mark Twain Medical Center

2.3 Public Engagement (A3)

The public had an opportunity to be involved in the LHMP planning process. The public was notified of the planning effort and updated quarterly via customer newsletter (see Appendix X). Additionally, monthly updates on the plan were provided at monthly SASD Board of Directors meetings, which are open to the public and recorded.

Additionally, SASD maintained a webpage for the LHMP where the public could find additional information. The draft LHMP was posted to this website for public review and the public was invited to submit comments to an email address listed on that webpage.

The LHMP was adopted during a public meeting on [**DATE**]. The meeting included an opportunity for public comment. [**Note comments here**].

2.3.1 How Public Input was Incorporated into the Plan

Input gained through the public meetings and the public comment period provided valuable insight to confirm the risk assessment findings and potential mitigation strategies. Feedback from the public offered during the public meetings offered greater insights into [**TBD**].

After the public comment period ended, [**#**] public feedback was received [**TO BE CONFIRMED**]. However, in order to keep the Plan current after it is approved, the District will ensure that the public continues to be involved in the Plan and how it is carried out. Refer to Chapter 7 for further details on continued public engagement.

2.4 Review and Incorporation of Existing Plans (A4)

This plan has been developed through an extensive review of available planning documents, including:

- 2023 SASD Master Plan Update
- 2016 SASD Collection System Master Plan
- 2012 SASD Sanitary Sewer Flow Monitoring and Inflow/Infiltration Study
- 2021 Calaveras County Multi-Jurisdictional Hazard Mitigation Plan
- 2019 Calaveras County General Plan
- 2019 Calaveras County Emergency Operations Plan
- 2018 Mokelumne, Amador, and Calaveras (MAC) Integrated Regional Water Management (IRWM) Plan
- 2024 Draft Climate Resilience Plan (also known as California Climate Adaptation Strategy)
- 2023 California Department of Water Resources (DWR) Plan

From the review of these existing plans, a comprehensive understanding of the SASD's infrastructure needs, environmental vulnerabilities, and future growth challenges were ascertained. Recommendations and identified priority projects from these plans were evaluated and incorporated into the mitigation strategies of this LHMP and revised, as necessary, to enhance their hazard mitigation and resilience potential for the SASD.

SASD's wastewater treatment and collection systems are aging and nearing capacity, with critical components requiring upgrades to meet projected demands through 2042. Inflow and infiltration studies have highlighted the need for targeted repairs to prevent overflows during storm events, while effluent storage and disposal strategies must adapt to increasingly variable hydrologic conditions. These findings underscore the importance of proactive infrastructure investment and operational improvements to maintain regulatory compliance and service reliability.

Additionally, the broader county and state-level plans emphasize the need for integrated hazard mitigation, climate adaptation, and emergency preparedness. The Calaveras County Multi-Jurisdictional Hazard Mitigation Plan and Emergency Operations Plan provides a framework for coordinated response and risk reduction, while the General Plan and IRWM Plan promote sustainable development, water reuse, and environmental stewardship. State strategies, such as the Climate Resilience Plan and DWR Climate Action Plan, reinforce the urgency of addressing impacts from environmental hazards through resilient infrastructure, energy efficiency, and community-focused adaptation. Together, these plans offer a roadmap for building a safer, more sustainable future for the region.

Refer to **Appendix B** for the detailed summaries of these existing plans.

3. SASD PROFILE

3.1 Overview and History

The SASD was formed in 1946 under the Sanitary District Act of 1923 (Government Code, Section 6400) to provide wastewater services to the community of San Andreas. The SASD is the sole entity providing public wastewater collection, treatment, solid waste disposal, and reclamation services for the City of San Andreas. Currently, the District boundaries include all of the unincorporated community of San Andreas as well as some areas outside. There currently exists within the District boundary approximately 796 acres of developed land with the potential to expand the service area up to an approximate total of 1,319 acres, or an additional 523 acres (2016 Collection System Master Plan (Technical Memorandum No. 1, Table 1-3).

The collection system, treatment plant, and disposal system were built in the mid-1950s. The original system was paid by taxpayers within the District through public bonds which were retired through monthly user fees and property taxes. Over the past 79 years, SASD has expanded its infrastructure and services and now maintains approximately 18.6 miles of sewer pipeline, four pump stations, and a wastewater treatment facility. The District has continuously invested in capital improvement projects, including upgrades to its Headworks, Biological Treatment System, Irrigation Pump Station, and Effluent Disposal System (i.e., tertiary treatment, chlorine disinfection, bisulfite dechlorination), to ensure compliance with evolving environmental regulations and to enhance system resilience.

The District is regulated by the Central Valley Regional Water Quality Control Board (CVRWCB) and must comply with a permit issued by them called the National Pollutant Discharge Elimination System (NPDES) permit. The NPDES permit limits the amount of constituents a treatment facility can legally discharge after proper treatment.

3.2 Service Area

The SASD provides wastewater collection, treatment and disposal services to the community of San Andreas and the surrounding area. The service area encompasses a mix of residential, commercial, and public land uses. As of 2023, the District provided wastewater services to 1,976 equivalent dwelling units.

As described above, the SASD serves an area of about 1,240 acres or about 1.9 square miles. The service area extends from Jasper Way and Gold Strike Road in the north, to Knief Lane in the south, to West Murray Creek Road in the east, and to Old Oak Road, Sunset Street, and Angels Road in the west. The District's Sphere of Influence (SOI) was last updated in 2016 and includes a larger area than the current District boundary. **Figure 1** shows an aerial view of the extent of the existing SASD service area and the SASDSOI boundary.

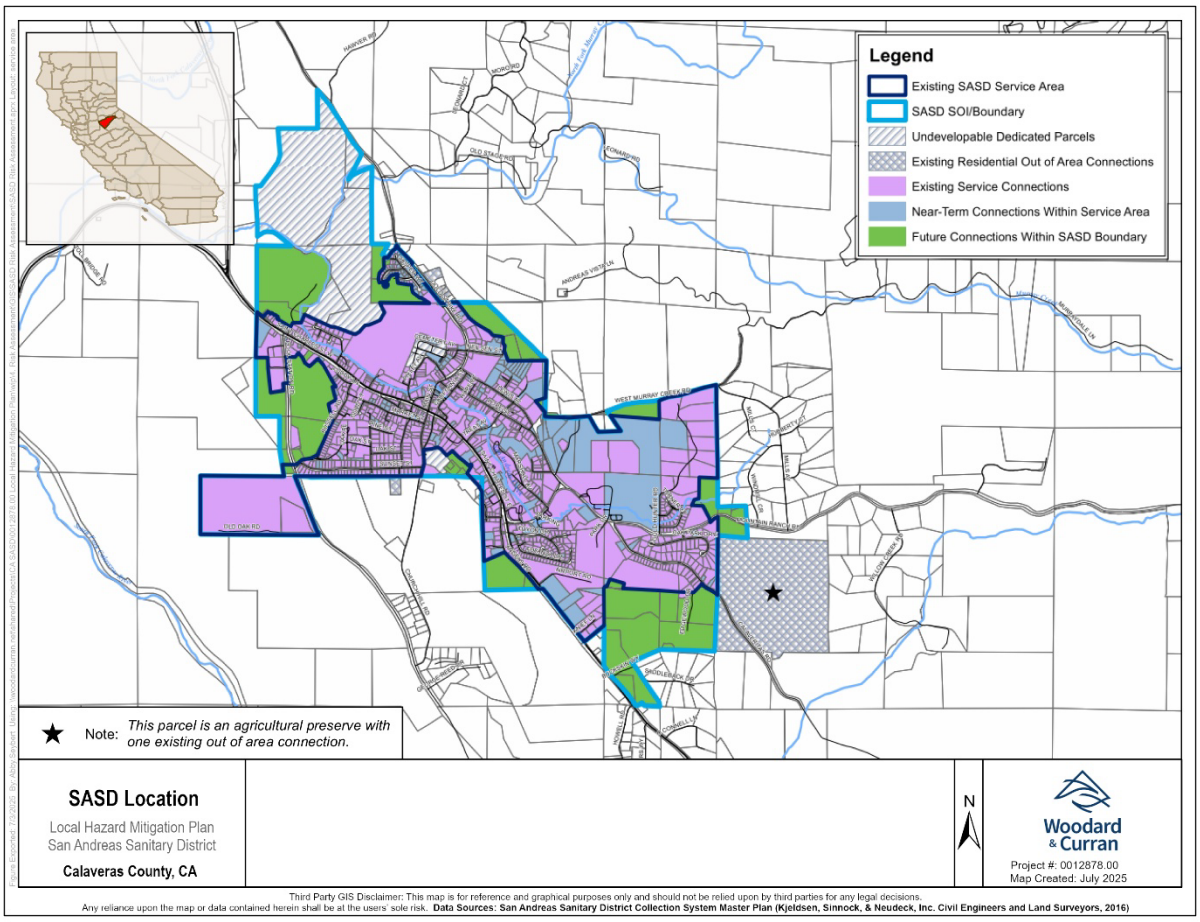


FIGURE 1: SASD LOCATION

3.2.1 Geography, Topography, and Climate

3.2.1.1 Geography

San Andreas is located in the Sierra Nevada foothills of the Central Valley Region of California and is part of Calaveras County. San Andreas is 52 miles southeast of Sacramento and 43 miles northeast of Stockton. The major access road through San Andreas is State Route 49.

3.2.1.2 Topography

The District has elevations ranging from approximately 715 to 1,321 feet above sea level (see **Figure 2**). This varied topography includes steep slopes, ridgelines, and seasonal drainage channels. The main water body in the District is San Andreas Creek, which is located north of and generally follows State Route 49 until diverting further north at Mountain Ranch Road. To the west of the District, is the Calaveras River. This terrain has influenced the design and maintenance of the District's wastewater infrastructure, as gravity-fed systems must account for elevation changes.

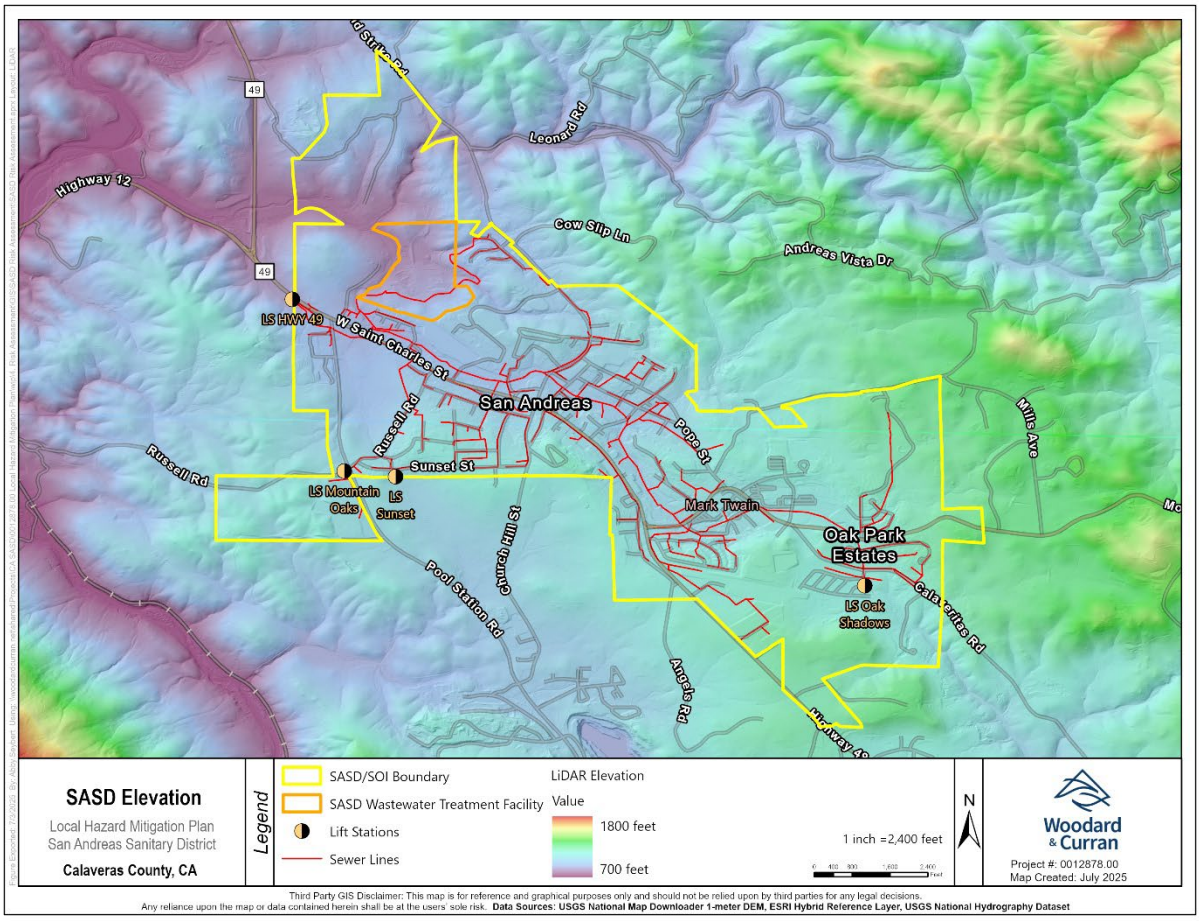


FIGURE 2: SASD ELEVATION

3.2.1.3 Climate

San Andreas experiences a Mediterranean climate, marked by hot, dry summers and cool, wet winters. Summer temperatures often reach the upper 80s to low 90s °F (29–34°C), while winters are milder, with highs in the 50s °F (10–15°C) and occasional nighttime lows near freezing. Most of the annual precipitation falls between November and March, contributing to seasonal flooding risks, while the dry summer months heighten the potential for heat-related hazards, including lightning and wildfires.

3.3 Governance and Management

The SASD has a five-member governing body. Board members are elected at large to staggered four-year terms. The District has budgeted for eight full and part-time staff that include certified wastewater operators and administrative staff. The SASD maintains a website, and keeps constituents updated through newsletters, mailings, and regular board meetings.

SASD operates under a NPDES permit from the California Regional Water Quality Control Board (Central Valley region) that outlines waste discharge requirements for the District's Wastewater Treatment Facility (WWTF).

The SASD's 2023 Wastewater Master Plan serves as a comprehensive assessment of the current facilities, future capacity needs, and recommended capital improvements. The WWTF is also governed by a Capital Improvement Plan that prioritizes infrastructure upgrades and expansions based on system needs and growth projections.

The SASD also maintains an Operations and Maintenance Program that ensures regular inspections, cleaning, and repair of all of SASD's assets, including its facilities, sewer lines, and equipment.

3.4 Financing

The SASD operates out of a single enterprise fund for its daily operational activities. Revenue sources include rates and charges, property tax, and interest and connection fees. The District has prepared a sewer system management plan and a 10-year capital improvement plan as planning tools to address long-term growth and capital needs. The capital improvement plan provides a list of potential projects, engineer's estimates of cost, and expected completion dates. The capital improvement plan was last updated in 2024. The District has a restricted fund for capital replacement and expansion purposes. Capital improvements are also addressed annually in the District's budget.

3.5 Critical Facilities and Infrastructure

The SASD owns and operates the wastewater collection, treatment, and disposal facilities in the unincorporated community of San Andreas (see **Figure 3**).

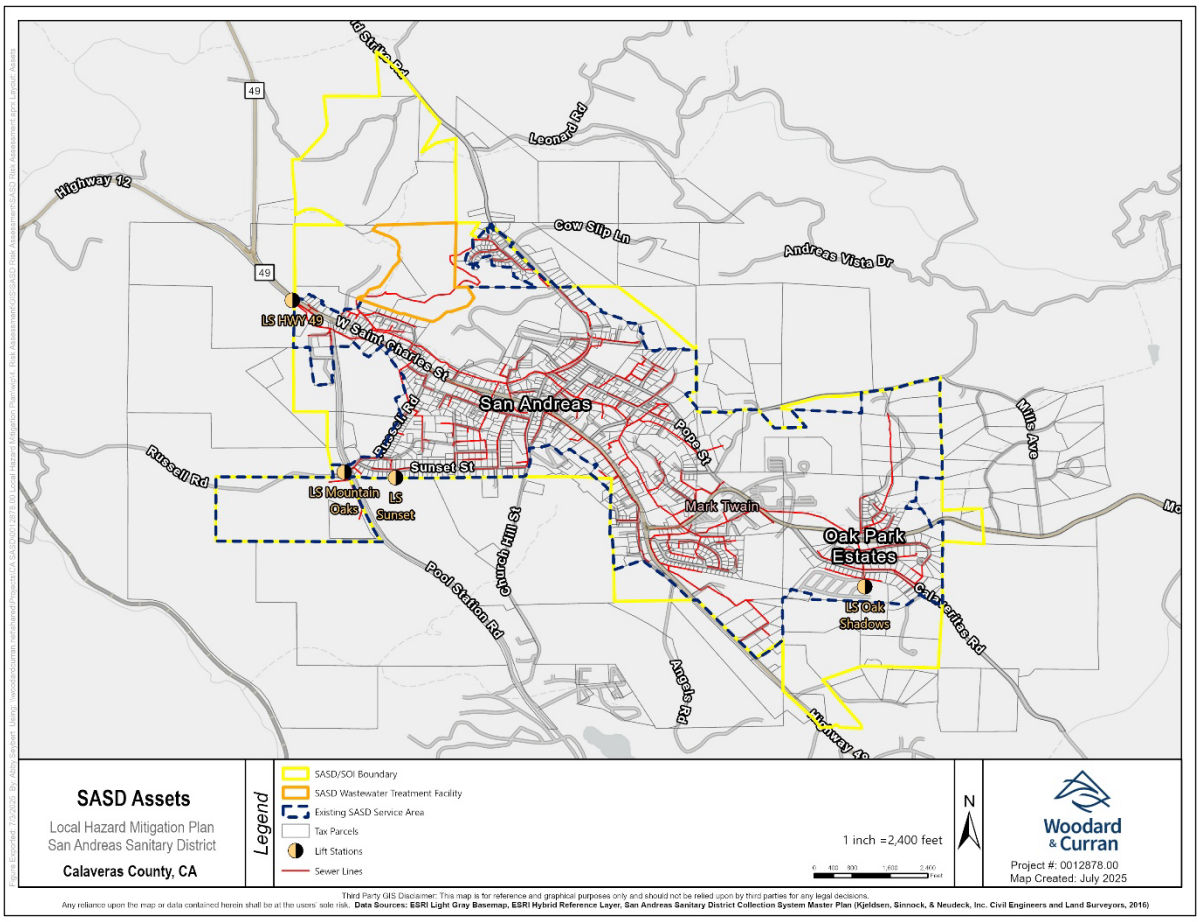


FIGURE 3: SASD ASSETS

3.5.1 Wastewater Treatment Facility

SASD processes and treats the area's wastewater at a centralized WWTF (see **Figure 4**). The facility is designed to treat domestic wastewater collected from residential, commercial, and public sources. The SASD WWTF is designed to treat an average dry weather flow (ADWF) of 0.322 million gallons per day (MGD) and peak hour wet weather flow (PHWWF) of 1.88 MGD (Woodard & Curran, 2023).

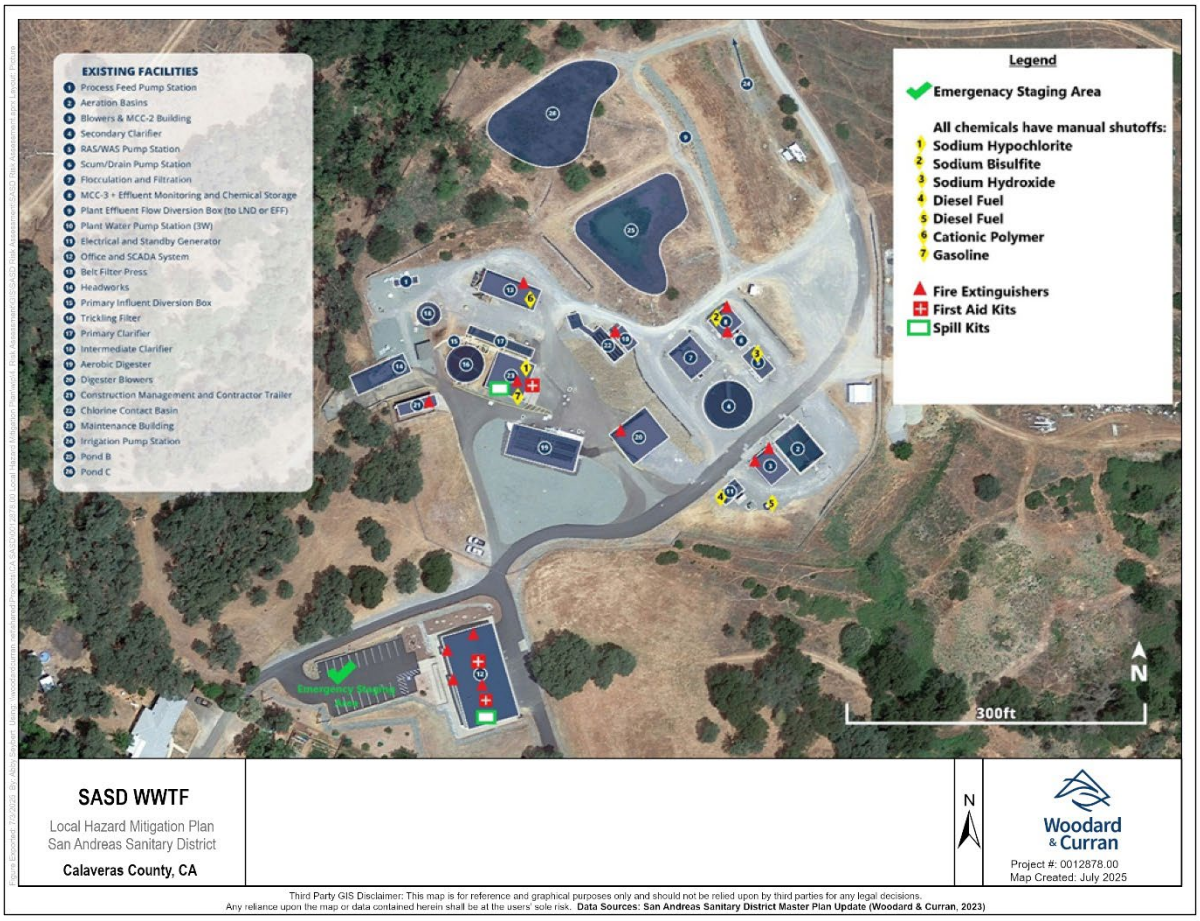


FIGURE 4: SASD WWTF

As described in the 2023 SASD Master Plan Update, the liquid treatment train consists of headworks with mechanical screening, primary clarification, followed by secondary treatment with a combination of fixed-film trickling filter process for removal of biochemical oxygen demand (BOD) and suspended growth activated sludge process for BOD removal and nitrification of ammonia. Mixed liquor from the aeration tanks flows to a circular secondary clarifier with return activated sludge (RAS) pumped back to the head of the activated sludge process. Secondary effluent flows to cloth disk filtration, disinfection with sodium hypochlorite, and de-chlorination using sodium bisulfite. Final effluent is either pumped to dedicated land disposal areas (DLDAs) located on the plant property or discharged to the North Fork of the Calaveras River when river flows provide a dilution of 20:1 or greater.

The solids process train consists of thickening and aerobic digestion, dewatering in a belt filter press, onsite drying, and offsite land application by a third-party contractor (currently Synagro). Synagro uses Class B biosolids from the SASD WWTF for beneficial agricultural use at an approved location in Sacramento County.

3.5.2 Sewer Collection System

The sewer collection system includes an 18.6-mile network of gravity-fed pipelines that convey wastewater to lift stations and the WWTF. Pipelines throughout the District vary in age and size.

3.5.3 Lift Stations

There are four lift stations in the District including the Highway 49 Station, located at 1215 Highway 49; Sunset Station, located at 595 Sunset Street; the Mt. Oaks School lift station and emergency generator, located at 1250 Pool Station Road; and Oak Shadows lift station and emergency generator, located at 1330 Calaveritas Road.

3.5.4 Other Assets

The District also owns and maintains a fleet of vehicles used in daily wastewater service operations including: five pickup trucks, four off road vehicles, heavy machinery (i.e., forklift, tractor, skid steer and various skid steer attachments, and a backhoe), and two trailers. Additionally, the District owns various hand and work station tools which are also used for daily maintenance and operation activities, two portable generators, road work tools, weed eaters, and chainsaws.

Other assets include SASD's dedicated workforce. Wastewater treatment facility operators play a crucial role in protecting public health and the environment. The core responsibilities of operators include: monitoring gauges, meters and control panels to ensure system are functioning properly; operating equipment such as pumps and valves to move wastewater through the treatment process; collecting water and sewage samples for testing and analyzing those samples to determine levels of pollutants - ensuring compliance with environmental regulations; performing routine maintenance and repairs on mechanical and electrical systems; cleaning tanks, filters, and screens to prevent blockages and maintain efficiency; documenting operational data, test results, and maintenance activities; preparing reports for regulatory agencies and internal use; ensuring regulator compliance by following local, state, and federal environmental regulations and adjust the treatment process to meet discharge standards; and responding to emergencies such as equipment malfunctions, power outages, and hazardous spills, and implementing contingency plans to prevent environmental damage.

During natural disasters, wastewater treatment facility operators play a vital role in safeguarding public health and the environment. They work to maintain essential sanitation services, preventing untreated sewage from contaminating water sources and reducing the risk of disease outbreaks. Operators assess damage to infrastructure, manage emergency system adjustments, and coordinate with local authorities to ensure continued operation. They also help prevent environmental pollution by controlling overflows and managing hazardous waste. After the disaster, operators are key to restoring systems and implementing improvements for future resilience. Their efforts are crucial in maintaining community safety and supporting recovery during and after emergencies.

3.5.4.1 Recent Upgrades

As of 2025, the system is generally in good condition. The treatment facilities were originally built in the 1950s and the following upgrades were made between 2017 and 2024:

- Replacement of the anaerobic digester with a new gravity thickened aerobic digester, completed in 2021.
- Replacement of the 60-year-old headworks with a new headworks including mechanical screening influent channel and Parshall flume, bypass channel, composite sampling equipment, automatic flow splitting, and SCADA monitoring, completed in 2023.
- Expansion of the chlorine contact basin to increase reliability of the disinfection process, completed in 2022.
- Modification and expansion of the irrigation pump station to deliver more effluent flow to the dedicated land application areas and return of effluent to the headworks, completed in 2024.

The collection system was originally installed in the 1950s and consists of 18.6 miles of pipes. In 2023, the District completed a significant replacement project for the main trunkline that runs along the San Andreas Creek. The Project improved portions of the District's sewer collection system, which had demonstrated insufficient hydraulic capacity to convey current and future peak wastewater flows. The District replaced 3,793 feet of 6 to 10-inch diameter existing sewer mains with 8 to 12-inch new sewer mains and replaced 22 manholes.

3.5.4.2 Critical Assets and Operational Dependencies

SASD relies on several critical assets and infrastructure components essential to maintaining uninterrupted wastewater service and emergency response capability. These include:

TABLE 3-1: CRITICAL SASD ASSETS AND OPERATIONAL DEPENDENCIES

Asset	Operational Dependency	Risk if Compromised
Highway 49 Lift Station	Key pumping facility for wastewater transport	Loss of pumping capacity could cause system backups
Pond D	Primary treatment and storage pond	Overflow or damage could disrupt treatment operations
Power Feed	Main electrical supply to treatment facilities	Power loss would halt operations and emergency systems
Access Road	Routes to the treatment plant and lift stations	Blocked access would delay emergency response and repairs

These assets are vital to the District's ability to maintain service continuity and respond effectively during hazard events. Their vulnerability to power outages, physical damage, or access limitations directly informs the hazard prioritization and mitigation strategies outlined in later sections of this plan.

3.5.4.3 Redundancy and Emergency Response Capability

To enhance resilience, the District maintains backup power systems at key facilities, including the Highway 49 Lift Station and the main treatment plant. These systems ensure continued operation during electrical outages.

Additionally, after-hours operational coverage is provided by on-call staff trained to respond to emergencies, further supporting the District's ability to mitigate service disruptions and protect public health during hazard events.

4. HAZARD IDENTIFICATION AND RISK ASSESSMENT

While this LHMP references the National Risk Index (see Section 4.1) to provide a broad understanding of hazard exposure and vulnerability, the San Andreas Sanitary District has identified four specific hazard as the most pressing threats based on operational experience and historical impacts. These hazards have demonstrated the greatest potential to disrupt critical infrastructure and limit emergency response and therefore warrant focused attention in the District's mitigation strategy. These hazards are:

- Localized flooding: Heavy rainfall can overwhelm drainage and affect access to critical facilities.
- Wildfire: Wildfire risk is elevated due to vegetation and climate trends.
- Power Loss: Power loss disrupts pumping and treatment operations.
- Landslide: Slope instability near access roads and infrastructure poses a risk to site access and safety.

4.1 Hazard Identification (B1)

The process of identifying hazards that affect or could affect the District at various levels was the first step in assessing overall risk. Using FEMA's National Risk Index, hazards potentially affecting the SASD were identified. **Table 4-1**. lists these hazards, their national risk index score specific to the SASD, and a brief description of the hazard. The following subsection details how these hazards could potentially affect or have previously affected the SASD, which areas of the SASD are most vulnerable to the hazard using Geographic Information System (GIS) mapping, and how the hazard may affect SASD assets. From this hazard identification, a vulnerability assessment was developed (see Section 4.2).

TABLE 4-1: HAZARD IDENTIFICATION TABLE

Hazard	National Risk Index[1]	Description
Very High to Relatively Moderate Hazards		
Landslide	Very High	Landslides are the downward and outward movement of slope-forming materials such as rock, soil, and debris under the influence of gravity.
Wildfire	Relatively High	Wildfires are uncontrolled fires that spread rapidly through vegetation, often fueled by dry conditions, wind, and high temperatures. They can be ignited by lightning, faulty or damaged electrical facilities, or by human activities.
Drought	Relatively Moderate	Drought is a prolonged period of below-average precipitation that can significantly impact water availability and infrastructure operations.
Heat Waves	Relatively Moderate	Heat waves are prolonged periods of excessively hot weather, often accompanied by high humidity and minimal nighttime cooling.

[1] The National Risk Index is the expected annual loss multiplied by social vulnerability and divided by Community Resilience (https://hazards.fema.gov/nri/learn-more).

Low Risk Hazards		
Earthquakes	Relatively Low	An earthquake is the sudden shaking of the ground caused by the movement of tectonic plates along faults, such as the nearby San Andreas Fault.
Riverine Flooding	Relatively Low	Riverine flooding occurs when rivers or streams overflow their banks due to excessive rainfall, snowmelt, or upstream water releases.
Lightning	Relatively Low	Lightning is a sudden electrostatic discharge that occurs during thunderstorms, capable of causing fires, power outages, and damage to electrical systems.
Strong Winds	Relatively Low	Strong winds are high-velocity air movements that can cause damage to structures, vegetation, and utilities.
Hail	Very Low	Hail is a form of precipitation consisting of solid ice balls or lumps that form within strong thunderstorm updrafts. Hailstones can range in size from small pellets to several inches in diameter and can cause significant damage to buildings, vehicles, and exposed infrastructure.
Winter Weather	Very Low	Winter weather hazards include a range of cold-season events such as freezing temperatures, frost, hail, freezing rain, and occasional snowfall. While San Andreas is located in the Sierra Nevada foothills and does not experience severe winter storms like higher elevations, it is still vulnerable to cold snaps, icy conditions, and winter precipitation that can disrupt operations and damage infrastructure.
Tornado	Very Low	Tornadoes are rapidly rotating columns of air extending from a thunderstorm to the ground, capable of producing extreme winds, structural damage, and flying debris. While tornadoes are rare in California, they do occasionally occur, particularly in the Central Valley and Sierra foothills during strong convective storms. Tornadoes are typically short-lived but can cause localized destruction.

Despite their national risk index score, all of the hazards listed in **Table 4-1** are discussed below for their potential impact to SASD assets.

4.2 Risk Assessment (B2)

A risk assessment was completed to evaluate the extent to which SASD's assets are vulnerable to the above identified hazards. The SASD system includes the WWTF, the sewer collection and conveyance system, lift stations, and other assets such as staff, vehicles, and equipment. The risk assessment includes a review of the risk data collected from the FEMA National Risk Index, other mapping sources, and previous plans describing assets developed by SASD.

The following sections describe the significant vulnerabilities to the SASD. Specific vulnerabilities related to moderate to high hazards are included, as well as relatively low hazards related to riverine flooding and earthquakes due to SASD's experience with impacts and their expected increase in frequency.

4.2.1 Landslides

In San Andreas, landslides are typically triggered by intense rainfall, seismic activity, or human-induced changes to the landscape. The region's steep terrain, fractured bedrock, and history of seismic activity, particularly its proximity to the San Andreas Fault, make it especially susceptible to slope failures. Landslide-prone areas in San Andreas are primarily located along steep hillsides, road cuts, and drainage channels. The California Geological Survey has identified multiple zones of high landslide susceptibility in Calaveras County, particularly along Highway 49 and adjacent slopes. These areas are characterized by unstable geologic formations and shallow soils that are prone to saturation and failure. As shown in **Figure 5**, the majority of SASD assets are within an area with an expected annual loss rating of Very High, with the exception of the Oak Park Estates area, which is in a Relatively High area for Landslides.

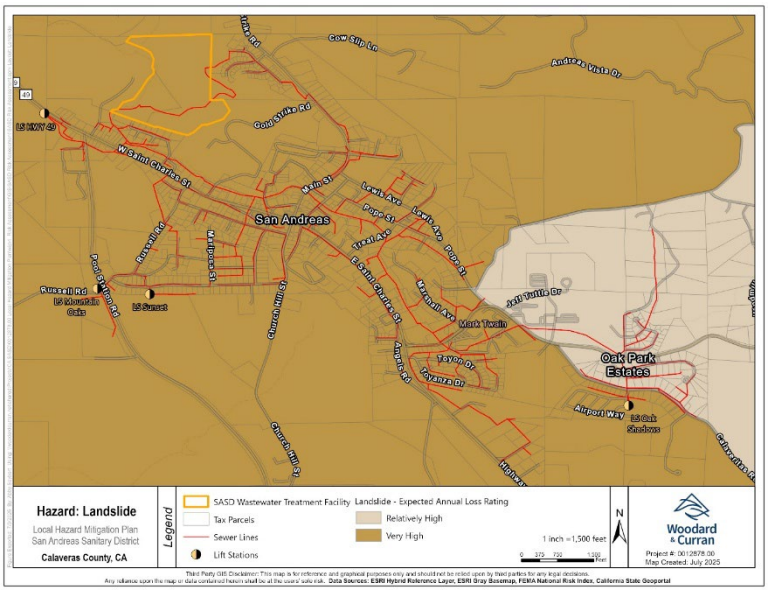


FIGURE 5: LANDSLIDES

San Andreas has experienced several notable landslide events, particularly during the El Niño winters of 1982–83 and 1997–98, which caused road closures, property damage, and temporary displacement of residents. More recent minor slides have occurred during heavy rainfall events in 2017 and 2023, though with limited structural damage. The probability of future landslides within the SASD is likely, especially during years of above-average rainfall or seismic activity. Current climate projections expect an increase in frequency and severity of extreme weather events, including rainfall events, posing a higher risk of landslides in the coming years.

Landslides can severely damage both surface and underground infrastructure, posing significant risks to the SASD. Key assets such as collection and conveyance infrastructure, lift stations, and the effluent storage pond (Pond D) at the WWTF are particularly vulnerable. For collection and conveyance infrastructure landslides pose a significant threat by shifting or crushing pipelines, with the potential to cut off wastewater service to the community. For lift stations, landslides can cause station failure by inducing pipeline breaks, damage to electrical and motor control center equipment and damage to the lift station structures themselves. For Pond D, landslides can damage embankments or introduce large volumes of sediment and debris into the pond. Landslides also increases the risk of a potential release of effluent and the

contamination of surface or groundwater resources. Additional impacts include damage to electrical equipment, blocked access roads, buried vehicles and equipment, isolation of operational staff, and disruption land application operations. These vulnerabilities can delay emergency response efforts and compromise the District's ability to maintain essential services.

4.2.2 Wildfire

In the San Andreas area, wildfires are a recurring natural hazard due to the region's Mediterranean climate, dense vegetation, and prolonged dry seasons (typically May to September). Wildfire risk in San Andreas is widespread, particularly in the wildland-urban interface (WUI) where development meets undeveloped vegetation. The District is surrounded by grasslands, oak woodlands, and chaparral; vegetation types that are highly flammable during the dry season.

The service area has experienced several significant wildfire events in recent years. In 2015, Calaveras County suffered damage to 70,000 acres, destroying hundreds of structures in the Butte Fire. Smaller fires erupted in 2018, 2020, and 2022, causing evacuations, air quality issues, and temporary power outages. Effects of environmental hazards are exacerbating the conditions for wildfires due to rising temperatures and more frequent droughts. As shown in **Figure 6**, the majority of SASD assets are within an area with an expected annual loss rating of Very High, with the exception of the Oak Park Estates area, which is in a Relatively High area for Wildfire. The area is also classified as a Very High Fire Hazard Severity Zone (VHFHSZ) by the California Department of Forestry and Fire Protection (CAL FIRE).

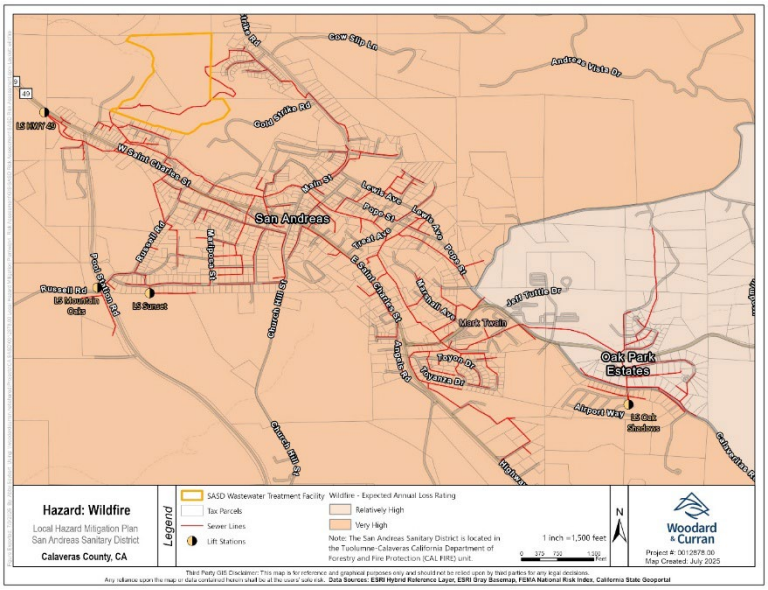


FIGURE 6: WILDFIRE

Wildfire poses a considerable risk to SASD assets such as fire damage to WWTF and lift station infrastructure, equipment and vehicles, electrical units, melting of plastic pipes, as well as restricted access for staff to operate and maintain systems. Key assets such as plastic collection and conveyance infrastructure, lift stations, and the WWTF are particularly vulnerable. At the WWTF, treatment tanks may be infiltrated by smoke and ash, which can impact oxygen transfer and microbial health within the aeration and digester tanks. Additionally, Pond D at the WWTF is an open-air facility that can be contaminated from ash and

debris or damaged with airborne embers and radiant heat. For lift stations, electrical equipment is subject to risk from fire and the structures themselves are vulnerable if constructed of wood. Wildfire also threatens the safety of personnel through direct fire exposure, smoke inhalation, and potential evacuation. Furthermore, fire behavior modeling indicates that embers from nearby wildfires could also easily ignite District facilities. Wildfires can also trigger other natural hazards such as landslides by destroying surrounding vegetation and increasing the risk of erosion and sedimentation during subsequent rain events, as well as droughts, and heat waves, which can compound impacts on the District.

4.2.3 Drought

Similar to the wildfire hazard, droughts are a recurring natural hazard due to the region's Mediterranean climate, dense vegetation, and prolonged dry seasons (typically May to September). Droughts can develop slowly but have long-lasting impacts on water availability, public health, and infrastructure operations.

San Andreas is prone to multiple prolonged events a year and is subject to California's water use restrictions. San Andreas has experienced multiple severe droughts in recent years. The 2012-2016 California drought led to mandatory water restrictions and in 2020, California experienced a two-year drought that resulted in intensified wildfire risk, reduced reservoir levels, and stressed local water systems. The region is expected to experience longer drier seasons and reduced water availability. As shown in **Figure 7**, the majority of SASD assets are within an area with an expected annual loss rating of Relatively Moderate, with the exception of the Oak Park Estates area, which is in a No Expected Annual Losses area for Drought.

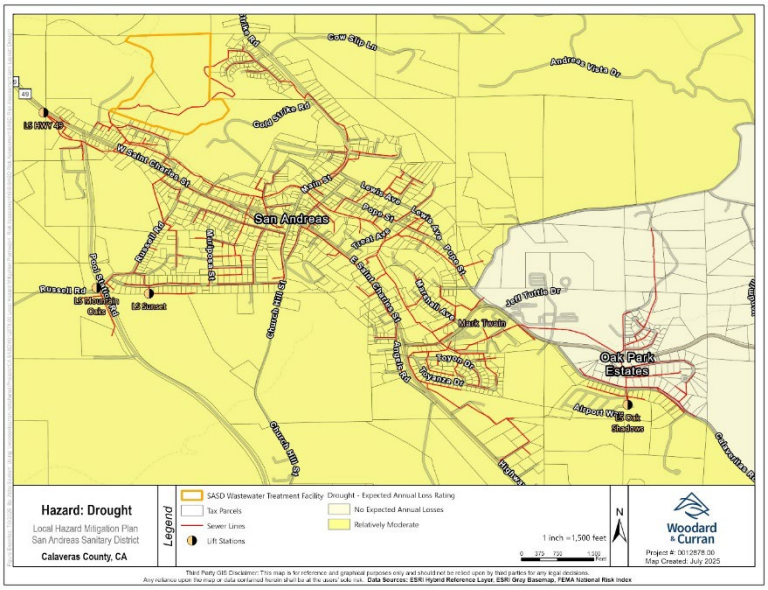


FIGURE 7: DROUGHT

Drought can significantly impact sanitary district operations. For the SASD, drought conditions pose challenges such as reduced influent flow, which can affect treatment efficiency and increased concentrations of pollutants in wastewater. Prolonged droughts can also lead to regulatory pressures to conserve water and strain operational practices. Drought-related water reduction regulations lower sanitary flows as customers are asked to reduce their usage of water. Limitations decrease the amount of water in the collection system, slowing down flow and allowing solids to settle within pipes causing blockages from

settling can impose higher stress on the system and require emergency response. This also leads to the expedited degradation of collection and conveyance pipes from gasification. Additional work is then required to remove solids from the pipeline, such as hydrant washing, which can disintegrate old pipes. Additionally, drought may strain the facility components of the WWTF, limit the availability of wastewater for land application, significantly lower water levels and concentrating pollutants within Pond D, and increase the risk of ground shifting or cracking, potentially damaging underground infrastructure.

4.2.4 Heat Waves

In San Andreas, heat waves typically occur during the summer months and are becoming more frequent and intense due to climate change. These events can pose serious health risks, strain energy and water systems, and disrupt critical infrastructure operations. The region's inland location and elevation contribute to high daytime temperatures and limited relief at night. Urbanized areas and facilities with limited shade or cooling infrastructure are particularly vulnerable.

Several extreme heat events have occurred in recent years in the San Andreas area. During the September 2022 heat wave, temperatures exceeded 110°F for multiple consecutive days, triggering statewide Flex Alerts and stressing local energy, water, and wastewater systems. Earlier events in 2017 and 2020 also resulted in elevated health risks, increased energy demand, and operational challenges for outdoor and uncooled facilities. As shown in **Figure 8**, all of SASD assets are within an area with an expected annual loss rating of Relatively High for Heat Waves.

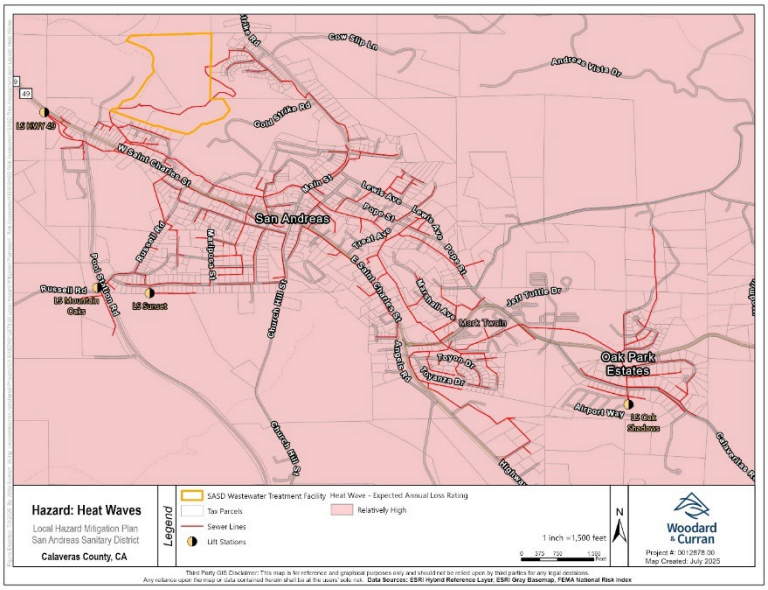


FIGURE 8: HEAT WAVES

Heat waves can stress both infrastructure and operations. High temperatures may lead to power outages and failures in the system's electronics and automation controls, equipment overheating, reduced efficiency of treatment processes, especially microbial digestion processes, and increased evaporation from open-air facilities like Pond D. Heat waves can also strain electrical systems, especially if cooling or ventilation systems are inadequate, and may pose health risks to on-site staff working outdoors or in poorly ventilated areas such as heat exhaustion and heat stroke. Additionally, extreme temperatures, such as those experienced

during heat waves can cause materials to expand, contract, or become brittle, increasing the likelihood of leaks or bursts. Furthermore, prolonged heat can exacerbate drought and wildfire conditions, reduce influent flow, and increase the concentration of pollutants in wastewater.

4.2.5 Low Risk Hazards

4.2.5.1 Earthquakes

Earthquakes pose a threat to the SASD due to the region's seismic activity. Earthquakes in this area can cause moderate to severe ground shaking, surface rupture, liquefaction, and landslides, all of which pose significant threat to the District's infrastructure and staff safety. The entire service area is exposed to seismic risk due to its proximity to the San Andreas Fault, as well as other regional fault lines such as Hayward, Calaveras, and Foothills Fault Zones.

San Andreas is within the Seismic Hazard Zone, classified by the California Geological Survey. Although San Andreas has not experienced a major earthquake in recent years, the region still experiences smaller quakes and aftershocks, providing evidence of its ongoing seismic activity. As shown in **Figure 9**, all of SASD assets are within an area deemed by the California Geological Survey for Ground Shaking Potential as Lowest (less than 15 percent).

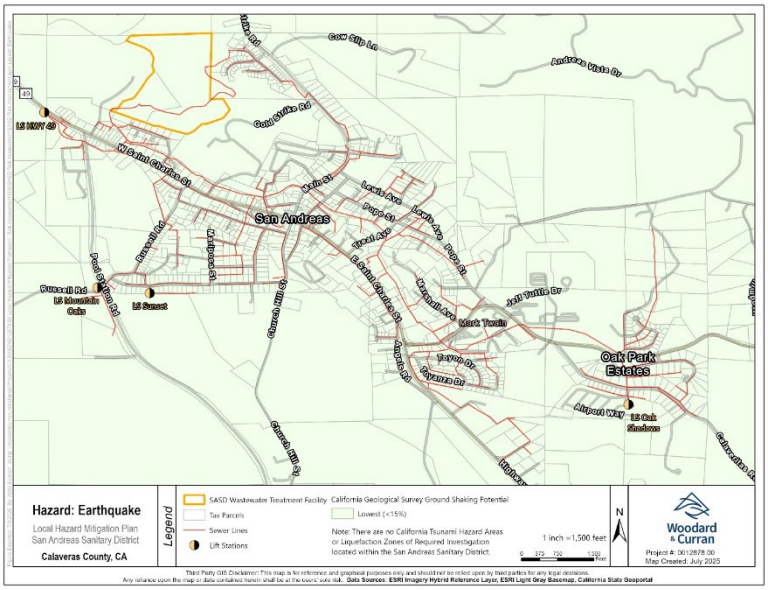


FIGURE 9: EARTHQUAKES

Potential impacts include structural damage to sewer collection and conveyance infrastructure, the WWTF and Pond D, and lift stations. Seismic activity can cause cracking or structural failures in treatment tank walls or foundations, piping, diffusers, or blowers and can interrupt operations by disrupting control systems. It can also damage the belt filter press, causing misalignment of rollers and belts, which disrupts the dewatering process and accelerates mechanical wear, increasing the chance of complete failure. Ground shaking can also crack or weaken support structures, loosen pipe connections, or lead to spills from dosing systems, all of which can result in equipment failure or unsafe operating conditions. For Pond D, earthquakes may cause cracks or breaches in pond liners and embankments, leading to leaks or structural failure. For lift stations, surface fault rupture, strong ground shaking, earthquake-induced liquefaction, and

earthquake-induced landslides can all cause failure of lift stations, rendering them inoperable or causing them to operate in a reduced mode. These lift station failures can be due to ground movement causing pipeline breaks and failure of equipment that is not properly secured against movement associated with seismic events. For collection and conveyance infrastructure, seismic activity can cause ground shaking and soil displacement, leading to cracks, joint failures, or complete pipeline ruptures. Earthquakes can cause structural damage to tanks, pipelines, and buildings, putting staff at risk of injury and disrupting essential operations. Earthquakes can also disrupt electrical systems, impairing the district's ability to monitor and manage operations, and also cause road access issues that could make obtaining process control chemicals for disinfection more difficult. These disruptions can lead to service outages, environmental contamination, delayed emergency response, and inability to access the site by operation staff.

4.2.5.2 Riverine Flooding

In San Andreas, flooding is primarily associated with stormwater runoff and seasonal precipitation that overwhelms local waterways, including San Andreas Creek and its tributaries. These events can lead to inundation of low-lying areas, erosion, and damage to infrastructure. Flood-prone areas in the SASD are concentrated along San Andreas Creek.

The SASD has had multiple flood events, primarily driven by intense rainfall and seasonal storm systems. In the winter of 1997, a series of powerful storms caused widespread runoff and localized flooding along San Andreas Creek, resulting in erosion and temporary road closures. The February 2017 storms, fueled by atmospheric river conditions, led to minor inundation near the WWTF and surrounding low-lying areas, though no major structural damage was reported. More recently, in January 2023, a sequence of back-to-back storm systems overwhelmed local drainage infrastructure, causing temporary ponding and access issues near critical SASD assets. These events highlight the District's vulnerability to flood hazards, particularly during years of above-average precipitation. Additionally, climate projections indicate more frequent atmospheric rivers, intense storm events, and earlier snowmelt, all contributing to increased flood risk. As shown in **Figure 10**, data from the FEMA National Flood Hazard Layer identifies areas with a 1 percent annual chance flood hazard in west of the WWTF, north of and parallel to Saint Charles Street, and Treat Avenue.

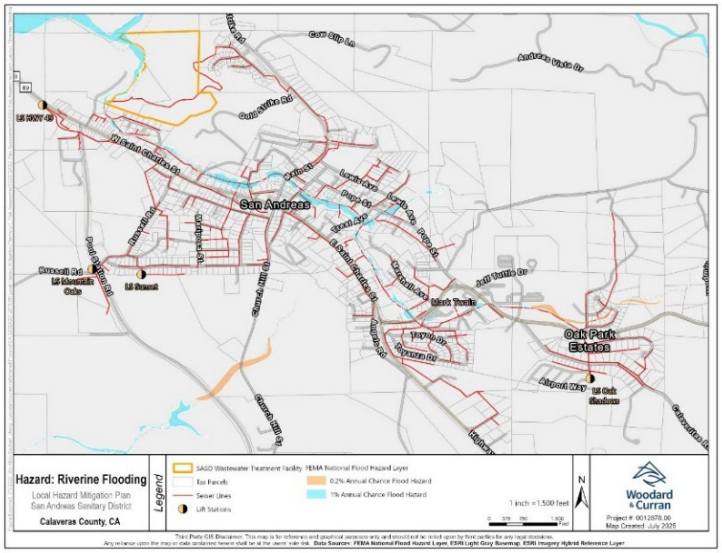


FIGURE 10: RIVERINE FLOODING

For the SASD, flooding poses a serious hazard, particularly during intense storm events or prolonged wet seasons. Key vulnerabilities include inundation of the WWTF, overflow or breach of the sewer collection and conveyance system, cause pipe separation (inflow/infiltration) and sanitary overflow, and damage to electrical, mechanical systems. Floodwater can also contaminate wastewater systems and impede staff access to critical infrastructure. Additionally, riverine flooding increases the risk of combined sewer overflows and environmental discharge violations.

Treatment tanks at the WWTF may see a reduction in effectiveness of the biological treatment process through dilution from floodwater. Flooding threatens the belt filter press at the WWTF by potentially submerging electrical components and causing structural damage to the equipment. Contaminated water can corrode metal elements and interrupt belts and rollers. Riverine flooding can lead to overtopping, erosion of embankments and the uncontrolled release of stored wastewater in Pond D. For collection and conveyance infrastructure, particularly along Main Street, Saint Charles Street, and Gold Strike Road, flood waters can cause significant damage and may contaminate surrounding areas. Water can inundate the system and infiltrate cracks, manholes and weakened connections. Flooding and soil erosion can expose or undermine buried pipelines, increasing the risk of physical damage and contamination of water supplies. High inflow of floodwaters can overwhelm the system and decrease efficiency and increase operational costs. For lift stations, flooding can cause electrical component failures and damage to structures. Generally, flooding can overwhelm treatment systems, expose workers to contaminated water, and hinder access to the facility.

Although the FEMA National Risk Index identifies this hazard as a relative low risk to the SASD, given the experiences with flooding in the District, it is considered a priority to address SASD asset vulnerabilities to this hazard.

4.2.5.3 Lightning

In San Andreas, lightning typically occurs during summer thunderstorms or dry lightning events, particularly during periods of high atmospheric instability. While less frequent than other hazards, lightning poses a significant risk to exposed infrastructure and can trigger secondary hazards such as wildfires.

San Andreas has experienced several lightning-related incidents in recent years. During the August 2020 dry lightning storm, multiple wildfires were ignited across Northern California, including small spot fires in Calaveras County. In July 2018, a lightning strike near the SASD perimeter caused a brief power outage and activated emergency backup systems. These events highlight the district's vulnerability to both direct strikes and secondary impacts. The surrounding wildland areas are also vulnerable to lightning-induced fires, especially during dry conditions. As shown in **Figure 11**, all of SASD assets are within an area with an expected annual loss rating of Relatively Low for Lightning.

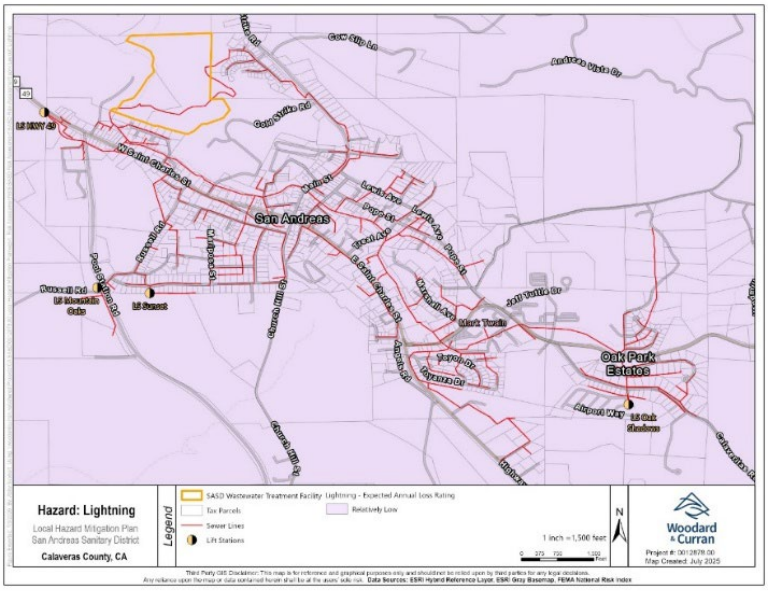


FIGURE 11: LIGHTNING

For the SASD, lightning, although relatively low risk, still poses a risk to electrical systems, communication equipment (i.e., instruments, sensors, transformers, circuit breakers, Variable Frequency Drives [VFDs], radios, and alarms or emergency shut offs), and exposed mechanical components. A direct or nearby strike can lead to power surges or outages, equipment failure, and data loss, and may potentially disrupt treatment operations. When there is a threat or presence of lighting, it impacts the ability of staff to conduct outdoor related operations and maintenance tasks. Additionally, lightning can ignite wildfires, compounding risks to facilities.

4.2.5.4 Strong Winds

In San Andreas, strong winds are typically associated with winter storms, cold fronts, and post-frontal systems, but can also occur during dry downslope wind events. These winds can lead to trees falling, power outages, and damage to above-ground infrastructure such as power lines, fences, and treatment plant equipment. Strong winds can affect the entire SASD service area, particularly elevated or exposed locations such as ridgelines and open fields.

San Andreas has experienced several damaging wind events in recent years. In January 2021, a winter storm brought gusts exceeding 60 mph, toppling trees and causing widespread power outages across Calaveras County. Similar events in February 2019 and December 2022 resulted in downed utility lines, minor structural damage, and temporary disruptions to SASD operations. As shown in **Figure 12**, all of SASD assets are within an area with an expected annual loss rating of Very Low for Strong Winds.

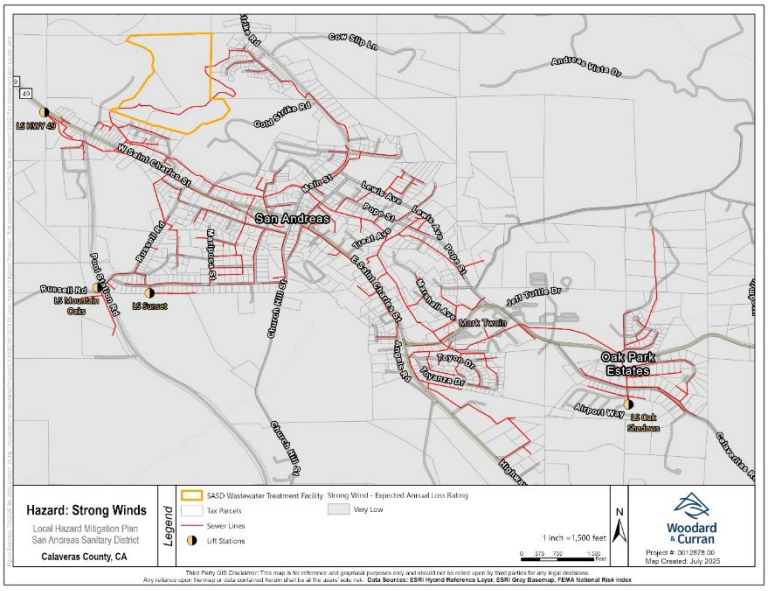


FIGURE 12: STRONG WINDS

Strong winds can cause physical damage to buildings, fencing, and exposed equipment, as well as disrupt power lines and communication systems, and land application operations. Windborne debris may damage electrical panels or ventilation systems, while sustained gusts can destabilize temporary structures or covers at the WWTF and stir up sediment, damage liners, and compromise inlet and outlet structures of Pond D. Additionally, strong winds can spread wildfires. Wind-prone corridors such as Highway 49 and open areas around Pond D are at increased risk. Downed trees along access roads could also impact access to facilities.

4.2.5.5 Hail

While less frequent than other hazards, hailstorms in San Andreas can occur during spring and summer thunderstorms. The probability of future hail events is considered low to moderate, with the greatest risk during the spring and early summer months. While not a frequent hazard, hailstorms can occur with little warning and may become more common with increased atmospheric instability.

As shown in **Figure 13**, all of SASD assets are within an area with an expected annual loss rating of Very Low for Hail.

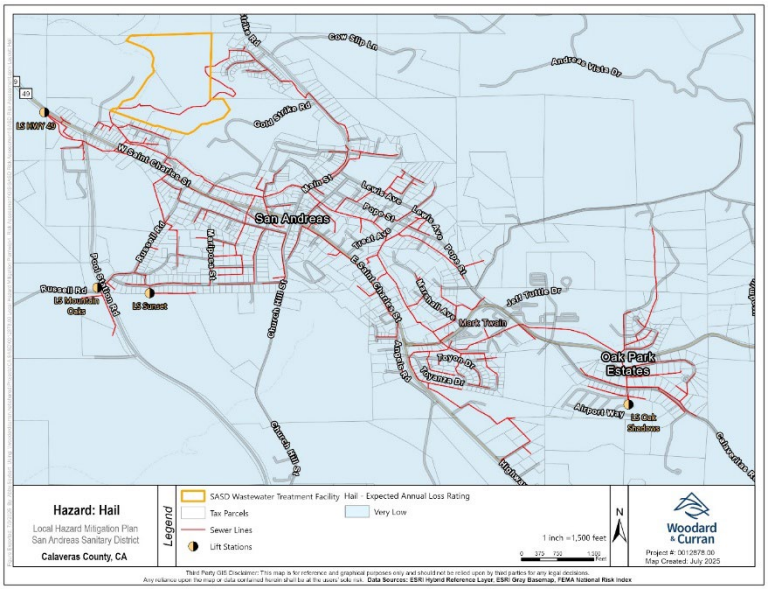


FIGURE 13: HAIL

Hail can affect the entire SASD service area, though impacts are typically localized to the storm path. Infrastructure with exposed surfaces—such as rooftops, solar panels, HVAC units, and vehicles—is most vulnerable. Large hailstones can cause physical damage to facility roofs, crack or puncture plastic piping, and disable sensitive electrical or monitoring equipment. Hail can also clog drainage systems, leading to localized flooding, and may delay staff access or operations during and after a storm.

4.2.5.6 Winter Weather

Winter weather can affect the entire District's service area, particularly elevated or shaded areas where frost and ice may persist. Roads, exposed pipelines, and outdoor equipment are especially vulnerable. While snowfall is rare, freezing temperatures and frost events are common during winter months, especially overnight.

As shown in **Figure 14**, all of SASD assets are within an area with an expected annual loss rating of Relatively Low for Winter Weather.

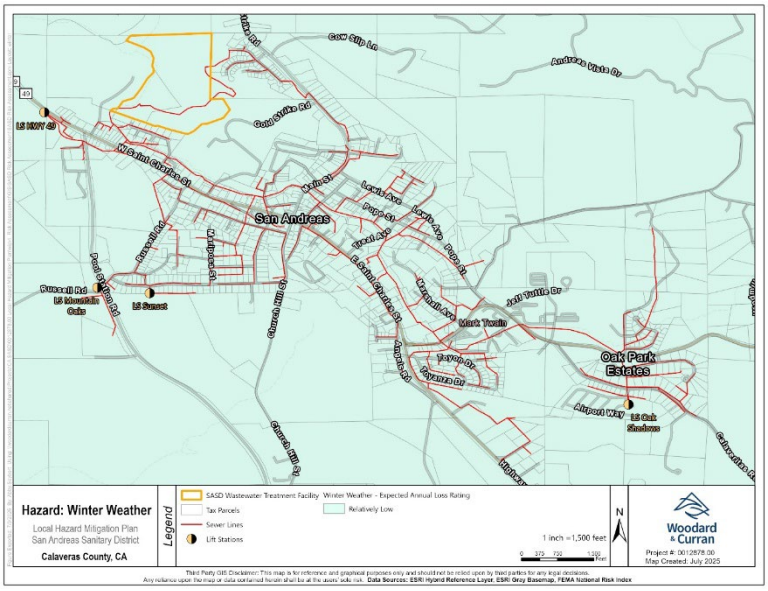


FIGURE 14: WINTER WEATHER

Winter weather can lead to frozen or burst pipes, impact process control equipment that operate automated valves, generally reduce equipment efficiency, and result in hazardous conditions for staff. Even when housed indoors, extreme temperatures can freeze WWTF components affecting belt tension, polymer performance, and overall efficiency of process equipment such as the belt filter press. Ice accumulation may damage electrical systems, exposed piping, and mechanical components, while snow and frost can block access roads and delay maintenance or emergency response. Prolonged cold can also affect biological treatment processes, reduce microbial activity and slowing wastewater treatment. Additionally, winter storms may cause power outages and road blockages, further disrupting operations.

4.2.5.7 Tornado

Tornadoes can occur anywhere within the service area, though the risk is generally low. The flat terrain and open spaces near the treatment plant and land application areas could be vulnerable to wind damage if a tornado were to touch down nearby. Most tornadoes in the region are classified as EF0 to EF1 on the Enhanced Fujita Scale, indicating wind speeds between 65 and 110 mph.

In March 2005, a weak tornado was reported near Valley Springs, causing minor tree and fence damage. More recently, in April 2020, a funnel cloud was observed near Angels Camp, though it did not touch down. While no tornadoes have directly impacted SASD facilities, these events demonstrate the potential for isolated but damaging wind events. The probability of a tornado impacting the SASD is considered low, but not zero. Tornadoes in California are most likely during spring and fall transitional weather patterns.

As shown in **Figure 15**, all of SASD assets are within an area with an expected annual loss rating of Very Low for Tornadoes.

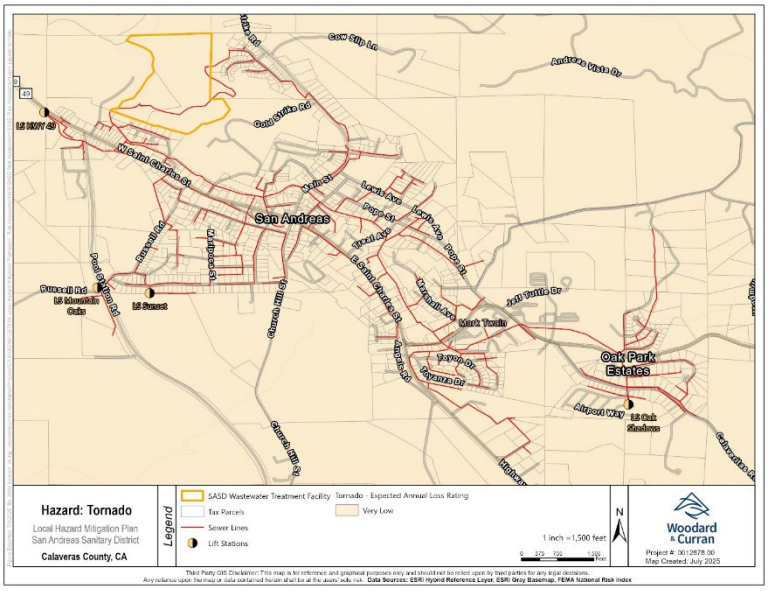


FIGURE 15: TORNADO

Potential impacts include structural damage to treatment facilities, lift stations, and storage tanks, as well as destruction of fencing, solar panels, and exposed equipment. Tornadoes can also disrupt power and communication systems, scatter hazardous materials, and block access roads with debris, hindering emergency response. Open-air assets like Pond D are particularly vulnerable to windborne debris and contamination.

4.3 Conclusion

The vulnerability status of the SASD is summarized in **Figure 16** to show areas within the service area that are most to least vulnerable to all natural hazards combined. It can serve as a geographical guide to where efforts should be allocated for greatest hazard mitigation benefit.

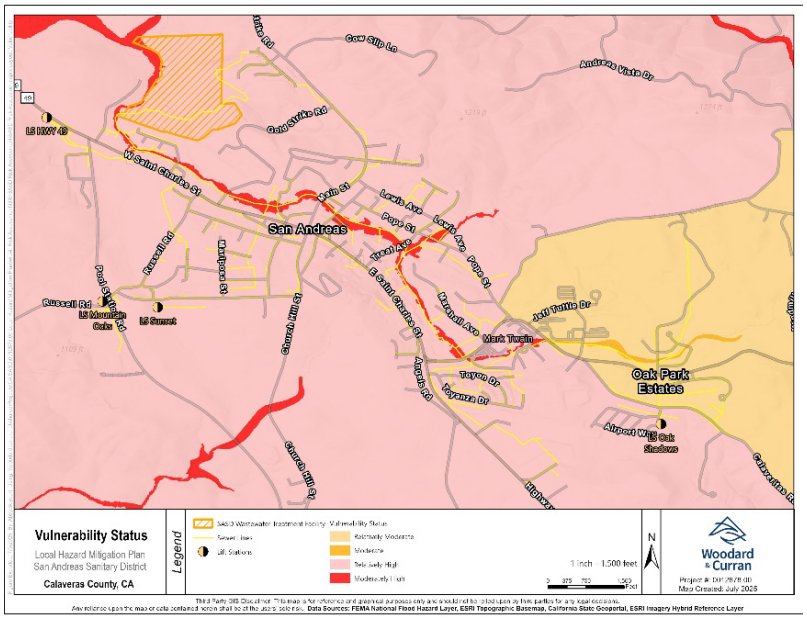


FIGURE 16: VULNERABILITY STATUS

4.4 Future Trends and Vulnerabilities

Climate projections for the region indicate hotter, drier summers and more intense storm events, which may increase wildfire risk and strain stormwater systems. The District also faces single-point vulnerabilities, including reliance on PG&E power feed and limited access routes to the treatment plant and lift stations. These dependencies heighten the risk of service interruption during hazard events and underscore the importance of targeted mitigation actions.

5. MITIGATION GOALS, OBJECTIVES, AND ACTIONS (C3)

The SASD's facilities stretch over an area of multiple natural hazards, and the system has a range of vulnerabilities to these hazards. Damage to one or more critical elements of the facilities may impact the SASD's ability to provide continuous sanitation services during and following a natural disaster, which may compromise public health and safety as well as pose environmental risks.

The SASD takes this responsibility seriously and has developed this plan to systematically address the vulnerabilities of its wastewater transmission, treatment, and disposal systems. In this capacity, the SASD's goals are in line with the goals of the community as addressed in the 2023 SASD Master Plan Update. The District's main goals are to reduce the vulnerability of people and property exposed to landslides, wildfires, earthquakes, and riverine flooding hazards. One of the approaches identified for meeting these goals is to promote the implementation of disaster mitigation projects and to increase disaster resistance and reliability. Considering the desires of the community, as expressed in the District's plan and the understanding of the system vulnerabilities, the SASD has formulated the following 3 main goals:

- **Goal 1**: Enhance organizational preparedness for natural disaster response.
- **Goal 2**: Strengthen the reliability of SASD's physical assets, including the wastewater collection and conveyance system, wastewater treatment facility, pump stations, and the effluent storage pond during and after natural disasters.
- **Goal 3**: Increase workforce resilience to natural disasters.

Based on the insights obtained from a system-wide natural hazard reliability assessment of the SASD's facilities, a series of goals, objectives, and mitigation actions are included in this plan to form the basis of a hazard mitigation strategy. The identified goals and objectives are intended to enhance system reliability, emergency response, and overall operational resilience in the face of potential risks to public health and safety and the environment from specific hazards and system vulnerabilities associated with the SASD facilities. For each goal, objectives that more specifically address areas of mitigation have been developed along with related mitigation actions that support implementation of those objectives. Actions were identified to address the vulnerabilities of SASD's assets. As discussed further in Chapter 6, Plan Implementation, the SASD will prioritize hazard mitigation upgrades and the safe operation of its systems through a strategic implementation approach. This strategy focuses first on addressing the most significant vulnerabilities, those with the highest potential impact and likelihood of occurrence (see Chapter 6).

Goal 1: Enhance organizational preparedness for natural disaster response.

Objective 1.1: Enhance operators' ability to identify and address issues quickly during and after disasters.

- **Action 1.1:** Upgrade Supervisory Control and Data Acquisition (SCADA) system infrastructure that would minimize vulnerability of SCADA operations during and after natural disasters.
- **Action 1.2:** Enhance the SCADA system infrastructure to include redundant remote communications to improve how operators communicate when offsite.
- **Action 1.3:** Automation and Monitoring Upgrades. Install automated process controls for automatic and remote access operation of flow diversion and process feed. Upgrade process critical manual valves and gates with motorized operators, replace antiquated

motorized operators, install new flow meters and sensors to allow for automatic and remote operation of the valves, upgrade and replace conduit, wiring, and programming of the communications for remote access capabilities to be able to signal for valve operators working in tandem with flow meters throughout the plant. New electrical and signal lines would need to be run to the new and upgraded equipment and back to the plant SCADA system for reliable controls. New programming would be uploaded to the current system after a control narrative is developed and adopted, as well as updating a user-friendly interface to allow for remote access and control of the equipment.

- **Action 1.4:** Install Solar Voltaic Panels (300 kW) onsite and install onsite battery bank for surplus and emergency power
- **Action 1.5**: Assess installation of a different method of disinfection, Peracetic Acid, which is simpler to operate, requires less retrofitting and poses fewer safety risks, and requires less deliveries of chemicals which can be problematic during natural disasters when supply chains are disrupted.
- **Action 1.6**: Assess installation of a different method of disinfection, Ultraviolet (UV), which eliminates the need for chemical handling or storage altogether and reduces risks to workers and communities, especially during natural disasters when infrastructure may be compromised.
- **Action 1.7:** Ensure proper grounding, surge protection, and backup power systems.

Objective 1.2: Strengthen SASD's ability to restore service after a natural disaster.

- **Action 1.8:** Purchase a vacuum truck, flexible hoses, emergency pumps, generators, pipe clamps, and related emergency response equipment.

Goal 2: Strengthen the reliability of SASD's physical assets, including the wastewater collection and conveyance system, wastewater treatment facility, pump stations, and the effluent storage pond during and after natural disasters.

Objective 2.1: Complete improvements to the wastewater treatment facility to modernize and protect against natural hazards.

- **Action 2.1:** Rehabilitate aging infrastructure at the WWTF including, replacing or upgrading old equipment, installing new equipment, make electrical and controls upgrades, and address a diverse backlog of other high priority issues.
- **Action 2.2:** Rehabilitate the primary sedimentation system, particularly to address the system's vulnerability to flooding hazard.
- **Action 2.3:** Trickling Filter & Primary Clarifier Rehabilitation. Rehabilitate original process equipment and structures including primary clarifier and trickling filter.
- **Action 2.4:** Rehabilitate secondary clarifier
- **Action 2.5:** Rehabilitate intermediate clarifier
- **Action 2.6:** Upgrade secondary process to increase capacity and reliability by installing additional secondary clarifier and RAS/WAS pumping. Project is recommended to build in tandem with primary and secondary clarifier rehabilitation primary clarifier as well as Trickling Filter.

Objective 2.2: Develop a condition assessment program and implement a phased collection system hazard mitigation program.

- **Action 2.7:** Phase 1 of the District's collection system hazard mitigation program would consist of repairing, rehabilitation, or replacement of defective collection system pipelines and manholes as recommended by the highest priorities identified by the District's condition assessment program. The projects would also repair, rehabilitate, or replace manholes and make easement access improvements, as necessary
- **Action 2.8:** Phase 2 would consist of replacing under-capacity pipes with larger pipes as recommended by the District's condition assessment
- **Action 2.9:** Phase 3 would consist of conducting detailed field investigations and then eliminating specific inflow and infiltration sources in the collection system through the repair, replacement, or rehabilitation of defective pipelines and manholes. It would also include the development and implementation of a private lateral program to help reduce infiltration from private laterals long term

Objective 2.3: Develop and implement recommendations from a lift station condition assessment study

- **Action 2.10:** Rehabilitate and improve pump stations as recommended by a pump station condition assessment study. Oak Shadows and Highway 49 Lift Stations are particularly vulnerable to multiple hazards and should be prioritized

Objective 2.4: Develop and implement an operational strategy to mitigate the effects of climate-related hazards to Pond D.

- **Action 2.11:** Implement Pond D Drainage Diversion Improvement Project

Objective 2.5: Develop and implement an operational strategy to mitigate the effects of climate-related hazards to the outfall pipe and other discharge points.

- **Action 2.12:** Implement improvements to outfall pipes and discharge points that are identified by an operational strategy.

Objective 2.6: Develop and implement a design strategy to mitigate the effects of landslides on SASD assets.

- **Action 2.13:** Evaluate and, if needed, design and mitigate the effects of landslides on SASD assets.
- **Action 2.14:** Evaluate and, if needed, design and mitigate the effects of landslides, particularly for SASD assets along Highway 49, Main Street, St. Charles Street, and Gold Strike Road, and at the WWTF (i.e., collection and conveyance infrastructure, the Highway 49 Lift Station, and Pond D at the WWTP).

Objective 2.7: Develop and implement a design strategy to mitigate the effects of wildfires on SASD assets.

- **Action 2.15:** Evaluate and, if needed, design and mitigate the effects of wildfire on SASD assets.
- **Action 2.16:** Develop and implement a post-fire inspection plan system-wide

Objective 2.8: Develop and implement a design strategy to mitigate the effects of drought and heat waves.

- **Action 2.17:** Evaluate and, if needed, design and mitigate the effects of drought and heat waves on SASD assets.
- **Action 2.18:** Study the impacts on the WWTF due to the reduced flow and increase concentration of wastewater that can cause corrosion in the collection system piping and noxious odors to community.

Objective 2.9: Develop and implement a design strategy to mitigate the effects of high stream flows and significant rainstorms.

- **Action 2.19:** Evaluate and, if needed, design and mitigate the effects of high stream flows on the collection system at along Main Street, St. Charles Street, and Gold Strike Road.
- **Action 2.20:** Install additional wet weather diversion and storage post headworks by repurposing Ponds B and C and installing lift station return flows to the headworks.
- **Action 2.21:** Evaluate and, if needed, design and mitigate the effects of storm water inflow and infiltration on the collection system during significant rainstorms

Objective 2.10: Develop and implement a design strategy to mitigate the effects of seismic hazards.

- **Action 2.22:** Evaluate and, if needed, design and mitigate seismic hazard at vulnerable locations as identified by the site-specific studies
- **Action 2.23:** Seismic retrofit and structural rehabilitation of Trickling Filter, Secondary Process, Tertiary Filtration, Aerobic Digestion, and Effluent Disposal systems.

Goal 3: Increase workforce resilience to natural disasters.

Objective 3.1: Improve workforce preparedness and training in emergency situations

- **Action 3.1:** Conduct regular emergency drills (e.g. fire, severe weather)
- **Action 3.2:** Provide resilience training for staff (e.g. stress management, crisis communication)
- **Action 3.3:** Create a continuity of operations plan that includes remote work capabilities
- **Action 3.4:** Cybersecurity Vulnerability Assessment. Perform a vulnerability assessment to identify potential weaknesses and threats to cybersecurity.

Objective 3.2: Prioritize employee health and wellbeing during and after natural disasters

- **Action 3.5:** Create a mental health support program for employees post-disaster
- **Action 3.6:** Stock emergency supplies (e.g. PPE, first aid kits, water, food)
- **Action 3.7:** Develop flexible leave policies for disaster related absences
- **Action 3.8:** Partner with local healthcare providers for rapid response support

Objective 3.3: Develop policies and governance structures to improve response during and after natural disasters

- **Action 3.9:** Integrate workforce resilience into human resource policies
- **Action 3.10:** Review and update insurance coverage for workforce-related disruptions

Objective 3.4: Optimize communications and engagement during and after natural disasters

- **Action 3.11:** Engage employees in hazard identification and planning through survey or workshops
- **Action 3.12:** Establish redundant communication channels (e.g., radios, satellite phones)

Table 5-1 below demonstrates the hazards addressed by each mitigation action.

TABLE 5-1: HAZARDS ADDRESSED BY MITIGATION ACTIONS (C4)

Hazards Addressed											
Mitigation Action	Landslides	Wildfire	Drought	Heat Waves	Earthquake	Riverine Flooding	Lightning	Strong Winds	Hail	Winter Weather	Tornado
1.1 -- 1.8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.2						✓					
2.3 -- 2.10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.11 & 12						✓			✓	✓	
2.13 & 2.14	✓				✓	✓					
2.15 & 2.16	✓	✓	✓	✓							
2.17 & 2.18			✓	✓							
2.19 -- 2.21						✓			✓	✓	
2.22 & 2.23	✓				✓	✓					
3.1 -- 3.12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Notes:	✓ – Core Hazard Addressed			✓ - Secondary Hazard Addressed							

As shown above in **Table 5-1**, the mitigation actions included in this Plan comprehensively address each of the hazards identified through the Plan's risk assessment. These actions were developed based on a thorough evaluation of the potential impacts and likelihood of each hazard, ensuring that the Plan provides targeted strategies to reduce vulnerability and enhance community resilience. By aligning mitigation efforts with the specific risks outlined in the assessment, the Plan demonstrates a proactive and data-driven approach to hazard management.

6. PLAN IMPLEMENTATION

6.1 Implementation Strategy (C5)

The SASD will prioritize hazard mitigation upgrades and the safe operation of its systems through a strategic implementation approach. This strategy focuses first on addressing the most significant vulnerabilities, those with the highest potential impact and likelihood of occurrence. Once these critical issues are mitigated, attention will shift to vulnerabilities of lesser significance and/or lower probability.

Additionally, the SASD incorporates opportunities to address vulnerabilities in conjunction with other necessary upgrades, planned maintenance, or ongoing projects. Newly identified vulnerabilities, whether revealed through updated assessments or refined data, should be prioritized in alignment with established vulnerabilities and addressed as resources allow. Continued improvement in the reliability of the system and responsiveness to natural disasters is expected to be a key outcome of this approach.

The actions identified in Chapter 5 address SASD's mitigation goals and objectives. However, implementation is based on mitigation and/or benefit of the individual mitigation actions identified. Key elements in determining implementation priorities include:

Significance of impact

Projects with the greatest impact on protecting the community will be prioritized. The significance of impact will be assessed by evaluating potential consequences to public health, safety, infrastructure, and the environment, with particular attention to the number of people affected.

While cost remains an important consideration (see below), it may be outweighed by the scale and severity of potential outcomes. This approach ensures that decisions reflect the District's commitment to safeguarding its community above all else.

Likelihood of failure

Priority will be given to critical facilities and operations, especially those with a higher likelihood of failure. As part of the decision-making process, the probability of system or component failure will be considered based on the Hazard Identification and Risk Assessment in Chapter 5.

This risk-based approach ensures that resources are directed where they are most needed, while also recognizing that likelihood of failure is a critical factor.

Cost to implement

While cost will be a key consideration, it will not be the sole factor in decision-making. The District will also evaluate positive externalities, such as environmental benefits, community health improvements, and long-term sustainability impacts, that may not be captured in direct financial metrics.

Additionally, as a smaller wastewater district, SASD does not benefit from the economies of scale that larger agencies experience. This means that while per-unit costs may be higher, investments often yield localized benefits that are deeply aligned with the goals and objectives of this plan.

6.2 Responsible Party

The SASD Board of Directors shall serve as the primary coordinating body responsible for final decision-making regarding the implementation of the LHMP. The Board will review and approve mitigation actions, ensure alignment with district priorities, and authorize necessary resources to support plan execution.

The Board of Directors convenes monthly to conduct regular business, including updates on hazard mitigation efforts. In the event of urgent matters or emerging threats, the Board retains the authority to call emergency meetings to address time-sensitive decisions related to plan implementation.

Oversight of day-to-day implementation activities will be delegated to District staff leadership, primarily the General Manager, who will manage coordination across departments, monitor progress on mitigation actions, and prepare updates for Board review.

6.3 Integration of the LHMP into Other Planning Mechanisms

The mitigation actions identified in this LHMP will be actively incorporated into all developed or updated planning efforts including the Capital Improvement Plan (CIP) and Master Plans, as appropriate. This integration ensures that long-term infrastructure investments are aligned with risk reduction strategies and community resilience goals.

In accordance with FEMA and CalOES guidance, mitigation actions will be treated as priority projects, especially those that address vulnerabilities to public health, safety, and critical infrastructure. These actions will be evaluated not only for their cost-effectiveness but also for their potential to reduce risk, protect the community, and deliver positive externalities such as environmental and equity benefits.

By embedding mitigation into the CIP and Master Plan, the District can:

- Strategically allocate resources to high-impact, risk-reducing projects.
- Improve eligibility for state and federal funding.
- Ensure consistency across planning documents.

This approach reflects the District's commitment to proactive planning and positions mitigation as a core component of infrastructure development.

6.4 Implementation Tiers

The SASD's implementation strategy is based on a two-tier system:

Primary Actions

Primary actions represent the highest-priority mitigation measures, selected based on their potential to significantly enhance the overall reliability and resilience of the system. Primary actions are estimated to have potential to be completed or initiated within the 5-year life of this plan based on current projections of available resources and/or opportunities. These actions are characterized by:

- High Significance of Impact: Substantial impact if unaddressed.

- High Likelihood of Failure: Elevated risk of occurrence based on current assessments.
- Strong Cost-Benefit: The improvement will provide benefits and positive externalities to the service area that justify the cost of the implementation.

Secondary Actions

Secondary actions offer additional risk reduction to SASD facilities and operations and will further enhance the system's reliability and resilience, following the implementation of the primary actions. Secondary actions consist of those actions for which the availability of dedicated resources or opportunities are not likely with the 5-year plan life.

With this approach, primary actions will generally be implemented with greater priority. However, some secondary actions may be implemented ahead of more critical primary actions due to such factors as the availability of different resources or opportunities.

6.5 Priority Actions [NEW]

The SASD LHMP actions have been further prioritized into the following categories:

- A1: Maintaining power and communication, emergency supplies, and critical equipment, addressing multiple high-risk hazards.
- A2: Workforce resilience, policies, and training and operations, addressing multiple high-risk hazards.
- A3: Critical facility and infrastructure upgrades and upgrades that address the highest risk hazards.
- A4: Retrofits and projects that would evaluate, design, and mitigate the effects of high risk and other hazards.
- B1: Important hazard mitigation projects; however, are unlikely to be achieved within five years.

For SASD, each LHMP action is important to pursue. The priority action categories allow SASD to pursue hazard mitigation and resilience on multiple fronts.

Table 6-1 categorizes the LHMP actions by implementation tier and priority action. Also included, is the potential funding opportunity that SASD could pursue to support the implementation of LHMP actions. Pursuing outside funding could leverage SASD's limited resources to mitigate the effects of hazards and become more resilient on a quicker timeline. **Appendix C** includes the scoring matrix for how LHMP actions were prioritized within each priority action category.

TABLE 6-1: 2025 SASD LHMP ACTIONS

Implementation Tier	Priority	LHMP Action	Description	Funding Opportunity
Primary Action	A1	3.6	Stock emergency supplies (e.g. PPE, first aid kits, water, food).	EMPG, BRIC, USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants
		3.12	Establish redundant communication channels (e.g., radios, satellite phones).	General Infrastructure Grants, CWSRF, BRIC
		1.7	Ensure proper grounding, surge protection, and backup power systems.	
		1.8	Purchase a vacuum truck, flexible hoses, emergency pumps, generators, pipe clamps, and related emergency response equipment.	EMPG, BRIC, USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants
		1.1	Upgrade Supervisory Control and Data Acquisition (SCADA) system infrastructure that would minimize vulnerability of SCADA operations during and after natural disasters.	CWSRF, California Energy Commission
		1.2	Enhance the SCADA system infrastructure to include redundant remote communications to improve how operators communicate when offsite.	
		1.3	Automation and Monitoring Upgrades. Install automated process controls for automatic and remote access operation of flow diversion and process feed. Upgrade process critical manual valves and gates with motorized operators, replace antiquated motorized operators, install new flow meters and sensors to allow for automatic and remote operation of the valves, upgrade and replace conduit, wiring, and programming of the communications for remote access capabilities to be able to signal for valve operators working in tandem with flow meters throughout the plant. New electrical and signal lines would need to be run to the new and upgraded equipment and back to the plant SCADA system for reliable controls. New programming would be uploaded to the current system after a control narrative is developed and adopted, as well as updating a user-friendly interface to allow for remote access and control of the equipment.	
		2.16	Develop and implement a post-fire inspection plan system wide.	HMGP, Wildfire Prevention Grant Program
		1.4	Install Solar Voltaic Panels (300 kW) onsite and install onsite battery bank for surplus and emergency power.	SGIP, CEC-Solar for All Program, ITC - Inflation Reduction Act, CEIC, REAP
	A2	3.1	Conduct regular emergency drills (e.g. fire, severe weather).	HMGP, Wildfire Prevention Grant Program, EMPG, BRIC, USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants
		3.9	Integrate workforce resilience into human resource policies.	EMPG, BRIC, FEMA Workforce Resilience, EDA Disaster Supplemental Grant
		3.2	Provide resilience training for staff (e.g. stress management, crisis communication).	EMPG, BRIC
		3.10	Review and update insurance coverage for workforce-related disruptions.	FEMA Workforce Resilience, EDA Disaster Supplemental Grant
		3.11	Engage employees in hazard identification and planning through survey or workshops.	General Infrastructure Grants, CWSRF, BRIC
		3.3	Create a continuity of operations plan that includes remote work capabilities.	
		3.8	Partner with local healthcare providers for rapid response support.	
		3.5	Create a mental health support program for employees' post-disaster.	FEMA Workforce Resilience, EDA Disaster Supplemental Grant
		3.7	Develop flexible leave policies for disaster related absences.	General Infrastructure Grants, CWSRF, BRIC

Implementation Tier	Priority	LHMP Action	Description	Funding Opportunity
	A3	2.9	Conduct detailed field investigations and eliminate specific inflow and infiltration sources in the collection system through the repair, replacement, or rehabilitation of defective pipelines and manholes. This includes the development and implementation of a private lateral program to help reduce infiltration from private laterals long term.	CWSRF, Proposition 4, Small Community Wastewater Program, USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants
		2.1	Rehabilitate aging infrastructure at the WWTF including, replacing or upgrading old equipment, installing new equipment, making electrical and controls upgrades, and addressing a diverse backlog of other high priority issues.	General Infrastructure Grants, CWSRF, BRIC
		2.3	Trickling Filter & Primary Clarifier Rehabilitation. Rehabilitate original process equipment and structures including primary clarifier and trickling filter.	USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants
		2.11	Implement Pond D Drainage Diversion Improvement Project.	
		2.20	Install additional wet weather diversion and storage post headworks by repurposing Ponds B and C and installing lift station return flows to the headworks.	
		2.10	Rehabilitate and improve pump stations as recommended by a pump station condition assessment study. Oak Shadows and Highway 49 Lift Stations are particularly vulnerable to multiple hazards and should be prioritized.	
		2.7	Repair, rehabilitate, or replace defective collection system pipelines and manholes as recommended by the highest priorities identified by a condition assessment program. The projects would also repair, rehabilitate, or replace manholes and make easement access improvements, as necessary.	CWSRF, Proposition 4, Small Community Wastewater Program, USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants
		2.8	Replace under-capacity pipes with larger pipes as recommended by a condition assessment.	General Infrastructure Grants, CWSRF, BRIC
		1.5	Assess installation of a different method of disinfection, Peracetic Acid, which is simpler to operate, requires less retrofitting and poses fewer safety risks, and requires less deliveries of chemicals which can be problematic during natural disasters when supply chains are disrupted.	
		2.12	Implement improvements to outfall pipes and discharge points that are identified by an operational strategy.	
		1.6	Assess installation of a different method of disinfection, Ultraviolet (UV), which eliminates the need for chemical handling or storage altogether and reduces risks to workers and communities, especially during natural disasters when infrastructure may be compromised.	
	A4	2.18	Study the impacts on the WWTF due to the reduced flow and increase concentration of wastewater that can cause corrosion in the collection system piping and noxious odors to community.	CWSRF, Proposition 4, Small Community Wastewater Program, USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants
		2.19	Evaluate and, if needed, design and mitigate the effects of high stream flows on the collection system at along Main Street, St. Charles Street, and Gold Strike Road.	
		2.21	Evaluate and, if needed, design and mitigate the effects of storm water inflow and infiltration on the collection system during significant rainstorms.	
		2.14	Evaluate and, if needed, design and mitigate the effects of landslides, particularly for SASD assets along Highway 49, Main Street, St. Charles Street, and Gold Strike Road, and at the WWTF (i.e., collection and conveyance infrastructure, the Highway 49 Lift Station, and Pond D at the WWTP).	USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants
		2.17	Evaluate and, if needed, design and mitigate the effects of drought and heat waves on SASD assets.	General Infrastructure Grants, CWSRF, BRIC
		2.15	Evaluate and, if needed, design and mitigate the effects of wildfire on SASD assets.	HMGP, Wildfire Prevention Grant Program
		2.23	Seismic retrofit and structural rehabilitation of Trickling Filter, Secondary Process, Tertiary Filtration, Aerobic Digestion, and Effluent Disposal systems.	BRIC, FEMA
		2.13	Evaluate and, if needed, design and mitigate the effects of landslides on SASD assets.	General Infrastructure Grants, CWSRF, BRIC
		2.22	Evaluate and, if needed, design and mitigate seismic hazard at vulnerable locations as identified by the site-specific studies.	BRIC, FEMA

Implementation Tier	Priority	LHMP Action	Description	Funding Opportunity
Secondary Action	B1	2.4	Rehabilitate secondary clarifier.	USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants
		3.4	Cybersecurity Vulnerability Assessment. Perform a vulnerability assessment to identify potential weaknesses and threats to cybersecurity.	DHS Grants, FEMA Preparedness Grants
		2.6	Upgrade secondary process to increase capacity and reliability by installing additional secondary clarifier and RAS/WAS pumping. Project is recommended to build in tandem with primary and secondary clarifier rehabilitation primary clarifier as well as Trickling Filter.	USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants
		2.5	Rehabilitate intermediate clarifier.	
Notes: Emergency Management Performance Grant (EMPG); Building Resilient Infrastructure and Communities (BRIC); United States Department of Agriculture (USDA); Emergency Community Water Assistance Grants (ECWAG); Clean Water State Revolving Fund (CWSRF); Hazard Mitigation Grant Program (HMGP); Self-Generation Incentive Program (SGIP); California Energy Commission (CEC); Investment Tax Credit (ITC); Clean Energy Investment Center (CEIC); Rural Energy for America Program (REAP); Federal Emergency Management Agency (FEMA); United States Economic Development Administration (EDA)				

7. PLAN MAINTENANCE

To ensure the effectiveness of meeting its objectives, the LHMP will rely on an ongoing program of assessment, which will review updated hazard conditions to ensure the validity of the mitigation priorities. The program will be managed with monitoring and maintenance of this hazard mitigation plan through a five-year update cycle. However, changes to the plan based on prioritization or implementation may be prompted within that timeframe by the occurrence of a hazard event.

7.1 Monitoring, Evaluating, and Updating the Plan

7.1.1 Monitoring the Plan

The SASD will keep the plan active through continued monitoring of the plan's objectives. The SASD will incorporate the hazard mitigation plan into other District plans, policies, and programs, including its yearly CIP planning process for projects that can be implemented over the next five years to monitor progress towards the objectives of the hazard mitigation plan. Because of the initiative of the SASD's District Manager and monthly regular board meetings committed to addressing the topic of hazard mitigation, the entire executive management of the SASD is committed to implementing the objectives of the plan. The District Manager will review the LHMP annually.

- Implementation of the plan will be monitored: annually
- The plan will be monitored by: The SASD District Manager
- How implementation of the plan will be monitored: The SASD District Manager will review the following:
    - Recent hazard events that occurred within the District's boundaries within the past year, including the scale of impact.
    - Mitigation activities in the Plan which have been implemented and are achieving success.
    - The timeline of implementation of mitigation activities, and whether the timeline should be amended.
    - Any mitigation actions prioritized for the past year which have not been completed.
    - The need for any new or revised mitigation actions.

7.1.2 Evaluating the Plan

- The plan will be evaluated: At least annually
- Who will evaluate the plan: The SASD District Manager
- How the plan will be evaluated: A team led by the SASD District Manager will conduct research and collect data to identify areas where the plan can be improved. New research-based evidence that can be used to assess risk will be implemented into the LHMP accordingly. Members of the LHMP team will review the following:

- Hazard events that occurred within the District's boundaries in the past year.
- Any changes or potential changes in funding options for mitigation activities.
- Any new scientific data or mapping that better informs the plan.
- Any new or revised planning programs or other initiatives applicable to SASD that involve hazard mitigation.

The LHMP's effectiveness will be assessed on an annual basis.

7.1.3 Updating the Plan

In compliance with the Disaster Mitigation Act of 2000, this LHMP will be updated every five years. The SASD will also update the plan if a significant change in the current assumptions arise. The SASD will apply for grant funding at least 16-18 months prior to the plan expiring to help cover the cost to update the LHMP.

- How the plan will be updated: The SASD District Manager, designated staff, or hired consultant will apply for grant funds for the update. The SASD District Manager, designated staff, or hired consultant will create the Core Planning Team for the update, including an engineer who will update the technical portions of the plan. The SASD District Manager, designated staff, or hired consultant will be in charge of facilitating the update of the plan and ensuring its updated in accordance with state and federal regulations.
- When the plan will be updated: Every 5 years, preferably concurrently with the Capital Improvement Plan, or if significant change to the plan is necessary based on hazard events or new information. A grant funding application will be submitted at least 16-18 months prior to the plan expiring.
- Who will update the plan: The SASD District Manager and potentially a consultant will be responsible for updating the plan.

7.2 Continued Public Involvement

The SASD, with its decision to incorporate the hazard mitigation plan in its yearly CIP planning process, has ensured continued public involvement in this plan. CIP approval is an open public process.

To further ensure continued public engagement, SASD will ensure the Plan is available on the SASD's webpage after it has been approved to allow the public an opportunity to provide continual feedback and input. As future needs and concerns arise, or if the public would like to provide feedback regarding the latest version of the Plan, the public is invited to use the comment form, which is provided on the website, to provide comments.

County Hazard Mitigation Webpage: https://sasanitary.org/

Comment Form: x

SASD will continue to work with Calaveras County and stakeholders to ensure that the public has an opportunity to learn about the Plan, mitigation actions planned for their community, and ways to get

involved. Hazard mitigation will be a part of the District's community outreach strategy to include, but not limited to, public meetings, community events, and newsletters throughout the year. Furthermore, SASD will continue to ensure equitable outreach by working with other departments, non-profits, and agencies that work with underserved communities throughout the County.

8. WORKS CITED

FEMA. (2025). Local Mitigation Planning Policy Guide (FP-206-21-0002). Retrieved from https://www.fema.gov/sites/default/files/documents/fema_hmd_local-mitigation-planning-policy-guide_2025.pdf

APPENDIX A: PUBLIC OUTREACH DOCUMENTATION

SASDnews
The official newsletter of San Andreas Sanitary District
San Andreas Sanitary District
March 2025

San Andreas Sanitary District Focuses on Emergency Preparedness in 2025

Recent weather events and wildfires have demonstrated more than ever the need to be prepared for an emergency that will impact not only individuals but the entire community. Some events do not provide much advance warning while others allow for a few days of planning. Either way, the District is implementing measures that will allow for mitigation and efficient recovery following an emergency. Read on to learn about three key components of the District's strategy and the precautionary efforts that you can implement at home.

Local Hazard Mitigation Plan Development

SASD is pleased to have received grants from the Federal Emergency Management Agency (FEMA) and Cal Office of Emergency Services (Cal OES) to develop a Local Hazard Mitigation Plan (LHMP) that will complete a comprehensive risk assessment and identify mitigation actions for the District. The plan will examine the environmental impacts from wildfire, drought, power disruption and extreme wet weather conditions have on the sewer system, and ultimately the community. Mitigation efforts will include staff training and identification of key actions and projects that will protect public health and safety, provide vital sanitary sewer services, protect the environment and ensure staff safety during an emergency.

The completed plan also makes the District eligible for funding through Building Resilient Infrastructure Communities (BRIC) and Flood Mitigation Assistance programs, as well as prior-approved grant funding from FEMA for projects identified in the LHMP.

Why is this important?

It means that should a catastrophic event hit the San Andreas community, the District is in the position to receive immediate financial assistance to ensure vital infrastructure is replaced or repaired to working condition as soon as possible.

Staff Training

District staff are continuously training for various emergency scenarios. This coming year, training is targeted on enhancing our response to natural disasters and ensuring public safety. Examples include proper application of CPR and use of an automated external defibrillator (AED), with instruction provided by Eric Werner, the District's certified trainer. Staff will also receive enhanced flagger and road safety training, especially when clearing sewer obstructions during rain events.

Community Collaboration

The District provides a vital service to San Andreas and values the community it serves. Customers will receive updates about the LHMP and be asked to participate in its development. Opportunities for public involvement, including workshops, will be publicized in the coming year.

Emergency preparedness applies to the community at every level. In addition to developing the LHMP, the District is pursuing opportunities to partner with community organizations, local utilities, and emergency service providers to identify collaboration efforts to better assist the community during an emergency. For example, SASD is currently coordinating with the school district on fire mitigation efforts along our shared fence line with Calaveras High. The school received a grant for clearing brush and fire hazard materials, and our District was able to join the effort.

The District conducts an annual elementary school outreach program that includes a classroom lesson, plant tour with hands-on activities, and an art contest. The theme of this year's program will incorporate topics about Emergency Preparedness and how families can prepare in advance. *(See Be Prepared article)*

Be Prepared!

Simple tips and preparedness can make a big difference when faced with a challenging situation. Is your emergency kit ready?

Wet Weather Tips:

- ☑ Use caution driving through running water on streets. Avoid standing water and flooded areas.
- ☑ Keep storm drains clear of debris to prevent street flooding.
- ☑ Make sure windshield wipers are properly working.

HOW TO REACH US

Contact the District at office@sasanitary.org or (209) 754-3281.
Stay updated on District news at **sasanitary.org**.
After-hour emergencies? Call the District's 24-hour Service Line at (209) 754-3281.

SASDnews
The official newsletter of San Andreas Sanitary District
San Andreas Sanitary District
May/June 2025

SAN ANDREAS SANITARY DISTRICT INITIATES LOCAL HAZARD MITIGATION PLAN

Work continues on the development of the District's Local Hazard Mitigation Plan (LHMP), which aims to identify and address potential hazards that could impact the San Andreas community and infrastructure. The goal is to enhance the resilience of the District against various risks, ensuring the safety and continuity of sanitary sewer service.

Initial efforts focused on Hazard Identification and Risk Assessment, where a long list of hazards was evaluated to determine how vulnerable the District is to them. The hazard identification process is based on data from the Federal Emergency Management Agency (FEMA), National Risk Index Community Report for Calaveras County and the Calaveras County Multi-Jurisdictional Hazard Mitigation Plan. These sources help anticipate and prepare for hazards that could affect SASD's system. Some of the hazards evaluated included:

1. Strong winds
2. Wildfires
3. Landslides
4. Earthquakes
5. Flood

Next, the District will look at its own infrastructure to determine how each of the identified hazards could impact parts of the sanitation system so that a mitigation plan can be created to protect the San Andreas community.

SASD is pleased to have received grants from FEMA and Cal Office of Emergency Services (Cal OES) to develop the LHMP. The final plan will ensure the District is eligible for funding through Building Resilient Infrastructure Communities (BRIC) and Flood Mitigation Assistance programs, as well as prior-approved grant funding from FEMA for projects identified in the LHMP. These efforts will demonstrate that the District is in the position to receive immediate financial assistance to ensure vital infrastructure in the event of an emergency.

Cal OES
GOVERNOR'S OFFICE OF EMERGENCY SERVICES

The California Governor's Office of Emergency Services
Local Mitigation Planning Program
recognizes the professional achievement of

Hugh Logan

who has completed the

4-Hour Local Hazard Mitigation Planning Workshop for Local Jurisdictions

offered at Cal OES, Building A in Mather, CA on

Tuesday, December 3, 2024

Robyn Fennig
California State Hazard Mitigation Officer,
Assistant Director of Hazard Mitigation

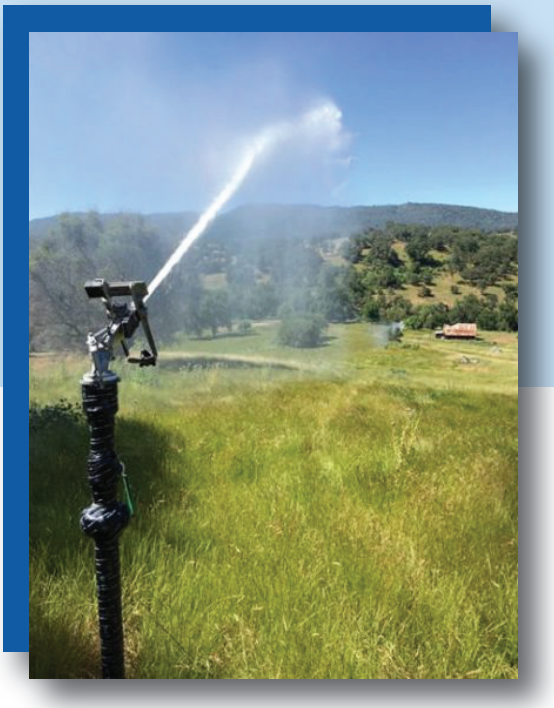
Victoria LaMar-Haas
Division Chief
Cal OES Mitigation Planning

FUEL REDUCTION COLLABORATION EFFORT COMPLETE

The District recently coordinated with Calaveras High School (CHS) in its efforts to complete fire mitigation measures along school and District's shared fence line. A total of 1,000 linear feet of brush and fire hazard debris was cleared by a contractor as part of the collaborative effort. The project was funded through a grant received by CHS.

DUAL BENEFIT DISPOSAL

As the weather warms and green fields start to dry, SASD increases its disposal of treated wastewater on its spray fields. The practice involves pumping disinfected wastewater through an irrigation system where dozens of spray nozzles release the water on the surrounding property. By releasing water on the spray fields, the District is not only returning water back to the environment but also reducing the risk of fire around the property by keeping the landscaping watered.



COMPLETE HOT WORK DURING COOL MORNING HOURS

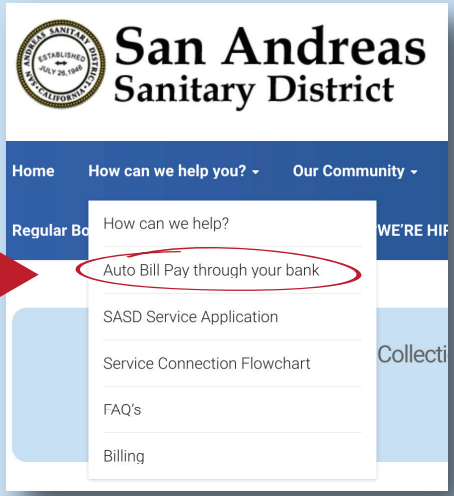
Summer in San Andreas brings hot temperatures and with that, the increased risk of grass fires. SASD enforces specific safety measures while conducting "hot work" or work that could potentially spark an unintended spot fire, such as mowing or weed-eating, in dry grass areas. District employees complete landscaping work, welding and other potential fire hazard maintenance jobs first thing in the morning before temperatures, and the risk of spark fires, increase. District vehicles are equipped with fire extinguishers in the event a fire should start whether on the wastewater treatment plant grounds or when working out in the field.

REMINDER!

Revised wastewater rates take affect July 1, 2025. The new, fixed residential rate is $80 per month.

The District offers many options for customers to pay their bill:

- Connect your bank with Online Bill Pay – see website for instructions
- By mail to P.O. Box 1630, San Andreas, CA 95249
- Via payment drop box at the parking lot or by front office door
- In person during office hours



HOW TO REACH US

- Contact the District at office@sasanitary.org or (209) 754-3281. Regular office hours are Monday, Tuesday and Thursday 7:30 a.m. – 3:30 p.m.
- Stay updated on District news at www.sasanitary.org.
- After-hour emergencies? Contact the District's 24-hour Service Line at (209) 754-3281 and press "9" to be connected to a live person.

San Andreas Sanitary District

Clean Water. It's what we do!

Local Hazard Mitigation Plan

At San Andreas Sanitary District, we understand that it is our responsibility to always provide sanitary services, even in the event of a disaster. Keeping our vital service available requires planning and preparation. One way to do so is developing a Local Hazard Mitigation Plan (LHMP).

San Andreas Sewer District (SASD) has received grants from the Federal Emergency Management Agency (FEMA) and the California Office of Emergency Services (Cal OES) to create this comprehensive plan. The LHMP will conduct an in-depth risk assessment and identify key mitigation actions to protect our community from various environmental hazards.

Benefits of the Local Hazard Mitigation Plan:

Comprehensive Risk Assessment:
• The LHMP will evaluate the impacts of wildfire, drought, power disruptions, and extreme wet weather conditions on the sewer system and the community.
Mitigation Actions:
• The plan will outline specific actions and projects to safeguard public health and safety, ensure the continuity of vital sanitary sewer services, protect the environment, and guarantee staff safety during emergencies.
Funding Eligibility:
• Completion of the LHMP makes the District eligible for funding through Building Resilient Infrastructure Communities (BRIC) and Flood Mitigation Assistance programs. Additionally, it opens up opportunities for prior-approved grant funding from FEMA for projects identified in the LHMP.

In the event of a catastrophic event, the San Andreas community will benefit from immediate financial assistance to ensure that vital infrastructure is quickly repaired or replaced. This proactive approach ensures that our community remains resilient and prepared for any emergency, maintaining the safety and well-being of all residents.

By developing the LHMP, SASD is taking significant steps to protect our community and enhance our ability to respond to and recover from environmental hazards.

Hugh Logan Certificate of Training

LHMP Kickoff

LHMP Planning RFP Oct 2024 | LHMP Planning Overview | SASD Newsletter March 2025

APPENDIX B: EXISTING PLANS SUMMARIES

Local

2023 San Andreas Sanitary District (SASD) Master Plan Update

The 2023 San Andreas Sanitary District (SASD) Master Plan Update builds on the previous 2007 and 2016 Master Plans and considers wastewater flows and loads data from September 2018 to November 2022. The goal of the 2023 Wastewater Treatment Master Plan is to provide a sound basis for updating and reprioritizing the District's Capital Improvement Plan and support project funding applications. Other goals of this plan included:

- Quantifying current plant capacity.
- Identifying limiting plant processes.
- Identify future capacity needs based on forecasted growth in the service area.
- Maintaining regulatory compliance and preparing for anticipated future regulations.
- Simplify operations and minimize operating costs.
- Improve performance reliability.
- Identify near-term capital improvement projects.
- Identify plant expansion, upgrade, or maintenance projects for consideration in the long-term capital project planning.

The 2018-2022 wastewater flows and loads were combined with the projected population growth for the service area, which allowed for the development of a design capacity projection for a 20-year planning horizon (2042). The projection showed a 32 percent increase in average annual flow and annual average loadings over the next 20 years; however, this was substantially lower than the projections developed in the 2007 Master Plan. Most likely due to the higher observed flows and loadings in 2007 and the application of more aggressive growth rates in the service area. The projections showed that the headworks, trickling filter, disk filters, and irritation pump station had capacity to serve the 2042 flows and loads; however, capacity expansion would be needed for the primary clarifier, aeration basins, secondary clarifier, and disinfection systems.

Considering the regulatory, environmental, and industry trends, the plan identified long-term planning considerations that included addressing SB1383 biosolids end use limitations and future PFAS regulations requiring monitoring, energy price increases, and public safety power shut offs within 1-5 years; PFAS regulations restricting effluent discharge or biosolids options within 5-10 years; and future nitrogen limitations and increases in peak wet and dry weather flows water conservation measures and water recycling partnerships within 10-20 years.

The relevant key findings of this plan include the wastewater treatment plan does not currently have system redundancy and several process units dating from the original construction require rehabilitation. The plan's recommended projects are categorized as near term (1-5 years) or long-term (5-10 or 10-20 years).

Table ES-4: Recommended Improvement Projects

Item No.	Project Name	Project Description	Project Identifiers	Planning Level Budget	Recommended Action Category
5.1	Trickling Filter & Primary Clarifier Rehabilitation	Rehabilitate original process equipment and structures including primary clarifier and trickling filter	Capital Improvements Project # PL-19-01, File # 60-19	$6,000,000	Near Term (1-5 Years)
5.2	Secondary Clarifier Rehabilitation	Rehabilitate secondary clarifier	Capital Improvements Project # PL-20-01, File # 70-12.07	$400,000	Near Term (1-5 Years)
5.3	Intermediate Clarifier Rehabilitation	Rehabilitate intermediate clarifier	Capital Improvements Project # PL-21-03, File # 70-12.16	$250,000	Near Term (1-5 Years)
Item No.	**Project Name**	**Project Description**	**Project Drivers**	**Opinion of Probable Cost**	**Recommended Action Category**
6.1	Secondary Process Improvements	Upgrade secondary process to increase capacity and reliability by installing additional secondary clarifier and RAS/WAS pumping, maximizing aeration capability with diffusers and additional blower, and installing an anoxic zone. Project is recommended to build in tandem with primary and secondary clarifier rehabilitation primary clarifier as well as Trickling Filter (5.1 & 5.2).	Consistent and reliable operations paired with optimal seasonal effluent quality, per the permitted limits, with simplified operations. Phased approach to developing and upgrading recommended secondary process with a sequencing approach to rehabilitation of the trickling filter secondary clarifier and intermediate clarifier.	5,101,000	Near Term (1-5 Years)
6.2	Onsite Power Generation and Storage	Install Solar Voltaic Panels (300 kW) onsite and install onsite battery bank for surplus and emergency power	Reduce energy costs and provide short term emergency back-up power to minimize disruptions in power delivery.	$2,849,000	Near Term (1-5 Years)
6.3	Wet Weather Diversion and Storage	Install additional wet weather diversion and storage post headworks by repurposing Ponds B and C and installing pump station to return flows to the headworks.	Recent storms and runoff have increased need for future equalization and storage	$1,260,000	Long Term (5-10 Years)
6.4	Water Conservation Impact on Treatment System	Study the impacts on the wastewater treatment facility due to the reduced flow and increase concentration of wastewater.	Senate Bill 606 and Assembly Bill 1668 established more stringent indoor water use limits	$50,000	Near Term (1-5 Years)
6.5	Cybersecurity Vulnerability Assessment	Perform a vulnerability assessment to identify potential weaknesses and threats to cybersecurity	Recent string of private and public security breaches	$20,000	Near Term (1-5 Years)
6.6	Automation and Monitoring Upgrade	Supply automation, instrumentation, and communication to key equipment items, such as valves, gates, and pumps, to allow for automatic flow and process diversion, remote access and control of equipment.	Addition for remote monitoring and automation of plant to maintain permit compliance and reduce emergency call outs and manual operation	$610,000	Near Term (1-5 Years)
6.7A	Disinfection Upgrades (Peracetic Acid)	Move away from chlorinated disinfection and install a different method of disinfection, Peracetic Acid.	Installation of new disinfection methods would eliminate cyanide as a disinfection byproduct.	$417,000	Long Term (10-20 Years)
6.7B	Disinfection Upgrades (UV)	Move away from chlorinated disinfection and install a different method of disinfection, UV.	Installation of new disinfection methods would eliminate cyanide as a disinfection byproduct and reduce total dissolved solids in effluent.	$1,363,000	Long Term (10-20 Years)

2016 San Andreas Sanitary District (SASD) Collection System Master Plan

The 2016 San Andreas Collection System Master Plan includes a three-part series of technical memorandums that cover future land use and flow, collection system expansion plan, and effluent storage and disposal. The summary of each follows:

Future Land Use and Flow. As a basis for projections, this memorandum characterized existing and anticipated future land uses, sanitary sewer flows, and connections. Recent historical influent flows, varying residential vacancy rates in San Andreas, and an existing commitment to the County Jail was considered to arrive at an average dry weather flow of 0.30 Mgal/d as of 2013. Added to this were potential future wastewater flows based on an estimated buildout of the General Plan within the District's boundary and sphere of influence. For future development, an increase in infiltration and inflow (I/I) over and above the rates experienced in the existing system by the District were not expected as a result of improved construction methods and anticipated improvements to the Districts existing system, therefore no additional I/I factor was added to the flow. Buildout within the District boundary consistent with the General Plan was expected to result in a total population of 11,042 and a resulting average flow of 0.98 Mgal/d.

Collection System and Expansion Plan. This memorandum presents recommendations for the districts collection system capital improvement plan, which was based on the results of a hydraulic analysis of the existing collection system. The analysis included evaluating the system for deficiencies then projecting system improvements to increase capacity to serve the anticipated new development. Existing and future sewers were evaluated with respect to their capacity to convey ADWF and a peak wet weather design storm I/I based on a 10-year, 6-hour design storm rainfall. From this, it was recommended that before any new connections were authorized, that the sewer segments from manhole E-1180 to E-1100; E-1000 to E-0900, and E-0900 to E-0800/ be improved.

In addition to the improvements listed in the Table, this memorandum recommended:

1. Conducting CCTV inspection and smoke testing at a rate such that the entire system is inspected in a 5-year cycle; and
2. Budgeting for system rehabilitation and replacement.

Effluent Storage and Disposal. This memorandum contains an evaluation of the District's effluent storage and disposal facilities. The key facility components evaluated under this technical memorandum include:

- Dedicated land disposal areas;
- Discharge to North Fork Calaveras River;
- Effluent Storage; and
- Effluent pumping and conveyance.

The District's NPDES permit contains certain constraints on effluent discharge to the North Fork Calaveras River and to the Dedicated Land Disposal Area (DLDA). Therefore, the District has a number of operational strategies for effluent storage and disposal to both comply with permitting and meet the wastewater service needs of the District. However, this is increasingly challenging

given the variability in hydrologic conditions. There are some conditions that render both disposal methods unavailable to the district. Therefore, this memorandum identified and evaluated alternative approaches to expanding effluent storage and disposal using a series of water balance calculations. The annual water balance calculations were prepared based on 1-in-100-year annual precipitation season conditions. Based on the analysis, it was concluded that even with expanding to the full anticipated potential DLDA area of 65 acres, that expansion of Pond D beyond 7.2 Mgal would be needed. Taking a maximized Pond D volume of 14.8 Mgal, it was estimated that the District would have to expand the DLDA be approximately 23 acres to result in a total of 53 acres of dedicated land disposal to meet storage and disposal needs within the next 20-35 years (or 2036-2051). For effluent pumping, the memorandum recommends to improve irrigation pumping capabilities to the DLDA when the first expansion of these facilities is contemplated; improve pumping capabilities to return secondary effluent from Pond D to the WWTP, at an estimated pumping rate of 900 gpm; and with expansion of the DLDA up to a maximum potential area of 65 acres, phase pumping improvements in increments of 600 to 800 gpm to match the acres of DLDA constructed. In addition, modifications to the way the District manages its discharge to the North Fork Calaveras River to maximize surface water discharge when flows existing in the river are recommended and include:

1. Changes to normal operational procedures are recommended when early winter storms occur and when flows are varying in the North Fork Calaveras River. Changes in procedures are recommended to allow monitoring of river flows on at least an hourly basis and to provide for surface water discharge adjustment such that the surface water discharge tracks with the river flow.
2. Because of the potential for late winter/early spring conditions to remain wet into May, it is plausible that the District would be prohibited from discharging to the DLDA but also prohibited from making a surface water discharge. It is recommended that the District request modification of the NPDES permit to allow discharge through May 31, in particular during wet years.

2012 San Andreas Sanitary District Sanitary Sewer Flow Monitoring and Inflow/Infiltration Study

In 2012, the San Andreas Sanitary District (SASD) conducted a comprehensive Sanitary Sewer Flow Monitoring and Inflow/Infiltration (I/I) Study to assess the condition and performance of its sewer system. This study aimed to identify areas of concern related to inflow and infiltration, which can significantly impact the efficiency and capacity of the wastewater collection and treatment infrastructure. The primary objectives of the study were to: measure and analyze sewer flow rates across various locations within the District to identify patterns and anomalies; locate sources of inflow and infiltration to target mitigation efforts; and assess the overall performance of the sewer system under different weather conditions and flow scenarios.

The study used advanced flow monitoring equipment and techniques such as flow meters, rain gauges, smoke testing, and CCTV inspections to collect data from California's wet season. The equipment assisted in correlating the rainfall data with flow rates, identifying points of vulnerability within the system, and determining whether the district's system has a sufficient capacity to accommodate peak flow conditions.

The study revealed that certain sections of the sewer system were nearing their capacity limits, necessitating targeted upgrades and expansions. A prioritized list of areas requiring immediate repair and maintenance was developed to improve system efficiency and reduce the risk of overflows. Additionally, the data

collected provided valuable support for future planning efforts, including infrastructure upgrades and long-term mitigation strategies.

County

2021 Calaveras County Multi-Jurisdictional Hazard Mitigation Plan

The 2021 Calaveras County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) outlines strategies to reduce vulnerability to natural hazards and enhance community sustainability. It integrates efforts across Calaveras County, the City of Angels Camp, and the Murphys Sanitary District, aligning with FEMA and California Governor's Office of Emergency Services guidelines. A snapshot of the Plan's Hazard Risk Assessment is provided below:

Hazard Risk Assessment			
Hazard	**Geographic Extent**	**Probability of Future Occurrences**	**Risk Ranking**
Climate Change	Critical	Likely	Serious
Dam Failure	Limited	Likely	Moderate
Debris Flow - Landslide	Critical	Likely	Serious
Debris Flow - Avalanche	Critical	Likely	Serious
Debris Flow - Mud Flows	Critical	Likely	Serious
Debris Flow - Erosion	Critical	Likely	Serious
Drought	Limited	Likely	High
Earthquake	Negligible	Unlikely	Moderate
Flooding	Critical	Likely	Serious
Land Subsidence (Sinkhole)	Critical	Likely	Moderate
Severe Weather – Extreme Heat	Critical	Likely	High
Severe Weather – High Wind	Critical	Likely	Serious
Severe Weather – Tornado	Critical	Likely	Serious
Severe Weather – Winter Storms & Extreme Cold	Critical	Likely	Serious
Volcano	Negligible	Unlikely	Low
Wildfire	Catastrophic	Highly Likely	High

Table 3.3: Hazard Risk Assessment

Key sections of the plan include:

1. **Introduction**: Defines hazard mitigation, its principles, purpose, and scope, emphasizing proactive planning to reduce disaster costs and impacts.
2. **Planning Process**: Details the collaborative approach, including public and stakeholder engagement, and the review of existing plans.
3. **Hazard Identification and Risk Assessment**: Identifies natural hazards, assesses risks, and evaluates vulnerabilities, including historical data and future projections.

4. **Mitigation Strategy**: Outlines goals, projects, and actions to mitigate hazards, including changes in development, priorities, and capabilities.
5. **Plan Review, Evaluation, and Implementation**: Describes the adoption, monitoring, evaluation, and updating processes.

The plan also includes a documentation of the planning process, community profiles for the City of Angels Camp and Murphys Sanitary District, and adoption letters. It emphasizes continuous review and adaptation to meet changing conditions and requirements, ensuring community resilience and preparedness for future hazards.

2019 Calaveras County General Plan

The intent of the Calaveras County General Plan is to guide orderly growth and development, promote equity, strengthen the economy, protect the environment, and promote public health and safety. The vision statement for the plan is "the historical character of the county's communities, the value of its productive resources, the distinction of its physical beauty, and growing economic opportunities will create a high quality of life for residents and a remarkable and memorable experience for visitors to the county." The guiding principles of the Plan fall within the themes of property rights, the role of the Plan, economic development, community development, infrastructure and services, and safety and natural resources.

The guiding principle for safety and natural resources includes protecting citizens and resources from natural and manmade hazards. The Safety Element addresses protecting the County from unreasonable risks associated with the effects of seismic hazards (earthquakes, dam failure), geological hazards (slope instability), flooding, and wildland and urban (structural) fires. Natural hazards in Calaveras County include the potential for flooding, wildland fire, earthquakes, and other geologic conditions. The Safety Element is intended to reduce the risks associated with these hazards and help the County prepare for and avoid emergency situations. Calaveras County Office of Emergency Services (OES) responds to major incidents associated with floods, fire, geotechnical hazards, and hazardous materials using the Standardized Emergency Management System (SEMS) and National Incident Management System (NIMS). Calaveras County is part of the California Emergency Management Agency Inland Region (Region IV). OES is responsible for implementing the Emergency Operations Plan (EOP).

The Safety Element goals and policies most relevant to the SASD include:

- **Goal S-1** - People, property, economy, and natural resources safe from the risks of natural and man-made hazards.
    - Policy S 1.7 – locate new essential public facilities, utilities, and services away from identified hazard areas.
    - Policy S 1.8 – develop cooperative planning efforts between local, state, and federal public safety and law enforcement agencies; the community; and other stakeholders to ensure cooperative, efficient and effective planning to minimize risks associated with natural and man-made hazards.

- **Goal S-2** – Communities protected from unreasonable risks of death, injuries, property damage and economic and social dislocation resulting from floods, including flooding caused by seiches and dam failure.
- **Goal S-3** – Communities protected from unreasonable risks of death, injuries, property damage and economic and social dislocation resulting from fires.
- **Goal S-4** – Communities protected from unreasonable risks of death, injuries, property damage and economic and social dislocation resulting from geotechnical hazards including seismic hazards, unstable slopes and soil-related hazards.
    - **Policy S 4.3** - Locate high occupancy structures and essential public facilities outside of identified geological hazard zones unless they can meet design standards eliminating or minimizing risks associated with geological hazards to a level of less-than-significant.

The guiding principle for infrastructure and services specifies new development will pay the costs of providing adequate additional infrastructure and services necessitated by development including sewage disposal; and promoted the coordination among agencies to provide effective and efficient wastewater disposal and other essential services. The Public Facilities and Services Element addresses the general location and extent of existing and proposed public utilities and facilities, such as wastewater and emergency services.

The Infrastructure and Services goals and policies most relevant to the SASD include:

- **Goal PF 1** - Adequate public infrastructure and services sufficient to serve the County's current and future demand and synchronized with the pace of development.
    - **Policy PF 1.8** - Consider the environmental sensitivity as well as the efficacy of the sites chosen for installation of new public facilities. Whenever feasible and equivalently useful, sites that are less environmentally sensitive shall be selected for placement of new public facilities.
- **Goal PF 2a** - Adequate water, water storage capacity, fire flow, and wastewater treatment for new and existing development, with no decline in service levels to existing County residents.
- **Goal PF 2b** - Efficient use of water resources.
    - **Policy PF 2.1** - Require new development and expansions of existing developments to demonstrate that sufficient, sustainable water supply and wastewater capacity exist to support the proposal including during times of severe drought.
    - **Policy PF 2.7** - Require connections to public sewage treatment and disposal systems in accordance with Table LU-1 where they are available and have the capacity to serve new connections. Provide limited exceptions to requirements that public water and/or wastewater systems be provided.
    - **Policy PF 2.12** - Pursue alternative means for funding water and wastewater infrastructure improvements and maintenance, including State and federal grants, for water and wastewater infrastructure projects within Calaveras County.

2019 Calaveras County Emergency Operations Plan

The Emergency Operations Plan is based on the National Incident Management System and its component parts, along with the California Standardized Emergency Management System (SEMS), and identifies Emergency Support Functions that represent core emergency response categories performed by agencies and jurisdictions with primary and supporting responsibilities within Calaveras County. This Plan is based on threats and hazards identified in the Calaveras County LHMP (2015). The Plan accomplishes:

- use as its foundation, the SEMS to provide the functional components and concepts;
- comply with and integrate the National Incident Management System (NIMS) concepts related to local government emergency management, including coordination with Federal, State and Local agencies and jurisdictions as well as non-governmental entities;
- facilitate multi-jurisdictional and interagency coordination in emergency operations particularly between local government, private sector, operational area (geographic county boundary), State response levels, and appropriate Federal agencies;
- serve as a County plan, a reference document, and when necessary, use for pre-emergency planning and emergency operations;
- utilize in coordination with applicable local, State and Federal contingency plans;
- identify the components of the emergency services organization and established associated protocols required to effectively mitigate, respond to, manage, and recover from any significant emergency or disaster affecting Calaveras County;
- identify the policies, responsibilities and procedures required to protect the health and safety of Calaveras County communities, public and private property and the environmental effects of natural and technological emergencies and disasters; and
- establish the operational concepts and procedures associated with Initial Response Operations (field response) to emergencies, the Expanded Response Operations (County Emergency Operations Center (EOC) activities) and the recovery process.

2018 Mokelumne, Amador, and Calaveras (MAC) Integrated Regional Water Management (IRWM) Plan

The MAC IRWM Plan was first completed in 2006 and has since been updated several times, most recently in 2018 to be eligible for Proposition 1 funding. IRWM is a collaborative effort to identify and implement water management solutions on a regional scale that increase regional self-reliance, reduce conflict, and build water and climate resilience, while concurrently achieving social, environmental, and economic objectives. The Upper Mokelumne River Watershed Authority (UMRWA) is the Lead Agency for the MAC IRWM Region. The member agencies of UMRWA are Alpine County, Alpine County Water Agency, Amador County, Amador Water Agency, Calaveras County, Calaveras County Water District, Calaveras County Public Utility District, East Bay Municipal Utility District, and Jackson Valley Irrigation District. The IRWM Plan lays out regional resources, conditions, climate change considerations, and water resource issues and major conflicts. The Plan also lays out policies, goals, and objectives as well as planned project implementation to achieve the goals and objectives. A consensus-based approach was used to develop the region's goals and objectives. Broad-based water resource policies sit at the top of

the hierarchy employed in this plan. The region's goals, which are next in the hierarchy, are statements of intended outcomes which serve to broadly outline the IRWMP direction. The region's objectives are actions that support fulfillment of the goals.

The Plan Policies most relevant to San Andreas Sanitary District are:

- Maintain and Improve Water Quality
    - Goal: Reduce sources of contaminants
        - Objectives
            - Reduce leakage from septic systems
            - Increase public awareness of how contaminated water resources affect quality of life
    - Goal: Manage stormwater flows and transport of sediment and contaminants
        - Objectives
            - Reduce stormwater runoff from peak storm events
            - Promote development of community-based flood protections strategies
- Improve Water Supply Reliability and Ensure Long-Term Balance of Supply and Demand
    - Goal: Promote water conservation, recycling, and reuse for urban and agricultural uses
        - Objective: Maximize use of recycled water from wastewater treatment plants
    - Goal: Develop appropriate drought mitigation measures
        - Promote preparation and adoption of drought contingency plans
- Practice Resource Stewardship
- Focus on Areas of Common Ground and Avoid Prolonged Conflict
- Prepare for Climate Change
    - Goal: Mitigate against climate change impacts
        - Objectives
            - Implement mitigation strategies that reduce energy consumption, ultimately reducing GHGs
            - Support carbon sequestration and using renewable energy, when possible, to support regional objectives
            - Consider strategies adopted by CARB in its AB 32 Scoping Plan when developing projects
    - Goal: Adapt to climate change
        - Objectives
            - Support projects that consider changes in the amount, intensity, timing, quality, and variability of runoff and recharge

State

2024 Draft Climate Resilience Plan (also known as California Climate Adaptation Strategy)

The California Climate Adaptation Strategy, mandated by Assembly Bill 1482 (Gordon, 2015), provides a model for the state's efforts to address climate change impacts. It integrates existing and planned adaptation initiatives to achieve six key climate resilience priorities, ensuring a coordinated approach to building climate resilience across California. The Strategy is organized around six outcome-based priorities that guide all resilience actions in the state. These include:

- implementing measures to safeguard communities most at risk from climate impacts, including low-income populations, elderly residents, and those with pre-existing health conditions;
- enhancing public health infrastructure and emergency response capabilities to protect against increasing climate risks such as heatwaves, wildfires, and flooding;
- promoting economic resilience by supporting industries and workers affected by climate change and encouraging sustainable business practices;
- investing in natural systems and green infrastructure to mitigate climate impacts and enhance ecosystem resilience;
- utilizing the latest scientific research and data to inform policy and decision-making processes; and
- fostering partnerships with local governments, community organizations, tribal nations, and other stakeholders to leverage resources and expertise.

The Strategy includes specific and measurable actions to achieve these priorities, with regular updates and progress reports to track implementation. The 2021 Strategy and the draft 2024 update emphasizes the importance of public engagement and collaboration to ensure effective and inclusive climate adaptation efforts. Once the 2024 update is finalized, the Strategy will provide accurate and effective guidelines and climate data for another 3 years.

2023 California Department of Water Resources (DWR) Plan

The California Department of Water Resources (DWR) Climate Action Plan is a thorough guide to addressing climate change within the department's programs, projects, and activities. The plan is divided into three phases, each focusing on different aspects of climate change mitigation and adaptation.

Phase I: Greenhouse Gas Emissions Reduction Plan

The Greenhouse Gas Emissions Reduction Plan outlines DWR's targets for reducing greenhouse gas (GHG) emissions and the strategies to achieve these goals. Updated in 2023, the plan includes measures such as efficiency improvements to existing facilities, the purchase and development of renewable and zero-carbon energy sources, and adjustments to business activities to reduce GHG emissions. The goal is to achieve carbon neutrality by 2035 and supply 100 percent of DWR's electricity load with zero-carbon resources.

Phase II: Climate Change Analysis Guidance

This phase develops a framework and guidance for consistently incorporating climate change impacts into DWR's project and program planning activities. It ensures that all analyses align with the latest climate science and state regulations, providing a standardized approach to evaluating climate risks and impacts.

Phase III: Climate Change Vulnerability Assessment and Adaptation Plan

The final phase of the plan involves assessing the vulnerabilities of DWR's assets and operations to potential climate change impacts. Phase III prioritizes resiliency efforts such as infrastructure improvements,

enhanced maintenance and operation procedures, revised health and safety protocols, and improved habitat management. The phase also aims to ensure that DWR's operations are resilient to the changing climate and can continue to provide reliable water resources.

APPENDIX C: TABLE 6-1 SCORING MATRIX

Implementation Tier	Priority Action	LMHP Action	Description	Funding Opportunity	Estimated Cost Range	Cost (in 2023 dollars)	Significance of Impact Score	Likelihood of Failure Score	Financial Feasibility Score	TOTAL SCORE
	A1	3.6	Stock emergency supplies (e.g. PPE, first aid kits, water, food).	EMPG, BRIC, USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants	$50,000 - $300,000		5	5	5	15
		3.12	Establish redundant communication channels (e.g., radios, satellite phones).	General Infrastructure Grants, CWSRF, BRIC	$100,000 - $400,000		5	5	3	13
		1.7	Ensure proper grounding, surge protection, and backup power systems.		$50,000 - $300,000		5	4	3	12
		1.8	Purchase a vacuum truck, flexible hoses, emergency pumps, generators, pipe clamps, and related emergency response equipment.	EMPG, BRIC, USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants	$300,000 - $1,000,000		5	5	1	11
		1.1	Upgrade Supervisory Control and Data Acquisition (SCADA) system infrastructure that would minimize vulnerability of SCADA operations during and after natural disasters.	CWSRF, California Energy Commission	$300,000 - $900,000		5	5	1	11
		1.2	Enhance the SCADA system infrastructure to include redundant remote communications to improve how operators communicate when offsite.		$300,000 - $900,000		5	5	1	11
		1.3	Automation and Monitoring Upgrades. Install automated process controls for automatic and remote access operation of flow diversion and process feed. Upgrade process critical manual valves and gates with motorized operators, replace antiquated motorized operators, install new flow meters and sensors to allow for automatic and remote operation of the valves, upgrade and replace conduit, wiring, and programming of the communications for remote access capabilities to be able to signal for valve operators working in tandem with flow meters throughout the plant. New electrical and signal lines would need to be run to the new and upgraded equipment and back to the plant SCADA system for reliable controls. New programming would be uploaded to the current system after a control narrative is developed and adopted, as well as updating a user-friendly interface to allow for remote access and control of the equipment.			$ 610,000	5	5	1	11
		2.16	Develop and implement a post-fire inspection plan system-wide.	HMGP, Wildfire Prevention Grant Program	$200,000 - $1,000,000		5	3	1	9
		1.4	Install Solar Voltaic Panels (300 kW) onsite and install onsite battery bank for surplus and emergency power.	SGIP, CEC-Solar for All Program, ITC - Inflation Reduction Act, CEIC, REAP		$ 2,849,000	5	3	1	9
	A2	3.1	Conduct regular emergency drills (e.g. fire, severe weather).	HMGP, Wildfire Prevention Grant Program, EMPG, BRIC, USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants	$50,000 - $300,000		5	4	4	13
		3.9	Integrate workforce resilience into human resource policies.	EMPG, BRIC, FEMA Workforce Resilience, EDA Disaster Supplemental Grant	$50,000 - $300,000		5	3	4	12
		3.2	Provide resilience training for staff (e.g. stress management, crisis communication).	EMPG, BRIC	$50,000 - $300,000		4	3	4	11
		3.10	Review and update insurance coverage for workforce-related disruptions.	FEMA Workforce Resilience, EDA Disaster Supplemental Grant	$100,000 - $400,000		5	3	1	9
		3.11	Engage employees in hazard identification and planning through survey or workshops.	General Infrastructure Grants, CWSRF, BRIC	$50,000 - $300,000		5	2	1	8
		3.3	Create a continuity of operations plan that includes remote work capabilities.		$100,000 - $400,000		4	2	1	7
		3.8	Partner with local healthcare providers for rapid response support.		$50,000 - $300,000		3	3	1	7
		3.5	Create a mental health support program for employees post-disaster.	FEMA Workforce Resilience, EDA Disaster Supplemental Grant	$50,000 - $300,000		2	2	1	5
		3.7	Develop flexible leave policies for disaster related absences.	General Infrastructure Grants, CWSRF, BRIC	$50,000 - $300,000		2	2	1	5

Primary Action

A3	2.9	Conduct detailed field investigations and eliminate specific inflow and infiltration sources in the collection system through the repair, replacement, or rehabilitation of defective pipelines and manholes. This includes the development and implementation of a private lateral program to help reduce infiltration from private laterals long term.	CWSRF, Proposition 4, Small Community Wastewater Program, USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants	$1,000,000 - $5,000,000		5	5	2	12
	2.1	Rehabilitate aging infrastructure at the WWTF including, replacing or upgrading old equipment, installing new equipment, make electrical and controls upgrades, and address a diverse backlog of other high priority issues.	General Infrastructure Grants, CWSRF, BRIC	$1,000,000 - $5,000,000		5	5	1	11
	2.3	Trickling Filter & Primary Clarifier Rehabilitation. Rehabilitate original process equipment and structures including primary clarifier and trickling filter.	USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants		$ 6,000,000	5	5	1	11
	2.11	Implement Pond D Drainage Diversion Improvement Project.			$ 500,000	5	5	1	11
	2.20	Install additional wet weather diversion and storage post headworks by repurposing Ponds B and C and installing lift station return flows to the headworks.			$ 1,260,000	5	5	1	11
	2.10	Rehabilitate and improve pump stations as recommended by a pump station condition assessment study. Oak Shadows and Highway 49 Lift Stations are particularly vulnerable to multiple hazards and should be prioritized.		$750,000 - $2,800,000		5	5	1	11
	2.7	Repair, rehabilitate, or replace defective collection system pipelines and manholes as recommended by the highest priorities identified by a condition assessment program. The projects would also repair, rehabilitate, or replace manholes and make easement access improvements, as necessary.	CWSRF, Proposition 4, Small Community Wastewater Program, USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants	$1,000,000 - $5,000,000		5	5	1	11
	2.8	Replace under-capacity pipes with larger pipes as recommended by a condition assessment.	General Infrastructure Grants, CWSRF, BRIC	$1,000,000 - $5,000,000		3	3	1	7
	1.5	Assess installation of a different method of disinfection, Peracetic Acid, which is simpler to operate, requires less retrofitting and poses fewer safety risks, and requires less deliveries of chemicals which can be problematic during natural disasters when supply chains are disrupted.			$ 417,000	3	2	2	7
	2.12	Implement improvements to outfall pipes and discharge points that are identified by an operational strategy.		$500,000 - $2,000,000		3	3	1	7
	1.6	Assess installation of a different method of disinfection, Ultraviolet (UV), which eliminates the need for chemical handling or storage altogether and reduces risks to workers and communities, especially during natural disasters when infrastructure may be compromised.			$ 1,363,000	3	2	1	6

	A4	2.18	Study the impacts on the WWTF due to the reduced flow and increase concentration of wastewater that can cause corrosion in the collection system piping and noxious odors to community.	CWSRF, Proposition 4, Small Community Wastewater Program, USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants		$ 50,000	2	4	5	11
		2.19	Evaluate and, if needed, design and mitigate the effects of high stream flows on the collection system at along Main Street, St. Charles Street, and Gold Strike Road.		$200,000 - $1,000,000		5	5	1	11
		2.21	Evaluate and, if needed, design and mitigate the effects of storm water inflow and infiltration on the collection system during significant rainstorms.		$200,000 - $1,000,000		5	5	1	11
		2.14	Evaluate and, if needed, design and mitigate the effects of landslides, particularly for SASD assets along Highway 49, Main Street, St. Charles Street, and Gold Strike Road, and at the WWTF (i.e., collection and conveyance infrastructure, the Highway 49 Lift Station, and Pond D at the WWTP).	USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants	$750,000 - $2,500,000		4	4	1	9
		2.17	Evaluate and, if needed, design and mitigate the effects of drought and heat waves on SASD assets.	General Infrastructure Grants, CWSRF, BRIC	$200,000 - $1,000,000		3	3	2	8
		2.15	Evaluate and, if needed, design and mitigate the effects of wildfire on SASD assets.	HMGP, Wildfire Prevention Grant Program	$200,000 - $1,000,000		3	4	1	8
		2.23	Seismic retrofit and structural rehabilitation of Trickling Filter, Secondary Process, Tertiary Filtration, Aerobic Digestion, and Effluent Disposal systems.	BRIC, FEMA	$2,000,000 - $6,000,000		4	2	1	7
		2.13	Evaluate and, if needed, design and mitigate the effects of landslides on SASD assets.	General Infrastructure Grants, CWSRF, BRIC	$750,000 - $2,500,000		3	2	1	6
		2.22	Evaluate and, if needed, design and mitigate seismic hazard at vulnerable locations as identified by the site-specific studies.	BRIC, FEMA	$100,000 - $500,000		3	2	1	6

Secondary Action	B1	2.4	Rehabilitate secondary clarifier.	USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants		$ 400,000	5	5	3	13
		3.4	Cybersecurity Vulnerability Assessment. Perform a vulnerability assessment to identify potential weaknesses and threats to cybersecurity.	DHS Grants, FEMA Preparedness Grants		$ 20,000	5	3	4	12
		2.6	Upgrade secondary process to increase capacity and reliability by installing additional secondary clarifier and RAS/WAS pumping. Project is recommended to build in tandem with primary and secondary clarifier rehabilitation primary clarifier as well as Trickling Filter.	USDA Rural Development: Water & Waste Disposal, ECWAG, Solid Waste Management Grants		$ 101,000	5	5	1	11
		2.5	Rehabilitate intermediate clarifier.			$ 250,000	5	3	2	10

Notes: Emergency Management Performance Grant (EMPG); Building Resilient Infrastructure and Communities (BRIC); United States Department of Agriculture (USDA); Emergency Community Water Assistance Grants (ECWAG); Clean Water State Revolving Fund (CWSRF); Hazard Mitigation Grant Program (HMGP); Self-Generation Incentive Program (SGIP); California Energy Commission (CEC); Investment Tax Credit (ITC); Clean Energy Investment Center (CEIC); Rural Energy for America Program (REAP); Federal Emergency Management Agency (FEMA); United States Economic Development Administration (EDA)

Woodard & Curran

woodardcurran.com