Nevada Irrigation District

Staff Report

TO: Board of Directors

FROM: Chip Close, Director of Water Operations
Shad Chittock, Treated Water Superintendent

DATE: October 28, 2026

SUBJECT: **2026 Yuba/Bear River Watershed Sanitary Survey Update**

OPERATIONS

RECOMMENDATION:

Receive a presentation from Bonnie Starr of Starr Consulting Services regarding the 2026 Yuba/Bear River Watershed Sanitary Survey Update; and receive and file the Watershed Sanitary Survey Report.

BACKGROUND:

The Surface Water Treatment Rule (SWTR) administered by the State Water Resources Control Board requires the District to conduct a Watershed Sanitary Survey (WSS) on an ongoing and regular basis (every 5 years). A Sanitary Survey is defined in the Interim Enhanced Safe Drinking Water Treatment Rule as: “an onsite review of the water source (identifying sources of contamination using results of source water assessments where available), facilities, equipment, operation, maintenance and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources and operations and the distribution of safe drinking water”.

Conducting sanitary surveys on a routine basis is an important element in preventing contamination of drinking water supplies. The information gathered helps assess the ability of existing water treatment plants to continue providing customers with drinking water that meets all drinking water standards.

The District and Placer County Water Agency (PCWA) share a source of supply from the Yuba and Bear River Watersheds. As such, the two agencies have

shared in the costs and development of the WSS conducted in 1996, 2002, 2012, 2017, 2021, and now 2026.

The 2026 update is intended to accomplish the following objectives:

- Fulfillment of the California SWTR and the Interim Enhanced Surface Water Treatment Rule (IESWTR) requirements that surface water agencies conduct a sanitary survey of the source watershed once every five years. Any significant changes within the last five years that affect source water quality are to be identified in each update. In addition, it is required to comment on the appropriate level of treatment for pathogens, specifically for *Giardia*, viruses, and *Cryptosporidium*.

- Review and evaluate selected constituents of interest to identify potential water quality or treatment issues at each water treatment plant. Assess the ability of the water treatment plants to meet standards based on current and future regulatory framework. Develop recommendations for treatment plant actions to address water quality or treatment issues and/or address planning needs to meet expected future regulations.

- Review and evaluate selected potential contaminating activities to identify impacts on source water quality. Determine whether it may be useful to conduct additional monitoring to further assess contaminant levels in the source water or contaminants from a particular watershed source.

- Identify appropriate watershed management actions to protect and possibly improve source water quality. Develop recommendations for watershed management actions that are economically feasible and within the authority of the participating water agencies to implement. Target contaminant activities that are most likely to affect source water quality, such as activities located near the water treatment plants or activities that are predominant in the watershed.

BUDGETARY IMPACT:

The estimated cost to complete the 2026 WSS was $100,000. Splitting the effort with PCWA yields substantial cost savings, and the Memorandum of Understanding sets the cost at $50,000 per agency. Currently, the project remains under the budgeted allotment.

Attachments: (2)

- Yuba/Bear River Watershed Sanitary Survey 2026 Update
    - Appendices available upon request or view full report here
- Slide Presentation

YUBA/BEAR RIVER WATERSHED SANITARY SURVEY 2026 UPDATE

October 2026



Prepared For

NID

PCWA
water • energy • stewardship

Prepared By

STARR CONSULTING

Palencia Consulting Engineers

YUBA/BEAR RIVER WATERSHED SANITARY SURVEY
2026 UPDATE

October 2026

Technical Committee:

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1996 Survey – Yuba/Bear River Watershed Sanitary Survey, 1996
2002 Update – Yuba/Bear River Watershed Sanitary Survey, 2002 Update
2012 Update – Yuba/Bear River Watershed Sanitary Survey, 2012 Update
2017 Update – Yuba/Bear River Watershed Sanitary Survey, 2017 Update
2021 Update – Yuba/Bear River Watershed Sanitary Survey, 2021 Update
2026 Update – Yuba/Bear River Watershed Sanitary Survey, 2026 Update

AB – Assembly Bill
ABC – American/Bear/Cosumnes Rivers
ACEP – Agricultural Conservation Easement Program
ACL – Administration Civil Liability
Alum – aluminum sulfate
APAP – Aquatic Pesticide Application Plan
ATS – automatic transfer switch

BAER – Burned Area Emergency Response
BMP – Best Management Practice

CABY – Cosumnes, American, Bear and Yuba Rivers
CALFIRE – California Department of Forestry and Fire Protection
Cal OES – California Office of Emergency Services
Cal EPA – California Environmental Protection Agency
Caltrans – California Department of Transportation
CalVTP – California Vegetation Treatment Program
CAO – Cleanup and Abatement Order
CAP – *Cryptosporidium* Action Plan
CCI – California Climate Initiative
CCR – Consumer Confidence Report
CDOC – California Department of Conservation
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
CES – Cannabis Enforcement Section
CEQA – California Environmental Quality Act
CFE – combined filter effluent
CFIP – California Forest Improvement Program
CIWQS – California Integrated Water Quality System
CNRA – California Natural Resources Agency
CRRIC – California Rangeland Research and Information Center
CRWL – California Rangeland Watershed Laboratory
CSP – Conservation Stewardship Program
CT – Disinfection Contact Time
CUPA – Certified Unified Program Agency
CWA – Clean Water Act

D/DBPR – Disinfectants/Disinfection By-Products Rule
DBP – disinfection by-product
DCC – California Department of Cannabis Control
DDW – State Water Resources Control Board, Division of Drinking Water
DFW – California Department of Fish and Wildlife
DOC – dissolved organic carbon
DPR – California Department of Pesticide Regulation
DSPUD – Donner Summit Public Utilities Department
DTSC – California Department of Toxic Substances Control
DWR – California Department of Water Resources

E. coli – Escherichia coli
EOC – Emergency Operations Center
EQIP – Environmental Quality Incentives Program

FACTS – Forest Activity Tracking System
FERC – Federal Energy Regulatory Commission
FIFRA – Federal Insecticide, Fungicide, and Rodenticide Act
FSA – Farm Service Agency
FTER – Fuel Treatment Effectiveness Report
FY – fiscal year

gal - gallon
GIS – geographic information system
gpm – gallons per minute
gpm/sf – gallons per minute per square foot
GRP – Geographic Response Plan

HAA5- sum of five HAAs
hr – hour
HSC – Health and Safety Code

IESWTR – Interim Enhanced Surface Water Treatment Rule
IFE – individual filter effluent
IOC – inorganic chemical
IRWMP – Integrated Regional Water Master Plan
ITP – Inspector Training Program

LAMP – local agency management program
lbs – pounds
LEPC – local emergency planning committee
LRAA – locational running annual average
LT1ESWTR – Long Term 1 Enhanced Surface Water Treatment Rule
LT2ESWTR – Long Term 2 Enhanced Surface Water Treatment Rule

MBBR – moving bed bioreactors
MCL – maximum contaminant level
MEP – maximum extent practicable
mg – million gallon
mgd – million gallons per day
mg/L – milligrams per liter
MHP – Mobile Home Park
min - minute
MMRSA - Medical Marijuana Regulation and Safety Act
MPN/100 mL – most probable number per 100 milliliters
MRP – Monitoring and Reporting Program Plan
MS4 – municipal separate storm sewer system
MUN – municipal and domestic supply beneficial use
MVUM – motorized vehicle use map

NAL – numeric action limit
ND – non-detect
NEL – numeric effluent limit
NEPA – National Environmental Protection Act
NID – Nevada Irrigation District
NIMS – National Incident Management System
NOA – Notice of Applicability
NOAA – National Oceanic and Atmospheric Administration
NOI – Notice of Intent
NOV – Notice of Violation
NPDES – National Pollution Discharge Elimination System
NPS – non-point source
NRCS – Natural Resources Conservation Service
NTU – nephelometric turbidity unit
NWQI – National Water Quality Initiative

OEL – operational evaluation limit
OHV – Off-Highway Vehicle
oocyst/L – oocysts per liter
OSPR – Oil Spill Prevention and Response
OSV – over-snow vehicle
OU – operable unit
OWTS – onsite wastewater treatment system

PACL – polyaluminum chlorohydrate
pCi/L – picocuries per liter
PCWA – Placer County Water Agency
PFAS – per- and polyfluoroalkyl substances
PG&E – Pacific Gas and Electric
PIT – point in time

QSE – qualifying storm event

RAA – running annual average
RCCP – Regional Conservation Partnership Program
Regional Board – Central Valley Regional Water Quality Control Board
RIMS – Response Information Management System
RMAC – Rangeland Management Advisory Committee
ROD – Record of Decision
RPA – reasonable potential analysis
RPF – Registered Professional Forester
RWQMP – Rangeland Water Quality Management Program

SB – Senate Bill
SCADA – system control and data acquisition
Second Update – Yuba/Bear River Watershed Sanitary Survey, Second Update
SEMS – Standardized Emergency Management System
sf – square feet
SMARA – Surface Mining and Reclamation Act of 1975
SMARTS - Storm Water Multiple Application and Report Tracking System
SNC – Sierra Nevada Conservancy
SOC – synthetic organic compound
SSMP – sewer system management plans
SSO – sanitary sewer overflow
State Board – State Water Resources Control Board
SWMP – storm water management plan
SWPPP – storm water pollution prevention plan
SWTR – Surface Water Treatment Rule

TC – Technical Committee
TCSI – Tahoe Central Sierra Initiative
THC - tetrahydrocannabinol
THP – Timber Harvest Plan
TMDL – total maximum daily load
TOC – total organic carbon
TSO – time schedule order
TSS – total suspended solids
TTHM – total trihalomethanes

UC – University of California
UCCE – University of California Cooperative Extension
UCMR 5 – Unregulated Contaminant Monitoring Rule 5
UFRV – Unit Filter Run Volume
µg/L – micrograms per liter
UPRR – Union Pacific Rail Road
USBLM – United States Bureau of Land Management

USDA – United States Department of Agriculture
USGS – United States Geological Survey
USEPA – United States Environmental Protection Agency
USFS – United States Forest Service
UV – ultraviolet light

VCA – voluntary cleanup agreements
VOC – volatile organic compound

WDRs – Waste Discharge Requirements
WIP – watershed improvement plan
WQMH – Water Quality Management Handbook
WQMP – Water Quality Management Plan
WTP – water treatment plant
WWTP – wastewater treatment plant
WY – water year

This report presents the findings of the 2026 Update to the Yuba/Bear River Watershed Sanitary Survey (2026 Update). This study covers the period January 2021 through December 2025. The initial watershed sanitary survey was completed in 1996 (1996 Survey), the first update was completed in 2002 (2002 Update), the second update was completed in 2007 (Second Update), the third update was completed in 2012 (2012 Update), the fourth update was completed in 2017 (2017 Update), and the fifth update was completed in 2021 (2021 Update). All were completed in accordance with the California Surface Water Treatment Rule (SWTR).

OBJECTIVES OF THE 2026 UPDATE

The overall objective of this 2026 Update is to assess the source water quality of the Yuba/Bear River to ensure the ability of the existing water treatment plants for the participating water agencies to continue to provide their customers with drinking water that meets all drinking water standards. This 2026 Update is intended to accomplish four key objectives.

Regulatory Compliance	•Fulfill California Surface Water Treatment Rule and Interim Enhanced SWTR •Submit Update to DDW by December 2026
Water Quality Evaluation	•Review and evaluate constituents of interest for study period, January 2021 through December 2025 •Identify potential water quality or treatment issues at water treatment plants
Watershed Contaminant Sources Evaluation	•Review and evaluate selected potential contaminating activities •Identify potential impacts to source water quality
Identify Watershed Management Actions	•Recommendations to protect or possibly improve source water quality •Recommendations within authority and resources of participating water agencies

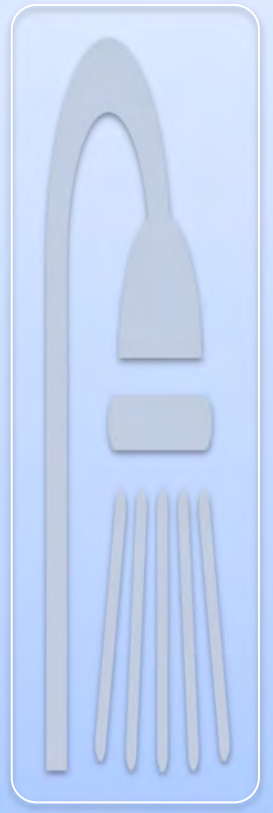
PARTICIPATING WATER AGENCIES

Placer County Water Agency (PCWA) and Nevada Irrigation District (NID) jointly conducted the 1996 Survey, the 2002 Update, the Second Update, the 2012 Update, the 2017 Update, and the 2021 Update. This 2026 Update has been conducted by these agencies as well. Together these two are herein referred to as the participating water agencies.

SIGNIFICANT CHANGES SINCE 2021 UPDATE

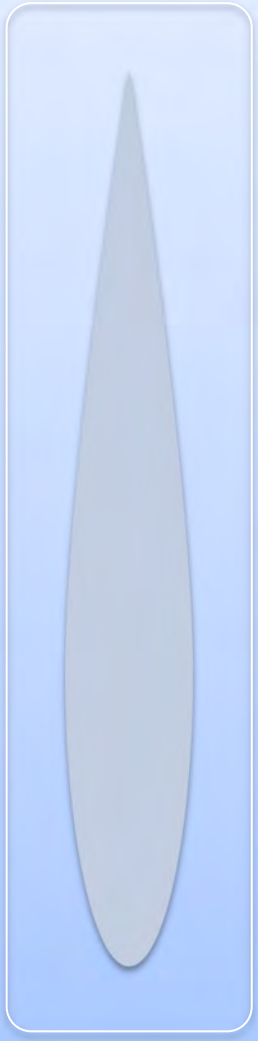
During the past five years, new information has been generated that was used to evaluate source water quality, treatment capabilities, and watershed contaminant sources, and has been summarized in **Section 6**. Some key changes include:

Significant Changes



- Prefilter pipe cleaning and Alta Forebay dredging at the Alta Water Treatment Plant (WTP)
- New 100,000 gallon steel clearwell, new emergency generator with automatic transfer switch, and a new prefilter at the Monte Vista WTP
- Addition of the Weimar water system to PCWA in 2023
- Recoating of the 100,000 gallon clearwell at the Applegate WTP
- Implementation of lab charge analyzers for jar testing at the Bowman, Auburn, Foothill1, and Foothill 2 WTPs
- Replacement of aluminum sulfate and sodium hypochlorite tanks at the Sunset WTP
- Relocation of post chlorination injection location to "pre-filter" for all NID water treatment plants
- Installation of additional storage tank mixers in various NID water systems
- Repacking of filters at the Elizabeth George WTP
- Installation of geese barriers and full cleaning of the raw water reservoir at the Lake of the Pines WTP
- Replacement of raw water control valve for the Combie Ophir Canal intake at the North Auburn WTP
- Conversion to aluminum sulfate for coagulation and upgrade of the sedimentation tank at the Smartsville WTP

Water Quality



- Failure of the South Yuba Canal and Spaulding Powerhouse 1 in February/March 2024 reduced diversions from Lake Spaulding in summer 2024 and 2025
- Source water turbidity remains similar to historic, with a slight increasing trend at Lake Wildwood WTP since 2023
- *Escherichia coli* (*E. coli*) in the source water increased at half the water treatment plants including Monte Vista, Bowman, Auburn, Foothill, Loma Rica, Elizabeth George, and Lake Wildwood WTPs, while Sunset, Lake of the Pines, and Smartsville WTPs saw decreases due to source water protection efforts
- Total organic carbon (TOC) was generally stable at the majority of water treatment plants, but the source water is less frequently lower than 2 milligrams per liter (mg/L) than historic
- Disinfection by-products in treated water have declined, due to successful operational procedures by NID and PCWA
- Elevated manganese in raw water at North Auburn WTP is potentially caused by accumulated sediment in Rock Creek Reservoir

Watershed Contaminant Sources



- Livestock populations increased over the past five years, but have stablized over the past 20 years
- Thousands of acres have been treated for fuel reduction, reducing the risk of wildfires
- Large amounts of timber harvesting is being conducted under Emergency or Exemption Notices, with reduced planning and inspections
- Vehicular accidents along Interstate 80 continue to occur and be a risk to the South Yuba Canal, Boardman Canal, and Rollins Lake supplies
- Crude oil imported by rail has decreased significantly, reducing the risk of a spill
- Penn Valley Mobile Home Park connected to the public sewer and significant improvements in microbial source water quality were seen at Smartsville WTP
- Outdoor cannabis cultivation is widespread, both legal and illegal. Commercial cultivation is limited to Nevada County, and nearly 200 permits have been issued

KEY FINDINGS AND CONCLUSIONS

The key findings and conclusions for this report are organized as they pertain to source water quality, treatment and treated water quality regulatory compliance, and watershed contaminant sources. These are summarized in **Section 6**.

Yuba/Bear River Water Quality

Overall, the Yuba/Bear River continued to provide excellent quality raw water. The raw water can currently be treated to meet all drinking water standards using conventional water treatment processes. There are no long-term constituent trends prevalent in the raw water that necessitates special treatment processes at this time. Key findings for each of the constituents of interest are presented below.

Turbidity

- Seasonally variable, peaking in wet weather and associated with high river flows and precipitation
- Raw water median values range from 1.0 to 8.2 nephelometric turbidity units (NTU), reflecting an increasing trend downstream
- Highest values were seen at Smartsville and North Auburn WTPs
- Rollins Reservoir fills with turbid waters during the wet season, increasing turbidity to water treatment plants downstream

Coliform

- Seasonally variable, peaking in wet weather and associated with high river flows and precipitation
- Raw water median values for *Escherichia coli* (*E. coli*) range from 6.3 to 52 most probable number per 100 milliliters (MPN/100 mL), reflecting an increasing trend downstream
- Sunset, Smartsville, and Lake of the Pines WTP saw decreased raw water *E. coli* values due to source water protections implemented
- *E. coli* values increase along the Boardman Canal, especially at the Auburn WTP
- Data supports 3/4-log reduction of *Giardia*/viruses for all water treatment plants except Smartsville WTP, which operates for 4/5-log reduction

Giardia/Cryptosporidium

- Few detects of either protozoa in the Yuba/Bear River
- All WTPs placed in Bin 1 under Round 2 of the Long Term 2 Enhanced SWTR, however Bowman WTP was not reclassified and remains Bin 2
- Data supports 3/4/2-log reduction of *Giardia*/viruses/*Cryptosporidium*

Total Organic Carbon

- Seasonally variable, peaking in wet weather and associated with high river flows and precipitation
- Raw water median values range from 1.3 to 2.5 milligrams per liter (mg/L)
- Raw water median values are less frequently lower than 2.0 mg/L than historic
- Peak levels occurred between October and April

Treatment and Treated Water Quality Regulatory Compliance

All of the water treatment plants are currently in compliance with all existing drinking water regulations. PCWA and NID implement various types of treatment processes, depending on facility size and source water quality, and meet all current drinking water standards, including maximum contaminant levels (MCLs) and treatment technology requirements. Below is a summary of the selected treatment and regulatory compliance issues.

Turbidity Reduction Requirements

- All WTPs achieve excellent suspended solids removal, ranging from 94.8 to 99.8 percent overall reduction of turbidity
- The average combined filter effluent turbidity ranges from 0.02 NTU to 0.06 NTU, well below regulatory limits
- All WTPs meet the Interim Enhanced SWTR turbidity reduction requirements and are awarded 2-log reduction credit for *Cryptosporidium*

Giardia/Virus/*Cryptosporidium* Reduction Requirements

- Monthly median *E. coli* levels are less than 200 MPN/100 mL in almost all months at all WTPs
- *Giardia* and *Cryptosporidium* are infrequently detected at low levels
- All WTPs should continue to provide 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium*

Total Organic Carbon Reduction Requirements

- All WTPs can meet the alternative compliance criteria for either raw and treated water TOC levels less than 2 mg/L

Disinfection By-Products Requirements

- Distribution system levels of total trihalomethanes (TTHM) and haloacetic acids (HAA5) are well below their respective MCLs in the systems associated with all WTPs
- TTHM and HAA5 levels are generally lower than the last study period
- There are no clear trends in the data due to other parameters impacting treated water quality

Watershed Contaminant Sources

There are numerous types of potential contaminating activities in the watershed. Nine activities were selected for evaluation in this report based on constituents of interest and predominance in the watershed. The key findings for each of these activities are provided below.

Canal Aquatic Herbicide Use

PCWA and NID implemented aquatic control programs under permitted plans

- PCWA and NID utilize aquatic herbicides on canals to control algae and aquatic weeds as necessary
- Pacific Gas and Electric (PG&E) only utilizes physical control programs
- Copper-based herbicides are the primary herbicide, along with sodium carbonate peroxyhydrate and glyphosate
- Both agencies avoid application near the WTP intakes and coordinate with the drinking water treatment plant staff
- No detects of any applied chemicals at the WTPs

Rangeland Livestock

Cattle population stabilized in the watershed, especially dairy cattle

- Livestock population increased during this study period, but has stablized over the past 20 years
- Limited pesticide use is associated with livestock
- Two active United States Forest Service (USFS) grazing allotments and one active NID grazing allotment in the watershed, all under grazing management plans
- State Water Resources Control Board (State Board) is developing a guidance document to identify management practices to protect water quality

Forest Activities

Timber harvesting expanded, while wildfires were limited

- Timber harvesting is conducted on private and public lands
- Timber harvesting can be for commercial or fuel reduction purposes
- Over 1 million acres in the watershed was harvested for timber during the study period
- Three wildfires burned approximately 2,700 acres in the watershed
- California Department of Foresty and Fire Protection (CALFIRE) and USFS manage separately
- Central Valley Regional Water Quality Control Board (Regional Board) manages impacts to receiving waters for Timber Harvest Plans
- Increasing use of Emergency and Exemption Notices has more limited involvement of Regional Board
- NID has implemented over 2,000 acres of forest management in the watershed during the study period

Recreation

Recreation is widespread, but well managed

- Recreation in the watershed includes a wide variety of body contact and non-body contact activities
- Facilities are operated and managed by federal, state, and local agencies
- Bear River Campground was converted to a day-use facility following the River Fire in 2021
- NID implemented a Golden Mussel Program to require decontamination or quarantine for all motorized boats at Scotts Flat, Rollins, and Jackson Meadows reservoirs

Source Water Spills

Cal OES operates the hazardous materials spill database, but few notifications are reaching PCWA and NID

- Spills can occur anywhere in the watershed, from roadways, railroads, pipelines, facilities, or other incident
- Cal OES reported 87 spill events that reached surface water in the watershed during the study period
- Majority of spill events are vehicular accidents, with many occurring along Interstate 80
- DDW/Cal OES provided few notifications to the participating water agencies
- NID and PCWA coordinate with County OES and PG&E
- PCWA has enhanced coordination with California Highway Patrol and California Department of Transporation (Caltrans) for potential incidents along Interstate 80

Wastewater

Three wastewater treatment plants, nine wastewater collection systems, and numerous onsite wastewater systems exist in the watershed

- Regional Board has issued three National Pollutant Discharge Elimination System (NPDES) permits for wastewater discharge to the Yuba/Bear River
- Donner Summit Public Utilities District and Cascade Shores Wastewater Treatment Plants (WWTPs) are generally in compliance with their permits
- City of Nevada City WWTP had more significant compliance issues, resulting in three major compliance projects during the study period
- Three Category 1 Sanitary Survey Overflows occurred during the study period, only one of significant volume
- Elimination of the Penn Valley Mobile Home Park wastewater ponds has resulted in improved water quality in Squirrel Creek

Stormwater Runoff

Urban runoff occurs mostly in the lower watershed and is minimal and well managed

- Caltrans is the only Phase I Municipal Storm Sewer System (MS4) systems permitted in the watershed, implementing stormwater management plans and pollution reduction programs and conducting monitoring
- Three Phase II MS4 systems are permitted, cities of Grass Valley and Auburn and Placer County/North Auburn, with fewer stormwater management requirements than Phase I
- 16 Industrial Stormwater permittees exist throughout the watershed
- 9 Construction Stormwater permits were active as of December 2025

Mining

Both legacy and active mining exists in the watershed

- Mining occurs on public and private lands, for both metallic and non-metallic ores
- 19 legacy mining sites are are in various states of remediation under State agency management
- Three active surface mines quarry for sand, rock, and stone, two of which have industrial stormwater permits
- One inactive gold mine exists
- Lava Cap Mine is an active Superfund Site that has completed Phase 1 of remediation (2008) and Phase 2, mine adit water treatment, is expected to be implemented in 2026

Outdoor Cannabis Cultivation

Outdoor cannabis cultivation is present in the watershed, most significantly in Nevada County

- Cannabis cultivation occurs both legally, and illegally, on private lands
- Cultivation on public lands is not permitted
- Nevada County, including the cities of Grass Valley and Nevada City, permit commercial cannabis cultivation
- Selected pesticides are now permitted to be applied to cannabis crops
- Cannabis cultivation regulation includes State level permitting through the State Board and the Department of Cannabis Control (DCC) and locally by Nevada County.
- The State Board issued 50 cannabis cultivation permits during the study period, the DCC licensed 42 individuals/organizations during the study period, and Nevada County permitted 185 cannabis cultivation applications

RECOMMENDATIONS

A final objective of this report is to identify appropriate watershed management actions that may assist in protecting and possibly improving source water quality. **Table ES-1** presents the recommendations developed for this 2026 Update, listed by subject area and not by priority.

Development of recommendations for watershed management actions that are economically feasible and within the authority of the participating water agencies to implement is critical. Of importance is to target potential contaminating activities that may be most likely to affect source water quality, such as activities located in the protection zones or activities that are predominant in the watershed. Some recommendations provide for information tracking, which will facilitate updating management actions as needed.

Recommendations apply to PCWA and NID as noted, and may be implemented by them as they have resources available.

Table ES-1
2026 Update Recommendations

Recommendation	Agency Impacted
Water Quality and Treatment	
Continue to optimize treatment during times of potentially reduced source water quality – i.e., adjust coagulant dose, optimize polymers, reduce flow if possible to increase hydraulic detention times and reduce filtration loading rates, ensure optimized disinfection practices and contact time (CT).	PCWA and NID
Continue to optimize disinfection treatment and distribution system management practices to prevent formation of DBPs. This could include; installation of tank mixers, increased flushing at dead ends, correlating water production more closely during transitional demand periods (i.e., fall), and optimize storage volume in the tanks seasonally.	PCWA and NID
Continue investigation of replacing Canyon Creek with engineered conveyance between Drum Forebay and Alta Forebay to minimize risk of spills along Interstate 80.	PCWA
Continue investigation of elevated *E. coli* in raw water for Auburn WTP.	PCWA
Continue to encourage canal protections (encasements) upstream of water treatment plants to protect source water quality. Also support opportunities for other canal protections, such as gunnite and fencing.	PCWA and NID
Watershed Contaminant Sources	
Continue enhanced coordination and communication with PG&E to discuss on-going maintenance needs throughout conveyance and storage system to protect source water quality (i.e., reservoir dredging, chemical or mechanical treatment of vegetation).	PCWA and NID
Continue to use the Regional Water Authority's American/Bear/Cosumnes River Watershed Resilience Plan as a vehicle for grant funding of projects related to water quality. Consider submitting application for grant funding of source water protection projects such as canal encasement, public education along the canals, pet waste management stations along the canals, and canal fencing through vulnerable areas.	PCWA and NID

Table ES-1 Cont'd
2026 Update Recommendations

Recommendation	Agency Impacted
Consider establishing contact with the California Department of Fish and Wildlife (DFW) staff at the Oil Spill Prevention and Response (OSPR) program to ensure that upcoming Geographic Response Plans (GRPs) for the Yuba and Bear River include all water treatment plants accurately.	PCWA and NID
Consider contacting Regional Board to request a formal closure plan for the Penn Valley Mobile Home Park wastewater ponds and WDRs.	NID
Consider contacting the Regional Board to confirm that Deer Creek and its tributaries, specifically Squirrel Creek, are formally designated with the Municipal (MUN) Beneficial Use as part of the Sacramento River Basin Plan.	NID
Continue outreach to City of Nevada City, City of Grass Valley, and Nevada County Sanitation District regarding education on water supply system and request for notification of significant sanitary sewer overflows to Deer Creek or Squirrel Creek.	NID

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This report presents the findings of the 2026 Update to the Yuba/Bear River Watershed Sanitary Survey (2026 Update). This study covers the period January 2021 through December 2025. The initial watershed sanitary survey was completed in 1996 (1996 Survey), the first update was completed in 2002 (2002 Update), the second update was completed in 2007 (Second Update), the third update was completed in 2012 (2012 Update), the fourth update was completed in 2017 (2017 Update), and the fifth update was completed in 2021 (2021 Update). All were completed in accordance with the California Surface Water Treatment Rule (SWTR).

For assistance with abbreviations and acronyms, the reader is referred to the List of Abbreviations at the front of the Report.

PARTICIPATING WATER AGENCIES

Placer County Water Agency (PCWA) and Nevada Irrigation District (NID) jointly conducted the 1996 Survey, the 2002 Update, the Second Update, the 2012 Update, the 2017 Update, and the 2021 Update. This 2026 Update has been conducted by these agencies as well. Together these two are herein referred to as the participating water agencies.

2026 UPDATE OBJECTIVES

The overall objective of this 2026 Update is to assess the source water quality of the Yuba/Bear River to ensure the ability of the existing water treatment plants for the participating water agencies to continue to provide their customers with drinking water that meets all drinking water standards.

A watershed sanitary survey focuses on the first barrier to contamination of the drinking water supply; source water protection. Evaluating source water quality and watershed contaminant sources provides key information to aid in understanding how to maintain and possibly improve the first barrier. In order to fully assess the ability of the participating water agencies to treat the Yuba/Bear River source water, some evaluation of treatment plant capabilities and treated water quality is also necessary. Therefore, certain aspects of the second barrier (water treatment) are also evaluated in relationship to water quality.

This 2026 Update is intended to accomplish the following objectives:

- Fulfillment of the California SWTR and the Interim Enhanced Surface Water Treatment Rule (IESWTR) requirements that surface water agencies conduct a sanitary survey of the source watershed once every five years. Any significant changes within the last five years that affect source water quality are to be identified in each update. In addition, it is required to comment on the appropriate level of treatment for pathogens, specifically for *Giardia*, viruses, and *Cryptosporidium*.

- Review and evaluate selected constituents of interest to identify potential water quality or treatment issues at each water treatment plant. Assess the ability of the water treatment plants to meet standards based on current and future regulatory framework.

Develop recommendations for treatment plant actions to address water quality or treatment issues and/or address planning needs to meet expected future regulations.

- Review and evaluate selected potential contaminating activities to identify impacts on source water quality. Determine whether it may be useful to conduct additional monitoring to further assess contaminant levels in the source water or contaminants from a particular watershed source.

- Identify appropriate watershed management actions to protect and possibly improve source water quality. Develop recommendations for watershed management actions that are economically feasible and within the authority of the participating water agencies to implement. Of importance is to target contaminant activities that are most likely to affect source water quality, such as activities located near the water treatment plants or activities that are predominant in the watershed.

The Updated Watershed Sanitary Survey Guidance Manual from the American Water Works Association, California-Nevada Section was published in October 2025 and the majority of the suggested content was already included in the scope of this report. Several items were incorporated into the report to address relevant portions of the guidance.

CONSTITUENTS AND TOPICS COVERED IN THE 2026 UPDATE

Several water quality constituents were selected for evaluation as part of the 2026 Update. **Table 1-1** presents a summary of the water quality constituents selected and the reason for selection.

Nine potential contaminating activities were selected for review as part of the 2026 Update:

- Canal aquatic herbicide use,
- Rangeland livestock,
- Forest activities, including timber harvesting and wildfires,
- Recreation,
- Source water spills,
- Wastewater,
- Stormwater runoff,
- Mining, and
- Cannabis cultivation.

In addition, two special topics were included for brief review. This includes a presentation of the watershed population and growth potential, as well as a brief discussion on the potential impacts of climate change on source water quality.

Each of these activities can contribute at least one of the constituents identified in **Table 1-1** to the source water.

Table 1-1
Water Quality Constituents Selected for Evaluation as Part of the 2026 Update

Constituent	Reason for Inclusion in 2026 Update
Turbidity	Turbidity is a measurement of suspended solids in water. Treated water turbidity levels are regulated in the SWTR and the IESWTR.
Escherichia coli (E. coli)	USEPA believes that source water *E. coli* may be the best surrogate to determine treatment requirements in lieu of actual pathogen and virus data.
Giardia	*Giardia lamblia* is infectious to humans. Source water levels of *Giardia* are used to determine treatment requirements under the SWTR.
Cryptosporidium	*Cryptosporidium parvum* is infectious to humans. Source water levels of *Cryptosporidium* are used to determine treatment requirements under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR).
Total Organic Carbon	Total organic carbon (TOC) is a surrogate measure of disinfection by-products (DBP) precursor material in water. TOC levels in either source or treated water are used to determine treatment requirements under the Stage 1 Disinfectant/Disinfection By-Product Rule (D/DBPR).
Other Detectable Constituents	Other constituents of interest regulated under Title 22 and unregulated constituents for which monitoring is required were considered for potential impacts to treatability or treated water quality.
Total Trihalomethanes	Total trihalomethanes (TTHMs) are disinfection by-products formed in treated water. Treated water levels are regulated under the Stage 1 D/DBPR and the Stage 2 D/DBPR.
Haloacetic Acids	Haloacetic acids (HAA5) are disinfection by-products formed in treated water. Treated water levels are regulated under the Stage 1 D/DBPR and the Stage 2 D/DBPR.

DESCRIPTION OF HOW THE 2026 UPDATE WAS CONDUCTED

The project team consisted of a Technical Committee (TC) comprised of representatives from both participating water agencies and the consultant team of Starr Consulting and Palencia Consulting Engineers. The TC reviewed data evaluation and identification and development of key findings and recommendations.

The consultant team obtained information from all water treatment plants through an agency survey that addressed each treatment plant's processes, including a discussion of treatment challenges and changes since the 2021 Update. The participating water agencies provided raw and treated water data as well as information on their actions relevant to recommendations from the 2021 Update.

The consultant team collected information on contaminant sources in the watershed through literature reviews, Internet searches, and discussions with various agencies' staff. A list of references is provided in **Appendix A**.

REPORT ORGANIZATION

Section 1 - Introduction

This section identifies the participating water agencies that funded the study, describes the objectives of the 2026 Update, lists the main topics and constituents covered in the 2026 Update, describes how the 2026 Update was conducted, and includes a description of the basic report organization.

Section 2 - The Watershed and Water Supply Systems

This section is largely descriptive and provides (1) a brief overview of the physical, hydrologic, and land use characteristics of the watershed, and (2) a description of each of the existing water supply systems. There have been very few significant changes in the watershed and water supply systems; therefore, the reader is referred to the 1996 Survey and the 2002 Update for more detailed descriptive information on watershed characteristics. The 2021 Update included an update to the boundary delineations for the Bear River Above Combie Reservoir and Rock Creek Reservoir sub basins, which included small expansions to incorporated areas that contribute to the local canal system. The watershed map has been updated to include the PCWA Weimar water system, which PCWA began coordinated operations of in February 2023 and acquired in October 2023.

This 2026 Update includes an update to the PCWA Alta water system to add the community of Dutch Flat and the Colfax water system to add the community of Shady Glen. Also included are summary information of the history of both participating water agencies, as well as general information on water supplies and emergency and response protocols.

Section 3 – Yuba/Bear River Water Quality Review

This section contains two parts. The first part provides an overall review of the available source, or raw, water quality data in the watershed. The second part provides a review of the constituents of interest, including an explanation for their selection and a summary of the data obtained for the period of study, for each constituent. **Appendix B** contains summaries of the water treatment plants' data used for this review. **Appendix C** provides the regulatory framework used for the compliance evaluations.

Section 4 - Watershed Contaminant Sources Review

This section describes pertinent characteristics of each of the nine potential contaminating activities that were reviewed as part of this study. **Appendix D** provides summaries of data collected as part of the contaminant source review.

Section 5 - Individual Intake Evaluations

This section contains an evaluation of all of the water treatment plant's treated water quality, as well as an evaluation of each water treatment plant's ability to meet the SWTRs and other existing regulations. **Appendix B** contains summaries of the water treatment plants' data used for this review. **Appendix C** provides the regulatory framework used for the compliance evaluations.

Section 6 - Findings and Recommendations

This section consists of key findings and a list of recommendations. Significant changes since the 2021 Update are summarized at the beginning of this section.

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This section provides an overview description of the watershed, which summarizes physical, hydrologic, and land use characteristics. Major watershed characteristics have changed little since the original 1996 Survey. For a more detailed account of this information, the reader is referred to the 1996 Survey and the 2002 Update. The 2021 Update included minor modifications to the Bear River Above Combie Reservoir and Rock Creek Reservoir sub basin boundary delineations. The boundary delineations were expanded to include local runoff with the potential to enter the canal system as described below. This 2026 Update includes addition of the Weimar Water Treatment Plant (WTP) and associated distribution system.

This section provides a description of the overall watershed including the ten sub basins, the canal water supply systems, and water treatment facilities, including a summary of significant changes since the 2021 Update. This work does not include evaluation of distribution system physical facilities.

For assistance with abbreviations and acronyms, the reader is referred to the List of Abbreviations at the front of the Report.

THE WATERSHED

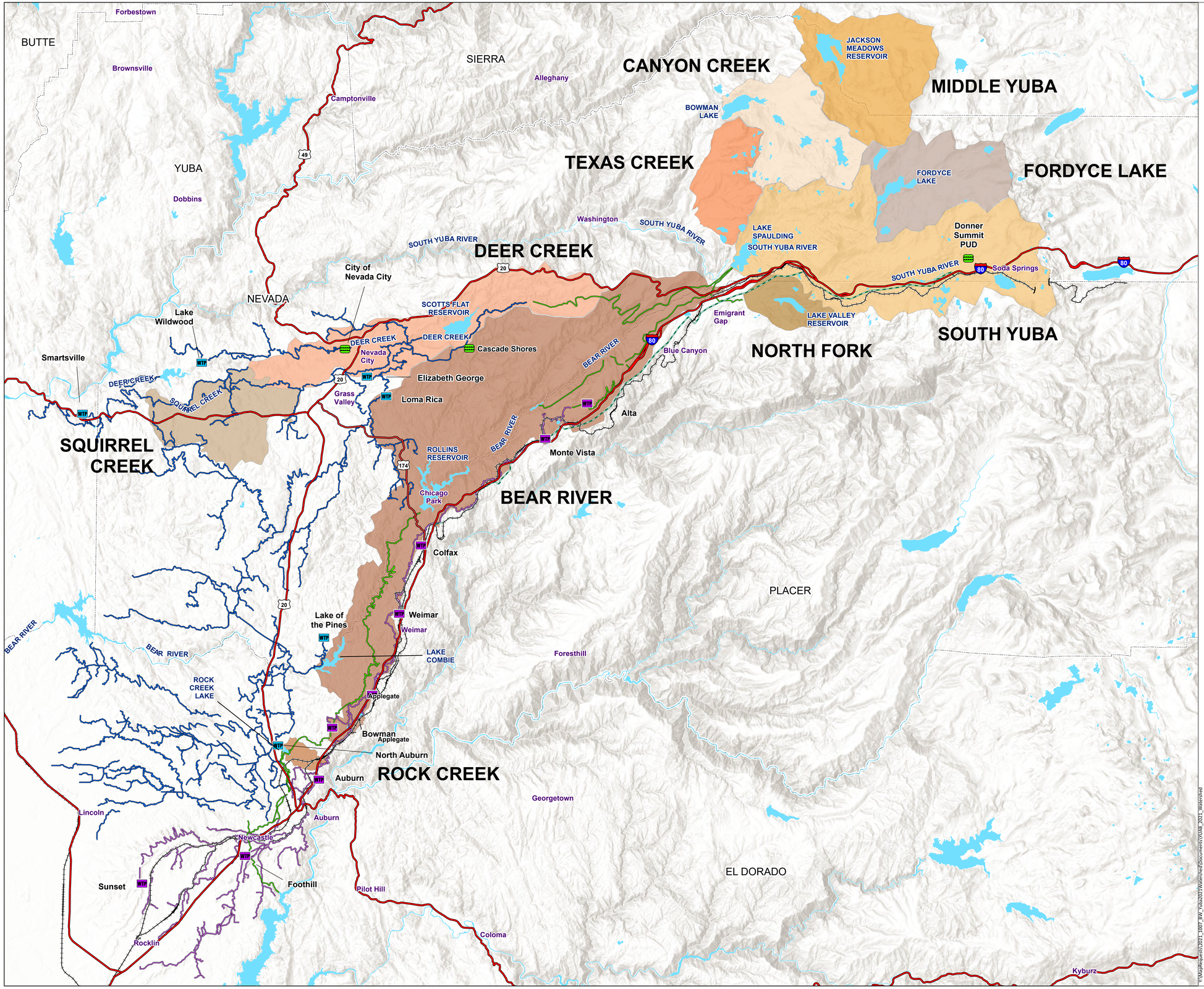
PCWA and Nevada Irrigation District (NID) both utilize water from the Yuba and Bear Rivers. The watersheds are located on the western slope of the Sierra Nevada in Sierra, Nevada and Placer counties. The watershed map is provided as **Figure 2-1**. There were some minor changes since the 2021 Update, these are described in the sub basin discussions below. Water is collected and transported in a variety of creeks, rivers, reservoirs, canals, and pipes. The water is eventually distributed to the fifteen water treatment plants for the participating water agencies.

The watershed includes several large lakes (Jackson Meadows, Bowman, Meadow, Fordyce, Spaulding, Lake Valley, Scotts Flat, Rollins, Combie), numerous small lakes (Milton, French, Jackson, Faucherie, Sawmill, Rucker, Feeley, Carr, Culbertson), and several key creeks and rivers (Fordyce, Middle and South Yuba, Deer, Bear, Squirrel). In addition to drinking water supply, these are used for other purposes including agricultural supply, power generation, and recreation. It should be noted that the canals that transport water below the watershed sub basins are mostly open ditches which have the potential to capture a small amount of local runoff and these contributions are minimally included in this evaluation.

Provided below is a brief description of each of the ten sub basins in the watershed.

Middle Yuba River above Milton Reservoir

The Middle Yuba River above Milton Reservoir has a watershed that is 39.3 square miles, or just over 25,000 acres, with elevations ranging from 5,700 to 8,200 feet and is largely covered by mixed coniferous forest. It is located in Sierra and Nevada counties. The sub basin ownership is approximately 50 percent Tahoe National Forest and 50 percent private. The principal uses in the sub basin are timber harvesting and year-round recreation. The



Legend

- PCWA WTP (source: PCWA's GE001r3.DWG)
- NID WTP (source: Carmen Holman, 8/31/2006)
- WWTP Discharge Point (source: Regional Board)

WATERSHED

- BEAR RIVER
- CANYON CREEK
- DEER CREEK
- FORDYCE LAKE
- MIDDLE YUBA
- NORTH FORK
- ROCK CREEK
- SOUTH YUBA
- SQUIRREL CREEK
- TEXAS CREEK

- NID Canal (source: Carmen Holman, 8/31/2006)
- PG&E Canal (sources: GE001r3.DWG and GE032.DWG)
- PCWA Canal (source: PCWA's GE032.DWG)
- Highway
- Railroad (source: GE001r3.DWG)
- Approximate alignment of Morgan Kinder Petroleum Pipeline (source: route map Roseville to Reno, Southern Pacific Pipe Lines, Los Angeles, CA; 4/28/86, R-11-1)

2.5 1.25 0 2.5 Miles

Revision Date: 5/28/2026

NID and PCWA
YUBA/BEAR RIVER WATERSHED MAP
2026 UPDATE

Watershed Boundary
Figure 2-1

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principal water bodies are Jackson Meadows Reservoir (fed by Middle Yuba River and Pass Creek) and Milton Reservoir.

Canyon Creek and Jackson Creek above Bowman Reservoir

The watershed above Bowman Reservoir is 30.4 square miles, or nearly 20,000 acres, with elevations ranging from 5,564 to 8,400 feet. It is largely covered by mixed coniferous forest. It is located in Nevada County. The sub basin ownership is approximately 60 percent Tahoe National Forest and 40 percent private. The principal uses in the sub basin are timber harvesting, seasonal recreation (spring to fall), and grazing. Bowman Reservoir is fed by Jackson Lake, via Jackson Creek, and French, Faucherie, and Sawmill lakes, via Canyon Creek.

Texas/Fall Creek System

Texas and Fall creeks have a watershed that is 17.2 square miles, or almost 11,000 acres, with elevations ranging from 5,400 to 7,700 feet and is largely covered by mixed coniferous forest. It is located in Nevada County. The sub basin ownership is approximately 50 percent Tahoe National Forest and 50 percent private. The principal uses in the sub basin are timber harvesting and year-round recreation. Water is stored in numerous small lakes, including; Upper Rock, Lower Rock, Culbertson, Upper Lindsey, Middle Lindsey, Lower Lindsey, Upper Feely, Lower Feely, Blue, Rucker, and Fuller. Water is then released to Rucker, Fall, Clear and Texas creeks where it is re-regulated into the Bowman-Spaulding Canal.

Fordyce Creek above Spaulding Reservoir

The Fordyce Creek watershed is 30.5 square miles, or nearly 20,000 acres, with elevations ranging from 6,400 to 9,000 feet and is largely covered by mixed coniferous forest. It is located in Nevada County. The sub basin ownership is approximately 50 percent Tahoe National Forest and 50 percent private. The principal uses in the sub basin are timber harvesting and year-round recreation. The principal reservoirs in the sub basin are Meadow and Fordyce, which release flows to Fordyce Creek and thence to Spaulding Reservoir.

South Yuba River above Spaulding Reservoir

The South Yuba River watershed is 86 square miles, just over 55,000 acres, with elevations ranging from 5,000 to 9,000 feet and is largely covered by mixed coniferous forest. It is located in Nevada and Placer counties. The sub basin ownership is approximately 35 percent Tahoe National Forest and 65 percent private. The principal uses in the sub basin are timber harvesting and year-round recreation, as well as some grazing. Interstate 80, the Union Pacific Rail Road, and the Kinder Morgan Petroleum Pipeline parallel the South Yuba River. The principal water bodies include Lake Van Norden and Kidd Lake, as well as the South Yuba River which flows to Spaulding Reservoir.

North Fork of the North Fork of the American River above Lake Valley Reservoir

The Lake Valley Reservoir watershed is 9.1 square miles, or nearly 6,000 acres, with elevations ranging from 5,475 to 6,824 feet and is largely covered by mixed coniferous forest. It is located in Placer and Nevada counties. The sub basin ownership is approximately 70 percent Tahoe National Forest and 30 percent private. The principal uses in the sub basin are timber harvesting and year-round recreation. Lake Valley Reservoir and Lake Valley Canal are the principal water bodies in the sub basin.

Bear River above Combie Reservoir

The watershed for the Bear River above Combie Reservoir is 134.9 square miles, over 86,000 acres, with elevations ranging from 1,600 to 5,200 feet and is largely covered with evergreen and mixed forest. It is located in Nevada and Placer counties. The sub basin ownership is approximately 20 percent Tahoe National Forest and 80 percent private. This sub basin contains nearly 20 rural community areas, such as; Alta, Dutch Flat, Peardale, Chicago Park, Colfax, Weimar, and Meadow Vista. The other principal uses in the watershed include timber harvesting, seasonal recreation (primarily Memorial to Labor days), and agriculture. Interstate 80, the Union Pacific Rail Road, and the Kinder Morgan Petroleum Pipeline travel along the southern boundary of the watershed. The principal water bodies are Rollins Reservoir, which is fed by imported water, the Bear River, and Greenhorn and Steephollow creeks, and Combie Reservoir, fed by the Bear River.

Deer Creek above the Tunnel Canal Diversion

The watershed for Deer Creek above the Tunnel Canal Diversion is 44.7 square miles, or almost 29,000 acres, with elevations ranging from 1,900 to 5,000 feet and is largely covered with evergreen and mixed forest. It is located in Nevada County. The sub basin ownership is approximately 25 percent Tahoe National Forest and 75 percent private. This sub basin contains portions of both Nevada City and Grass Valley, as well as several other rural community areas. Other uses in the watershed include timber harvesting, recreation, mining, and cannabis cultivation. Highway 20 travels along the northern boundary of the watershed. The principal water body is Scotts Flat Reservoir, which Deer Creek flows through.

Squirrel Creek above China Union Canal Diversion

Water from Deer Creek is diverted through the Tunnel Canal into Squirrel Creek near Rough and Ready. The water is conveyed via Squirrel Creek to the China Union Canal below Lake Wildwood. The watershed for Squirrel Creek above China Union Canal is 26 square miles, or almost 17,000 acres, with elevations ranging from 1,070 to 2,570 feet. The sub basin is located in Nevada County and is largely privately owned. The sub basin contains portions of Grass Valley, Rough and Ready, and Penn Valley. The landscape is still primarily oak-studded grasslands. Other uses in the watershed include recreation, grazing, and farming (including cannabis cultivation). The principal contributing water bodies are Tunnel Canal and Squirrel, Grub, and Clear creeks.

Rock Creek Reservoir

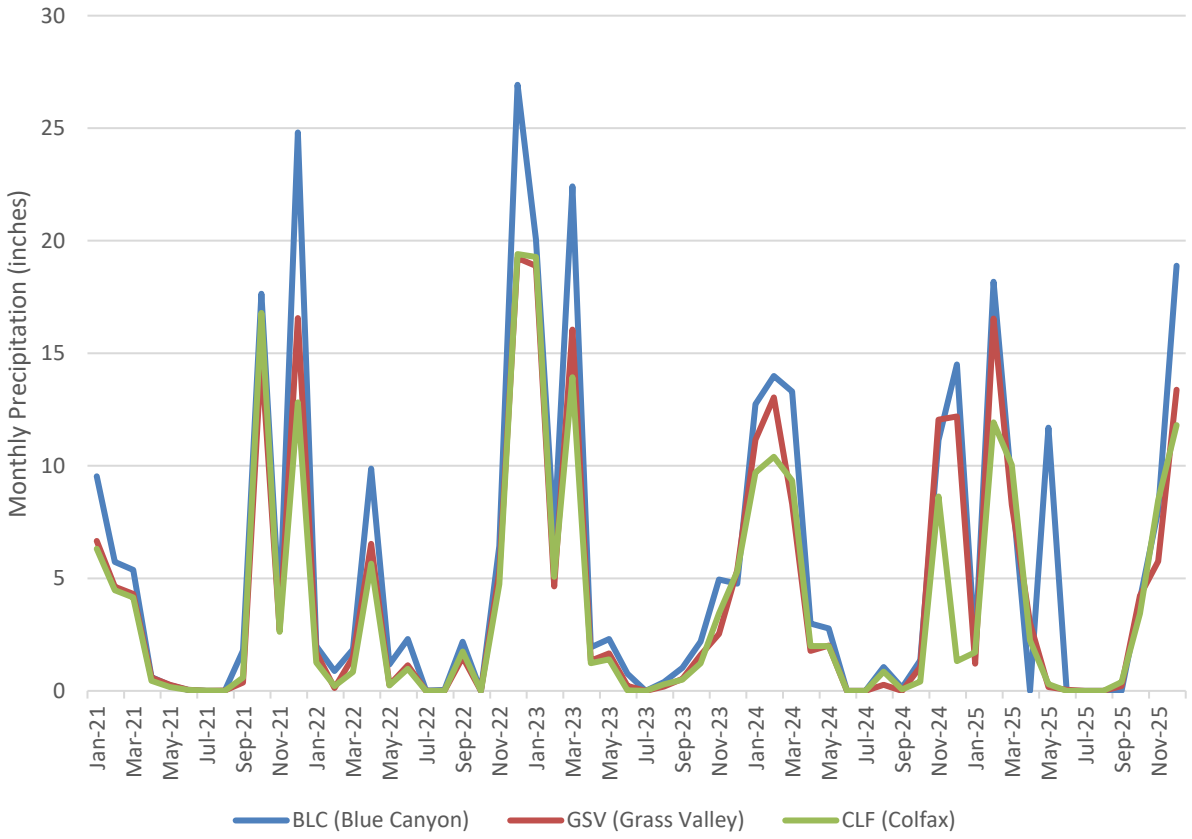
The local watershed for Rock Creek Reservoir is 2.3 square miles, nearly 1,500 acres, with elevations ranging from 1,440 to 1,692 feet. The sub basin ownership is totally private and wholly located within Placer County. The sub basin contains a portion of North Auburn. The watershed includes native oak-studded grasslands, but has significant urban development and associated landscaping. The principal contributing water bodies are imported water, Upper Dry Creek, Wise Canal, Rock Creek, and local drainage.

WATERSHED HYDROLOGY DURING STUDY PERIOD

During this study period there was wide variability in the hydrology, including precipitation, reservoir storage, and canal diversions, that had the potential to impact source water quality.

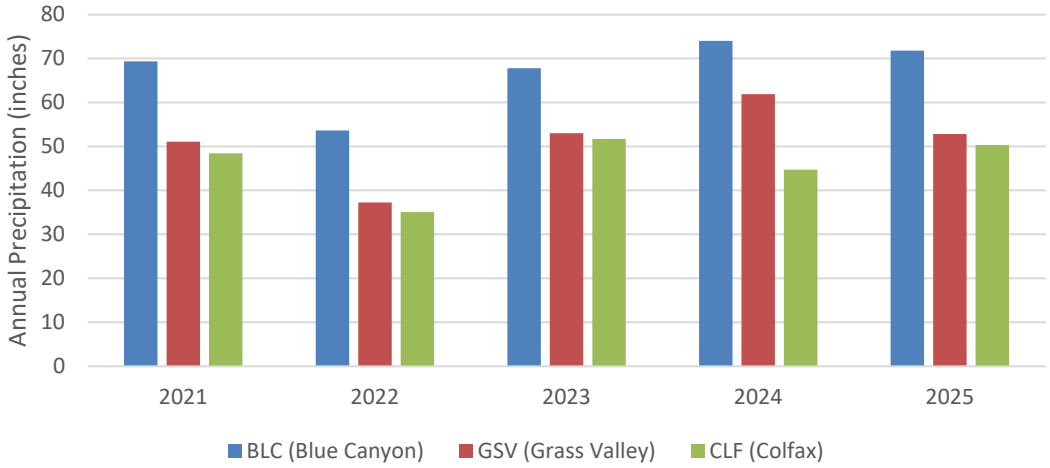
The study period, 2021 through 2025, included periods of above average rainfall and periods of drought. **Figure 2-2** provides a timeseries plot of the monthly precipitation at Blue Canyon (Yuba River upper watershed), Colfax (Bear River lower watershed), and Grass Valley (Deer Creek lower watershed). The winter month wet season is evident in the chart.

Figure 2-2. Monthly Precipitation in the Watershed, 2021 - 2025



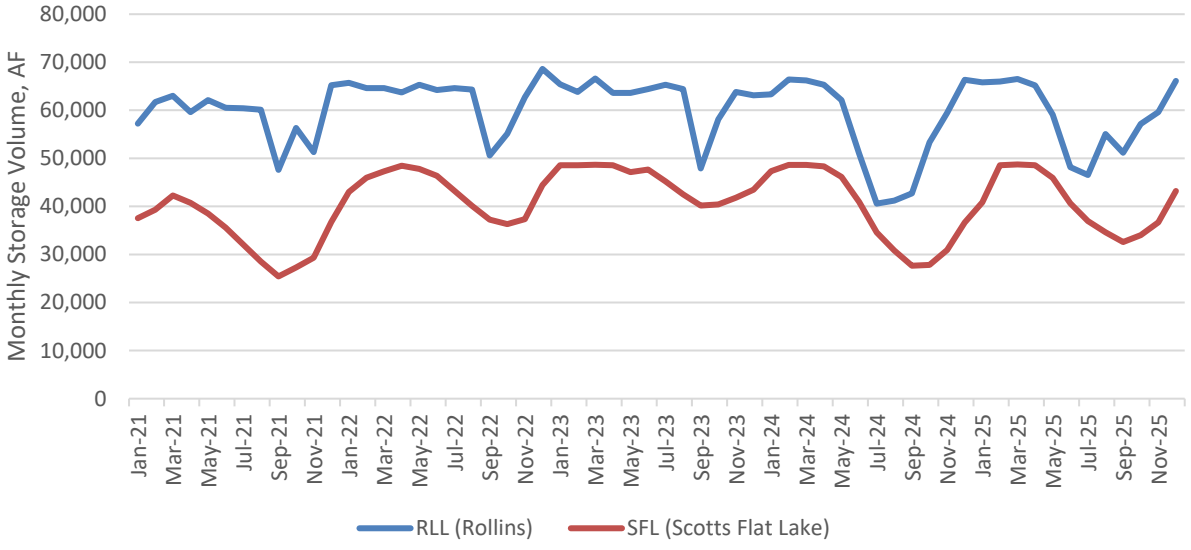
When reviewing annual precipitation totals, **Figure 2-3** shows that Blue Canyon gets the highest annual rainfall while Colfax has the lowest. The average annual precipitation at each site was very similar to the last study period. Water years (October through September year ending) 2021 and 2022 were considered "Critical" for the Sacramento Valley, while water year 2023 was a "Wet" year, 2024 was an "Above Normal" year, and 2025 has not yet been classified, but was similar to 2023 so may be considered a "Wet" year. It can be seen that the years can vary significantly, with 2022 being well below normal and increased precipitation in the second half of the study.

Figure 2-3. Annual Precipitation in the Watershed, 2021 - 2025



The amount of precipitation occurring each year determines the amount of storage available in key reservoirs in the watershed. Storage volumes were available for Rollins Reservoir and Scotts Flat Reservoir, but not for Lake Spaulding. The seasonal fill and release cycles are evident each year in **Figure 2-4**.

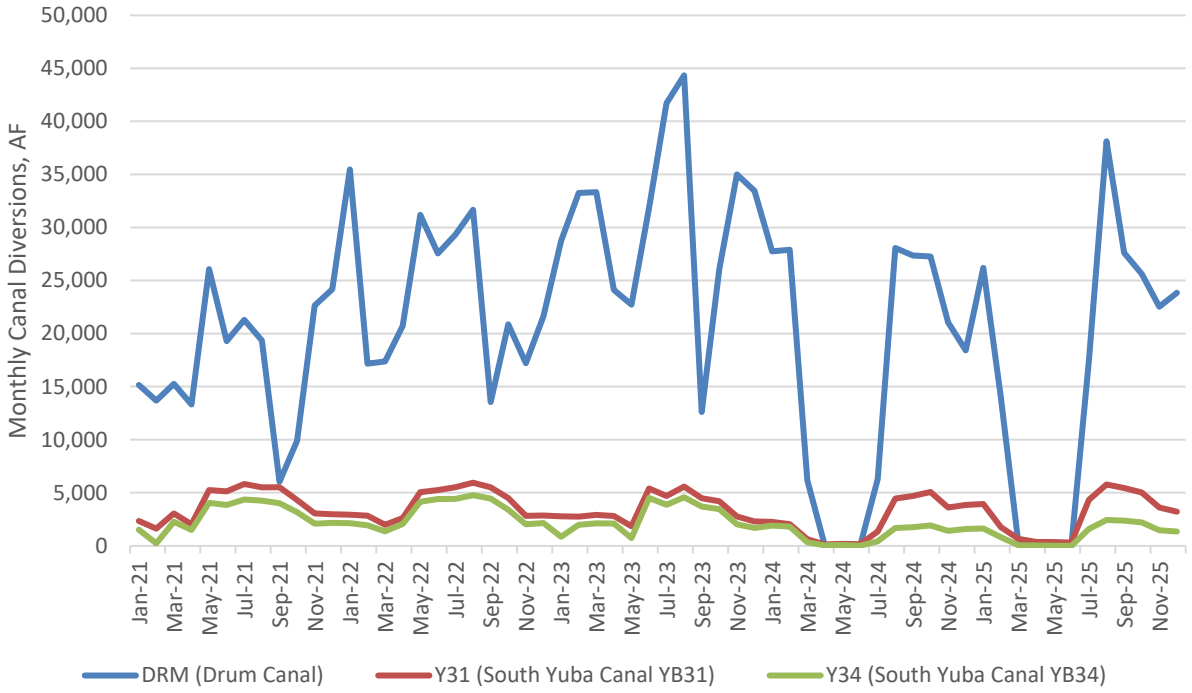
Figure 2-4. Reservoir Storage Volume in the Watershed, 2021 - 2025



Calendar years 2024 and 2025 showed a significantly earlier and longer drop in both reservoir storage volumes. In early February 2024, a portion of the South Yuba Canal (the South Yuba Pipe owned by Pacific Gas and Electric [PG&E]) suffered a complete collapse due to a rockslide rendering the South Yuba Canal inoperable. This reduced inflows to Scotts Flat Reservoir, as evident on **Figure 2-4**. In early March 2024, PG&E's Spaulding 1 Powerhouse suffered an unscheduled outage/failure rendering the Drum Canal undeliverable also. This significantly reduced inflows to both Scotts Flat and Rollins reservoirs, as evident on **Figure 2-4**. In spring 2025, PG&E conducted additional repairs to the Spaulding 1 Powerhouse, and both the South Yuba Canal and Drum Canal were again impacted. Both PCWA and NID water treatment plants relied on inflows from Lake Valley Reservoir, lower watershed system storage, and lower watershed local drainage during the spring and summer of 2024 and 2025.

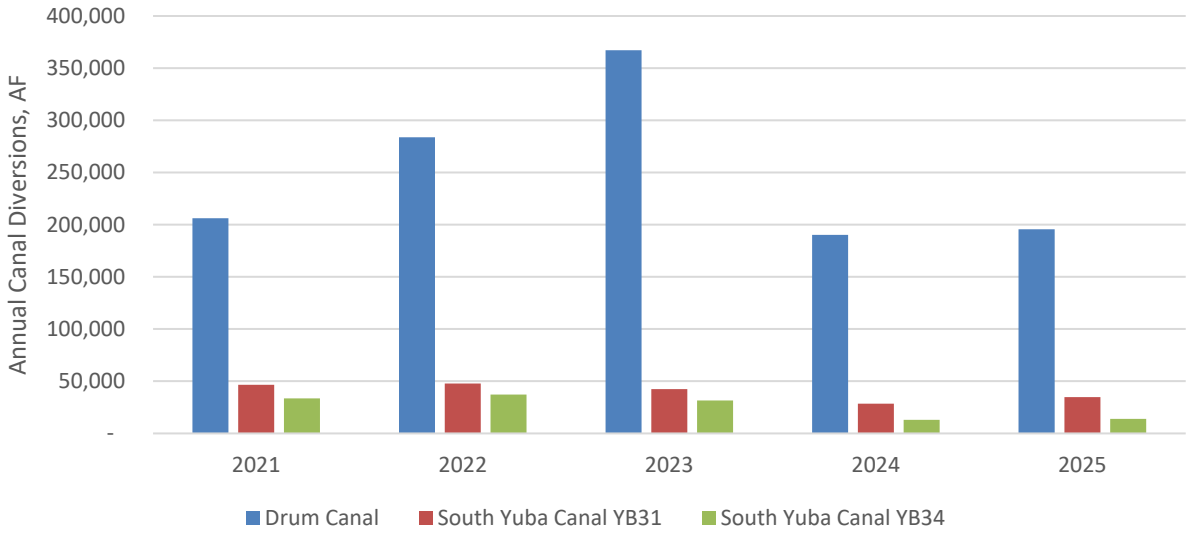
The amount of water flowing through the canals to the water treatment plants from the upper watershed to the lower watershed can be better understood when evaluating the canal diversions. The monthly canal diversions, as shown in **Figure 2-5**, exemplify the seasonal trends in the South Yuba Canal (to NID water treatment plants) and the Drum Canal (to PCWA and NID water treatment plants). The Drum Canal has much higher flows, likely due to the amount of water transported by PG&E for power generation, and has significantly larger swings in diversion rates, likely attributable to seasonal power demand. The annual canal diversions, as shown in **Figure 2-6**, allow comparison of water in the canals by water year. The Drum Canal annual diversion volume is significantly larger than the South Yuba Canal. Both canal systems showed annual variability.

Figure 2-5. Monthly Canal Diversions in the Watershed, 2021 - 2025



The South Yuba Canal volume of water transported annually ranged from less than 14,000 acre-feet per year in 2024 and 2025, caused by the February 2024 rockslide and PG&E powerhouse failure, to just over 37,000 acre-feet per year in 2022 (at YB34). The Drum Canal volume of water transported annually is a wide range from 190,000 acre-feet per year (lowest in 2024 and 2025) to just over 367,000 acre-feet per year in 2023.

Figure 2-6. Annual Canal Diversions in the Watershed, 2021 – 2025



THE WATER SUPPLY SYSTEMS

In the upper watershed above Spaulding Reservoir, water is collected from the Middle Fork of the Yuba River at Milton Reservoir and then conveyed down to Bowman Reservoir in the Milton-Bowman Tunnel. Bowman Reservoir also receives water from Canyon and Jackson creeks, water is then diverted and conveyed to Spaulding Reservoir in the Bowman-Spaulding Conduit. Along the way, water from Texas and Fall creeks is also collected. Spaulding Reservoir also receives water from Fordyce Creek and the South Yuba River. Below Spaulding Reservoir water is also received from Lake Valley Reservoir via the Lake Valley Canal.

The water from Spaulding Reservoir is channeled into the South Yuba Canal for NID's water treatment plants and into the Drum Canal, which also includes flows from Lake Valley Reservoir, for PCWA and NID's water treatment plants. Provided below is a description of the typical water supply systems for the participating water agencies below Spaulding Reservoir. These have been organized into five groups of similar water supply. It should be noted that these are typical operations and that most water treatment plants have alternative supplies that can be used during emergencies or outages. Major outages occurred during the study period in early 2024 at Lake Spaulding, which impacted deliveries to both the South Yuba Canal and the Drum Canal.

It should be noted that all the natural waterbodies in California are designated by the Central Valley Regional Water Quality Control Board (Regional Board) with specific beneficial uses in the Basin Plan. When evaluating a potential discharge permit, only water quality objectives associated with designated beneficial uses are protected. A review of Table 2-1 in the Basin Plan for the Sacramento River Basin indicates that the Municipal and Domestic Supply (MUN) beneficial use is designated as existing for the Yuba River headwaters to Englebright Dam and the entirety of the Bear River. The Yuba River below Englebright Dam is not specifically designated as existing MUN use, which is where Deer Creek, and thus Squirrel Creek, discharge into. When smaller waterbodies are not specifically listed in the designation table, it can be unclear how to apply beneficial uses. Sometimes MUN is automatically applied and sometimes it is only applied if it is tributary to a MUN designated source. Since Deer Creek, and thus Squirrel Creek, enter the Yuba River just below Englebright Dam it is unclear from Table 2-1 of the Basin Plan how these smaller watercourses would consistently be designated.

Banner Cascade Pipeline System

The South Yuba Canal feeds Deer Creek 300 feet above the Cascade Canal diversion, which then provides water supply to the Elizabeth George WTP and Loma Rica WTP. Both of these water treatment plants are owned and operated by NID. The Banner Cascade Pipeline was completed to replace the Cascade Canal as the main conveyance from the Deer Creek diversion to the Loma Rica Reservoir to protect source water quality. Both of the downstream water treatment plants have the ability to take water directly from this pipeline now.

Deer Creek System

Deer Creek then passes through Scotts Flat Reservoir and Nevada City. Water is diverted from Deer Creek into the Newtown Canal (upstream of the Nevada City Wastewater Treatment Plant) to feed the Lake Wildwood WTP. Further downstream, water is diverted from Deer Creek into the Tunnel Canal down to Squirrel Creek, then to China Union Canal. This then feeds the Meade Canal to the Smarstville WTP. Water can be sent to the Union Reservoir for later use via the Union Canal. Both of these water treatment plants are owned and operated by NID.

Upper Boardman Canal System

The Drum Canal feeds the Drum Forebay which then spills into the upper portion of Canyon Creek and into the Towle Canal, which then feeds the Alta Forebay. The Alta WTP uses the Alta Forebay for water supply. The Alta Forebay also feeds Lake Alta and Cedar Creek Canal, which is the water supply for the Monte Vista WTP. Lake Alta can also be filled seasonally during winter months from Canyon Creek via Pulp Mill Canal. The Cedar Creek Canal later feeds the Boardman Canal. The Boardman Canal is the water supply for the Colfax, Weimar, and Applegate WTPs. All of these water treatment plants are owned and operated by PCWA.

Bear River Canal and Lower Boardman Canal Systems

Water is diverted from Rollins Lake on the Bear River into the Bear River Canal. Water from the Bear River Canal is used three ways; diverted into the Lower Boardman Canal via the Ragsdale Random in Applegate, diverted upstream of the Halsey Forebay to the Bowman Canal to feed the Bowman WTP, and sent to the Halsey Afterbay, via the Halsey Forebay.

The Boardman Canal enters Lake Theodore and becomes the Lower Boardman Canal and is used to feed the Auburn WTP. This can also be used as an alternate feed for the Foothill WTP, including flows from the Boardman-Fiddler Green Diversion.

At the Halsey Afterbay water is collected from Halsey Forebay, Upper Dry Creek, Lake Arthur, and possibly seasonal overflows from the Lower Boardman Canal system (including the Ragsdale Random and Lake Theodore). Water passes from the Halsey Afterbay into Wise Canal, which transports water to Rock Creek Reservoir. The North Auburn WTP is fed directly from Rock Creek Reservoir. The Wise Canal leaves the Rock Creek Reservoir, passes through the Wise Forebay, and into the South Canal. The South Canal is the water supply for the Foothill WTP (which can also get water from the Lower Boardman Canal and the American River Pump Station). The South Canal also feeds the Dutch Ravine Canal, which feeds the Caperton Canal (portions of this canal were encased through Bickford Ranch), which feeds Caperton Reservoir (which was also encased in pipe) and Whitney Reservoir, the water supply for Sunset WTP. The North Auburn WTP is owned and operated by NID, while the other water treatment plants are owned and operated by PCWA.

Bear River System

Water released from Rollins Lake into the Bear River then enters Combie Lake. Water is diverted from Combie Lake into the Magnolia III Canal, via the Combie Phase I Canal and Magnolia Reservoir, to supply the Lake of the Pines WTP. Lake of the Pines WTP is owned and operated by NID. Much of the Magnolia III Canal has been enclosed in a pipeline to protect source water quality.

THE WATER TREATMENT FACILITIES

Placer County Water Agency

PCWA owns and operates nine water treatment plants, in seven public water systems, that utilize Yuba/Bear River water supply. These are presented below. Two of the water treatment plants, Bowman and Foothill, have two parallel treatment trains with different processes. The Alta, Monte Vista, Colfax, Weimar, and Applegate WTPs provide water to individual distribution systems, which are separate public water systems. The Bowman and Auburn WTPs both feed water into the Auburn/Bowman distribution system, which is one combined public water system. The Foothill and Sunset WTP both feed water into the Foothill distribution system, which is one combined public water system.

Water ditches were originally constructed throughout Placer County as part of the 1800s mining efforts. These ditches were later converted for agricultural use at the end of the 19th Century when mining was exhausted. The expansion of electricity illuminated the value of the region for hydroelectric power generation and PG&E began development of its Yuba/Bear Rivers hydroelectric operations. Struggles over water rights ensued between out of county interests related to hydroelectric, federal/state water supply, agriculture, and mining. Placer County Board of Supervisors passed a resolution in September 1948 to develop its own water resources on the American River.

PCWA was officially formed as a new government agency on September 11, 1957 to develop its water rights within Placer County for an adequate supply of water for the people of the county. PCWA began acquiring sections of PG&E's Zone 1 water conveyance system in the late 1960s. Zone 1 was defined as Auburn, Bowman, Ophir, Newcastle, Rocklin, Lincoln, Penryn, Loomis and part of Granite Bay. This included a network of canals, water treatment plants, storage tanks and distribution lines plus the right to purchase 100,000 acre-feet of water each year from PG&E. In 1982 PCWA purchased PG&E's Upper Placer Canal System, forming Zone 3 that served Christian Valley to Meadow Vista, Applegate, Colfax, Dutch Flat and Alta. PCWA's' system operates more than 165 miles of canals, pipelines, flumes and siphons; nine water treatment plants; six wells; 27 water tanks; nine raw water reservoirs; and over 500 miles of treated water transmission and distribution lines.

For each of its seven public water systems included in this Report, PCWA implements numerous plans, programs, and reporting. These documents are updated as appropriate or required for each individual public water system. Key items include:

- Emergency Notification Plan
- Emergency Response Plan
- Emergency Disinfection Plan
- Flushing Program
- Valve Exercise Program
- Tank Inspection Program
- Operations Plan
- Operations and Maintenance Plan
- Cross Connection Control Plan
- Bacteria Sample Site Plan
- Disinfection Byproduct Monitoring Plan
- Lead and Copper Monitoring Plan
- Consumer Confidence Report

Alta Water Treatment Plant

The Alta water system (CA3110024) is a community water system with fewer than 300 service connections; primarily single-family residential connections and a few multi-family residential and commercial/institutional connections. The only source of water to the Alta system is the Yuba/Bear river surface water at the Alta Forebay, there are no interties or

standby sources. PCWA has the Monte Vista water system located nearby and is part of a mutual aid organization that can be considered in an emergency situation.

The Alta WTP is located along Interstate 80 in Placer County about 30 miles northeast of Auburn, off the Alta Forebay. Alta has been classified as a direct filtration plant by the California Division of Drinking Water (DDW), and consists of pre-chlorination, adsorption clarification, pressure filtration, and post chlorination. The plant design flow is 356 gallons per minute (gpm), with average flows at 217 gpm.

During the study period an upgrade project was completed that replaced pre-filter piping to address hydraulic limitations to plant capacity. The Alta Forebay has developed excessive vegetation and PG&E implemented a cleanout and dredging in a small portion between the canal inlet and the Alta WTP diversion during this study period. The Dutch Flat Mutual public water system was consolidated into the Alta water distribution system.

PCWA has plans to install 200,000 gallons of additional treated water storage in the Alta water system in the near future. Additionally, PCWA is conducting a feasibility study to replace Canyon Creek through the Alta and Monte Vista areas with an engineered conveyance between Drum and Alta forebays, which would reduce vulnerability to watershed spills from Interstate 80.

Monte Vista Water Treatment Plant

The Monte Vista water system (CA3110124) is a community water system with fewer than 20 service connections; primarily single-family residential connections and a few multi-family residential and commercial/institutional connections. The only source of water to the Monte Vista system is the Yuba/Bear river surface water from Cedar Creek Canal, there are no interties or standby sources. PCWA has the Alta and Colfax water systems located nearby and is part of a mutual aid organization that can be considered in an emergency situation.

The Monte Vista WTP is located off the Cedar Creek Canal approximately 2.4 miles downstream from Lake Alta. Monte Vista has been classified as a direct filtration plant by DDW, and consists of pre-chlorination, adsorption clarification, pressure filtration, and post chlorination. The plant design flow is 85 gpm, with average flows at 35 to 40 gpm.

During the study period a redundant filter was added to the facility to provide fifty percent capacity to maintain feed for residential customers. In addition, a new emergency generator was added, as well as a new 100,000 gallon steel clearwell, to the facility.

Colfax Water Treatment Plant

The Colfax water system (CA3110006) is a community water system with just under 1,000 service connections; majority single-family residential connections and several multi-family residential and numerous commercial/institutional connections. The only source of water to the Colfax system is the Yuba/Bear river surface water from the Boardman Canal, there are no interties or standby sources. PCWA has other community water systems located in

the vicinity of the Colfax water system and is part of a mutual aid organization that can be considered in an emergency situation.

The Colfax WTP is located in Colfax off the Boardman Canal approximately 14.2 miles downstream from Lake Alta. Colfax is a conventional water treatment plant, and consists of pre-chlorination, coagulation/flocculation, sedimentation, pressure filtration, and post-chlorination. The plant design flow is 1.244 million gallons per day (mgd), with average flows at 0.57 mgd.

During the study period no water treatment facility improvements were made, however the Shady Glen Community public water system was consolidated into the Colfax water distribution system. A new replacement water treatment facility is under construction that will serve as a regional plant to serve treated water all the way to the Applegate system as part of regional consolidation.

Weimar Water Treatment Plant

The Weimar water system (CA3110035) is a community water system with just over 600 service connections; primarily single-family residential connections and a few commercial/institutional connections. The only source of water to the Weimar system is the Yuba/Bear river surface water from the Boardman Canal, there are no interties or standby sources. PCWA has other community water systems located in the vicinity of the Weimar water system and is part of a mutual aid organization that can be considered in an emergency situation.

The Weimar WTP is located in Weimar off the Boardman Canal near Weimar Cross Road. Weimar is a conventional water treatment plant, and consists of pre-chlorination, coagulation, circular clarification, gravity filtration, and post-chlorination. The plant design flow is 1 mgd, with average summer flows at 0.53 mgd and average winter flows of 0.34 mgd.

PCWA began coordinated operations in February 2023, acquired the Weimar WTP and associated retail distribution system on October 2, 2023 as part of small system consolidation, and the DDW water supply permit was issued on June 29, 2023 to formally change the ownership. During the study period facility improvements were made to modernize the facility, such as replacing older parts, new power cabling to the pump station, and installation of a manual transfer switch for the portable generator.

Applegate Water Treatment Plant

The Applegate water system (CA3110050) is a community water system with nearly 70 service connections; primarily single-family residential connections and one multi-family residential connection. The only source of water to the Applegate system is the Yuba/Bear river surface water from the Boardman Canal, there are no interties or standby sources. PCWA has other community water systems located in the vicinity of the Applegate water system and is part of a mutual aid organization that can be considered in an emergency situation.

The Applegate WTP is located in Applegate off the Boardman Canal downstream of Pine Crest Road. Applegate is a microfiltration membrane plant, with no pretreatment and only post-chlorination. The plant design flow is 50 gpm, with average flows at 7 gpm. Previously, the plant was converted to a hydrated lime feed system, with a mixer added to the tank, after a corrosion study was completed.

During the study period the only water treatment facility improvement conducted was the recoating of the 100,000 gallon clearwell.

Bowman Water Treatment Plant

The Bowman WTP is part of the Auburn Bowman water system (CA3110005), which is a community water system with over 8,500 service connections; majority single-family residential connections, numerous multi-family residential connections, numerous commercial/institutional connections, some landscape irrigation connections, and a few agricultural irrigation connections. The primary source of water to the Bowman WTP is the Yuba/Bear river surface water from the Bear River Canal (via Rollins Lake), but an alternate feed can be provided by the Upper Bowman Canal (fed by the Boardman Canal) during out-of-service periods on the Bear River Canal. There are three interties with NID's North Auburn water system that could potentially provide an emergency connection to the Auburn Bowman water system (at a very minor flow of 0.5 mgd). The Auburn Bowman water system is also supplied by the Auburn WTP and is part of a mutual aid organization that can be considered in an emergency situation.

The Bowman WTP is located along Interstate 80 on the east side of Auburn, off the Bowman Canal. Water is diverted from the Bear River Canal into an inverted siphon to Bowman Canal and passes through a PG&E staging area, above Halsey Forebay. The Bowman WTP has two separate treatment trains. The Bowman WTP is a conventional water treatment plant, consisting of pre-chlorination, coagulation/flocculation, sedimentation, gravity filtration, and post-chlorination. The plant design flow is 5.0 mgd, with average flows at 3.6 mgd. The Bowman Package WTP has been designated as a conventional filtration plant by DDW, and consists of a CPC Microfloc package unit (adsorption clarification and gravity filtration) followed by post-chlorination. The plant design flow is 2.0 mgd and the average flow is 2.0 mgd. The Bowman Package WTP typically operates from April through October.

During the study period no water treatment facility improvements were made. There are plans to construct a new 12-inch transmission pipeline through the Duncan Hill community that will provide an intertie from the Auburn Bowman water system to the Foothill Sunset water system.

Auburn Water Treatment Plant

The Auburn WTP is also part of the Auburn Bowman water system (CA3110005), as described above. The primary source of water to the Auburn WTP is the Yuba/Bear river surface water from the Boardman Canal, via the Upper Bowman, and Ragsdale Random.

During out-of-service periods for PG&E maintenance, supply from the Boardman Canal direction through Lake Theodore can be provided. There are three interties with NID's North Auburn water system that could potentially provide an emergency connection to the Auburn Bowman water system (at a very minor flow of 0.5 mgd). The Auburn Bowman water system is also supplied by the Bowman WTP and is part of a mutual aid organization that can be considered in an emergency situation.

The Auburn WTP is located along Interstate 80 in Auburn, off the Lower Boardman Canal whose source of supply is a combination of Upper Boardman Canal, Bear River Canal/Rollins Lake, and local runoff from Ragsdale Random and Lake Theodore. The Auburn WTP consists of pre-screening, pre-chlorination, Actiflo pretreatment, gravity filtration, post-chlorination, and a centrifuge for sludge thickening. The plant design flow is 8.0 mgd, with average flows at 2.16 mgd. The plant typically operates from April through October.

During the study period no water treatment facility improvements were made. There are plans to construct a new 12-inch transmission pipeline through the Duncan Hill community that will provide an intertie from the Auburn Bowman water system to the Foothill Sunset water system.

Foothill 1 Water Treatment Plant

The Foothill 1 WTP is part of the Foothill Sunset water system (CA3110025), which is a community water system with approximately 29,000 service connections; majority single-family residential connections, numerous multi-family residential connections, numerous commercial/institutional connections, one industrial connection, some landscape irrigation connections, and one agricultural irrigation connections. The primary source of water to the Foothill 1 WTP is the Yuba/Bear river surface water from the South Canal (via Rock Creek Reservoir and Wise Forebay), but alternate feeds can be provided by either the Lower Boardman Canal or the American River Pump Station during PG&E out-of-service maintenance periods. The Foothill Sunset water system is also supplied by the Foothill 2 and Sunset WTPs and two active groundwater wells. In addition, there are interties with PCWA's Auburn Bowman system, the City of Roseville, and San Juan Water District (at a very minor flow of 6.46 mgd) and PCWA is part of a mutual aid organization that can be considered in an emergency situation.

The raw water intake location for the Foothill 1 WTP is located off PG&E's South Canal. The plant can also be fed from the Lower Boardman Canal at station 903+00, or off the American River during South Canal maintenance. Foothill 1 WTP is a ballasted clarification water treatment plant. The plant design flow is 42 mgd, with average flows at about 25.9 mgd. The plant includes trash rack, grit removal, fine screening, Actiflo pretreatment, high rate filtration, post-chlorination, and a solids management system.

During the study period no water treatment facility improvements were made. The Foothill Raw Water Pipeline from Dutch Ravine to the Foothill WTP was completed in October 2021. There are plans to construct a new 12-inch transmission pipeline through the Duncan Hill community that will provide another intertie from the Auburn Bowman water system to the

Foothill Sunset water system. In addition, PCWA has approved construction of the new Ophir WTP that will also supply the Foothill Sunset water system.

Foothill 2 Water Treatment Plant

The Foothill 2 WTP is also part of the Foothill Sunset water system (CA3110025), with all the same features as the Foothill 2 WTP as described above.

The Foothill 2 WTP is located in Newcastle off PG&E's South Canal. The plant can also be fed from the Lower Boardman Canal at station 903+00, or off the American River during South Canal maintenance. Foothill 2 is a conventional water treatment plant, consisting of pre-chlorination, coagulation/flocculation, sedimentation, gravity filtration, and post-chlorination. It is also permitted to run in direct filtration mode. The plant design flow is 15.0 mgd as a conventional filtration plant and 18.26 mgd as a direct filtration plant, with average flows at 15.1 mgd.

During the study period no water treatment facility improvements were made.

Sunset Water Treatment Plant

The Sunset WTP is part of the Foothill Sunset water system (CA3110025), as described above for Foothill 1 WTP. The primary source of water to the Sunset WTP is the Yuba/Bear river surface water at the Whitney Reservoir (via the Caperton Canal). The same interties exist as described for the Foothill 1 WTP.

The Sunset WTP is located in Rocklin and takes water from the Whitney Reservoir. The source of supply is the Caperton Canal. Sunset is a conventional water treatment plant, consisting of pre-chlorination, coagulation/flocculation, sedimentation, gravity filtration, and post-chlorination. The plant design flow is 8.0 mgd, with average flows at 4.32 mgd.

During the study period the only water treatment facility improvement conducted was the replacement of the aluminum sulfate and sodium hypochlorite storage tanks.

Nevada Irrigation District

NID owns and operates six water treatment plants, in six public water systems, that utilize Yuba/Bear River water supply. These are presented below. Each provides water to a distinct distribution system and is a separate public water system.

NID was organized in 1921 under the California Irrigation District Act of 1897 as a nonprofit water agency and operates under Division 11 of the California Water Code. It was originally organized for the purpose of storing and delivering irrigation water to farmers and ranchers. In the early 1920s, NID acquired storage and regulating facilities in the upper reaches of the Middle and South Yuba rivers. In 1926, NID acquired most of its Canyon Creek holdings and associated water rights including the Bowman, Sawmill, French, and Faucherie reservoirs. Deer Creek water rights were obtained in the 1920s for the development of Scotts Flat

Reservoir. NID water rights are comprised of both watershed runoff and storage carryover, including 24 pre-1914 rights acquired from mining interests, 28 post-1914 rights filed with the State of California to provide for domestic, municipal, industrial, recreational, power, and irrigation uses, and three riparian rights. These include rights for both consumptive and power purposes.

NID began producing power in 1966 with the completion of the Yuba-Bear Power Project, which includes Chicago Park, Dutch Flat, Bowman, and Rollins powerhouses. Recreational facilities owned by NID provide camping, fishing, and boating at Rollins Lake, Scotts Flat Reservoir, and Jackson Meadows – Bowman Lake areas.

NID transports raw water from high elevation mountain reservoirs to the lower elevation foothills and into portions of the northern Sacramento valley near the City of Lincoln. NID provides raw water to its agricultural customers and some other municipal providers, and treated water to its treated water customers and some other municipal providers. The two major distribution and storage systems within NID are the Deer Creek System and the Bear River System. These systems are a mixture of canals, siphons, pipelines, and other water conveyance structures.

For each of its six public water systems included in this Report, NID implements numerous plans, programs, and reporting. These documents are updated as appropriate or required for each individual public water system. Key items include:

- Emergency Notification Plan
- Emergency Response Plan
- Emergency Disinfection Plan
- Flushing Program
- Valve Exercise Program
- Tank Inspection Program
- Operations Plan
- Operations and Maintenance Plan
- Cross Connection Control Plan
- Bacteria Sample Site Plan
- Disinfection Byproduct Monitoring Plan
- Lead and Copper Monitoring Plan
- Consumer Confidence Report

During the study period NID relocated the post chlorination injection location to “pre-filter” for all NID water treatment plants and installed additional storage tank mixers in various NID water systems.

Elizabeth George Water Treatment Plant

The Elizabeth George water system (CA2910004) is a community water system with over 6,400 service connections; primarily single-family residential connections, some multi-

family residential connections, commercial/institutional connections, and one industrial connection. The primary source of water to the Elizabeth George water system is the Yuba/Bear river surface water from the Banner Cascade Pipeline, alternately water can be supplied from the D.S. Canal via Scotts Flat Reservoir (during periods when PG&E's South Yuba Canal is closed for maintenance) or from Deer Creek South Canal via the Pinewoods Pumping Station (other emergency). There is one intertie with NID's Loma Rica water system. NID has other community water systems located in the vicinity of the Elizabeth George water system and is part of a mutual aid organization that can be considered in an emergency situation.

The Elizabeth George WTP is located in Nevada City, 2,000 feet east of Banner Reservoir. The source of supply includes the Banner Cascade Pipeline or the Loma Rica Reservoir. The Elizabeth George WTP is a conventional filtration plant and has a capacity of 18 mgd, with an average flow of 4 mgd. The facility includes pre-chlorination, sedimentation basins, dual media gravity filters, a filter backwash wastewater handling system, post-chlorination, and upgraded solids handling. The primary disinfectant is sodium hypochlorite.

The filters at the Elizabeth George WTP were repacked during the reporting period.

Loma Rica Water Treatment Plant

The Loma Rica water system (CA2910006) is a community water system with approximately 5,100 service connections; primarily single-family residential connections, some multi-family residential connections, commercial/institutional connections, and four industrial connections. The primary source of water to the Loma Rica water system is the Yuba/Bear river surface water from the Loma Rica Reservoir (via the Cascade Pipeline and Canal). There is one intertie with NID's Elizabeth George water system and one with NID's Lake of the Pines water system. NID has other community water systems located in the vicinity of the Loma Rica water system and is part of a mutual aid organization that can be considered in an emergency situation.

The Loma Rica WTP is located in Grass Valley and diverts water from Loma Rica Reservoir, which is the terminus of the Cascade Pipeline and Canal, at mile marker 19.01. Loma Rica WTP is a conventional water treatment plant, consisting of pre-chlorination, coagulation/flocculation, sedimentation, pressure filtration, and post-chlorination. The plant design flow is 8.3 mgd, with average flows at 3 mgd.

During the study period no water treatment facility improvements were made.

Lake of the Pines Water Treatment Plant

The Lake of the Pines water system (CA2910014) is a community water system with approximately 2,500 service connections; primarily single-family residential connections, some multi-family residential connections, and a few commercial/institutional connections. The primary source of water to the Lake of the Pines water system is the Yuba/Bear river surface water from the Magnolia III Canal (via Lake Combie). There is one intertie with NID's

Loma Rica water system. NID is part of a mutual aid organization that can be considered in an emergency situation.

The Lake of the Pines WTP is located south of Grass Valley on the Magnolia III Canal. The source of supply is pumped from Lake Combie. Lake of the Pines WTP is a conventional water treatment plant, consisting of pre-chlorination, upflow clarification, gravity filtration, and post-chlorination. The primary disinfectant is sodium hypochlorite. The plant design flow is 5 mgd, with average flows at 1.3 mgd.

During the study period no water treatment facility improvements were made.

Lake Wildwood Water Treatment Plant

The Lake Wildwood water system (CA2910023) is a community water system with approximately 3,200 service connections; primarily single-family residential connections, some multi-family residential connections, and a few commercial/institutional connections. The primary source of water to the Lake Wildwood water system is the Yuba/Bear river surface water from the Newtown Canal (via Deer Creek). There are no interties or emergency sources. NID is part of a mutual aid organization that can be considered in an emergency situation.

The Lake Wildwood WTP is located in Penn Valley on the Newtown Canal, whose source of supply is Deer Creek. Lake Wildwood WTP is a conventional water treatment plant, consisting of pre-chlorination, coagulation, upflow clarification, gravity filtration, and post-chlorination. The primary disinfectant is sodium hypochlorite. The plant design flow is 4 mgd, with average flows at 1.5 mgd.

During the study period no water treatment facility improvements were made.

North Auburn Water Treatment Plant

The North Auburn water system (CA3110026) is a community water system with approximately 2,500 service connections; primarily single-family residential connections, some multi-family residential connections, commercial/institutional connections, and two industrial connections. The primary source of water to the North Auburn water system is the Yuba/Bear river surface water from Rock Creek Reservoir, alternately water can be supplied from the Combie Ophir Canal (via the Lower Bear River). There are three interties with PCWA's Auburn Bowman water system. NID is part of a mutual aid organization that can be considered in an emergency situation.

The North Auburn WTP is located in North Auburn on Rock Creek Reservoir, or the Combie Ophir Canal. North Auburn WTP is a conventional water treatment plant, consisting of pre-chlorination, coagulation, upflow clarification, gravity filtration, and post-chlorination. The primary disinfectant is sodium hypochlorite. The plant design flow is 6 mgd, with average flows at 2.5 mgd.

During the study period the raw water control valve for the Combie Ophir Canal intake was replaced, but no water treatment facility improvements were made.

Smartsville Water Treatment Plant

The Smartsville water system (CA5810005) is a community water system with fewer than 50 service connections; primarily single-family residential connections, some multi-family residential connections, and two commercial/institutional connections. The primary source of water to the Smartsville water system is the Yuba/Bear river surface water from the Meade Canal (via Squirrel Creek). There are no interties or emergency sources. NID is part of a mutual aid organization that can be considered in an emergency situation.

The Smartsville WTP is located in Smartsville, and receives water from the Meade Canal. The Smartsville WTP is a conventional water treatment plant, consisting of coagulation, flocculation, sedimentation, pressure filtration, and post-chlorination. The primary disinfectant is sodium hypochlorite. The plant design flow is 0.085 mgd, with average flows at 0.037 mgd.

Over the reporting period, the sedimentation tank was upgraded and repaired and in March 2024 and the primary coagulant was changed to aluminum sulfate in September 2023.

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SECTION 3 – YUBA/BEAR RIVER WATER QUALITY REVIEW

This section provides an overall review of the water quality data available within the focus area of this study. This includes all of the source (raw) water data collected by Placer County Water Agency (PCWA) and Nevada Irrigation District (NID). **Appendix B** contains summaries of the water treatment plants' intake data used for this review. **Appendix C** provides the regulatory framework used for the compliance evaluations.

This section then provides a review of the constituents of interest, including an explanation for their selection and a summary of the data obtained for the study period, which is January 2021 through December 2025.

For assistance with abbreviations and acronyms, the reader is referred to the List of Abbreviations at the front of the Report.

OVERALL WATER QUALITY REVIEW

The review of overall water quality is largely based on comparison of the participating water agencies' intake water (also called raw water) to drinking water standards for the constituents currently regulated. This includes all constituents with primary and secondary Maximum Contaminant Levels (MCLs) and unregulated constituents that have Notification Levels. In general, it is assumed that if the raw water is below these limits, then the treated water (also called finished water) will be also. MCLs and Notification Levels are typically based on treated water sample results, but some do apply to raw water. **Appendix C** contains a summary of each of the contaminants currently regulated in drinking water by both the U.S. Environmental Protection Agency (USEPA) and the California Division of Drinking Water (DDW).

Overall, the Yuba and Bear Rivers provide excellent quality source water. The raw water can be treated to meet all drinking water standards using conventional filtration processes. There are no constituents present in the raw water that will require additional treatment processes based on data collected during this reporting period. The individual intake evaluations for treated water and regulatory compliance are presented in **Section 5**.

Selected data, for turbidity, *Escherichia coli* (*E. coli*), and total organic carbon (TOC), from the 15 existing water treatment plant (WTP) intakes (raw water) has been summarized and is included in the summary tables below. Turbidity is reported in nephelometric turbidity units (NTU), *E. coli* is reported in most probable number per 100 milliliters (MPN/100 mL), and TOC is reported in milligrams per liter (mg/L). **Table 3-1 through Table 3-3** shows the general statistics for each selected constituent from the last study period (2016 – 2020) and **Tables 3-4 through Table 3-6** shows the general statistics for the selected constituents from this study period (2021 – 2025). The far right columns for **Tables 3-4** through **Table 3-6** show the percent change in the average and median from the last study period to the current study period.

Table 3-1
Raw Water Turbidity Summary Statistics for all WTPs, NTU, 2016 - 2020

WTP	Minimum	Maximum	Average	Median	95th %
Alta	0.61	6.9	2.2	1.9	4.9
Monte Vista	2.4	9.5	5.0	4.8	7.5
Colfax	1.6	17.7	8.2	8.1	13.7
Applegate	2.5	18.8	8.1	8.1	14.1
Bowman	1.2	114	9.9	3.1	30.5
Auburn	2.0	23.3	8.5	7.2	16.9
Foothill 1	1.4	57.3	8.4	4.2	26.5
Foothill 2	1.4	39.5	6.5	3.5	22.0
Sunset	0.63	3.8	1.7	1.6	2.5
Loma Rica	1.1	8.3	2.7	2.5	5.9
Elizabeth George	0.7	10.5	2.8	2.6	4.8
Lake of the Pines	2.0	40.2	7.1	4.3	24.7
Lake Wildwood	2.2	15.1	5.4	4.6	12.4
North Auburn	3.0	88.7	15.8	9.5	48.7
Smartsville	3.9	31.4	10.5	9.3	20.5

Table 3-2
Raw Water *E. coli* Summary Statistics for all WTPs, MPN/100mL, 2016 – 2020

WTP	Minimum	Maximum	Average	Median	95th %
Alta	<2	81.9	12.0	5.9	49.4
Monte Vista	<2	240	18.5	6.1	81.6
Colfax	<2	184	23.6	10.6	80.4
Applegate	3.6	680	59.5	28.7	201
Bowman	<2	168.2	18.8	12.2	52.3
Auburn	6.5	305	54.3	40.8	139.1
Foothill	1	260	34	15.5	124.4
Sunset	1.5	1600	121.9	25.9	546
Loma Rica	<2	160	8.9	3.6	20.2
Elizabeth George	<2	108.1	5.5	3.1	15.8
Lake of the Pines	<2	1986.3	115.8	45.7	313.5
Lake Wildwood	<2	1046	56.1	18.7	241.6
North Auburn	<2	727	56	21.6	213.5
Smartsville (Meade Canal)	<2	6,488	220.1	58.3	599.9

Table 3-3
Raw Water TOC Summary Statistics for all WTPs, mg/L, 2016 – 2020

WTP	Minimum	Maximum	Average	Median	95th %
Alta	0.9	2.8	1.6	1.5	2.1
Monte Vista	0.7	2.7	1.5	1.4	2.5
Colfax	0.99	2.4	1.5	1.5	2.0
Applegate	1.0	3.4	1.6	1.6	22.5
Bowman	0.9	3.1	1.6	1.4	2.8
Auburn	1.1	2.8	1.6	1.4	2.8
Foothill 1	1.0	2.4	1.5	1.4	2.1
Foothill 2	1.0	2.1	1.5	1.4	1.9
Sunset	1.2	2.4	1.8	1.8	2.3
Loma Rica	0.5	2.2	1.4	1.5	2.0
Elizabeth George	0.66	2.4	1.4	1.3	2.2
Lake of the Pines	1.1	2.1	1.5	1.6	2.0
Lake Wildwood	0.88	3.8	1.6	1.3	3.1
North Auburn	1.1	2.6	1.5	1.4	2.5
Smartsville	1.1	7.7	2.6	2.0	5.9

Table 3-4
Raw Water Turbidity Summary Statistics for all WTPs, NTU, 2021 -2025

WTP	Min	Max	Avg	Median	95th %	Percent Change for Avg[1]	Percent Change for Median[1]
Alta	0.5	2.2	1.1	1.0	1.9	-50.0%	-47.4%
Monte Vista	1.7	7.1	3.8	3.7	5.8	-22.4%	-22.9%
Colfax	1.5	14.4	5.1	4.9	8.5	-37.8%	-38.8%
Weimar	1.9	8.4	3.4	3.0	5.3	NA	NA
Applegate	2.1	16.1	7.8	7.7	13.6	-3.7%	-4.9%
Bowman	0.9	39.8	6.1	3.7	15.4	-37.8%	19.4%
Auburn	1.1	9.9	4.6	4.3	8.9	-45.9%	-40.3%
Foothill 1 [2](42 mgd)	0.8	58.8	5.1	2.5	14.7	-21.5%	-28.6%
Foothill 2 (15 mgd)	0.8	37.3	5.5	2.6	16.7	-34.5%	-39.5%
Sunset	0.7	2.8	1.7	1.5	2.8	-48.5%	-21.1%
Loma Rica	1.7	3.8	2.4	2.3	3.4	-11.1%	-8.0%
Elizabeth George	1.0	5.4	2.7	2.4	4.3	-3.6%	-7.7%
Lake of the Pines	2.8	15.5	5.8	4.8	11.2	-18.3%	11.6%
Lake Wildwood	2.6	12.4	5.2	4.6	9.3	-3.7%	0.0%
North Auburn	3.0	51.7	11.2	7.5	28.3	-29.1%	-21.1%
Smartsville	3.1	26.9	8.8	8.2	15.6	-16.2%	-11.8%

[1] Change between last study period (2016-2020) and current study period (2021 – 2025)
[2] Data from filters 5-9

Table 3-5
Raw Water *E. coli* Summary Statistics for all WTPs, MPN/100mL, 2021-2025

WTP	Min	Max	Avg	Median	95th %	Percent Change for Avg[1]	Percent Change for Median[1]
Alta	<2	124.1	14.0	6.7	46.7	16.7%	13.6%
Monte Vista	<2	80.6	13.3	8.4	43.8	-28.1%	37.7%
Colfax	<2	51.7	12.9	9.8	36.9	-45.3%	-7.5%
Weimar	2.0	122	27.4	24.3	65.9	NA	NA
Applegate	2.6	347.5	56.3	33.7	176.2	-5.4%	17.4%
Bowman	<2	428.2	36.5	15.7	144.3	94.1%	28.7%
Auburn	6.8	1234.8	88.8	52.0	207.3	63.5%	27.5%
Foothill	3.6	205.6	34.7	31.2	69.0	2.1%	101.3%
Sunset	1.5	161.0	30.0	18.1	93.9	-75.4%	-30.1%
Loma Rica	<2	142.0	17.5	10.8	63.6	96.6%	200.0%
Elizabeth George	<2	142.0	14.5	6.3	49.8	163.6%	103.2%
Lake of the Pines	<2	686.7	71.7	11.8	420.8	-38.1%	-74.2%
Lake Wildwood	2	1410.0	62.2	35.9	139	10.9%	92.0%
North Auburn	<2	686.7	46.4	21.0	163.1	-17.1%	-2.8%
Smartsville	<2	365.4	52.3	36.2	163.8	-76.2%	-37.9%

[1] Change between last study period (2016-2020) and current study period (2021 – 2025)

Table 3-6
Raw Water TOC Summary Statistics for all WTPs, mg/L, 2021 – 2025

WTP	Min	Max	Avg	Median	95th %	Percent Change for Avg[1]	Percent Change for Median[1]
Alta	0.8	4.0	1.9	1.8	3.0	18.8%	20.0%
Monte Vista	0.7	3.6	1.8	1.6	3.3	20.0%	14.3%
Colfax	0.6	3.2	1.7	1.6	2.5	13.3%	6.7%
Weimar	0.9	2.2	1.7	1.8	2.2	NA	NA
Applegate	0.7	3.2	1.6	1.5	2.4	0.0%	-6.3%
Bowman	0.7	4.4	1.7	1.5	3.4	6.2%	7.1%
Auburn	0.9	3.0	1.8	1.8	3.0	12.5%	28.6%
Foothill 1	0.5	2.9	1.5	1.4	2.5	0.0%	0.0%
Foothill 2	0.5	2.9	1.4	1.4	2.6	-6.7%	0.0%
Sunset	0.9	1.6	1.3	1.3	1.6	-27.8%	-27.8%
Loma Rica	1.0	2.9	1.7	1.6	2.6	21.4%	6.7%
Elizabeth George	0.48	2.4	1.5	1.7	2.3	7.1%	30.8%
Lake of the Pines	1.2	2.3	1.8	1.9	2.3	20.0%	18.8%
Lake Wildwood	0.6	3.3	1.7	1.5	3.0	6.2%	15.4%
North Auburn	0.9	3.0	1.9	1.7	2.8	23.3%	21.4%

[1] Change between last study period (2016-2020) and current study period (2021 – 2025)

In general, there was:

- A decrease in median raw water turbidity from the last study period to the current study period for all water treatment plants, except for a 19.4 percent increase at Bowman WTP and an 11.6 percent increase at Lake of the Pines WTP, while Lake Wildwood WTP remained unchanged.
- There was a 20 percent or greater increase in median raw water *E. coli* from the last study period to the current study period for seven water treatment plants, which were Monte Vista**,** Bowman, Auburn, Foothill, Loma Rica, Elizabeth George, and Lake Wildwood. Conversely, there was a 20 percent or greater decrease in median raw water *E. coli* for Sunset WTP, Lake of the Pines WTP, and Smartsville WTP. The other water treatment plants, Alta, Colfax, Applegate, and North Auburn, had less variability in their raw water *E. coli* concentrations.
- There was a 20 percent or greater increase in median raw water TOC from the last study period to the current study period for four water treatment plants, which were Alta, Auburn, Elizabeth George, and North Auburn. Only the Sunset WTP saw a large decrease in median raw water TOC, while the other water treatment plants had less variability in their raw water TOC.

SELECTED CONSTITUENT REVIEW

This section contains a general discussion of selected water quality constituents and the reasons why they were selected for further evaluation. The constituents selected for further review in this section include turbidity, microbials including *E. coli, Giardia,* and *Cryptosporidium*, and disinfection by-product precursors including total organic carbon (TOC). A brief discussion of manganese was also provided for the North Auburn WTP. The constituents' general characteristics, seasonal and historical trends, and significance with respect to existing and potential future regulations are presented, along with data analysis and review. Additional evaluation of these constituents, with respect to treated water quality and regulatory compliance, is presented in **Section 5**. Inorganic chemicals, volatile organic chemicals, and synthetic organic chemicals will be discussed in **Section 5**, as they are monitored in treated water only.

In order to provide a spatial analysis, the data has been grouped into five categories: 1) Lake Spaulding via Boardman Canal, 2) Lake Spaulding via Banner Cascade Pipeline, 3) Deer Creek downstream Scotts Flat Reservoir, 4) Downstream Rollins Reservoir via Bear River Canal, and 5) Downstream Rollins Reservoir via Bear River. Within each category, the water treatment plants have been arranged from upstream to downstream.

The constituents selected for further review were selected based on several criteria including; existing or upcoming regulatory standards, critical operational evaluation parameters, and relevance to significant potential contaminating activities. These items are discussed in the background section for each constituent. **Table 3-7** shows the relationship between potential contaminating activities and water quality constituents. Other detectable

constituents, regulated and unregulated, were monitored in treated water and are discussed in **Section 5**.

Table 3-7
Relationship Between Potential Contaminating Activities and Water Quality

	Turbidity	Microbials	DBP Precursors	Other Detectable
Canal Aquatic Herbicide Use	√		√	√
Livestock Grazing	√	√	√	√
Forest Activities	√		√	√
Recreation	√	√	√	
Source Water Spills	√	√	√	√
Wastewater	√	√	√	√
Urban Runoff	√	√	√	√
Mining	√		√	√
Cannabis Cultivation	√		√	√

Turbidity

General Characteristics and Background

Turbidity is the measurement of light scatter in water and provides a measure of the degradation of clarity in water. Clarity is typically degraded by suspended colloids and fine suspended solids such as clay, organic particulates, and microorganisms such as *Giardia* and *Cryptosporidium*, if present. Turbidity is measured to evaluate the efficiency of the treatment process at removing these particles and also to comply with regulatory requirements.

Turbidity was selected for further evaluation since most utilities, including PCWA and NID, optimize pretreatment processes to maximum turbidity removal in order to reduce the potential for pathogens, such as *Giardia* and *Cryptosporidium*, in treated drinking water. Turbidity is monitored throughout each of the treatment plants to ensure that particles are removed. Turbidity has been assumed to be an indicator for the presence of *Giardia* and C*ryptosporidium*. However, turbidity alone may be a poor predictor of microbiological quality.

Current drinking water regulations require that the combined filtered effluent be less than 0.3 NTU in 95 percent of measurements and that the turbidity never exceed 1 NTU. Continuous turbidity monitoring for individual filters is required. Turbidity has also been indirectly regulated in drinking water as part of the Filter Backwash Rule. This rule requires that recycled waste streams return to the plant headworks upstream of all chemical feed systems and recommends return at a controlled, small percentage of total flow (less than 10 percent) to ensure that chemical feed is adjusted for blended water quality, including potential increases in turbidity caused by recycle streams.

High turbidity levels in surface water sources, such as rivers and lakes, are typically the result of erosion and sediment transport during precipitation and high flow events, and are undesirable because high turbidity can mask the presence of harmful particulates. The

principal source of turbidity is general watershed runoff, and it can also be contributed by all of the other potential contaminating activities. It is common for turbidities to vary seasonally as a result of precipitation and flow. It has also been found that the presence of suspended matter can interfere with disinfection of microorganisms.

Evaluation

Turbidity has been selected for evaluation not only because it is a regulated constituent, but also because it is commonly used as an indicator of general water quality and overall plant performance. Averages, medians, minimums, maximums, and 95th percentiles have been summarized for each plant in **Table 3-4**. Timeseries plots have been developed for raw water turbidity over the reporting period for each of the water treatment plants (**Figures 3-1** through **3-5**).

Figure 3-1 indicates that for the Boardman Canal water treatment plants, the monthly average raw water turbidity generally increases from upstream to downstream**.** Raw water turbidities for the Alta WTP are the lowest, with higher turbidities at the Applegate and Auburn WTPs. The Applegate WTP raw water turbidities occasionally rise above 10 NTU.

Figure 3-1. Raw Water Turbidity, Lake Spaulding via Boardman Canal WTPs, 2021-2025

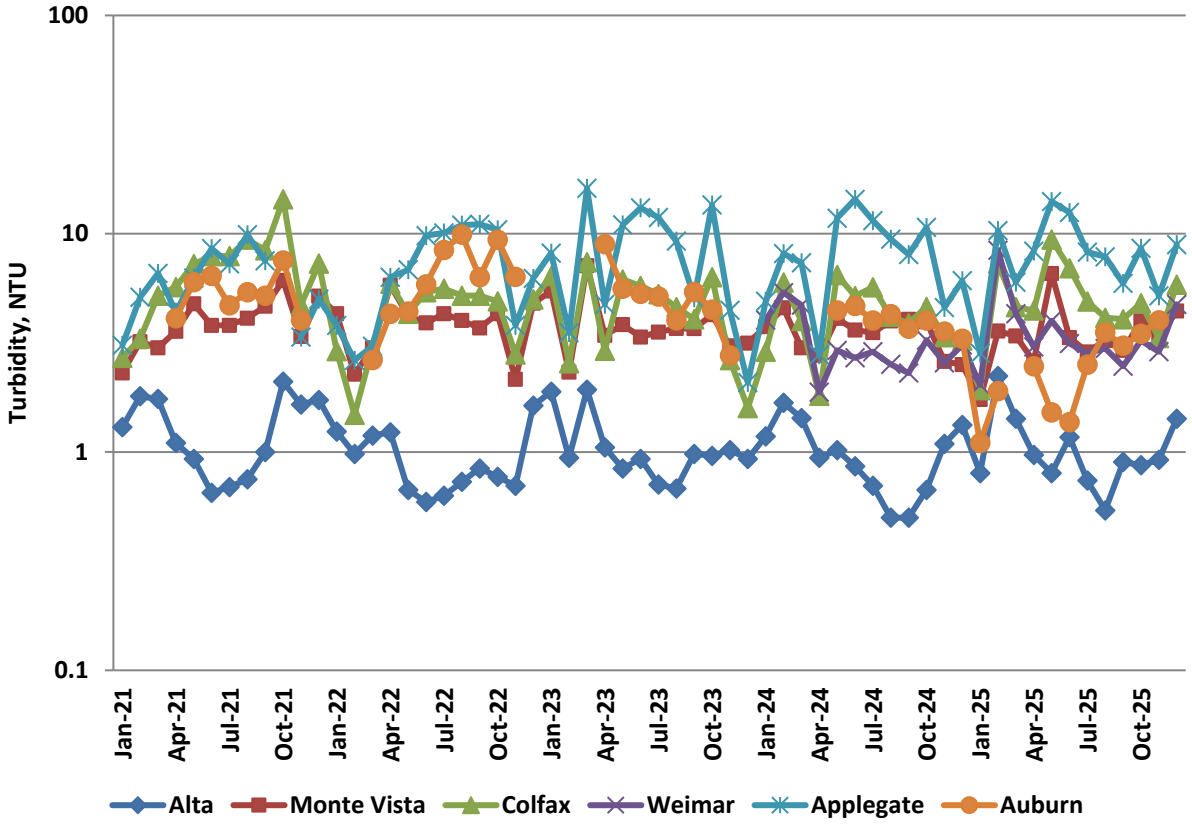


Figure 3-2 indicates that for the Banner Cascade Pipeline water treatment plants, turbidity is similar between the Elizabeth George and the Loma Rica WTPs, as both water treatment plants generally receive water directly from the Banner Cascade Pipeline via the Loma Rica Reservoir. During the 2021 to 2025 time period, the monthly average raw water turbidity for both water treatment plants stayed below 6 NTU.

Figure 3-2. Raw Water Turbidity, Lake Spaulding via Banner Cascade Pipeline WTPs, 2021-2025

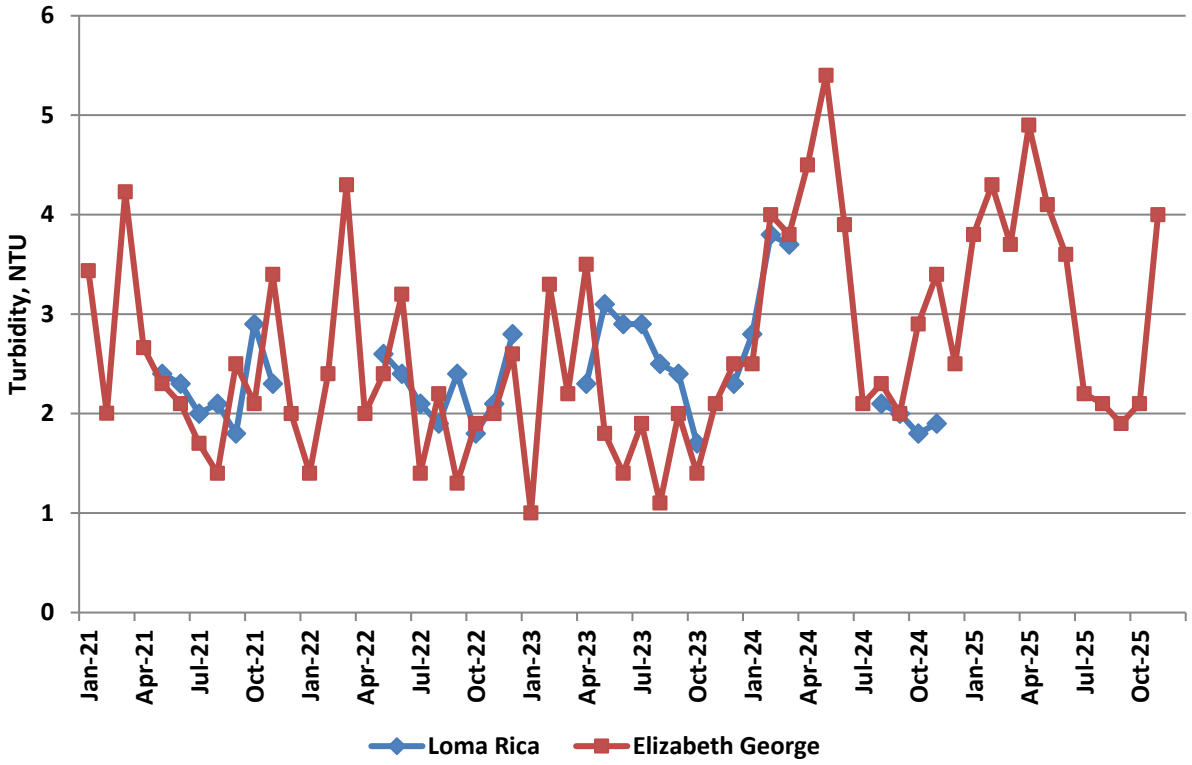
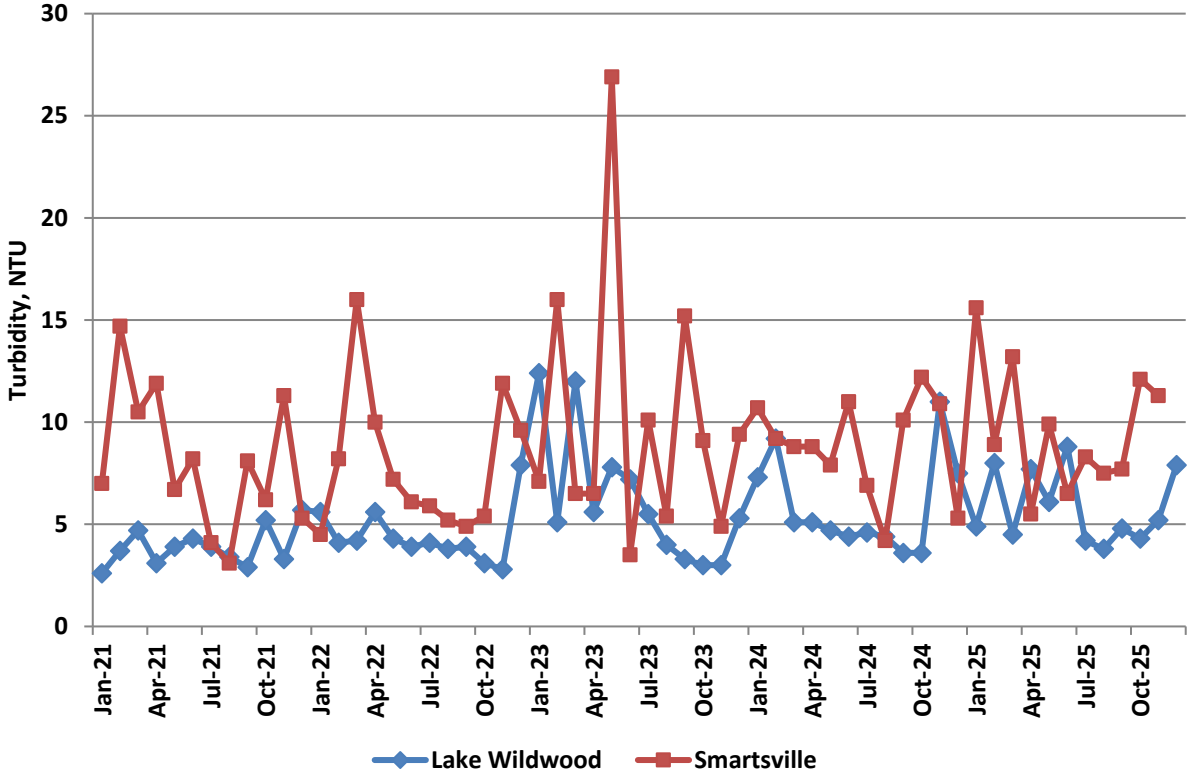


Figure 3-3 presents turbidity for the Deer Creek downstream of Scotts Flat Reservoir water treatment plants. Turbidity is generally below 10 NTU for Lake Wildwood WTP, with the exception of a few peaks in the January to March 2023 time period. Raw water turbidity at Lake Wildwood WTP trended higher through the study period, with turbidity generally at or below 5 NTU during the first half of the study period compared with turbidity generally at or above 5 NTU during the second half of the study period. Turbidities at Smartsville WTP are frequently over 10 NTU. NID has been able to reduce source water peaks at these water treatment plants through an operating procedure; NID stops diverting off the canals during a storm and does not begin diverting again until the storm has passed. This can be effective in reducing source water turbidities at the water treatment plants, however it impacts the reliability of the water supply during vulnerable periods. NID notes that the operating procedure is less effective at Smartsville WTP due to the very long canal system leading to the plant and provides operational constraints at the Lake Wildwood WTP.

Figure 3-3. Raw Water Turbidity, Deer Creek Downstream Scotts Flat Reservoir WTPs, 2021-2025



As shown in **Figure 3-4**, the downstream Rollins Reservoir water treatment plants show seasonal variation, with peaks during the winter and spring and lower turbidities in the summer. This is due to turbid water filling up Rollins Reservoir after rain events, with subsequent release to the downstream canals throughout the winter and spring, particularly in 2023. The North Auburn WTP had the most months where the raw water turbidity monthly average was over 10 NTU. This occurred in 22 out of 60 months. North Auburn WTP is fed from Rock Creek Reservoir, which is a small water body at low elevation that is fed by the Wise Canal and also receives local drainage. PG&E operates this reservoir and does not implement any algae control measures so there are times of algae blooms which could be contributing to the increased turbidity levels. In addition, PG&E does not perform significant maintenance on the reservoir so there could be a need for dredging or cleaning of the reservoir. Turbidities may also increase at the North Auburn WTP during the annual fall maintenance of the Bear River Canal. Additionally, NID is unable to isolate the North Auburn WTP and stop diversion during storm events (similar to the operational procedure at the Lake Wildwood WTP).

Lake of the Pines WTP is the only water treatment plant classified as downstream of Rollins Reservoir via the Bear River. **Figure 3-5** indicates that the source water turbidities for the Lake of the Pines WTP are generally below 10 NTU. Raw water turbidities for Lake of the Pines WTP show seasonal variation, with higher turbidities during the wet season.

Figure 3-4. Raw Turbidity Data, Downstream Rollins Reservoir via Bear River Canal WTPs, 2021-2025

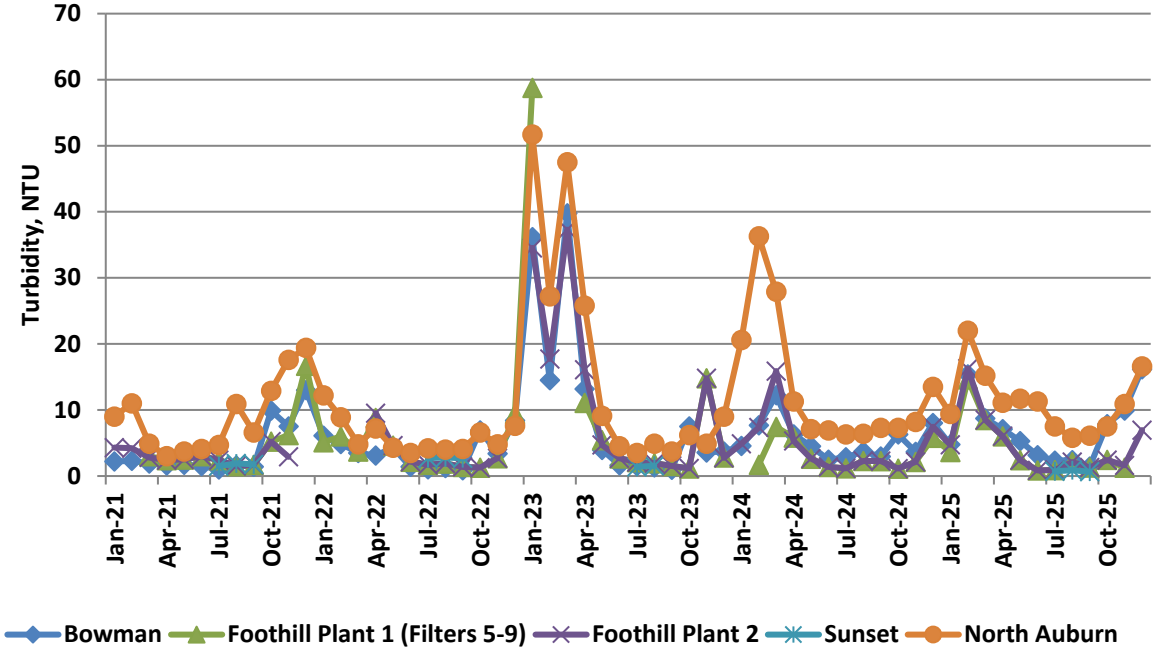
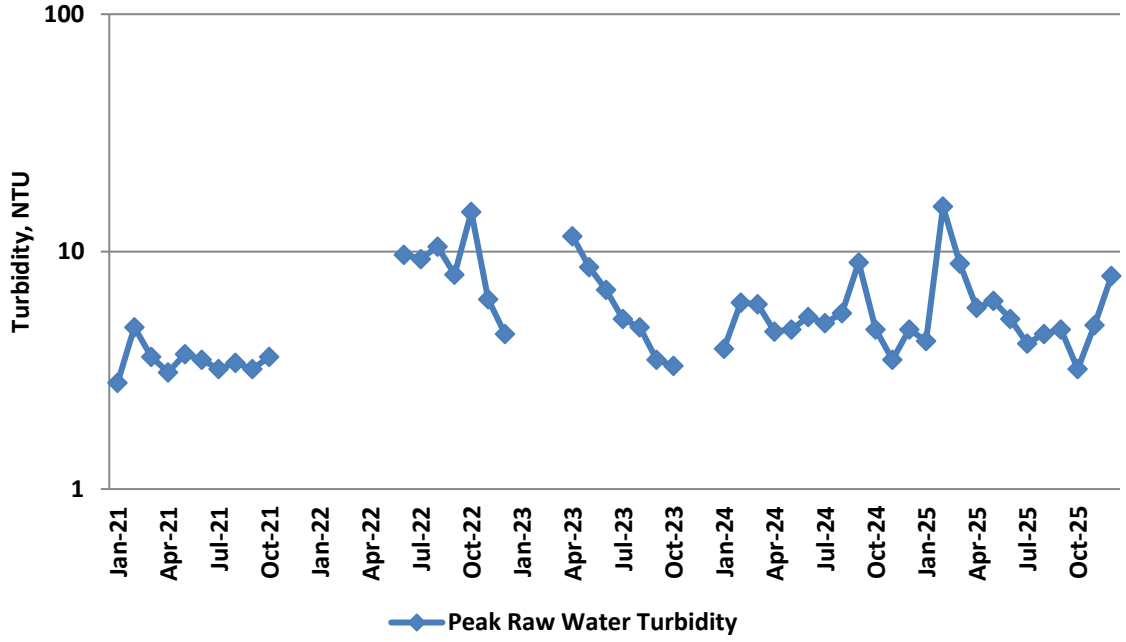


Figure 3-5. Raw Turbidity Data, Downstream Rollins Reservoir via Bear River (Lake of the Pines WTP), 2021-2025



Summary of Results for Turbidity

- The median of the monthly average raw water turbidity ranges from 1.0 NTU at the Alta WTP to 8.2 NTU at the Smartsville WTP. Generally, the raw water turbidity for the Alta, Monte Vista, Colfax, Weimar, Loma Rica, Elizabeth George, and Sunset WTPs stays below 10 NTU. During the reporting period, the remainder of the water treatment plants occasionally measured above 10 NTU, with the Bear River Canal and Deer Creek water treatment plants (particularly North Auburn WTP and Smartsville WTP) most frequently over 10 NTU.
- Smartsville and North Auburn WTP had the most months where raw water monthly averages were above 10 NTU, for 22 months out of 60 months for North Auburn and for 20 months out of 60 months for Smartsville. Higher turbidities at North Auburn WTP could be due to algal blooms or lack of maintenance in Rock Creek reservoir, maintenance of Bear River Canal, turbid water released from Rollins Reservoir, and the inability to stop diversion off the canal during storm events. Higher turbidities at Smartsville WTP are likely caused by the long canals leading to the water treatment plant, which are more susceptible to storm runoff.
- Rollins Reservoir can fill with turbid waters during the wet season. This results in higher turbidities at water treatment plants located downstream of Rollins Reservoir, when turbid waters are released from Rollins Reservoir during the winter and spring.

Microbiological Constituents

General Characteristics and Background

The major microbiological constituents of concern include fecal coliforms, *E. coli*, *Giardia lamblia*, and *Cryptosporidium parvum*. Generally speaking, pathogenic organisms carried by mammalian species may be infectious to humans although this depends on the species of microorganism. Pathogens infecting other types of animals, such as birds and reptiles, are usually not infectious to humans. However, some types of animals, such as birds, may be vectors for human pathogens. Each of these constituents was identified for further evaluation because they are currently regulated. The presence of the constituents in the raw water governs the overall treatment requirements for the water treatment plants.

Fecal coliform and *E. coli* have been used to indicate the potential presence of pathogenic microorganisms in source waters. Although coliform levels have not been shown to correlate well with pathogenic microorganisms, they continue to be used as indicators due to the lack of affordable and reliable direct analytical methods for detecting pathogens. Potential sources of coliform bacteria include general watershed runoff, grazing, recreation, wastewater, urban runoff, spills, and animal populations. Coliform levels in treated water are currently regulated directly through the Total Coliform Rule, to ensure the effectiveness of the disinfection process throughout the distribution system.

Giardia lamblia is a species of the protozoa genus *Giardia* that infects humans and can cause the gastrointestinal disease giardiasis. *Giardia* is found in the environment as a cyst from the

feces of humans and animals; both wild and domestic animals may be hosts. Sources close to waterbodies have the most potential to introduce viable cysts to the source water. Cysts may be destroyed naturally in the environment by desiccation and/or heat. The cysts are effectively inactivated using chlorine disinfection. The detectability of *Giardia* has been greatly improved with USEPA Method 1623, which is better able to establish concentrations, but still does not determine viability. *Giardia* may be carried in urban runoff and wastewater sources or may be contributed directly as a result of body-contact recreation or animal defecation.

Giardia lamblia is currently regulated by the Surface Water Treatment Rule (SWTR), the Interim Enhanced Surface Water Treatment Rule (IESWTR), and the Long Term 1 ESWTR (LT1ESWTR). Surface water supplies must provide for at least 3-log reduction of *Giardia* through physical removal and chemical inactivation. Additional reduction may be required for impaired water supplies. The USEPA provided guidance with the SWTR that indicated additional reduction would be appropriate if measured *Giardia* levels in the source water were greater than 0.01 cysts per liter. However, in the 1980's there was no practical means to measure *Giardia*, therefore the DDW prepared guidance under the SWTR that indicated that 3-log reduction would likely be appropriate when monthly median levels of total coliform in the raw water were less than 1,000 most probable number per 100 milliliters (MPN/100 mL). In recent years DDW has allowed for the substitution of fecal coliform or *E. coli* levels in raw water since they are more specific indicators. The DDW have set the guidance level for increased treatment at raw water monthly fecal or *E. coli* median levels greater than 200 MPN/100 mL, based on the historic ratio of five total coliform to one fecal coliform.

Cryptosporidium parvum is a species of the protozoa genus *Cryptosporidium* that infects humans and can cause the gastrointestinal disease cryptosporidiosis. *Cryptosporidium* is found in the environment as an oocyst principally from the feces of domestic animals, although both wild and domestic animals are known to be hosts. Like *Giardia*, *Cryptosporidium* oocysts may be destroyed naturally in the environment by desiccation and/or heat. Once in the source water, however, viable oocysts are very resistant to traditional chemical inactivation using chlorine. Stronger disinfectants such as ozone or ultraviolet (UV) light are required to inactivate these pathogens. The detectability of *Cryptosporidium* has been greatly improved with USEPA Methods 1622 and 1623, which are able to establish truer concentrations, but still do not determine viability. *Cryptosporidium* may be carried in urban runoff and wastewater sources or may be contributed directly as a result of body-contact recreation or animal defecation.

Cryptosporidium is currently regulated through the IESWTR and the LT1ESWTR, which require 2-log reduction, and the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), which potentially requires additional log action based on source water monitoring results for either *E. coli* or *Cryptosporidium*, depending on system size. Under the IESWTR and LT1ESWTR well-operated conventional and direct treatment plants are granted a 2-log removal credit for *Cryptosporidium* if they meet all treated water turbidity standards. The LT2ESWTR further regulates *Cryptosporidium* and requires additional action (treatment or protection) if the source water quality is determined to be impaired based on direct *E. coli*

or *Cryptosporidium* monitoring of the source. This classification was based on source water monitoring, conducted in two rounds. Round 1 was completed between 2010 and 2015 for initial classification and Round 2 was completed between 2015 and 2020 for confirmation or revision of the initial classification. Small systems with a population less than 10,000 were to first monitor for *E. coli* bi-weekly for one year. If the average annual value was greater than 10 MPN/100 mL for a lake source or 100 MPN/100 mL (as modified by USEPA) for a flowing stream source, then *Cryptosporidium* must be monitored monthly for two years. If not, then the source was classified as Bin 1 and no additional action or treatment is required. If any *Cryptosporidium* running annual average level was greater than 0.075 oocysts per liter (oocyst/L) then additional action must be achieved based on bin classification of the source.

The DDW also developed the *Cryptosporidium* Action Plan (CAP) in the mid-1990's to address *Cryptosporidium* while federal regulations were being formed. The CAP identified recommended turbidity limits for settled water, treated water and recycled water in lieu of treated water *Cryptosporidium* levels. The CAP was developed to help utilities optimize treatment processes to ensure maximum removal of *Cryptosporidium* oocysts and reduce the risk of waterborne illness. This plan was intended for utilities with over 1,000 service connections.

Evaluation for E. coli

Both PCWA and NID monitor raw water for total coliform and *E. coli* twice a month for each individual water treatment plant.

As shown in **Table 3-5**, there was a 20 percent or greater increase in median raw water *E. coli* from the last study period to the current reporting period for seven water treatment plants, which were Monte Vista**,** Bowman, Auburn, Foothill, Loma Rica, Elizabeth George, and Lake Wildwood. Conversely, there was a 20 percent or greater decrease in median raw water *E. coli* for Sunset WTP, Lake of the Pines WTP, and Smartsville WTP.

For the Boardman Canal water treatment plants, **Figure 3-6** demonstrates similar combined monthly median (for all study years) *E. coli* levels for the Alta, Monte Vista, and Colfax WTPs, with increasingly higher *E. coli* levels at Weimar and Applegate WTP. *E. coli* levels appear to increase from the Colfax WTP to the Weimar WTP, and increase again from the Weimar WTP to the Applegate WTP. This trend was also observed in the Second, 2012 Update, 2017 Update, and 2021 Update. The Auburn WTP had the highest *E. coli* levels, with a time-series plot shown in **Figure 3-7.** PCWA staff are currently investigating the source of elevated *E. coli* at the Auburn WTP levels since September 2025. The source water includes the Bear River Canal, via the Ragsdale Random, and the Boardman Canal, below Lake Theodore to the Auburn WTP, both of which are open and earthen in sections, and pass through rural residential areas with numerous crossings making them susceptible to localized vulnerabilities.

Figure 3-6. Combined Monthly Medians for Raw Water *E. coli*, Lake Spaulding via Boardman Canal WTPs, 2021-2025

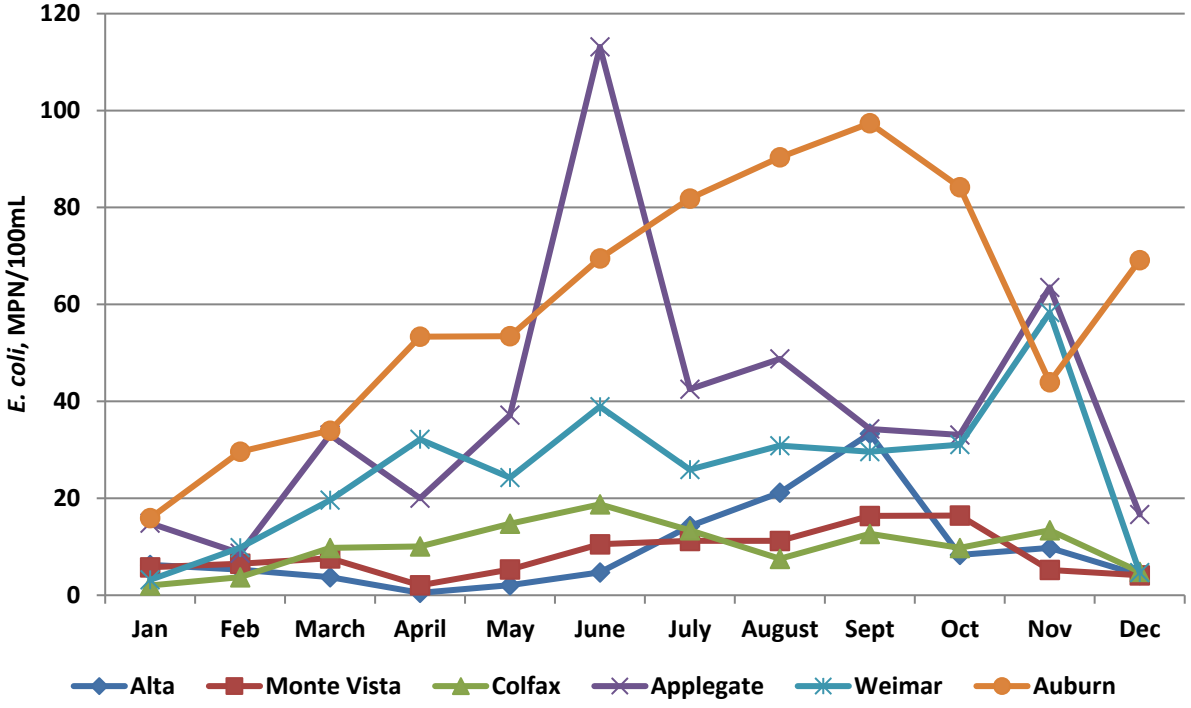


Figure 3-7. *E. coli* Auburn WTP Influent, Jan. 2016 – April 2026

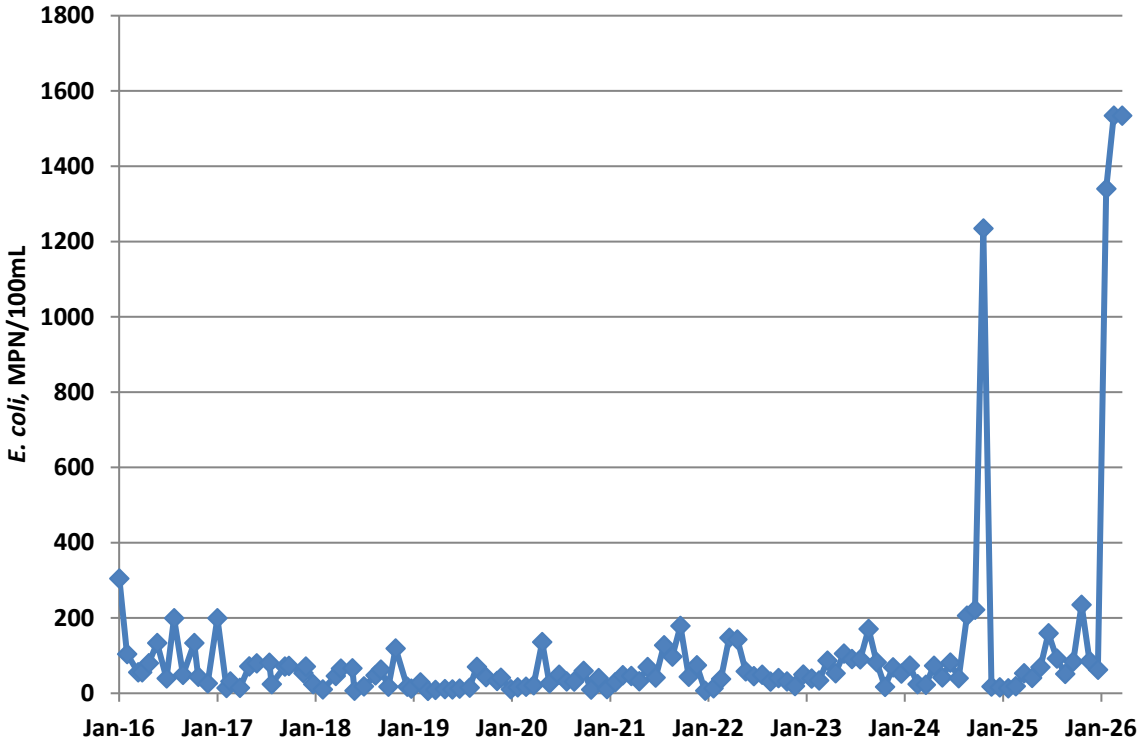
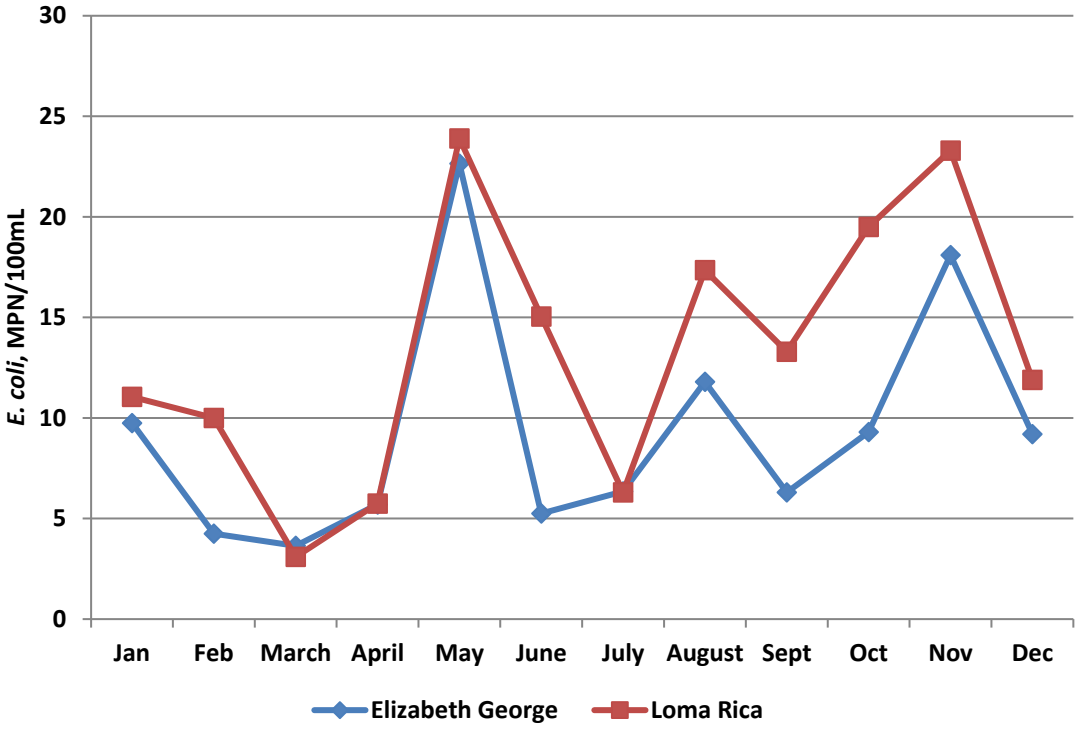


Figure 3-8 indicates that *E. coli* levels at the Elizabeth George and the Loma Rica WTPs are similar, as both water treatment plants receive water from the Banner Cascade Pipeline via the Loma Rica Reservoir. **Figure 3-8** also demonstrates that the monthly median *E. coli* levels for the Banner Cascade Pipeline water treatment plants are always well below 200 MPN/100mL.

Figure 3-8. Combined Monthly Medians for Raw Water *E. coli*, Lake Spaulding via Banner Cascade Pipeline WTPs, 2021-2025

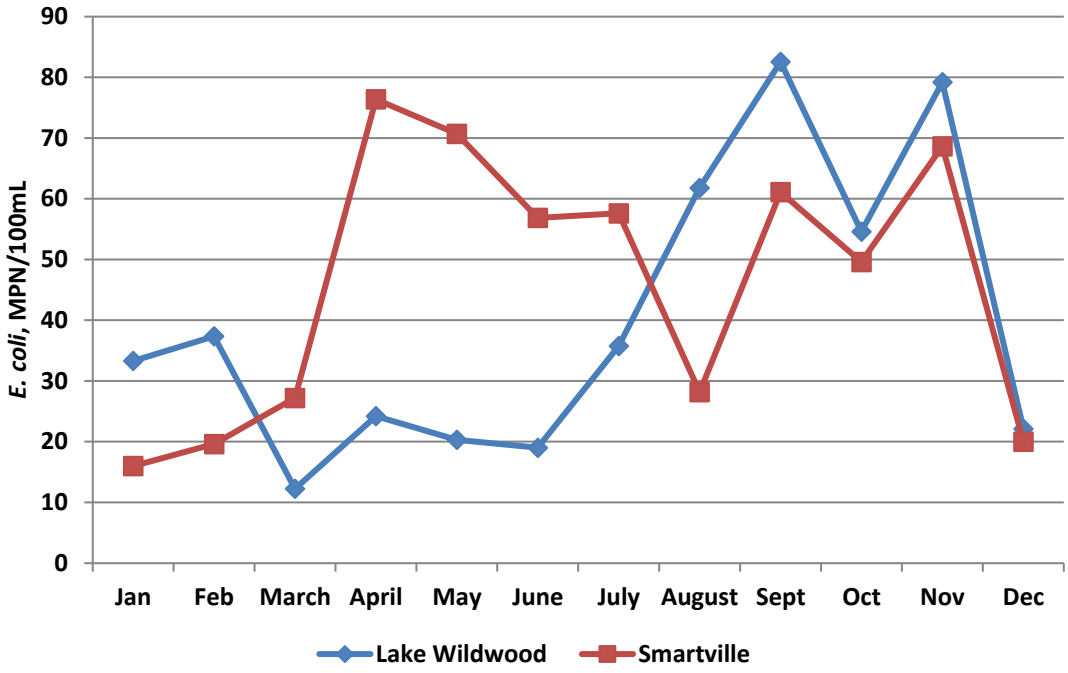


For the Deer Creek water treatment plants downstream of Scotts Flat Reservoir, **Figure 3-9** shows that the monthly median *E. coli* levels increase from Lake Wildwood WTP to Smartsville WTP, particularly during April through June/July which is likely due to increased flows at the start of the irrigation season on April 1st of each year.

There has been a significant improvement in raw water *E. coli* levels at the Smartsville WTP from the previous 2016 to 2020 reporting period to the current reporting period of 2021 to 2025. The 2016 to 2020 *E. coli* average was 220.1 MPN/100mL and the 2021 to 2025 *E. coli* average was 52.3 MPN/100mL, a 76.2 percent decrease.

There are a number of potential sources of *E. coli* in the Squirrel Creek and Deer Creek watersheds, which include runoff from ranches, cattle walking in and along the creeks and canals, treated wastewater effluent, wastewater ponds, and recreation in Western Gateway Park. Some of these sources have been addressed/eliminated (i.e., Penn Valley Mobile Home Park connection to sewer in April 2021 and encasement of sections of the Meade and Newtown Canals) as discussed in the previous 2021 Update.

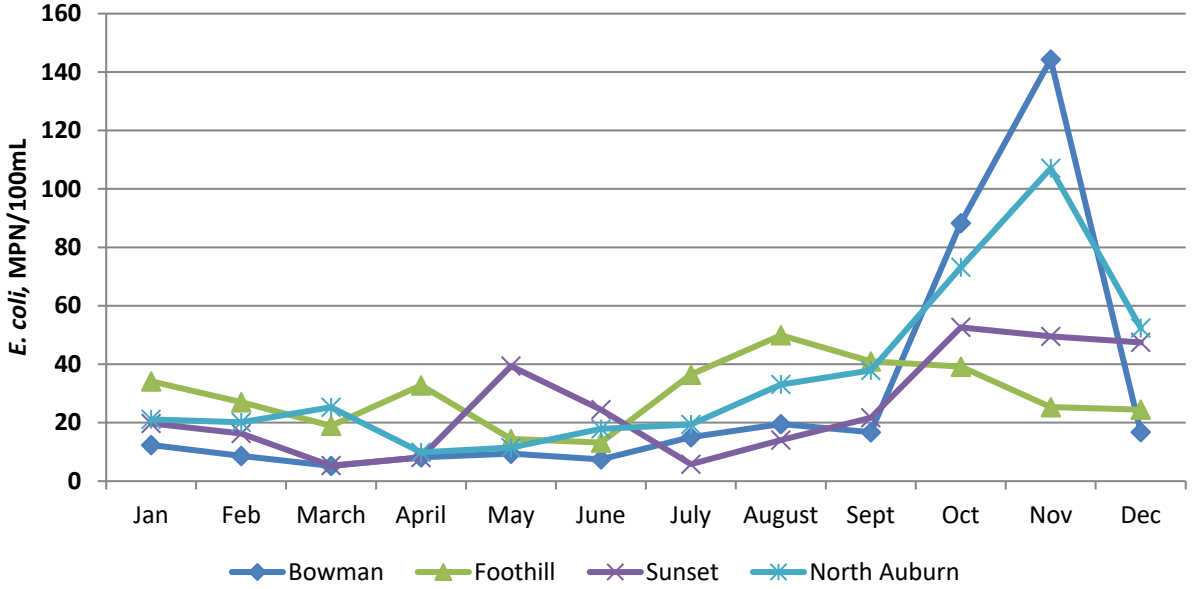
Figure 3-9. Combined Monthly Medians for Raw Water *E. coli*, Deer Creek Downstream Scotts Flat Reservoir WTPs, 2021-2025



For the Downstream Rollins Reservoir via Bear River Canal water treatment plants, **Figure 3-10** indicates no clear trend from upstream to downstream. This trend continues from the Second, 2012, 2017, and 2021 Updates. The North Auburn, Sunset, and Bowman WTPs show an increase in *E. coli* from September to November, which is when PG&E conducts their annual maintenance on the Bear River Canal. During Bear River Canal Outages, the North Auburn WTP reverts to a backup water supply from the Combie-Ophir Canal. This is an NID earthen canal that is supplied water from the Bear River below the dam at Lake Combie. The Sunset and Bowman WTPs revert to the Lower Boardman Canal. These changes in source water supply are likely the cause of the increased monthly medians.

A second trend shown in **Figure 3-10** is an increase in *E. coli* from July through September for the North Auburn, Foothill, and Sunset WTPs. This is a historic trend and it is unclear what is the source of these elevated *E. coli* levels, however they remain below the 200 MPN/100 mL threshold.

Figure 3-10. Combined Monthly Medians for Raw Water *E. coli*, Downstream Rollins Reservoir via Bear River Canal WTPs, 2021-2025



Monthly medians for *E. coli* were examined, as DDW requires an additional log reduction for *Giardia* and viruses if the monthly median for *E. coli* is greater than 200 MPN/100mL. **Table 3-8** shows the number of monthly medians which were greater than 200 MPN/100mL over the 60 month study period.

Table 3-8
Number of Raw Water Monthly *E. coli* Medians (MPN/100mL) Above 200 MPN/100mL for all PCWA and NID WTPs, 2021 to 2025

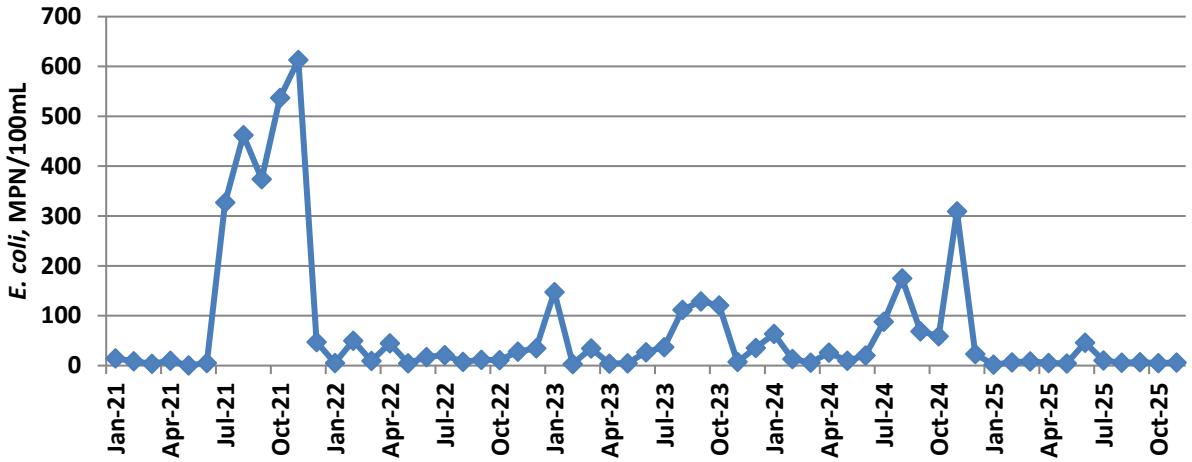
WTP	Number of Monthly Medians > 200 MPN/100mL
Alta	0
Monte Vista	0
Colfax	0
Weimar	0
Applegate	3
Bowman	2
Auburn	4
Foothill	1
Sunset	1
Loma Rica	0
Elizabeth George	0
Lake of the Pines	6
Lake Wildwood	2
North Auburn	1
Smartsville	1 (Meade)

All of the water treatment plants with 10 percent or less of monthly medians (six or fewer during the study period) exceeding the 200 MPN/100 mL threshold were determined to need no further evaluation and should be operated to achieve 3/4-log reduction for *Giardia* and viruses. That includes all of the water treatment plants except Lake of the Pines WTP, which is discussed further below. It should also be noted that the Smartsville WTP is already classified as needing additional reduction and is operated by NID to achieve 4/5-log reduction for *Giardia* and viruses. Therefore, the Smartsville WTP should continue to be operated to achieve 4/5-log reduction for *Giardia* and viruses.

During the previous 2016 to 2020 period, Lake of the Pines, Smartsville and Sunset WTPs all had more than six monthly medians greater than the 200 MPN/100mL threshold. As discussed earlier, the Smartsville WTP experienced lower raw water *E. coli* levels during this study period, likely due to sections of the Meade Canal leading to the Smartsville WTP being encased in 2018/2019 and the Penn Valley Mobile Home Park connection to sewer in April 2021. Similarly, the Sunset WTP experienced lower raw water *E. coli* levels during this study period, likely due to the elimination of the Caperton reservoir and encasement of a portion of the Caperton Canal, which was completed in July 2020.

Since the Lake of the Pines WTP had six *E. coli* monthly medians greater than 200 MPN/100mL during this study period, a closer examination of its monthly medians was completed. **Figure 3-11** shows that five out of the six monthly medians exceeding the 200 MPN/100mL threshold occurred from July to November 2021. NID staff monitored the reservoir for potential causes of microbial contaminants and suspected that the *E. coli* levels may be due to geese overnighting on the reservoir surface. NID has taken a number of actions to reduce *E. coli* levels, including draining and cleaning sediment from the Lake of the Pines raw water reservoir. A geese barrier was also installed across the reservoir, and finally a two to three foot fence was installed around the reservoir in 2024. The fencing around the reservoir appears to have addressed geese overnighting, and raw water *E. coli* levels in 2025 have decreased, as shown in **Figure 3-11.**

Figure 3-11. Lake of the Pines WTP Influent, 2021 to 2025



Summary of Results for E. coli

- The median *E. coli* values ranges from 6.3 MPN/100mL at Elizabeth George WTP to 52.0 MPN/100mL at the Auburn WTP.

- *E. coli* levels increase downstream for the Boardman Canal water treatment plants, particularly after Colfax WTP to Applegate WTP. The Auburn WTP had the highest *E. coli* levels, and PCWA staff have been investigating the source of elevated *E. coli* levels since September 2025. There is no clear spatial trend in the data for the water treatment plants downstream of Rollins Reservoir or for the Deer Creek water treatment plants. *E. coli* levels for the Smartsville WTP tend to increase at the start of the irrigation season on April 1st.

- All of the water treatment plants, except for Smartsville, can continue with their current level of treatment of 3/4-log reduction for *Giardia* and viruses under the SWTR. The Smartsville WTP is currently operated to achieve 4/5-log reduction for *Giardia* and viruses, and should continue.

- In comparison to the 2016 to 2020 data, raw water *E. coli* levels have decreased at the Smartsville and Sunset WTPs, due to source water protection activities conducted at the end of the previous reporting period. For the Sunset WTP, a portion of the Caperton Canal was encased and the Caperton reservoir was eliminated in July 2020. For the Smartsville WTP, sections of the Meade Canal leading to the Smartsville WTP were encased in 2018/2019 and the Penn Valley Mobile Home Park sewer connection was completed in April 2021.

- Lake of the Pines WTP was the only water treatment plant with 10 percent or more of monthly medians (six or more during the study period) exceeding the 200 MPN/100 mL threshold, with the majority occurring in 2021. NID identified geese as the cause and have been able to deter geese overnighting on the Lake of the Pines reservoir by placing wire across the reservoir and fencing around the reservoir. This has resulted in a decrease of raw water *E. coli* levels in 2025.

Evaluation for Giardia and Cryptosporidium

Results from the second round of LT2ESWTR monitoring was completed and discussed in detail in the 2021 Update. The only water treatment plant which was not discussed in the 2021 Update is the Weimar WTP. Additionally, the alternative source water (Combie-Ophir Canal) for the North Auburn WTP was not discussed in the 2021 Update, and updated information is provided below.

Weimar WTP was classified as a Schedule 4 system under the first round of LT2 monitoring and submitted grandfathered data in August 2008. Two additional samples were required and were collected. As the average level of *E. coli* in the raw water was 24 MPN/100mL, and

less than the trigger level of 100 MPN/100mL for flowing streams, no *Cryptosporidium* monitoring was required and the source was classified as Bin 1. A second round of LT2 monitoring was planned to be conducted in 2018, prior to PCWA ownership of this water system. For this 2026 Update, PCWA asked DDW to provide historical records for the second round of LT2 monitoring for the Weimar WTP source. No specific data was able to be provided by DDW, but inspection reports indicate that a Bin 1 classification was awarded. Therefore, it is assumed that Round 2 results reflected Round 1 results, and that Weimar WTP continues its Bin 1 classification. A review of the source water *E. coli* data for the Weimar WTP influent shows that the maximum running annual average from October 2022 through December 2025 was 44.1 MPN/100 mL, which also confirms a Bin 1 classification.

NID sampled the Combie-Ophir Canal as an alternative source water for the North Auburn WTP, from September 2019 to September 2021. The highest 12-month mean for *Cryptosporidium* was 0.008 oocysts/L, indicating the Combie-Ophir Canal source is classified as Bin 1. The highest 12-month mean for *Giardia* was 0.015 cysts per liter.

Summary of Results for Giardia and Cryptosporidium

- All PCWA and NID water treatment plants are classified under Bin 1 for the second round of LT2ESWTR monitoring. However, DDW would not allow Bowman WTP to reclassify to Bin 1 based on Round 2 monitoring.

Disinfection By-Product Precursors

General Characteristics and Background

Disinfection By-Products (DBPs) are formed when disinfectants added to water react with naturally occurring organic matter or other constituents, such as bromide. Since the Yuba and Bear Rivers do not have detectable levels of bromide, total organic carbon (TOC) is the key precursor for DBPs. In addition, temperature significantly affects the rate of disinfection kinetics and can result in increased levels of DBPs. The most common DBPs are total trihalomethanes (TTHMs), which are suspected carcinogens. Other DBPs, including haloacetic acids (HAA5), are suspected mutagens and teratogens. Potential sources of these organic precursors are plant matter, animal matter, and soil, which can be contributed by general watershed runoff, urban runoff, agricultural runoff, recreation, grazing, and wastewater sources.

The Stage 1 Disinfectants/Disinfection Byproduct Rule (D/DBPR) requires varying levels of TOC removal if the source water TOC concentrations exceed 2 mg/L and a utility uses conventional filtration. TOC was a selected constituent for further evaluation due to its importance in the formation of DBPs and also as a general indicator of organic contamination in water.

Evaluation for TOC

Raw water TOC data was provided by PCWA and NID. Average TOC levels for all water treatment plants range from 1.3 mg/L at Sunset WTP to 2.5 mg/L at Smartsville WTP. As shown in **Table 3-6**, there was a 20 percent or greater increase in median raw water TOC from the previous reporting period to the current reporting period for four water treatment plants, which were Alta, Auburn, Elizabeth George, and North Auburn.

As stated above, additional TOC removal is required when source water TOC concentrations exceed 2 mg/L and a utility uses conventional filtration. **Table 3-9** compares the percent occurrence of source water TOC less than or equal to 2 mg/L, for the last study period and the current study period. With the exception of Sunset WTP and Lake Wildwood WTP, all water treatment plants showed a decrease in the percent of source water TOC concentrations occurring at 2 mg/L or less. In other words, the current study period shows that source water TOC concentrations were greater than 2 mg/L at an increasing frequency during this study period, for all water treatment plants except for Sunset WTP and Lake Wildwood WTP. The greatest change was for the Alta WTP, followed by the Lake of the Pines WTP.

Table 3-9
Percent Occurrence of Source Water TOC Equal to or Less than 2 mg/L

Water Treatment Plant	2016-2020	2021-2025	Change
Alta	92.5%	60%	↓ 32.5%
Monte Vista	87.5%	67.5%	↓ 20%
Colfax	95%	75%	↓ 20%
Weimar	NA	67.5%	NA
Applegate	87.5%	85%	↓ 2.5%
Bowman	90%	77.5%	↓ 12.5%
Auburn	85.2%	67.6%	↓ 17.6%
Foothill	97.5%	82.5%	↓ 15%
Sunset	66.6%	100%	↑ 33.4%
Loma Rica	93.7%	85.3%	↓ 8%
Elizabeth George	90%	87.5%	↓ 2.5%
Lake of the Pines	95%	72.2%	↓ 22.8%
Lake Wildwood	75%	75%	-
North Auburn	91.4%	71.4%	↓ 20%
Smartsville	49.1%	36.6%	↓ 12.5%

NA = Not available

Figure 3-12 shows that for the Lake Spaulding via Boardman Canal water treatment plants, TOC levels are similar for all of the water treatment plants; there is no clear trend of TOC increasing as water moves downstream from Alta to Auburn. The highest TOC value of 4.0 mg/L occurred in November 2023 at the Alta WTP. In November 2023, 3.44 inches of precipitation was measured at the Colfax WTP, which likely was a first flush event, causing a spike in TOC.

Figure 3-12. Raw Water TOC, Lake Spaulding via Boardman Canal WTPs, 2021-2025

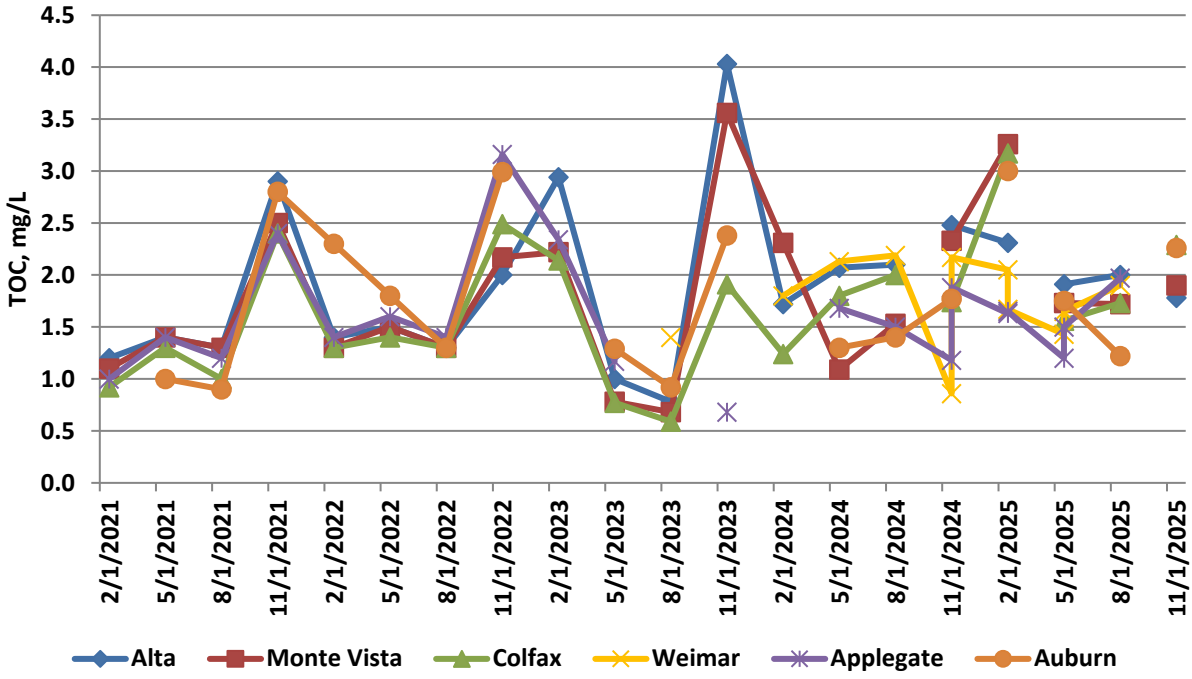


Figure 3-13 shows that TOC levels are similar for the Banner Cascade Pipeline water treatment plants. The highest TOC value of 2.9 mg/L occurred in December 2023 at the Loma Rica WTP.

Figure 3-13. Raw Water TOC, Lake Spaulding via Banner Cascade Pipeline WTPs, 2021-2025

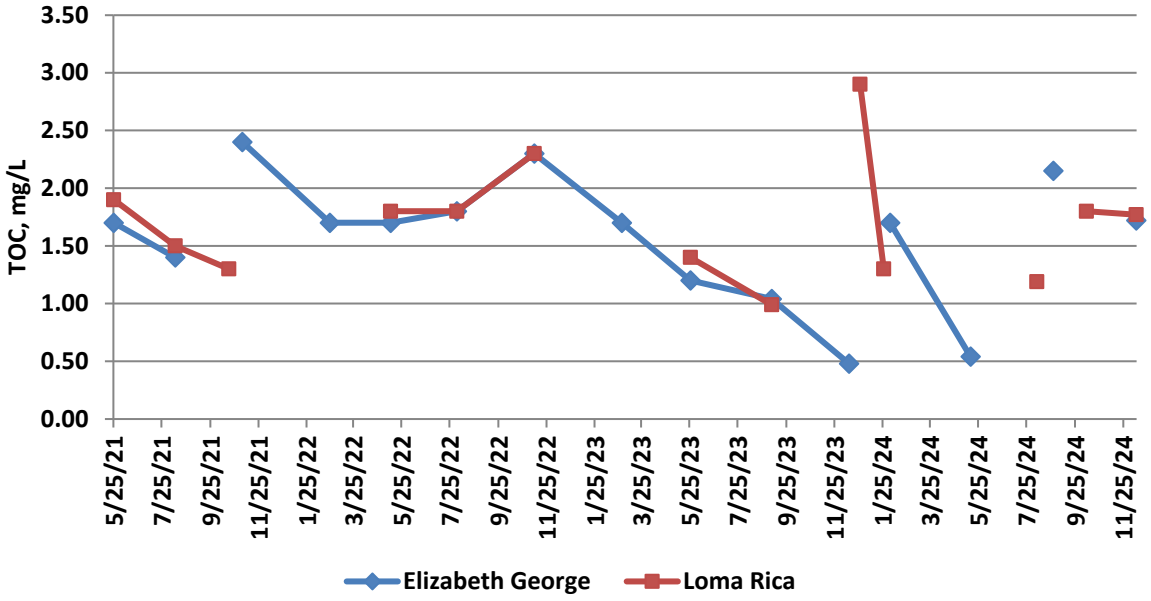
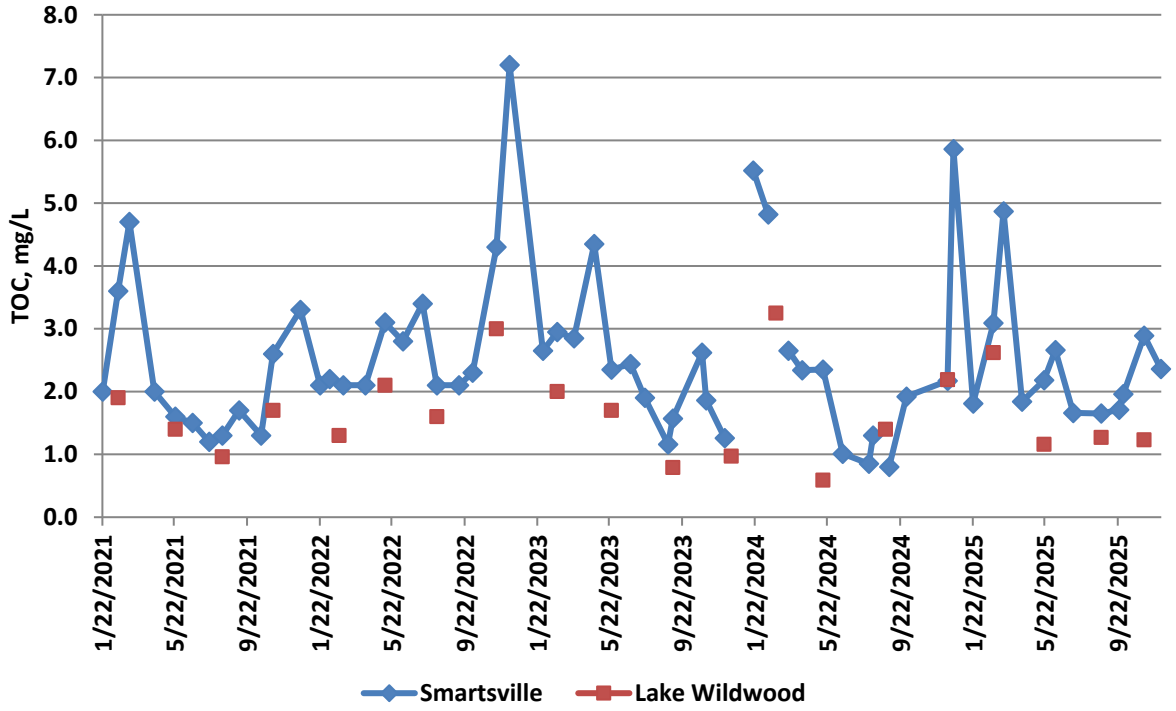


Figure 3-14 shows that TOC increases downstream for the water treatment plants using Deer Creek downstream of Scotts Flat Reservoir. It has been suggested that this is due to the water entering a natural watercourse, Squirrel Creek, and local canals before entering the Smartsville WTP, as well as other localized potential contaminant sources, such as grazing. Higher TOC levels at Smartsville WTP typically occur in the November to January time period. The highest TOC value of 7.2 mg/L occurred in December 2022 at the Smartsville WTP.

Figure 3-14. Raw Water TOC, Deer Creek Downstream Scotts Flat Reservoir WTPs, 2021-2025



Figures 3-15 and **3-16** show that downstream Rollins Reservoir via Bear River Canal, TOC levels follow no clear pattern from upstream to downstream. The highest TOC value of 4.4 mg/L occurred in February 2025 at the Bowman WTP. **Figure 3-22** shows raw water TOC at Lake of the Pines WTP, via the Bear River, with the peak TOC of 2.30 mg/L in November 2022.

Figure 3-15. Raw Water TOC, Downstream Rollins Reservoir via Bear River Canal WTPs, 2021-2025

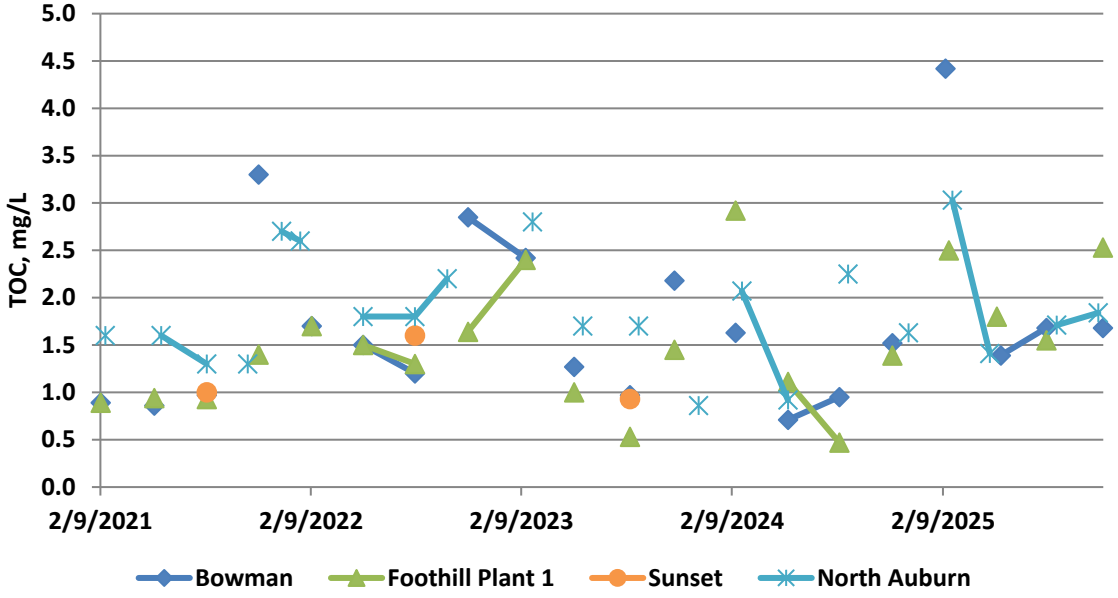
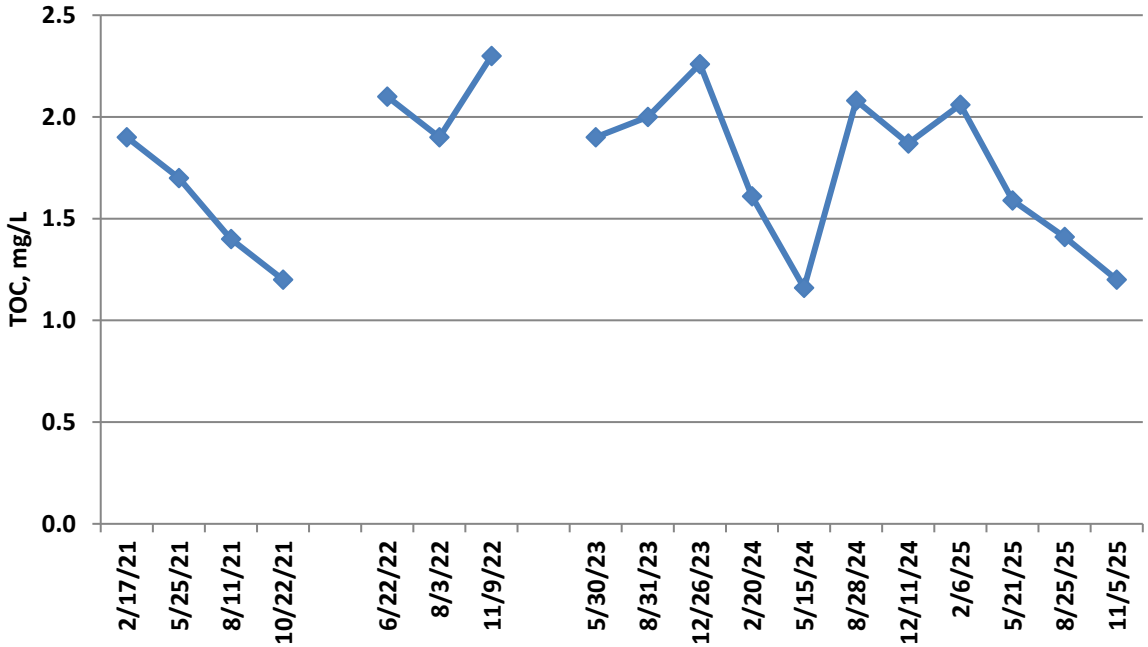


Figure 3-16. Raw Water TOC, Downstream Rollins Reservoir via Bear River (Lake of the Pines WTP), 2021- 2025



Summary of Results for TOC

- Average TOC levels for all water treatment plants range from 1.3 mg/L at Sunset WTP to 2.5 mg/L at Smartsville WTP.

- TOC levels did not increase consistently downstream for similar groupings of water treatment plants, except for the water treatment plants using Deer Creek downstream of Scotts Flat Reservoir

- Smartsville WTP has the highest TOC levels, likely due to exposure to a natural watercourse (Squirrel Creek) and local canals and their associated localized vulnerabilities.

- TOC levels are seasonally variable, with the peak levels typically occurring during the wet season (November to February).

Source Water Temperature/TOC and DBP Formation Evaluation

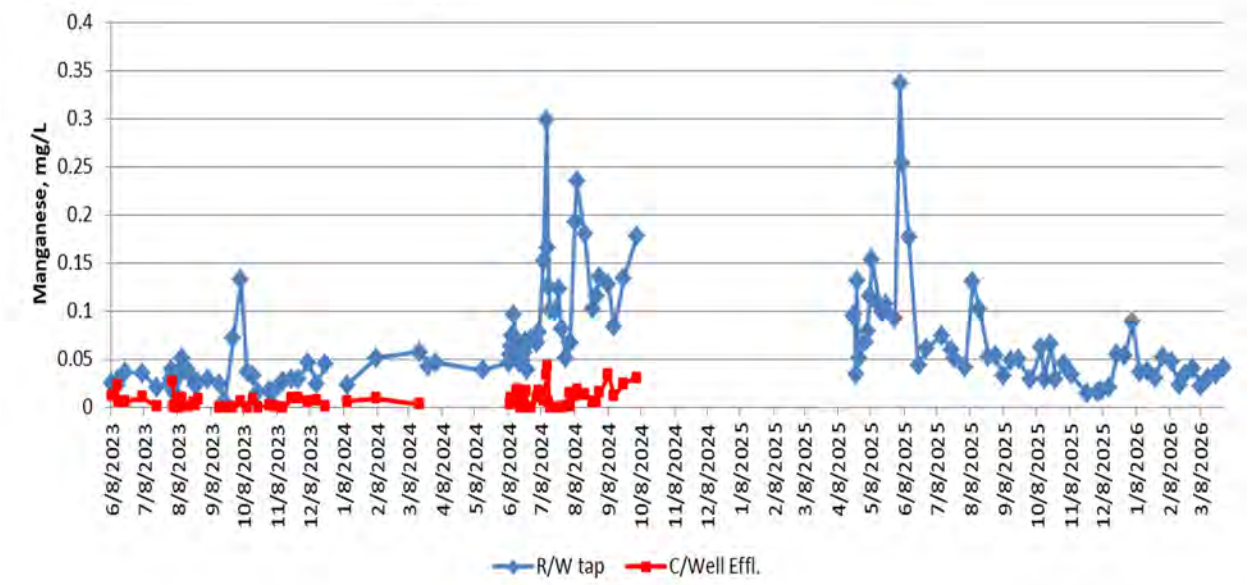
During this study period, there were fewer incidences of elevated DBPs in the distribution systems, indicating that both PCWA and NID have implemented successful operational procedures to control DBP formation. Selected water treatment plants for this evaluation had individual distribution system TTHM concentrations above the MCL of 80 micrograms per liter (µg/L). There were no water treatment plants with individual distribution system HAA5 concentrations above the MCL of 60 µg/L. Source water temperatures and TOC levels were compared to TTHMs at these selected water treatment plants to determine if any correlations could be identified.

- The Alta WTP had a TTHM of 81 µg/L on November 8, 2021. The raw water temperature was 45.9°F and the raw water TOC was 2.9 mg/L. This raw water TOC concentration is higher than the median value of 1.8 mg/L (over the study period) and could have contributed to the elevated TTHM.
- Monte Vista, Colfax and Applegate WTPs had a TTHM of 85, 84 and 98 µg/L, respectively in August 2024. According to the Operational Evaluation Limit (OEL) report prepared by PCWA for Applegate, the cause of the elevated TTHM was a failure of the alarm system for the tank mixer. The tank mixer and ventilation effectively reduces the TTHM level for Applegate. PCWA staff determined that there was likely a mixer or ventilation issue at Colfax, but the result for Monte Vista was unusual.
- Lake Wildwood WTP had a TTHM of 87 µg/L on November 28, 2024. The raw water temperature was 46.4°F. Unfortunately, there was no corresponding TOC sample collected on the same date. The raw water TOC was 2.2 mg/L on December 11, 2024. Therefore, it is difficult to determine a likely cause for the elevated TTHM.

Manganese at North Auburn WTP

Over the reporting period, there was a 1.5 year period (from June 2024 to December 2025) when raw water manganese at the North Auburn WTP was above the secondary MCL of 50 µg/L. As shown in **Figure 3-17**, the raw water average was 87.4 µg/L and the median was 67.0 µg/L, from June 2024 to December 2025. NID staff determined that the source of the manganese is from the sediment/mud in Rock Creek Reservoir, which contributes to elevated water concentrations when the water elevation in Rock Creek Reservoir is low. NID staff is able to manage elevated raw levels in the North Auburn WTP, as treated levels are below the secondary MCL. On June 2, 2026, the DDW issued a revised Notification Level from 500 µg/L to 50 µg/L for manganese.

Figure 3-17. Raw Water Manganese at North Auburn WTP, June 2023 to March 2026



This section contains an evaluation of the nine watershed potential contaminant sources selected for review for the 2026 Update. The nine potential contaminating activities that were selected for review as part of the 2026 Update include:

- Canal aquatic herbicide use,
- Rangeland livestock,
- Forest activities, including timber harvesting and wildfires,
- Recreation,
- Source water spills,
- Wastewater,
- Urban runoff,
- Mining, and
- Cannabis cultivation.

In addition to the nine activities listed above, brief evaluations of the projected population growth in the watershed and the potential for climate change to impact source water quality are also included.

The reader is also referred to the Watershed Map, **Figure 2-1,** which provides information on selected activities in the watershed. For assistance with abbreviations and acronyms, the reader is referred to the List of Abbreviations at the front of the Report.

CANAL AQUATIC HERBICIDE USE

Although there is limited pesticide application in the Yuba/Bear River watershed, it has the potential to be significant in terms of source water quality due to the regulation of many pesticides in drinking water and its proximity of use to the water treatment plants. For that reason, canal operations and maintenance was selected for investigation.

Background

The canals used to collect and transport water from the upper watershed to the lower watershed and to the water treatment plants are owned either by Placer County Water Agency (PCWA), Nevada Irrigation District (NID), or Pacific Gas & Electric (PG&E). These canals can be lined or earthen, and are typically shallow and only slightly sloped. For this reason, there can be times of slow-moving water during the summer and fall months that results in the growth and proliferation of aquatic weeds and algae.

Both PCWA and NID implement seasonal algae control programs as needed, typically sometime between April and November, that are based on chemical control using herbicides.

PG&E operates their canals and reservoirs, such as Alta Forebay, Halsey Forebay, Halsey Afterbay, and Rock Creek Reservoir, for the purpose of power generation and does not implement any type of chemical algae control program. They do not add any pesticides or herbicides to the canal or reservoir water. They utilize mechanical methods, such as drawdown to dry out the canals and pressure washing, to address aquatic weeds and algae.

The canals that are subject to treatment with aquatic pesticides supply the water treatment plants ranging from Monte Vista and Loma Rica Water Treatment Plants (WTPs) down to the communities of Rocklin and Smartsville.

Seasonal Patterns

During the treatment season, generally April through November, any portion of the canals in the PCWA and NID systems may be treated with aquatic pesticides to effectively control aquatic pests. Not all of these locations are used throughout the year, nor are all locations treated regularly.

Related Constituents

PCWA regularly utilizes aquatic pesticides on an as-needed basis to control the growth of aquatic vegetation that impedes the efficient and reliable flow of water. The aquatic pesticides used for aquatic vegetation control during the study period include:

- Algimycin-PWF (copper chelated based algaecide/cyanobacteriocide)
- Cutrine-Plus (copper ethanolamine herbicide)
- Harpoon Granular (copper ethylenediamine complex herbicide)

NID also utilizes aquatic pesticides on an as-needed basis to control aquatic vegetation. The aquatic pesticides used during the study period include:

- Aquamaster (glyphosate herbicide, replace Rodeo in 2025)
- Captain (copper ethylenediamine complex chelated copper herbicide)
- Cutrine–Plus (copper ethanolamine herbicide)
- Nautique (copper carbonate herbicide)
- Phycomycin (sodium carbonate peroxyhydrate algaecide, replace Green Clean Pro in 2022)
- Rodeo (glyphosate herbicide, discontinued 2024)
- Round Up Custom (glyphosate herbicide)

Algimycin-PWF is a copper-based algaecide that is a liquid formulation designed to effectively control a broad range of algae and cyanobacteria growth. Control of certain forms of algae and cyanobacteria can aid in the reduction of taste and odor problems. Dosage rates and frequency of treatment depend on the sensitivity of species present, the extent/biomass of the bloom, and the depth of the growth present in the water column. The active ingredient is copper, which has a secondary drinking water standard of 1 milligram per liter (mg/L).

Aquamaster is applied as a liquid on the inside of canal banks for emerged aquatic plants and other weeds growing at the water line and to floating-leaved aquatic weeds. This is a non-selective aquatic and terrestrial herbicide. It is mixed with a non-ionic surfactant. The active ingredient is glyphosate (53.8 percent), which has a primary drinking water standard of 0.7 mg/L. This is a replacement product for Rodeo.

Captain is a chelated copper aquatic herbicide used against algae and elodea. Captain is administered into canals through a drip method. The active ingredient in Captain is copper ethylenediamine complex. Copper has a secondary drinking water standard of 1 mg/L.

Cutrine-Plus is a liquid that is applied to flowing water using a continuous drip system to achieve desired aquatic pest control with the least amount of chemical use. The active ingredient is copper, which has a secondary drinking water standard of 1 mg/L.

Harpoon Granular is an elemental copper, but is presented in a solid form that is added to sink to the bottom of a waterbody and attack weeds and algae in deeper water more efficiently. The active ingredient is copper, which has a secondary drinking water standard of 1 mg/L.

Nautique is an aquatic herbicide that is a double chelated copper formulation that provides effective control of floating, submersed, and immersed aquatic plants. The copper carbonate is 15.9 percent, which is equivalent to metallic copper of 9.1 percent. Nautique can be applied directly as a surface spray, subsurface through trailing weighted hoses, or in combination with other aquatic herbicides and algaecides, surfactants, sinking agents, polymers, or penetrants. This product can be applied diluted or directly. The active ingredient is copper, which has a secondary drinking water standard of 1 mg/L.

Phycomycin is an organic granular algaecide containing sodium carbonate peroxyhydrate. Degradation byproducts include sodium carbonate, carbon dioxide, bicarbonate carbonate, and hydrogen dioxide. There are no drinking water standards for this or its byproducts. This is a replacement product for Green Clean Pro.

Rodeo is applied as a liquid within rights of ways and in canals for emerged aquatic plants and other weeds growing at the water line and to floating-leaved aquatic weeds. This is a non-selective aquatic and terrestrial herbicide. It is mixed with a non-ionic surfactant. The active ingredient is glyphosate (53.8 percent), which has a primary drinking water standard of 0.7 mg/L.

Round Up Custom is applied as a liquid on the inside of canal banks for emerged aquatic plants and other weeds growing at the water line and to floating-leaved aquatic weeds. This is a non-selective aquatic and terrestrial herbicide. It is mixed with a non-ionic surfactant. The active ingredient is glyphosate (53.8 percent), which has a primary drinking water standard of 0.7 mg/L.

Presence in the Watershed

Glyphosate products can be applied on the inside banks and adjacent areas of canals and drains located in predominately rural settings away from inhabited dwellings utilizing a back-pack sprayer. Some products are also approved for direct application to the water.

PCWA does not apply copper based herbicides 300 yards upstream of the intake to any water treatment plant. NID does not apply copper based herbicides ½ mile upstream of the intake to any water treatment plant. Generally, the water treatment plants by-pass the canal water during the application of copper-based aquatic pesticides.

For both agencies, an application schedule is created each year by the Raw Water Lead and Approved by the Raw Water Maintenance Supervisor (for PCWA) or the Assistant Maintenance Superintendent Vegetation Control (for NID) detailing the canals to be treated and the dates that they will be treated. This calendar is provided to each of the affected water treatment plants, other water treatment plants and customer services department (which is posted on their website). Affected customers are notified of treatments per customer request or general notification through the agency website. NID also provides an annual mailer to affected customers. Affected water treatment plants are again notified the day before the application of copper-based aquatic pesticides. A scheduled application of aquatic pesticide may be cancelled if it is determined by the Raw Water Supervisor/Assistant Maintenance Superintendent Vegetation Control that the application will have minimal or no effect on the targeted aquatic pests.

The typical application area for copper-based products is in canals located in predominately rural settings away from inhabited dwellings utilizing a continuous drip system to maintain a desired dose rate over the treatment period. There are 19 application sites in the PCWA canal system and some are located upstream of water treatment plants; these are shown in **Table 4-1**. The goal is to treat aquatic vegetation frequently when vegetation is small, in order to minimize buildup of vegetation and potential dissolved oxygen depletion due to decaying vegetation. The sodium carbonate peroxyhydrate products are manually applied in slow moving waters and along the edge of some reservoirs.

The dose rate is dependent on the number of algae found during a pre-application inspection of the canal to be treated and usually ranges from 0.4 mg/L to 1.0 mg/L, with most canals receiving a dosage that results in a copper concentration of 0.8 mg/L at the point of application. **Table 4-2** provides a summary of the amount of the herbicides applied from 2021 through 2025 by PCWA. **Table 4-3** provides a summary of the amount of all herbicides applied from 2021 through 2025 by NID.

A post assessment of the treated canals is performed within two weeks of the aquatic pesticide application to assess the effectiveness of the treatment.

Table 4-4 provides a summary of the herbicide applications that may impact the various water treatment plants for PCWA and NID.

Table 4-1
Permanent Herbicide Application Points in PCWA Canal System

Boardman at Clipper Gap (YB 179) [1]
Boardman at Colfax Header Box (YB 49) [1]
Boardman at Foothill WTP (YB 78) [1]
Boardman at Heather Glenn and 49 Spill[1]
Boardman at Luther and Channel Hill Road [1]
Boardman at Hoyer Lane (YB 92)
Boardman below Mammoth Reservoir at Horseshoe Bar Road (YB 81)
Bowman Canal (YB 87) [1]
Caperton Above Spill 4 at Clark Tunnel Road [1]
Cedar Creek (YB 96) [1]
Dutch Ravine at Ridge and Taylor Road
Lower Antelope and Antelope Stub (YB 181A)
Lower Greeley (YB 91)
Laird Pump Station
Middle Fiddler Green at Raccoon Hollow
Perry at Mammoth Drive and Hooter Spill
Red Ravine at Gilardi Road
Shirland at Pacific Ave. (YB 147)
Upper Fiddler Green at RR Spill

[1] Application sites that may affect PCWA water treatment plants

Table 4-2
PCWA 2021 through 2025 Herbicide Application[1,2,3]

Herbicide	2021	2022	2023	2024	2025
Algimycin PWF (gal)	373.25	263.25	80.5	-	478.75
Cutrine-Plus (gal)	816.75	856.5	923.5	922.5	770.8
Harpoon Granular (lbs)	115	13.56	-	-	-

[1] There is 0.512 lbs of available copper per gallon of Algimycin PWF
[2] There is 0.909 lbs of available copper per gallon of Cutrine products
[3] There is 0.0341 lbs of elemental copper per pound of Harpoon Granular

Table 4-3
NID 2021 through 2025 Herbicide Application[1,2]

Herbicide	2021	2022	2023	2024	2025
Aquamaster (gal)	-	-	-	-	7.51
Captain (gal)	-	48.25	-	-	-
Cutrine-Plus (gal)	117.3	76.45	100.25	120.45	86
Nautique (gal)	9.46	9.75	9	7.75	6.5
Phycomycin (lbs)	-	100	10	-	-
Rodeo (gal)	10.88	-	13.16	-	-
Round Up Custom (gal)	10.5	12.75	-	18.68	2.37

[1] There is 0.909 lbs of available copper per gallon of Cutrine products
[2] There is 0.96 lbs of available copper per gallon of Nautique

Table 4-4
Application of Products Directly to Canals for Water Treatment Plants [1]

Cedar Creek and Boardman Canals	**Monte Vista, Colfax, Weimar, and Applegate WTPs**	**Active Ingredients**
Cutrine-Plus, Algimycin-PWF, or Harpoon Granular		0.909, 0.512, or 0.0341 Pounds Copper per Gallon
Applications of Cutrine-Plus/Algimycin-PWF occur between April and November. Applications are made at least 0.8 miles above Monte Vista WTP, 0.8 miles above Colfax WTP, 7.14 miles above Weimar WTP, and 0.5 miles above Applegate WTP. Monte Vista, Colfax, Weimar, and Applegate WTPs are shut off for the duration of the application and clean up.		
Bowman Canal	**Bowman WTP**	**Active Ingredients**
Cutrine-Plus or Algimycin-PWF		0.909 or 0.512 Pounds Copper per Gallon
Applications of Cutrine-Plus/Algimycin-PWF occur between April and November. Applications are made at least 1.4 miles above of the Bowman WTP. Bowman WTP is shut off for the duration of the application and clean up.		
Boardman Canal	**Auburn WTP**	**Active Ingredients**
Cutrine-Plus, Algimycin-PWF, or Harpoon Granular		0.909, 0.512, or 0.0341 Pounds Copper per Gallon
Applications of Cutrine-Plus/Algimycin-PWF occur between April and November. Applications are made at least 3.0 miles above of the Auburn WTP. Auburn WTP is shut off for the duration of the application and cleanup.		
Caperton Canal	**Sunset WTP**	**Active Ingredients**
Cutrine-Plus		0.909 Pounds Copper per Gallon
Applications of Cutrine-Plus occur between April and November. Applications are made at least 2.0 miles above of the Sunset WTP. Sunset WTP is shut off for the duration of the application and cleanup.		

Table 4-4 Cont'd
Application of Products Directly to Canals for Water Treatment Plants [1]

Newtown Canal	**Lake Wildwood WTP**	**Active Ingredients**
Captain, Cutrine-Plus Aquamaster, Rodeo, Round Up Custom		0.909 Pounds Copper per Gallon Glyphosate 53.8%
Applications of Captain or Cutrine-Plus occur between April and October. Applications are made at least 0.5 mile above of the Lake Wildwood WTP. The application is 0.5 ppm. Aquamaster, Rodeo or Round Up Custom is applied only as needed, at a 1.0 percent solution, and only to foliage. Lake Wildwood WTP is off-line for 24 hours after a treatment.		
Meade & Town Canals	**Smartsville WTP**	**Active Ingredients**
Captain, Cutrine-Plus, Nautique Aquamaster, Rodeo, Round Up Custom		0.909 or 0.96 Pounds Copper per Gallon Glyphosate 53.8%
Applications of Captain, Cutrine-Plus, or Nautique occur only on canals between April and October. Applications are made at least 1.0 mile above of the Smartsville WTP. The application is 1 ppm. Canals are dosed separately to allow Smartsville WTP to run on untreated water. Aquamaster, Rodeo or Round Up Custom is applied only as needed, at a 1.0 percent solution, and only to foliage. Canals are dosed separately to allow Smartsville WTP to run on untreated water.		
Magnolia III Canal	**Lake of the Pines WTP**	**Active Ingredients**
Captain, Cutrine-Plus Aquamaster, Rodeo, Round Up Custom		0.909 Pounds Copper per Gallon Glyphosate 53.8%
Applications of Captain or Cutrine-Plus occur between April and October. Applications are made at least 1.25 mile above of the Lake of the Pines WTP. The application is 1 ppm. Aquamaster, Rodeo or Round Up Custom is applied only as needed, at a 1.0 percent solution, and only to foliage. Lake of the Pines WTP is off-line for 24 hours after a treatment.		
Combie Ophir III Canal	**North Auburn WTP**	**Active Ingredients**
Aquamaster, Rodeo, Round Up Custom		Glyphosate 53.8%
Aquamaster, Rodeo or Round Up Custom is applied only as needed, at a 1.0 percent solution, and only to foliage. North Auburn WTP is off-line for 24 hours after a treatment.		
Cascade Canal	**Loma Rica WTP**	**Active Ingredients**
Aquamaster, Rodeo, Round Up Custom		Glyphosate 53.8%
Aquamaster, Rodeo or Round Up Custom is applied only as needed, at a 1.0 percent solution, and only to foliage. Loma Rica WTP is off-line for 24 hours after a treatment.		

[1] Round Up Custom is applied at a 1.75 percent solution and is only applied to vegetation along the edge of the canal, not into the water (rarely used).

Regulation and Management

Both PCWA and NID are regulated under General National Pollutant Discharge Elimination System (NPDES) Order (2013-0002-DWQ) from the State Water Resources Control Board (State Board) for their pesticide application programs. The current permits included a Notice of Intent (NOI), Aquatic Pesticide Application Plan (APAP), and Notice of Applicability (NOA). The General NPDES Order (2013-0002-DWQ) includes implementation of a monitoring program and Best Management Practices (BMPs). NID's APAP is dated October 2013 and PCWA's APAP is dated August 2016. There have been no revisions, updates or violations to these permits.

PCWA aquatic pesticide applications are administered by an outside consultant for Pest Control Advisor Services, who maintains a California Pest Control Advisor License and a California Qualified Applicator Certificate. All applications are made in conformance with current regulations and according to Federal Insecticide Fungicide and Rodenticide Act (FIFRA) label instructions, Department of Pesticide Regulation and Department of Public Health on the use of each chemical. Round Up Custom is used to keep right-of-ways clear along canals.

NID aquatic pesticide applications are administered by the Assistant Maintenance Superintendent Vegetation Control who maintains a California Pest Control Advisor License and a California Qualified Applicator Certificate. All applications are made in conformance with current regulations and according to FIFRA label instructions, Department of Pesticide Regulation, and Department of Public Health on the use of each chemical. Round Up Custom is used to keep right-of-ways clear along canals.

All PCWA and NID representatives involved with the transportation and/or application of pesticides are either Qualified Applicators or work with a Qualified Applicator. Annually, all applicators attend a training session on the mixing, loading and application of pesticides. All new staff are required to attend the same training before being permitted to transport or apply any pesticides. The training is conducted by a licensed and/or certified Pest Control Advisor/Qualified Applicator.

In adherence with the NPDES permits issued to PCWA and NID, water quality tests are performed in the receiving waters. NID is required to sample Squirrel Creek, Deadman's Ravine, and Sailor's Ravine for copper and glyphosate. Field tests are performed before the application (background monitoring), during the application (event monitoring), and within seven days after the application of aquatic pesticides (post-event monitoring) to demonstrate the full restoration of water quality and protection of beneficial uses of the receiving waters following aquatic pesticide application. Water samples are also collected at the same time and area to be analyzed at an independent lab for the active ingredient in the aquatic pesticide being used.

The NPDES permits also require implementation of best management practices by PCWA and NID. This includes; herbicide spill prevention, selection of appropriate herbicides and application rates, education of staff, and coordination with water users.

Monthly reports on the amounts of pesticide used is prepared by PCWA and NID and sent to their respective County Agricultural Commissioners by the Raw Water Lead and Raw Water Supervisor/Assistant Maintenance Superintendent of Vegetation Control. An annual report is sent to the State Board and Central Valley Regional Water Quality Control Board (Regional Board) in compliance with the NPDES permit. The annual report to the State includes the amounts of aquatic pesticide used, testing sites, the results of water quality testing, and compliance with the permit. There are also 24-hour and five day non-compliance reports due to the State Board and Regional Board.

Water Quality Issues and Data Review

A review of water quality from the PCWA and NID water treatment plants shows that there have been no detects of glyphosate in the source water. Also, copper levels in the treated water are either non-detectable or well below the secondary Maximum Contaminant Level (MCL) of 1 mg/L and the Action Level of 1.3 mg/L.

Source Water Protection Activities

PCWA and NID both implement direct coordination between the aquatic herbicide application staff and the water treatment plant operations. This prevents the herbicide-treated water from entering the plants and minimizes the vulnerability to the activity. In addition, both agencies also have ongoing coordination with PG&E to optimize maintenance of the shared conveyance and storage facilities to minimize algae and vegetation growth, such as at Alta Forebay and Rock Creek Reservoir.

RANGELAND LIVESTOCK

Background

In the Yuba/Bear River watershed, grazing can occur on either pastureland, which is irrigated, or rangeland. Livestock in the Yuba/Bear River watershed primarily includes cattle and sheep. There is a relatively small livestock population in the watershed, especially rangeland grazing cattle. Cattle are a known host for *Cryptosporidium parvum* and *Giardia*. Just one infected animal can shed a large number of *Cryptosporidium parvum* oocysts and *Giardia* cysts. Calves are present year-round in dairies; calves are known to be able to transmit *Cryptosporidium*, and a single infected calf can shed millions of oocysts. Livestock grazing can impact water quality by contributing sediment, total organic carbon (TOC), nutrients, and pesticides used for weed control in pastures.

Irrigated pastureland is included as part of the Irrigated Lands Regulatory Program. Good management of pastureland is no longer voluntary through elective participation in the Rangeland Water Quality Management Program. Non-irrigated rangeland grazing mostly occurs higher in the watershed on United States Forest Service (USFS) lands and is managed under lease conditions set by those agencies or on other private lands.

Information for this section was obtained from several agencies' websites and from discussions with personnel from the State Board, the Regional Board, and the USFS.

Seasonal Patterns

The risk of loading viable *Cryptosporidium parvum* oocysts and *Giardia* cysts into the river system from cattle in the watershed appears to be highest during storm events. Storms can cause sheet flow over rangeland areas that can pick up fecal matter from grazing livestock. Storm runoff from rangeland grazing areas is more likely to carry *Cryptosporidium parvum* during the calving season since calves are more likely to be infected with the pathogen than adult cows. Spring is calving season and therefore is the time of peak risk of infected herds and also still a time when oocysts likely survive well. Early summer can also result in oocysts being contributed from young calves as they graze with cows.

Peak *Cryptosporidium* shedding occurs within a very limited group of calves (two months of age[1]), and therefore manure management for the young is of far more importance than manure management for adult animals. Since transport of *Cryptosporidium* overland is inefficient in most range environments, rangeland located proximally to rivers and tributaries is of primary concern. Survival of oocysts is also likely affected by seasonal temperature. Research shows that when the temperature of a cow fecal pat exceeds 104°F the *Cryptosporidium* will die within a matter of hours[2]. When air temperatures exceed 78°F, a fecal pat in direct sunlight will achieve the required 104°F. The killing rate declines as the temperature or sunlight exposure declines so that fecal pats deposited in winter (January through April) may provide temperature conditions that allow for oocysts survival for 90 plus days.

Giardia and *Cryptosporidium* survive well in cool, moist environments and can be transported overland. However, freeze-thaw cycles reduce survivability. Overland transport may be required which will reduce the viability of oocysts; studies show that grassland buffers can capture up to 99.9 percent of oocysts[6].

Another source is created when ranchers use check dams on small watercourses to create waterholes for grazing livestock. Ranchers typically release the boards on these check dams in anticipation of storm events, to prevent flooding of the rangeland upstream of the check dam. Close proximity of fecal waste to water bodies would reduce the opportunity for desiccation, which can cause inactivation of oocysts.

High levels of coliform in the Yuba/Bear River system can be associated with precipitation, as discussed in **Section 3**. Even though coliform is not considered a good indicator for *Cryptosporidium* and *Giardia*, the bacteria data available for the water treatment plants supports the theory that storm events are the time of highest risk with respect to microbial

[1] University of California Agriculture and Natural Resources, California Rangeland Watershed Laboratory, Department of Plant Sciences, University of California at Davis. www.Rangelandwatersheds.ucdavis.edu/MWQIC/MWQIC/Indicators_Crypto_window.html. May 13, 2015.
[2] www.Rangelandwatersheds.ucdavis.edu/MWQIC/MWQIC/Indicators_Crypto_window.html

contaminants. There is no similar correlation for *Cryptosporidium* and *Giardia* data, which possibly indicates that insufficient data exists to consistently connect the source impact to water quality.

Pesticides applied to rangeland are typically applied from late spring through fall, essentially during the dry season. This should reduce the likelihood that the pesticides are transported to receiving waters.

The highest use pesticides, glyphosate and triclopyr, have not been detected in the source or treated water at the water treatment plants, as discussed in **Sections 3 and 5**.

Related Constituents

Giardia and Cryptosporidium

Although *Giardia* and *Cryptosporidium* can come from a variety of animal populations, loading from cattle is a source of key interest. In the Western United States studies have shown that about 19 percent of cattle are infected with *Giardia* and about four percent are infected with *Cryptosporidium*[3]. According to the University of California, California Rangeland Watershed Laboratory, an infected calf can shed upwards of 10,000,000 *Cryptosporidium* oocysts per gram of feces and up to 1,000,000 *Giardia* cysts per gram of feces. Loading is a function of animal density, or stocking rates, timing of grazing, and infection rate among the herd. Calves from one to four months contribute over 99 percent of oocysts shed by cattle. Given the low ratio of calves to adults in grazing cattle as compared to dairy cattle, as well as their geographic spread, it may be that grazing cattle populations do not spread *Cryptosporidium* as readily as dairy cattle. Current studies suggest that the daily contact between a calf and a carrier-mother results in an initial infection that is then spread between calves though calf play. Therefore, dairies are expected to have greater opportunity for spreading infection than rangeland cattle.

Pesticides

Ranchers use selected pesticides to manage irrigated pastureland and non-irrigated rangeland. Invasive weed management typically includes chemical treatment, only applied in spot treatments as needed, during the spring and fall. The most commonly used pesticides are glyphosate and triclopyr. Glyphosate is a regulated constituent with a primary drinking water standard of 0.7 mg/L. Triclopyr has been used on pastureland through the study period. There is no drinking water standard for triclopyr.

[3] University of California Agriculture and Natural Resources, California Rangeland Watershed Laboratory, Department of Plant Sciences, University of California at Davis. www.Rangelandwatersheds.ucdavis.edu/MWQIC/MWQIC/Indicators_Giardia_window.html. May 13, 2015.

Presence in Watershed

There are several impediments to collecting comparable, accurate data for livestock in the watershed, including the possible changes in cattle population through the year as well as the difference between County and watershed boundaries, which results in an overestimate in the cattle population in the Yuba/Bear River watershed. Nevertheless, the numbers provide a general picture of livestock populations and overall changes in the watershed. The total livestock population documented by the United States Department of Agriculture (USDA) for Nevada County, including both rangeland and dairy cows, was 4,861 in 2022, as shown in **Table 4-5**. This is an 18 percent increase over the five-year period from 2017 to 2022, a 2 percent increase over the ten-year period from 2012 to 2022, a 14 percent decrease over the 15-year period from 2007 to 2022, and a four percent decrease over the 20-year period from 2002 to 2022. Although the inventory varies over five year periods, it appears to be remaining steady over the long-term.

Table 4-5
Inventory of Livestock[1], 2002, 2007, 2012, 2017, and 2022

County	Cattle and Calves, count								
	2002	2007	2012	2017	2022	5 Year Change	10 Year Change	15 Year Change	20 Year Change
Nevada	5,042	5,615	4,778	4,108	4,861	+18%	+2%	-14%	-4%

Based on information from the USDA website: www.nass.usda.gov.
Data reported are inventory numbers and do not reflect livestock sold off during the course of the year.
[1]Includes rangeland and dairy cattle

The Nevada County Agricultural Commissioner keeps statistics on cattle/calf and steer/heifer populations in the county. These statistics are updated annually. The annual populations for cattle varied, increased during the study period, and did not match the USDA statistics; 2021 was 6,200 head, 2022 was 6,200 head, 2021 was 7,000 head, 2024 was 7,000 head, and 2025 was 6,800 head. The sheep population ranged between 500 and 1,300 head each year during this period. The overall population in the entire county are quite low, with the majority of livestock being cattle.

The US Department of Agriculture also tracks the amount of irrigated pastureland in Nevada County, shown in **Table 4-6**. This shows that there has been an increase in the amount of land utilized for pastureland over the study period, similar to the inventory of livestock.

Table 4-6
Irrigated Pastureland[1], 2002, 2007, 2012, 2017, and 2022

County	Pastureland, acres								
	2002	2007	2012	2017	2022	5 Year Change	10 Year Change	15 Year Change	20 Year Change
Nevada	4,044	4,856	4,088	3,516	4,132	+18%	+1%	-15%	+2%

Based on information from the USDA website: www.nass.usda.gov.

The Nevada County Agricultural Commissioner also keeps statistics on pastureland and rangeland in the county. Consistently, they have reported 10,000 acres of pastureland and 95,000 acres of rangeland.

There are five USFS grazing allotments in the upper watershed. Two are active, Canyon Creek and Webber Lake allotments, and three are vacant, Devil's Peak, Pass Creek, and English Mountain allotments. The active permits require the permittee to prepare a Management Plan to detail the season of use, number and kind of livestock, and imposes fees for use. Permittees are required to submit an Annual Operation Plan to the USFS.

- Canyon Creek allotment, between Bowman Lake and Fordyce Lake in the Canyon Creek, Texas/Fall Creek and South Yuba sub basins, 20,743 acres including 17,280 acres of USFS land. This allotment includes five pastures, Five Lakes, Alderman Homestead, Loney Meadows, Downey Flat, and Beyers Lake. The cattle prefer to graze near Loney Meadows in the western portion of Texas/Fall Creek subbasin. The permit currently covers 100 head of cattle grazing during the summer, between July 16 and September 20, which is usually implemented as 20 cow/calf pairs. This is a term permit covering 10 years and is granted to a rancher with adjacent lands. A new holding pen of 0.5 acres was approved in 2024. Grazers are required to keep cows out of sensitive features such as wetlands.
- Webber Lake allotment, east of Jackson Meadows in the Middle Yuba sub basin, 4,378 acres includes 1,262 acres of USFS land. This allotment includes one pasture, Webber Lake. Sheep are grazed on this land.
- Devil's Peak allotment, 27,953 acres including 13,573 acres of USFS land, is along the South Yuba River in the South Yuba sub basin and would require a full National Environmental Policy Act (NEPA) analysis before it could be activated. This allotment includes two pastures, Devil's Peak and Rattlesnake. It is considered vacant and unavailable until that is completed.
- Pass Creek allotment, between Jackson Meadows and Webber Lake in the Middle Yuba sub basin, 10,900 includes 5,869 acres of USFS land. This allotment includes two pastures, Ahart and Horse Camp. It is considered vacant and unavailable until new corral pens are established and coordination with adjacent landowners is completed.
- English Mountain allotment, between Bowman Lake and Jackson Meadows Reservoir in the Middle Yuba and Canyon Creek sub basins, 21,549 includes 14,839 acres of USFS land. This allotment includes five pastures, Jackson Catfish, Austin East Fork, Bear Valley Minton, Home Range, and Meadow Moscove. The term permittee waived the allotment back to USFS in 2025. It is considered vacant and unavailable as the adjacent landowner in the allotment (NID) will no longer allow grazing.

Livestock grazing also occurs on private lands in the upper watershed and the lower watersheds. These are typically small operations with limited number of head. Three areas of particular interest are private ownership along Highway 20 in the Squirrel Creek sub basin between Penn Valley and Smartsville, northwest of Lake Combie, and along the Ragsdale

Random in Meadow Vista due to their proximity to NID and PCWA canals and water treatment plants. NID operates one limited grazing allotment in the watershed, the Luster Lease, located north of the Bear River below Rollins Reservoir. This is about 50 acres of limited grazing. No more than 23 cow/calf pairs are allowed and grazers are required to move cattle frequently to avoid over utilization. A portion of the grazing allotment is contributory to the Bear River, but the terrain is steep and the rancher fences the allotment to prevent cattle from grazing close to the river. Grazers are also required to keep cows out of sensitive features such as wetlands.

Pastureland and rangeland in the watershed have been treated with pesticides to control the growth of invasive weeds. **Table 4-7** provides a summary of the pesticide applications between 2019 and 2023 for pastureland and rangeland in Nevada County. It can be seen that the overall level of chemical applied, as well as the prevalence on pastureland versus rangeland, varies from year to year but is generally low. The predominant pesticides continue to be glyphosate and triclopyr.

Table 4-7
Chemical Application on Pastureland and Rangeland in Nevada County, pounds[1]

Pesticide	2019		2020		2021		2022		2023	
	Pasture	Range	Pasture	Range	Pasture	Range	Pasture	Range	Pasture	Range
2,4-D	0	0	0	0	0	0	0.2	0	0	0
Aminopyralid	2.1	0.1	0	1.3	0	0.4	0.2	0.1	0.2	0
Clethodim	0	0	0	0	0	0	0	0	0	0.4
Clopyralid	0	0	0	0	0	0	0.1	0	0	0
Glyphosate	5.7	12.6	290	0	3	10	0	3.4	0	0.8
Imazyapyr	0	0.03	0	0	0	0	0	0	0	0
MCPP-P	0	0	0	0	0	0	0.1	0	0	0
Strychnine	0	0	0	0	0.6	0	0	0	0	0
Triclopyr	4.4	9.3	4.5	0	4.6	0.5	5.6	11	0	0.8
Total Annual Pounds	**34.23**		**295.8**		**19.1**		**20.7**		**2.2**	

[1]Source is California Department of Pesticide Regulation

Regulation and Management

Runoff from rangeland is considered a non-point source of pollution and it is covered under the State Board's Non-Point Source (NPS) Program. As for all non-point sources under this program, the state has a three-tiered approach to regulation:

- Tier 1: Self-determined implementation – non-regulated management practices.
- Tier 2: Regulatory based encouragement – conditional waiver of Waste Discharge Requirements (WDRs).
- Tier 3: Effluent limitations and enforcement actions - WDRs.

In order to address rangeland issues in California, the Rangeland Management Advisory Committee (RMAC) was created. This committee is comprised of livestock industry and public members. The RMAC advises the California Department of Forestry and Fire Protection (CALFIRE) Board of Forestry on issues related to rangeland management. The RMAC worked with the State Board to create a rangeland water quality management program to comply with Tier 1 for the NPS program.

Grazing on United States Bureau of Land Management (USBLM) lands is governed by the Water Quality Management Plan (WQMP) for National Forest System Lands in California. This was developed in 2000 and includes standards and guidelines to meet the Clean Water Act (CWA) and California Standards. This program focuses on range management through BMPs. This includes range analysis and planning, grazing permits, and rangeland improvements as necessary. Permits and leases generally cover a 10-year period and are renewable if the USBLM determines that the terms and conditions of the expiring permit or lease are being met. The amount of grazing that takes place each year on USBLM-managed public lands can be affected by such factors as drought, wildfire, and market conditions. In September 2022 the USBLM published updated BMPs for Water Quality in California, which included new BMPs for livestock grazing and wildhorse management to protect riparian resources.

The USFS requires completion of a National Environmental Policy Act (NEPA) analysis for all grazing allotments prior to award. These evaluations are required to follow the Water Quality Handbook and Forest Practice Rules to ensure that the permitted allotment will not have a significant effect on the environment, including water quality. USFS also utilizes the WQMP and maintains a Rangeland Analysis and Planning Guide, which was updated in 2017 to accommodate newer methods in the Southwest (including California).

The State Board began development of a statewide waiver for USFS (including timber harvest, roads, range, recreation, and fuel management) in 2009 to streamline management policies state-wide for non-point source activities. A proposed Resolution was prepared in 2011 to cover the USFS statewide activities under one order, but it was never finalized or adopted. As part of the resolution development, the USFS worked in collaboration with the State Board and Regional Boards to develop a new Water Quality Management Handbook (WQMH) to address control of nonpoint source pollution generated by various activities on National Forest System lands in California. The WQMH was adopted by the USFS in May 2011 with revised management practices to improve water quality protection related to the activities in the proposed statewide order. Some key new provisions include road, range, and recreation management policies; BMPs with adaptive management; and an expanded monitoring program.

In September 2015, the State Board adopted Resolution No. 2015-0062. This instructed staff to engage with the University of California to update tools and documents related to grazing BMPs and water quality. Accordingly, the State Board began developing a non-regulatory guidance document on livestock grazing management in California. It was intended to be completed as an update to the 1995 Rangeland Water Quality Management Program, see discussion above. In 2020 the State Board sought public input on water quality impacts of

grazing and BMPs. In September 2022 the State Board published an "Analysis of Grazing Regulatory Actions" to summarize what currently exists through the State, which found a wide range of regulatory management tools being implemented. The report lists no Orders or Total Maximum Daily Loads (TMDLs) by the Central Valley Regional Board. Overall, there seemed to be limited consistency on management practices. Currently, the State Board is developing a "Grazing Water Quality Guidance". The document has not yet been released for public review and comment, that is expected by June 2026, so an internal draft from November 2022 was reviewed. It is a non-regulatory document outlining management practices designed to protect water quality on grazed lands. The document has three key purposes; document existing management efforts, providing ranchers with funding information, and identify technical resources. The document heavily utilizes the Rangeland Water Quality Management Program (RWQMP) Short Course discussed below. A new California Grazing Water Quality Partnership is also proposed.

Rangeland Water Quality Management Program

The RWQMP, developed in 1995 by the University of California Cooperative Extension (UCCE), the Cattlemen's Association, and the USDA's Natural Resources Conservation Service (NRCS) for the State Board as a Tier 1 approach. It continues to be used as a voluntary management program for privately owned rangeland. The heart of the program was a series of short courses given to ranchers to help them develop and implement water quality management plans at their ranch. This included grazing and irrigation management practices to improve runoff quality. The last workshop was in 2009 and over 1,000 ranchers, covering over 2 million acres, took the course. The course is now administered on the University of California (UC) Rangelands website as the Ranch Water Quality Planning Short Course.

University of California Cooperative Extension

The UCCE Sierra Foothill Research and Extension Center is located east of Marysville in Browns Valley and conducts research on various topics, including grazing. Current and recent research focuses on rangeland watershed and water quality management, invasive species management, native plant conservation and restoration, as well as cattle production and health. In addition, the UCCE county offices provide support to ranchers and farmers.

University of California at Davis

The University of California's Division of Agricultural and Natural Resources also hosts two programs through the College of Agriculture and Environmental Science: the California Rangeland Watershed Laboratory (CRWL) and the California Rangelands Research and Information Center (CRRIC). These both have informative websites. The CRWL conducts extensive research coordination, while the CRRIC focuses more on public outreach and information sharing. This includes the Rustici Rangeland Science Symposium, held most recently in 2025, to discuss rangeland management and water quality. Updates on applied research findings from the Sierra Foothill Research and Extension Center and strategies to

ranchers are presented. These also provide a short course on grazing management for ranchers.

United States Department of Agriculture

The USDA has two services that implement assistance programs for farmers and ranchers. One is the Farm Service Agency (FSA) and the other is the NRCS.

The FSA implements numerous voluntary programs for farmers and ranchers related to conservation.

- Conservation Reserve Program – This program provides yearly rental payments to farmers/ranchers in exchange for removing environmentally sensitive land from agricultural production and planting species to improve environmental quality.
- Conservation Reserve Enhancement Program – This program is an offshoot of Conservation Reserve Program that targets high-priority conservation issues identified by government and non-governmental organizations. Farm land that falls under these conservation issues is removed from production in exchange for annual rental payments.
- Emergency Conservation Program – This program provides funding and technical assistance for farmers and ranchers to restore farmland damaged by natural disasters and for emergency water conservation measures in severe droughts.
- Emergency Forest Restoration Program – This program is very similar to the Emergency Conservation Program as it provides funding to restore privately owned forests damaged by natural disasters.
- Farmable Wetlands Program – This program is designed to restore wetlands and wetland buffer zones that are farmed. Farmers and ranchers receive annual rental payments in return for restoring wetlands and establishing plant cover.
- Source Water Protection Program – This program is designed to protect surface and ground water used as drinking water by rural residents. The program targets states based on their water quality and population.
- Organic Certification Cost Share Program – This program provides cost share assistance to handlers of agricultural products who are certified under the National Organic Program.
- Water-Saving Commodities Program – This program supports agricultural commodities produced while reducing water losses in places experiencing drought. Grants are designed to help build long-term drought resilience.
- Emergency Forest Restoration Program – This program helps non-industrial private forestland owners recover from natural disasters by providing funding and technical support for conservation practices to restore forest health, mitigate further damage, and promote sustainable forest management.

The NRCS implements multiple voluntary programs on financial, technical, and easement assistance basis for farmers and ranchers related to conservation.

Financial Programs:

- Environmental Quality Incentives Program (EQIP) – This is a program that provides financial and technical support to farmers and ranchers to promote agricultural production and improve environmental quality. This includes the Conservation Innovation Grant Program and the National Water Quality Initiative (NWQI). Cost shares from the NRCS are 50 to 90 percent.
- Conservation Stewardship Program (CSP) – This program provides financial and technical support to farmers and ranchers to help conserve and enhance soil, water, air, and habitat on working lands for selected watersheds. Payments are based on conservation performance, with higher payment for higher performance.
- Agricultural Management Assistance – This program helps agricultural producers use conservation to manage risks, such as water management, soil erosion, integrated pest management, and transition to organic farming.
- Regional Conservation Partnership Program (RCPP) – This program promotes coordination of NRCS conservation activities with partners to implement projects that demonstrate innovative solutions to conservation challenges and provide measurable improvements and outcomes tied to the resource concerns they seek to address. This was expanded in 2018 to include drinking water source protection.
- Grazing Lands Conservation Initiative – This program is a coordinated effort to identify priority issues, find solutions and effect change on private grazing lands to enhance existing conservation programs.
- Water Bank Program – This program preserves land to conserve water for the benefit of migratory fowl and improve water quality.

Of special interest is the 2018 Farm Bill, which formally acknowledged source water protection as a goal of the NRCS conservation programs and turned RCPP into a standalone program with its own funding, $300 million annually. Ten percent of this funding must be allocated to drinking water source protection. The source water protection funds can be accessed most easily through Agricultural Conservation Easement Program (ACEP), CSP, EQIP, and RCPP. Through the RCPP, NRCS may award up to 15 Alternative Funding Arrangement projects, which are more grant-like and rely more on partner co-investment to implement conservation activities. RCPP now has two funding pools; Critical Conservation Areas (50 percent of funding) and a State/Multistate pool (50 percent of funding). RCPP partners must develop and report on environmental outcomes. The Yuba/Bear River watershed is no longer included in the Western Waters Critical Conservation Area, as 2026 funding priorities are focused on groundwater in Northern California. RCPP projects include conservation activities implemented by farmers, ranchers, and forest landowners.

Technical Programs:

- Conservation Technical Assistance Program – This program is available to any group or individual interested in conserving our natural resources and sustaining agricultural production in this country. This program functions through a national network of locally-based, professional conservationists located in nearly every county of the United States. This assistance may be in the form of resource assessment, practice design, resource monitoring, follow-up of installed practices, or

assist to develop a conservation plan. This program does not include financial or cost-share assistance, but may lead to participation in other USDA financial or easement assistance programs. This assistance can help land users:

- Maintain and improve private lands and their management
- Implement better land management technologies
- Protect and improve water quality and quantity
- Maintain and improve wildlife and fish habitat
- Enhance recreational opportunities on their land
- Maintain and improve the aesthetic character of private land
- Explore opportunities to diversify agricultural operations and
- Develop and apply sustainable agricultural systems

Easement Programs:

- Agricultural Conservation Easement Program (ACEP) – This program provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits.
- Healthy Forests Reserve Program – This program helps landowners restore, enhance and protect forestland resources on private lands through easements and financial assistance. Through the program, landowners promote the recovery of endangered or threatened species, improve plant and animal biodiversity and enhance carbon sequestration.

Water Quality Issues and Data Review

Giardia and Cryptosporidium

There has been no monitoring of runoff from pastureland or rangeland for fecal indicator bacteria or protozoa during the study period. **Section 3** presents a discussion of the available *Cryptosporidium* analyses for the PCWA and NID source waters. Historic data under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) Round 2 monitoring showed that all of the water treatment plants in the upper watershed had relatively low levels of *Giardia*, *Cryptosporidium* (averages less than 0.075 oocysts per liter), or *Escherichia coli* (*E. coli*) and were placed in Bin 1. Smartsville WTP, Lake Wildwood WTP, and Auburn WTP have seasonally higher *E. coli* levels at their influent. There is potential for grazing upstream of each of these intake locations.

Pesticides

There has been no monitoring of runoff from pastureland or rangeland for pesticides in the watershed either. A review of the raw and treated water monitoring for the water treatment plants shows that there were no detects of glyphosate in the Yuba/Bear River water supply. Triclopyr is not regulated in drinking water; therefore, there is no monitoring data available at the water treatment plants.

Source Water Protection Activities

NID manages one grazing allotment in the watershed, along the Bear River below Rollins Reservoir, and as part of the management plan for the allotment there are BMPs specified to protect source water quality, including fencing to keep cattle away from the river.

FOREST ACTIVITIES

Since most of the watershed is covered by evergreen forest and a large portion of the upper watershed is part of the Tahoe National Forest, the activities occurring on these lands are critical to the long-term quality of the water supply. This study identified timber harvesting and wildfires as activities of significant interest and these are discussed below.

Timber Harvest

Background

Timber harvesting activities can impact ambient water quality directly and indirectly. Direct impacts include development and use of dirt roads, water crossings used to assist timber removal, and the use of chemicals for silviculture or revegetation. Indirect impacts include the increased access for other forest users, increased soil erosion, and increased nutrient loading to the waterways. The USFS and the State Board agree that the most important source of pollution in the forests is the timber harvesting road system. Timber harvesting can occur on both public and private lands and is regulated separately.

Seasonal Patterns

Timber harvesting activities occur throughout much of the year, depending on the location of the harvest. For locations below the normal snowline, tree felling and removal can occur almost any time of year. It is easier to complete prior to the wet season, but can be conducted during the winter. For locations above the normal snowline, tree felling historically occurred during the summer months, after snow melted and access roads were cleared. This would allow removal of the timber prior to the next wet season. More recently, and with the increased use of helicopter removal, tree felling has extended into the fall. Trees are cut down and brought to a removal landing site. The trees can then be removed from the landing into the winter months.

Related Constituents

The primary concerns associated with timber harvesting are the potential for increased erosion and the subsequent increase in solids loading to receiving waters, resulting in higher turbidity, TOC, and nutrients. Another concern is the use of pesticides and herbicides in silviculture and revegetation programs.

A recent study showed that timber harvesting activities can double the amount of sediment transported to receiving waters, especially in the first years after harvest[4]. It also showed that the strategies to limit ground disturbance during timber harvesting are very effective at reducing impacts, such as suspending logs, avoiding heavy machinery, and implementing mulching and mastication.

Presence in the Watershed

As described in **Section 2**, much of the Yuba/Bear River watershed is covered with evergreen forest. Harvesting activities occur in most of the sub basins, but more commonly in those locations greater than 3,000 feet of elevation. Timber harvesting on federal lands is regulated by the USFS and by CALFIRE on state and private lands. These agencies do not track statistics on the quantity of acres actually harvested in a timely manner, so there are limited means to accurately estimate this activity in the watershed. Beginning in the mid-1990s, there was a significant shift away from timber harvest on federal lands to harvesting on state and private lands. However, due to the recent droughts and the presence of bark beetles throughout the forested area there has been substantial tree mortality on both public and private lands in the watershed. This has significantly increased timber harvesting to remove these dead trees and reduce the fuel load associated with wildfire risk. In addition, wildfires in the watershed, discussed in the Wildfires subsection below, drought, and beetle infestation have warranted significant salvage timber harvesting operations.

USFS staff provided an export from the Forest Activity Tracking System (FACTS) database for fuel reduction projects in the watershed during the study period. There were three specific projects (Western Nevada County Community Defense Project – Deer Creek, Westzone Invasive Plant Treatment, and Bear Trap Salvage) in addition to general work. The work included mechanical, hand, and physical removal as well as pile burning. The acreage treated varied annually; 2021 – 239.3 acres, 2022 – 392.3 acres, 2023 – 2.4 acres, 2024 – 141.5 acres, and 2025 – 36.5 acres. This resulted in a total of 812 acres treated for fuel reduction.

A review of commercial timber sales and timber harvesting showed very little in the watershed on USFS lands. Three (Rucker Settlement, Highway 20 Settlement, and PG&E Decks) were in the Yuba River Ranger District in 2021 for a total of 122.9 acres. The Casa Loma project included six units in the American River Ranger District in 2025 for a total of 285 acres. Additional projects approved by TNF during the study period did occur, but it does not appear that the work has been completed yet. This includes:

- Pliocene Ridge Roadside Fuel Break (Henness Pass Road east of Jackson Meadows Reservoir)
- South Yuba Roadside Fuel Break (Along Highway 20 and other USFS roads)
- Texas Vegetation and Fuel Management Project (Lake Valley Reservoir)

[4] Safeeq M., Grant G., Lewis S., Hayes S.. Disentangling effects of forest harvest on long-term hydrologic and sediment dynamics, western Cascades, Oregon. Journal of Hydrology, Volume 580, January 2020. 124259.

- Truckee Roadside Fuel Breaks (Soda Springs/Norden and Boreal Ridge Road)
- Sugar Bowl Speed Course Tree Removal (Sugar Bowl Ski Resort)
- Jackson Reoffer Commercial Timber Sales (timber harvesting on 339 acres east of Jackson Meadows Reservoir)

CALFIRE tracks timber harvest plans (THPs) by county, with little detail on the specific location. Where possible, THPs that provided information to clarify location outside of the watershed were removed. The remaining numbers represent the watershed counties (Nevada, Placer, and Sierra), and may be beyond the Yuba/Bear River watershed. During the study period, 2021 through 2025, there were 1,633 active THPs covering over 39,640 acres. Sierra Pacific Industries accounted for over 1,400 of those THPs for a total of 31,130 acres (78.5 percent of THP acreage).

In addition, CALFIRE has modified its Forest Practice Rules to expand the use of Emergency and Exemption Notices for timber harvesting under specific scenarios. It should be noted that Emergency and Exemption Notices are not nearly as well vetted for protection to receiving waters and the Central Valley Regional Board is not involved in any pre- or post-harvest inspections on these permits.

Emergency Notices are reserved for hazardous fuel removal only and a form must be completed and approved by CALFIRE to proceed with the harvest. During the study period, 2021 through 2025, there were 13 Emergency Notices approved in the watershed counties for a total of 1,453 acres. Three of these were for Sierra Pacific Industries covering 316 acres (22 percent of the overall acreage). Two were to address post-fire salvage operations, six were for hazardous fuel, four were for beetle infestation, and one was unknown.

Exemption Notices are more expansive, including 300-foot structure clearance, dead/dying/diseased tree removal, drought mortality, forest fire prevention, and small timberland owner. A form must be completed and approved by CALFIRE to proceed with harvest. During the study period, 2021 through 2025, there were 863 Exemption Notices approved in the watershed counites for a total of 1,164,034 acres. This is nearly 30 times the acreage approved under THPs. The median size of an Exemption Notice is 2.3 acres. Sierra Pacific Industries accounted for 77 Exemption Notices for a total of 1,148,521 acres (98.7 percent of Exemption Notice acreage), which makes them essentially the only entity utilizing this process. There is also an Exemption Notice for Utility Right-of-Way and 42 of those were permitted during the study period for a total of 6,900 acres. Sierra Pacific Industries accounted for two of these, for 89 additional acres.

The Central Valley Regional Board also tracks THPs and according to California Integrated Water Quality System (CIWQS), there were 86 THPs permitted to harvest in watershed counties during the study period, in two Regional Board jurisdictions under four different WDRs General Orders. A summary of the number of approved THPs under each County is provided in **Table 4-8** and a summary of the number of approved THPs in each WDR is provided in **Table 4-9**. The majority of the THPs approved were from the Central Valley

Regional Board and those WDRs General Orders are discussed below. There were two violations and two enforcement actions on these THPs over the last five years.

Table 4-8
Number of THPs Acted On by Watershed County, 2021 - 2025[1]

Order Number	Number of THPs Approved
Nevada	41
Placer	38
Sierra	7

[1] Data from the California Integrated Water Quality System Database

Table 4-9
Number of THPs Acted on by Order, 2021 - 2025[1]

Order Number	Number of THPs Approved
R5-2014-0144	70
R5-2017-0061	12
R5-2024-0059	1
R6T-2024-0035	3

[1] Data from the California Integrated Water Quality System Database

The Nevada County Agricultural Commissioner tracks the production of timber, in terms of board feet. This is not an accurate account of the acreage or amount of timber harvesting occurring in the watershed, but can provide an idea on the relative scale of timber harvesting operations over time in the county. **Table 4-10** provides a summary of the annual timber harvest between 2021 and 2025. This table shows that the harvesting operations vary quite widely between the years. This could be explained by the fact that most of the timber harvesting in the Yuba/Bear River watershed is by commercial growers, such as Sierra Pacific Industries, who plan their harvesting in rotation cycles. Also, salvage operations from a wildfire burn area can account for large amounts of harvest.

Table 4-10
Timber Harvested in Nevada County, board feet

	2021	2022	2023	2024	2025
Timber	7,326,000	2,977,000	6,180,000	25,537,000	15,907,000

There were seven chemicals applied to forested land in the process of silviculture but only four were used at more than 100 pounds in at least one year in Nevada County, glyphosate, imazapyr, oxyfluorfen, and triclopyr. The remaining three were all sporadically used at low levels. **Table 4-11** provides a summary of the pesticides used on timberland forest.

Table 4-11
Chemical Application on Forest Lands in Nevada County, pounds[1]

Chemical	2019	2020	2021	2022	2023
2,4-D	-	25.7	-	-	-
Clopyralid	9	18.8	7.9	-	-
Glyphosate	1,886.7	738.1	1,903.6	1,059.9	-
Imazapyr	50.6	378	389.3	82.8	-
Oxyfluorfen	63.4	112	62.4	-	-
Penoxsulam	1.3	2.4	1.3	-	-
Triclopyr	21.3	65	198.6	212.5	-

[1]Source is California Department of Pesticide Regulation

Regulation and Management

As mentioned previously, there are two separate, parallel regulatory programs for timber harvesting, including fuel management and salvage operations as well. The USFS governs timber harvesting on federal lands according to the Forest Service Directives and the Land Management Plan for the region, while CALFIRE governs timber harvesting on state and private lands according to the California Forest Practice Act of 1973 and subsequent Forest Practice Rules. These programs are discussed separately. In addition, as of 2003 all applications for a THP must obtain coverage under the General permit from the Regional Board (as discussed below).

Assembly Bill 904 was adopted in October 2013, and amended by Assembly Bill 2239 in August 2014, which added new text to the Forest Practice Act creating a new category of timberland management. This added a "Working Forest Management Plan" to allow large landowners, up to 15,000 acres, to prepare a non-expiring plan for creating a sustainable yield from an uneven aged timber stand. This essentially removes the requirement for specific timber harvest plans from these landowners.

US Forest Service

The USFS implements a Strategic Plan every five years, most recently for Fiscal Years (FY) 2021 – 2026. In this plan are strategic objectives for management of the National Forests. This includes an objective to provide abundant clean water, with understanding the importance of National Forests as the headwaters of many water supplies. The USFS has developed the Forests to Faucets 2.0, to use Geographic Information Systems (GIS) data to display the forested landscapes, as 12-digit HUC that are most important to surface drinking water and display the extent to which they are threatened by development, insects and disease, and wildland fires. The tool also projects the degree to which a water source is vulnerable to future reductions in water supply due to climate change. This data set is available for downloading and more detailed review. The data shows that the American River is a very important source of surface drinking water that is vulnerable in the upper watershed to insects and wildfires.

The USFS requires proposed harvesters to submit a THP, prepared by a Registered Professional Forester (RPF), in accordance with the Forest Service Manual, Chapter 1921. The THP must substantially meet the intent of the NEPA procedures as a complete discovery document. The THPs are reviewed by the USFS, as well as the Regional Board, for possible impacts to receiving waters. This includes road construction, road abandonment, and water crossings. The USFS has several key rules for timber harvesting on public lands.

- No irreversible damage to soil slope or watershed conditions allowed
- Waterbodies must be protected from blockage, sediment, or temperature impacts
- Clear cutting is only allowed if it is the optimum method for forest health to create an even-aged forest
- Only trees of 30-inch diameter or greater (at breast height) can be harvested
- Maximum size limit for harvest is 40 to 60 acres in California
- No herbicide application is allowed
- Thinning from below is the preferred harvest method
- Revegetation plan is required and must be restocked within five years

In addition, the National Forests implement fuel reduction and forest health projects (including timber harvesting) on an on-going basis to enhance watershed conditions. Timber harvesting is used as part of silviculture, the treatment needs for the forest, to ensure the long-term health of the resources. All trees must be marked for harvesting, road inspections must be conducted, and a fire plan must be submitted before operations begin.

The TNF is in the process of approving the "Steep Slopes Forest Plan Amendment", which will allow logging on steep slopes using tethered logging systems. This is expected to be approved in 2026 and will apply forest-wide. This will allow logging with a tethered ground-based harvest system on slopes up to 90 percent. USFS studies have shown that the work can be completed with these systems and maintain soil and water quality.

CALFIRE

In 2008, the Farm Bill required each State to prepare a Forest Action Plan by 2010 and update it every five years thereafter. The purpose was to conserve and manage forests, protect them from threats, and increase public benefit. This was incorporated into California's existing requirements for assessing the conditions of the forest and range lands, into the California Forest Action Plan. The goal of this document is to improve forest health and community protection as well as preserve and enhance the forests. This is implemented through BMPs by CALFIRE and the California Department of Pesticide Regulation (DPR).

CALFIRE requires proposed harvesters to submit a THP, prepared by an RPF. The THP must substantially meet the intent of the California Environmental Quality Act (CEQA) procedures as a complete discovery document. THPs are valid to be operated on for five years, and then an owner may apply once for a two-year extension on the THP (as per Assembly Bill 1492, approved in September 2012). The THPs are reviewed by CALFIRE, as well as the Regional Board, for possible impacts to receiving waters and cumulative impacts to the area. This includes road construction, road abandonment, and water crossings. New "Road Rules" took

effect in January 2015 to further protect the watershed from road construction and use activities. THPs include:

- Checklist of proposed activities
- Description of proposed harvest area, method for harvest, season of operations
- Assessment of:
    - Road Construction
    - Erosion Control
    - Stream Protection
    - Protection of Unstable Areas
    - Hazard and Fire Control
    - Cumulative Impacts
    - Archaeology
- Revegetation Plan (Restocking for Industrial Permittees)
- Pre-harvest on-site inspection by CALFIRE and other related state regulatory agencies (conducted for 95 percent of THPs).

CALFIRE expanded the THP exemptions during the study period in order to expedite removal of dangerous fuels. This includes a Notice of Exemption, Notice of Emergency for Fuel Hazard Reduction, Substantially Damaged Timberland Exemption, Structure Protection Exemption, and Drought Mortality Exemption. These can be applied for as special requests if a harvester meets the specific criteria for each exemption. The Forest Practice Rules still apply, and there are still limits on using heavy equipment and placing roads on slopes under these exemptions from THPs. These applications are reviewed within five days of submittal and are effective for up to one year. Post-fire exemptions are used broadly on private lands, removing significant timber and often without Regional Board review since the exemptions are acted upon so quickly.

State Water Resources Control Board

The State Board began development of a statewide waiver for USFS (including timber harvest, roads, range, recreation, and fuel management) in 2009 in order to streamline management policies state-wide for non-point source activities. A proposed Resolution was prepared in 2011 to cover the USFS statewide activities under one order, but it was not finalized or adopted. As part of this resolution development, the USFS worked in collaboration with the State Board and Regional Boards to develop a new Water Quality Management Handbook (WQMH) to address control of nonpoint source pollution generated by various activities on National Forest System lands in California. The WQMH was adopted by the USFS in May 2011 with revised management practices to improve water quality protection related to the activities prioritized in the proposed statewide order. Some key new provisions include road, range, and recreation management policies; BMPs with adaptive management; and an expanded monitoring program. USBLM also updated BMPs for water quality on its lands in California in 2022 to better protect riparian resources.

In May 2018, then-Governor Jerry Brown signed Executive Order B-52-18 that mandates various state agencies to implement a minimum of 500,000 acres per year of statewide forest

treatments within five years to reduce wildfire risk. In order to address the increased pace and scale of vegetation treatment allowed under this Order, the State Board adopted a Vegetation Treatment General Order (Order No. 2021-0026) in July 2021. This will ensure that vegetation treatments are conducted in a manner that is protective of water quality. This Order requires project proponents to follow the California Vegetation Treatment Program (CalVTP) developed by the California Board of Forestry and Fire Protection. The order prohibits degradation of water quality, impacts to waters of the State, construction of new roads, aerial spraying of pesticides, and commercial timber harvesting. This General Order and the CalVTP are designed to streamline the permitting process to enable the pace required by the Executive Order.

Central Valley Regional Water Quality Control Board

In January 2003, the Regional Board adopted the Conditional Waiver of Waste Discharge Requirements Related to Timber Harvest Activities. The Conditional Waiver was subsequently renewed by the Regional Board in 2010 (R5-2010-0022) and modified by the State Board in 2011 (Order WQ 2011-0014 DWQ) to simplify the enrollment process. The Conditional Waiver was renewed by Order R5-2014-0144 in December 2014 as it was expiring. It was replaced in 2017 with Order R5-2017-0061, which is a WDRs General Order for Discharges Related to Timberland Management Activities for Non-Federal and Federal Lands. The scope of the WDRs was expanded to include all timberland management activities, not just timber harvesting so that even Working Forest Management Plan operators must comply with the WDRs.

The WDRs applied to all state and federal lands, however, any federal lands that require a THP after December 2024 will be enrolled under the new federal lands permit described below. The WDRs specify eligibility criteria and conditions that must be met in order to qualify. The WDRs include eight categories of permittees, each with a specific set of eligibility criteria and conditions. Three categories are related to emergency notices approved by either CALFIRE or USFS, and the permittees are automatically enrolled; the other five categories require the permittee to submit a Notice of Intent (NOI) prior to initiating activities. The WDRs also contain monitoring (implementation, forensic, and effectiveness) and reporting conditions, which vary according to category, and they include investigations of impacts to waterbodies. The Regional Board has developed guidance documents to assist with implementation of the WDRs, specifically related to monitoring requirements.

In December 2024, the Regional Board adopted Order No. R5-2024-0059 (WDRs for Certain Activities Conducted by the U.S. Forest Service and Bureau of Land Management) to address the 11 million acres of federal lands throughout the region. This federal lands order was developed in coordination with the USFS and the USBLM to meet several overall goals:

- To ensure compliance with federal and state clean water laws and policies that require control of water quality pollution.

- To provide regulatory coverage for a broad selection of projects undertaken by the USFS and BLM that have the potential to result or contribute to nonpoint source pollution.
- To ensure regulatory compliance with water quality protection and remediation standards.
- To reduce the burden of developing an individual permit for each project conducted by the USFS and BLM.

Activities covered under the new federal lands order include:

- Vegetation Management
- Transportation Management
- Recreation Facilities Management
- Post-Emergency Recovery Activities
- Restoration Activities

Any projects that were enrolled under R5-2017-0061 would remain under that order until August 15, 2025 and then the coverage would be automatically terminated.

Water Quality Issues and Data Review

A review of the ambient water quality for the water treatment plants in **Section 3** for turbidity and TOC shows that the Boardman Canal and the Bear River Canal water treatment plants show a distinct seasonal trend with most peaks occurring during the wet weather season. It is possible that timber harvesting contributes to the increased solids loading due to storm runoff from dirt access roads and water crossings. It should be noted that both systems have upstream reservoirs that serve to buffer many water quality impacts downstream, including turbidity.

As noted previously, there were no detects of pesticides in the treated water for any water treatment plants. Also, there are no significant nutrient water quality concerns in the source water either.

Wildfires

Background

Another potential contaminating activity associated with forests is wildfires. The loss of ground cover, the chemical transformation of soil, and the reduction in soil infiltration rates all increase the likelihood of erosion and hydrophobic soils. These all can contribute to increased solids in the receiving water and an increase in the turbidity of the raw water at the water treatment plants, especially from the first rains after significant wildfires.

In the western United States, a common wildfire fighting practice is to implement the use of aerial application of fire retardants. There is a variety of fire retardants used, but they are primarily 85 percent water and 15 percent ingredients. The active ingredients account for

60 to 90 percent of the ingredients and are typically inorganic fertilizers, such as ammonia sulfate and ammonia polyphosphates. The remaining inactive ingredients are thickeners, such as guar gum and clay, and corrosion inhibitors. The purpose of the retardant is to slow the rate of fire spread by cooling and coating fuels. These are typically applied in front of the fire as a suppression tactic, most often on ridge tops and near fire breaks. The fire breaks can sometimes include aquatic breaks such as rivers, streams and lakes.

Seasonal Patterns

Wildfires can be caused by several activities, including naturally induced (such as lightning), human induced (arson or accident), and loss of control of a prescribed burn. Conditions that contribute to a wildfire include dry, tinder wood, heavy fuel loads, warm, dry weather, and wind. These conditions typically occur during the late summer and early fall in the Yuba/Bear River watershed, but can occur during the late spring and early summer as well. Climate change, combined with an extended drought, beetle infestation and overgrown forests, is contributing to increased wildfire activity in the watershed during the past decade.

The impacts of wildfires on water quality are usually not seen at the time of the fire but rather later, during the following wet season, when precipitation falls on the recently burned area causing erosion. However, the dry season is extending further into the fall resulting in significant wildfire events closer to the onset of winter rains so the timespan between burn events and rainfall events may be reduced. It has been documented by the United States Geological Survey (USGS) that fire impacts to source water quality can be seen for up to 15 years after the event.

Related Constituents

Since erosion is the key concern associated with wildfires, turbidity, organic carbon, nutrients, and total dissolved solids are the key constituents of concern. In addition to these, it is possible that the increased soil erosion in the Yuba/Bear River watershed could also increase the levels of metals (such as aluminum, iron, and manganese) and possibly organic compounds (such as pesticides) in the source water.

A recent study shows that in burn areas that runoff has higher rates of dissolved organic carbon due to transformation of carbon compounds[5]. Depending on their use and proximity to water bodies, retardants may result in water quality impacts since they contain active ingredients. As the wildland/urban interface continues to expand there is increased potential for wildfires to involve residential and commercial facilities as well. This would increase the exposure to a wider array of potential contaminants.

[5] Hohner, Summers, Rosario-Ortiz. Laboratory simulation of postfire effects on conventional drinking water treatment and disinfection byproduct formation. AWWA WaterScience. 2019, e1155.

Presence in the Watershed

Most wildfires, whether prescribed, accidental, or arson, occur during the summer and fall months in the watershed. Wildfires can be either under the jurisdiction of CALFIRE or the USFS.

There were only three fires greater than 10 acres in the Yuba/Bear River watershed during this study period, 2021 through 2025.

- The River Fire was the largest and most significant fire, burning 2,619 acres in Colfax along the Bear River. The fire started at the Bear River Campground at Milk Ranch Road and burned upstream toward Rollins Reservoir. The fire burned from August 4 to 13, 2021.
- The Dutch Fire (Placer) burned 48 acres along Interstate 80 at Ridge Road in Dutch Flat. The fire burned from September 13 to 19, 2022.
- The Dutch Fire (Nevada) burned 28.3 acres on Lowell Hill Road at Dutch Flat Forebay Dam in Dutch Flat. The fire burned from October 5 to 11, 2024.

The River Fire began at the Bear River Campground in Placer County on August 4, 2021, and was declared an Emergency Disaster by the NID Board on August 25, 2021. The fire had widespread impacts within the Bear River watershed. Burn severity varied within the burn scar, and the River Fire dramatically altered the condition of the forest within the Bear River watershed, and water supply, water quality and watershed function were expected to be impacted by the fire.

Emergency erosion control and hazard tree removal was implemented in autumn 2021 to protect the Bear River Canal and Bear River from hazardous post-fire debris and sediment delivery into the Bear River. NID prioritized and completed 85 acres of emergency wildfire recovery actions in 2021 (discussed later) to address immediate impacts to water system infrastructure and to remove hazard trees, masticate and lop and scatter the “black forest” that was left after the burn to reduce the potential for excessive erosion, water system repair, impacts to public roads, hazards to people and property, and forest recovery.

Regulation and Management

Wildfire response and management is led either by the USFS or by the State of California, often by CALFIRE, depending on the fire location. The agencies typically work together on larger fires, along with local fire agencies. Once a fire is controlled and extinguished, a detailed field survey is conducted to assess the damage. On federal lands, typically a Burned Area Emergency Response (BAER) Report is prepared which summarizes the location and extent of burn damage. The report also outlines recommended actions to implement to restore the vegetation, if appropriate. Revegetation is only recommended for severe burn areas where natural reforestation is unlikely. State and federal agencies are both working toward new forest health management programs, including significant amounts of fuel reduction.

US Forest Service

Given the substantial amount of National Forest land in California, wildfires often include federally owned and managed land. Over the past decade, there has been a tremendous number of burned acres on federal lands. As a result, the USFS has restructured several of its management programs to directly address wildfires, including their impacts, restoration and resilience. In February 2021, the USFS published "*Postfire Restoration Framework for National Forests in California*" to provide a regulatory framework for forest managers to use ecologically-based decision-making to plan and implement restoration projects. In January 2022, the USFS published "*Confronting the Wildfire Crisis; A Strategy for Protecting Communities and Improving Resilience in America's Forests*". The focus of this document is to guide forest managers under a new management paradigm, where the USFS works with local partners to implement targeted forest treatments and fuel reduction focused on "firesheds" to protect communities and infrastructure.

Guidelines for Aerial Delivery of Retardants and Foam Near Waterways

The use of approved long-term retardants in wildland fire suppression is standard in fire management and planning. The retardants are most often delivered in fixed or rotor-wing aircraft. A current list of qualified products and approved uses is listed on the USFS Wildland Fire Chemical Systems website (http://www.fs.fed.us/rm/fire). According to the USFS, the fire retardant commonly used is Phos-Check. The use of fire retardants can impact water quality if chemicals are accidentally dropped into a water body, or if heavy rains occur before the product has had time to naturally degrade.

Post-fire water quality monitoring for streams near four wildfires showed that aerial application of fire retardant near but not into streams had minimal effect on surface water quality (Crouch et al, 2006). Ammonia and phosphorus from the burning of wood and other organics in burn area streams where fire retardant was not used were found in concentrations similar to those found in area where fire retardant was aerially applied.

The National Interagency Fire Center has developed *Interagency Standards for Fire and Fire Aviation Operations* which are annually revised. The *Interagency Standards for Fire and Fire Aviation Operations* states, references, or supplements policy for Reclamation, the USFS, the U.S. Fish and Wildlife Service, and the National Park Service. Regarding the use of fire retardants, the Aerial Application Guidelines are to "avoid aerial or ground application of retardant or foam within 300 feet of waterways." (http://www.fire.blm.gov/Standards/redbook.htm). This policy was recently upheld in a December 2011 Record of Decision, Nationwide Aerial Application of Fire Retardant on National Forest System Land, USFS.

The USFS recently updated their GIS database to incorporate aerial retardant avoidance areas, specifically the 300-foot distance from hydrographic features. This is the Aerial Fire Retardant Avoidance Area datasets for National Forest System Lands, delivered as part of the 2011 Nationwide Aerial Application of Fire Retardant on National Forest System Land

Environmental Impact Statement, the 2023 Supplemental Environmental Impact Statement, and the 2024 Record of Decision. These maps depict areas where the aerial application of fire retardant is prohibited in order to avoid or limit potential of impacts to specified resources. Aquatic avoidance areas are based on the presence of water, whether mapped or not, or as mapped to protect Endangered Species Act threatened, endangered, proposed, or candidate species of critical habitat or Regional Forester sensitive species or habitat associated with waterways, waterbodies, or riparian areas. Terrestrial avoidance areas are areas mapped to protect Endangered Species Act threatened, endangered, proposed, or candidate species or critical habitat or Regional Forester sensitive species or habitat or other resources that are not associated with waterways or riparian areas. These datasets are to be used in planning and implementation phases of Forest Service fire activities to help prevent intrusions of aerial fire retardant these avoidance areas on National Forest lands. Compliance is essential in order for the Forest Service to be able to use aerially delivered long-term fire retardant as a fire management tool. These occur in the upper watershed, where the USFS lands occur. **Figures 4-1 through 4-3** present screen shots of the protected waterbodies in the Yuba/Bear River watershed, which only include some of the key water supply waterbodies.

Figure 4-1
USFS Aerial Avoidance Areas Bear River Watershed

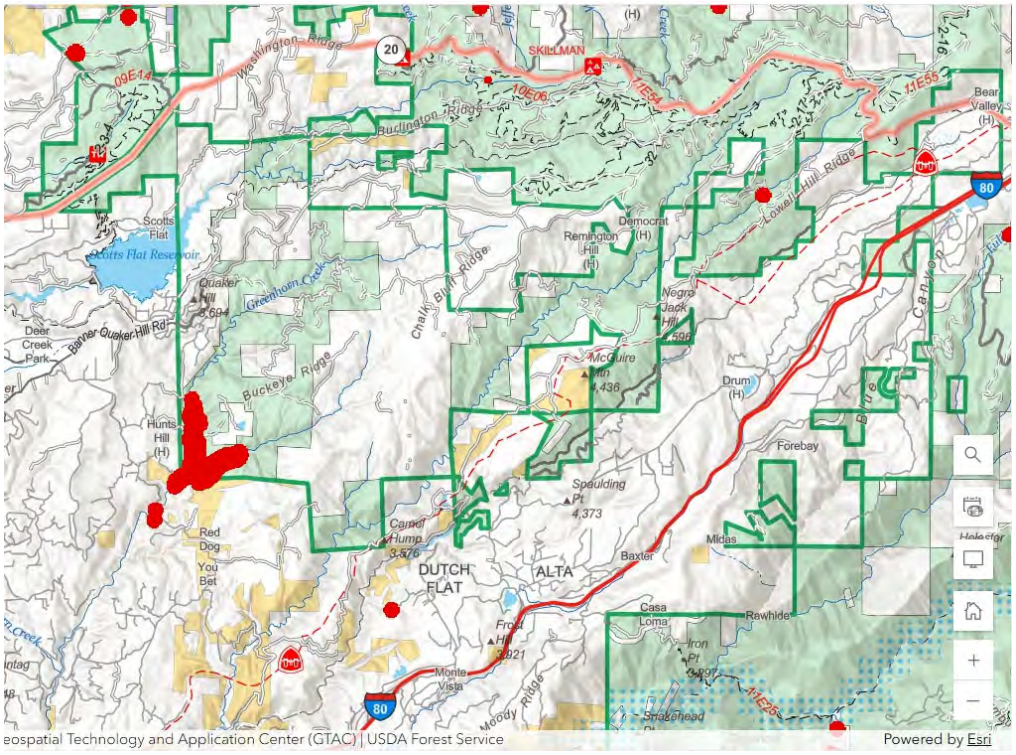


Figure 4-2
USFS Aerial Avoidance Areas Upper Watershed Along Interstate 80

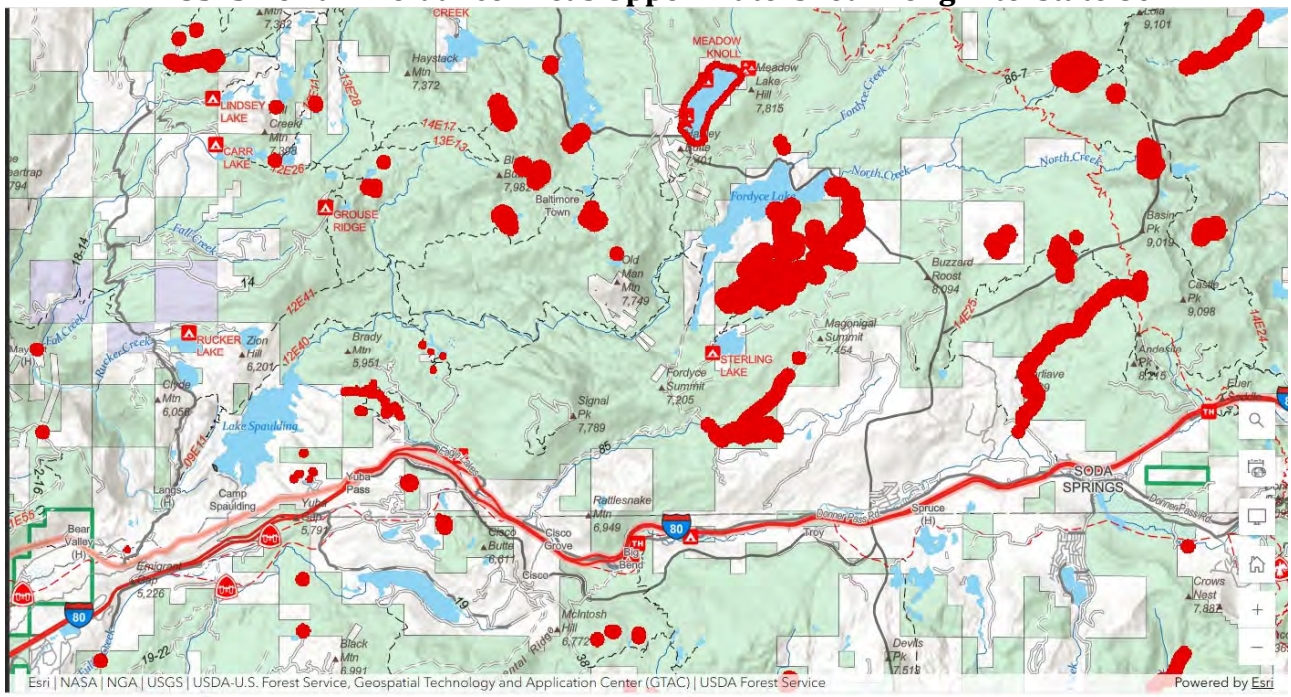
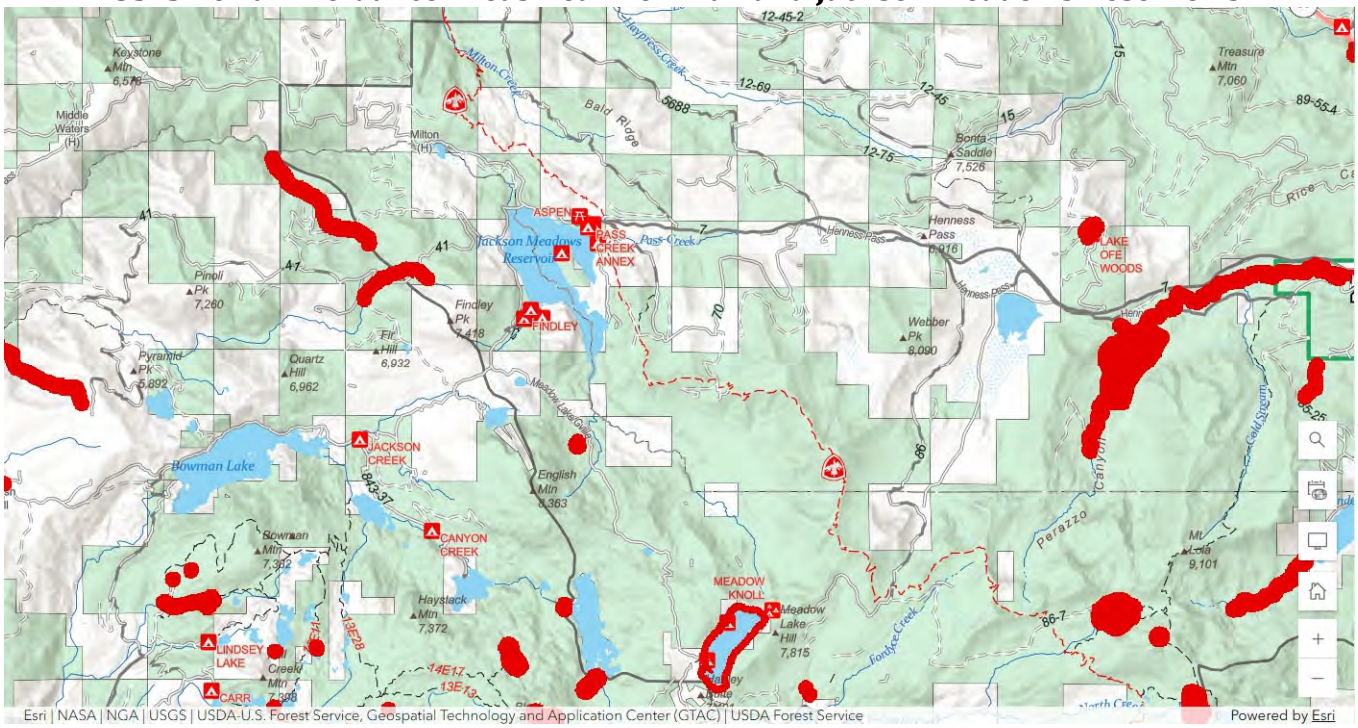


Figure 4-3
USFS Aerial Avoidance Areas Near Bowman and Jackson Meadows Reservoirs



State of California

California Wildfire and Forest Resilience Task Force

In 2018, the California Forest Management Task Force was created to implement an integrated approach to forest management to improve forest health and resiliency in face of climate change, drought, and wildfires. In January 2021, the Task Force published the "Wildfire and Forest Resilience Action Plan", which outlined plans to reduce wildfire risk to communities, improve forest health, and combat climate change. In April 2021, the Task Force was renamed the California Wildfire and Forest Resilience Task Force to reflect the specific focus of the Action Plan. In March 2022, the Task Force published "California's Strategic Plan for Expanding the Use of Beneficial Fire", which outlined plans to increase the use of prescribed burns to reduce catastrophic wildfire.

The Task Force coordinates numerous state agencies, as well as federal, local, and tribal organizations. This Action Plan relies upon the August 2020 Agreement for Shared Stewardship of California's Forest and Rangelands between California and the USFS. This agreement commits both agencies to implementing fuel reduction and forest treatments on 500,000 acres each year by 2025, for a total of 1,000,000 acres per year statewide. This includes the use of prescribed fire to reduce undergrowth, increase timber harvesting, installation of more fuel breaks, implementation of strategic reforestation, and use of best available science.

The Task Force hosts an Interagency Treatment Dashboard, which lists the acreage of fuels treated by county and year (2021 through 2024). This dashboard breaks out the administering agency, activity category (mechanical and hand fuels reduction, prescribed fire, tree planting, targeted grazing, and timber harvest), and acreage ownership (federal, state, local, private, and tribal). **Table 4-12** presents an annual summary of the various types of fuel reduction work completed within the Yuba/Bear River watershed, there was no targeted grazing or timber harvest in the watershed.

Table 4-12
California Wildfire and Forest Resilience Task Force
Fuel Treatment in Nevada County, 2021 - 2024

Year	Fuel Treatment (acres)		
	Mechanical and Hand Treatment	Prescribed Fire	Tree Planting
2021	805.12	401.5	202
2022	224	8.5	33
2023	476.6	93.5	19
2024	36.05	-	92

Source: https://interagencytrackingsystem.org/

In March 2025, Governor Newsom issued a Proclamation of A State of Emergency, after the January 2025 Palisades Fire in Southern California, to allow the Secretaries of the California

Natural Resources Agency (CNRA) and California EPA to determine which projects are eligible for suspension of regulatory requirements to expedite critical fuel reduction projects. On December 31, 2025 the State of Emergency was extended through May 1, 2026 allowing more time for projects to be fast-tracked. There are four requirements for qualifying for the suspensions:

1. Project primary objective must be removal of hazardous/dead/dying trees, strategic fuel breaks for fire prevention, community defensible space, roads/highways/ freeway, cultural burning, or maintenance of fuel breaks.
2. Project must be conducted in 2025.
3. Project work must be performed by qualified responsible parties.
4. Project work must follow the BMPs listed in the Statewide Fuel Reduction Environmental Protection Plan (May 2025). The BMPs include protection of water quality.

To date, there are five projects approved in the Yuba/Bear River watershed for a total of just over 634 acres. This work is to be completed between 2025 and 2028. This includes work on Towle Mountain, South Yuba Canal, Scotts Flat Reservoir, Banner Mountain, and within Nevada City.

CALFIRE

CALFIRE implements both forest health and fuel reduction grants to fund projects throughout the state on both public and private lands. Most work under CALFIRE in the watershed occurs at the mid and lower elevations, below the TNF western boundary. CALFIRE has three basic sources of funding for this work; General Fund, California Climate Investments (CCI), and Proposition 4 (The Safe Drinking Water, Wildfire Prevention, Drought Preparedness, and Clean Air Bond Act of 2024 [2024 Climate Bond]).

The General Fund varies annually, and in some years is zero. No projects in the Yuba/Bear River watershed could be identified through this funding during the study period.

The CCI is funded by the sale of State-owed allowances from Cap-and-Invest auctions to the Greenhouse Gas Reduction Fund. The amount appropriated from the Fund to CALFIRE each year varies. Under the CCI, the California Forest Improvement Program (CFIP) allows owners of land between 20 and 5,000 acres to apply for grants to improve management of non-industrial forest lands. There were numerous CFIP grants awarded throughout the watershed during the study period, some key ones of interest include: 2021 Theodore Arther Project (40 acres treated around Lakes Theodore and Arthur), NID CFIP 2020 and 2021 (300 acres treated around Rollins Lake and Lower Bear River), and 2020 Scotts Flat NID Project (16.7 acres around Scotts Flat and Rollins Lake).

Proposition 4 allocated $185 million to CALFIRE Wildfire Prevention Grants as follows: “projects and grants to improve local fire prevention capacity, improve forest health and resilience, and reduce the risk of wildfire spreading into populated areas from wildlands. The Wildfire Prevention Grants Program funds three types of activities: Hazardous Fuels

Reduction, Wildfire Prevention Planning, and Wildfire Prevention Education. Work can be conducted on private land, state land, and federal land. There were numerous wildfire prevention grants awarded throughout the watershed during the study period, some key ones of interest include: Emigrant Gap Forest Project (2,053 acres around Lake Valley Reservoir and along Interstate 80), Egress/Ingress Fire Safety Project (688 acres of roadside around Nevada County), and Winter Storm Hazard Vegetation Cleanup Program (209 acres throughout Nevada County).

CALFIRE also tracks fuel reduction projects and started completing Fuel Treatment Effectiveness Reports (FTERs) in 2023. In June 2024, CALFIRE published a dashboard that allows viewers to see maps showing fuel treatment projects in the watershed. There were no significant fires after 2023 so no FTERs were available.

Sierra Nevada Conservancy

The Sierra Nevada Conservancy (SNC) is a state agency that leads efforts to restore and enhance natural resources and communities of California's Sierra Nevada-Cascade region while protecting them from wildfire and a changing climate. This includes the Yuba/Bear River watershed. The SNC was established by bi-partisan legislation (Assembly Bill 2600) and signed into law in 2004. One of primary goals is to protect and improve water quality, through landscape restoration and land conservation. The SNC is funded by the California Environmental License Plate Fees and is awarded Proposition 1, 4, 68, and 84 funds for regional projects. The Sierra Nevada Conservancy will be administering $10 million of Proposition 4 funding for forest health projects in the Sierra/Cascade region, including the Yuba/Bear River watershed. Applications were due January 31, 2026 and work will be conducted in 2026.

The Sierra Nevada Watershed Improvement Plan (WIP) was adopted in March 2015, along with a Strategic Plan for 2016 through 2019. This led to the development of the Tahoe Central Sierra Initiative (TCSI) in 2017, as a pilot program for the WIP, which implements high-priority forest health projects that sequester carbon and reduce the risk of wildfires through partnerships and grant funding. The TCSI provides a framework for forest resilience including pillars, elements, and metrics. The pillars include forest health, fire dynamics, and water security, among others. The TCSI Project Tracker includes numerous projects in the Yuba/Bear River watershed. Some of these projects have been described elsewhere and some are in planning. This includes work around Sugar Bowl Ski Resort, Royal Gorge Ski Resort, Emigrant Gap Demonstration Forest, Deer Creek Resilience and Restoration, Lower Steephollow Restoration, as well as numerous roadside vegetation and small area plans throughout Nevada County.

A Strategic Plan was adopted for January 2019 through June 2024. This document is more complex and addresses healthy forests and communities. The Strategic Plan works to significantly increase the pace of restoration efforts, including prescribed burns, to encourage carbon sequestration and reduce catastrophic wildfire. The work for healthy forests and watersheds includes: needs assessment, partnerships and resources, funding, advocacy/policy, and new ways of doing business.

Water Quality Issues and Data Review

A review of the ambient water quality for the water treatment plants in **Section 3** for turbidity and TOC shows that the Deer Creek, Bear River, and the Bear River Canal water treatment plants show a distinct seasonal trend with most peaks occur during the wet weather season. Erosion for recent burn areas could be contributing to these peaks.

Source Water Protection Activities

Nevada Irrigation District

NID coordinates with CALFIRE and USFS related to their own efforts in the watershed, as well regarding land conversion and timber sales. NID implemented several California Forest Improvement Plans, as discussed previously, on its lands in the watershed for fuel treatment around Scotts Flat Reservoir and Rollins Lake. NID is evaluating a Master Stewardship Agreement with Tahoe National Forest to continue forestland improvement on both NID and USFS lands.

NID also implemented 15 forest management projects, including treatment of over 2,000 acres, throughout the watershed during the study period. The Deer Creek subwatershed included six mastication and selective thinning projects around Scotts Flat Reservoir and Cascade Shores, for a total of 623 acres during the study period (see Scotts Flat Fire Fuels Removal Partnership below). The Bear River subwatershed included seven mastication and selective thinning projects around Rollins Reservoir, Combie Reservoir, the Bear River Canal, and the South Yuba Canal, for a total of 711 acres during the study period. This included remediation efforts after the River Fire occurred along the Bear River below Rollins Reservoir (see Bear River Wildfire Recovery Project below). The Middle and South Yuba River subwatershed included two mastication projects in the headwaters of English Meadow and the Upper Yuba, for 725 acres during the study period (see English Mountain Restoration below).

Scotts Flat Fire Fuels Removal Partnership

To address wildfire risks, NID partnered with the SNC to reduce wildfire risk and to improve forest resilience at Scotts Flat Reservoir, in the Deer Creek watershed in 2021. NID and the SNC worked together to create a “shaded fuel break” by thinning excess trees and reducing ground fuels. The project removed trees with a diameter of less than 12” and chipped and spread them throughout the site. This project completed 361 acres of fire fuels treatment adjacent to Scotts Flat Reservoir, and is part of a 3-year and 600 acre treatment goal for NID.

Bear River Wildfire Recovery Project

The SNC awarded NID $570,000 in grant funding to address burned forest conditions caused by the 2021 River Fire and improve forest health in the Bear River watershed. NID’s Bear River Wildfire Recovery Project was conducted in 2022 on District-owned lands on the steep

slopes of the Bear River canyon, between Chicago Park and Lake of the Pines in Nevada County. The Bear River Wildfire Recovery Project significantly reduced the negative impacts of the River Fire and improved forest health on 181 acres in the Bear River watershed by implementing fire fuels reduction treatment utilizing both mastication and hand crew and installing strategic erosion control to limit sediment transport. The project will reduce fire fuels by treating burned and unburned forest areas, expand defensible space adjacent to highly populated rural communities (Lake of the Pines and Alta Sierra), safeguard water quality and water supply, and promote sediment attenuation through erosion control measures.

English Meadow Restoration

The English Meadow Floodplain Restoration project is on 325 acres of USFS and NID lands, with intent to reduce sediment transport. Mountain meadow health has been prioritized in the Sierra Nevada due to their connection to overall water quality and quantity in headwater systems. In summer of 2023, NID began implementing the English Meadow Restoration project with a grant of $1.25 million from the California Wildlife Conservation Board. Improving the functionality of English Meadow would allow more water and sediment to remain within the floodplain and aquifer, rather than being carried downstream during peak flow periods in the spring into Jackson Meadows Reservoir.

Watershed Resilience Planning

Proposition 50 was adopted by voters in 2002 as part of the Regional Water Management Planning Act (SB 1672) and aimed to help communities plan and implement water management solutions that increase self-reliance, reduce conflict, and build resilience to drought, flood, and climate change. The Cosumnes, American, Bear and Yuba (CABY) Integrated Regional Water Master Plan (IRWMP) is a planning document that identifies a vision, guiding principles, broadly-supported goals, objectives, strategies, actions and projects for the purposes of enhancing the beneficial uses of water for the CABY region. This effort was initiated by water suppliers, power utilities, and watershed conservation groups to; provide long-term water supplies, protect and improve water quality, and enhance environmental and habitat resources. The IRWMP was completed in 2006 and was subsequently updated, most recently in July 2021. Both PCWA and NID participated in CABY historically, but neither are active participants at this time.

Following the Newsom Administration's policies on Water Supply Strategy (2022) and Water Resilience Portfolio (2020), the California Water Plan Update 2023 emphasized the need for watershed-based solutions, climate resilience, and equity through collaboration with local partners to address climate extremes.

Key aspects of this approach are:

- Managing water from headwaters to outflow at a watershed scale.
- Prioritizing equity and inclusiveness.
- Analyzing climate risks and adaptations at the watershed level.

- Collaborating across water, flood, groundwater, quality, forest/fire, ecosystem, and land use sectors.
- Developing metrics to track outcomes regionally and statewide.

The Watershed Resilience Program is an evolution of the IRWM program that builds on regional planning while placing a stronger emphasis on watershed resilience. Watershed resilience broadens the scope of the IRWM program to address climate adaptation, ecosystem health, and community resilience alongside water supply. Essentially, IRWM programs are being reshaped as a watershed-based approach to water management.

DWR is funding pilot programs through Proposition 4 funding, including the Regional Water Authority's Greater American River Watershed (which includes the Bear and Cosumnes rivers). The Yuba River watershed is a separate watershed. Both the American/Bear and Yuba watershed were determined to have moderate climate vulnerability.

The Regional Water Authority's American/Bear/Cosumnes (ABC) Watershed Resilience program was kicked off in 2024 and has resulted in a gap analysis, vulnerability assessment, strategies to prepare for climate impact, and completion of a Watershed Resilience Plan (2026). The analysis included water quality and water supply, as well as consideration of key hydrologic events such as the 2020 – 2022 drought, the September 2022 heat wave, and the January 2023 bomb cyclone event. The water quality analysis is limited to temperature, dissolved oxygen, salinity, and the potential for algal blooms. Temperature is projected to increase, dissolved oxygen is projected to decrease, while salinity and algal blooms are projected to remain unchanged. Adaptation strategies are identified, including implementing sustainable forest management and watershed protection and restoration. This includes adaptation actions related to hazardous fuel reduction, post-fire restoration plans, long-term forest management strategies, livestock grazing, and restoration of headwater meadows. This plan connects projects to watershed resilience goals and will allow the participating agencies, such as PCWA and NID, to pursue Proposition 4 funding for projects.

RECREATION

Background

There is a large amount of recreation that occurs in the Yuba/Bear River watershed. Recreation occurs in each of the sub basins, at varying levels. Recreation includes body and non-body contact activities. Body contact recreation includes swimming, wading, and rafting and is allowed on all major reservoirs and river reaches in all sub basins. The number of body contact recreationalists cannot be estimated, but is expected to be far less than the total number of recreationalists. Non-body contact recreation includes camping, boating, off-highway vehicle (OHV) use, fishing, hiking, biking and winter activities such as snow play, skiing, and snowmobiling. Recreation occurs on both private and public lands, including local, state, and federal.

Seasonal Patterns

Body contact recreation occurs primarily between Memorial and Labor days. Most non-body contact recreation can occur throughout the year. Most camping, and associated activities, occurs in the upper watershed and is limited to May through October, with peak use over the summer holiday periods. During the winter months, December through March, winter activities such as skiing and snowmobiling primarily occur in the upper watershed only. Recreation in the lower watershed consists of more day-use activities such as boating, OHV use, fishing, hiking, and biking and can occur throughout the year, but is most significant during the spring, summer, and fall.

Related Constituents

Body contact recreation in general has long been known to be a source of pathogen contamination, resulting partly from personal sanitary conduct and partly from a natural shedding process. Pathogens shed by recreationalists include bacteria, viruses, and protozoa. Moreover, because their origin is human, microorganisms shed by recreationalists are transmissible to other humans. Also, boaters may dump sewage waste into a waterbody rather than use a pumpout.

Non-body contact recreation can also contribute to pathogen levels in the watershed but the more significant concern is associated with erosion caused by land-based activities which may in turn cause an increase in the solids loading to the receiving water and a subsequent increase in constituents such as turbidity, total dissolved solids, TOC, iron, and manganese at the water treatment plants.

Since late 2024, recreation has become a potential source of an invasive aquatic species – the golden mussel. Although it isn't a direct water quality concern, it has the potential to impact the source water quality. The golden mussel filters water at rates up to half a liter per hour, or about 12 liters per day. This filtering results in increased clarity of the water by decreasing suspended material, chlorophyll a, and primary production in the water supply, thus decreasing turbidity. This results in modification to the nutrient concentrations and proportions in water bodies, such as an increase in dissolved nitrogen, which can promote aggregation of solitary *Microcystis* spp. cells into colonies; both these effects can favor blooms of this cyanobacteria that have the potential to be harmful. Golden mussel colonies are extremely dense and can be present at hundreds of thousands of organisms per square meter. This high density of organisms can be very problematic for waste production and die-off. Anything the mussels have filtered through, that is not consumed, is rejected as a mucous known as pseudofeces. This pseudofeces is known to decrease the dissolved oxygen and increase the pH of the water. Additionally, in the event that there is a die-off event, for any reason, it has been documented that significant taste and odor events are possible following the die-off. Both of these have the potential to impact source water quality at the intake.

Presence in the Watershed

Multiple agencies own and manage recreational facilities in the Yuba/Bear River watershed, including the USFS, PG&E, and NID. Recreational facilities are located from the headwaters down to the lower reaches of the watershed. This discussion has been separated into camping and day-use to assist with presentation.

Since golden mussels are most successful spawning in water temperatures ranging from 60 to 82°F[6], it is expected that they only have the potential to proliferate at the middle or lower elevations of the Yuba/Bear River watershed.

Camping

Overnight camping occurs throughout the watershed and in all sub basins. Camping occurs in both formal campgrounds and dispersed in the Tahoe National Forest. **Table 4-13** provides a summary of all of the formal campgrounds, by sub basin, and the number of developed campsites.

The facilities at each campground vary, from full flush toilets to pit toilets and from running water to bring your own. The formal campgrounds are actively operated by various entities that are responsible for waste management and disposal and on-going maintenance. No formal statistics are kept by the Tahoe National Forest for recreational uses, therefore no assessment of overall impact or change during the past five years could be made. PG&E no longer tracks user statistics for its recreation facilities. Annual user statistics were provided for the NID recreation facilities at Scotts Flat and Rollins reservoirs, see **Table 4-14**.

The Bear River Campground, located adjacent to the Bear River below Rollins Reservoir, was closed by Placer County in 2022 after the River Fire. The facility was converted to day-use and is discussed below.

Table 4-13
NID User Statistics for Recreation Facilities*

Facility	2021	2022	2023	2024	2025
Scotts Flat Campground	76,915	82,274	89,473	77,641	77,658
Long Ravine Campground – Rollins Reservoir	43,828	45,434	35,250	22,515	18,230
Orchard Springs Campground – Rollins Reservoir	31,856	33,365	29,190	21,292	23,582
Peninsula Campground – Rollins Reservoir	13,700	14,700	16,498	9,959	7,837

*Including both camping and day use combined

[6] USFWS, Ecological Risk Screening Summary Golden Mussels, October 4, 2021.

Table 4-14
Formal Campgrounds in Yuba/Bear River Watershed

Sub Basin	Campground	Operator	Number of Sites
Middle Yuba River	Jackson Meadows - Pass Creek	USFS	30
	Jackson Meadows - Pass Creek Annex (Overflow)	USFS	6
	Jackson Meadows - East Meadow	USFS	46
	Jackson Meadows - Woodcamp	USFS	20
	Jackson Meadows - Findley	USFS	14
	Jackson Meadows - Fir Top	USFS	12
	Jackson Meadows - Jackson Point	USFS	10
	Jackson Meadows - Aspen Group	NID	3 Units (100 max)
	Jackson Meadows - Silvertip Group	NID	2 Units (50 max)
	Jackson Meadows - Little Laiser Meadow Horse Camp	USFS	11
Canyon Creek	Bowman Lake	NID	7
	Jackson Creek	USFS	14
	Faucherie Group	NID	2 Units (50 max)
	Canyon Creek (closed due to hazard trees)	USFS	20
	Sawmill Lake - Dispersed	NID	5
	Milton - Dispersed	USFS	4
Texas/Fall Creek	Carr-Feeley Lakes - Dispersed	PG&E	11
	Upper Rock Lake – Dispersed	PG&E	3
	Lower Rock Lake – Dispersed	PG&E	3
	Culbertson Lake – Dispersed	PG&E	3
	Middle Lindsey Lake – Dispersed	PG&E	3
	Lower Lindsey Lake – Dispersed	PG&E	12
	Blue Lake – Dispersed	PG&E	9
	Rucker Lake – Dispersed	PG&E	7
	Grouse Ridge - Dispersed	PG&E	9
Fordyce Lake	Meadow Lake Individual and Groups	PG&E	25 + 2 Units (50 max)
	White Rock Lake - Dispersed	PG&E	6
	Sterling Lake – Dispersed (closed 2024-2028 seasons for dam repair)	PG&E	8

Table 4-14 Cont'd
Formal Campgrounds in Yuba/Bear River Watershed

Sub Basin	Campground	Operator	Number of Sites
South Yuba River	Big Bend Group	USFS	2 Units (max 50)
	Hampshire Rocks	USFS	31
	Indian Springs	USFS	35
	Woodchuck (closed for 2026 season)	USFS	8
	Cisco Grove Campground and RV Park (currently closed for renovations and new amenities)	Private	417
	Thousand Trails Snowflower RV Park	Private	208
	Kidd Lake Group	PG&E	10 Sites (69 max)
	Lake Spaulding (closed for 2026 season for dam repair)	PG&E	26
NF of the NF of the American River	Lodgepole	PG&E	35
Deer Creek	Scotts Flat Reservoir – Individual and Groups	NID	171 + 4 Units (190 max)
	White Cloud	USFS	45
	Skillman Horse Group	USFS	15 Units (96 max)
Bear River	Rollins Reservoir - Peninsula	NID	77
	Rollins Reservoir - Orchard Springs	NID	95
	Rollins Reservoir - Greenhorn	Concess-onaire	84
	Rollins Reservoir - Long Ravine	NID	90
	Bear Valley Group	PG&E	1 Unit (50 max)

Day-Use Activities

Some of the key day-use activities that occur in the watershed include body-contact recreation, hiking, OHV use, boating, fishing, cross-country skiing, and snowmobiling. Hiking, OHV use, cross-country skiing, and snowmobiling largely occurs on public lands. Boating and fishing can occur on public and private lands.

Highly used hiking trails in the region include; Loch Leven Lakes Trail (near Big Bend Visitor Center), Grouse Lakes Area, Pioneer Trail east of Nevada City off Highway 20, Palisade Creek Trail (near Kidd Lake), and Pacific Crest Trail (along the summit).

OHV use can occur throughout the watershed, but is more prevalent in the upper watershed in the Tahoe National Forest. Some popular areas for OHV use include White Cloud, Meadow Lake, and along Fordyce Creek/I80 corridor.

Boating and fishing occurs on most waterbodies in the watershed. Public boat ramps are available for the large reservoirs including; Jackson Meadows, Bowman Reservoir, Lake Spaulding, Lake Valley Reservoir, Scotts Flat Reservoir, and Rollins Reservoir. There are also

private docks and access on Lake Combie. PG&E allows access to most of its facilities for day-use, including boating and fishing. This includes access to parts of the water supply system such as Drum Forebay and Afterbay, Alta Forebay, Halsey Forebay and Afterbay, Rock Creek Reservoir, and Wise Forebay. Most of these are limited to on-shore fishing with limited parking available.

Day-use for the lower Bear River and Squirrel Creek has significant use during the warm weather months of June through October. Access to the Bear River is used at the Highway 174 and Dog Bar Road crossings, as well as the adjacent landowners. There are no sanitation facilities at any of these areas. Squirrel Creek recreation is centered around Western Gateway Regional Park in Penn Valley. The park offers baseball fields, playgrounds, off-leash runs for dogs, and creek access for body contact recreating. There are sanitation facilities provided.

The Bear River Fishing Access (formerly campground), located adjacent to the Bear River below Rollins Reservoir, is operated by Placer County as a site for hiking, fishing, and swimming. The land includes 250 acres and is owned by the California Department of Fish and Wildlife, and operated by Placer County. There is no site manager, but the site is patrolled and maintained daily during the season of use. This includes trash removal and bathroom services. The vault toilets are pumped regularly, typically between three and four times per year. No campfires or fireworks are allowed.

Another day-use activity is winter use for snow play, cross-country skiing and snowmobiling. These uses are significantly lower than the other summer season activities. There are several areas where snow play occurs. Most are located along Interstate 80, including: Loch Leven, Rainbow, Cisco Grove, Sno-Park at Yuba Gap, Nyack, and Blue Canyon. A few are located on the eastern end of Highway 20, including: Bear Valley and Omega Rest Area. Also, the Soda Springs/Boreal ski resorts are located in the uppermost part of the watershed and continue to expand and have significant operations.

There are five areas designated for cross-country skiing and two of those also have trails for snowmobiling, or over-snow vehicles (OSV). They include Castle Peak, Rattlesnake (near Yuba Gap), Big Bend, Donner Sno-Park, and Steephollow. There is also a multi-use snow trail loop from Jackson Meadows Reservoir to Meadow Lake. The key areas for OSV use are Pass Creek, Meadow Lake, Road 18, Rattlesnake, Sterling Lake, and Lola Montez.

Regulation and Management

There is regulation over recreation in the Yuba/Bear River watershed. As described previously, the owners and operators of the formal recreational facilities are required to conduct on-going maintenance and operations and appear to be vigilant in their activities. One management activity of note is the USFS Travel Management Plan. The Travel Management Plan completed in 2015, consists of three Subparts; A – Forest-Wide Road Analysis, B-OHV road and trail designation, and C-OSV road and trail designation. Subpart A was completed in 2005, and should be updated every five years thereafter. The most recent Travel Analysis Report was published in 2015. The Report assesses the Tahoe

National Forest's road system to determine the minimum roads and trails needed to serve its goals, it is not an assessment of the road conditions. The Report looks at trends in road uses and makes general recommendations for the future. Roads are recommended as either "keep", "convert", "decommission", or "store". The USFS uses this Report to inform future planning and maintenance activities in the forest.

The Pacific Southwest Region of the USFS completed Subpart B to designate routes for wheeled motorized vehicle use in the Tahoe National Forest. Routes were designated between 2005 and 2010, following a five-step Route Designation Strategy. Not all existing routes were designated for future use. After an intensive public input process, the Tahoe National Forest completed the designation process and approved the Motorized Travel Management Program Environmental Impact Statement in September 2010. This included a Motorized Vehicle Use Map (MVUM), which shows the roads and trails approved for use. Each year the TNF updates the MVUM and makes them available as PDF files or through a GPS-enabled application (Avenza Maps) for each Ranger District.

Subpart C of the Travel Management Plan, OSV road and trail designation, has been developed for the Tahoe National Forest. The USFS completed and approved the Over-Snow Vehicle Use Designation Environmental Impact Statement in February 2019. This included 247 miles of groomed OSV trails and 126 miles of additional non-groomed OSV trails in the Tahoe National Forest. An OSV Use Map has been created, most recently updated in 2024, indicating that most of the USFS land in the Yuba/Bear River watershed will be open to OSV use. Hardcopies of the maps can be obtained at Ranger District offices, or via the Avenza Maps application.

The USFS has determined that Class 1 e-bikes are designated as motorized vehicles and therefore subject to the Travel Management Plan. Currently, the E-Bike Designation Project is expected to be finalized in 2026. This includes designation of 143 miles of trails for e-bike use, with approximately 23 miles of new trails planned.

The USFS had several other recreation projects approved during the study period in the watershed, including; Castle Trailhead Development Project (a multi-use recreation facility planned for Donner Summit), Pines to Mines Trail Project (trails connecting Nevada City to Truckee along Highway 20 and Interstate 80), Pioneer Trail Bridge and Realignment Project (new bridge at Lake Spaulding), Sugar Bowl Snow Play (new 1.5 acre snow tubing area), Memorial Overlook Emigrant Trail and Donner Lake Rim Trail Project (new native surface trails connecting Sugar Bowl and Donner Lake), and Van Norden Meadow Restoration and Recreation Project (485 acre meadow restoration and recreation access improvement).

As part of their Federal Energy Regulatory Commission (FERC) relicensing process, NID and PG&E continue to evaluate recreational use of their facilities in the Yuba/Bear River watershed. Both agencies indicate in their current Recreation Plans that they will be expanding, or improving, recreational access. This includes improved access for fishing at forebays, improved boat access at reservoirs, and improved campground facilities.

Due to the threat of the golden mussel, in March 2025 NID developed a Golden Mussel Program. All motorized and trailered boats must either be decontaminated (by an approved decontaminator) or quarantined for 30/60 days (depending on type of boat) prior to their first launch at Scotts Flat, Rollins, or Jackson Meadows reservoirs. Once a boat has passed the quarantine period or has been decontaminated the boat is free to launch. At the end of the day the boat is resealed with a blue re-entry seal allowing the boat to launch again at an NID lake without having to quarantine or decontaminate. If a seal has been broken, tampered with, or the seal code is not in the database the boat will not be able to launch.

In August 2025, Placer County approved modification of the special use permit for Cisco Grove Campground to allow for renovations and installation of new amenities (pool, mini-golf course, pickleball courts) to create a resort campground experience to address declining visitation. No new campsites are proposed.

Water Quality Issues and Data Review

Microbiological Data

There has been very limited monitoring of runoff from recreational areas for microbial constituents. **Section 3** presents *E. coli* data for the water treatment plants. The various water supply systems have variable water quality. The Auburn WTP and Lake Wildwood WTP show an increasing trend in *E. coli* during the summer use season, June through September. North Auburn, Foothill, and Sunset WTPs show a slight increasing trend in *E. coli* during the summer season, between July and September. Additionally, Applegate WTP sees a peak monthly median in June.

Historic data for *Giardia* and *Cryptosporidium* at the water treatment plants show low levels of protozoa in the water and sporadic detection, which likely indicate that body contact recreation is not significantly contributing.

Solids Data

A review of the ambient water quality for the water treatment plants in **Section 3** for turbidity and TOC shows that the water treatment plants show a distinct seasonal trend with most peaks occur during the wet weather season, but some peaks occurring during summer months. The summer months are when algal blooms can occur in the slower moving canals, which would contribute to both TOC and turbidity, so it is thought that these are potentially responsible for those peaks. Since there are numerous activities in addition to general watershed erosion that could contribute, it is uncertain how much is attributable to recreational activities.

Source Water Protection Activities

There is limited opportunity for stakeholder activity in the recreation source. NID manages its recreation facilities using BMPs to protect source water quality.

SOURCE WATER SPILLS

Background

A hazardous material spill or leak into the river system could occur as a result of a vehicular traffic accident, railroad accident, pipeline leak or spill, wastewater treatment plant spill, or other incident. This section has been expanded to include homeless encampments, as they have the potential to result in discharges to receiving waters.

In the event of a leak or spill, timely notification is critical to ensure that the water treatment plant operators are provided with sufficient time and information to best respond to potential treatment concerns or plan measures to protect the water supply. Formal notification to potentially impacted water utilities is expected to be provided by the State Water Resources Control Board, Division of Drinking Water (DDW), if DDW is apprised of a hazardous material spill with risk to drinking water through the California Office of Emergency Services (Cal OES) State Warning Center.

Seasonal Patterns

Spills associated with vehicular traffic, railroads, and pipelines could occur at any time of the year. Sewage spills typically occur during wet weather as a result of capacity exceedances, facility failures, or power outages affecting wastewater treatment plant operations, but they can also occur during other seasons. Wet weather is more likely to transport spill materials to the receiving waters.

Related Constituents

The most common spills are related to oil and petroleum products or sewage spills. Therefore, typical constituents of concern include volatile organic compounds (VOCs) and hydrocarbons to microbial constituents (i.e., viruses, bacteria, *Giardia*, *Cryptosporidium*). However, hazardous materials emergencies can involve a virtually infinite number of chemicals or chemical combinations.

Presence in the Watershed

There are numerous roadways in the watershed, many of which cross either the rivers, creeks, or canals associated with the Yuba/Bear River water supply. The main truck transportation routes through the watershed are Interstate 80, Highway 20, Highway 174, and portions of Highways 49 and 193, as shown on **Figure 2-1**. There are no restrictions on transport of hazardous materials in the watershed. A significant threat is near bridge crossings because of the immediate potential for spilled material to enter the river system. Of note during this study period was the frequency of vehicular accidents resulting in potential discharge to receiving waters along Interstate 80 between Auburn and Donner Summit.

A review of the USEPA Toxics Release Inventory Program revealed that there are still no active facilities located in the watershed, and no discharges occurred. A review of the Cal EPA Regulated Site Portal (nSite - https://siteportal.calepa.ca.gov/nsite/map/results) website revealed hundreds of permitted facilities throughout the watershed. This includes aboveground petroleum storage, chemical storage facilities, and hazardous material waste generators. The interactive map can be queried to identify sites of potential interest, such as those with recent permit violations. Many violations are related to reporting, training, and documentation and have been resolved with the managing agency. No significant violations related to a discharge to surface water were identified.

Union Pacific Rail Road (UPRR) owns and operates the railroad tracks that parallel Interstate 80. Both railroad lines are used by UPRR and BNSF Railway Company to transport hazardous materials as long as they follow the Federal Department of Transportation guidelines for the transportation of hazardous materials. This includes Bakken crude oil transported into California via rail. Spills could occur at any time, and at any location, however no significant spills occurred during the study period.

Kinder Morgan owns a petroleum product pipeline that closely parallels Interstate 80 and the UPRR rail road tracks through the watershed. The pipeline ranges from six to eight inches in diameter, and transports a variety of petroleum products. No significant spills were reported during the study period.

A review of the Cal OES Hazardous Materials Spill Reports revealed 87 spill events occurring that resulted in a discharge that reached a receiving water upstream of the water treatment plants. A complete list of all the Cal OES-reported spill events in the watershed during the study period is provided in **Appendix D**. The majority of spills were small petroleum discharges associated with vehicular accidents (62 events), or small to medium sized wastewater discharges (9 events). There are frequent vehicular accidents along Interstate 80 that result in discharges of petroleum products to the Boardman Canal tributary area and have the potential to impact source water supply.

Homeless encampments could occur anywhere in the watershed, but typically occur in urban areas where resources and transportation are available. The most likely areas for encampments in the Yuba/Bear River watershed are located in Nevada County, specifically in the urban areas near Nevada City and Grass Valley. Nevada County's Point in Time (PIT) homeless counts include the following counts of unsheltered homeless populations (county-wide); 2019 – 249, 2021 – 163, 2022 – 284, 2023 – 227, 2024 – 258, and 2025 – 264. The County's Homeless Outreach and Medical Engagement Team indicates that the majority of the unsheltered population lives near resources, such as in the Brunswick Basin and Glenbrook areas of Grass Valley, which are not inside of the Yuba/Bear River watershed.

A detailed review of the sanitary sewer overflows from wastewater collection systems is provided in the Wastewater subsection later.

Regulation and Management

UPRR inspects the train tracks regularly and conducts inspections whenever a problem is detected. There have also been improvements to the train tracks in areas where there have been historical problems, such as in the mountains along Interstate 80.

The California Department of Forestry and Fire Protection, Office of the State Fire Marshal, Pipeline Safety Division currently regulates the safety of intrastate hazardous liquid transportation pipelines. Staff inspect pipeline operations to ensure compliance with federal and state pipeline safety laws and regulations. The Division is also responsible for the investigation of all spills, ruptures, fires, or pipeline incidents. California pipeline safety standards exceed the minimum federal standards by mandating that a pipeline system be hydrostatically tested before initial operation begins; they must then be tested at least every five years by an independent third-party approved by the Division, provided the pipeline is newer than 1971. In these hydrostatic tests the hazardous liquid is removed from the pipe and replaced with water. The pipe is then pressurized to 125 percent of the maximum pipeline operating pressure and held for eight hours. Testing results are submitted to the Division for review and concurrence. Tests are randomly witnessed by Division engineers. In certain cases, the Division has approved the use of internal inspection tools "smart pigs" in lieu of hydrostatic testing. In these cases, the test results are also submitted to the Division for review and concurrence. Kinder Morgan has installed cathodic protection on each of these pipelines. The lines are inspected regularly and are also inspected whenever a problem is detected or construction occurs near the pipelines. Kinder Morgan monitors the pipelines for spills by checking for pressure changes along the pipeline and also by comparing flow in and flow out. If these show discontinuities, the pipeline is inspected. Senate Bill (SB) 295 requires an annual inspection of all pipelines beginning January 2017. Assembly Bill (AB) 864 requires all intrastate hazardous liquid pipelines to have auto-shutoff systems to reduce accidental releases.

When a hazardous material spill or leak of a reportable quantity occurs, notification to emergency response agencies is required by state and federal law. In California, Cal OES Hazardous Materials Section coordinates statewide implementation of hazardous materials accident prevention and emergency response programs for all types of hazardous materials incidents and threats. In response to any hazardous materials emergency, the Section staff is called upon to provide state and local emergency managers with emergency coordination and technical assistance.

A sewage spill is required to be reported if 1,000 gallons or more are released, and any amount that reaches a water of the United States. An oil or petroleum product spill is required to be reported if 42 gallons or more are released. Any other hazardous material spill is required to be reported if there is a reasonable belief that the release poses a significant present or potential hazard to human health and safety, property, or the environment.

Notification must also be made to the Cal OES State Warning Center for the following:

- Discharges that may threaten or impact water quality.
- Discharges of any hazardous substances or sewage, into or on any waters of the state.
- Discharges or threatened discharges of oil in marine waters.
- Discharges of oil or petroleum products, into or on any waters of the state.
- Any spill or other release of one barrel (42 gallons) or more of petroleum products at a tank facility.
- Hazardous Liquid Pipeline releases and every rupture, explosion or fire involving a pipeline.
- Any found or lost radioactive materials.

Other considerations for reporting to Cal OES State Warning Center include discharges such as:

- Biological agents;
- Infectious wastes;
- Industrial and Agricultural chemicals (pesticides, herbicides, fungicides, etc.);
- Explosives; or
- Air contaminants.

Hazardous Materials Incidents are Classified in the following descriptions, consistent with *NFPA 471: Recommended Practice for Responding to Hazardous Materials Incidents (1997 Edition)*:

- Level One Incident (Minor): An incident that can be easily handled using resources immediately available to first responders having jurisdiction. Significant human health and safety and/or environmental issues do not arise.
- Level Two Incident (Moderate): An incident that is beyond the capabilities of a local jurisdiction that may require the use of mutual aid, either for operational assistance or logistical support. A declaration of a local emergency may be issued, a Governor's Proclamation may be issued, and the local Emergency Operations Center (EOC) may be partially or fully activated. Human health and safety and/or the environment are affected.
- Level Three Incident (Major – Catastrophic): An incident that significantly exceeds local capabilities. Considerable environmental and/or public health impacts have occurred or are expected. A local emergency is usually declared; a Governor's Proclamation may be issued, along with a request for a Presidential Declaration; and the local EOC and the State Operations Center are fully activated.

When a hazardous material spill or leak occurs, it is the owner's or operator's responsibility to notify the local designated emergency response agency, which is called the Certified Unified Program Agency (CUPA), as well as the Cal OES. There are three CUPAs governing discharges that enter the watershed: Placer County Environmental Health, Nevada County Environmental Management Department, and Sierra County Human Services Department. They are responsible for the following local "unified programs":

- Hazardous Materials Release Response Plans and Inventories
- California Accidental Release Prevention Program
- Underground Storage Tank Program
- Aboveground Petroleum Storage Act Program
- Hazardous Waste Generator and Onsite Hazardous Waste Treatment (tiered permitting) Programs
- California International Fire Code: Hazardous Material Management Plans and Hazardous Material Inventory Statements
- Hazardous waste generator regulation, including most of the state's "tiered permit" requirements.
- California Accidental Release Prevention program.

Cal OES Oil by Rail

Historically oil has come into California for refining by marine vessels. California is the third-largest refining state in the US. Increasingly, oil was delivered in to California by rail. The oil comes from increased drilling in Canada, North Dakota, Wyoming, and New Mexico. Cal OES projected quantities between 150 and 200 million barrels annually, but these levels have not yet manifested. The California Energy Commission tracks crude oil imports by rail. On an annual basis between 2016 and 2023, that volume of crude imported has ranged from 667,000 (2023) to 8,245,000 (2019) barrels. The majority of the import was from Canada, which ceased in 2021. There has been a significant decline since the peak in 2019.

The oil being shipped from Canada, North Dakota, and Wyoming, specifically the Bakken Shale production area, is unique in that it is highly flammable "light" crude oil, known as Bakken Crude oil. There have been numerous rail accidents associated with the Bakken Shale that have been more devastating due to the flammable nature of the oil. This quality of the Bakken Crude oil has raised concern over the potential for increased risk of derailments, explosions, fires, accidental releases, and the potential for crimes and terrorist acts.

The US Department of Transportation issued an Emergency Order (DOT-OST-2014-0067) in May 2014 that requires transporters to provide notification to States if they intend to ship greater than 1,000,000 gallons of Bakken Shale on a single train. The transporters are required to disclose the number of trains, per week, per county. The Cal OES, Fire and Rescue Branch, Hazardous Materials Section manages California's Oil by Rail program and receives these notifications. Cal OES has identified all the possible oil by rail routes in the State and the location of the various types of certified Hazardous Materials teams that could respond to an incident. These are shown in **Figure 4-4**.

There are two transporters in the Yuba/Bear River watershed: UPRR and BNSF. Cal OES then shares the notifications with the public and first responders by posting on its website. First responders are required to be prepared for any emergency incidents. To date, there have been a few notifications provided to Cal OES for the railway lines in Northern California.

Notifications are not required for smaller loads (less than 1,000,000 gallons) or blended oils, so it is uncertain how accurate and effective the notification requirement is.

Figure 4-4. Cal OES Oil By Rail Routes and Hazardous Materials Teams



Cal OES State Warning Center

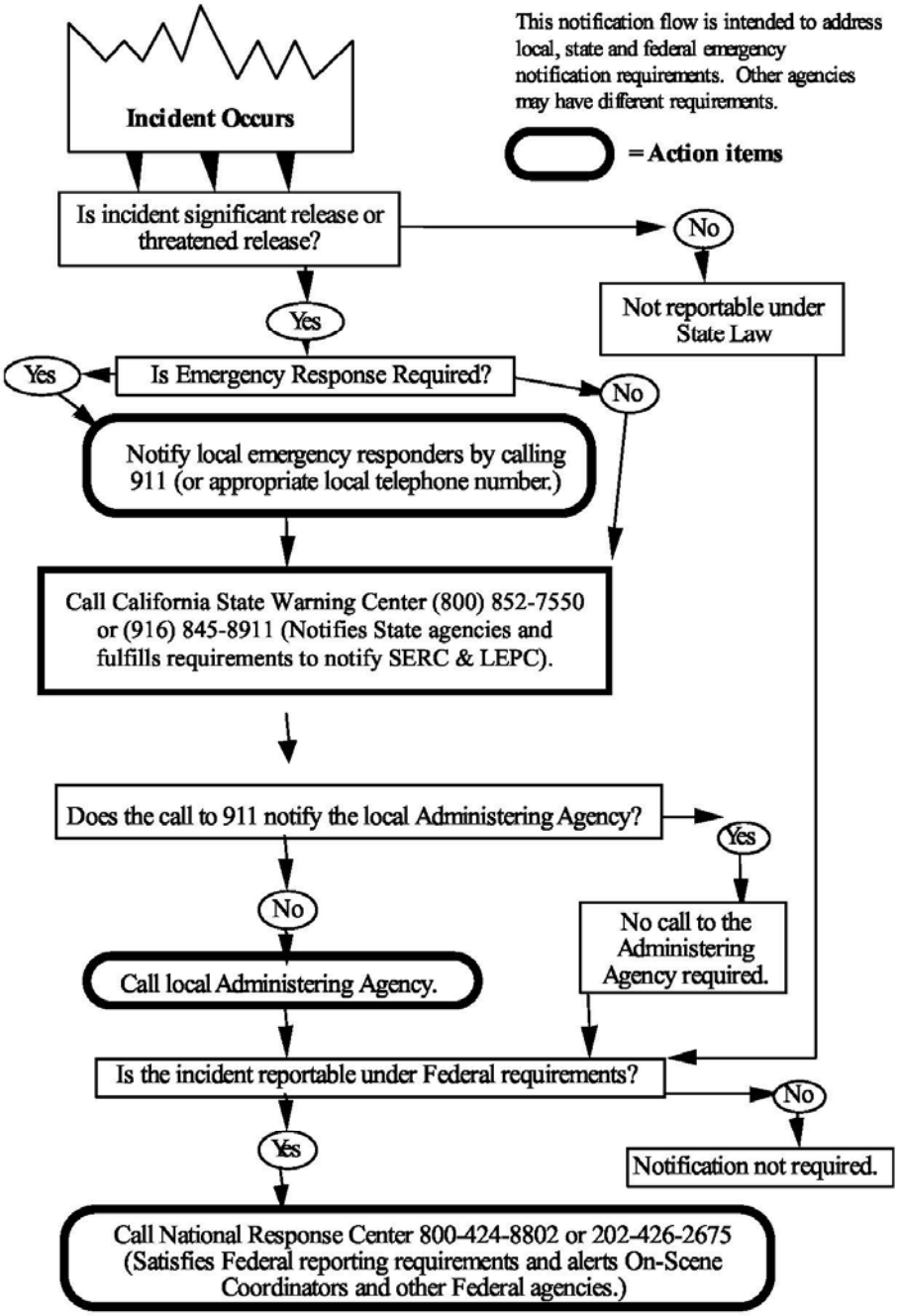
There is a 24-hour telephone number for the Cal OES State Warning Center. The Cal OES State Warning Center is a single point of notification for all state agencies, as well as federal and local agencies. When spill information is received, the Cal OES State Warning Center will assign a spill control number to the incident that can be used to track various activities associated with the incident.

At a minimum, the Cal OES State Warning Center is looking for this information:

- Who is making the notification and who is the responsible party, if different - name, address, and phone number;
- Where did the release occur? (exact location, address, and county)
- What was the material involved in the release/threatened release?
- What was the quantity released/threatened to be released?
- What are the potential hazards presented by this release/potential release, if known?
- How did the release happen?
- Whether or not a body of water is affected.
- Local agencies that are on-scene and/or notified.
- What containment and/or cleanup actions have been taken?

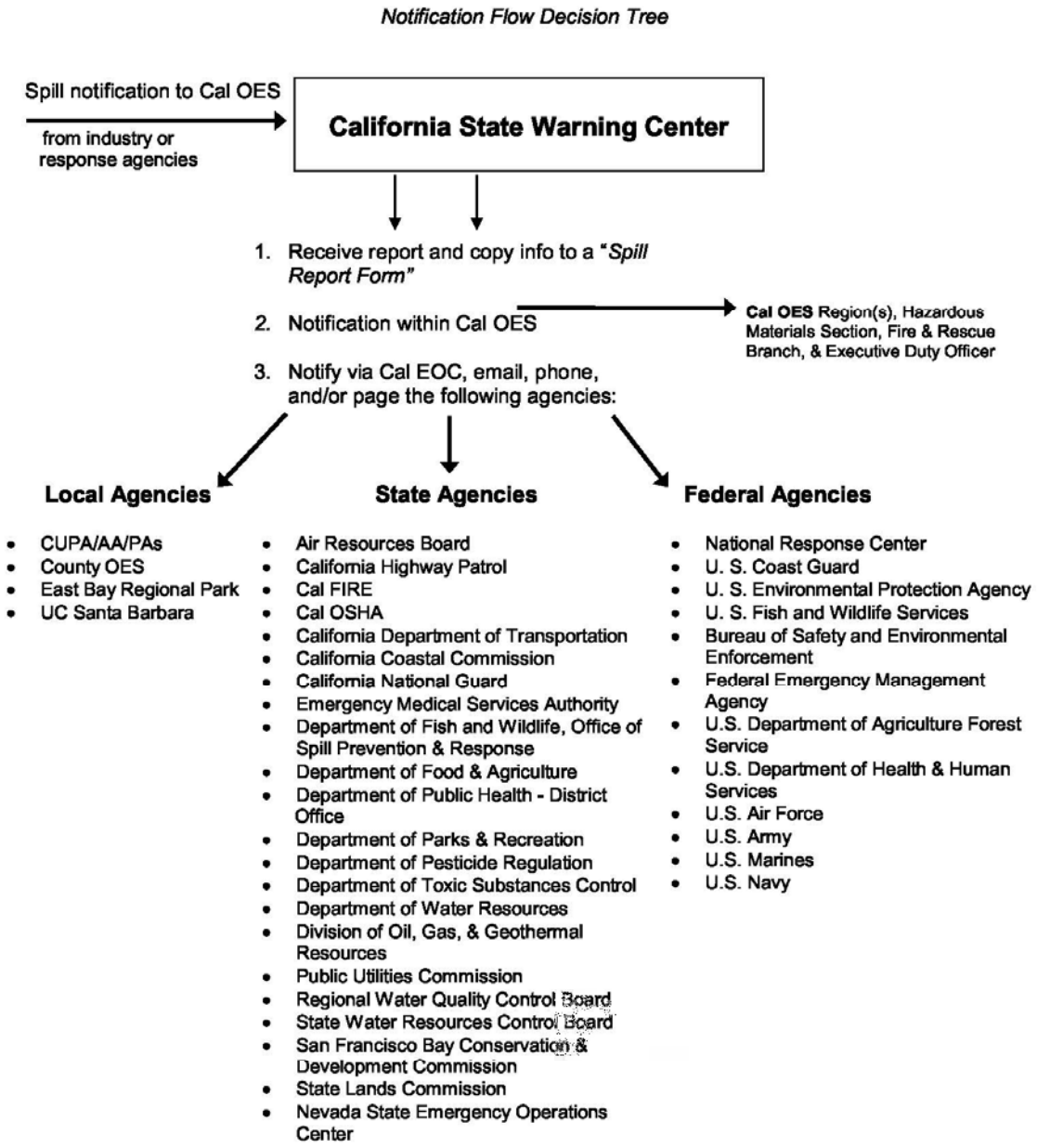
Figure 4-5 illustrates the decision-making process for determining emergency response notification requirements if an incident occurs. **Figure 4-6** illustrates the decision-making process for notification, and the list of agencies that are contacted by the Cal OES State Warning Center. It should be noted that in the event of a hazardous materials incident, the Cal OES State Warning Center can also assist responding agencies in contacting other response agencies during business hours and after-hours.

Figure 4-5. Cal OES State Warning Center Notification Determination



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Figure 4-6. Cal OES State Warning Center Notification Flow Decision Tree



State Board/Regional Board

There are three main functions for the Regional Board in spill events as follows.

Notification Requirements for Cal OES Notification to the State Board/Regional Board: Immediate verbal notification is required by the Cal OES State Warning Center to the Regional Board of all hazardous materials spills that enter or threaten to enter in, or on, any waters of the state.

Follow-up Reports: A Damage Assessment Report or Remedial Action Plan may be required of the responsible party. The responsible party will also report accumulated petroleum and heavy metal concentrations in drainage systems to the Cal OES State Warning Center via written follow-up reports.

Capabilities and Limitations: Support functions include the following:

- Conduct water sampling, analysis, and monitoring activities to assist in hazardous materials release evaluation and mitigation.
- In cooperation with the California Department of Toxic Substances Control (DTSC), designate sites for disposal of hazardous materials.
- Assist DDW in advising water users of potential adverse impacts of a spill.

DDW

DDW has statutory responsibility for the regulation of public water systems to ensure that drinking water is safe, wholesome, and potable. In the event of a hazardous materials spill or threatened release which affects a public water system or source of drinking water such as a lake, river, or aqueduct, the State Board is notified of the impact to the source. There is no specific protocol for how OES spill notifications are triaged and forwarded to DDW. Once they are determined to be sent, the State Board would then notify the Regional DDW Duty Officer of the spill. The Regional DDW Duty Officer then notifies the DDW District Engineer for the impacted source. The District Engineers have call down lists to assist with notifying DDW staff engineers and water utilities. District Engineers will work with the water utility to prevent contamination of the water system. The District Engineers will also issue recommendations to the public in coordination with the utility and local health department to prevent use of contaminated water.

Notification Requirements for Cal OES Notification to DDW: Immediate verbal notification is required for radioactive material incidents; releases involving a public water system or drinking water source; releases affecting a food, drug, medical device, cosmetic, or bottled water manufacturer or wholesaler; or significant releases affecting a large population or involving deaths, serious injuries, evacuations or in-place sheltering.

Response Information Management System (RIMS)

Cal OES developed the RIMS as part of the development of the State's Standardized Emergency Management System (SEMS). This was developed in response to the US Department of Homeland Security's National Incident Management System (NIMS). NIMS was developed so responders from different jurisdictions and disciplines can work together better to respond to natural disasters and emergencies, including acts of terrorism. NIMS benefits include:

- Unified approach to incident management;
- Standard command and management structures; and
- Emphasis on preparedness, mutual aid, and resource management.

The purpose of RIMS is to provide a single point for tracking the status and progress of hazardous materials spills statewide; this is the Spill/Release Reporting notification website. Only registered users can input data into the website, but anyone can access the website to review current or archived Cal OES cases. The current cases can be accessed at: https://veoci.com/v/p/dashboard/7q4z24sxqb

California Department of Fish and Wildlife (DFW)

DFW's Office of Spill Prevention and Response (OSPR) is the state's lead for response to oil spills in its inland and marine waters. In 2014, Governor Brown expanded the OSPR program to cover all state surface waters, including inland waters, at risk of oil spills from any source, including pipelines, production facilities, and the increasing shipments of oil transported by railroads. Senate Bill 861 authorized the expansion and provided the additional statutory and regulatory authority, for the prevention, preparedness and response activities in the new inland areas of responsibility.

Geographic Response Plans (GRPs) are developed by OSPR for inland waters in conjunction with other federal, state, and local government, industry and other partners for priority inland waters of the state with higher risk of an oil spill. GRP's are driven by access to sites along river systems and lakes where response activities are feasible. The GRPs include response strategies, response methods, and shoreline countermeasures to be used to rapidly and efficiently address actual and threatened oil spill releases. The intention is that GRPs will be vetted through the regional Local Emergency Planning Committees (LEPCs) comprised of industry representatives, federal, State, and local government agencies, public health agencies, tribal representatives and other stakeholders, and may utilize local subcommittees to the LEPCs to provide further input and review of the GRPs. OSPR staff have communicated with water utilities to ensure that they are aware of intake locations and have direct means of communication in the event of a spill impacting the source water.

A GRP has been prepared for the North Fork of the American River (February 2020), with PCWA included as a participating water agency. OSPR has a list of the top ten watersheds to be completed, including the Yuba/Bear River system. OSPR plans to include information on the participating water agencies' intakes, but there is still no timeline for completion.

Water Quality Issues and Data Review

A review of the available water quality data, as presented in **Section 5** showed that none of the water treatment plants had detects of organic constituents.

Source Water Protection Activities

Because the potential for spills exists, PCWA and NID have established their own voluntary informal spill notification program consisting of direct notification and inter-notification agreements, internal procedures for routing of spill information, and internal response procedures. Both agencies are provided direct notification from their respective County OES in the event that a canal or receiving water is impacted. NID has also established direct email notification from Cal OES for watershed spill events within their boundary. Both agencies also coordinate with PG&E regarding source water quality. PCWA also implements enhanced coordination with the California Highway Patrol for potential spills along Interstate 80. There are no formal agreements with these agencies, or any of the specific dischargers in the watershed.

NID tracks the notifications they receive via DDW and other sources, such as Nevada County and Placer County Environmental Health Departments and PCWA. Twelve were received during the study period. This included seven that were identified in **Appendix D**, while four were either out of the watershed or didn't reach surface water and one was not reported to Cal OES. For selected events with the greatest potential to impact NID's water treatment plants a summary report is prepared by collecting site-specific information related to the spill event and water treatment plants and other infrastructure potentially impacted. This allows NID to assess the potential impacts and document actions taken, such as monitoring, operational modifications, and communications.

PCWA is currently conducting a Feasibility Study to investigate the potential to install an engineered conveyance between Alta and Monte Vista on the north side of Interstate 80 as an alternative to use of Canyon Creek. This would significantly reduce vulnerability of the water supply system to vehicular accidents along this stretch of freeway that has historical problems.

WASTEWATER

Background

Wastewater is known to contain pathogenic microorganisms. Wastewater treatment plants remove and/or inactivate some, though not all, of these organisms through various treatment processes. Secondary treatment of domestic sewage is expected to remove 75 to 99 percent of enteric viruses[7], 85 to 99 percent of heterotrophic bacteria[8], and 92[9] percent of *Giardia* cysts. Wastewater discharges occur primarily in the lower portion of the watershed.

Spills of raw or partially treated wastewater can occur from collection systems and from wastewater treatment plants. A sanitary sewer overflow (SSO) is any overflow, spill, release, discharge, or diversion of untreated or partially treated wastewater from a sanitary sewer collection system. Major causes of SSOs include grease, root and debris blockages; sewer line flood damage; manhole structure failures; vandalism; pump station mechanical failures; power outages; excessive storm or groundwater inflow/infiltration; sanitary sewer age; improper construction; lack of proper operation and maintenance; insufficient capacity; and contractor-caused damage. Spills of raw or partially treated wastewater occur due to equipment malfunctions or operator errors at wastewater treatment plants. Spills also occur during storm events when stormwater infiltrates a wastewater collection system and when the capacity of the wastewater treatment plant is exceeded.

Seasonal Patterns

Municipal wastewater treatment plants discharge throughout the year. All of the collection systems in the watershed are separated sewer systems. During high flow events, typically during the wet season, discharge of treated, partially treated, and untreated sewage can occur. This can happen from permitted treatment plants or from backups in the collection systems caused by blockages or breaks.

Related Constituents

Wastewater is a blend of sewage, washwater from showers, kitchens, etc., and any effluent from industrial facilities within the sewer collection system. Potential contaminants of concern in wastewater include microbial pathogens (such as bacteria, viruses, and protozoa), inorganics (such as metals and nutrients), TOC, VOCs, and synthetic organic compounds (SOCs). Many types of industrial effluent discharges to the collection system are regulated by the wastewater treatment plants and must meet effluent limits set, including pretreatment if necessary.

[7] National Research Council, 1998. Issues in Potable Reuse: The Viability of Augmenting Drinking Water Supplies with Reclaimed Water. National Academy Press.
[8] Chauret, C. et al., 1999. Fate of *Cryptosporidium oocysts*, *Giardia cysts*, and microbial indicators during wastewater treatment and anaerobic sludge digestion. Canadian Journal of Microbiology, 45: 257-262.
[9] www.Rangelandwatersheds.ucdavis.edu/MWQIC/MWQIC/Indicators_Giardia_window.html.

Presence in the Watershed

There are three permitted NPDES wastewater treatment plants (WWTPs) in the Yuba/Bear Watershed, see **Table 4-15**. These are shown on the Watershed Map, **Figure 2-1**. Each of these facilities has a collection system associated with them that are also located within the watershed.

Table 4-15
Wastewater Treatment Plants in the Yuba/Bear River Watershed

County	Name of Facility	City	2017 Capacity (mgd)	2026 Capacity (mgd)
Nevada	Donner Summit PUD WWTP	Donner	0.52	0.52
Nevada	Cascade Shores WWTP	Nevada City	0.026	0.026
Nevada	Nevada City WWTP	Nevada City	0.69	0.69

There are nine permitted wastewater collection systems located either entirely or partially within the Yuba/Bear River watershed. This includes: City of Colfax, Donner Summit Public Utilities District, City of Grass Valley, City of Nevada City, Nevada County Sanitation District (Mountain Lake Estates, Cascade Shores, Penn Valley), Sierra Lakes Community Water District/Soda Springs, and Placer County Sewer Maintenance District No. 1.

In addition to the three permitted NPDES facilities there are other facilities with WDRs for land disposal located in the watershed, as well as individual on-site septic systems. The facilities located in close proximity to the lower watershed canals may have the potential to impact source water quality if there was a failure in the system. Failures from community systems would be reported through the spill notification systems, however spills from individual residences would only be reported by the owner. The counties do not inspect facilities regularly. It is likely that either NID or PCWA staff would notice such a discharge during routine canal maintenance and inspection.

One of the community permitted facilities, Creekside Village Mobile Home Park located in Penn Valley, will be discussed in further detail below.

Donner Summit Public Utilities District Wastewater Treatment Plant

The Donner Summit Public Utilities District (DSPUD) Wastewater Treatment Plant (WWTP) is located near Soda Springs, northwest of Lake Van Norden. The facility services the communities of Norden, Soda Springs, Sugar Bowl Ski Resort, Soda Springs Ski Resort, Serene Lakes, Sierra Lakes Community Water District, and the Caltrans Rest Area. The plant discharges to the South Fork of the Yuba River from October through July. Some winter flows are diverted for snow-making. The treated effluent is used for irrigation during the summer months (August and September) and discharge to the South Yuba River is prohibited during this period.

NPDES permit R5-2021-0023 was adopted in 2021 and was applicable during the study period. This order reinstated effluent limits for copper and added them for nickel, silver, and zinc. A Time Schedule Order (TSO) was also adopted (R5-2021-0034) that provided interim effluent limits for these four constituents, as well as lead, through October 31, 2023 to allow the discharger time to plan for compliance and avoid mandatory minimum penalties.

In January 2023, DSPUD submitted a Notice of Applicability under State Board Order 2016-0068-DDW-R5022, Water Recycling Requirements for Recycled Water Use, to separate out the Title 22 recycled water use that exists (irrigation during summer months and snow-making during winter months) as well as formalize and make permanent the construction water fill station from 2021. The recycled water permit includes use-area limits as well as monitoring for total coliform, turbidity, and flow.

The tertiary treatment system at the DPSUD WWTP consists of influent flow equalization, preliminary treatment, conventional activated sludge process, lime addition equipment to control pH and reduce salinity, biological treatment with membrane bioreactors plus filtration, and ultraviolet light (UV) disinfection. Biosolids treatment consists of two aerobic digesters and sludge drying beds. Sludge disposal is to a landfill. The permitted capacity is 0.52 million gallons per day (mgd). The facility includes a 1.56 million gallon storage tank for effluent emergency storage if necessary.

The Regional Board issued eight Notice of Violations (NOVs) for 24 violations between 2021 and 2025. This included six related to deficient monitoring and 18 for effluent limitation violations (one ammonia, one nitrate/nitrite, and 16 zinc). The Regional Board issued an Administrative Civil Liabilities (ACL) Order to cover most of the violations during the study period (R5-2025-0520).

A review of the effluent monitoring data shows that most constituents are well below drinking water standards, with the exception of manganese and total organic carbon (TOC). Manganese levels in the effluent ranged from 16 – 110 micrograms per liter (µg/L) and were above the Secondary Maximum Contaminant Level (MCL) of 50 µg/L in 65 percent of samples, averaging 61.8 µg/L. The TOC levels in the effluent ranged from 1.2 to 52 milligrams per liter (mg/L) and were above 2 mg/L in 96 percent of samples, averaging 7.3 mg/L. Although zinc violated the NPDES permit effluent limits, all effluent levels are well below the Secondary MCL of 5,000 µg/L. DPSUD zinc violations mostly occurred in 2023 and 2024 and were thought to be attributable to either the drinking water supply or plumbing fixtures. A new NPDES permit will be issued in 2026 and will address the zinc violations either through another TSO or a Cease and Desist Order.

Cascade Shores Wastewater Treatment Plant

This wastewater treatment plant is owned and operated by Nevada County Sanitation District No. 1. It is located in Cascade Shores, on the south side of Scotts Flat Reservoir, and discharges to Gas Canyon Creek, which is a tributary to Greenhorn Creek and eventually discharges to Rollins Reservoir. The historic individual NPDES Permit Order No. R5-2015-0031 was rescinded and replaced by General Order R5-2017-0085-015 in March 2021,

which was in effect during the study period. In May 2021, the Regional Board adopted Order No. R5-2021-0032, which rescinded the previous individual orders R5-2015-0031 and TSO R5-2019-1001. As of April 2026, the facility was converted to the new General Order, R5-2023-0025-016. The effluent limitations are similar to the previous order, except that ammonia is slightly higher, electrical conductivity was removed, and there is a new effluent limitation for methylene chloride.

The treatment system at the facility was upgraded in 2010 and consists of combined grit screens at the headworks, an odor control unit, and an equalization tank. Secondary treatment consists of two parallel trains of anoxic moving bed bioreactors (MBBRs), aerobic MBBR, and dissolved air flotation units. Tertiary treatment consists of 12 ultrafiltration membrane filters, two inline UV units, an outdoor re-aeration tank and an effluent meter. Excess sludge is transported to the Discharger's Lake Wildwood Wastewater Treatment Plant to be dewatered, then it is taken offsite for disposal at a landfill. The permitted capacity remained the same at 0.026 mgd.

The Regional Board issued eight NOVs for 21 violations between 2021 and 2025. This included eight related to deficient monitoring, seven related to order conditions (turbidity), and six for effluent limitation violations (four nitrate/nitrite, one zinc, and one copper). The Regional Board issued no ACL Orders during the study period.

A review of the effluent monitoring data shows that most constituents are well below drinking water standards, with the exception of TOC. The TOC levels in the effluent ranged from 3.64 to 38.12 mg/L and were above 2 mg/L in 100 percent of samples, averaging 8.2 mg/L. Although zinc and copper violated the NPDES permit effluent limits, all effluent levels are well below the respective Secondary MCLs (5,000 µg/L and 1,000 µg/L). Nitrate/nitrite levels ranged from 1.43 to 32 mg/L as Nitrogen, with 96 percent of results below the Primary MCL of 10 mg/L as Nitrogen.

City of Nevada City Wastewater Treatment Plant

This wastewater treatment plant is owned and operated by the City of Nevada City. It discharges to Deer Creek, just west of Nevada City. NPDES Permit Order No. R5-2017-0060 was replaced by Order No. R5-2022-0039 in August 2022, during the study period.

The WWTP consists of screening, grit removal, lime addition, influent flow equalization and emergency storage, nitrification/denitrification, activated sludge, filtration, chlorination, and dechlorination. The waste activated sludge is stored in an aerated day tank, dewatered by a belt filter press, and hauled to Ostrom Road Landfill in Wheatland, CA. The permitted capacity of the facility is 0.69 mgd.

The Regional Board issued nine NOVs for 59 violations between 2021 and 2025. This included three related to deficient monitoring, three related to late reporting, seven related to order conditions (turbidity), one related to chronic toxicity, and 45 for effluent limitation violations (34 total coliform, five ammonia, five dichlorobromomethane, and one total suspended solids). The Regional Board issued four ACL Orders to cover most of the

violations during the study period (R5-2021-0501, R5-2021-0532, R5-2023-0526, and R5-2025-0518).

In lieu of paying penalties for three of the ACLs, the City agreed to conduct compliance projects. Under R5-2021-0501, the City agreed in April 2021 to initiate one compliance project to cover the chlorine contact tank and implement improvements to the flow modulation/equalization basins. This was completed by August 2021. Under R5-2023-0526, the City agreed in April 2024 to a compliance project to enhance and modify the pH feed system and implement Standard Operating Procedures for periodic aeration basin cleaning to address total coliform violations. Under R5-2025-0518, the City agreed in July 2025 to another compliance project to install components to integrate ammonium sulfate dosing with the system control and data acquisition (SCADA) system.

A review of the effluent monitoring data shows that most constituents are well below drinking water standards, with the exception of dissolved organic carbon (DOC). The DOC levels in the effluent ranged from 5.04 to 20.95 mg/L and were above 2 mg/L in 100 percent of samples, averaging 9.5 mg/L. Although dichlorobromomethane violated the NPDES permit effluent limits, all effluent levels are well below the combined Total Trihalomethane MCL (80 µg/L).

Penn Valley Mobile Home Park

Squirrel Creek passes through Penn Valley where there are a significant number of septic systems and one former community wastewater system, the Penn Valley Mobile Home Park (MHP). In April 2021, the Penn Valley MHP was connected to the Nevada County Sanitation District Penn Valley collection system and no longer discharges to the waste lagoon system.

The MHP is located along the south side of Squirrel Creek and the evaporative/percolation ponds (three) are located adjacent to the north side of Squirrel Creek. The Penn Valley MHP had an original permit from the Regional Board for disposal to land, from 1976. The Waste Discharge Requirements (WDRs) were most recently renewed in 1998 (Order No. 98-010). The order has a companion Monitoring and Reporting Program (MRP) which indicates that dissolved oxygen and pH are monitored in the discharge weekly, while other constituents are monitored in the discharge monthly (BOD, nitrogen, total dissolved solids, and conductivity). There is no requirement to conduct any monitoring in the adjacent Squirrel Creek.

The Regional Board kept the WDR open throughout the study period, with the discharger paying annual fees and complying with the MRP. As per Regional Board staff, there has been no progress in formally closing the ponds. There is currently no timeline for specific activities or permit rescission, but it should include sludge removal, monitoring, and professional judgement.

Collection Systems

A review of the CIWQS database for SSOs from collection systems located in the Yuba/Bear River watershed identified only three Category 1 spills (SSOs that reach surface water).

- Nevada County Sanitation District No. 1 (Penn Valley) had one Category 1 SSO (18038 Penn Valley Drive) on December 31, 2022 that resulted in 15,000 gallons discharged to Squirrel Creek. This discharge was upstream of NID's Smartsville WTP.
- Nevada County Sanitation District No. 1 (Penn Valley) had one Category 1 SSO (12382 Spenceville Road) on December 30, 2022 that resulted in over 250 gallons discharged to Squirrel Creek. This discharge was upstream of NID's Smartsville WTP.
- The City of Nevada City had one Category 1 SSO (Uren Street at B Street) on September 3, 2025 that resulted in approximately 50 gallons discharged to Deer Creek. This discharge was upstream of NID's Smartsville WTP and Lake Wildwood WTP.

Regulation and Management

National Pollutant Discharge Elimination System

Direct discharges of wastewater to surface water are regulated by the Regional Board through the NPDES permit system. A discharge is regulated through requirements to meet effluent discharge limits and receiving water limits. Effluent limits are typically site specific, but usually include biochemical oxygen demand, total suspended solids, settleable matter, total coliform levels, chlorine residual, and site-specific constituents with reasonable potential to impact receiving waters. Receiving waters are typically monitored upstream and downstream of the discharge for constituents such as pH, dissolved oxygen, ammonia, temperature, turbidity, and electrical conductivity. NPDES Permits issued by the Regional Board for wastewater treatment plant discharges contain standard provisions that prohibit the discharge of wastewater that has not been treated to the level required by the permit. The standard provisions also require that the discharger provide safeguards, such as alternate power supplies and emergency storage basins, to prevent discharges of untreated or partially treated wastewater in the event of an electrical power failure. Upon request of the Regional Board, a discharger must file a report on the measures to prevent and clean up spills.

DSPUD WWTP and Cascade Shores WWTP have individual permits. The City of Nevada City WWTP is regulated under the General Order for Municipal Wastewater Dischargers that Meet Objectives/Criteria at the Point of Discharge to Surface Water (R5-2017-0085-01). Order R5-2017-0085 was amended twice to add the Salt and Nitrate Control Program (R5-2020-0022) and to add new water quality objectives for selenium and thallium (R5-2022-0023). This General Order NPDES permit was replaced during the study period with R5-2023-0025 in June 2023.

In August 2008 the Regional Board issued Spill Reporting Procedures for wastewater treatment plant spills. This was issued to ensure consistency in notification procedures with the State Board Order for Sanitary Sewer Systems. This requires facilities to notify the Cal OES, the local health department, and the Regional Board within two hours of a spill or discharge. The spill notification must be certified within 24 hours, and a written report documenting the event must be submitted to the Regional Board within five days.

Sanitary Sewer Overflow Program

To provide a consistent, statewide regulatory approach to address SSOs, the State Board adopted Statewide General WDRs for Sanitary Sewer Systems, Water Quality Order No. 2006-0003-DWQ (Sanitary Sewer Order) on May 2, 2006, including an MRP. The MRP for the Order was amended in 2008 (2008-2002-EXEC) to clarify deficiencies in timely notification. The MRP was amended again in 2013 to further improve the program (2013-0058-EXEC). During this study period, the State Board reissued the order under Order No. 2022-0103-DWQ, to update the existing order. This was effective June 5, 2023.

The Sanitary Sewer Order was developed in accordance with California Water Code Section 13271 and prohibits any SSO that results in a discharge of untreated or partially treated wastewater to waters of the United States and any SSO that results in a discharge of untreated or partially treated wastewater that creates a nuisance as defined in California Water Code Section 13050(m). Enrollees shall take all feasible steps and necessary remedial actions to 1) control or limit the volume of untreated or partially treated wastewater discharged, 2) terminate the discharge, and 3) recover as much of the wastewater discharged as possible for proper disposal, including any wash down water. This includes public notification to protect the public from exposure to the SSO for any spills that potentially affect public health or reach waters of the United States.

The Sanitary Sewer Order, its amendments, and the newly reissued Order require public agencies that own or operate sanitary sewer systems to develop and implement sewer system management plans (SSMPs) and report all SSOs to the State Board's online Sanitary Sewer System Database. These also require the owners and operators of sanitary sewer systems to take all feasible steps to eliminate SSOs and to develop and implement a system-specific SSMP. SSMPs must include provisions to provide proper operation and maintenance while considering risk management and cost. A new Guide for Developing and Updating Sanitary Sewer Management Plans was published in July 2024. The SSMP must contain a spill response plan that establishes standard procedures for immediate response to an SSO in a manner designed to minimize water quality impacts and potential nuisance conditions. The SSMPs must now be updated every six years, as well as internal audits conducted every three years. If there are significant changes to the SSMP then it must be recertified by the enrollee.

Key updates to the Sanitary Sewer Order include:

- Clarify definition of "Spill" as a discharge of sewage from any portion of a sanitary sewer system due to a sanitary sewer system overflow, operational failure, and/or infrastructure failure.
- Clarify prohibition of sewage to a surface water unless properly cleaned up and reported.
- Prohibit discharge of sewage to waters of the State (full implementation of Water Code compared to only waters of the U.S.).
- Require increased coordination between sanitary sewer system operators and storm drain system operators.
- Require a new Sanitary Sewer System Service Area Boundary Map be uploaded to CIWQS.
- Require update to the Spill Emergency Response Plan and increase the requirements for post-spill assessments to include receiving water monitoring for Category 1 spills greater than 50,000 gallons within 18 hours.
- Require preparation of an Annual Report for the sanitary sewer system, in lieu of a Collection System Questionnaire.

Notification Requirements

When a spill of untreated or partially treated wastewater occurs, the owner or operator of the collection system or wastewater treatment plant is required to provide notice of the spill to the California State Warning Center when certain criteria are met, and they must provide updates if there are substantial changes to the spill report. Order No. 2022-0103-DWQ now requires Category 1 and 2 spills to make notification to the California State Warning Center within two hours.

A key requirement of the Sanitary Sewer Systems Order is that SSOs must be entered into the State Board's CIWQS online Sanitary Sewer System Database. The Central Valley region began reporting in September 2007. Under the new Order (2022-0103-DWQ), there are now four categories of SSOs:

- Category 1 – wastewater spills of any volume that reach surface water or a drainage conveyance system discharging to surface water that are not fully captured and returned to the sanitary sewer system,
- Category 2 – wastewater spills of 1,000 gallons or greater that don't reach surface water,
- Category 3 – wastewater spills of 50 gallons or greater that don't reach surface water, and
- Category 4 – wastewaters spills less than 50 gallons that don't reach surface water.

All Category 1 and 2 SSOs must: notify the California State Warning Center within two hours of the enrollee being aware of the spill, submit a draft report by the enrollee via the CIWQS Online SSO Database within three business days of them becoming aware of the SSO, and

certify within 15 calendar days of SSO end date. Also, Category 1 spills larger than 50,000 gallons a written technical report must be submitted to the CIWQS Online SSO Database within 45 days of the spill. Category 3 and 4 SSOs must submit a monthly report documenting required spill information.

Septic System Local Agency Management Plans

The State Board adopted the first Onsite Wastewater Treatment System (OWTS) Policy (Resolution 2012-0032) in June 2012, and it became effective in May 2013. This is a conditional waiver program that lasts five years and must be renewed. It was updated in April 2018 (Resolution 2018-0019) and again in April 2023 (Resolution 2023-0012).

Under the OWTS Policy (most recently updated in April 2023), counties are required to develop a Local Agency Management Plan (LAMP) to show how the Policy requirements will be implemented. The OWTS Policy was a new level of management for septic systems in California. It uses a tiered system to address septic systems based on risk management. The tiers are based on the potential receiving waters, ranging from zero (low risk) to four (high risk). The tiers are designed to be protective of impaired waterbodies. If a septic system is located within 600 feet of a waterbody with a designated TMDL related to coliform then the system will be required to be upgraded. The higher the tier, the higher the priority and level of improvement required. There are no priority waterbodies in the Yuba/Bear River watershed.

There are septic systems located throughout the Yuba/Bear River watershed and these are regulated through county programs. The LAMP for Nevada County was approved by the Regional Board (R5-2017-0047) in April 2017 and was most recently updated January 2018. The LAMP for Placer County was approved by the Regional Board (R5-2017-0048) in April 2017 and was most recently updated in October 2025. The LAMP for Sierra County was approved by the Regional Board (R5-2018-0060) in August 2018 and was most recently updated in May 2018. All of these allow for the continued use of OWTS under local agency oversite on existing small domestic parcels.

Water Quality Issues and Data Review

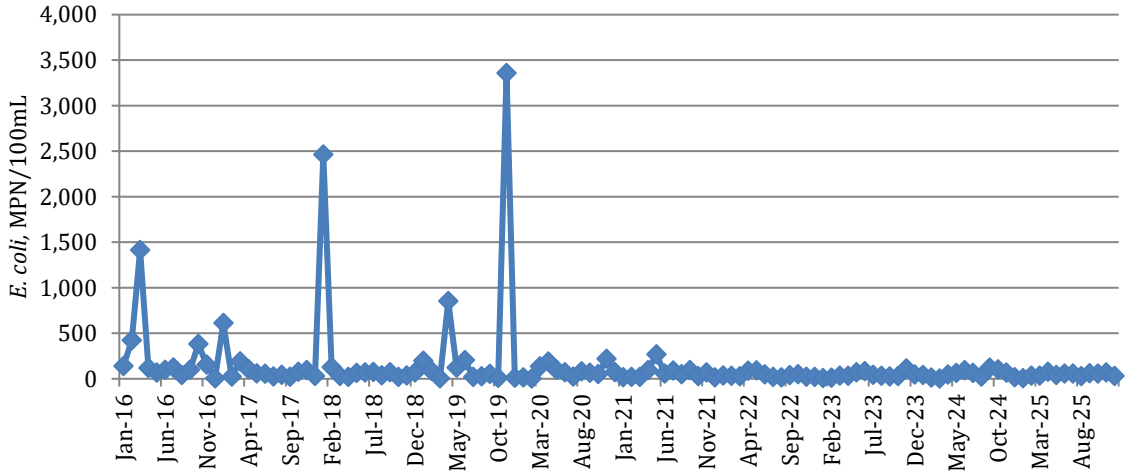
A review of the available water quality data, as presented in **Section 5** showed that none of the water treatment plants had detects of inorganic or organic constituents.

The DSPUD WWTP generally discharges to the South Yuba River in the winter months with the potential to contribute elevated levels of TOC and manganese. A review of water quality data for Alta and Elizabeth George WTPs show general trends of elevated levels of turbidity, TOC, and coliform during the wet weather season. There are no elevations of manganese at the upper watershed water treatment plants. Seasonal increases could be associated with many activities. Lake Spaulding likely provides some buffering capacity on the magnitude of impact from the wastewater plant to downstream water treatment plants.

The Cascade Shores WWTP discharges to the Bear River/Rollins Reservoir throughout the year with the potential to contribute elevated levels of TOC and nitrate. A review of the water quality data for the water treatment plants downstream of Rollins Reservoir, thus the Cascade Shores WWTP, show general trends of elevated levels of turbidity, TOC, and coliform during the wet weather season. This could be associated with many activities. Rollins Reservoir likely provides some buffering capacity on the magnitude of impact from the wastewater plant to downstream water treatment plants.

Only the Smartsville WTP is located downstream of the Nevada City WWTP and the Penn Valley MHP pond system. The Smartsville WTP has higher levels of *E. coli* than the other water treatment plants, but there was a significant reduction in overall levels since 2021 as shown in **Figure 4-7**, which may be attributable to the closure of the Penn Valley MHP system in April 2021. The Smartsville WTP also shows significant increases in turbidity and TOC during the winter months, which could be associated with many activities in the watershed.

Figure 4-7
Smartsville WTP Influent *E. coli* (2016 – 2025)



A review of Smartsville WTP *E. coli* data at the water treatment plant influent during specific SSO events during the study period did not reveal a correlation to increased microbiological levels. Levels at the Smartsville WTP in January 2023 and September 2025 were generally low (less than 10 and 60 MPN/100 mL, respectively). Raw water *E. coli* on January 2, 2023 was 9.7 MPN/100 mL. It seems unlikely that the SSO impacted influent water quality.

Source Water Protection Activities

Currently, there is little opportunity for source water protection activities related to wastewater. The treatment facilities are managed under NPDES discharge permits by the Regional Board. NID implements direct coordination with local wastewater agencies to encourage notification of spills into Deer Creek.

The spill notification program previously discussed under the Source Water Spills section provides direct contact with emergency response agencies in the event of a potentially significant discharge (greater than 1,000 gallons of wastewater) to the Yuba/Bear River watershed.

STORMWATER RUNOFF

Background

There is limited urban stormwater runoff to the Yuba/Bear River system, focused in the urban areas of Nevada City, Grass Valley, Penn Valley, and Auburn. Other types of stormwater runoff can occur from industrial facilities, construction facilities, and from the general watershed.

Seasonal Pattern

Runoff occurs on a year-round basis and includes wet (stormwater) and dry weather flows. Wet weather runoff resulting from seasonal storms is of relatively short duration and can have highly variable pollutant concentrations. Because of the high degree of imperviousness and the efficiency of the drainage systems, urban areas generally generate higher per acre volumes of runoff than undeveloped or agricultural lands. Dry weather runoff reaching surface waters is referred to as "non-stormwater discharges"; it results from activities such as lawn irrigation and washing activities including street, sidewalk, parking lot, building, and car washing.

Related Constituents

Stormwater and urban runoff is one of several sources of microorganisms, turbidity, and TOC. It can contain volatile organic compounds (VOCs), synthetic organic compounds (SOCs), and inorganic constituents such as metals and nutrients. Urban runoff from municipal separate storm sewer systems (MS4) is generally associated with anthropogenic sources of increased runoff volume in urbanized land use areas. With higher volumes of runoff, some constituents can be present at higher than background concentrations. The relative impact of stormwater and urban runoff depends on a number of watershed factors, as well as the timing of wet weather events.

Data on general stormwater runoff indicate that the watershed conditions and precipitation event type have a strong influence on the amount and quality of the runoff. For example, stormwater from agricultural fields will vary depending on agrarian practices, while runoff from undeveloped lands could be impacted from wildfires or other uses.

Data on urban runoff discharges indicate that MS4 discharge water quality and mass loads can be variable based on antecedent and rainfall conditions (i.e., build-up and wash-off). Data also indicates urban runoff discharges can have highly variable turbidity and organic carbon concentrations, is a source of indicator bacteria, and is a source of other constituents such as pesticides, metals, and organic compounds. Limited data on *Giardia* and *Cryptosporidium*

levels in urban runoff have shown few protozoa detections in dry weather runoff and generally low-level detections in wet weather runoff with the exception of high protozoa levels in urban runoff from an early season storm, first-flush event.

Presence in the Watershed

The State Board's CIWQS database was queried to identify the number of currently active stormwater permittees in the watershed in the various programs.

In the Yuba/Bear River watershed there is one NPDES Municipal Stormwater Phase I permits; the Statewide California Department of Transportation (Caltrans).

Under the 2013 Municipal Stormwater Phase II Permit, as amended six times, there are three city, county, or census designated places designated in the watershed. This includes; the City of Auburn, the City of Grass Valley, and Placer County/North Auburn. The City of Auburn had one violation and two enforcement actions over the past five years. The City of Grass Valley had one violation and one enforcement action over the past five years. Placer County did not have any violations.

Caltrans also has two individual NPDES permits under the State's Construction General NPDES Permit program in the watershed, both related to construction along Interstate 80. Caltrans had one violation and an enforcement action at one of the sites. Under the Construction General Permit program there are nine other sites that have filed a Notice of Intent (NOI) to comply with the Construction General Permit Order. Due to the temporary nature of construction, this list varies over time. A list is provided in **Table 4-16**. There were no violations from the other permittees during the study period.

Table 4-16
Construction Stormwater Permittees In Watershed*

Discharger	Facility Name	WDID
Briar Meadows 36 LLC	Briar Meadows	5S31C404131
DeSilva Gates Construction	Old Nyack Road Batch Plant	5S31C409242
DeSilva Gates Construction	Placer County Staging Area	5S31C405029
Isaac Lassiter	Rustic Woods Subdivision	5S29W006158
Nevada County Engineering	Dog Bar Bridge Replacement Project	5S29C406342
Pacific Gas and Electric Company	Fordyce Dam Seepage Mitigation	5S29C404100
Pacific West Communities Inc	Lone Oak Apartments Ph 2	5S29C410374
Placer County Water Agency	Colfax Water Treatment Plant Replacement	5S31C407278
Tahoe National Forest	Van Norden Meadow	5S29C410959

* Data obtained from CIWQS

There are 16 NPDES permits under the Industrial General Permit Order located throughout the watershed, including two new facilities. A list is provided in **Table 4-17**. There was a total of five violations and six enforcement actions from all permittees during the study period.

Table 4-17
Industrial Stormwater Permittees In Watershed*

Discharger	Facility Name	WDID
Armstrong Technology Inc.	Armstrong Technology Inc.	5S31I026104
Auburn City	Auburn City Airport	5S31I002840
Bear River Aggregates	Bear River Aggregates	5S31I023694
Nevada County	County of Nevada Department of Public Works	5S29I001610
English Mountain Ranch	English Mountain Ranch	5S29NEC006215
Hansen Brothers Ent	Hansen Bros Ent Greenhorn Creek	5S29I002778
Knee Deep Brewing Company LLC	Knee Deep Brewing Company LLC	5S31NEC003385
Placer County Department of Facility Services	Meadow Vista Transfer Station	5S31I005173
Mid Placer Public Schools Transportation	Mid Placer Public Schools Transportation	5S31I017901
Morgan Advanced Ceramics Inc	Morgan Advanced Ceramics Inc	5S31I002506
Placer Hills Union School District	Placer Hills Union School District	5S31I017900
Preserva Products Ltd	Preserva Products	5S31NEC006943
REACH Air Medical Svcs LLC	RCH 034 Auburn	5S31NEC010945
Robinson Enterprises Inc.	Robinson Enterprises Inc	5S29I010822
Teichert Construction	Teichert Kingvale Batch Plant	5S291030761
Union Pacific Railroad	Norden Yard	5S29NEC000271

* Data obtained from CIWQS

Regulation and Management

In 1972, The Federal Water Pollution Control Act (also referred to as the CWA) was amended to provide that the discharge of pollutants to waters of the United States from any point source is unlawful, unless the discharge is in compliance with an NPDES permit. The 1987 amendments to the CWA added section 402(p) which directs that stormwater discharges are point source discharges and establishes a framework for regulating municipal and industrial stormwater discharges under the NPDES program. On November 16, 1990, the USEPA promulgated final regulations that established the stormwater permit requirements.

NPDES permits are required for discharges from a municipal separate storm sewer system (MS4). The USEPA developed its stormwater regulation in two phases. The Phase I regulation was promulgated in 1990 for cities or contiguous unincorporated urban areas with populations greater than 100,000. The Phase II regulation was promulgated in 1999 for cities and other contiguous areas with populations less than 100,000. USEPA defined MS4 to include road systems owned by states which are in an area with a population greater than 100,000. MS4 permits do not establish numeric effluent limitations for stormwater, although the permits do include receiving water limits. Therefore, implementation of the stormwater management programs to the Maximum Extent Practicable (MEP) is considered compliance with the MS4 discharge permits and limits. Also, wasteload allocations can be included in permits to protect receiving waters through the TMDL process required by the CWA.

The federal regulations also specified a requirement for stormwater permits from 10 categories of industry, as well as construction activities equal or greater than one acre.

Municipal Stormwater Program

Both the Phase I and Phase II stormwater regulations require municipalities to reduce urban runoff pollution to the MEP through implementation of control measures known as BMPs. Management programs must include public education, pollution prevention and good housekeeping for municipal operations, implementation of new development BMPs, erosion and sediment control measures at construction sites, and control of illicit discharges. Phase I and Phase II programs must also include control programs for select industrial/commercial sites. Both the Phase I and II regulations provide the regulated municipalities with the flexibility to make their own selection of BMPs in designing their own individual programs. Although the entire slate of program elements (new development BMPs, municipal activities [street sweeping], etc.) is designed to improve water quality, program elements of special interest to downstream drinking water agencies are the construction site element, illicit discharges element, new development element, and the public outreach element. Phase I permittees now submit an NOI to comply with a Regional General NPDES permit (R5-2016-0040-ms4), while Phase II permittees submit a NOI to comply with a Statewide General NPDES permit (WQO 2013-0001-DWQ).

In April 2015 the State Board adopted Resolution 2015-0019, which was an Amendment to the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) to Control Trash and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California (collectively referred to as "the Trash Amendments"). The Trash Amendments apply to all Phase I and II permittees under the NPDES municipal separate storm sewer systems (MS4) permits and include:

- establishment of a narrative water quality objective for trash,
- corresponding applicability,
- establishment of a prohibition on the discharge of trash,
- implementation requirements for permitted storm water and other discharges,
- a time schedule for compliance, and
- a framework for monitoring and reporting requirements.

<u>Caltrans</u>

The entire watershed encompasses numerous state highways and roads that are regulated for stormwater discharge by the State Board. Caltrans District 3 is located within the watershed. Generally, road drainage is diverted locally to receiving waters.

In 1996, Caltrans requested that the State Board consider adopting a single NPDES permit for stormwater discharges from all Caltrans properties, facilities, and activities that would cover both the MS4 requirements and the statewide Construction General Permit

requirements. The federal regulations allow for the issuance of system-wide MS4 NPDES permits. Caltrans stormwater was then regulated under State Board Order No. 99-06-DWQ, beginning July 1999. The permit did not establish numeric effluent limitations for stormwater, rather it implemented BMPs to comply with the requirements of this permit. Caltrans created a Storm Water Management Plan (SWMP) that it implements statewide.

USEPA Region 9 audited Caltrans' Stormwater Management Program in October 2009. As a result of that audit, the USEPA issued a Findings of Violation and Order for Compliance to Caltrans requesting substantial changes to its program in October 2010. In response, Caltrans prepared a revised 2003 SWMP (CTSW-RT-11-286.19.1) and submitted it to USEPA on March 1, 2011. Caltrans received a renewal of its statewide NPDES permit on September 19, 2012 (2012-0011-DWQ). This Permit became effective in July 2013, and was amended four times with clarifications related to TMDLs and sensitive biological areas. Caltrans revised its program in 2013 to accommodate the requirements of the new Permit, and modified the measurable goals and reporting process accordingly.

The key components of the Caltrans SWMP, originally created in 2003 and updated in July 2012 and July 2016, include:

- Vegetation Control Program
- Storm Water System Management
- Accidental Spills
- Illicit Connection/Illegal Discharge Detection
- Characterization of Discharges
- Maintenance Facilities – Pollution Prevention Programs
- Training and Public Education – Employees, Contractors, General Public (Don't Trash California and Adopt-A-Highway)
- Region Specific Concerns

Caltrans has adopted the California Stormwater Quality Association approach to assessing program effectiveness, which has six outcome levels. Caltrans conducted an effectiveness assessment for each program element. District 3 has an Annual Report and Plan that they use to implement the SWMP.

On June 22, 2022, the State Board adopted the Statewide Stormwater Permit (Order No. 2022-0033-DWQ) and Time Schedule Order (Order No. 2022-0089-DWQ) for Caltrans, replacing the previous order (2012-0011-DWQ). The Time Schedule Order is a complex tool to assist Caltrans with complying with 88 TMDLs statewide, by 2035. The order was effective January 2, 2023.

A review of the State's Storm Water Multiple Application and Report Tracking System (SMARTS) database showed that statewide there were 20 violations and 23 enforcement actions issued by the Regional or State Board in the past five years for the Caltrans Phase I permit. It is unclear where these were located, but likely a limited number occurred in the Yuba/Bear River watershed. In addition, there was one enforcement action and violation for

one of the Caltrans construction projects in the watershed under the State's Construction General Permit Order.

Phase II MS4s

There are three current Phase II MS4 systems in the watershed, including the cities of Auburn and Grass Valley and Placer County/North Auburn. It should be noted that large portions of these urban areas do not drain in to the Yuba/Bear River water supply system for PCWA and NID.

In 2003, smaller urban areas came under a Statewide General Permit for Phase II stormwater permits (Water Quality Order No. 2003-0005-DWQ). Phase II permittees implement urban stormwater management programs similar to, but on a smaller scale than, the Phase I permittees. The Phase II program focuses on implementation of BMPs, including implementation of treatment BMPs in new development. A monitoring program was not required for most permittees. Areas that were required to monitor include those with high population, high growth rate, or a discharge to a sensitive water body. There was no required monitoring in the Yuba/Bear River watershed. Under this program, each of these entities was required to develop and implement a SWMP to manage the stormwater program. These entities implemented their SWMP using existing programs and ordinances (such as a grading ordinance) to the extent possible, but expanded the programs as necessary to cover all aspects of the SWMP. Each program element has specific control measures the entity identified for implementation, and those are largely efforts that were already on-going through various departments.

A SWMP has six key components;

- Public Education and Outreach: Ensure greater public support and knowledge of stormwater issues in the implementation of the SWMP.
- Public Participation and Involvement: Provide the public with a way to contribute an active role in the development of better stormwater management and become more informed on stormwater issues.
- Illicit Discharge Detection and Elimination: Intended to minimize discharges into the stormwater system that are not stormwater, and reduce and eliminate pollutants entering the stormwater system and any receiving waters.
- Construction Site Runoff Control: Minimize polluted stormwater from construction activities.
- Post-Construction Run-Off Control: Minimize impact to stormwater caused by development and redevelopment. Planning and design to minimize pollutants in any run-off.
- Pollution Prevention/Good Housekeeping: Reduction in the volume and type of stormwater and surface run-off that enters the stormwater system in the operation and maintenance of municipal activities.

The Statewide Phase II General Permit expired on May 1, 2008, and the State Board re-issued the permit until a new permit was adopted. This permit was revised in 2013 with Water Quality Order No. 2013-0001-DWQ, adopted on February 5, 2013 and effective July 1, 2013. The new Phase II MS4 Permit was effective during this study period. Reissuance of this permit is ongoing at the State Board. This permit generally carries forward the key program elements from the SWMP and has more extensive requirements than the previous permit; a few significant items are:

- SWMPs will no longer be required; dischargers will use guidance documents developed by the Regional Board,
- Development of a program effectiveness evaluation,
- Requirements focus on water quality issues post-construction,
- Encourages the use of low impact development,
- Targets high priority waterbodies,
- Dischargers will use the SMARTS database for data management which will increase availability of public reports,
- Dischargers must submit boundary and outfall maps, and
- Water quality monitoring requirements for population greater than 50,000, waterbodies with a TMDL or a CWA Section 303(d) impairment listing with urban runoff listed as a source, and areas of special biological significance. There are none in the Yuba/Bear River watershed.

Construction Stormwater Program

The NPDES General Permit for Discharges of Storm Water Associated with Construction Activity is the Construction General Permit (Order 2009-0009-DWQ), which was subsequently amended twice by Order Nos. 2010-0014-DWQ and 2012-0006-DWQ. The State Board adopted a new Construction Stormwater General Permit in September 2022, Order 2022-0057-DWQ. The Order was effective September 1, 2023. The new permit was substantially similar to the previous permit, with a few significant changes:

- Implementation of TMDLs (none in the Sacramento River watershed),
- Implementation of the Statewide Trash Policy Requirements,
- Removal of Bioassessment Monitoring,
- Regulation of Passive Treatment Technologies,
- Increased Sampling and Monitoring Requirements,
- Removal of Rain Event Action Plans, and
- Updated Notice of Termination Process.

The Construction Stormwater General Permit dictates that any development project that disturbs one or more acres of land will be subject to the requirements of this permit. Some of the construction activities subject to this permit include: clearing, grading, excavation, stockpiling, vertical structures, landscaping, and/or linear projects (i.e. wet and dry utilities). The permit provided an exclusion for projects that are considered regular maintenance activities, such as linear projects in already developed areas and relining of existing wet

utility lines and/or roadway resurfacing projects and projects that discharge to combined sewer systems.

The permit requires each project to assess its risk level to water quality based on the project's sediment discharge risk and the receiving water risk. The permit establishes three risk levels with different monitoring and sampling requirements. The permit also establishes numeric effluent parameters for discharges of risk levels 2 and 3: Numeric Action Levels (NAL) and Numeric Effluent Limitations (NEL) for pH and turbidity.

The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP should contain a site map(s) which shows the construction site perimeter; existing and proposed buildings, lots, roadways, storm water collection and discharge points; general topography both before and after construction; and drainage patterns across the project. The SWPPP must list BMPs the discharger will use to protect stormwater runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

Industrial Stormwater Program

Federal regulations require that stormwater associated with industrial activity that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit. The regulations allow states to issue general permits or individual permits to regulate stormwater discharges. The State Board issued the first Statewide General Permit on November 19, 1991, and then amended it in 1992 and 1997 (Order No. 97-03-DWQ). In 2014, the State Board adopted an updated General Permit for Stormwater Associated with Industrial Activity (Order 2014-0057-DWQ). In 2018 the State Board amended the General Permit in accordance with Order 2015-0122-DWQ to incorporate federal testing methodology, TMDL implementation requirements, and incentivization for storm water capture and use.

The basis of this program is implementation of BMPs to prevent discharge of pollutants. The General Permit generally requires facility operators to:

- Eliminate unauthorized non-stormwater discharges;
- Develop and implement a SWPPP; and
- Perform monitoring of stormwater discharges and authorized non-stormwater discharges. This includes two events per year for total suspended solids (TSS), oil and grease, and pH. Monitoring for additional parameters is based on the Standard Industry Code of the facility and the results of a pollutant source assessment.

Significant changes in the new Industrial General Permit include:

- Electronic Reporting Requirements; requires Dischargers to submit and certify all reports electronically via the SMARTS database.
- Minimum BMPs: requires Dischargers to implement a set of minimum BMPs.
- Conditional Exclusion - No Exposure Certification; applies USEPA Phase II regulations regarding a conditional exclusion for facilities that have no exposure of industrial activities and materials to storm water.
- Notice of Non-Applicability: allows industrial facilities to submit a Technical Report claiming either they have designed their facility to contain storm water so that there is no discharge of storm water to waters of the United States or their facility is not hydrologically connected to waters of the United States.
- Training Expectations and Roles: requires that Dischargers have appropriately trained personnel implementing this General Permit's requirements at each facility.
- NALs and NAL Exceedances: contains two types of NAL exceedances: (1) an annual NAL and (2) an instantaneous maximum NAL. Instantaneous maximum NALs are only for total suspended solids and oil and grease.
- Exceedance Response Actions (ERA): requires Dischargers to develop and implement ERAs, when an annual NAL or instantaneous maximum NAL exceedance occurs during a reporting year.
- CWA section 303(d) Impairment and TMDLs: requires a Discharger to monitor additional parameters if the discharge(s) from its facility contributes pollutants to receiving waters that are listed as impaired for those pollutants.
- Design Storm Standards for Treatment Control BMPs: includes design storm standards for Dischargers implementing treatment control BMPs.
- Qualifying Storm Event (QSE): defines a QSE as a precipitation event that produces a discharge for at least one drainage area and is preceded by 48 hours with no discharge from any drainage area.
- Sampling Protocols: requires Dischargers to collect samples during scheduled facility operating hours from each drainage location within four hours of either the start of the discharge or the start of scheduled facility operating hours if the QSE occurred in the previous twelve hours.
- Compliance Groups: allows the formation of Compliance Groups and Compliance Group Leaders. Dischargers participating in a Compliance Group are required to sample twice a year at each facility.
- Discharges to Ocean Waters: Dischargers with ocean-discharging outfalls subject to model monitoring provisions of the California Ocean Plan shall develop and implement a monitoring plan in compliance with the monitoring requirements established pursuant to Water Code section 13383.

Water Quality Issues and Data Review

A review of the available water quality data, as presented in **Section 5** showed that none of the water treatment plants had detects of organic constituents.

A review of the ambient water quality for the water treatment plants in **Section 3** for turbidity and TOC shows that most of the water treatment plants show a distinct seasonal trend with most peaks occurring during the wet weather season. This could be associated with storm runoff periods from the urban areas, industrial sites, or construction areas for those water treatment plants downstream of these sites.

Microbial constituents, specifically *E. coli, Giardia,* and *Cryptosporidium,* are also a potential concern from urban runoff. During the study period, *E. coli* data was most readily available at the water treatment plant intakes. The *E. coli* levels were relatively low, but the most frequent and more significant *E. coli* peaks occurred during the winter months, as discussed in **Section 3**. High coliform levels are frequently associated with high precipitation, which are associated with high river flow events. There is a potential for urban runoff discharges to impact source water coliform levels.

Source Water Protection Activities

Currently, there is little opportunity for source water protection activities related to urban runoff. The urban areas are required to implement Stormwater Management Plans to protect source water quality. PCWA and NID coordinate with the County OESs regarding potential source water spills from the drainage systems as discussed previously.

MINING

Overall, the relative risk for the Yuba/Bear River drinking water supply from mining, both active and historic, is low due to regulation and management. There were extensive amounts of historic mining activity in the watershed, both the upper and lower watershed, while the current mining activities are very limited. The focus of this update is on active mining in the watershed and key mines in active remediation from historic operations.

Background

Mining can include both metallic and non-metallic resources, can be either surface or underground, and can be either active or historic. Mines are potential contaminant sources for the drinking water supply since they discharge waste flows to receiving waters. This can include adit or tunnel drainage and stormwater runoff from the facility.

The Lava Cap Mine, which is a Superfund Site, is located in the watershed. Superfund is the name given to the environmental program that the USEPA established to address abandoned hazardous waste sites. It is also the name of the fund established by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The funding under this Act allows the USEPA to clean up such sites and to compel responsible parties to perform

cleanups or reimburse the government for USEPA-led cleanups. The Superfund cleanup process is complex and involves many steps to assess sites, place them on the National Priorities List, and establish and implement appropriate cleanup plans. This is a long-term cleanup process.

Seasonal Patterns

The timing of discharge from mines varies depending on the type, operation, and regulatory status of the mine. Most mines have at least some amount of consistent flow throughout the year.

Related Constituents

The constituents discharged are dependent on the type of mining conducted, but water quality impacts associated with mining generally includes; sediment, acidity, low dissolved oxygen, high heavy metals, and mercury (generally not at levels of human health concern).

Presence in the Watershed

Mining can occur on both private and public lands in the watershed. USFS manages mining on federal lands, such as Tahoe National Forest, and the California Department of Conservation (CDOC) manages mining on state and private lands. USEPA and Regional Board regulate discharge from closed and abandoned mines, such as the Lava Cap Mine. Surface mines are regulated under the Surface Mining and Reclamation Act of 1975 (SMARA) and have mine identifications, which are managed by Counties.

Both metallic and non-metallic mining occurs, and has occurred in the watershed since the 1840s. Metallic mining is primarily gold, which can be mined through lode, placer, or hydraulic methods. Non-metallic primarily includes sand, gravel, and decorative rocks, which are typically surface-mined.

Mines can be classified as either; active, idle, closed, or abandoned by the respective regulatory and management agencies. Historic mines that are either closed or abandoned are remediated by CDOC and USFS if they are a danger to people or the environment.

Remediated Mines

The DTSC and Regional Board manage cleanup efforts at numerous historic mining sites in the Yuba/Bear River watershed. A review of the Envirostor and Geotracker websites was conducted to identify a list of 19 cleanup sites that were associated with historic mining activities. A list is provided in **Appendix D**. Most of these sites entered Voluntary Cleanup Agreements (VCAs) with DTSC to conduct a preliminary endangerment assessment report based on site characterizations to determine if any remediation actions needed to be implemented.

Of the 19 sites identified, two were transferred to the Regional Board for review (Murchie and Banner mines), four required no further action based on site characterization, three were certified complete, three were certified complete with land use restrictions, four are inactive and need evaluation, and three are active.

The three active sites are The Grove at Nevada City, Kenny Ranch (including Wildflower Ridge Preserve), and Willow Valley Road. The Grove has a remediation workplan and is currently looking for a developer to lead the work, Kenny Ranch is being implemented by the Yuba Land Trust and City of Grass Valley, and Willow Valley is a private cleanup.

The four inactive and needing evaluation sites include Rising Sun Mine, Zeibright Mine, Buckeye Diggins Mine, and Bridge Street Property (Sierra Queen Mine). Rising Sun Mine is 44 acres of two historic mines tributary to Rollins Reservoir that have acid mine drainage with arsenic, lead, and mercury. There is currently no funding for evaluation and cleanup. Zeibright Mine is located at the Donner Mine Camp and is owned by Newmont USA Ltd and was on the Superfund List, but was removed after soil remediation was completed in 2006. However, recent public concern on the limited scope of remediation has reopened the case. Buckeye Diggins Mine is located near Dutch Flat and tributary to Rollins Reservoir. The mine drainage includes arsenic, mercury, copper, and sulfate. This site is not eligible for Superfund status, but still needs a California evaluation. The Bridge Street Property is located in downtown Nevada City along Deer Creek. The site includes mine contamination of arsenic, lead, and mercury. The property owners want to develop the site so are preparing a removal action workplan.

Murchie Mine was referred to the Regional Board in August 2022, as they are able to enforce cleanup through non-voluntary measures. The site is located two miles east of Nevada City and is tributary to Deer Creek. Newmont Mining Corporation is the responsible party and they are developing a workplan to address the mining waste debris and seeps associated with the site. Lead and manganese are the primary contaminants of interest.

Gold Mining

The Yuba/Bear River watershed was an important part of the California Gold Rush. Historically, there have been thousands of gold mining claims in the watershed. Currently, there is one permitted gold mining operation in the watershed. The Blue Lead Gold Mine, owned by Red Dog Mining and Reclamation LLC, is permitted as an open pit placer gold mine in Nevada County and obtained an individual WDR permit (R5-2018-0044) during the last study period. There was a change in ownership in 2025 under Order R5-2025-0024. It is located at Red Dog Road at Guy Blue Road, near Greenhorn Creek and tributary to Rollins Lake. There does not appear to be any active mining at this time.

Casual mining using metal detectors and hands/pans is allowed throughout the watershed. Suction dredging in waterbodies is not allowed in California.

SMARA Mining

The CDOC regulates and manages surface mines in California. A review of their interactive mapping tool resulted in the identification of 12 surface mines in the watershed. **Table 4-18** presents the mines, as well as their current status and product. Only three mines are active, and they provide sand and gravel products. Two of the three active mines also have industrial stormwater permits for runoff (HBE Greenhorn Gravel Plant and Bear River Aggregate). Blue Lead Gold Mine was issued an individual WDR permit by the Central Valley Regional Board (R5-2018-0044) governing mining operations at the site, however the site has not initiated any mining activities. This WDR requires construction and operation of onsite ponds for holding process waste water and that the Blue Lead Gold Mine must obtain coverage under the general industrial stormwater permit (Order 2014-0057-DWQ), which has not been done since it is not yet operational. Sierra Boulder still does not have an industrial stormwater permit.

Table 4-18
SMARA Regulated Surface Mines in the Yuba/Bear River Watershed

Mine ID	Mine Name	Mine Status	Product
91-29-0006	HBE - GREENHORN GRAVEL PLANT	Active	Sand and Gravel (Gold)
91-29-0007	HBE - BEAR RIVER PLANT - NEVADA COUNTY	Closed	Sand and Gravel
91-29-0012	LAKE COMBIE FACILITY	Reclaimed	Sand and Gravel
91-29-0015	SECRET TOWN	Reclaimed	Sand and Gravel
91-29-0016	MEADOW LAKE GOLD MINE	Reclaimed	Gold
91-29-0019	LIBERTY HILL MINE	Abandoned	Gold
91-29-0022	SIERRA BOULDER	Active	Decorative Rock
91-29-0025	BLUE LEAD GOLD MINE	Inactive	Gold
91-31-0004	BEAR RIVER AGG. - MEADOW VISTA QUARRY	Active	Sand and Gravel
91-31-0011	BEAR RIVER GRAVEL PLANT - PLACER COUNTY	Reclaimed	Sand and Gravel
91-31-0015	ROLLINS LAKE SHALE PIT	Reclaimed	Shale
91-31-0016	COLFAX SHALE MINE	Reclaimed	Clay

US Bureau of Land Management (USBLM)

The USBLM operates the Mineral and Lands Records System that records all active and closed mining claims in the watershed. A query of this map-based system was conducted to identify case recordations related to placer, lode, tunnel, or mill mining sites in the watershed counties; Nevada, Placer, and Sierra. Thousands of cases have been opened in the watershed counties, but the new map-based system is difficult to navigate and provided little useful information other than general location and mining site type. No new mining sites were able to be identified.

Lava Cap Mine Superfund Site

The Lava Cap Mine site occupies approximately 33-acres in western Nevada County. The site includes the mining area where ore was processed to recover gold, and areas where tailings which originated at the mine have been washed downstream and deposited over time. Gold and silver mining occurred from 1861 through 1918. The site was inactive until 1934. At that time, a flotation plant was installed to process ore and then a cyanide plant was installed to process concentrates. The facility was closed in 1943 due to World War II.

The site was issued a Cleanup and Abatement Order (CAO) from the Regional Board in 1979 to clean up mine tailings and prevent mine drainage to Little Clipper Creek, which is a tributary to Lost Lake. The primary contaminant of concern is arsenic, in addition to other metals found in local groundwater. Water can be released into Greenhorn Creek and subsequently to Rollins Reservoir and the Bear River. A dam and several detention basins were put in place. In 1997, a major storm caused the dam to collapse and mine tailings were deposited in Little Clipper Creek.

Regulation and Management

Mining activities are regulated by several agencies in the watershed, depending on type and location. Current active surface mines covering large areas are required to obtain coverage for stormwater discharges under the Industrial Stormwater Permit General Order (discussed previously in the Urban Runoff subsection). All surface mines must obtain a surface mining use permit from their county under SMARA. Any mining in the Tahoe National Forest must meet federal management requirements. Casual mining in waterbodies is prohibited to use suction dredging, as per the California Department of Fish and Wildlife. The Lava Cap Mine must meet all USEPA Superfund requirements.

SMARA Regulation

SMARA provides a comprehensive surface mining and reclamation policy with the regulation of surface mining operations to assure that adverse environmental impacts are minimized and mined lands are reclaimed to a usable condition. California Public Resources Code Section 2207 provides annual reporting requirements for all mines in the state, under which the State Mining and Geology Board is also granted authority and obligations. SMARA is administered and enforced locally, usually by county engineering or planning departments.

In 1991, following significant revisions to SMARA, the CDOC Office of Mine Reclamation was created to provide a measure of oversight for local governments as they administer SMARA. To accomplish this goal, the Office of Mine Reclamation may provide comments to lead agencies on a mining operation's reclamation plan and financial assurance and may initiate compliance actions that encourage SMARA compliance. Since the primary focus is on existing mining operations and the return of those mined lands to a usable and safe condition, issues relating to abandoned legacy mines are addressed through the CDOC Abandoned Mine Lands program.

For mines to meet the SMARA regulations, their operations must meet all of the following conditions:

- The operation has an approved reclamation plan,
- The operation has an approved financial assurance,
- The operation has filed its annual report,
- The operation has paid its reporting fee, and
- The operation has had its annual inspection by the lead agency which reflects the operation is in full compliance with the law.

On April 18, 2016, Governor Brown signed Senate Bill 209 and Assembly Bill 1142 into law and thereby enacted significant changes to SMARA. These reforms affected how the State Mining and Geology Board, the DOC, local lead agencies, and surface mine operators oversee, implement and comply with SMARA. In response to this rulemaking, CDOC prepared and incorporated a training document entitled, "Guidance Document for Surface Mine Inspectors". The Division of Mine Reclamation established an Inspector Training Program (ITP) for all surface mine inspectors by December 31, 2017. The Guidance Document was designed to provide the basic instructions and recommendations for surface mine inspections. The ITP consists of inspection workshops designed to provide practical application of the Guidance Document. Mine inspections must be conducted by an inspector who has, on file with the Department of Conservation and the Lead Agency, an inspection workshop Certificate of Completion by July 31, 2020. In October 2025, Governor Newsom signed Senate Bill 831 to add climate-related geologic hazards to the SMARA mining regulatory considerations.

Federal Management

The USFS and the USBLM work together to manage mineral resources on the National Forests. The USBLM has primary responsibility for development and enforcement of mineral rights regulations and requirements. The USFS uses the USBLM to record all mining claims and patents on National Forests.

The USFS Handbook includes a section on Minerals and Geology (Section 2800), with a Chapter on Mining Claims. The USFS requires anyone proposing to conduct a mining operation to submit a Notice of Intent (NOI) for a proposed mining operation to the local USFS District Ranger. The NOI must provide sufficient information, related to location, nature of operations, access, and transport, to determine if the level of proposed disturbance will require a Plan of Operations and a detailed environmental analysis. The District Ranger will, within 15 days of receipt of the NOI, evaluate the NOI and notify the operator whether or not a Plan of Operations is required.

If a Plan of Operations is required, form FS-2800 must be completed. This includes identification of potential impacts to water quality:

"State how applicable state and federal water quality standards will be met. Describe measures or management practices to be used to minimize water quality impacts and meet applicable standards.

1. State whether water is to be used in the operation, and describe the quantity, source, methods and design of diversions, storage, use, disposal, and treatment facilities. Include assumptions for sizing water conveyance or storage facilities.
2. Describe methods to control erosion and surface water runoff from all disturbed areas, including waste and tailings dumps.
3. Describe proposed surface water and groundwater quality monitoring, if required, to demonstrate compliance with federal or state water quality standards.
4. Describe the measures to be used to minimize potential water quality impacts during seasonal closures, or for a temporary cessation of operations.
5. If land application is proposed for waste water disposal, the location and operation of the land application system must be described. Also describe how vegetation, soil, and surface and groundwater quality will be protected if land application is used."

The USFS has an abandoned mine unit to address remediation of dangerous sites. They often work with the CDOC and counties in implementing remediation.

California Department of Fish and Wildlife

California has prohibited the use of any motorized vacuum or suction dredge equipment as part of a mining operation in any river, stream, or lake in California. This moratorium was in place through June 30, 2016. Under existing state law, the California Department of Fish and Wildlife (DFW) is also currently prohibited from issuing any permits for suction dredging in California under the Fish and Game Code.

The ongoing statutory moratorium established by Fish and Game Code section 5653.1 prohibits some, but not all forms of mining in and near California rivers, streams, and lakes. Individuals engaged or interested in otherwise lawful instream mining should be aware that other environmental laws may apply to these various other mining practices. Fish and Game Code section 5650, for example, prohibits the placement of materials deleterious to fish, including sand and gravel from outside of the current water level, into the river or stream. Further, Fish and Game Code section 1602 requires that any person notify DFW before substantially diverting or obstructing the natural flow of, or substantially changing or using any material from the bed, channel or bank of any river, stream or lake.

Under new state law effective January 1, 2016, Senate Bill 637 amends Fish and Game Code section 5653 and adds section 13172.5 to the Water Code.

SB 637 amends Fish and Game Code section 5653 as follows:

- Prohibits DFW from issuing any suction dredging permits absent a complete application which must include, among other things, a copy of any water quality permit or other authorization required by the State Board or Regional Board, or the U.S. Army Corps of Engineers, or a written determination by such agency that no water quality permit or other such authorization is necessary;
- Conditions DFW issuance of permits on regulations implementing the section that must ensure the use of vacuum or suction dredge equipment will not cause any significant effects to fish and wildlife, as opposed to prior law which conditioned the issuance of permits on regulations ensuring suction dredging would not be deleterious to fish;
- Provides DFW with authority to adjust permit fees to an amount sufficient to cover all reasonable costs incurred by DFW to regulate suction dredging as provided by the Fish and Game Code;
- Directs DFW to work with the State Board and the Regional Boards regarding potential violations of requirements, conditions, or prohibitions governing the use of vacuum or suction dredge equipment; and
- Defines for the first time by statute what it means to use vacuum or suction dredge equipment, otherwise known as suction dredging, as the use of a mechanized or motorized system for removing or assisting in the removal of, or the processing of, material from the bed, bank, or channel of a river, stream, or lake in order to recover minerals; but also clarifying the definition does not apply to, prohibit, or otherwise restrict non-motorized recreational mining activities, including panning for gold.

In general, Water Code section 13172.5, added by SB 637:

- Defines the use of vacuum or suction dredge equipment, otherwise known as suction dredging, in the same terms as described above and now provided in Fish and Game Code section 5653;
- Provides the State Board or the appropriate Regional Board may take one or more of three specified actions related to suction dredging to protect water quality, including (1) the adoption of waste discharge requirements or a waiver of such requirements; (2) specifying certain conditions or areas where the discharge of waste or other adverse impacts on beneficial uses of the waters of the state from the use of vacuum or suction dredge equipment is prohibited; or (3) prohibit any particular use of, or methods of using, vacuum or suction dredge equipment, or any portion thereof, to extract minerals based on a determination generally that doing so will cause or contribute to an exceedance of applicable water quality objectives or unreasonably impact beneficial uses; and
- Directs the State Board or the appropriate Regional Board to solicit public input as detailed and to hold at least one noticed public hearing before taking any action as provided.

Superfund Regulation

The Lava Cap Mine was added to the Superfund program National Priorities List in 1999, which made funding available for remediation. The key contaminant in the surface discharge

is arsenic (up to a flow-weighted concentration of 598 µg/L), as well as iron (up to 1,280 µg/L) and manganese (up to 379 µg/L). There are four Operable Units (OU) at the site; OU1 – Main Mine Area, OU2 – Groundwater, OU3 - Lost Lake Area, OU4 - Mine Area Residences.

The first Five-Year Review of the site was published in September 2011, a second Five-Year Review in 2016, and a third Five-Year Review in 2021. The purpose of the Review is to determine whether the remedial actions implemented at the site are protective of human health and the environment. In addition, the Review summarizes remaining issues and identifies follow-up actions to address them. Records of Decision (RODs) have been signed for OU1 (2004 - including the tailings and adit water in the mine area and the mine residences) and OU2 (2008 - groundwater).

The ROD for OU1 is being implemented as two distinct phases; 1) excavation of tailings and tailings consolidation, vegetative covers, a tailings and pile cap, a rock buttress, and drainage channels (completed between 2006 and 2008) and 2) treatment of adit water emanating from the mine area (remedial design completed September 2024). This also includes institutional controls to minimize potential future exposure to remaining contaminated materials. The remedy for OU4 is also included in this ROD and consisted of demolition of mine residences followed by removal of contaminated debris and soils in 2006. For phase 2, treatment of adit water, the USEPA proposed the Remedial Action and conducted community meetings in late 2025. DTSC and the Regional Board both provided detailed comments to USEPA on the proposal. The treatment system will be a semi-passive wetlands system with liquid iron used to precipitate the arsenic and reactive limestone to remove iron and manganese. Construction of the treatment system is expected to occur in 2026.

As per the remedial design (60 Percent Design Report) the discharge to surface water (Little Clipper Creek) from Adit 3a (Main Mine) has flows ranging from 77 to 977 gallons per minute (gpm), with an average of 239 gpm. There are also discharges from the tailings that are estimated to average 25 gpm and a seasonal spring that average 5 gpm. The adit treatment system will be designed to treat these three sources up to 1,200 gpm. The effluent concentrations of arsenic, iron, and manganese are all expected to be below their respective drinking water standards (10, 300, and 50 µg/L).

The remedy for OU2 is in the remedial design phase and the remedy for OU3 is currently in the remedial investigation/feasibility phase (a feasibility study is still in progress and an ROD will follow). The Review addressed the remedies that have been implemented at the site, which are the soil remedies for OU1 and OU4.

The 2016 Five-Year Review found that the remedies for OU1 and OU4 were implemented in accordance with the requirements of the ROD. The remedies are functioning as designed. The remedies are protective of human health and the environment in the short term, but are not protective in the long term, because land use covenants, specified by the OU1 ROD, have not yet been implemented. The land use covenants have been prepared and are ready to be recorded, but the property owner has not yet agreed to record them. In addition, the planned institutional controls do not address two areas where wastes were left in place. It may be necessary to expand the area where institutional controls are implemented to include these

two areas to prevent disturbance of and/or exposure to the wastes left in place. The 2021 Review found that there were no changes affecting the protectiveness of the remedies. There remain numerous maintenance issues related to the tailings cap and the land use covenants still need to be implemented.

Follow-up actions include implementing OU2 ROD, finalizing OU3 ROD, and developing strategies for addressing these issues related to filing land use covenants for OU1 and OU4 RODs.

Water Quality Issues and Data Review

A review of the available water quality data, as presented in **Section 5** showed that none of the water treatment plants had detects of inorganic or organic constituents.

A review of the ambient water quality for the water treatment plants in **Section 3** for turbidity and TOC shows that most of the water treatment plants show a distinct seasonal trend with most peaks occurring during the wet weather season. This could be associated with storm runoff periods from mines.

Source Water Protection Activities

There is minimal opportunity for stakeholder involvement in mining activities. Lost Lake could be operated to control the flow into Greenhorn Creek if necessary.

OUTDOOR CANNABIS CULTIVATION

Outdoor cannabis (also referred to as marijuana) cultivation has the potential to contribute solids, fertilizers, and pesticides to source water. This subsection focuses on outdoor cultivation since it has the highest potential to impact source water quality.

Background

Medical marijuana use was approved in California in 1996 under Proposition 215, which amended Health and Safety Code (HSC), Section 11362.5. The intent of this regulation was to allow individuals to grow small amounts of marijuana for their personal medical use. There was no approval of recreational use or commercial grow. Unfortunately, lack of specificity in the rule led to misuse and confusion and an increase in the illegal cultivation of cannabis.

SB 420 was passed in 2003 to clarify the provisions and intent of Proposition 215 and establish that the California Department of Public Health would issue medical marijuana use identification cards, by adding new HSC Sections 11362.7-11362.83.

ABs 243 and 266 and SB 643 were all passed in October 2015, known collectively as the Medical Marijuana Regulation and Safety Act (MMRSA) to further regulate the process/procedures of medical marijuana cultivation, manufacturing, dispensing,

distribution, transportation. This expanded and added new HSC Sections, as well as Water Code Section 13276. MMRSA established the California Bureau of Medical Cannabis Regulation in the Department of Consumer Affairs (to license distributors, dispensaries, and transportation). MMRSA identified the California Department of Food and Agriculture as the licensor of cultivators (through County Agricultural Commissioners). Finally, MMRSA identified the State Board as responsible for developing guidelines for the California Department of Food and Agriculture on the diversion and use of water for cannabis cultivation. Ten grades of cultivator licenses were established in the regulations, based on location (indoor or outdoor), light sensitivity, and grow size. The regulations also required counties to pass ordinances by March 1, 2016 if they wanted to establish local controls over MMRSA items, and all three watershed counties passed ordinances for local control.

Assembly Bill 21 was adopted in February 2016 to formalize the cultivation requirements and Senate Bill 837 was adopted in June 2016 to revise all references to "marijuana" to "cannabis" for consistency in the regulations.

In November 2016, California voters approved Proposition 64 that allowed recreational use of cannabis for adults over 21 years of age. Subsequent to the legalization of recreational use of cannabis, California has developed an extensive program of regulation and licensing for the cultivation, manufacturing, distribution, testing, and retail sales of cannabis. This discussion only considers the legal cultivation of cannabis. This includes personal use cultivation and commercial cultivation, which is regulated through the Department of Cannabis Control program as discussed below.

It should be noted that substantial illegal cannabis cultivation has been occurring in the watershed for many years, wherever there is significant open space and access to water. Illegal cannabis cultivation is not included in any management program, and is usually addressed by law enforcement as complaints arise. Each watershed county ordinance passed includes the identification of the county code enforcement officer as the primary mechanism to file complaints related to illegal cannabis cultivation. The sheriff departments in all watershed counties will support the code enforcement divisions.

Seasonal Patterns

Outdoor cannabis is cultivated in the watershed similar to other agricultural crops. Cannabis can be grown on either natural soil or in pots of pre-made or commercial soil. To generate optimum quantities of tetrahydrocannabinol (THC)-containing resin, the plant needs fertile soil and long hours of daylight. This means THC production for outdoor growth occurs optimally anywhere within 35° of the equator, which includes the Yuba/Bear River watershed.

Growers typically plant seeds in mid-April, late May, or early June to provide plants a full four to nine months of growth. Plants require large amounts of water during the growth phase. Harvest is usually between mid-September and early October.

Related Constituents

Grower activities that can cause source water quality impacts include: grading, terracing, dam, and road construction, causing erosion and sediment deposition in streams; illegal use of rodenticides, fungicides, herbicides and insecticides; use of soil amendments and fertilizers where run off to surface waters may occur; discarding of trash and mismanagement of human waste; substandard storage of hazardous materials such as diesel and gasoline; and unauthorized diversion of surface water.

Pesticides must be approved by USEPA and DPR for use on a specific crop. Since cannabis is illegal under federal law, there are no pesticide products registered for use specifically on cannabis. When cannabis was legalized in California, DPR identified criteria for legal pesticide use on cannabis cultivation in the State. A pesticide meets these criteria if the active ingredients found in the product is:

1. a minimum risk ("25(b)") product, which is a pesticide that USEPA and DPR have determined to be safe, effective and exempt from registration due to the low-risk nature of the product, and is also exempt from federal pesticide residue tolerance requirements, or
2. a product that is exempt from residue tolerance requirements and the use of the product would not be legally considered a use in conflict with the registered label.

Products used on cannabis, including minimum risk 25(b) products, must be used in accordance with applicable label, regulatory, and other legal requirements, including directions for use, storage and disposal, personal protective equipment for applicators and any other requirements.

MMRSA charged the DPR with identifying pesticides for use on cannabis and the associated safe levels on harvested marijuana leaf. In December 2024, DPR released a new resource to support compliance in the legal cannabis market: a list of products that meet California's criteria for legal use on cannabis. The list includes 260 registered products exempt from pesticide residue tolerances set by USEPA that meet California's legal use criteria. It does not include available 25(b) products that are also legal to use on cannabis in California. (https://www.cdpr.ca.gov/cannabis-cultivation/)

A review of the DPR Pesticide Use Reporting database found that cannabis has reported pesticide application, although mostly natural or biological products. **Table 4-19** provides a summary of the pesticides used from 2019 through 2023 on cannabis. During the study period the pounds applied annually increased steadily.

Pesticides most frequently found associated with illegal cannabis cultivation are Round Up (glyphosate) and carbofuran, as per Regional Board.

Table 4-19
DPR Pesticide Use Reporting on Cannabis, pounds

Pesticide	2019	2020	2021	2022	2023
ALKYL* DIMETHYL BENZYL AMMONIUM CHLORIDE *(50%C14, 40%C12, 10%C16)				0.48	
AZADIRACHTIN	0.15	0.55	1.36	0.71	0.35
BACILLUS AMYLOLIQUEFACENS STRAIN: F727				0.94	0.94
BACILLUS THURING. (BERLINER), SUBSP. AIZAWAI, SEROTYPE H-7			0.21		0.15
BACILLUS THURING. SUBSP. AIZAWAI STRAIN: ABTS-1857				0.27	0.34
BACILLUS THURING. SUBSP. ISRAELENSIS STRAIN: AM 65-52				0.19	
BACILLUS THURING. SUBSP. KURSTAKI STRAIN: ABTS-351	0.08	0.61	1.33	1.69	2.13
BACILLUS THURING. SUBSP. KURSTAKI STRAIN: SA-12				15.60	
BEAUVERIA BASSIANA STRAIN: GHA				0.14	0.22
BURKHOLDERIA RINOJENSIS STRAIN A396		30.63	2.27	84.09	100.51
CHROMOBACTERIUM SUBTSUGAE STRAIN: PRAA4-1	0.99	4.83	3.32	30.21	20.14
CLARIFIED HYDROPHOBIC EXTRACT OF NEEM OIL	1.28			2.60	0.72
DIDECYL DIMETHYL AMMONIUM CHLORIDE				0.72	
HYDROGEN PEROXIDE				0.39	
ISARIA FUMOSOROSEA APOPKA STRAIN: 97			0.04	0.02	
MINERAL OIL			1.57	34.29	
PEROXYACETIC ACID				0.03	
POTASSIUM LAURATE	6.06	17.54	15.89	99.58	9.19
POTASSIUM SILICATE			3.81		
PYRETHRINS	0.01	0.27	0.18	1.44	1.00
REYNOUTRIA SACHALINENSIS PLANT EXTRACT	0.44	0.50	1.27	4.22	6.83
SULFUR		0.13	2.31	6.63	33.11

Presence in the Watershed

Cannabis cultivation can only legally occur on private lands, it is illegal and prohibited to cultivate on public lands, such as the National Forests. However, USFS and county law enforcement confirm that there are illegal commercial grow operations within the National Forests. Essentially, cannabis cultivation can occur anywhere in the watershed where water and sunlight are available.

Medicinal and adult personal cannabis cultivation can occur in any county in the watershed. Currently, only Nevada County permits commercial cultivation in unincorporated areas and two cities permit commercial cultivation within city limits (Grass Valley and Nevada City).

As per the CIWQS website, there were 13 cannabis cultivation facilities permitted under the State Board's General Order 2017-0023-DWQ in the Yuba/Bear River watershed at some point during the study period. Five of these permittees were terminated during the study period and eight were transferred to the new General Order 2023-0102-DWQ. Under

General Order 2023-0102-DWQ, there were 47 permits active during the study period. Thirteen of these were terminated in 2024 or 2025, leaving 34 currently active commercial cannabis cultivators in the watershed (specifically in Nevada County). Little is reported about the cultivation location (indoor or outdoor) and size (canopy sf) for these permitted commercial facilities under this General Order report.

As per the California Department of Cannabis Control (DCC) there are 42 individuals or organizations with cannabis cultivation licenses for facilities in the Yuba/Bear River watershed. Only 23 of these are currently active. One-third are for adult use cultivation and two-thirds are for medicinal cultivation. Thirty-seven of the licenses are for either outdoor or mixed light (greenhouse or hoophouse) facilities. These 37 licenses are permitted to cultivate 6.85 acres of commercial cannabis. A cross-reference of the licensees with the facilities permitted under the General Order 2023-0102-DWQ revealed that eight facilities do not appear to be operated by an individual with a DCC cultivation license.

Nevada County Agricultural Commissioner started tracking commercial cannabis production in 2020 and prepares a supplement to their Annual Crop Report with legal crop statistics. Currently, there are 213 approved cannabis projects in Nevada County with 36 additional projects in review. As per the Annual Crop Report supplements, the number of permits issued increased during the study period, along with the canopy size.

- 2020, there were 57 permits with 9.13 acres of canopy.
- 2021, there were 112 permits, with 63 outdoor facilities and a total canopy of 18.74 acres.
- 2022, there were 171 permits, with 87 outdoor facilities and a total canopy of 33.02 acres.
- 2023, there were 175 permits, with 98 outdoor facilities and a total canopy of 35.4 acres.
- 2024, there were 143 permits, with 98 outdoor facilities and a total canopy of 29.2 acres.
- 2025, there were 144 permits, with 72 outdoor facilities and a total canopy of 35.9 acres.

Regulation and Management

California

Department of Cannabis Control

In July 2021, AB 141 was passed and established the California Department of Cannabis Control (DCC) to consolidate all the various state agency authorities over cannabis. DCC issues licenses for cultivators for both adult use and medicinal permits. It only issues permits in counties or cities where it is legal to commercially cultivate cannabis. Cultivation licenses can be for either medicinal or adult use, indoor or outdoor cultivation, and can be for facilities that either cultivate, propagate, or process cannabis. Nurseries are a specific type of

cultivation license that only grows immature plants and designated mature seed plants. DCC works with the State Board and the DFW in permitting cultivators.

State Board/Regional Board

The State Board is responsible for developing requirements for the diversion of water and discharge of waste associated with cannabis cultivation activities. In order to achieve this, they adopted a Cannabis Cultivation Policy in Resolution 2017-0063. The Cannabis Policy established principles and guidelines for cannabis cultivation activities to protect water quality and instream flows. The purpose of the Cannabis Policy is to ensure that the diversion of water and discharge of waste associated with cannabis cultivation does not have a negative impact on water quality, aquatic habitat, riparian habitat, wetlands, and springs. In February 2019 the State Board updated the Cannabis Cultivation Policy by adopting Resolution 2019-0007. The updates were focused on requirements related to tribal buffers, indoor cultivation sites, onstream reservoirs, and winterization requirements.

The Cannabis Cultivation Policy requirements related to discharge of wastes associated with cannabis cultivation are implemented through the State Board Cannabis Cultivation NPDES General Order, adopted by the State Board (Order 2017-0023-DWQ) on October 17, 2017. When the Cannabis Cultivation Policy was updated, Order 2017-0023-DWQ was terminated and replaced with Order 2019-0001-DWQ. The Cannabis Cultivation General Order was updated again in 2023, Order No. 2023-0102-DWQ. Generally, the permittees are those transferred from the previous order. The permittees in Nevada County were discussed previously.

The Order covers commercial and personal outdoor cultivation. It includes a tiered permitting approach (Tier 1 less than 1 acre and Tier 2 greater than 1 acre), and includes conditional exemptions for small personal and commercial outdoor cultivation (<2,000 square feet [sf]). Orders are risk-based (low, medium, or high), accounting for size of cultivation, slope of disturbed area, and proximity to a waterbody. The Cannabis Cultivation Policy includes BMPs and prohibitions on cultivation that are intended to protect water quality. Order 2023-0102-DWQ includes a Technical Report Guidance to assist Tier 1 and 2 facilities with compliance in developing a Site Management Plan. This includes best practical treatment or control for sediment, pesticides, petroleum, trash, and winterization.

The State Board, Office of Enforcement's Cannabis Enforcement Section (CES) is comprised of scientific, geological and engineering staff capable of specialized inspection and enforcement investigations of cannabis cultivation sites for water quality impacts. CES conducts and advises on technical and investigative initiatives to ensure fair, firm, consistent, and transparent enforcement of aspects of the Cannabis Cultivation Regulatory Programs, consistent with the Water Quality Enforcement Policy. The CES coordinates with the State Water Board Legal Unit, as well as DFW, DCC, DPR, and other state and local agencies related to enforcement initiatives. A review of the CIWQS databased found 129 violations of the Cannabis Cultivation General Order in Nevada County during the study period. These were all Class B violations, for unauthorized discharges (either a discharge or threat of discharge to a water of the State). There was one 13267 Letter (investigational order) issued to an

unpermitted cannabis cultivation site in the watershed (upstream of Rollins Reservoir) and one Cleanup and Abatement Order issued to an unpermitted cannabis cultivation site in the watershed (also upstream of Rollins). Both of these are still active and pending remediation.

As per the Regional Water Board's Executive Officer's Report dated February 27, 2026, there were 205 active enrollments for the Cannabis General Order in Nevada County, which differs from the CIWQS enrollment information and more closely matches the Nevada County Agricultural Commissioner's data. This includes 84 percent of those permitted under Tier 1 (almost entirely low risk), 11 percent of those permitted under Tier 1 (all low risk), and five percent as conditionally exempted. The Regional Water Board conducts inspections throughout the watershed for reports of illicit grow sites, including helicopter flyovers of reported sites and enforcement sites. In 2024, there were 62 in-person inspections conducted at illegal sites, with 58 of those eventually enrolling into the General Order.

The California Department of Resources Recycling and Recovery implements a grant program for farm and ranch solid waste cleanup and abatement. They reported that they are working with the State Water Board to identify illegal or abandoned cannabis grow sites that need to be abated.

The State Board and DFW have identified priority watersheds for inspections. These are of special environmental concern and are at increased risk of environmental impacts due to cannabis cultivation activities. The State Board has indicated that the priority watersheds will be those with a high concentration of non-compliant cultivators with the potential to cause serious environmental impact.

US Forest Service

Since it is illegal to cultivate cannabis on public lands, the USFS does not have any management structure to prevent or minimize impacts of outdoor cultivation. All response efforts are law enforcement abatement efforts. The USFS Patrol Captain works with county sheriffs and the US Drug Enforcement Agency.

In the Tahoe National Forest, the primary type of outdoor cannabis cultivator is a drug-trafficking organization. These grow operations occur in the Yuba/Bear River watershed and are primarily illegal commercial operations conducted by criminal gangs. Typically, these grow operations are identified either by recreationalists or helicopter fly-overs conducted in the spring and early summer. They are usually located in an isolated canyon with southern exposure. Once law enforcement finds the grow operation, the plants are eradicated, any individuals present are taken into custody, and the scope of site contamination is assessed. Generally, these sites are contaminated with a variety of pesticides, fertilizers, and other waste that must be remediated.

Local Agencies

Nevada County

Nevada County permits personal and commercial cannabis cultivation. Section 2.08 establishes the Code and Cannabis Compliance Division under the Community Development Agency to manage cannabis. Section 5.08 established a business tax on January 1, 2019 for cannabis businesses. Section 12.03.300 regulates commercial and personal use cannabis cultivation. Personal use is limited to six plants per person. Commercial facilities are required to obtain an Annual Cannabis Permit.

Personal cultivation is allowed both indoors and outdoors, but is limited by residence zone. In addition, the property must have a legally established residence and there is a six-plant maximum per parcel (with a residence) and a 100-foot setback requirement from the property line.

Outdoor commercial cultivation can only occur on parcels greater than five acres and has limitations on the amount cultivated. The limit is based on the square feet (sf) of canopy. Parcels 5 to 9.99 acres can have 2,500 sf, parcels 10 to 19.99 acres can have 5,000 sf, parcels 20 to 39.99 acres can have 10,000 sf, parcels 40 to 59.99 acres can have 20,000 sf, parcels 60 to 79.99 acres can have 30,000 sf, and parcels greater than 80 acres can have 40,000 sf. A Commercial Cannabis Cultivation License from DCC is required. Cultivators must obtain an Administrative Development Permit and an Annual Cannabis Permit from the County, and they are limited to three per person.

The ordinances specifically prohibit discharge from the site, set visual, odor, noise and light limits, and have fencing and setback requirements. Cultivation premises must have a secure locking mechanism.

Nevada County manages cannabis cultivation through the Community Development Agency, Code and Cannabis Compliance Division. The County can issue a "Notice to Abate Unlawful Cannabis Cultivation" to anyone they receive a complaint regarding.

Placer County

In November 2016 the Board of Supervisors approved preparation of an ordinance related to cannabis cultivation. This ordinance was passed and took effect January 2017. This is two-phased effort by the county to enact comprehensive cannabis regulation, focusing immediately on permitting limited personal cannabis cultivation and banning commercial cannabis activities.

The ordinance is consistent with the Proposition 215, MMRSA, and Proposition 64. It allows cultivation of up to six non-medical plants on 50 square feet or cultivation of 50 square feet of medical cannabis for personal use, but bans all commercial activity related to cannabis including cultivation, processing, manufacturing, delivery, and distribution. Cultivation, both

indoors and outdoors, will only be allowed on parcels where the private residence of the authorized grower is located.

The ordinance also establishes a 100-foot setback from property lines and require planting closer to the grower's residence than to a neighbor's; require grows to be fenced; prohibit outdoor cultivation within 600 feet of a school, church, park, library, fairgrounds or youth-oriented facility; and institute an odor limit. In 2019, Placer County established a ban on burning of cannabis waste.

Placer County enforces a violation of the cannabis ordinance as a misdemeanor and it is subject to enforcement with a 72-hour notice to abate.

Sierra County

In July 2014 Sierra County passed Ordinance 1055 related to cannabis cultivation, including several key provisions: medical marijuana only, personal use only, no commercial grows, limit of 18 plants per person (maximum of 72 plants per property limit), must be property owner or have notarized letter from property owner, not within 100 feet of a school, no lights outdoors, six foot opaque fence around outdoor operations, 10 foot setback from property line, and misdemeanor penalty if violate ordinance. The County Ordinance also allows for enforcement and requires abatement within 10 days if any violations are found.

City of Grass Valley

The City of Grass Valley has modified its Municipal Code to prohibit the cultivation of cannabis outdoors. Chapter 5.06 established a license fee on January 1, 2021 for cannabis businesses. Chapter 5.60 regulates commercial cannabis activities, which prohibits outdoor cultivation within the City. The City will allow for up to two indoor cannabis nurseries un Chapter 5.60.100, as per the DCC licensing requirements.

City of Nevada City

The City of Nevada City has modified its Municipal Code to prohibit outdoor cultivation of cannabis. Chapter 5.06 established a license fee on July 1, 2028 for cannabis businesses. Chapter 9.22 regulates commercial cannabis businesses, which prohibits commercial outdoor cultivation within the City. Similar to the City of Grass Valley, the City allows for indoor cannabis nurseries to submit business license applications, without limit. They would also need to meet the DCC licensing requirements. Chapter 17.140 regulates personal cannabis cultivation and prohibits outdoor cultivation and limits indoor cultivation to less than 25 sf for adult use or six plants for medicinal per residence.

Water Quality Issues and Data Review

A review of the available water quality data, as presented in **Section 5** showed that none of the water treatment plants had detects of inorganic or organic constituents.

A review of the ambient water quality for the water treatment plants in **Section 3** for turbidity and TOC shows that most of the water treatment plants show a distinct seasonal trend with most peaks occurring during the wet weather season, however some peaks can occur during the summer and fall months. Increases in the presence of algae in the source waters could be contributed to by increased nutrients applied on cannabis in the watershed.

Source Water Protection Activities

Cannabis cultivation is a newer activity in the watershed. The scope of legal cultivation is somewhat substantial in Nevada County, but appears to be well regulated and managed. Neither PCWA or NID has been contacted by any of the management agencies in the watershed regarding the presence of outdoor cultivation, or the status of any ongoing inspections or activities.

SPECIAL TOPICS

Population Growth

Growth trends were examined to identify the potential long-term impacts of growth on the related potential contaminant sources being investigated. The estimated total population of the counties in the Yuba/Bear River watershed was calculated using the 2020 Census by tract. The total population in the Yuba/Bear River watershed based on the 2020 Census data is estimated at 61,216 as shown in **Table 4-20.** The California Department of Finance prepares county-wide population counts as well, also shown on the table. The percent of county population located in the watershed was calculated as overall 12 percent based on the matching 2020 tract data from the Census with the California Department of Finance.

Table 4-21 provides information on population projections for the Yuba/Bear River watershed by assuming that the percent of county population will remain the same for the watershed boundary (at 12 percent) and using the Department of Finance projections through 2070. The projection for 2020, 61,115, almost exactly matches the 2020 US Census data. The population of the Yuba/Bear River watershed is projected to increase approximately 8 percent, to over 66,600, during the next 45 years. These projections are estimates and assume that large areas of the upper watershed will remain undeveloped.

Table 4-20
Population Change in Watershed Counties[1]

County	Yuba/Bear River Watershed Census Tract	2020 Census Tract Population	2020 Census Total Yuba/Bear River Watershed Population	CA DOF County Population 2020	Percent Watershed of DOF County Population
Sierra	100	Negligible	-	3,232	0%
Placer	218.02	6,052	24,760	405,734	6%
	219.01	3,315			
	219.02	4,462			
	220.02	6,569			
	220.13	2,833			
	220.14	1,529			
Nevada	3	2,496	36,456	102,142	36%
	4.03	1,894			
	4.04	5,090			
	5.03	1,225			
	6.01	1,907			
	7.01	7,581			
	8.01	5,289			
	8.02	6,700			
	9	4,274			
TOTAL			**61,216**	511,108	**12%**

[1] Based on data from the US 2020 Census and California Department of Finance

Table 4-21
Population Projections for the Yuba/Bear River Watershed Through 2070

County	2020	2025	2030	2040	2050	2060	2070
Nevada	36,771	35,998	35,469	34,460	32,913	31,537	30,756
Placer	24,344	25,691	27,236	29,907	32,168	34,033	35,867
Sierra	-	-	-	-	-	-	-
Watershed Projection	61,115	61,689	62,704	64,367	65,080	65,571	66,623

[1] Based on data from 12 percent proportion and the California Department of Finance County Projections

This increasing human population in the watershed will likely mean an increasing urbanization of the watershed as well as the potential for expanded wastewater and stormwater, as well as new industrial discharges. The change in land use may be significant in terms of the potential contaminating activities and resultant impact on source water quality. It is uncertain as to whether this shift will result in quantifiable changes in source water quality. Most of the potential contaminating activities in the watershed are regulated now, so that should minimize the impact of growth. As development occurs in the middle and upper watershed it will be important for upstream communities to implement measures to protect water quality, such as those identified in the Phase II MS4 permits like source

controls, encouraging low impact development, and potentially implementing hydromodification management.

Climate Change

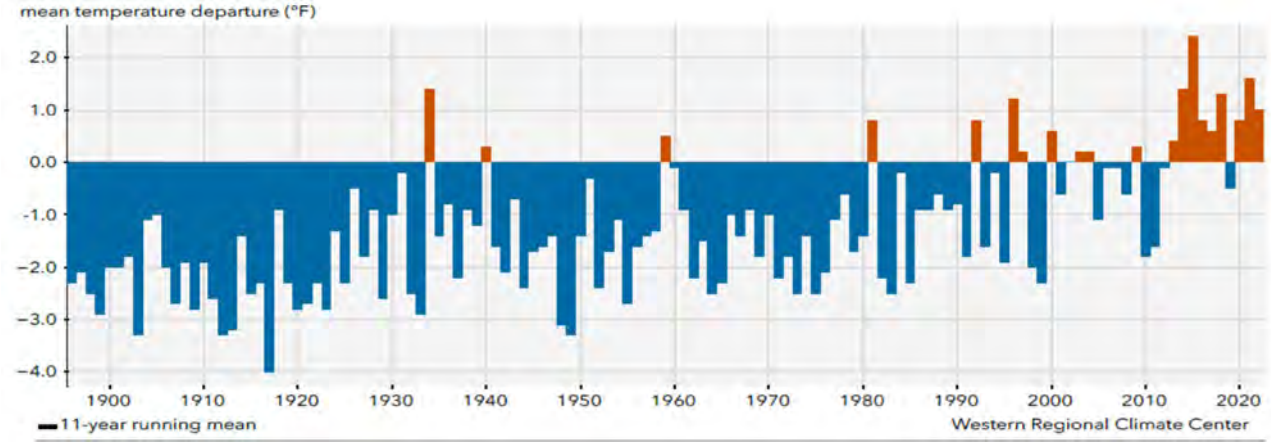
Background and Occurrence in Watershed

Climate is defined as expected average conditions, plus the characteristic range of variability of those conditions. Therefore, climate change is the expected difference in the likelihood of types of weather events. The climate system includes the atmosphere, oceans, ice, land, vegetation, and freshwaters. A change in any part of the system can cause global and regional changes to climate. As greenhouse gases are emitted into the atmosphere, they trap infrared radiation in the atmosphere and cause increases in air, land, and water temperatures.

Climate change is already having an impact on California's water resources, as evidenced by greater weather extremes, reduced snowpack, higher sea level, and changes in river flows. Models predict that more precipitation will fall as rain instead of snow, exacerbating flood risks and creating additional challenges for water supply reliability and water quality. The National Oceanic and Atmospheric Administration (NOAA) calculates a long-term average air temperature in California. For the period 1981 – 2010 that average was 57.7°F and for the period 1991 – 2020 that average was 58.4°F, a nearly 1°F increase in just one decade.

In the California Department of Water Resources' (DWR) Hydroclimate Report for Water Year 2022 (WY22 Report), the most recently available report from July 2024, data was presented to demonstrate the already changing climate in California. The key hydroclimate indicators are air temperature, precipitation, snowpack, and streamflow. When looking at the departure of annual average air temperatures from this long-term average, as shown in **Figure 4-8**, it can be seen that the last decade has been significantly warmer than historic (red bars in the figure below).

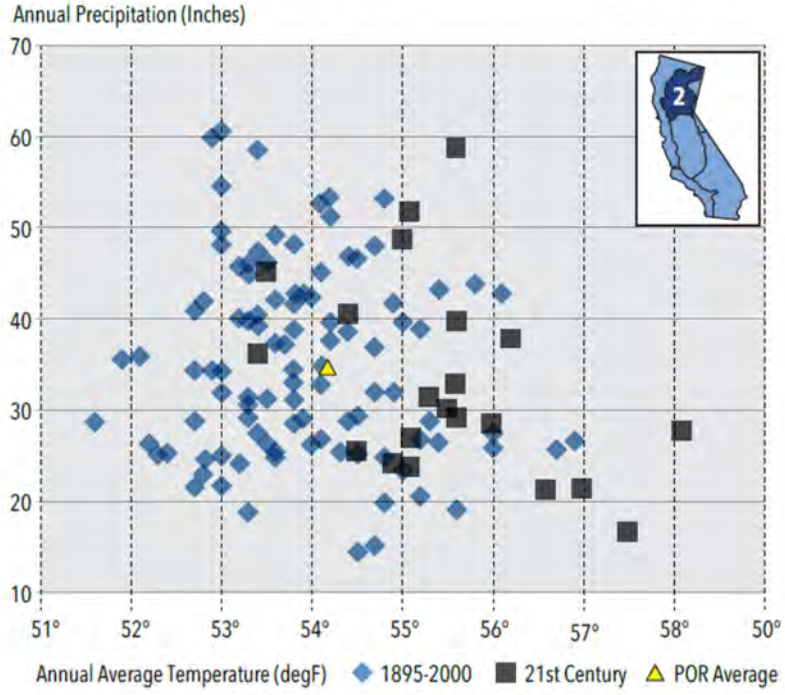
Figure 4-8
California Annual Average Air Temperature Departure from Long-Term Average, 1895 - 2022



Source: DWR Hydroclimate Report Water Year 2022

The WY22 Report presents information on precipitation and air temperature for the Sacramento Climate Division, as shown in **Figure 4-9**. This figure shows that the 20th and 21st centuries are showing a departure in both precipitation and air temperature, with increased frequency of lower annual precipitation and higher annual average air temperatures in the 21st Century.

Figure 4-9
Sacramento Climate Division Precipitation and Temperature, 1895 - 2022



Source: DWR Hydroclimate Report Water Year 2022

Seasonal Patterns

Climate change impacts to the surface water supply will result in more than seasonal impacts, there will be shifts in long-term patterns and trends to water quality. The Yuba/Bear River watershed will be insulated from impacts to sea level, but key impacts to snowpack, precipitation timing and intensity, air and water temperature, and overall water system operations will be most significant.

- Extreme Rain, Flood, and Drought Events - Climate models indicate that California is likely to see larger and warmer storms, resulting in increased rainfall and flooding. The storms, however, may not bring more water overall, leading to more frequent or severe droughts. Severe droughts may increase the likelihood of wildfire risk.
- Water Supply and Demand - Earlier and decreased runoff can reduce water supplies, even when overall rainfall remains the same. Decreased snowpack is a critical concern. Warmer temperatures will lead to higher snow levels and cause what snow we do get to melt faster and earlier, making it more difficult to store and use. In

addition, water demand is expected to grow as higher temperatures and a longer growing season increase the demand for water.

- Water System Operations - Changes in precipitation patterns will require modifications in how water system managers operate and manage dams and reservoirs. Past patterns can no longer be used to confidently forecast the future and more water may need to be released to prevent flooding and not be able to recoup it through spring runoff.

Related Constituents

Temperature, pathogens, algal toxins, sediment, organic carbon, nitrogen, phosphorus, and metals in source waters are expected to be impacted by climate change, either as a result of increased periods of drought, extreme precipitation events, increase in air or water temperature, increase in wildfires, salt water intrusion, infrastructure failure, or changes in water system management. These could increase the level of treatment required, decrease treated water quality, and increase costs for treatment and residual management.

Examples of how climate change can lead to changes in water quality include, but are not limited to:

- Dry periods and drought lowering stream flow and reducing dilution of pollutant discharges,
- Increase of harmful algal blooms due to warmer waters and potentially cyanotoxins in source water,
- Increase of water-related pathogens due to runoff from more frequent and intense precipitation events,
- Reduced ability of warm water to hold dissolved oxygen,
- More erosion and sedimentation caused by intense rainfall events, especially following wildfires,
- Increased velocity of stream flow,
- Potential sewer overflows due to intense precipitation and storm runoff, and
- Increased formation of disinfection byproducts due to warmer waters.

"*Global River Water Quality Under Climate Change and Hydroclimatic Extremes*" was published in September 2023 (van Vliet, et al 2023) and discusses the impacts from droughts and heatwaves, rainstorms and floods, and long-term climate change on water quality. After compiling and analyzing 965 literature case studies published between 2000 and 2022, water quality deterioration was found for 68 percent of the case studies under drought-heatwave events.

- The majority of the case studies reported changes in salinity (29 percent), followed by algae, nutrients, dissolved oxygen, and water temperature.
- Water quality deterioration is evident during extended dry conditions. Lower dilution capacities under low flow and continued source inputs of pollutants result in higher contaminant concentration. Salinity levels can also increase owing to

increased evapo-concentration. Hydrological droughts, particularly when combined with heatwaves, can create favorable conditions for the development of algal blooms owing to higher water temperatures, increased stratification and longer water residence times.

- Water quality deterioration was also found during extended rainstorms and flood events. The majority of the case studies reported changes in nutrients (23 percent), plastics, and microorganisms. High intensity rainfall events and floods result in increased erosion, mobilization and resuspension of in-stream, floodplain and catchment sources, resulting in increased nutrients, sediment, and sometimes metals, as they have high adsorption capacities to suspended sediment. Plastics in rivers also show strong increases during floods owing to increase mobilization and transport capacity of plastic particles.
- For long-term climate change, most cases focused on water quality model projects dominated by nutrients (45 percent), microorganisms (21 percent), and water temperature (14 percent). Climate change can increase risks for wildfires, which destabilize soil storage of nutrients, organics, and metals, and bring suspended particles and other contaminants in post-fire runoff.

Regulation and Management by Mitigation and Adaptation

In response to the already occurring impacts from a changing climate, the State of California is actively working on mitigation and adaptation strategies. In August 2022, a consortium of California agencies published "California's Water Supply Strategy: Adapting to a Hotter, Drier Future". This document outlines the approach by the State and its agencies to address the expected impacts of climate change by increasing the use of recycled water, production of desalination water, stormwater capture, and conservation.

California's Fourth Climate Change Assessment was completed in August 2018. The assessment contains a series of regionally focused reports, including the Sierra Nevada Area that includes the Yuba/Bear River watershed in its North Range subregion. It also includes new climate projections with higher spatial resolution to better simulate and project extreme events. These updated projections reinforce past findings about temperature and precipitation extremes. The fourth assessment confirmed significantly increased air temperatures and increased frequency of extreme wildfires by the end of the 21st Century.

The regional report for the Sierra Nevada Area contained many of the same trends and concerns as for the state as a whole. Some specific details were found in this report:

- In the last decade, Northern California experienced among the worst droughts (2012-2016) in over 1,000 years followed by the wettest winter on record (2016-2017). Whiplash precipitation events, where conditions shift rapidly from drought to deluge, are expected to increase modestly by approximately 25 percent in Northern California. New extremes will challenge water storage and flood control systems which were designed for historical climate patterns.

- By the end of the 21st century, temperatures in the Sierra Nevada are projected to warm by 6 to 9ºF on average, enough to raise the transition from rain to snow during a storm by about 1,500 to 3,000 feet. In contrast, future precipitation is predicted to vary less than temperature; long term changes may be no more than ±10-15 percent of current totals.
- Sierra Nevada snowpacks will very likely be eradicated below about 6,000 feet elevation and will be much reduced by more than 60 percent across nearly all of the range. Notably, though, recent studies suggest that even these snowpack-loss projections may be underestimates, due to feedback loops with warming trends causing snow cover losses, and snow cover losses resulting in warmer land surfaces and thus enhanced warming trends in turn.
- The loss of snowpack will combine to dry soils 15 to 40 percent below historical norms, depending on elevations. The result will be reduced soil and vegetation moisture; changes in rivers and lakes; and ultimately stresses on fora and fauna. Loss of snowpack and overall drying will lead to increased winter streamflows and foods, and to (largely compensating) reductions in spring and summer streamflows.

California's Fifth Climate Change Assessment is underway and is expected to be completed in late 2026. This assessment has a unique focus to address gaps in the existing literature and knowledge base on climate change impacts and adaptation. The Fifth Assessment's team will lead competitive research funding programs to address California specific research gaps related to climate change impacts and adaptation. This will include impacts of drought on water supply, forest health, and headwater management practices.

In April 2019, Governor Newsom signed Executive Order N-10-19 calling for the California Natural Resources Agency, the California Environmental Protection Agency, the California Department of Food and Agriculture, and the Department of Finance to prepare a water resilience portfolio that meets the needs of California's communities, economy, and environment. The Water Resilience Portfolio was finalized in July 2020. The portfolio includes 142 separate actions to be taken by state agencies to support local efforts, including actions related to drinking water. The Water Resilience Portfolio is now part of the Climate Adaptation Strategy, published in 2021 and updated in 2024, which brings together numerous state plans and strategies. The Strategy is available as an interactive website that serves as a hub for state climate resilience action (https://www.climateresilience.ca.gov/).

DWR is responsible for sustainably managing water resources throughout the State. This also involves developing and updating the California Water Plan every five years, which is the strategic plan for managing and developing water resources. The 2023 Update to the California Water Plan addresses climate urgency and promotes climate resilience across regions and water sectors with a statewide vision, watershed resilience planning framework with strategies and toolkit, and indicators and metrics to track progress, sustainability, and resilience. A cornerstone of Update 2023 is the Water Resilience Portfolio, discussed earlier. In addition, "California's Water Supply Strategy: Adapting to a Hotter, Drier Future" was incorporated. The Plan focuses on future scenarios for climate change and includes adaptation strategies utilizing risk-based vulnerability assessments.

Cal-Adapt is a website developed by the University of California at Berkeley's Geospatial Innovation Facility and Eagle Rock Analytics, with funding and advisory oversight by the California Energy Commission's Public Interest Energy Research Program and advisory support from Lawrence Berkeley National Laboratory. The development of the website is a key recommendation of the 2009 California Climate Adaptation Strategy. Cal-Adapt has been designed to provide access to the wealth of data and information that has been, and continues to be, produced by the State of California's scientific and research community. Cal-Adapt is a web-based climate adaptation planning tool. The platform provides interactive visualizations, downloadable datasets, the Analytics Engine and the Cal-Adapt API, helping individuals analyze how climate change may impact California at both state and local levels. Cal-Adapt synthesizes volumes of existing downscaled climate change scenarios and climate impact research and presents it in an easily available, graphical layout that is intended to benefit local planning efforts. It allows the user to identify potential climate change risks in specific geographic areas throughout the state. The website allows users to input a specific location or click on an interactive map to explore what climate impacts are projected to occur in their area of interest. The raw data used in Cal-Adapt can also be downloaded. The website also provides guidance on using climate projections by answering what climate projections are, how they are produced, and sources of uncertainty in climate projections (https://cal-adapt.org/).

Water Quality Issues and Data Review

The overall water quality from the Yuba/Bear River water source for the constituents selected for evaluation, as described in **Section 3**, appears to be maintaining the same quality over this study period as historic periods. There are seasonal, annual, and short-term (five year period) variability that can occur. However, impacts to source water quality are not significant at this time, but will likely occur slowly and be related to increased air and water temperatures.

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The purpose of this section is to evaluate the existing water treatment plants using Yuba and Bear River water for compliance with existing drinking water regulations, and identify potential treatment concerns related to future drinking water regulations (if applicable). For assistance with abbreviations and acronyms, the reader is referred to the List of Abbreviations at the front of the report.

There are fifteen existing intakes and associated water treatment plants (WTP) within the study area. The Placer County Water Agency (PCWA) plants include: Alta, Monte Vista, Colfax, Weimar, Applegate, Bowman, Auburn, Foothill, and Sunset. Nevada Irrigation District (NID) plants include: Elizabeth George, Loma Rica, Lake of the Pines, North Auburn, Lake Wildwood, and Smartsville. Each of these is discussed herein within the context of current and future regulatory compliance and potential treatment issues beginning with the most upstream diversion point and then moving downstream for each agency.

Tables 5-1 and **5-2** provide a summary of design parameters for each of PCWA's and NID's water treatment plants, respectively.

Highlights of Selected Existing Drinking Water Regulations

National Interim Primary Drinking Water Regulations and Phase I, II, and V Regulations. Sets Maximum Contaminant Levels (MCLs) for many inorganic chemicals (IOCs), synthetic organic compounds (SOCs), and volatile organic compounds (VOCs).

Surface Water Treatment Rule (SWTR). Sets minimum 3 and 4- log reduction requirements for *Giardia* and viruses, respectively. Sets turbidity requirements, which have since been tightened.

Interim or Long Term 1 Enhanced Surface Water Treatment Rule (ESWTR) and Filter Backwash Rule. Interim ESWTR applies to systems serving at least 10,000 population and Long Term 1 ESWTR applies to smaller systems. Sets minimum 2-log reduction requirement for *Cryptosporidium*. Requires continuous monitoring of individual filter effluents (IFE) and combined filter effluent (CFE). Tightened treated water turbidity requirements: CFE < 0.3 nephelometric turbidity units (NTU) in 95 percent of samples, and not to exceed 1 NTU longer than 1 hour. Set IFE reporting and evaluation requirements. Requires recycling of all return flows to the headworks.

Stage 1 Disinfectants/Disinfection By-Products Rule (D/DBPR). Sets a treatment technology for DBP precursor removal (enhanced coagulation) based on source water total organic carbon (TOC) levels. Varying levels of removal are required if the source water concentrations are > 2 mg/L. Sets MCLs for total trihalomethanes (TTHMs) and haloacetic acids (HAA5) at 80/60 micrograms per liter (µg/L), respectively, in distribution system as system-wide running annual average (RAA), but these were superseded by the Stage 2 D/DBP Rule.

Long Term 2 ESWTR. Requires *Cryptosporidium*, or *Escherichia coli* (*E. coli)* source water monitoring depending on system size, including a second confirmation round. Source water bin classification to be dependent on monitoring results. If average *Cryptosporidium* value is greater than 0.075 oocysts per liter, bin classification will require additional action (which could be additional log reductions or other actions, including source water protection). Also requires disinfection profiling and benchmarking if monitoring for *Cryptosporidium*.

Stage 2 D/DBPR. Requires compliance with distribution system MCLs for TTHM and HAA5 to be based on locational running annual average (LRAA). In Stage 2, compliance is based on LRAA of 80/60 µg/L. Initial Distribution System Evaluations were completed to identify long term monitoring locations. Operational evaluations are required if projected DBP levels exceed the MCLs.

Table 5-1
Placer County Water Agency Water Treatment Plants - Design Information

WTP	Design Flow (gpm)	Average Flow (gpm)	Type of Plant	Flash-Mix Type	Pre-oxidant Used*	Coagulant and Coagulant Aid Used	Flocculator Type	Floc. DT (min.)	Sed. DT (min.)	Filter Type	Filtration Rate gpm/sf	Primary Disinfectant
Alta	356	217	Direct Filtration	Static Mixer	Sodium Hypochlorite	Poly Aluminum Chlorohydrate (PACL)	Adsorption clarifier	N/A	N/A	3 Vertical dual media pressure filters	5	Sodium Hypochlorite
Monte Vista	85	35-40	Direct Filtration	Static Mixer	Sodium Hypochlorite	Poly Aluminum Chlorohydrate (PACL)	Adsorption clarifier	N/A	N/A	1 Vertical dual media pressure filter	3	Sodium Hypochlorite
Colfax	1.244 mgd	0.57 mgd	Conventional	Mechanical	Sodium Hypochlorite	Liquid aluminum sulfate	5 stage tapered hydraulic energy flocculation basin	23.2	360	2 Horizontal dual media pressure filters	3	Sodium Hypochlorite
Weimar	1 mgd	0.53 mgd (summer) 0.34 mgd (winter)	Conventional	Mechanical	Sodium Hypochlorite	Poly Aluminum Chlorohydrate (PACL)	Circular clarifier	37	98	2 dual media gravity filters	1.8	Sodium Hypochlorite
Applegate	50	7	Microfiltration	N/A	None	None	N/A	N/A	N/A	N/A	N/A	Sodium Hypochlorite
Bowman	5 mgd	3.6 mgd	Conventional	Mechanical	Sodium Hypochlorite	Liquid aluminum sulfate and Non-Ionic	Three paddle wheel zones	20.4	20	2 tri-media gravity filters	5	Sodium Hypochlorite
Bowman Package	2 mgd	2 mgd	Microfloc package units	Static Mixer	Sodium Hypochlorite	Poly Aluminum Chlorohydrate (PACL)	Adsorption clarifier	N/A	N/A	4 Tri-media filters	5	Sodium Hypochlorite

***Using sodium hypochlorite as pre-oxidant is no longer normal practice, however, injection point exists for emergency use only**

Table 5-1 Cont'd
Placer County Water Agency Water Treatment Plants - Design Information

WTP	Design Flow (gpm)	Average Flow (gpm)	Type of Plant	Flash-Mix Type	Pre-oxidant Used*	Coagulant and Coagulant Aid Used	Flocculator Type	Floc. DT (min.)	Sed. DT (min.)	Filter Type	Filtration Rate gpm/sf	Primary Disinfectant
Auburn	8 mgd	2.16 mgd	Actifloc/ Conventional	Static Mixer	Sodium Hypochlorite	Poly Aluminum Chlorohydrate (PACL) and Non-Ionic	Ballasted Sedimentation			4 dual media gravity filters	5	Sodium Hypochlorite
Foothill 1	42 mgd	25.9 mgd	Actiflo/ Conventional	Induction in line +vertical turbine propeller	Sodium Hypochlorite	Liquid alum or PACL, NIP polymer or PACL	Actiflo	2 min	8 min	9 dual media gravity filters	10	Sodium Hypochlorite
Foothill 2	18 mgd	15.1 mgd	Conventional or Direct (depending on flow rate)	Mechanical Mixer	Sodium Hypochlorite	Liquid alum or PACL, NIP polymer or PACL	3 stage tapered variable speed vertical flocculator	30	120	4 dual media gravity filters	5.9	Sodium Hypochlorite
Sunset	8 mgd	4.32 mgd	Conventional	Mechanical Mixer and Static Mixer	Sodium Hypochlorite	Liquid aluminum sulfate and NIP polymer	Single paddle energy zone	25	160	2 dual media gravity filters	2.9	Sodium Hypochlorite

***Using sodium hypochlorite as pre-oxidant is no longer normal practice, however, injection point exists for emergency use only**

gpm - gallons per minute DT = Detention Time gpm/ft^2 = gallons per minute per square foot

Table 5-2
Nevada Irrigation District Water Treatment Plants - Design Information

WTP	Design Flow (mgd)	Average Flow (mgd)	Type of Plant	Flash-Mix Type	Pre-oxidant Used	Coagulant and Coagulant Aid Used	Flocculator Type	Floc. DT (min.)	Sed. DT (min.)	Filter Type	Filtration Rate (gpm/sf)	Primary Disinfectant
Elizabeth George	18	4	Conventional	Adjustable Mechanical Flash Mixer	Sodium Hypochlorite	Alum with Caustic	Horizontal Paddle	20 @ max flow	52 min	2 cluster-type (4 cells each) dual media gravity filter	6	Sodium Hypochlorite
Loma Rica	8.3	3	Conventional	Adjustable Mechanical Flash Mixer	Sodium Hypochlorite	Alum with Caustic	Horizontal Paddle	30min	4.5 hours	4 dual media pressure filters	6	Sodium Hypochlorite
Lake of the Pines	5	1.3	Conventional	Adjustable Mechanical Flash Mixer	Sodium Hypochlorite	Alum with Caustic	Pulsator-Upflow Clarifier	Floc and Sed in same basin	46 min	2 tri media gravity filters	6	Sodium Hypochlorite
Lake Wildwood	4	1.5	Conventional	Partial Mechanical Mixer	Sodium Hypochlorite	Alum with Caustic	– Circular Steel Upflow Clarifier.	Floc and Sed in same basin	2.3 hours	4 dual media gravity filters	6	Sodium Hypochlorite
North Auburn	6	2.5	Conventional	Adjustable Mechanical Flash Mixer	Sodium Hypochlorite	Alum with Caustic	Upflow Clarifier	Floc and Sed in same basin	91 min	2 dual media gravity filters	6	Sodium Hypochlorite
Smartsville	0.085	0.037	Conventional	Inline static mixer	None	100% Clarion or Alum with Soda Ash	Contact Tank	13.5 min	78 min	2 dual media pressure filters	1.5	Sodium Hypochlorite

PLACER COUNTY WATER AGENCY WATER TREATMENT PLANTS

Alta Water Treatment Plant

System Description

The raw water intake location for the Alta WTP is located in the Alta Forebay, a small impoundment at the end of Pacific Gas and Electric's (PG&E) Towle Canal. The Alta WTP is located on the ridge between the Bear River and the North Fork of the American River along Interstate 80 in Placer County about 30 miles northeast of Auburn. Alta has been classified as a direct filtration plant by the State Water Resources Control Board, Division of Drinking Water (DDW). The plant design flow is 356 gallons per minute (gpm), with average flows at 217 gpm.

Polyaluminum chlorohydrate is added as coagulant to the influent water. Chemicals are mixed by a static mixer, and the coagulated water enters an adsorption clarifier (contact flocculator). The clarified water, which has a maximum turbidity control point of 0.45 nephelometric turbidity units (NTU), is then filtered through three vertical dual media pressure filters. The filter loading rate is 5.0 gallons per minute/square foot (gpm/sf).

The filters are backwashed based on uniform filter run volumes (UFRV). Backwash water is recycled after settling in a 24,000-gallon tank, and recycle rates are kept below 10 percent of total plant flow. The plant has filter-to-waste capability after backwash and plant start-up. The filtered water is disinfected with sodium hypochlorite, and stored in one of two 100,000-gallon tank to meet contact time (CT) requirements. The average residual leaving the plant is 0.64 to 1.0 milligrams per liter (mg/L).

Highlight of Changes Since 2021 Update

During the study period the prefilter piping was cleaned to address hydraulic limitation on plant capacity. In June 2026, the section of the forebay closest to the Alta WTP was dredged for debris removal to improve water flow to the PG&E penstock and to the Alta WTP. Plans to dredge/clean the entire reservoir are being planned between PG&E and PCWA at a date to be determined. A feasibility study is also being conducted to move the Canyon Creek diversion to the north side of Interstate 80 to eliminate the potential for chemical spills caused by truck accidents. PCWA is also in the design phase to add a Towle Canal diversion which would allow for direct feed to the Alta WTP and bypass the reservoir if it became contaminated.

Significant Potential Contaminating Activities

The Alta WTP is located furthest upstream in the watershed. It diverts water from the Alta Forebay. In the upper watershed above Lake Spaulding, recreational use is heavy as well as timber harvesting, limited grazing, and seasonal discharge from the Donner Summit Public Utilities District Wastewater Treatment Plant (WWTP). More significant is the local drainage received into the Towle Canal and Alta Forebay from Canyon Creek. It is possible for runoff

from Interstate 80 and the railroad tracks to enter the receiving water, making spills a potential significant concern as it includes constituents that are not easily amenable to conventional filtration and could occur at any hour of the day with limited, if any, spill notification.

The upper watershed supply into the Drum Canal was impacted by outages at Lake Spaulding Powerhouse from March through July 2024 and again in March through July 2025. Water from Lake Spaulding was not able to be delivered due to power house repairs and the flows in the Drum Canal were largely from Lake Valley Canal and local flows into the downstream canal system and Canyon Creek.

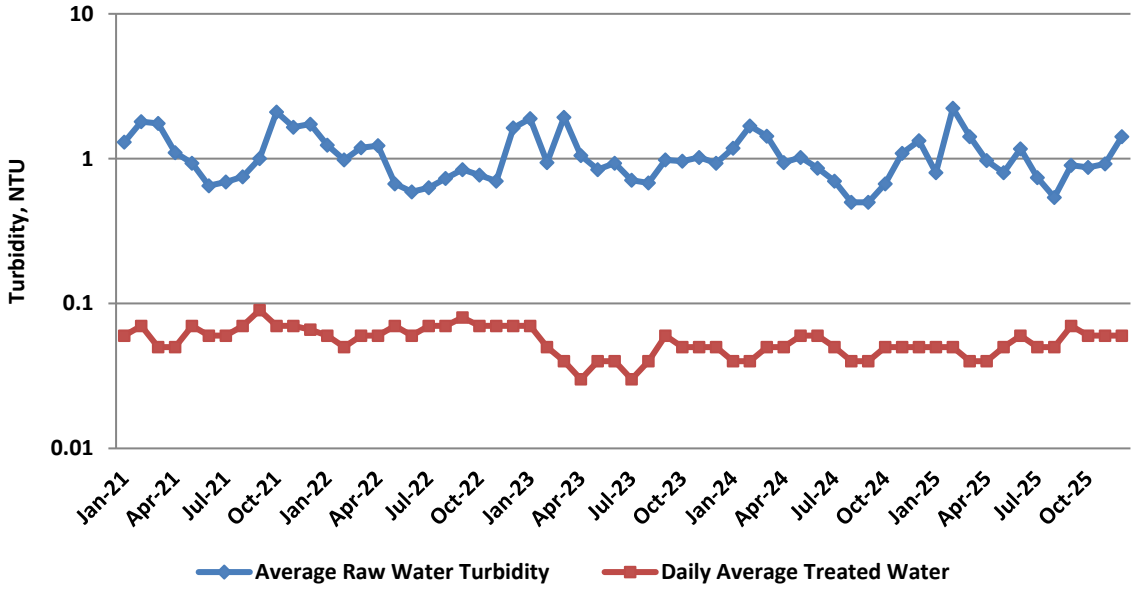
Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

Turbidity

The average raw water turbidity at Alta WTP for the period of study was 1.1 NTU, and on average the treatment process decreased this to 0.06 NTU, which equates to an average removal of solids of 94.8 percent. **Figure 5-1** shows a timeseries plot of raw and treated turbidities. There is a distinct raw water seasonal trend with peaks during winter months. Alta WTP meets all current turbidity standards. It should be noted that the raw water turbidities plotted are a monthly average of daily grab samples. The treated water turbidities are a monthly average of daily samples, where the daily average is an average of all 4-hour (hr) samples taken in a 24 hour period.

Figure 5-1. Alta WTP – Raw and Treated Water Turbidity, 2021-2025



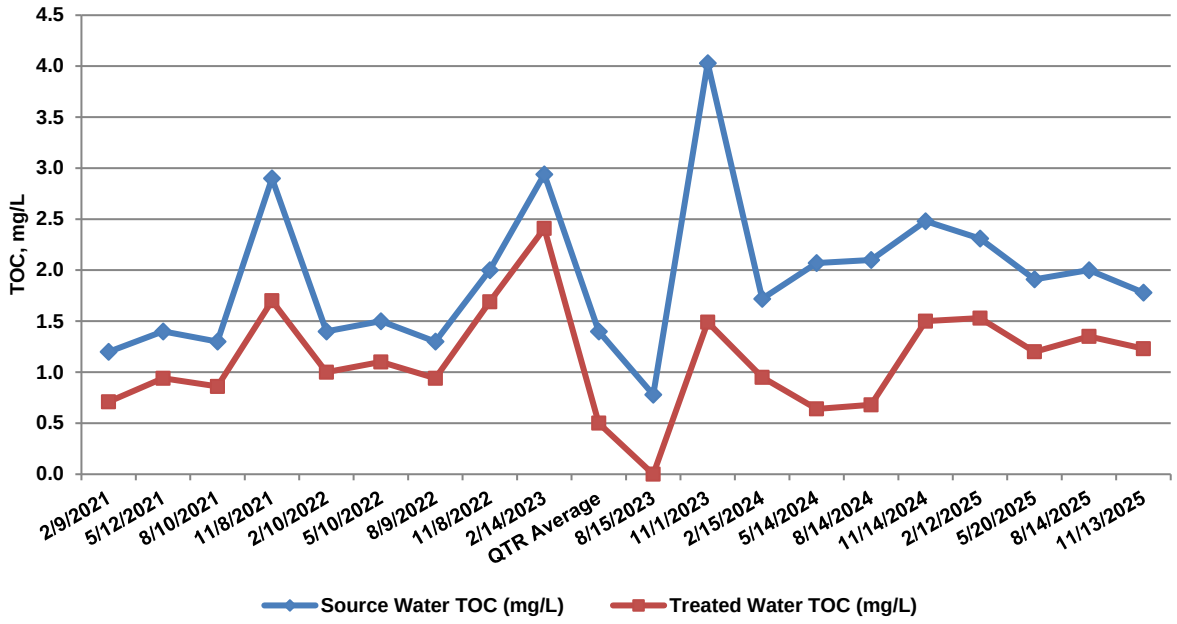
Microbiological Constituent

There were no positive coliform samples in the distribution system during the period of study.

Disinfection By-Products

PCWA monitors alkalinity and total organic carbon (TOC) levels in its raw water and TOC levels in its treated water quarterly in order to determine TOC removal compliance. The average raw and treated water TOC levels at Alta WTP were 1.9 mg/L and 1.1 mg/L, respectively, equating to 41.7 percent average removal. Since all of the treated TOC running annual averages (RAA) were less than 2.0 mg/L, no TOC removal calculation is required for the Alta WTP. **Figure 5-2** shows a timeseries plot of raw and treated water TOC at Alta WTP. Peak raw water TOC levels typically occur during the wet season (November to February).

Figure 5-2. Alta WTP, Total Organic Carbon, 2021-2025



Stage 2 D/DBP Rule Compliance Period

PCWA began Stage 2 D/DBP monitoring in December 2013. PCWA is continuing to use the Stage 1 monitoring location for compliance monitoring under Stage 2 D/DBPR. Although two locations are required to be monitored, Section 141.605 of the Stage 2 D/DBPR allows that Subpart H systems less than 3,300 population and on quarterly monitoring, may use one site with a dual sample (both total trihalomethanes (TTHM) and haloacetic acids (HAA5)) if the peak concentration of DBPs are expected to occur at the same time. TTHM locational running annual averages (LRAAs) ranged from 39.8 to 59.3 micrograms per liter (µg/L) and HAA5 LRAAs ranged from 19.9 to 37.5 µg/L. Based on available data over the reporting

period, TTHM and HAA5 LRAAs were below the respective Maximum Contaminant Levels (MCLs) of 80 and 60 µg/L per the Stage 2 Disinfectants/Disinfection By-Products Rule (D/DBPR).

Other Detectable Title 22 Constituents of Interest

Based on a review of the 2021 to 2025 Consumer Confidence Reports (CCRs), there are no other detectable Title 22 constituents of interest. Lead and Copper Rule sampling in 2022 resulted in a high 90th percentile (12 µg/L) and one distribution system site above the Action Level. Subsequent investigation by PCWA determined that the site was a vacation home with stagnant water and follow up samples were non-detect.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* data presented in **Section 3,** 3/4-log reduction of *Giardia*/virus continues to be appropriate reduction requirements for the Alta WTP under the SWTR. Under the second round of the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) the source water for the Alta WTP was classified as Bin 1 in 2018.

The Alta WTP is classified as a direct filtration plant, and currently receives reduction credit for 2.0-log *Giardia,* 1.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with sodium hypochlorite provides 1.0-log credit for *Giardia* and 3.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Long Term 1 ESWTR, and the LT2ESWTR.

Regulatory Compliance Evaluation

PCWA has been monitoring the raw and treated water for the Alta WTP for all required Title 22 compliance constituents. **Table 5-3** lists the existing drinking water regulations and a compliance evaluation for these standards at the Alta WTP. The Alta WTP is currently in compliance with existing regulations.

Table 5-3
Regulatory Compliance Evaluation
Placer County Water Agency – Alta WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No MCLs exceeded based on review of the CCRs.
SWTR	Microbial and Turbidity	Data continue to support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Long Term 1 ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in treated water. Therefore, not required to implement enhanced coagulation for TOC removal.
Long Term 2 ESWTR	Microbial	Classified as Bin 1, from second round of monitoring for *E. coli*.
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively).

Monte Vista Water Treatment Plant

System Description

The raw water intake location for the Monte Vista WTP is located off the Cedar Creek Canal at station 128+60, approximately 2.4 miles downstream from Lake Alta. Monte Vista has been classified as a direct filtration plant by DDW. The plant design flow is 85 gpm, with average flows at 35 to 40 gpm.

Polyaluminum chlorohydrate is added as coagulant to the influent water. Soda ash is added for alkalinity adjustment. Chemicals are mixed by a static mixer, and the coagulated water enters an adsorption clarifier (contact flocculator). The clarified water is then filtered through one vertical dual media pressure filter. The filter loading rate is three gpm/sf.

The filters are backwashed based on UFRV. Backwash water is recycled after settling in a 5,700-gallon tank. The plant has filter to waste capability after backwash or plant start-up. The filtered water is disinfected with sodium hypochlorite, and stored in a 60,000-gallon tank to meet CT requirements. The average residual leaving the plant is 0.6 to 1.1 mg/L.

Highlight of Changes Since 2021 Update

During the study period a new 100,000 gallon steel clearwell, new emergency generator and associated automatic transfer switch (ATS) were installed. Additionally, a prefilter was installed to maintain feed for residential customers, however it is not a true redundant backup of the original filter.

Significant Potential Contaminating Activities

The Monte Vista WTP is located downstream from the Alta Forebay and Lake Alta. Similar to the Alta WTP, recreational use, timber harvesting, limited grazing, and wastewater discharge occur in the upper watershed above Lake Spaulding and the possibility for spills entering the receiving water for Canyon Creek, Lake Alta, and Alta Forebay are of significant concern. The Monte Vista WTP was also impacted by the Lake Spaulding Powerhouse outages, similar to the Alta WTP described previously. The supply system between Alta and Monte Vista WTPs is largely open, earthen canals or natural water courses that could potentially be impacted by localized activities.

Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

Turbidity

The average raw water turbidity at Monte Vista WTP for the period of study was 3.8 NTU, and on average the treatment process decreased this to 0.05 NTU, which equates to an average removal of solids of 98.8 percent. **Figure 5-3** shows a timeseries plot of raw and treated water turbidities. Monte Vista WTP meets all current turbidity standards. It should be noted that the raw water turbidities plotted are a monthly average of daily grab samples. The treated water turbidities are a monthly average of a daily average, which is based on samples taken every four hours in a 24 hour period.

Microbiological Constituent

There were no positive coliform samples in the distribution system during the period of study.

Disinfection By-Products

PCWA monitors alkalinity and TOC levels in its raw water and TOC levels in its treated water quarterly in order to determine TOC removal compliance. The average raw and treated water TOC levels at Monte Vista WTP were 1.8 mg/L and 1.1 mg/L, respectively, equating to 36.6 percent average removal. Since all of the treated water TOC RAAs were less than 2.0 mg/L, no TOC removal calculation is required for the Monte Vista WTP. **Figure 5-4** shows a

timeseries plot of raw and treated water TOC at Monte Vista WTP. Peak raw water TOC levels typically occur during the wet season (November to February).

Figure 5-3. Monte Vista WTP – Raw and Treated Water Turbidity, 2021-2025

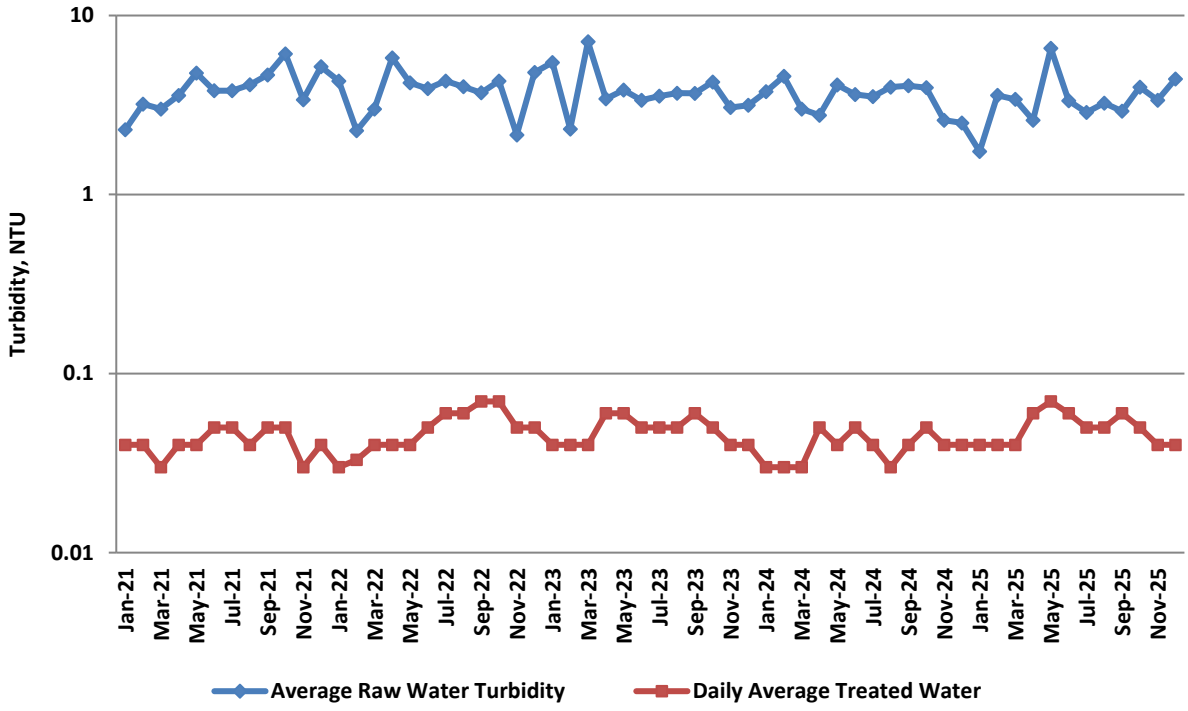
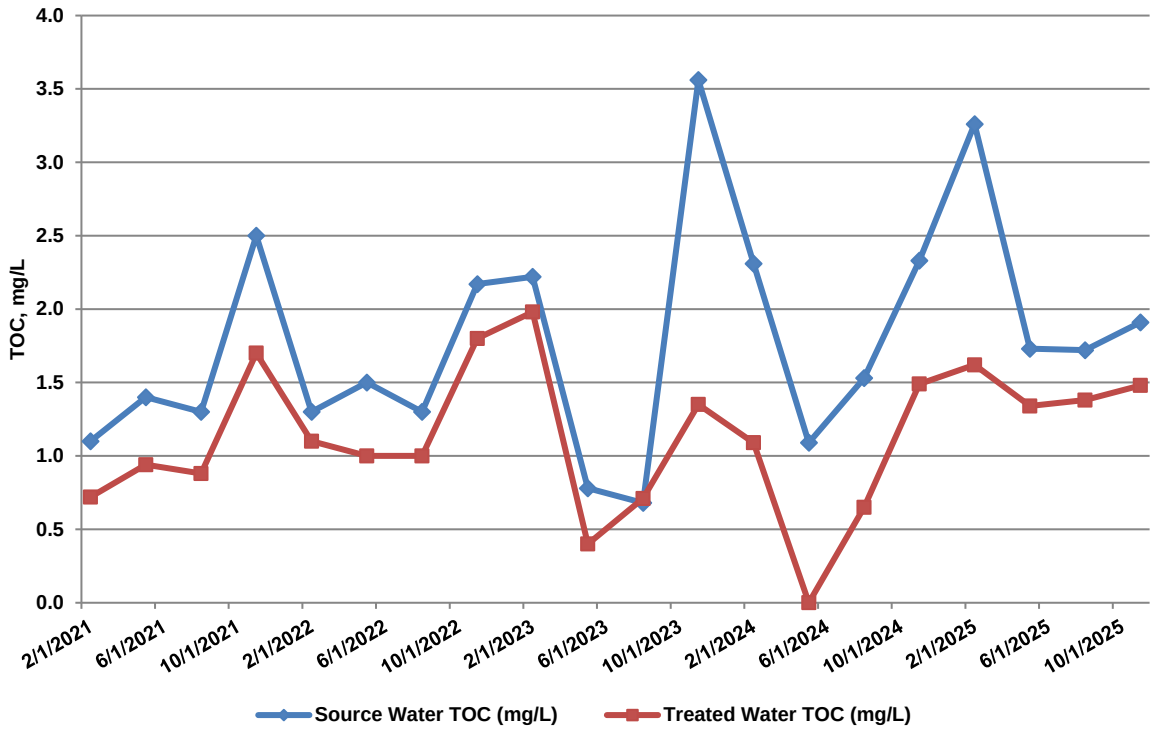


Figure 5-4. Monte Vista WTP, Total Organic Carbon, 2021-2025



Stage 2 D/DBP Rule Compliance Period

PCWA submitted an official Stage 2 D/DBP monitoring plan in September 2013. PCWA monitors annually for THM and HAA5 at one site in the distribution system. TTHM LRAAs ranged from 34 to 58 µg/L and HAA5 LRAAs ranged from 16.4 to 30.3 µg/L. Based on data over the reporting period, TTHM and HAA5 LRAAs were below the respective MCLs per the Stage 2 D/DBPR.

Other Detectable Title 22 Constituents of Interest

Based on a review of the 2021 to 2025 CCRs, detectable odor, below the secondary MCL, was found in 2024 and attributed to a redwood treated water tank. The 2024 CCR notes that the tank is being replaced with a steel tank and anticipates that odors may be reduced or eliminated.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* data presented in **Section 3**, 3/4-log reduction of *Giardia*/virus continues to be appropriate reduction requirements for the Monte Vista WTP under the SWTR. Under the second round of the LT2ESWTR the source water for the Monte Vista WTP was classified as Bin 1 in 2018.

The Monte Vista WTP is classified as a direct filtration plant, and currently receives reduction credit for 2.0-log *Giardia,* 1.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with sodium hypochlorite provides 1.0-log credit for *Giardia* and 3.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Long Term 1 ESWTR, and the LT2ESWTR.

Regulatory Compliance Evaluation

PCWA has been monitoring the raw and treated water for the Monte Vista WTP for all required Title 22 compliance constituents. **Table 5-4** lists the existing drinking water regulations and a compliance evaluation for these standards at the Monte Vista WTP. The Monte Vista WTP is currently in compliance with existing regulations.

Table 5-4
Regulatory Compliance Evaluation
Placer County Water Agency – Monte Vista WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No MCLs exceeded based on review of the CCRs.
SWTR	Microbial and Turbidity	Data continue to support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Long Term 1 ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in treated water. Therefore, not required to implement enhanced coagulation for TOC removal.
Long Term 2 ESWTR	Microbial	Classified as Bin 1 from second round of *E. coli* monitoring.
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively).

Colfax Water Treatment Plant

System Description

The raw water intake location for the Colfax WTP is located off the Upper Boardman Canal at station 704+62, approximately at the corner of Rollins Lake Road and Highway 174. Colfax is a conventional water treatment plant. The plant design flow is 1.244 million gallons per day (mgd), with average flows at 0.57 mgd.

Aluminum sulfate (alum) is the primary coagulant. Powdered activated carbon is fed only when conditions warrant its use. Chemicals are mixed by a hydraulic jump and a mechanical flash mixer. The coagulated water enters a five stage tapered hydraulic energy flocculation basin, with a detention time of 23.2 minutes and then into a serpentine sedimentation basin with a detention time of six hours. The clarified water is then filtered through two horizontal dual media pressure filters. The filter loading rate is 3.0 gpm/sf. Polyaluminum chloride is used as a filter aid in the winter, and a non-ionic polymer is used in the summer.

The filters are backwashed on an as needed basis. Backwash water is recycled to rapid mix after settling in a backwash pond. The plant has filter to waste capability after backwash or plant start-up. The filtered water is disinfected with sodium hypochlorite, and stored in two

tanks, one at 0.3 million gallons (mg) and one at 1.0 mg, to meet CT requirements. The average residual leaving the plant is 1.0 mg/L.

Highlight of Changes Since 2021 Update

No changes were made to the water treatment processes during the reporting period.

Significant Potential Contaminating Activities

The Colfax WTP diverts off the Upper Boardman Canal upstream of Colfax. The Colfax WTP was also impacted by the Lake Spaulding Powerhouse outages, similar to the Alta WTP described previously. The supply system between Monte Vista and Colfax WTPs is largely open, earthen canals or natural water courses that could potentially be impacted by localized activities. This includes all the vulnerabilities from the Monte Vista WTP diversion, as well as limited development, runoff, and access to the canal downstream of the Monte Vista WTP. There are residences in proximity of the intake.

Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

Turbidity

The average raw water turbidity at Colfax WTP for the period of study was 5.1 NTU, and on average the treatment process decreased this to 0.04 NTU, which equates to an average removal of solids of 99.2 percent. **Figure 5-5** shows a timeseries plot of raw and treated water turbidities. Colfax WTP meets all current turbidity standards. It should be noted that the raw water turbidities plotted are a monthly average of daily grab samples. The treated water turbidities are a monthly average of a daily average, which is based on samples taken every four hours in a 24 hour period.

Microbiological Constituent

There were no positive coliform samples in the distribution system during the period of study.

Disinfection By-Products

PCWA monitors alkalinity and TOC levels in its raw water and TOC levels in its treated water quarterly in order to determine TOC removal compliance. The average raw and treated water TOC levels at Colfax WTP were 1.7 mg/L and 1.0 mg/L, respectively, equating to 38.7 percent average removal. Since all of the treated TOC RAAs were less than 2.0 mg/L, no TOC removal calculation is required for the Colfax WTP. **Figure 5-6** shows a timeseries plot of raw and treated water TOC at Colfax WTP. Peak raw water TOC levels typically occur during the wet season (November to February).

Figure 5-5. Colfax WTP – Raw and Treated Water Turbidity, 2021-2025

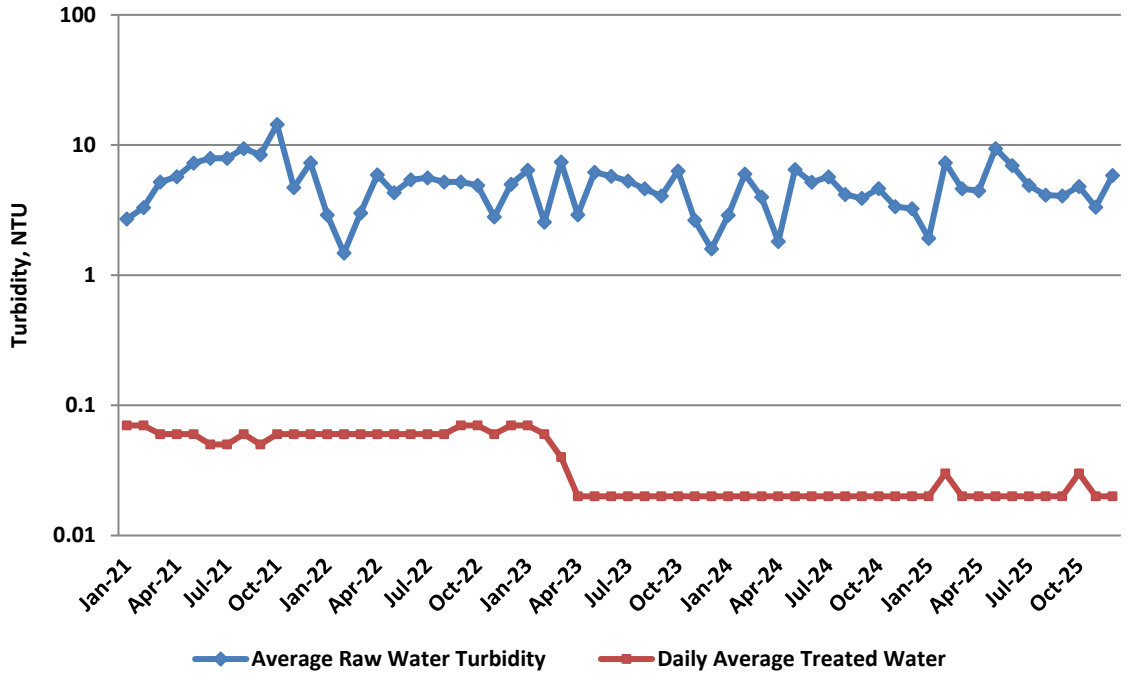
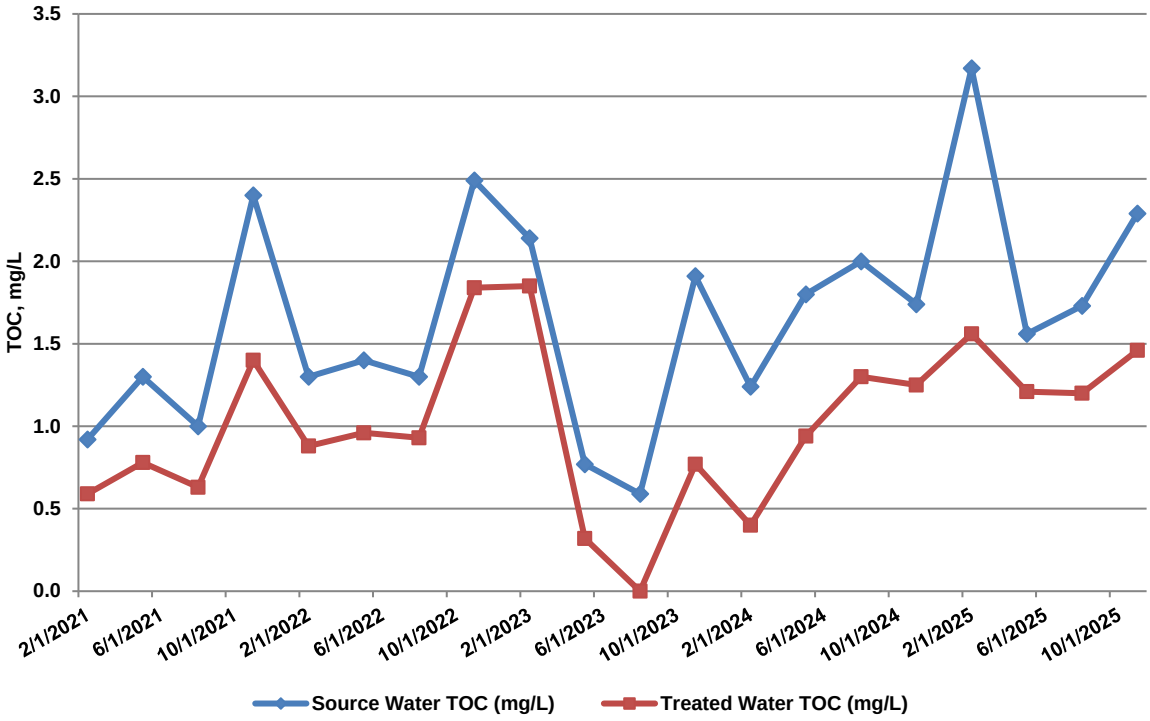


Figure 5-6. Colfax WTP, Total Organic Carbon, 2021-2025



Stage 2 D/DBP Rule Compliance Period

PCWA began Stage 2 D/DBP monitoring in February 2013. PCWA is continuing to use the Stage 1 monitoring location for compliance monitoring under Stage 2 D/DBPR. TTHM LRAAs ranged from 27.3 to 63.3 µg/L and HAA5 LRAAs ranged from 20.0 to 46.5 µg/L. Based on available data over the reporting period, TTHM and HAA5 LRAAs are below the respective MCLs per the Stage 2 D/DBPR.

Other Detectable Title 22 Constituents of Interest

As reported in the 2023 CCR, odor was detected at 3 units, which is equal to the secondary MCL of 3 units. As reported in the 2025 CCR, iron ranged from non-detect (ND) to 230 µg/L, with an average of 115 µg/L. The secondary MCL is 300 µg/L.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* data presented in **Section 3**, 3/4-log reduction of *Giardia*/virus continues to be appropriate reduction requirements for the Colfax WTP under the SWTR. Under the second round of the LT2ESWTR the source water for the Colfax WTP was classified as Bin 1 in 2018.

The Colfax WTP is classified as a conventional filtration plant, and currently receives reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with sodium hypochlorite provides 0.5-log credit for *Giardia* and 2.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Long Term 1 Enhanced SWTR, and the LT2ESWTR.

Regulatory Compliance Evaluation

PCWA has been monitoring the raw and treated water for the Colfax WTP for all required Title 22 compliance constituents. **Table 5-5** lists the existing drinking water regulations and a compliance evaluation for these standards at the Colfax WTP. The Colfax WTP is currently in compliance with existing regulations.

Table 5-5
Regulatory Compliance Evaluation
Placer County Water Agency – Colfax WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No MCLs exceeded based on review of the CCRs.
SWTR	Microbial and Turbidity	Data continue to support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Long Term 1 ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in treated water. Therefore, not required to implement enhanced coagulation for TOC removal.
Long Term 2 ESWTR	Microbial	Classified as Bin 1, from second round of monitoring for *E. coli.*
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively).

Weimar Water Treatment Plant

System Description

PCWA began coordinated operations of the Weimar WTP and distribution system in February 2023, amended the water supply permit in June 2023, and formally acquired the system on October 2, 2023. Some water quality data is available for 2023 from the previous owner of the system. The raw water intake location for the Weimar WTP is located off the Upper Boardman Canal at station 1089+70, approximately between Orchard Lane and Snooks Road. Weimar is a conventional water treatment plant. The plant design flow is 1 mgd, with average summer flows at 0.53 mgd.

Weimar WTP consists of a conventional rapid mix, flocculation and sedimentation process. Raw water for the plant is pumped from the Upper Boardman Canal and into pipe that moves the water approximately 150 yards uphill to the plant holding pond where soda ash can be injected for alkalinity and pH adjustment. The water travels through the rapid mix/flocculation chamber and is treated using PACL as a coagulant. The flocculation detention time is 37 minutes. The coagulated water enters a circular clarifier for sedimentation with a detention time of 98 minutes. The total volume of the rapid mix/flocculation chamber is 25,600 gallons and sedimentation segment of the conventional

process is 68,000 gallons. The clarified water is then filtered through two dual media filters. The filter loading rate is 1.8 gpm/sf. The water from the filters flows into the 21,000 gallon clear well where the water receives its sodium hypochlorite and zinc orthophosphate. Water from the clear well is pumped into five treated water storage tanks with a capacity of approximately 1.25 mg.

Significant Potential Contaminating Activities

The Weimar WTP diverts off the Upper Boardman Canal at Weimar. The Weimar WTP was also impacted by the Lake Spaulding Powerhouse outages, similar to the Alta WTP described previously. The supply system between Colfax and Weimar WTPs is largely open, earthen canals or natural water courses that could potentially be impacted by localized activities. This includes all the vulnerabilities from the Colfax WTP, as well as low density rural development between Colfax and Weimar.

Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

Turbidity

The average raw water turbidity at Weimar WTP from January 2024 to December 2025 was 3.4 NTU, and on average the treatment process decreased this to 0.05 NTU, which equates to an average removal of solids of 98.4 percent. **Figure 5-7** shows a timeseries plot of raw and treated water turbidities. Weimar WTP meets all current turbidity standards. It should be noted that the raw water turbidities plotted are a monthly average of daily grab samples. The treated water turbidities are a monthly average of a daily average, which is based on samples taken every four hours in a 24 hour period.

Microbiological Constituent

There were no positive coliform samples in the distribution system during the period of study.

Disinfection By-Products

PCWA monitors alkalinity and TOC levels in its raw water and TOC levels in its treated waters quarterly in order to determine TOC removal compliance. The average raw and treated water TOC levels at Weimar WTP from 2023 through 2025 were 1.7 mg/L and 1.2 mg/L, respectively, equating to 29.0 percent average removal. Since all of the TOC RAAs for both source and treated waters were less than 2.0 mg/L, no TOC removal calculation is required for the Weimar WTP. **Figure 5-8** shows a timeseries plot of raw and treated water TOC at Weimar WTP. There are no specific temporal trends.

Figure 5-7. Weimar WTP – Raw and Treated Water Turbidity, 2024-2025

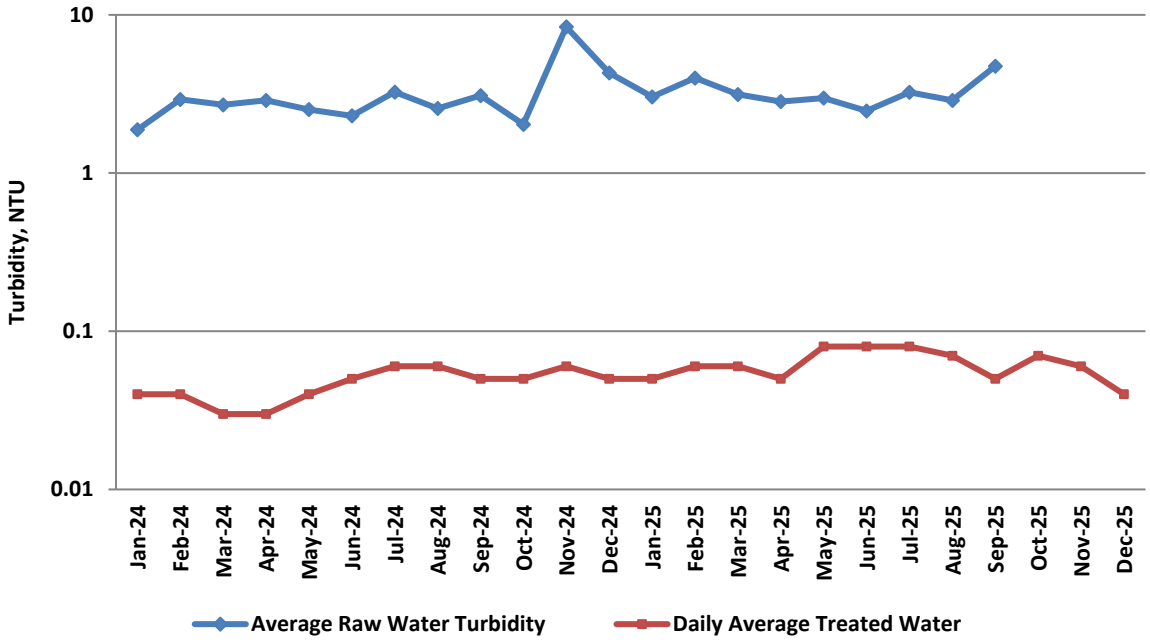
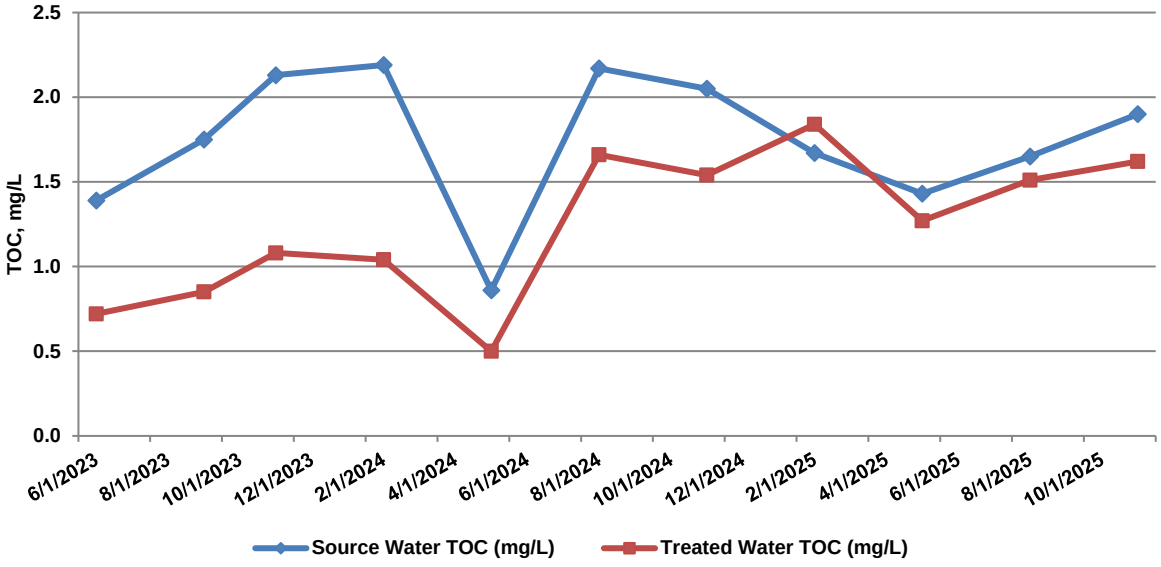


Figure 5-8. Weimar WTP, Total Organic Carbon, 2023-2025



Stage 2 D/DBP Rule Compliance Period

PCWA began Stage 2 D/DBP monitoring in March 2023. TTHM LRAAs ranged from 32.0 to 50.3 µg/L and HAA5 LRAAs ranged from 29.3 to 38.8 µg/L. Based on available data over the reporting period, TTHM and HAA5 LRAAs are below the respective MCLs per the Stage 2 D/DBPR.

Other Detectable Title 22 Constituents of Interest

As reported in the 2023, 2024 and 2025 CCR, the average for aluminum was 143 µg/L, 192 µg/L, and 267 µg/L, respectively. The secondary MCL is 200 µg/L. There were no similar detects at the water treatment plants upstream or downstream on the Upper Boardman Canal. Quarterly monitoring was initiated in late 2025. There have been no detects of treated water aluminum above the secondary MCL in the quarterly monitoring conducted since August 2025.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* data presented in **Section 3**, 3/4-log reduction of *Giardia*/virus is the appropriate reduction requirements for the Weimar WTP under the SWTR.

Weimar WTP was classified as a Schedule 4 system under the first round of LT2 monitoring and submitted grandfathered data in August 2008. Two additional samples were required and were collected. As the average level of *E.coli* in the raw water was 24 MPN/100 mL, less than the trigger level of 100 MPN/100mL for flowing streams, no *Cryptosporidium* monitoring was required and the source was classified as Bin 1. A second round of LT2 monitoring was planned to be conducted in 2018, prior to PCWA ownership of this water system. For this 2026 Update, PCWA asked DDW to provide historical records for the second round of LT2 monitoring for the Weimar WTP source. No specific data was able to be provided by DDW, but inspection reports indicate that a Bin 1 classification was awarded. Therefore, it is assumed that Round 2 results reflected Round 1 results, and that Weimar WTP continues its Bin 1 classification. A review of the source water *E. coli* data for the Weimar WTP influent shows that the maximum running annual average from October 2022 through December 2025 was 44.1 MPN/100 mL, which also confirms a Bin 1 classification.

The Weimar WTP is classified as a conventional filtration plant, and currently receives reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with sodium hypochlorite provides 0.5-log credit for *Giardia* and 2.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Long Term 1 Enhanced SWTR, and the LT2ESWTR.

Regulatory Compliance Evaluation

PCWA has been monitoring the raw and treated water for the Weimar WTP for all required Title 22 compliance constituents. **Table 5-6** lists the existing drinking water regulations and a compliance evaluation for these standards at the Weimar WTP. The Weimar WTP is currently in compliance with existing regulations.

Table 5-6
Regulatory Compliance Evaluation
Placer County Water Agency – Weimar WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No primary MCLs exceeded based on review of the CCRs. The secondary MCL for aluminum was exceeded in 2025, but there have been no exceedances in the quarterly treated water data since.
SWTR	Microbial and Turbidity	Data support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Long Term 1 ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in source and treated water. Therefore, not required to implement enhanced coagulation for TOC removal.
Long Term 2 ESWTR	Microbial	Classified as Bin 1, from first round of monitoring for *E. coli.*
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively).

Applegate Water Treatment Plant

System Description

The raw water intake location for the Applegate WTP is located off the Upper Boardman Canal downstream of Pinecrest Road. Applegate is a microfiltration membrane plant. The plant design flow is 50 gpm, with average flows at 7 gpm.

No pre-oxidation or coagulants are needed. The influent water enters two Memcor microfiltration units, with six membrane modules each. The loading rate is approximately 0.05 gpm/sf. The membranes are backwashed with compressed air to remove particulate matter off the membrane every 20 minutes. The backwash water goes to a 200-gallon backwash waste tank and is not recycled. After about 1,000 hours of run time, a maintenance wash using caustic soda and citric acid is performed.

The filtered water is disinfected with sodium hypochlorite as the primary and residual disinfectant. The water is then stored in a 60,000-gallon tank to meet CT requirements. The average chlorine residual leaving the plant is 0.5 to 0.75 mg/L.

Highlight of Changes Since 2021 Update

During the study period, the 100,000 gallon clearwell was recoated.

Significant Potential Contaminating Activities

The Applegate WTP diverts off the Upper Boardman Canal at Applegate. The Applegate WTP was also impacted by the Lake Spaulding Powerhouse outages, similar to the Alta WTP described previously. The supply system between Weimar and Applegate WTPs is largely open, earthen canals or natural water courses that could potentially be impacted by localized activities. This includes all the vulnerabilities from the Weimar WTP, as well as low density rural development between Weimar and Applegate.

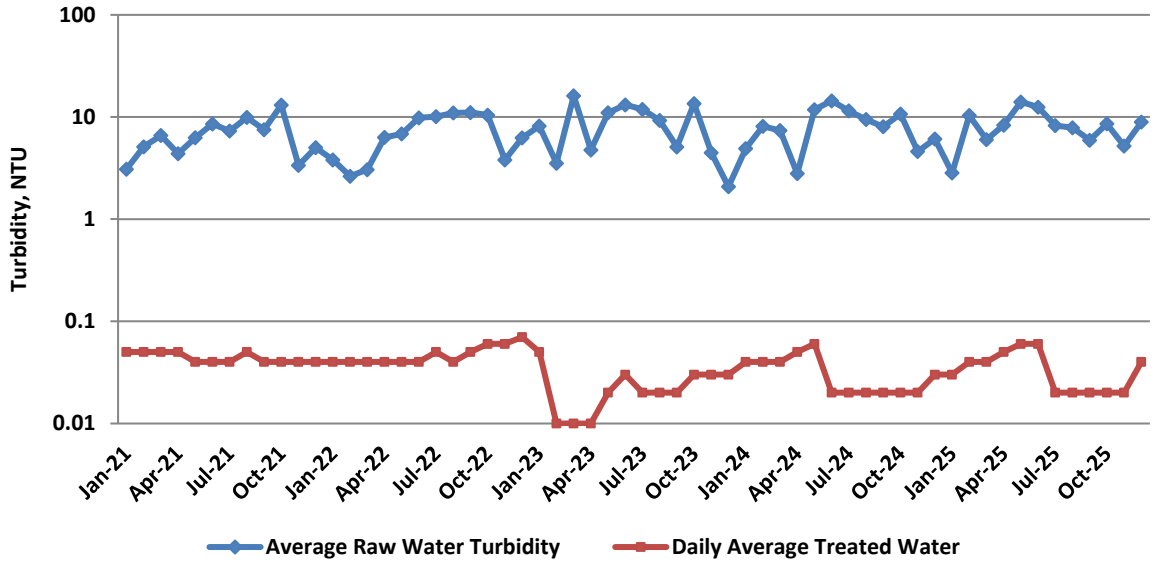
Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

Turbidity

The average raw water turbidity at Applegate WTP for the period of study was 7.8 NTU, and on average the treatment process decreased this to 0.04 NTU, which equates to an average removal of solids of 99.5 percent. **Figure 5-9** shows a timeseries plot of raw and treated water turbidities. Applegate WTP meets all current turbidity standards. It should be noted that the raw water turbidities plotted are a monthly average of daily grab samples. The treated water turbidities are a monthly average of a daily average, which is based on samples taken every four hours in a 24 hour period.

Figure 5-9. Applegate WTP – Raw and Treated Water Turbidity, 2021-2025



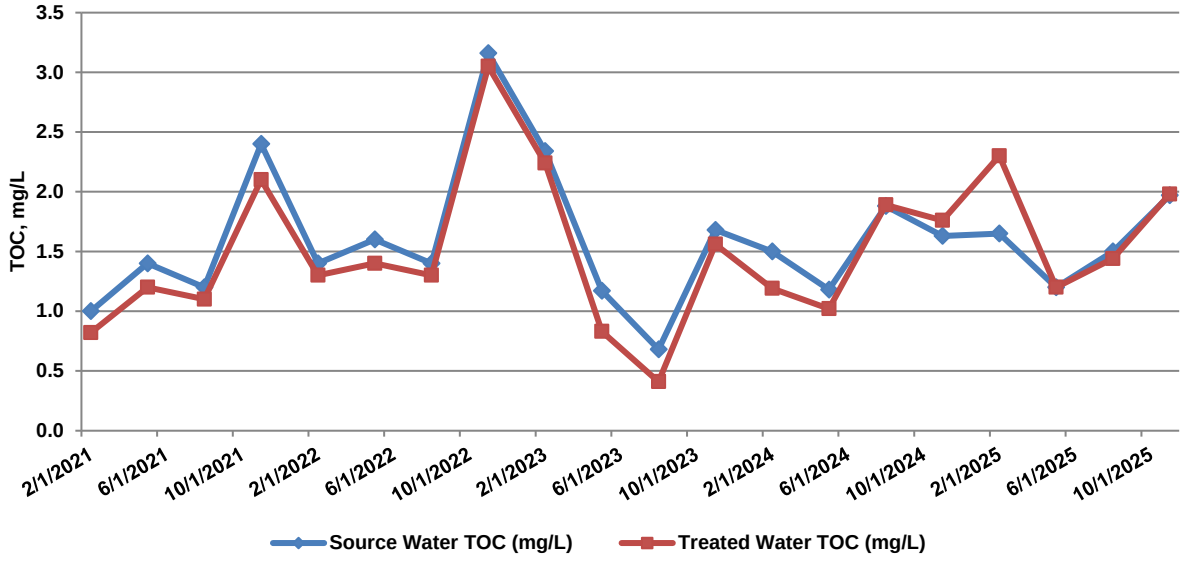
Microbiological Constituent

There were no positive coliform samples in the distribution system during the period of study.

Disinfection By-Products

PCWA monitors alkalinity and TOC levels in its raw water and TOC levels in its treated waters quarterly in order to determine TOC removal compliance. The average raw and treated water TOC levels at Applegate WTP were 1.6 mg/L and 1.5 mg/L, respectively, equating to 5.8 percent average removal. Membrane filtration plants are not required to comply with the enhanced coagulation requirements. **Figure 5-10** shows a timeseries plot of raw and treated water TOC at Applegate WTP. TOC levels in the raw water were generally at or below 2.0 mg/L, with two samples measured at 2.4 mg/L and 3.2 mg/L, in November 2021 and November 2022. Peak raw water TOC levels typically occur during the wet season (November to February).

Figure 5-10. Applegate WTP, Total Organic Carbon, 2021-2025



Stage 2 D/DBP Rule Compliance Period

PCWA began Stage 2 D/DBP monitoring in December 2013. TTHM LRAAs ranged from 42.8 to 72.5 µg/L and HAA5 LRAAs ranged from 13.9 to 26.8 µg/L. TTHM and HAA5 LRAAs are below the respective MCLs per the Stage 2 D/DBPR. However, the individual TTHM sample collected in the third quarter of 2024 was 98 µg/L. This high level triggered a TTHM Operational Evaluation Limit (OEL) under the Stage 2 D/DBP Rule in the third quarter of 2024. An OEL report was submitted, and the reason for the exceedance was a failure of the alarm system for the tank mixer, which is installed to reduce DBP formation.

Other Detectable Title 22 Constituents of Interest

As reported in the 2025 CCR, gross alpha was detected at 3.6 picocuries per liter (pCi/L). This is below the primary MCL of 15 pCi/L.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* data presented in **Section 3**, 3/4-log reduction of *Giardia*/virus continues to be appropriate reduction requirements for the Applegate WTP under the SWTR. Under the second round of the LT2ESWTR the source water for the Applegate WTP was classified as Bin 1 in 2018.

The Applegate WTP is classified as an alternative treatment technology, and currently receives reduction credit as a conventional plant for 4.0-log *Giardia,* 4.0-log *Cryptosporidium*, and 0.5-log viruses at 110 liter per hour per square meter, for physical removal. Applegate WTP is not currently receiving inactivation credit for the UV system, which is currently operated to reduce DBPs. Disinfection with sodium hypochlorite provides 0.5-log credit for *Giardia* and 3.5-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Long Term 1 ESWTR, and the LT2ESWTR.

Regulatory Compliance Evaluation

PCWA has been monitoring the raw and treated water for the Applegate WTP for all required Title 22 compliance constituents. **Table 5-7** lists the existing drinking water regulations and a compliance evaluation for these standards at the Applegate WTP. The Applegate WTP is currently in compliance with existing regulations.

Table 5-7
Regulatory Compliance Evaluation
Placer County Water Agency – Applegate WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No MCLs exceeded based on review of the CCRs.
SWTR	Microbial and Turbidity	Data continue to support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Long Term 1 ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	Not required to implement enhanced coagulation for TOC removal.
Long Term 2 ESWTR	Microbial	Classified as Bin 1, from second round of monitoring for *E. coli*.
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively). One TTHM OEL exceedance occurred in 3rd quarter of 2024.

Bowman Water Treatment Plant

System Description

The raw water intake location for the Bowman WTP is located off the Bowman Canal. Water is diverted from the Bear River Canal into an inverted siphon to Bowman Canal and passes through a PG&E staging area, above Halsey Forebay. The Bowman WTP consists of two separate treatment trains; Bowman WTP and Bowman Package WTP. They have common source and treated water quality results.

The Bowman WTP is a conventional water treatment plant. The plant design flow is 5.0 mgd, with average flows at 3.6 mgd. Alum and nonionic polymer are added as the primary coagulant and coagulant aid, respectively. Chemicals are mixed by a vertical turbine propeller. The coagulated water enters a three staged paddle wheel flocculation basin, with a detention time of 20.4 minutes and then into a sedimentation basin with a detention time of 20 minutes. The clarified water is then filtered through two tri media gravity filters. The filter loading rate is 5 gpm/sf. Non-ionic polymer is used as a filter aid as needed.

The filters are backwashed on an as needed basis, but production is usually limited to 24 hours. Backwash water and filter to waste flows to two reclaim settling ponds in series. Decant water from the second pond is returned to the plant, ahead of coagulation. The plant has filter to waste capability after backwash or plant start-up. The filtered water is disinfected with chlorine and stored in two clearwells, one at 1 mg and one at 10 mg, to meet CT requirements. The average residual leaving the plant is 1.0 mg/L.

The Bowman Package WTP consists of four-0.5 mgd CPC Microfloc package units. The plant design flow is 2.0 mgd, with an average flow of 2.0 mgd. The plant typically operates from April through October. Polyaluminum chloride is the primary coagulant. The coagulated water enters an adsorption clarifier which serves as both flocculation and sedimentation. The clarified water is then filtered through four dual media filters. The filter loading rate is 5.0 gpm/sf at 350 gpm per filter, and non-ionic polymer is used as a filter aid.

The filters are backwashed on an as needed basis, but production is usually limited to 24 hours. Backwash water and filter to waste flows to two reclaim settling ponds in series. Decant water from the second pond is returned to the plant, ahead of coagulation. The plant has filter to waste capability after backwash or plant start-up. The filtered water is disinfected with sodium hypochlorite and stored in two clearwells, one at 1 mg and one at 10 mg, to meet CT requirements. The average residual leaving the plant is approximately 0.9 mg/L.

Highlight of Changes Since 2021 Update

No changes were made to the water treatment processes during the reporting period. PCWA started using the ChemTrac Lab Charge Analyzer at the Bowman WTP, which provides a five minute jar test, providing the coagulant dose needed to achieve charge neutralization in under five minutes.

Significant Potential Contaminating Activities

The Bowman WTP receives water from the Bear River Canal upstream of Halsey Forebay. The water in the Bear River Canal comes from Rollins Lake, which is subject to significant recreation, timber harvesting, mining, as well as a wastewater discharge from the Cascade Shores WWTP. The supply system between Rollins Lake and the Bowman WTP is largely open, earthen canals or natural water courses that could potentially be impacted by localized activities. The Canal also crosses under Highway 174 and other local roads that could be a source for spills.

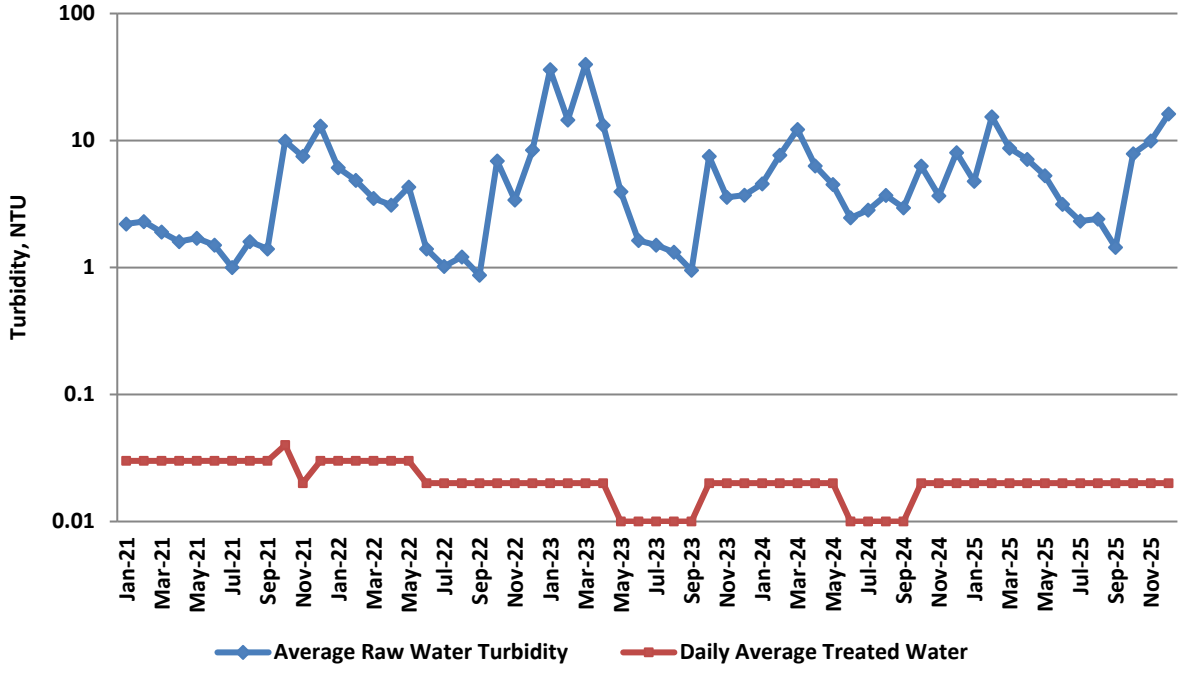
Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

Turbidity

The average raw water turbidity at Bowman WTP for the period of study was 6.1 NTU, and on average the treatment process decreased this to 0.02 NTU, which equates to an average removal of solids of 99.7 percent. **Figure 5-11** shows a timeseries plot of raw and treated water turbidities. There is a raw water seasonal trend with peaks during wet weather months. Bowman WTP meets all current turbidity standards. It should be noted that the raw water turbidities plotted are a monthly average of daily grab samples. The treated water turbidities are a monthly average of a daily average, which is based on samples taken every four hours in a 24 hour period.

Figure 5-11. Bowman WTP – Raw and Treated Water Turbidity, 2021-2025



Microbiological Constituent

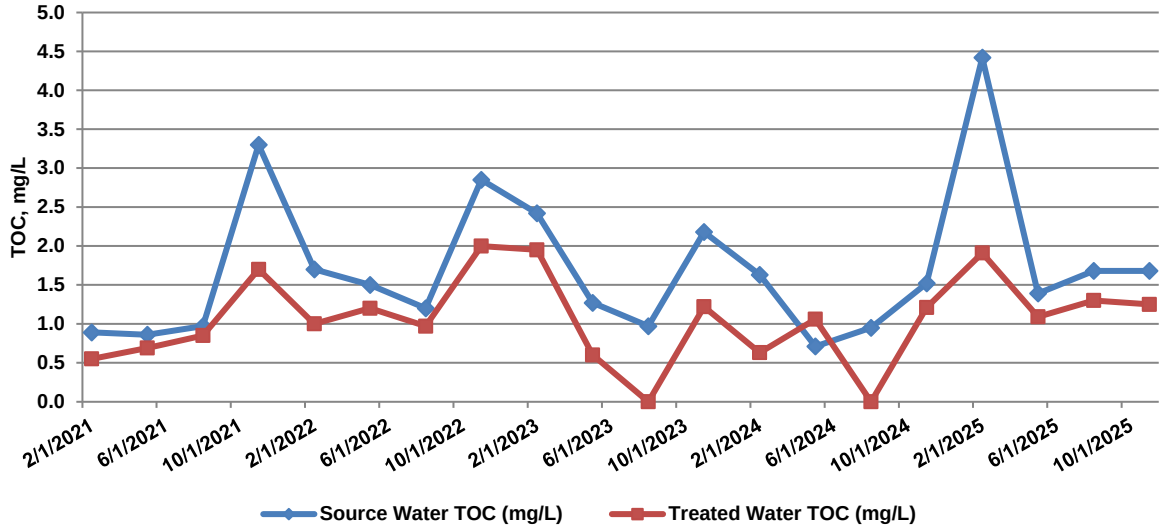
There were no positive coliform samples in the distribution system during the period of study.

Disinfection By-Products

PCWA monitors alkalinity and TOC levels in its raw water and TOC levels in its treated water quarterly in order to determine TOC removal compliance. The average raw and treated water TOC levels at Bowman WTP were 1.7 mg/L and 1.1 mg/L, respectively, equating to 37.9 percent average removal. Since all of the treated water TOC RAAs for were less than 2.0 mg/L, no TOC removal calculation is required for the Bowman WTP. **Figure 5-12** shows a timeseries plot of raw and treated water TOC at Bowman WTP. The highest raw water TOC

was 4.4 mg/L in February 2025. Peak raw water TOC levels typically occur during the wet season (November to February).

Figure 5-12. Bowman WTP, Total Organic Carbon, 2021-2025



Stage 2 D/DBP Rule Compliance Period

PCWA began monitoring the four Stage 2 D/DBP monitoring sites in November 2013. TTHM LRAAs ranged from 29.8 to 60.8 µg/L and HAA5 LRAAs ranged from 14.7 to 39.3 µg/L. The LRAAs are shown for TTHMs in **Figure 5-13** and HAA5 in **Figure 5-14**. TTHM and HAA5 LRAAs are below the respective MCLs per the Stage 2 D/DBPR.

Figure 5-13. LRAA TTHMs at Auburn Bowman Distribution System, Stage 2 D/DBP Data, 2021 – 2025

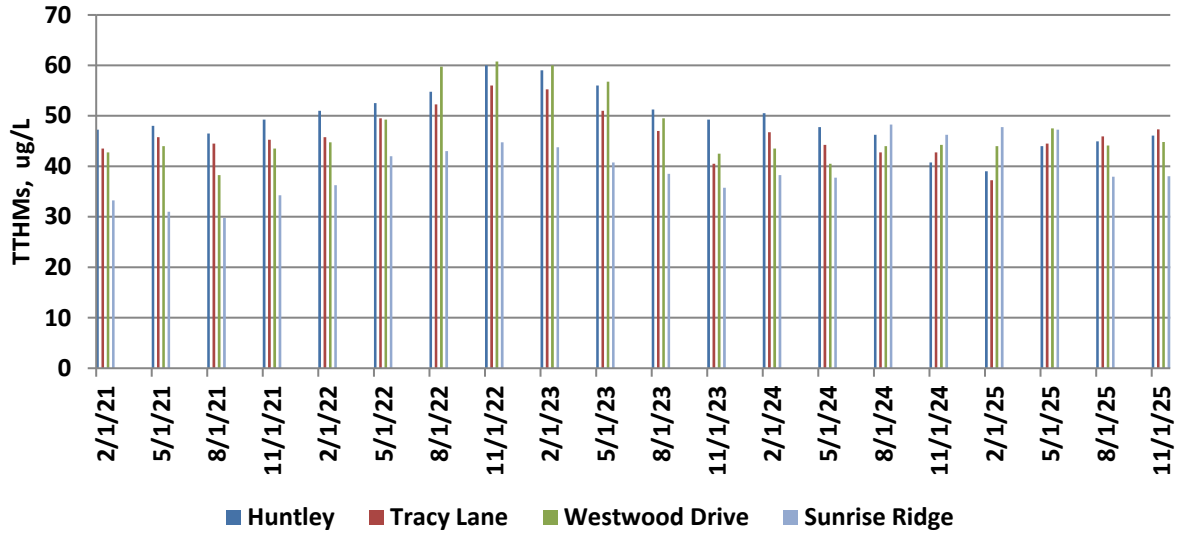
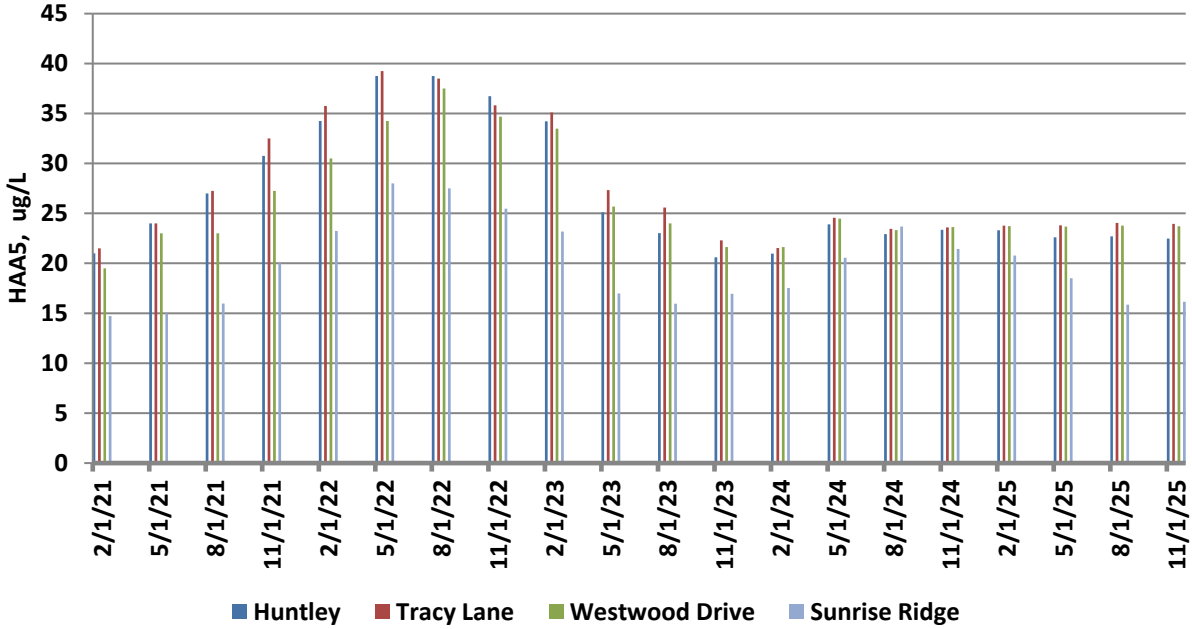


Figure 5-14. LRAA HAAs at Auburn Bowman Distribution System, Stage 2 D/DBP Data, 2021 – 2025



Other Detectable Title 22 Constituents of Interest

As reported in the 2023 CCR, lead was detected in the distribution system in 2022. Out of 32 samples collected, one sample exceeded the lead Action Level of 15 µg/L. However, the 90th percentile for lead did not exceed the lead Action Level and follow-up testing was non-detectable. Also reported in the 2023 CCR, radium 228 was detected, with a range of ND to 1.21 pCi/L, and an average of 0.83 pCi/L. The primary MCL for radium 228 is 5 pCi/L, so results are well below that level.

As reported in the 2025 CCR, there were detectable levels of zinc in the treated water at the Bowman WTP. The average value was 485 µg/L, well below the primary MCL.

Unregulated Contaminant Monitoring Rule (UCMR) 5

UCMR 5 requires quarterly monitoring for 29 per- and polyfluoroalkyl substances (PFAS) and lithium at the entry point to the distribution system. Quarterly monitoring was conducted in January, April, July and October 2024. All sample results were non-detect.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* and *Giardia* data presented in **Section 3**, 3/4-log reduction of *Giardia*/virus continues to be appropriate reduction requirements for the Bowman WTP under the SWTR. Under Round 1 of source water monitoring as part of the LT2ESWTR, Bowman WTP was designated as Bin 2 and required an additional 1-log action. There was a significant reduction (62 percent) in the highest 12-month mean value of *Cryptosporidium*

from Round 1 to Round 2, however PCWA was denied a change from Bin 2 to Bin 1 by DDW, and continues to meet the additional log action required by using combined filter effluent and individual filter effluent options from the Microbial Toolbox in the LT2ESWTR.

The Bowman WTP is classified as a conventional filtration WTP, and currently receives reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with chlorine provides 0.5-log credit for *Giardia* and 2.0-log credit for viruses.

Regulatory Compliance Evaluation

PCWA has been monitoring the raw and treated water for the Bowman WTP for all required Title 22 compliance constituents. **Table 5-8** lists the existing drinking water regulations and a compliance evaluation for these standards at the Bowman WTP. The Bowman Package WTP is currently in compliance with existing regulations.

Table 5-8
Regulatory Compliance Evaluation
Placer County Water Agency – Bowman WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No MCLs exceeded based on review of the CCRs.
SWTR	Microbial and Turbidity	Data continue to support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Interim ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in treated water. Therefore, not required to implement enhanced coagulation for TOC removal.
Long Term 2 ESWTR	Microbial	Although the second round of LT2 monitoring showed data to qualify for the Bin 1 classification, DDW did not grant Bin 1. Due to Bin 2 classification, PCWA has been implementing more stringent turbidity requirements on CFE and individual filter effluents to receive 1.0-log action credit.
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively). d

Auburn Water Treatment Plant

System Description

The raw water intake location for the Auburn WTP is located off the Lower Boardman Canal, whose source of supply is a combination of Upper Boardman Canal, Bear River Canal/Rollins Lake, and local drainage from the Ragsdale Random and Lake Theodore. Auburn is a conventional water treatment plant. The plant design flow is 8.0 mgd, with average flows at 2.16 mgd. The plant typically operates from April through October.

Raw water is delivered to the wet well of the raw water pump station at the Auburn WTP. After flowing through the wet well and a self-cleaning bar screen, the water is pumped to four Actifloc pre-treatment and filtration treatment process units. The modular Actifloc treatment train units consist of static mixing, coagulation-sedimentation, and filtration. Chemicals used in the clarification and disinfection process are injected ahead of the flash mixing chamber. During routine treatment the water is injected with a primary coagulant, generally polyaluminum chlorohydrate and non-ionic polymer as a coagulant aid, prior to entering the rapid mix chamber. Powdered activated carbon can be added if needed.

Following the flash mixing chamber, the water overflows to the coagulation and maturation chamber. Polymer and microsand are added to this chamber and are mixed with a turbine mixer. From here, the water overflows into the settling chamber. Tube settlers, installed at a 30 degree angle, allow the "ballasted" floc to settle to the bottom of the chamber and from there it is pumped to hydrocyclones. The hydrocyclones are designed to separate the microsand from sludge, allowing the microsand to be recycled back to the injection tank and the sludge to be discharged.

Each of the four triple media gravity filters has a surface area of 275 square feet. The filter media consists of 18 inches of anthracite coal, 9 inches of silica sand, and 3 inches of garnet sand. The multimedia sits above a dual parallel lateral type underdrain system. The filters are designed for a nominal filtration rate of 5 gpm/sf. Post-chlorination is applied prior to the water flowing into the 500,000 gallons clear well.

Highlight of Changes Since 2021 Update

No changes were made to the water treatment processes during the reporting period. PCWA started using the ChemTrac Lab Charge Analyzer at the Auburn WTP, which provides a five minute jar test, providing the coagulant dose needed to achieve charge neutralization in under five minutes.

Significant Potential Contaminating Activities

The Auburn WTP receives water from the Lower Boardman Canal near the Interstate 80 Foresthill exit. The water in the Lower Boardman Canal comes from two main sources; the Bear River Canal and the Upper Boardman Canal. The Bear River Canal comes from Rollins Lake and is subject to the same vulnerabilities as the Bowman WTP. The supply system

above the Auburn WTP is largely open, earthen canals or natural water courses that could potentially be impacted by localized activities. Water flows to the Lower Boardman Canal via the Ragsdale Random, which is subject to local drainage including low density residential and grazing. The Auburn WTP was also impacted by the Lake Spaulding Powerhouse outages, by the Upper Boardman Canal, similar to the Alta WTP described previously. The Upper Boardman Canal is subject to the same vulnerabilities as the Applegate WTP, plus there is additional local runoff between Applegate and Auburn WTPs that include Lake Theodore, Interstate 80, and the railroad tracks. Just upstream of the diversion location for the Auburn WTP there is residential development and hobby farms with numerous private crossings of the canal, as well as the California Department of Forestry and Fire Protection station, including a heliport.

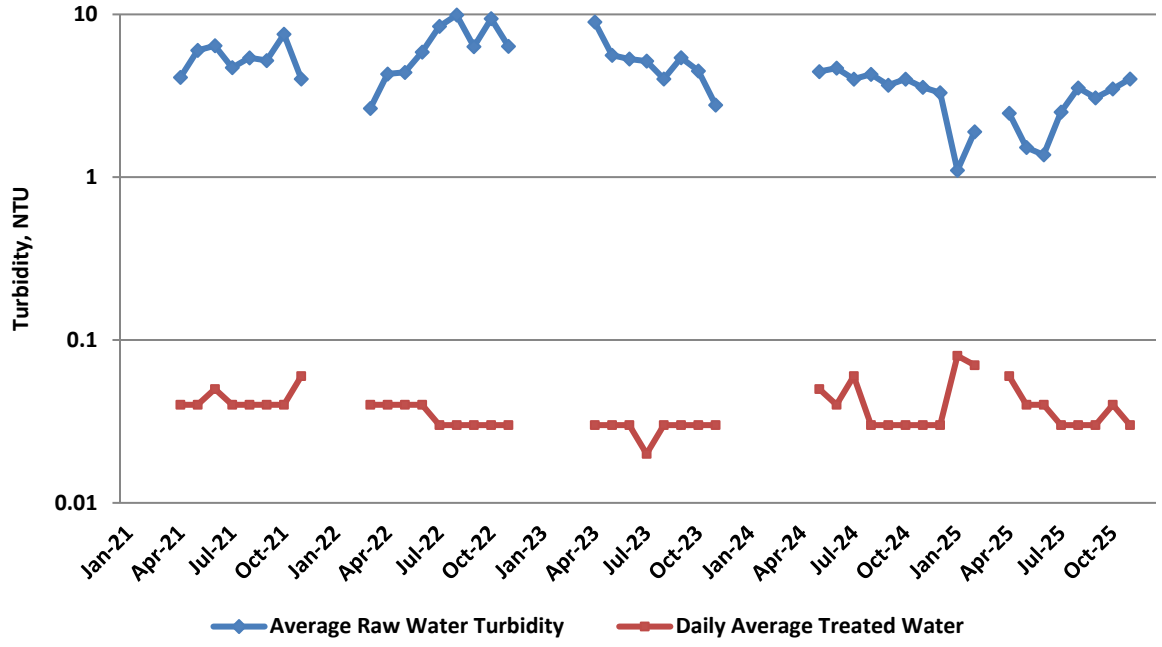
Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

Turbidity

The average raw water turbidity at Auburn WTP for the period of study was 4.6 NTU, and on average the treatment process decreased this to 0.04 NTU, which equates to an average removal of solids of 99.2 percent. **Figure 5-15** shows a timeseries plot of raw and treated water turbidities. It should be noted that the raw water turbidities plotted are a monthly average of daily grab samples. The treated water turbidities are a monthly average of a daily average, which is based on samples taken every four hours in a 24 hour period.

Figure 5-15. Auburn WTP – Raw and Treated Water Turbidity, 2021-2025



Microbiological Constituent

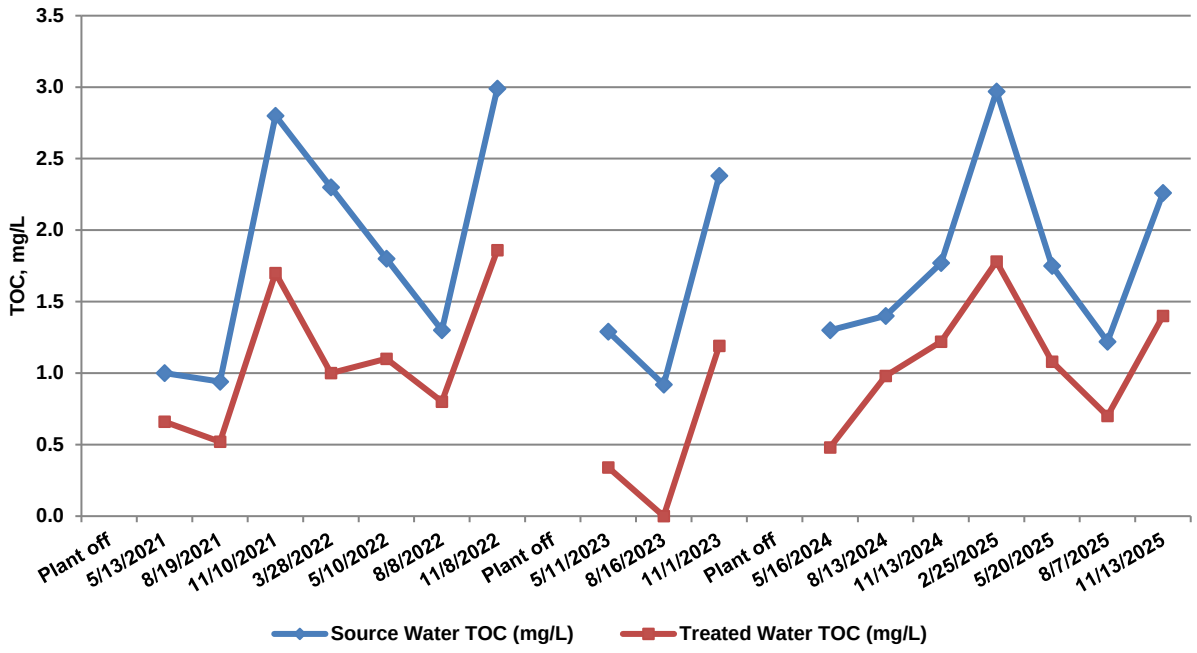
There were no positive coliform samples in the distribution system during the period of study.

Disinfection By-Products

PCWA monitors alkalinity and TOC levels in its raw water and TOC levels in its treated water monthly in order to determine TOC removal compliance. The average raw and treated water TOC levels at Auburn WTP were 1.8 mg/L and 1.0 mg/L, respectively, equating to 44.7 percent average removal. Since all of the treated water TOC RAAs were less than 2.0 mg/L, no TOC removal calculation is required for the Auburn WTP. **Figure 5-16** shows a timeseries plot of raw and treated water TOC at Auburn WTP. Peak raw water TOC levels typically occur during the wet season (November to February).

Since the Bowman WTP and Auburn WTP share the same distribution system, TTHM and HAA5 data is discussed in the section above for Bowman WTP.

Figure 5-16. Auburn WTP, Total Organic Carbon, 2021-2025



Other Detectable Title 22 Constituents of Interest

See information provided for Bowman WTP above for lead and radium detects. As reported in the 2025 CCR, there were detectable levels of aluminum, nickel, iron, and manganese reported in the treated water at the Auburn WTP, as shown in **Table 5-9**. All averages were below the respective MCLs, except for iron and manganese. A review of the companion

turbidity results collected on August 7, 2025 (when metals concentrations peaked) showed a turbidity of 4.3 NTU in the treated water. This indicates that it is possible that the bottle for metals analysis may have been raw, rather than treated, water. PCWA is currently monitoring treated water for the constituents in **Table 5-9** quarterly, and no additional samples to date have exceeded any secondary MCL.

Table 5-9
Detectable Constituents of Interest for Auburn WTP, as reported on 2025 CCR

Constituent, µg/L	Range, µg/L	Average, µg/L	Secondary MCL, µg/L
Aluminum	ND – 94.4	31.5	200
Nickel	ND- 20.5	6.8	100 (primary)
Iron	ND – 2,300	575	300
Manganese	ND - 218	59.6	50

UCMR 5

UCMR 5 requires quarterly monitoring for 29 PFAS and lithium at the entry point to the distribution system. Quarterly monitoring was conducted in May 2024, July 2024, October 2024 and January 2025. All sample results were non-detect.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli and Giardia* data presented in **Section 3**, 3/4-log reduction of *Giardia*/virus continues to be appropriate reduction requirements for the Auburn WTP under the SWTR. Under the second round of the LT2ESWTR the source water for the Auburn WTP was classified as Bin 1 in 2017.

The Auburn WTP is classified as a conventional filtration WTP, and currently receives reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with chlorine provides 0.5-log credit for *Giardia* and 2.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Interim ESWTR, and the LT2ESWTR

Regulatory Compliance Evaluation

PCWA has been monitoring the raw and treated water for the Auburn WTP for all required Title 22 compliance constituents. **Table 5-10** lists the existing drinking water regulations and a compliance evaluation for these standards at the Auburn WTP. The Auburn WTP is currently in compliance with existing regulations.

Table 5-10
Regulatory Compliance Evaluation
Placer County Water Agency – Auburn WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No primary MCLs exceeded based on review of the CCRs. Samples from 2025 showed exceedance of the secondary MCLs for iron and manganese, but neither has been elevated in treated water subsequently.
SWTR	Microbial and Turbidity	Data continue to support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Interim ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in treated water. Therefore, not required to implement enhanced coagulation for TOC removal.
Long Term 2 ESWTR	Microbial	Classified as Bin 1, from second round of monitoring for *Cryptosporidium.*
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively). d

Foothill 1 Water Treatment Plant

System Description

The raw water intake location for the Foothill 1 WTP is located off PG&E's South Canal near Powerhouse Road. The plant can also be fed from the Lower Boardman Canal at station 903+00 or from the American River during PG&E canal maintenance. Foothill 1 WTP is a ballasted clarification water treatment plant. The plant design flow is 42 mgd, with average flows at about 25.9 mgd.

Alum or polyaluminum chloride are used as the primary coagulant. Nonionic polymer is also used as coagulant aid. Powdered activated carbon is used seasonally as needed for tastes and odors. Chemicals are mixed by a mechanical in pipe induction mixer, and a mixing time of about two seconds. The coagulated water then enters a four chamber Actiflo microsand-ballasted separation process consisting of a coagulation, injection, maturation and separation chamber, with a detention time of 15 minutes, and then into contact basins. The clarified water is then filtered through nine dual media gravity filters. The filter loading rate is 100 gpm/sf. Filter aid is used as needed.

The filters are backwashed at least every three days, sometimes daily. The plant has filter to waste capability after backwash or plant start-up. Washwater and filter to waste flow to separate reclaim settling basins, where the decant is handled by a separate reclaimed pumping system and is returned ahead of coagulation. The filtered water is disinfected with chlorine and stored in a storage system, consisting of one-1 mg and one-10 mg storage basins, to meet CT requirements. The average residual leaving the plant is 0.5 to 0.75 mg/L.

Highlight of Changes Since 2021 Update

No changes were made to the water treatment processes during the reporting period. PCWA started using the ChemTrac Lab Charge Analyzer at the Foothill WTP, which provides a 5 minute jar test, providing the coagulant dose needed to achieve charge neutralization in under five minutes.

Significant Potential Contaminating Activities

The Foothill 1 WTP receives water from PG&E's South Canal, which is fed by the Wise Canal from Rock Creek Reservoir, which is fed with water from the Bear River Canal, Upper Boardman Canal, and local drainage from Lake Theodore, Lake Arthur, and Halsey Afterbay. The Foothill WTP was also impacted by the Lake Spaulding Powerhouse outages, by the Upper Boardman Canal, similar to the Alta WTP described previously. The canal system between Auburn and Foothill WTPs is largely open, earthen canals or natural water courses that could potentially be impacted by localized activities. Therefore, the source water has all the same vulnerabilities as the Auburn WTP plus additional risk from Interstate 80 and local drainage from the Rock Creek area that includes high-density rural development, commercial, light industrial areas, and a portion of the Auburn Airport.

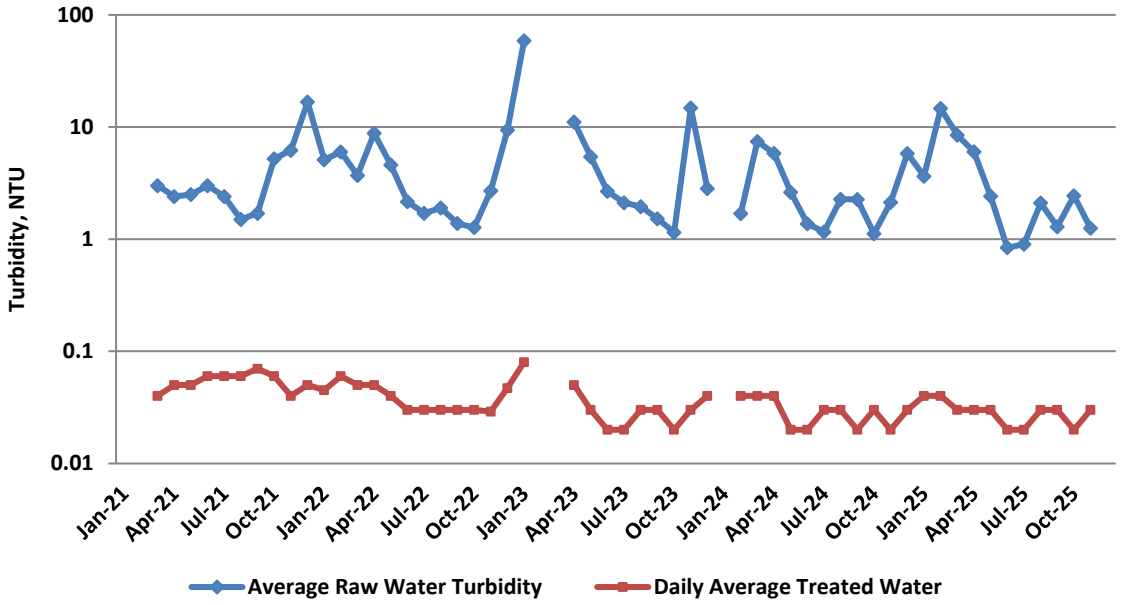
Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

Turbidity

The average raw water turbidity at the Foothill 1 WTP for the period of study was 5.1 NTU, and on average the treatment process decreased this to 0.04 NTU, which equates to an average removal of solids of 99.3 percent. Filters 5 through 9 were selected for analysis, as there were more months in operation, compared to filters 1 through 4. **Figure 5-17** shows a timeseries plot of raw and treated turbidities. There is a raw water seasonal trend with peaks during wet weather months. Foothill 1 WTP meets all current turbidity standards. It should be noted that the raw water turbidities plotted are a monthly average of daily grab samples. The treated water turbidities are a monthly average of a daily average, which is based on samples taken every four hours in a 24 hour period.

Figure 5-17. Foothill 1 WTP – Raw and Treated Water Turbidity, 2021-2025



Microbiological Constituent

There was one positive total coliform sample in the distribution system in November 2023 and in August 2025. However, this is not in violation of the Total Coliform Rule since it was less than five percent of the total number of samples collected and there were no detects of *E. coli*. For both instances, three repeat samples were collected and all repeat samples were total coliform negative.

Disinfection By-Products

PCWA monitors alkalinity and TOC levels in its raw water and TOC levels in its treated water quarterly in order to determine TOC removal compliance. The average raw and treated water TOC levels at Foothill Plant 1 WTP were 1.5 mg/L and 0.8 mg/L, respectively, equating to 49.7 percent average removal. Since the treated water TOC RAAs were less than 2.0 mg/L, no TOC removal calculation is required for the Foothill Plant 1 WTP. **Figure 5-18** shows a timeseries plot of raw and treated water TOC at Foothill Plant 1 WTP. Peak raw water TOC levels typically occur during the wet season (November to February).

Stage 2 D/DBP Rule Compliance Period

PCWA began monitoring the eight Stage 2 D/DBP monitoring sites in February 2012. TTHM LRAAs ranged from 25.3 to 57.0 µg/L and HAA5 LRAAs ranged from 17.8 to 36.3 µg/L as shown in **Figures 5-19** and **5-20**, respectively. Based on available data over the reporting period, TTHM and HAA5 LRAAs are below the respective MCLs per the Stage 2 D/DBPR.

Figure 5-18. Foothill 1 WTP, Total Organic Carbon, 2021-2025

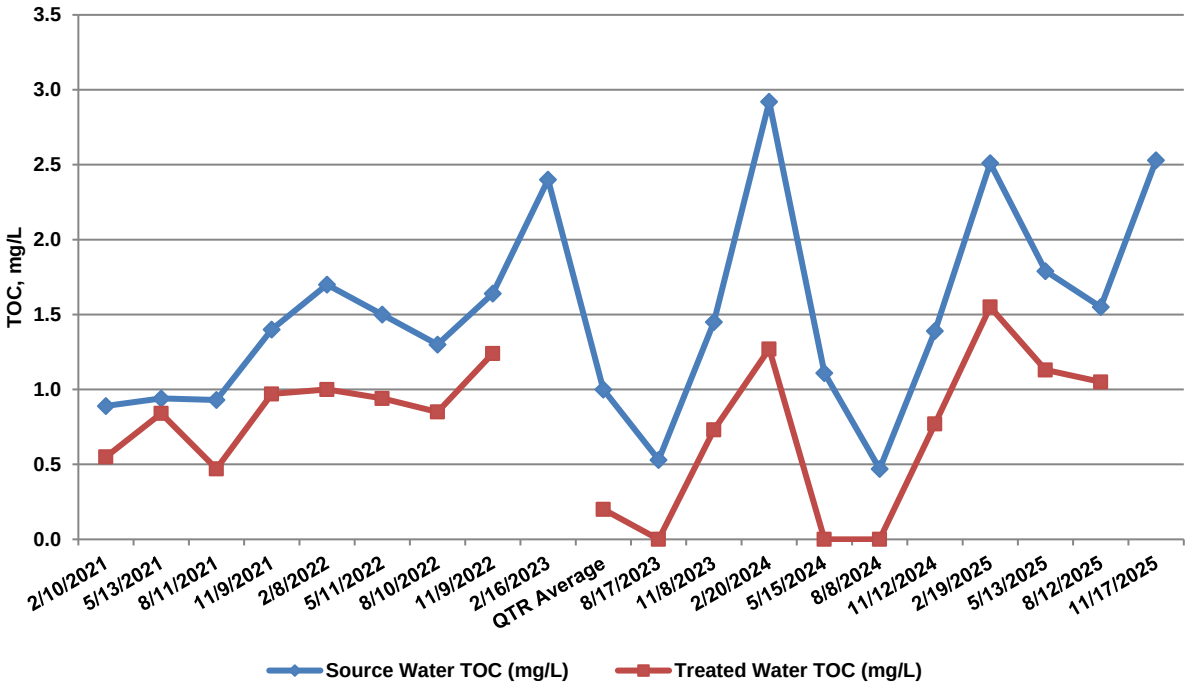


Figure 5-19. LRAA TTHMs at Foothill Sunset System, Stage 2 D/DBP Data, 2021 – 2025

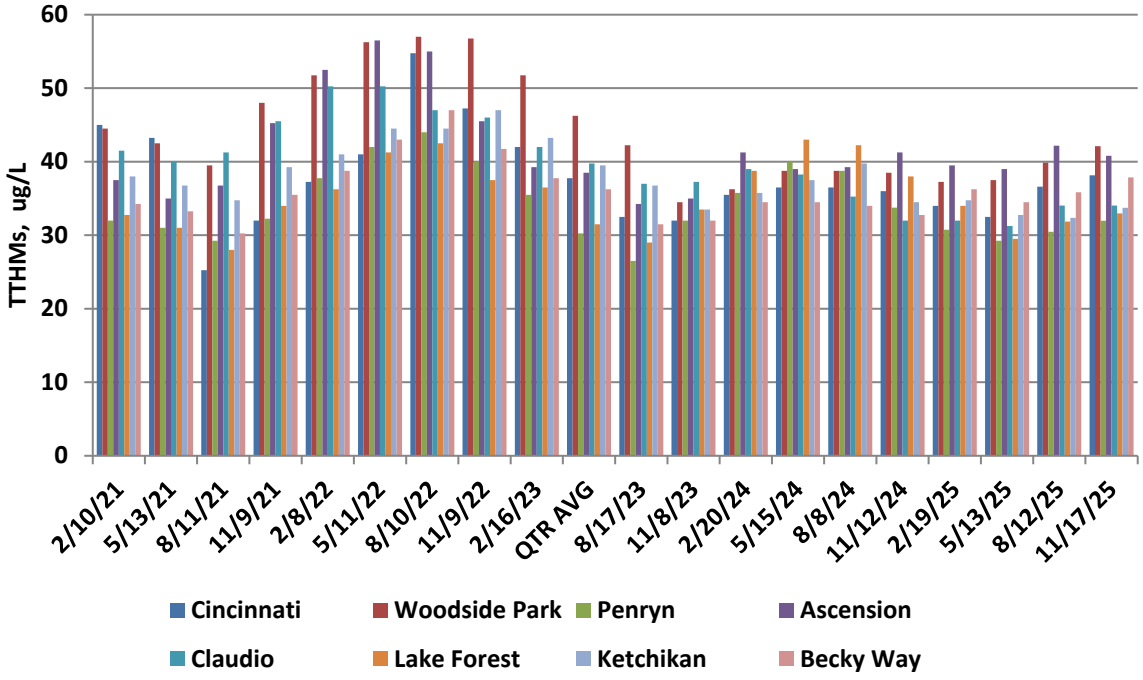
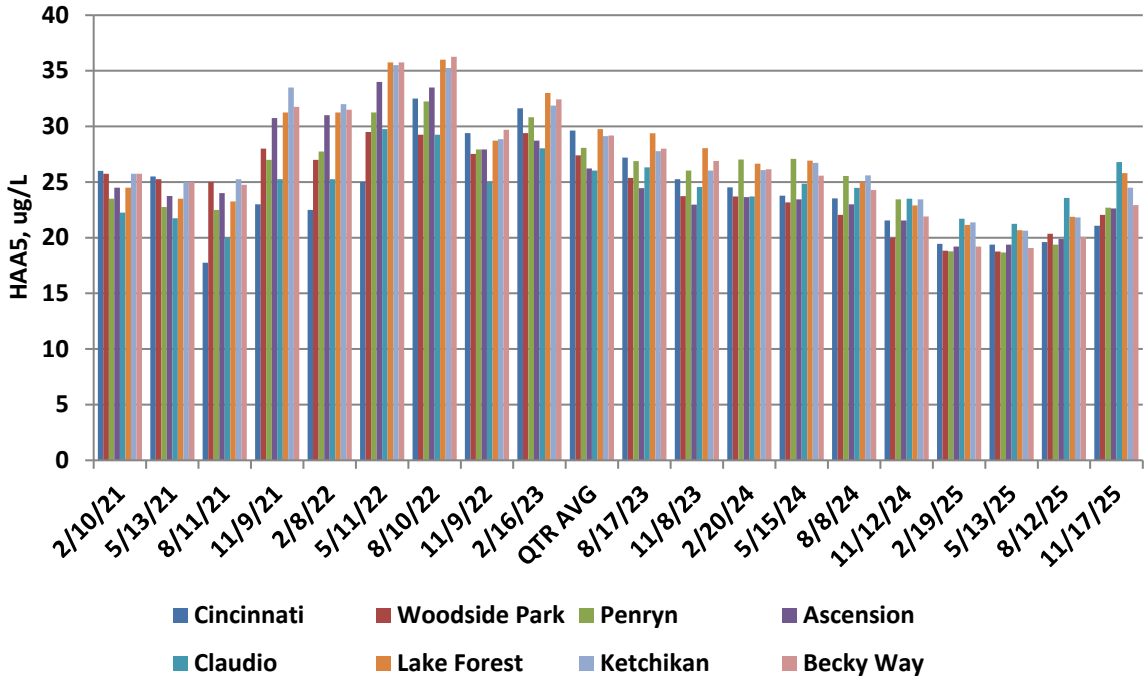


Figure 5-20. LRAA HAAs at Foothill Sunset System, Stage 2 D/DBP Data, 2021 – 2025



Other Detectable Title 22 Constituents of Interest

As reported in the 2021 CCR, the range of detected aluminum was ND to 67.9 µg/L, with an average of 29.9 µg/L. The secondary MCL is 200 µg/L. As reported in the 2025 CCR, the range of detected hexavalent chromium was ND to 0.13 µg/L, with an average of 0.04 µg/L. The primary MCL is 10 µg/L.

UCMR 5

UCMR 5 requires quarterly monitoring for 29 PFAS and lithium at the entry point to the distribution system. Quarterly monitoring was conducted in January, April, July and October 2024. All sample results were non-detect.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* and *Giardia* data presented in **Section 3**, 3/4-log reduction of *Giardia*/virus continues to be appropriate reduction requirements for Foothill 1WTP under the SWTR. Under the second round of the LT2ESWTR the source water for the Foothill 1 WTP was classified as Bin 1 in 2017.

The Foothill 1 WTP is classified as a conventional filtration WTP, and currently receives reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with chlorine provides 0.5-log credit for *Giardia* and 2.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Interim ESWTR, and the LT2ESWTR.

Regulatory Compliance Evaluation

PCWA has been monitoring the raw and treated water for the Foothill 1 WTP for all required Title 22 compliance constituents. **Table 5-11** lists the existing drinking water regulations and a compliance evaluation for these standards at the Foothill 1 WTP. The Foothill 1 WTP is currently in compliance with existing regulations.

Table 5-11
Regulatory Compliance Evaluation
Placer County Water Agency – Foothill 1 WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No MCLs exceeded based on review of the CCRs.
SWTR	Microbial and Turbidity	Data continue to support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Interim ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in treated water. Therefore, not required to implement enhanced coagulation for TOC removal.
Long Term 2 ESWTR	Microbial	Classified as Bin 1 from second round of source water monitoring for *Cryptosporidium*.
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively).

Foothill 2 Water Treatment Plant

System Description

The raw water intake location for the Foothill 2 WTP is the same as Foothill 1 WTP, located off PG&E's South Canal. The plant can also be fed from the Lower Boardman Canal at station 903+00 or off the American River during South Canal maintenance. Foothill 2 WTP is a conventional water treatment plant. The plant design flow is 18.0 mgd under conventional treatment but is classified as direct filtration, with average flows at 15.1 mgd.

Alum or polyaluminum chloride is used as the primary coagulant. Nonionic polymer and powdered activated carbon are also used as coagulant aids. Chemicals are mixed by a

mechanical mixer that has two speed settings, and a mixing time of about 15 seconds. The coagulated water then enters a three stage tapered variable speed vertical flocculator, with a detention time of 30 minutes, and then into sedimentation basins with a detention time of 120 minutes. The clarified water is then filtered through four dual media gravity filters. The filter loading rate is 5.9 gpm/sf. Filter aid is used as needed.

The filters are backwashed at least every three days, sometimes daily. The plant has filter to waste capability after backwash or plant start-up. Washwater and filter to waste flow to separate reclaim settling basins, where the decant is handled by a separate reclaimed pumping system and is returned ahead of coagulation. The filtered water is disinfected with chlorine, and stored in 1.0 mg and 10 mg storage basins to meet CT requirements. The average residual leaving the plant is 0.5 to 0.75 mg/L.

Highlight of Changes Since 2021 Update

No changes were made to the water treatment processes during the reporting period. PCWA started using the ChemTrac Lab Charge Analyzer at the Foothill WTP, which provides a 5 minute jar test, providing the coagulant dose needed to achieve charge neutralization in under five minutes.

Significant Potential Contaminating Activities

Please see previous discussion for Foothill 1 WTP.

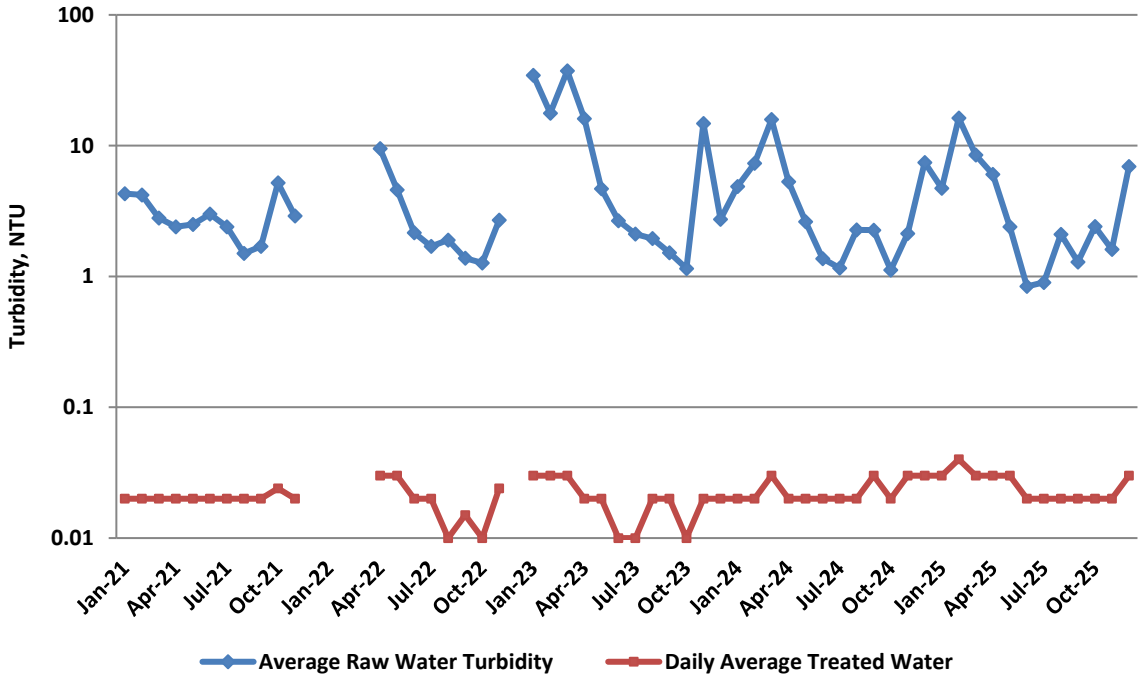
Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

Turbidity

The average raw water turbidity at the Foothill 2 WTP for the period of study was 5.5 NTU, and on average the treatment process decreased this to 0.02 NTU, which equates to an average removal of solids of 99.6 percent. **Figure 5-21** shows a timeseries plot of raw and treated turbidities. There is a raw water seasonal trend with peaks during wet weather months. The Foothill 2 WTP meets all current turbidity standards. It should be noted that the raw water turbidities plotted are a monthly average of daily grab samples. The treated water turbidities are a monthly average of a daily average, which is based on samples taken every four hours in a 24 hour period.

Figure 5-21. Foothill 2 WTP – Raw and Treated Water Turbidity, 2021-2025



Microbiological Constituent

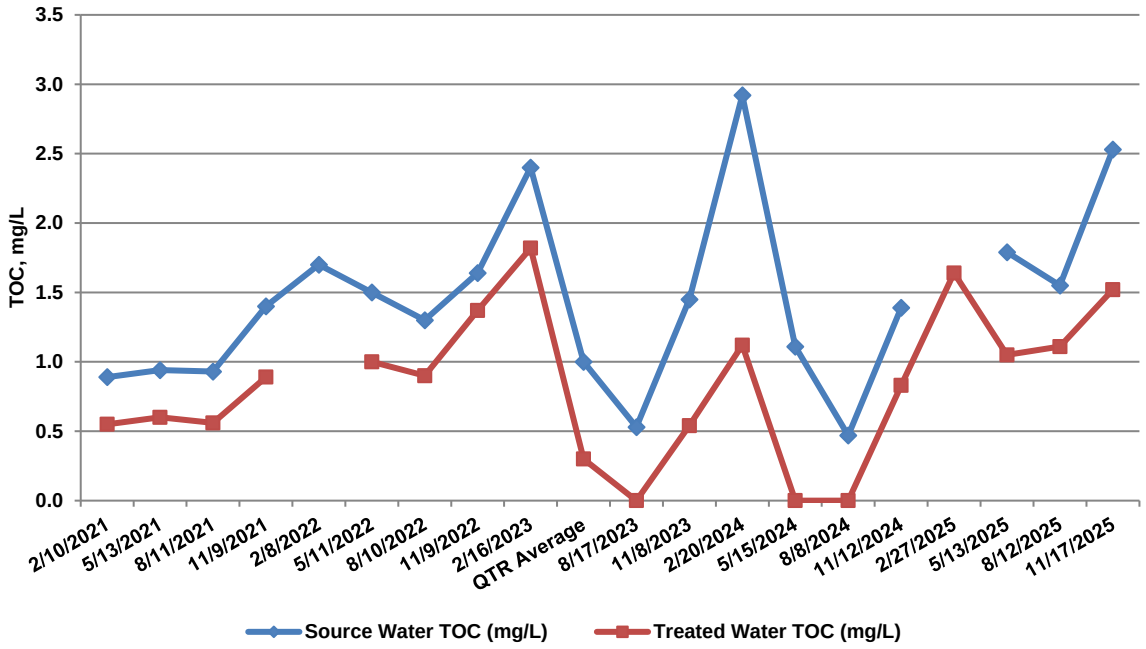
Please see previous discussion for Foothill 1 WTP.

Disinfection By-Products

PCWA monitors alkalinity and TOC levels in its raw water and TOC levels in its treated water quarterly in order to determine TOC removal compliance. The average raw and treated water TOC levels at the Foothill 2 WTP were 1.4 mg/L and 0.8 mg/L, respectively, equating to 42.4 percent average removal. Since all of the treated TOC RAAs were less than 2.0 mg/L, no TOC removal calculation is required for the Foothill 2 WTP. **Figure 5-22** shows a timeseries plot of raw and treated water TOC at the Foothill 2 WTP. TOC levels in the raw water were always below 2.0 mg/L, except in February 2023 and February 2024. Peak raw water TOC levels typically occur during the wet season (November to February).

Since the Foothill 2 WTP and the Foothill 1 WTP share the same distribution system, TTHM and HAA5 data is discussed in the discussion above for Foothill 1 WTP.

Figure 5-22. Foothill 2 WTP, Total Organic Carbon, 2021-2025



Other Detectable Title 22 Constituents of Interest

Please see previous discussion above for Foothill 1 WTP.

UCMR 5

Please see previous discussion above for Foothill 1 WTP.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* and *Giardia* data presented in **Section 3**, 3/4-log reduction of *Giardia*/virus continues to be appropriate reduction requirements for the Foothill 2 WTP under the SWTR. Under the second round of the LT2ESWTR the source water for the Foothill 2 WTP was classified as Bin 1 in 2017.

The Foothill 2 WTP is classified as a conventional filtration WTP for flows up to 15 mgd, and currently receives reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. For flows over 15 mgd, and up to 18.26 mgd, the Foothill 2 WTP is classified as a direct filtration WTP and receives reduction credit for 2.0-log *Giardia,* 1.0-log viruses, and 2-log *Cryptosporidium*. Disinfection with chlorine in conventional mode provides 0.5-log credit for *Giardia* and 2.0-log credit for viruses, and in direct mode provides 1.0-log credit for *Giardia* and 3.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Interim ESWTR, and the LT2ESWTR.

Regulatory Compliance Evaluation

PCWA has been monitoring the raw and treated water for the Foothill 2 WTP for all required Title 22 compliance constituents. **Table 5-12** lists the existing drinking water regulations and a compliance evaluation for these standards at the Foothill 2 WTP. The Foothill 2 WTP is currently in compliance with existing regulations.

Table 5-12
Regulatory Compliance Evaluation
Placer County Water Agency – Foothill 2 WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No MCLs exceeded based on review of the CCRs.
SWTR	Microbial and Turbidity	Data continue to support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Interim ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in raw and treated water. Therefore, not required to implement enhanced coagulation for TOC removal.
Long Term 2 ESWTR	Microbial	Classified as Bin 1 from second round of source water monitoring for *Cryptosporidium*.
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively).

Sunset Water Treatment Plant

System Description

The raw water intake location for the Sunset WTP is located within Whitney Reservoir. The source of supply is the Caperton Canal, which is fed by PG&Es South Canal. Sunset WTP is a conventional water treatment plant. The plant design flow is 8.0 mgd, with average flows at 4.32 mgd.

Alum and nonionic polymer are the primary coagulant and coagulant aid, respectively. Chemicals are mixed by a static mixer and a "blender" type-mixing blade. The coagulated water enters two single staged paddle wheel flocculation basins, with a detention time of 25 minutes and then into two sedimentation basins with a detention time of 160 minutes at five

mgd. The clarified water is then filtered through two dual media gravity filters. The filter loading rate is 2.9 gpm/sf. Non-ionic polymer is used as a filter aid as needed.

The filters are backwashed based on an as needed basis, but production is usually limited to 24 hours. The plant has filter to waste capability after backwash or plant start-up. Washwater and filter to waste flow to a reclaim settling basin, where the decant is returned ahead of coagulation. The filtered water is disinfected with sodium hypochlorite and stored in a 2.5 mg tank to meet CT requirements. The average residual leaving the plant is 1.0 to 3.0 mg/L.

Highlight of Changes Since 2021 Update

During the study period, the alum and sodium hypochlorite tanks were replaced.

Significant Potential Contaminating Activities

The Sunset WTP receives water from the Caperton Canal, which is fed by PG&E's South Canal, which is fed by the Wise Canal from Rock Creek Reservoir, which is fed with water from the Bear River Canal, Upper Boardman Canal, and local drainage from Lake Theodore, Lake Arthur, and Halsey Afterbay. The Sunset WTP was also impacted by the Lake Spaulding Powerhouse outages, by the Upper Boardman Canal, similar to the Alta WTP described previously. The supply system above Sunset WTP is largely open, earthen canals or natural water courses that could potentially be impacted by localized activities. The supply is vulnerable to all the same activities as the Foothill WTP, plus residential and grazing activities along the Caperton Canal. A portion of the Caperton Canal was encased in 2020.

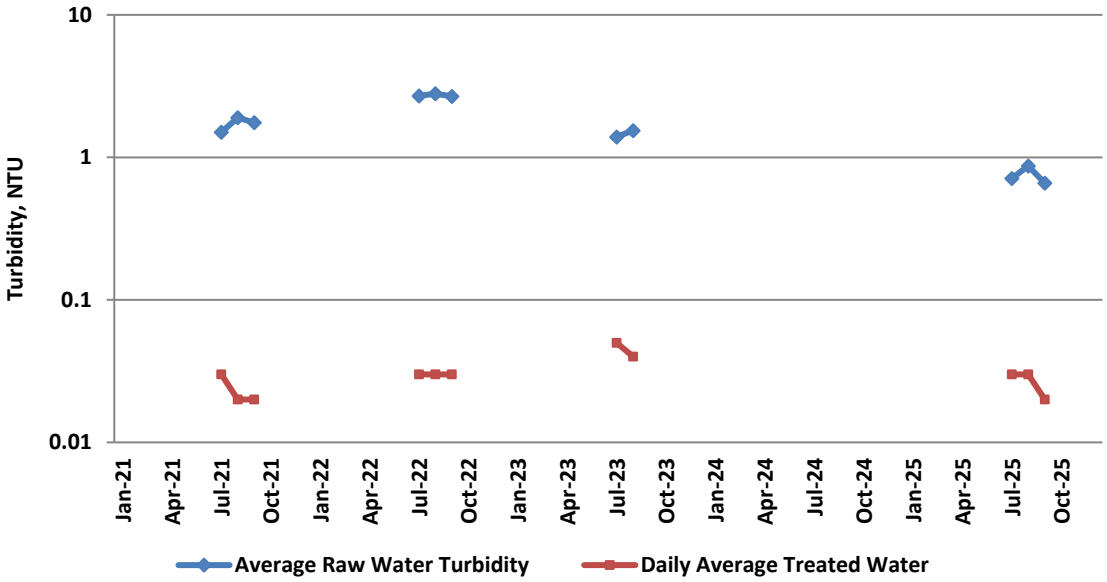
Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

Turbidity

The average raw water turbidity at Sunset WTP for the period of study was 1.7 NTU, and on average the treatment process decreased this to 0.03 NTU, which equates to an average removal of solids of 98.2 percent. **Figure 5-23** shows a timeseries plot of raw and treated turbidities. Sunset WTP meets all current turbidity standards. It should be noted that the raw water turbidities plotted are a monthly average of daily grab samples. The treated water turbidities are a monthly average of a daily average, which is based on samples taken every four hours in a 24 hour period.

Figure 5-23. Sunset WTP – Raw and Treated Water Turbidity, 2021-2025



Microbiological Constituent

Please see previous discussion for Foothill 1 WTP.

Disinfection By-Products

PCWA monitors alkalinity and TOC levels in its raw water quarterly and TOC levels in its treated water quarterly (when operational) in order to determine TOC removal compliance. The average raw and treated water TOC levels at Sunset WTP were 1.3 mg/L and 0.7 mg/L, respectively, equating to 42.8 percent average removal. Since all of the source and treated water TOC RAAs were less than 2.0 mg/L, no TOC removal calculation is required for the Sunset WTP. **Figure 5-24** shows a timeseries plot of raw and treated water TOC at Sunset WTP. There is no specific temporal trend.

Since the Foothill WTP and Sunset WTP share the same distribution system, TTHM and HAA5 data is discussed above for Foothill WTP.

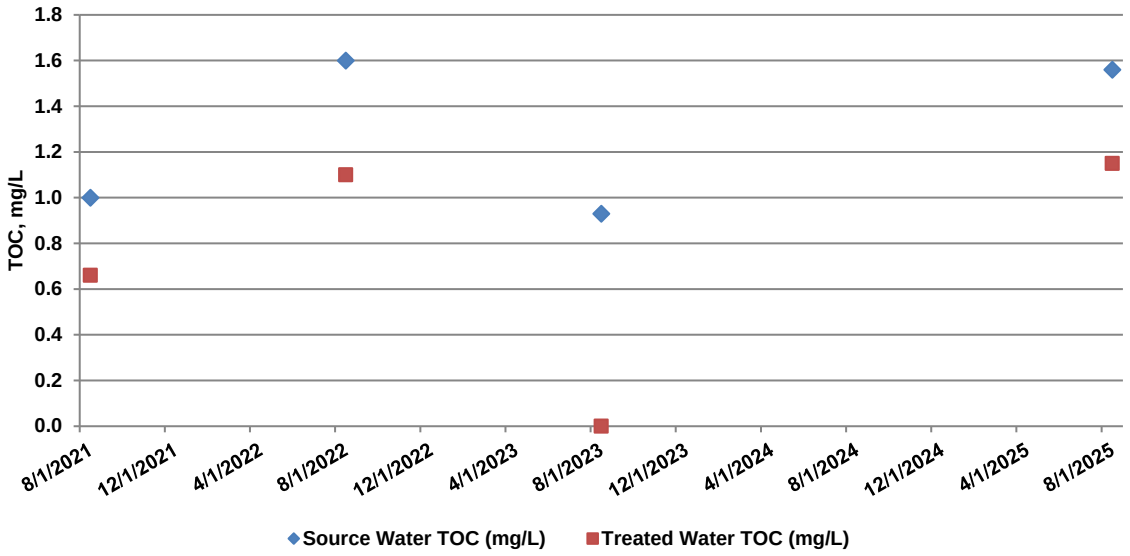
Other Detectable Title 22 Constituents of Interest

Please see previous discussion for Foothill 1 WTP.

UCMR 5

UCMR 5 requires quarterly monitoring for 29 PFAS and lithium at the entry point to the distribution system. The Sunset WTP is normally only in operation over the summer months, therefore monitoring was conducted in July 2025. All sample results were non-detect.

Figure 5-24. Sunset WTP, Total Organic Carbon, 2021-2025



Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* and *Giardia* data presented in **Section 3**, 3/4-log reduction of *Giardia*/virus continues to be appropriate reduction requirements for Sunset WTP under the SWTR. Under the second round of the LT2ESWTR the source water for the Sunset WTP was classified as Bin 1 in 2017.

The Sunset WTP is classified as a conventional filtration WTP, and currently receives reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with sodium hypochlorite provides 0.5-log credit for *Giardia* and 2.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Interim ESWTR, and the LT2ESWTR.

Regulatory Compliance Evaluation

PCWA has been monitoring the raw and treated water for the Sunset WTP for all required Title 22 compliance constituents. **Table 5-13** lists the existing drinking water regulations and a compliance evaluation for these standards at the Sunset WTP. The Sunset WTP is currently in compliance with existing regulations.

Table 5-13
Regulatory Compliance Evaluation
Placer County Water Agency – Sunset WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No MCLs exceeded based on review of the CCRs.
SWTR	Microbial and Turbidity	Data continue to support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Interim ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in source and treated water. Therefore, not required to implement enhanced coagulation for TOC removal.
Long Term 2 ESWTR	Microbial	Completed second round of source water monitoring for *Cryptosporidium*, which is classified as Bin1.
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively).

NEVADA IRRIGATION DISTRICT WATER TREATMENT PLANTS

During the study period NID relocated the post chlorination injection location to "pre-filter" for all NID water treatment plants and installed additional storage tank mixers in various NID water systems.

Elizabeth George Water Treatment Plant

System Description

The raw water intake location for the Elizabeth George WTP is diverted off of Deer Creek, via the Banner Cascade Pipeline, except for short periods when the PG&E's South Yuba Canal is offline for maintenance and then the D.S. Canal is utilized. Elizabeth George is a conventional water treatment plant, and the plant design flow is 18 mgd, with average flows at 4 mgd.

The influent water is pre-oxidized with sodium hypochlorite, alum is used as the primary coagulant, and caustic is used for pH adjustment. Chemicals are mixed with an adjustable mechanical flash mixer. The coagulated water goes to a horizontal paddle flocculation basin with a detention time of 20 minutes, and then to a sedimentation basin with a detention time

of 52 minutes. The clarified water is then filtered through two cluster-type (4 cells each) dual media gravity filter. The filter loading rate is 6.0 gpm/sf.

The filters are backwashed based on time, pressure differential, or turbidity. Backwash water is sent to new backwash water settling and reclamation basins with sludge removal systems and after settling, the decant is returned to the plant headworks. The plant has filter to waste capability for normally 10 minutes after backwash. The filtered water is disinfected with sodium hypochlorite and stored to meet CT requirements. The average residual leaving the plant is 0.5 mg/L.

Highlight of Changes Since 2021 Update

The filters at the Elizabeth George WTP were repacked during the reporting period.

Significant Potential Contaminating Activities

Since completion of the Banner Cascade Pipeline, which begins at the Deer Creek diversion, there have been reductions in the risks of potential contaminating activities to the water treatment plant. Similar to PCWA's Alta WTP, in the upper watershed above Lake Spaulding recreational use is heavy as well as timber harvesting, limited grazing, and seasonal discharge from the Donner Summit Public Utilities District Wastewater Treatment Plant (WWTP). The South Yuba Canal and Deer Creek (above the diversion) are largely open, earthen canals or natural water courses that could potentially be impacted by localized activities. Just upstream of the Deer Creek diversion is a PG&E powerhouse.

Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

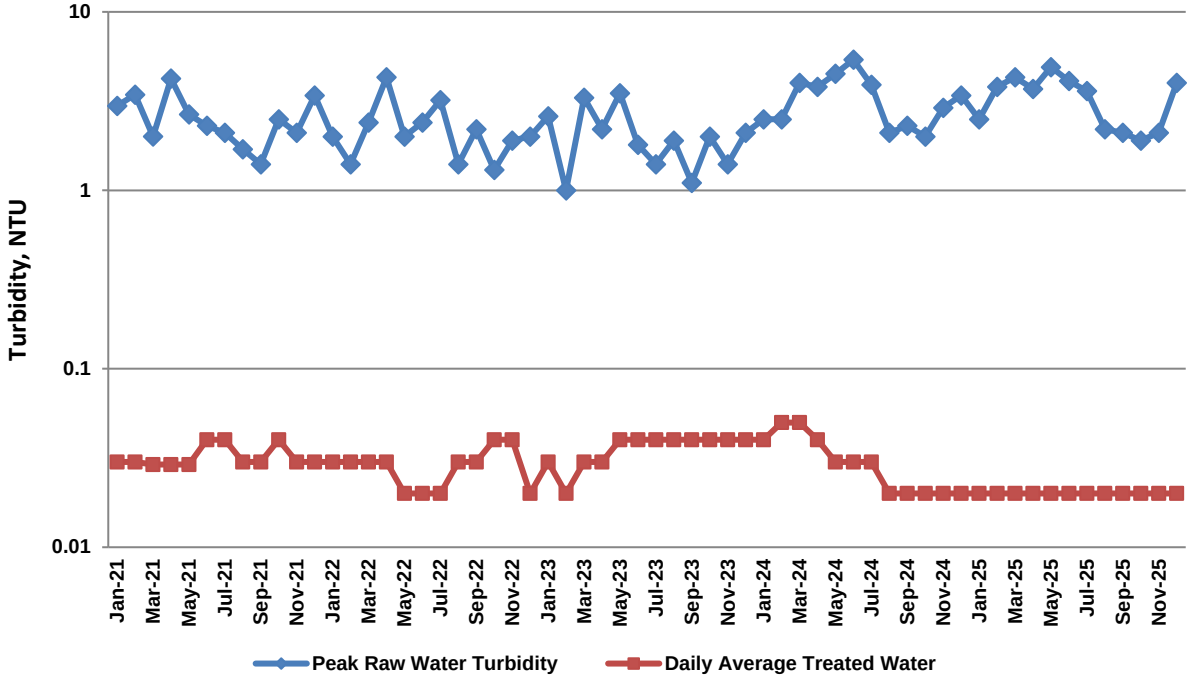
Turbidity

The average raw water turbidity at Elizabeth George WTP for the period of study was 2.7 NTU, and on average the treatment process decreased this to 0.03 NTU, which equates to an average removal of solids of 98.9 percent. **Figure 5-25** shows a timeseries plot of raw and treated water turbidities. Elizabeth George WTP meets all current turbidity standards. It should be noted that the raw water turbidity is the maximum peak daily, provided as a monthly average. The treated water turbidities are a monthly average of a daily average, which is based on samples taken every four hours in a 24 hour period.

Microbiological Constituent

There were no positive coliform samples in the distribution system during the period of study.

Figure 5-25. Elizabeth George WTP – Raw and Treated Water Turbidity, 2021-2025



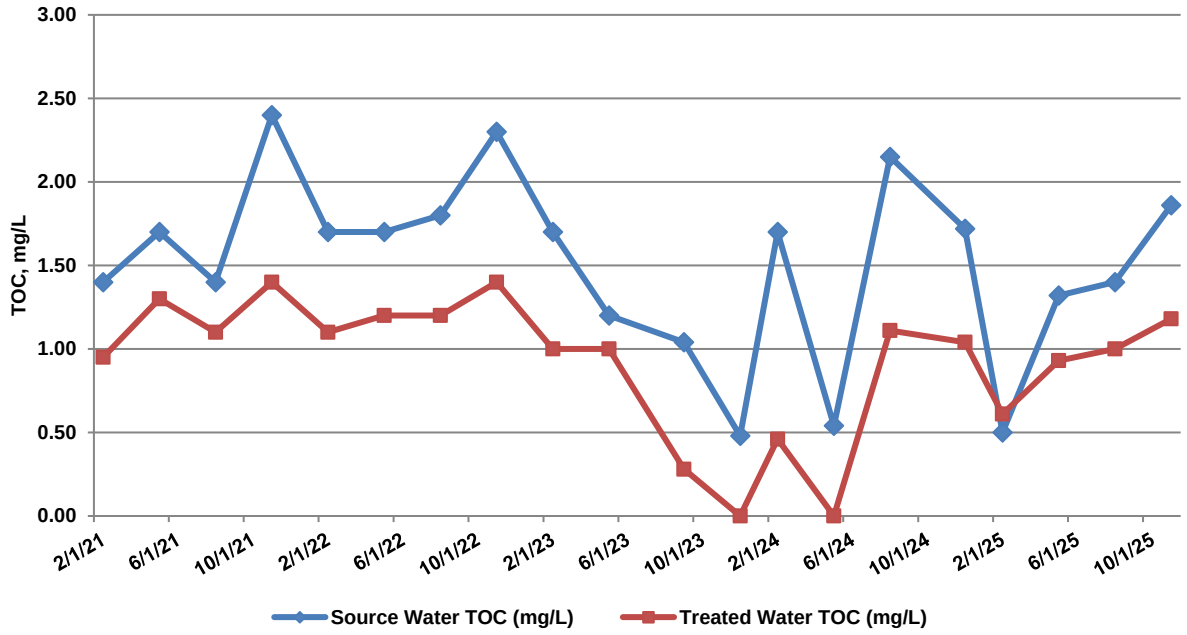
Disinfection By-Products

NID monitors for alkalinity and TOC levels in its raw water and TOC levels in its treated water quarterly in order to determine TOC removal compliance. The average raw and treated water TOC levels at Elizabeth George WTP were 1.5 mg/L and 0.9 mg/L, respectively, equating to 39.1 percent average removal. Since all of the TOC RAAs for both source and treated waters were less than 2.0 mg/L, no TOC removal calculation is required for the Elizabeth George WTP. **Figure 5-26** shows a timeseries plot of raw and treated water TOC at Elizabeth George WTP. TOC levels in the raw water were always at or below 2.0 mg/L, except in November 2021, November 2022 and August 2024. Peak raw water TOC levels typically occur during the wet season (November to February).

Stage 2 D/DBP Rule Compliance Period

NID converted to four Stage 2 D/DBP Rule monitoring sites for the Elizabeth George distribution system in January 2011. TTHM LRAAs ranged from 23 to 45.3 µg/L and HAA5 LRAAs ranged from 10.1 to 35.0 µg/L. Based on data over the reporting period, TTHM and HAA5 LRAAs were below the respective MCLs per the Stage 2 D/DBPR.

Figure 5-26. Elizabeth George WTP, Total Organic Carbon, 2021-2025



Other Detectable Title 22 Constituents of Interest

As reported in the 2021 and 2022 CCR, aluminum was detected at 63 µg/L and 50 µg/L, respectively, which are below the secondary MCL of 200 µg/L.

UCMR 5

UCMR 5 requires quarterly monitoring for 29 PFAS and lithium at the entry point to the distribution system. Quarterly monitoring was conducted in April, July, October 2023 and January 2024. NID's contract lab could not provide data for the 4th quarter of monitoring, and samples were recollected in June 2026. All sample results were non-detect.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* data presented in **Section 3**, 3/4-log reduction of *Giardia*/virus continues to be appropriate reduction requirements for the Elizabeth George WTP under the SWTR. Under the second round of the LT2ESWTR the source water for the Elizabeth George WTP was classified as Bin 1 in 2018.

The Elizabeth George WTP is classified as a conventional filtration WTP, and currently receives reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with chlorine provides 0.5-log credit for *Giardia* and 2.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Interim ESWTR, and the LT2ESWTR.

Regulatory Compliance Evaluation

NID has been monitoring the raw and treated water for the Elizabeth George WTP for all required Title 22 compliance constituents. **Table 5-14** lists the existing drinking water regulations and a compliance evaluation for these standards at the Elizabeth George WTP. The Elizabeth George WTP is currently in compliance with existing regulations.

Table 5-14
Regulatory Compliance Evaluation
Nevada Irrigation District – Elizabeth George WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No MCLs exceeded based on review of the CCRs.
SWTR	Microbial and Turbidity	Data continue to support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Interim ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in raw and treated water. Therefore, not required to implement enhanced coagulation for TOC removal.
Long Term 2 ESWTR	Microbial	Classified as Bin 1, from second round of *Cryptosporidium* monitoring.
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively).

Loma Rica Water Treatment Plant

System Description

The raw water for the Loma Rica WTP is diverted off of Deer Creek, via the Banner Cascade Pipeline. Loma Rica WTP is a conventional water treatment plant, and the plant design flow is 8.3 mgd, with average flows at 3 mgd.

The influent water is pre-oxidized with sodium hypochlorite, alum is used as the primary coagulant, and caustic is used for pH adjustment. Chemicals are mixed with an inline mechanical flash mixer. The coagulated water then goes to a serpentine basin where both flocculation and sedimentation occur. The flocculation type is horizontal paddle, with a detention time of 30 minutes. Sedimentation detention time is 4.5 hours at 6.4 mgd. The

clarified water is then filtered through four dual media pressure filters. The filter loading rate is six gpm/sf.

The filters are backwashed based on time, pressure differential, or turbidity. Backwash water is sent to sedimentation ponds for two hours and is then recycled back to the headworks, at no greater than 10 percent of the plant influent flow. The plant has filter to waste capability after backwash. The filtered water is disinfected with sodium hypochlorite and stored in a clearwell to meet CT requirements. The average residual leaving the plant is 0.5 mg/L.

Highlight of Changes Since 2021 Update

No changes were made to the water treatment processes during the reporting period.

Significant Potential Contaminating Activities

Since completion of the Banner Cascade Pipeline, which begins at the Deer Creek diversion, there have been reductions in the risks of potential contaminating activities to the plant. Similar to PCWA's Alta WTP, in the upper watershed above Lake Spaulding recreational use is heavy as well as timber harvesting, limited grazing, and seasonal discharge from the Donner Summit Public Utilities District WWTP. The South Yuba Canal and Deer Creek (above the diversion) are largely open, earthen canals or natural water courses that could potentially be impacted by localized activities. Just upstream of the Deer Creek diversion is a PG&E powerhouse.

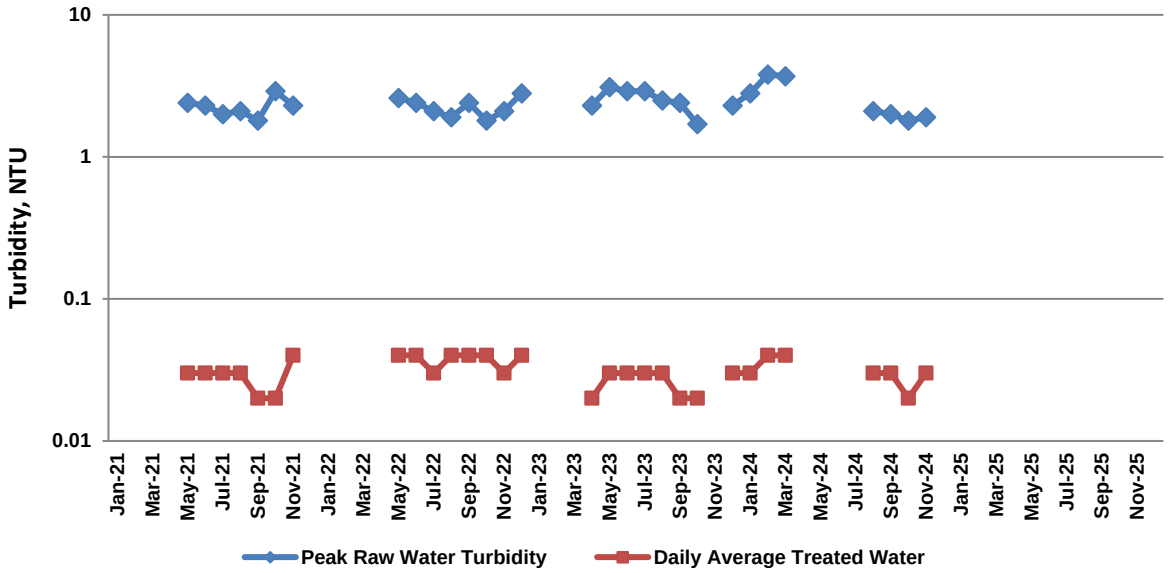
Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

Turbidity

The average raw water turbidity at Loma Rica WTP for the period of study was 2.4 NTU, and on average the treatment process decreased this to 0.03 NTU, which equates to an average removal of solids of 98.7 percent. **Figure 5-27** shows a timeseries plot of raw and treated turbidities when Loma Rica WTP was in operation. Loma Rica WTP meets all current turbidity standards. It should be noted that the raw water turbidity is the maximum peak daily, provided as a monthly average. The treated water turbidities are a monthly average of a daily average, which is based on samples taken every four hours in a 24 hour period.

Figure 5-27. Loma Rica WTP – Raw and Treated Water Turbidity, 2021-2025



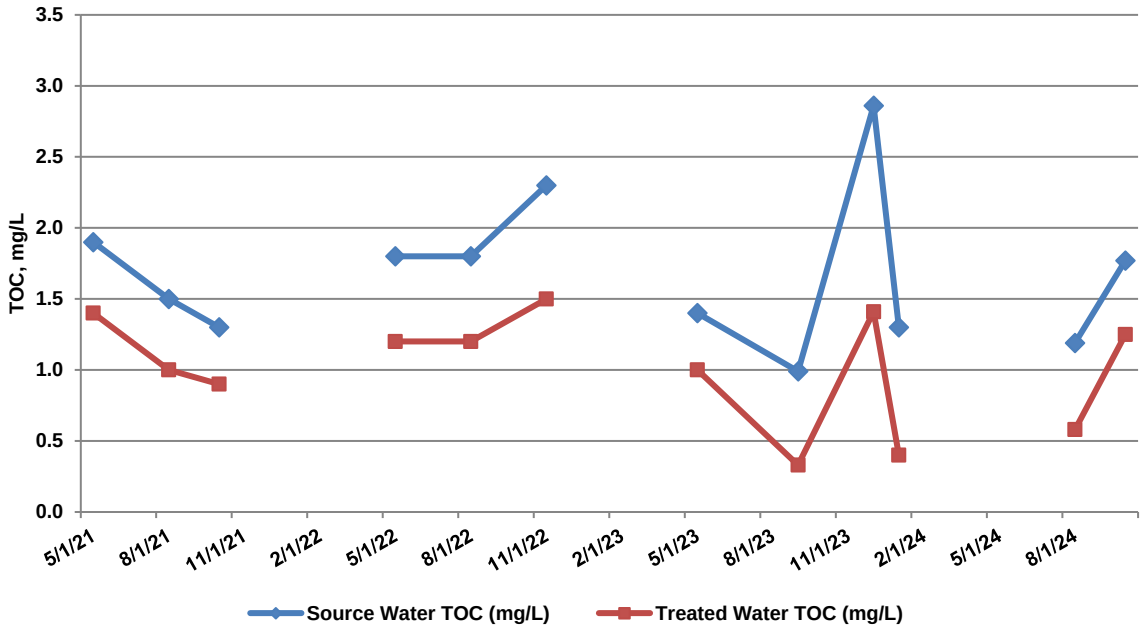
Microbiological Constituent

There were two positive total coliform samples in the distribution system in October 2021. The second sample was collected at 16637 Curtis Court on October 18, 2021. After the second positive detection, NID's contract lab informed them that the positive sample could be due to a new bottle type. NID collected samples using provided bottles with paper strip certificate of sterility from the contract lab, which is not the normal screw cap bottle. The contract lab supplier was not able to provide the normal screw cap bottle. In a letter dated December 7, 2021, NID requested that DDW invalidate the sample collected on October 18, 2021 based on the possibility of contamination occurring from the bottle. NID also conducted a Level One assessment related to these total coliform positive samples and reported to DDW that there were no sanitary defects found in a report dated November 10, 2021.

Disinfection By-Products

NID monitors for alkalinity and TOC levels in its raw water and TOC levels in its treated water quarterly in order to determine TOC removal compliance. The average raw and treated water TOC levels at Loma Rica WTP were 1.7 mg/L and 1.0 mg/L, respectively, equating to 39.4 percent average removal. Since all of the TOC RAAs for both source and treated waters were less than 2.0 mg/L, no TOC removal calculation is required for the Loma Rica WTP. **Figure 5-28** shows a timeseries plot of raw and treated water TOC when the Loma Rica WTP was in operation. The peak concentration was 2.9 mg/L in December 2023. Similar to Elizabeth George WTP, peak concentrations generally occur during wet weather months.

Figure 5-28. Loma Rica WTP, Total Organic Carbon, 2021-2025



Stage 2 D/DBP Rule Compliance Period

NID converted to four Stage 2 D/DBP Rule monitoring sites for the Loma Rica distribution system in March 2011. TTHM LRAAs ranged from 21.0 to 58.8 µg/L and HAA5 LRAAs ranged from 10.5 to 23.5 µg/L. Based on data over the reporting period, TTHM and HAA5 LRAAs were below the respective MCLs per the Stage 2 D/DBPR.

Other Detectable Title 22 Constituents of Interest

Aluminum was detected at 56 µg/L, which is below the secondary MCL of 200 µg/L. Nitrate was detected at 0.32 mg/L on the 2023 CCR, which is well below the primary MCL of 45 mg/L.

UCMR 5

UCMR 5 requires quarterly monitoring for 29 PFAS and lithium at the entry point to the distribution system. Quarterly monitoring was conducted in April, July, October 2023 and January 2024. NID's contract lab could not provide data for the 4th quarter of monitoring, and samples were recollected in June 2026. All sample results were non-detect.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* data presented in **Section 3**, 3/4-log reduction of *Giardia*/virus continues to be appropriate reduction requirements for the Loma Rica WTP under the SWTR. Under the second round of the LT2ESWTR the source water for the Loma Rica WTP was classified as Bin 1 in 2018.

The Loma Rica WTP is classified as a conventional filtration WTP, and currently receives reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with chlorine provides 0.5-log credit for *Giardia* and 2.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Interim ESWTR, and the LT2ESWTR.

Regulatory Compliance Evaluation

NID has been monitoring the raw and treated water for the Loma Rica WTP for all required Title 22 compliance constituents. **Table 5-15** lists the existing drinking water regulations and a compliance evaluation for these standards at the Loma Rica WTP. The Loma Rica WTP is currently in compliance with existing regulations.

Table 5-15
Regulatory Compliance Evaluation
Nevada Irrigation District – Loma Rica WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No MCLs exceeded based on review of the CCRs.
SWTR	Microbial and Turbidity	Data continue to support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Interim ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in raw and treated water. Therefore, not required to implement enhanced coagulation for TOC removal.
Long Term 2 ESWTR	Microbial	Classified as Bin 1, from second round of *Cryptosporidium* monitoring.
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively).

Lake of the Pines Water Treatment Plant

System Description

The raw water intake location for the Lake of the Pines WTP is located within the terminal reservoir onsite. The source of supply is pumped from Lake Combie via the Magnolia III Canal. Lake of the Pines WTP is a conventional water treatment plant, and the plant design flow is 5 mgd, with average flows at 1.3 mgd.

The influent water is pre-oxidized with sodium hypochlorite, alum is used as the primary coagulant, and caustic is used for pH adjustment. Chemicals are mixed with an adjustable mechanical flash mixer. The coagulated water then goes to a Pulsator Upflow Clarifier where both flocculation and sedimentation occur. The sedimentation detention time is 46 minutes. The clarified water is then filtered through two tri-media gravity filters. The filter loading rate is six gpm/sf.

The filters are backwashed based on time, pressure differential, or turbidity. Backwash water is sent to a settling tank. After settling, the decant water is reclaimed back to the plant's raw water reservoir. The plant has filter to waste capability after backwash, normally for five to seven minutes. Filter to waste water is sent to a separate holding tank where it is then pumped back to the headworks. The filtered water is disinfected with sodium hypochlorite and stored in a clearwell to meet CT requirements. The average residual leaving the plant is 0.5 mg/L.

Highlight of Changes Since 2021 Update

No changes were made to the water treatment processes during the reporting period.

Significant Potential Contaminating Activities

The Lake of the Pines WTP uses water diverted from Lake Combie, which is located on the Bear River downstream of Rollins Reservoir. Rollins Reservoir is subject to recreation, timber harvesting, mining, as well as a wastewater discharge from the Cascade Shores WWTP. The Bear River between Rollins and Combie is also a summer season recreational area. The River Fire burned this area in August 2021 during the study period, which resulted in a brief closure of the Bear River Canal but there were no significant impacts. The Bear River passes under Highway 174 as well as Dog Bar Road, which could have the potential for spills. Lake Combie has low-density residential development around the lake which includes some private docks. The Magnolia III Canal between Lake Combie and the water treatment plant previously passed through some areas with cattle grazing but is now completely encased. Encasement of the Magnolia III Canal was completed in two phases; Phase 1 from Baldwin Ranch to Alexis Drive was completed in November 2013 and Phase 2 –from Robles Drive to Baldwin Ranch was completed in 2017/2018 (two outages). NID also installed geese barrier across and around the Lake of the Pines raw water reservoir to prevent nighttime roosting.

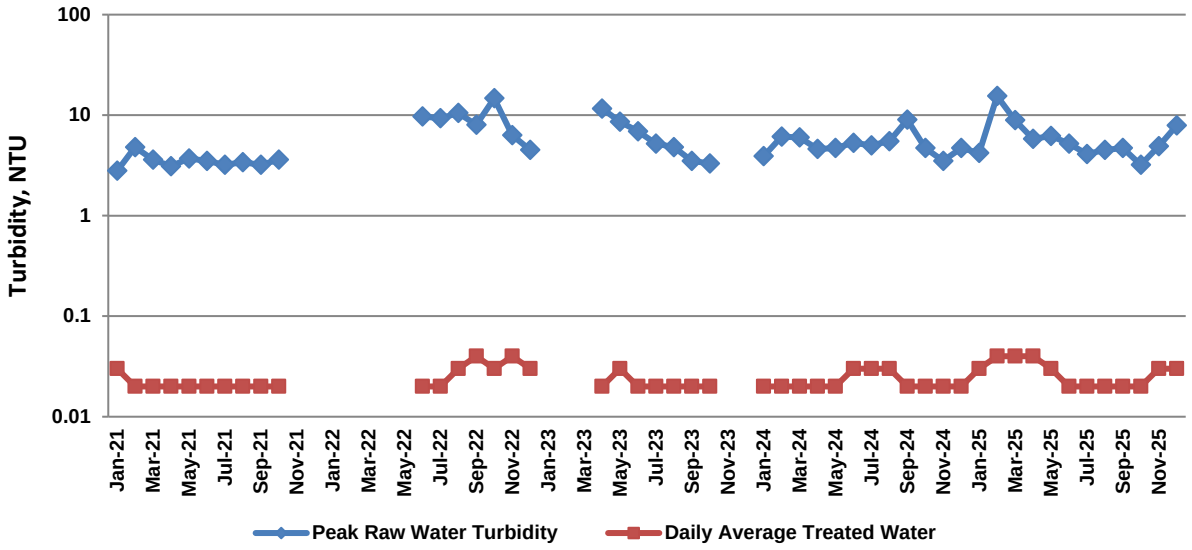
Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study. The Lake of the Pines WTP was offline from October 2021 through May 2022 for reservoir cleaning and maintenance. It was offline again from January through March 2023 for routine plant maintenance and cleaning.

Turbidity

The average raw water turbidity at Lake of the Pines WTP for the period of study was 5.8 NTU, and on average the treatment process decreased this to 0.02 NTU, which equates to an average removal of solids of 99.6 percent. **Figure 5-29** shows a timeseries plot of raw and treated turbidities. Lake of the Pines WTP meets all current turbidity standards. It should be noted that the raw water turbidity is the maximum peak daily, provided as a monthly average. The treated water turbidities are a monthly average of a daily average, which is based on samples taken every four hours in a 24 hour period.

Figure 5-29. Lake of the Pines WTP – Raw and Treated Water Turbidity, 2021-2025



Microbiological Constituent

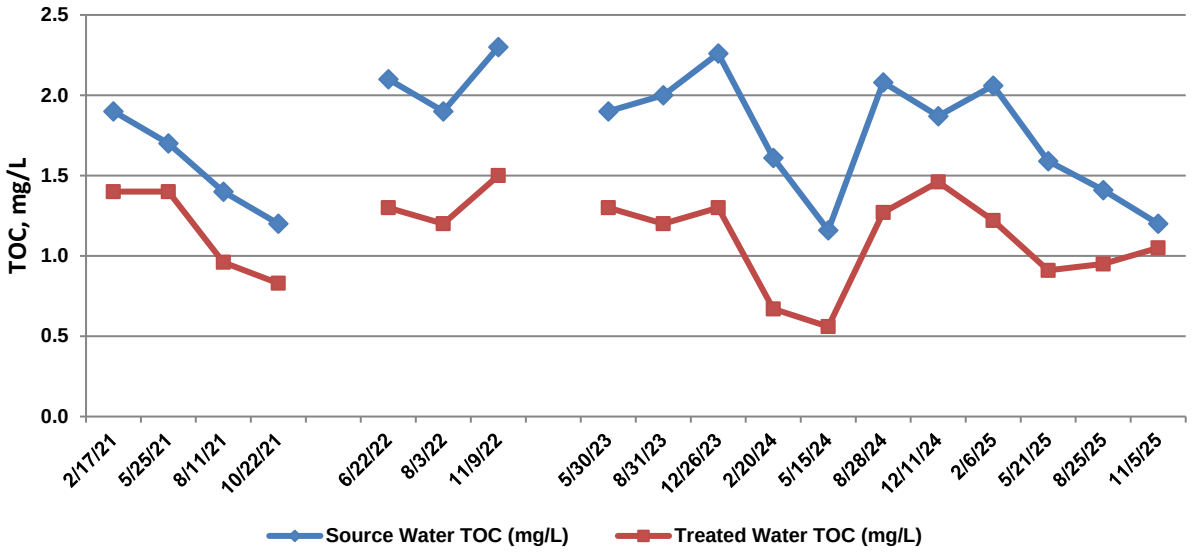
There were no positive coliform samples in the distribution system during the study period.

Disinfection By-Products

NID monitors for alkalinity and TOC levels in its raw water and TOC levels in its treated water quarterly in order to determine TOC removal compliance. The average raw and treated water TOC levels at Lake of the Pines WTP were 1.8 mg/L and 1.1 mg/L, respectively, equating to 35.2 percent average removal. Since all of the treated water TOC RAAs were less than 2.0 mg/L, no TOC removal calculation is required for the Lake of the Pines WTP. **Figure**

5-30 shows a timeseries plot of raw and treated water TOC at Lake of the Pines WTP. The peak concentration was 2.3 mg/L in November 2022 and December 2023. Peak raw water TOC levels typically occur during the wet season (November to February).

Figure 5-30. Lake of the Pines WTP, Total Organic Carbon, 2021-2025



Stage 2 D/DBP Rule Compliance Period

NID converted to two Stage 2 D/DBP Rule monitoring sites in February 2013. TTHM LRAAs ranged from 21.0 to 49.0 µg/L and HAA5 LRAAs ranged from 10.2 to 34.3 µg/L. Based on data over the reporting period, TTHM and HAA5 LRAAs were below the respective MCLs per the Stage 2 D/DBPR.

Other Detectable Title 22 Constituents of Interest

As reported on the 2021 CCR, aluminum was detected at 50 µg/L, which is below the secondary MCL of 200 µg/L. Additionally, the 2024 CCR reported that lead was detected in one out of twenty samples in the distribution system and that one sample exceeded the lead Action Level of 15 µg/L. However, the 90th percentile for lead did not exceed the lead Action Level.

UCMR 5

UCMR 5 requires quarterly monitoring for 29 PFAS and lithium at the entry point to the distribution system. Quarterly monitoring was conducted in April, July, September and December 2023. All sample results were non-detect.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* data presented in **Section 3**, 3/4-log reduction of *Giardia*/virus continues to be appropriate reduction requirements for the Lake of the Pines WTP under the SWTR. Under the second round of the LT2ESWTR the source water for the Lake of the Pines WTP was classified as Bin 1 in 2019.

The Lake of the Pines WTP is classified as a conventional filtration WTP, and currently receives reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with chlorine provides 0.5-log credit for *Giardia* and 2.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Long Term 1 ESWTR, and the LT2ESWTR.

Regulatory Compliance Evaluation

NID has been monitoring the raw and treated water for the Lake of the Pines WTP for all required Title 22 compliance constituents. **Table 5-16** lists the existing drinking water regulations and a compliance evaluation for these standards at the Lake of the Pines WTP. The Lake of the Pines WTP is currently in compliance with existing regulations.

Table 5-16
Regulatory Compliance Evaluation
Nevada Irrigation District – Lake of the Pines WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No MCLs exceeded based on review of the CCRs.
SWTR	Microbial and Turbidity	Data continue to support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Long Term 1 ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in treated water. Therefore, not required to implement enhanced coagulation for TOC removal.
Long Term 2 ESWTR	Microbial	Classified as Bin 1, from second round of *Cryptosporidium* monitoring.
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively).

Lake Wildwood Water Treatment Plant

System Description

The raw water intake location for Lake Wildwood WTP is located on the Newtown Canal, whose source of supply is Deer Creek. Lake Wildwood WTP is a conventional water treatment plant, and the plant design flow is 4 mgd, with average flows at 1.5 mgd.

The influent water is pre-chlorinated with sodium hypochlorite, alum is used as the primary coagulant, and caustic soda is used for pH adjustment. Chemicals are mixed with a mechanical mixer on clarifier A while clarifier B utilizes a static inline mixer. The coagulated water then goes to two circular upflow (steel) clarifiers where both flocculation and sedimentation occur. The sedimentation detention time is 2.3 hours. The clarified water is then filtered through four dual media gravity filters. The filter loading rate is six gpm/sf.

The filters are backwashed based on time, and then pressure differential or turbidity. Each filter is backwashed at least every five days. Backwash water is sent to a reclaim pond, and after settling, the decant water is reclaimed back to the plant's raw water reservoir. The plant has filter to waste capability after backwash, normally for three to five minutes. The filtered water is disinfected with sodium hypochlorite and stored in a clearwell and storage tanks to meet CT requirements. The average residual leaving the plant is 0.6 mg/L.

Highlight of Changes Since 2021 Update

No changes were made to the water treatment processes during the reporting period.

Significant Potential Contaminating Activities

The Lake Wildwood WTP diverts off of Deer Creek into the Newtown Canal. Deer Creek is filled with water from the South Yuba Canal/Lake Spaulding, so it is vulnerable to all the same activities as the Elizabeth George WTP, plus it passes through Upper and Lower Scotts Flat Reservoirs where there is summer recreational use. Deer Creek is a natural waterway that receives local runoff and flows through parts of Nevada City where there is urban runoff and the potential for wastewater collection system spills. Highways 20 and 49 cross the creek, as well as many other local roads, which could be a source of spills. The Newtown Canal is an open, earthen ditch that passes through low-density residential areas as well as cattle and horse grazing. In May 2017, 1/3 of a mile of the Newtown Canal (near homes and septic systems) was encased in pipe. However, there is still substantial vulnerability of the water supply along Deer Creek and the Newtown Canal.

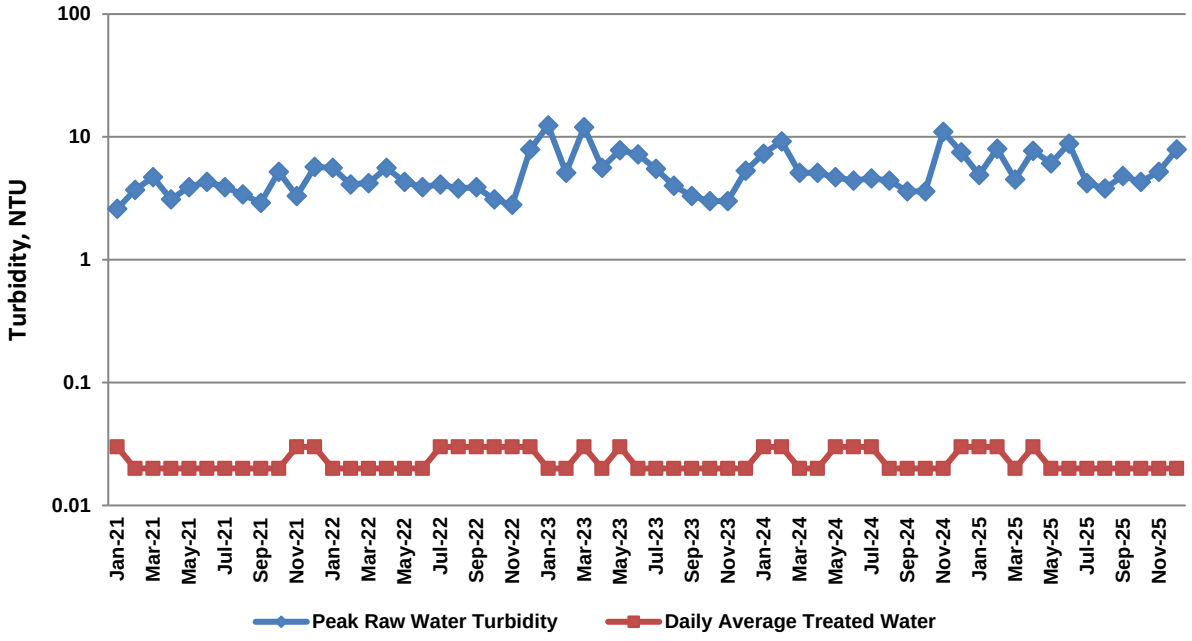
Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

Turbidity

The average raw water turbidity at Lake Wildwood WTP for the period of study was 5.2 NTU, and on average the treatment process decreased this to 0.02 NTU, which equates to an average removal of solids of 99.6 percent. **Figure 5-31** shows a timeseries plot of raw and treated turbidities. Lake Wildwood WTP meets all current turbidity standards. It should be noted that the raw water turbidity is the maximum peak daily, provided as a monthly average. The treated water turbidities are a monthly average of a daily average, which is based on samples taken every four hours in a 24-hour period.

Figure 5-31. Lake Wildwood WTP – Raw and Treated Water Turbidity, 2021-2025



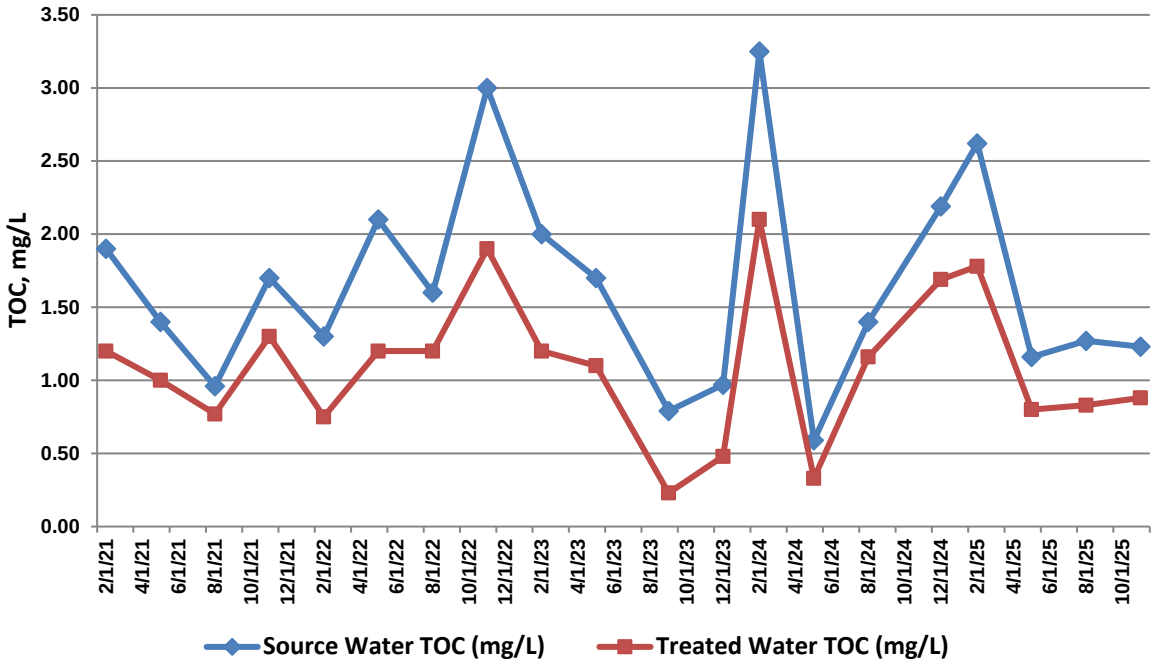
Microbiological Constituent

There were no positive coliform samples in the distribution system during the study period.

Disinfection By-Products

NID monitors for alkalinity and TOC levels in its raw water and TOC levels in its treated water quarterly in order to determine TOC removal compliance. The average raw and treated water TOC levels at Lake Wildwood WTP were 1.7 mg/L and 1.1 mg/L, respectively, equating to 33.9 percent average removal. Since the treated water TOC RAAs were less than 2.0 mg/L, no TOC removal calculation is required for the Lake Wildwood WTP. **Figure 5-32** shows a timeseries plot of raw and treated water TOC at Lake Wildwood WTP. Peak raw water TOC levels typically occur during the wet season (November to February).

Figure 5-32. Lake Wildwood WTP, Total Organic Carbon, 2021-2025



Stage 2 D/DBP Rule Compliance Period

NID converted to two new Stage 2 D/DBP Rule monitoring sites in February 2013. TTHM LRAAs ranged from 21.8 to 58.3 µg/L and HAA5 LRAAs ranged from 15.2 to 57.0 µg/L. Based on data over the reporting period, TTHM and HAA5 LRAAs were below the respective MCLs per the Stage 2 D/DBPR.

NID has been trying to limit DBP formation by keeping chlorine residuals as low as possible, while still providing a residual at the furthest locations in the distribution system. NID staff believes that the Lake Wildwood WTP is vulnerable to spikes in DBPs due to the higher TOC and temperatures caused by long, meandering canals that supply the water treatment plant.

Other Detectable Title 22 Constituents of Interest

Based on a review of the 2021 to 2025 CCRs, there are no other detectable Title 22 constituents of interest.

UCMR 5

UCMR 5 requires quarterly monitoring for 29 PFAS and lithium at the entry point to the distribution system. Quarterly monitoring was conducted in April, June/August, September and December 2024/March 2025. All sample results were non-detect.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* data presented in **Section 3**, 3/4-log reduction of *Giardia*/virus continues to be appropriate reduction requirements for the Lake Wildwood WTP under the SWTR. Based on the second round of the LT2ESWTR the source water for the Lake Wildwood WTP was reclassified as Bin 1 in October 2020 by DDW.

The Lake Wildwood WTP is classified as a conventional filtration WTP, and currently receives reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with chlorine provides 0.5-log credit for *Giardia* and 2.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Long Term 1 ESWTR, and the LT2ESWTR.

Regulatory Compliance Evaluation

NID has been monitoring the raw and treated water for the Lake Wildwood WTP for all required Title 22 compliance constituents. **Table 5-17** lists the existing drinking water regulations and a compliance evaluation for these standards at the Lake Wildwood WTP. The Lake Wildwood WTP is currently in compliance with existing regulations.

Table 5-17
Regulatory Compliance Evaluation
Nevada Irrigation District – Lake Wildwood WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No MCLs exceeded based on review of the CCRs.
SWTR	Microbial and Turbidity	Data continue to support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Long Term 1 ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in treated water. Therefore, not required to implement enhanced coagulation for TOC removal.
Long Term 2 ESWTR	Microbial	Reclassified as Bin 1, from second round of *Cryptosporidium* monitoring.
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively).

North Auburn Water Treatment Plant

System Description

The raw water intake location for North Auburn WTP is located on Rock Creek Reservoir, or alternately the Combie-Ophir Canal can be used during periods when Rock Creek Reservoir is unavailable. North Auburn WTP is a conventional water treatment plant, and the plant design flow is 6 mgd, with average flows at 2.5 mgd.

The influent water is pre-oxidized with sodium hypochlorite, alum is used as the primary coagulant, and caustic was used for pH adjustment. Chemicals are mixed with an adjustable inline flash mixer. The coagulated water then goes to an upflow clarifier where both flocculation and sedimentation occur. The sedimentation detention time is 91 minutes. The clarified water is then filtered through two dual media gravity filters. The filter loading rate is six gpm/sf.

The filters are typically backwashed based on turbidity. In the summer, each filter is backwashed at least every five days. In the winter, each filter is backwashed at least every three days. Backwash water is sent to a reclaimed pond, and after settling, the decant water is reclaimed back to North Auburn WTP's headworks at no more than ten percent of overall plant flow. The plant has filter to waste capability after backwash, normally for three to five minutes. The filtered water is disinfected with sodium hypochlorite and stored in a clearwell to meet CT requirements. The average residual leaving the plant is 0.5 mg/L.

Highlight of Changes Since 2021 Update

During the study period the raw water control valve for the Combie Ophir Canal intake was replaced, but no water treatment facility improvements were made.

Significant Potential Contaminating Activities

The North Auburn WTP receives water from Rock Creek Reservoir, which is fed with water from the Bear River Canal, Upper Boardman Canal, and local drainage from Lake Theodore, Lake Arthur, and Halsey Afterbay. Therefore, the source water has all the same vulnerabilities as the Auburn WTP plus additional risk from Interstate 80 and local drainage from the Rock Creek area that includes high-density rural development, commercial, light industrial areas, and a portion of the Auburn Airport.

PG&E does not implement any water quality management programs at the Rock Creek Reservoir and conducts limited maintenance on the reservoir.

The Combie-Ophir Canal diverts the Bear River below Combie Reservoir, so is vulnerable to all the same activities as Lake of the Pines WTP as well as additional rural residential areas and several road crossings between the Bear River and the North Auburn WTP.

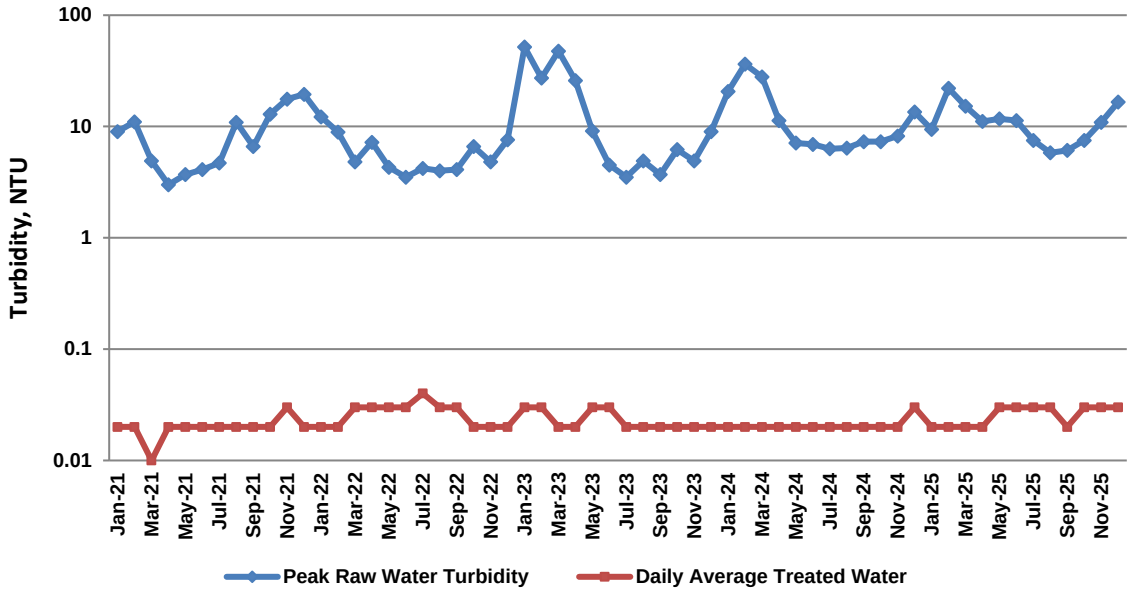
Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

Turbidity

The average raw water turbidity at North Auburn WTP for the period of study was 11.2 NTU, and on average the treatment process decreased this to 0.02 NTU, which equates to an average removal of solids of 99.8 percent. **Figure 5-33** shows a timeseries plot of raw and treated turbidities. There is a distinct seasonal trend of increasing turbidity during wet weather months. North Auburn WTP meets all current turbidity standards. It should be noted that the raw water turbidity is the maximum peak daily, provided as a monthly average. The treated water turbidities are a monthly average of a daily average, which is based on samples taken every four hours in a 24 hour period.

Figure 5-33. North Auburn WTP – Raw and Treated Water Turbidity, 2021-2025



Microbiological Constituent

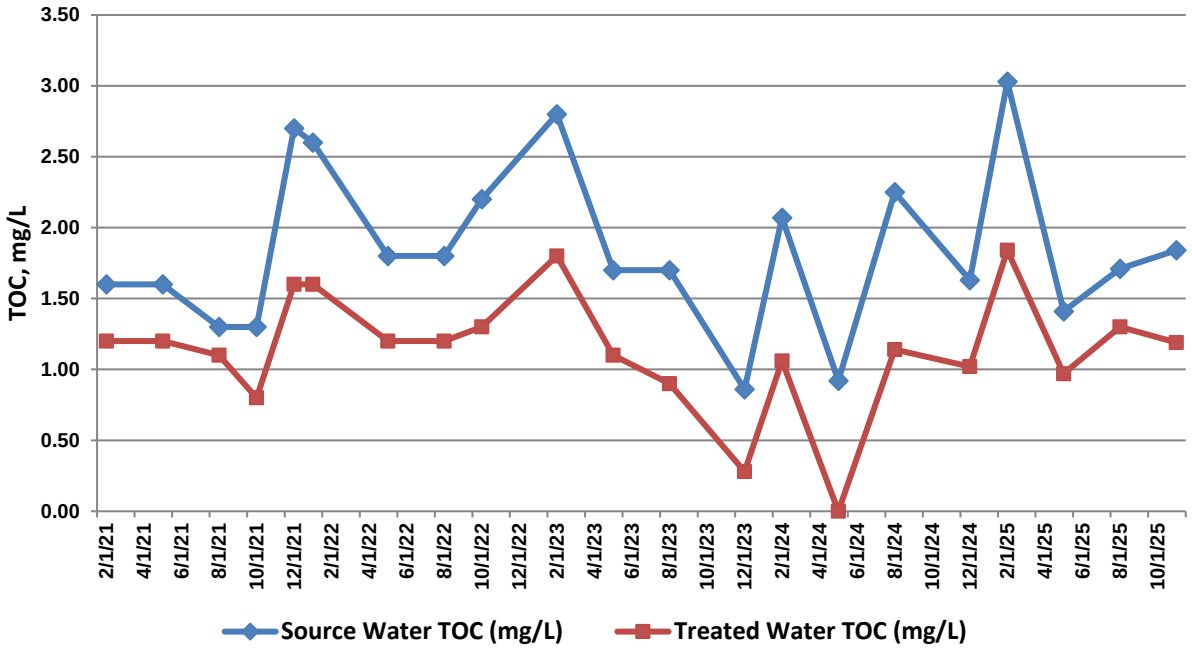
There were no positive coliform samples in the distribution system during the study period.

Disinfection By-Products

NID monitors for alkalinity and TOC levels in its raw water and TOC levels in its treated water quarterly in order to determine TOC removal compliance. The average raw and treated water TOC levels at North Auburn WTP were 1.9 mg/L and 1.1 mg/L, respectively, equating to 38.7 percent average removal. Since all of the treated water TOC RAAs were less than 2.0 mg/L, no TOC removal calculation is required for the North Auburn WTP. **Figure 5-34**

shows a timeseries plot of raw and treated water TOC at North Auburn WTP. The peak TOC was 3.03 mg/L in February 2025. Peak raw water TOC levels typically occur during the wet season (November to February).

Figure 5-34. North Auburn WTP, Total Organic Carbon, 2021-2025



Stage 2 D/DBP Rule Compliance Period

NID converted to two new Stage 2 D/DBP Rule monitoring sites in March 2013. TTHM LRAAs ranged from 32.0 to 62.5 µg/L and HAA5 LRAAs ranged from 12.6 to 34.5 µg/L. Based on data over the reporting period, TTHM and HAA5 LRAAs were below the respective MCLs per the Stage 2 D/DBPR.

Other Detectable Title 22 Constituents of Interest

As reported on the 2022 CCR, manganese was detected at 42 µg/L, which is below the secondary MCL of 50 µg/L.

UCMR 5

UCMR 5 requires quarterly monitoring for 29 PFAS and lithium at the entry point to the distribution system. Quarterly monitoring was conducted in April, June, September (lithium and method 537.1 only) and December 2024 and January 2025 (Method 533 only). All sample results were non-detect.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* and *Giardia* data presented in **Section 3**, 3/4-log reduction of *Giardia*/virus/*Cryptosporidium* continues to be appropriate reduction requirements for the North Auburn WTP under the SWTR. Under the second round of the LT2ESWTR the source water from Rock Creek Reservoir for the North Auburn WTP was classified as Bin 1 in 2019. NID also sampled the Combie-Ophir Canal as an alternative source water for the North Auburn WTP, from September 2019 to September 2021. The highest 12-month mean for *Cryptosporidium* was 0.008 oocysts per liter, indicating the Combie-Ophir Canal source is classified as Bin 1. The highest 12-month mean for *Giardia* was 0.015 cysts per liter.

The North Auburn WTP is classified as a conventional filtration WTP, and currently receives reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with chlorine provides 0.5-log credit for *Giardia* and 2.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Long Term 1 ESWTR, and the LT2ESWTR.

Regulatory Compliance Evaluation

NID has been monitoring the raw and treated water for the North Auburn WTP for all required Title 22 compliance constituents. **Table 5-18** lists the existing drinking water regulations and a compliance evaluation for these standards at the North Auburn WTP. The North Auburn WTP is currently in compliance with existing regulations.

Table 5-18
Regulatory Compliance Evaluation
Nevada Irrigation District – North Auburn WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No MCLs exceeded based on review of the CCRs.
SWTR	Microbial and Turbidity	Data continue to support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Long Term 1 ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in treated water. Therefore, not required to implement enhanced coagulation for TOC removal.
Long Term 2 ESWTR	Microbial	Classified as Bin 1, from second round of *Cryptosporidium* monitoring. The Combie-Ophir Canal alternative source was also classified as Bin 1.
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively).

Smartsville Water Treatment Plant

System Description

The raw water intake location for Smartsville WTP is located on the Meade Canal. At the end of 2010, the primary raw water location for Smartsville WTP was changed to the Meade Canal in order to provide higher source water quality. Smartsville WTP is a conventional water treatment plant, and the plant design flow is 0.085 mgd, with average flows at 0.037 mgd.

Clarion and soda ash were used as the primary coagulants and pH buffer, and the influent water is mixed with an inline static mixer. In September 2023, the primary coagulant was changed to aluminum sulfate. The coagulated water goes to an enclosed flocculation basin with a detention time of 13.5 minutes, and then to a sedimentation basin with a detention time of 78 minutes. The clarified water is then filtered through two dual media pressure filters. The filter loading rate is 1.5 gpm/sf.

The filters are typically backwashed based on time or turbidity. Backwash water is sent to a decant pond and then to an irrigation canal downstream of the plant. The plant has filter to waste capability after backwash, normally for 10 to 15 minutes. The filtered water is disinfected with sodium hypochlorite. The average residual leaving the plant is 0.5 to 1.0 mg/L.

Highlight of Changes Since 2021 Update

Over the reporting period, the sedimentation tank was upgraded and repaired and in March 2024 and the primary coagulant was changed to aluminum sulfate in September 2023.

Significant Potential Contaminating Activities

The Smartsville WTP is fed by the Meade Canal. This is fed by the China Union Canal, which diverts off of Squirrel Creek. Water from Deer Creek is fed into Squirrel Creek via the Tunnel Canal. Deer Creek is filled with water from the South Yuba Canal/Lake Spaulding, so it is vulnerable to all the same activities as the Elizabeth George WTP, plus it passes through Scotts Flat Reservoir where there is summer recreational use. Deer Creek then flows through parts of Nevada City where there is urban runoff and the potential for wastewater collection system spills and discharges from the City of Nevada City WWTP. Highways 20 and 49 cross the creek, as well as many other local roads, which could be a source of spills. Squirrel Creek also passes through Penn Valley where there are extensive small ranch grazing, perched septic systems, and historically a mobile home park with wastewater ponds adjacent to the creek. In April 2021, Penn Valley Mobile Home Park connected to a centralized sewer system and ceased discharge to the ponds, but there has not yet been a formal closure plan implemented. There is also a popular swimming hole in Western Gateway Park. Sections of the Meade Canal leading to the Smartsville WTP were encased in 2018/2019 in an effort to preserve source water quality.

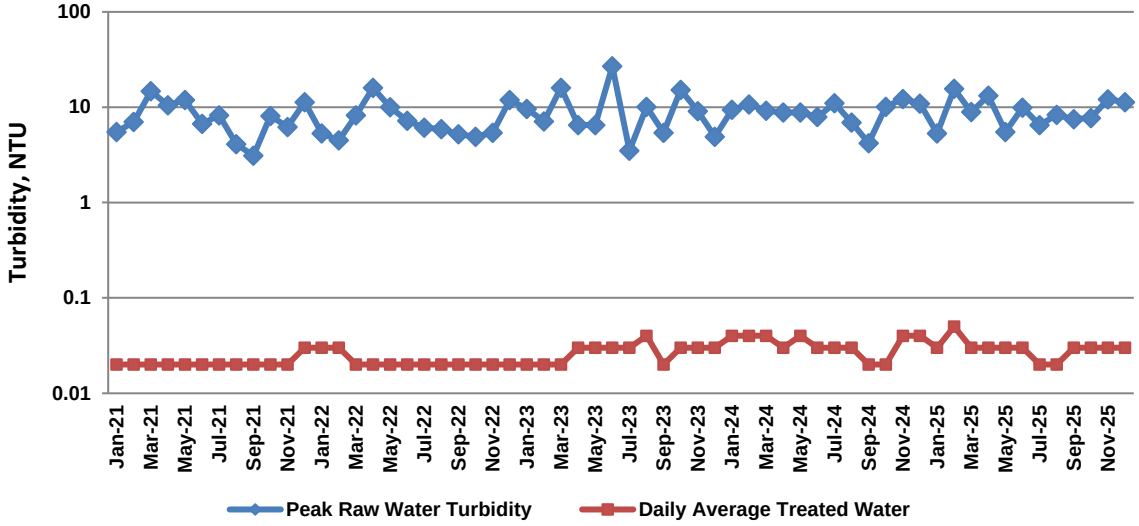
Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

<u>Turbidity</u>

The average raw water turbidity at Smartsville WTP for the period of study was 8.8 NTU, and on average the treatment process decreased this to 0.03 NTU, which equates to an average removal of solids of 99.7 percent. **Figure 5-35** shows a timeseries plot of raw and treated turbidities. Smartsville WTP meets all current turbidity standards. It should be noted that the raw water turbidity is the maximum peak daily, provided as a monthly average. The treated water turbidities are a monthly average of a daily average, which is based on samples taken every four hours in a 24 hour period.

Figure 5-35. Smartsville WTP – Raw and Treated Water Turbidity, 2021-2025



Microbiological Constituent

There were no positive coliform samples in the distribution system during the period of study.

Disinfection By-Products

NID monitors for alkalinity and TOC levels in its raw water and TOC levels in its treated water monthly in order to determine TOC removal compliance. The average raw and treated water TOC levels at Smartsville WTP were 2.5 mg/L and 1.6 mg/L, respectively, equating to 36.7 percent average removal. Out of the 60 month reporting period, there were eight months where the percent TOC removal required was not met. However, the system was in compliance as the RAA TOC removal ratio was always greater than 1.0.

Figure 5-36 shows a timeseries plot of raw and treated water TOC at Smartsville WTP. Based on the monthly alkalinity and TOC levels in the raw water, Smartsville WTP needs to achieve 25 to 45 percent TOC removal, depending on source water alkalinity. Peak raw water TOC levels typically occur during the wet season (November to February).

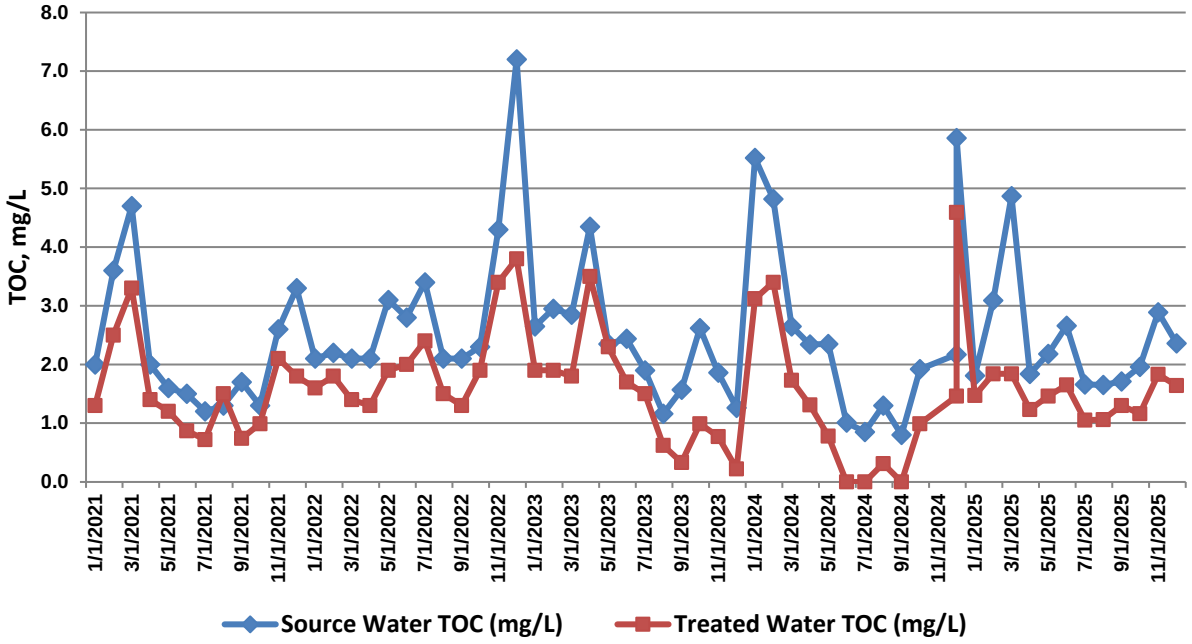
Stage 2 D/DBP Rule Compliance Period

NID converted to one Stage 2 D/DBP Rule monitoring sites for the Smartsville distribution system in January 2011. TTHM LRAAs ranged from 19.0 to 39.8 µg/L and HAA5 LRAAs ranged from 25.2 to 44.5 µg/L. Based on data over the reporting period, TTHM and HAA5 LRAAs were below the respective MCLs per the Stage 2 D/DBPR

NID has been trying to limit DBP formation by keeping chlorine residuals as low as possible, while still providing a residual at the furthest locations in the distribution system. NID staff

believes that the Smartsville WTP is vulnerable to spikes in DBPs due to the higher TOC and temperatures caused by long, meandering canals that supply the water treatment plant.

Figure 5-36. Smartsville WTP, Total Organic Carbon, 2021-2025



Other Detectable Title 22 Constituents of Interest

Based on a review of the 2021 to 2025 CCRs, there are no other detectable Title 22 constituents of interest.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* data presented in **Section 3**, 4/5-log reduction of *Giardia*/virus continues to be appropriate reduction requirements for the Smartsville WTP under the SWTR. Under the second round of the LT2ESWTR the source water for the Smartsville WTP was classified as Bin 1 in 2019.

The Smartsville WTP is classified as a conventional filtration WTP, and currently receives reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with chlorine provides 1.5-log credit for *Giardia* and 3.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Long Term 1 ESWTR, and the LT2ESWTR.

Regulatory Compliance Evaluation

NID has been monitoring the raw and treated water for the Smartsville WTP for all required Title 22 compliance constituents. **Table 5-19** lists the existing drinking water regulations

and a compliance evaluation for these standards at the Smartsville WTP. The Smartsville WTP is currently in compliance with existing regulations.

Table 5-19
Regulatory Compliance Evaluation
Nevada Irrigation District – Smartsville WTP

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	No MCLs exceeded based on review of the CCRs.
SWTR	Microbial and Turbidity	Data continue to support 4/5—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Long Term 1 ESWTR and Filter Backwash Rule	Microbial and Turbidity	All turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBPR	Disinfectants and Disinfection By-Products	RAA treated water TOC > 2.0 mg/L in 9 out of 60 months and therefore TOC removal required. For these nine months (January to September 2023) TOC removal was not met in April, May and July 2023.
Long Term 2 ESWTR	Microbial	Classified as Bin 1, from second round of *Cryptosporidium* monitoring.
Stage 2 D/DBPR	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (<80/60 µg/L, respectively).

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This section consists of a discussion of the key findings for this 2026 Update and a list of recommendations. Significant changes over the past five years are summarized at the beginning of this section.

For assistance with abbreviations and acronyms, the reader is referred to the List of Abbreviations at the front of the Report.

SIGNIFICANT CHANGES SINCE THE 2021 UPDATE

During the past five years, new information has been generated that was used to evaluate source water quality, treatment capabilities, and potential contaminating activities. This new information, which is summarized below, was obtained and evaluated for this 2026 Update.

- Many of the water treatment plants underwent upgrades and minor modifications, some key changes included:
    - Prefilter pipe cleaning and Alta Forebay dredging at the Alta Water Treatment Plant (WTP).
    - New 100,000 gallon steel clearwell, new emergency generator with automatic transfer switch, and a new prefilter at the Monte Vista WTP.
    - Addition of the Weimar water system to Placer County Water Agency (PCWA) in 2023.
    - Recoating of the 100,000 gallon clearwell at the Applegate WTP.
    - Implementation of lab charge analyzers for jar testing at the Bowman, Auburn, Foothill1, and Foothill 2 WTPs.
    - Replacement of aluminum sulfate and sodium hypochlorite tanks at the Sunset WTP.
    - Relocation of post chlorination injection location to "pre-filter" for all NID water treatment plants.
    - Installation of additional storage tank mixers in various NID water systems.
    - Repacking of filters at the Elizabeth George WTP.
    - Installation of geese barriers and full cleaning of the raw water reservoir at the Lake of the Pines WTP.
    - Replacement of raw water control valve for the Combie Ophir Canal intake at the North Auburn WTP.
    - Conversion to aluminum sulfate for coagulation and upgrade of the sedimentation tank at the Smartsville WTP.

- Failure of the South Yuba Canal and Spaulding Powerhouse 1 in February and March 2024 resulted in reduced diversions from Lake Spaulding to the lower watershed in the summer of 2024 and 2025 while repair work was conducted.

- Generally during the study period, 2021 through 2025, the source water turbidity median levels were lower than in the last study period. The same peaking trend during storm events was evident. There are other periods of higher turbidity outside of storm events that could be attributable to reservoir and canal operations and maintenance or algal blooms. The Lake Wildwood WTP saw a distinct increasing trend for turbidity

over the study period, with most peak excursions occurring in 2023 through 2025. Nevada Irrigation District (NID) has an operating procedure to avoid diverting water during peak storm turbidities, which can cause operational constraints at the Lake Wildwood WTP.

- *Escherichia Coli (E. coli)* monthly median values increased at nearly half of the water treatment plants, compared to the previous study period. A quarter of the water treatment plants saw no change in median *E. coli* levels. Sunset, Lake of the Pines, and Smartsville WTPs saw decreases in *E. coli*, likely due to source water protection efforts. Both Sunset and Smartsville WTPs benefitted from canal encasements, while the Lake of the Pines WTP benefitted from geese barriers at the raw water reservoir. Beginning in September 2024, the Auburn WTP has seen an increasing trend in *E. coli* peaks.

- Total organic carbon (TOC) levels are generally stable in the raw and treated water at the majority of water treatment plants. However, the raw water TOC is less frequently lower than 2 milligrams per liter (mg/L) at almost all water treatment plants during this study period, as compared with the last study period. Increases were seen at Alta, Auburn, Elizabeth George, and North Auburn WTPs.

- An evaluation of source water temperatures and disinfection by-product (DBP) levels indicates that there were fewer incidents of increased total trihalomethane (TTHM) and haloacetic acid (HAA5) levels. This is likely due to successful operational procedures by NID and PCWA to control DBP formation.

- Elevated levels of manganese in the raw water at North Auburn WTP is potentially caused by accumulated sediment in Rock Creek Reservoir. All treated water values of manganese are below the secondary Maximum Contaminant Level (MCL).

- Livestock population trends vary over five-year increments, but are relatively stable over the past 20 years. Cattle are a significant potential source of *Cryptosporidium* so this is favorable to source water quality.

- There have been large numbers of fuel reduction projects implemented over thousands of acres in the watershed to help reduce the risk of wildfires, funded by federal, state and local agencies, including NID.

- There has been a big shift in the process for timber harvest operations to be approved on private land in the watershed. Much is conducted under Exemption and Emergency Notices, rather than under Timber Harvest Plans, which have less rigorous requirements for planning and inspection and have the potential to impact source water quality. 2024 was a peak harvest year at over 25 million board-feet harvested in Nevada County.

- The most significant spill events reported to the California Office of Emergency Services (Cal OES) that had the potential to impact the Yuba/Bear River continue to be those associated with vehicular accidents, often along Interstate 80, and many of these were

not reported to the participating water agencies via the formal Cal OES and DDW process.

- There has been a significant reduction in the amount of crude oil imported by rail into California since 2021, to only 667,000 barrels annually.

- The Penn Valley Mobile Home Park did connect to the public sewer and no longer discharges to the ponds adjacent to Squirrel Creek in Penn Valley, however the wastewater ponds have not been formally closed by the Central Valley Regional Water Quality Control Board (Regional Board).

- Outdoor cannabis cultivation is widespread in the watershed, especially in Nevada County. Each county has independent ordinances and regulations to limit and manage the potential impacts from outdoor cultivation, with only Nevada County permitting commercial cultivation. Statewide regulations have been developed and implemented, but these only apply to legal grow operations. There continue to be illegal grow operations throughout the watershed.

- Population projections show limited growth in the watershed over the next 45 years, at approximately eight percent.

- Climate change impacts are already documented in the watershed with increasing air temperature and departures from historic precipitation and runoff patterns.

KEY FINDINGS AND CONCLUSIONS

The key findings and conclusions for this report are organized as they pertain to source water quality, treatment and regulatory compliance, and watershed contaminant sources. Highlights of these findings and conclusions are presented below.

Raw Water Quality for the Yuba/Bear River

Overall, the Yuba/Bear River provides excellent quality water. The raw water can be treated to meet all drinking water standards using conventional treatment processes. No persistently present constituents that require additional treatment processes have been identified in the raw water. Key findings for the constituents of interest are presented below.

Turbidity

- The median of the monthly average raw water turbidity ranges from 1.0 nephelometric turbidity unit (NTU) at the Alta WTP to 8.2 NTU at the Smartsville WTP. Generally, the raw water turbidity for the Alta, Monte Vista, Colfax, Weimar, Loma Rica, Elizabeth George, and Sunset WTPs stays below 10 NTU. During the reporting period, the remainder of the water treatment plants occasionally measured above 10 NTU, with the Bear River Canal and Deer Creek water treatment plants (particularly North Auburn WTP and Smartsville WTP) most frequently over 10 NTU.

- Smartsville and North Auburn WTP had the most months where raw water monthly averages were above 10 NTU, for 22 months out of 60 months for North Auburn and for 20 months out of 60 months for Smartsville. Higher turbidities at North Auburn WTP could be due to algal blooms or lack of maintenance in Rock Creek reservoir, maintenance of Bear River Canal, turbid water released from Rollins Reservoir, and the inability to stop diversion off the canal during storm events. Higher turbidities at Smartsville WTP are likely caused by the long canals leading to the water treatment plant, which are more susceptible to storm runoff.

- Rollins Reservoir can fill with turbid waters during the wet season. This results in higher turbidities at water treatment plants located downstream of Rollins Reservoir, when turbid waters are released from Rollins Reservoir during the winter and spring.

Microbiological Constituents

- The median *E. coli* values ranges from 6.3 most probably number per 100 milliliters (MPN/100mL) at Elizabeth George WTP to 52.0 MPN/100mL at the Auburn WTP.

- *E. coli* levels increase downstream for the Boardman Canal water treatment plants, particularly after Colfax WTP to Applegate WTP. The Auburn WTP had the highest *E. coli* levels, and PCWA staff have been investigating the source of elevated *E. coli* levels since September 2025. There is no clear spatial trend in the data for the water treatment plants downstream of Rollins Reservoir or for the Deer Creek water treatment plants. *E. coli* levels for the Smartsville WTP tend to increase at the start of the irrigation season on April 1st.

- All of the water treatment plants, except for Smartsville, can continue with their current level of treatment of 3/4-log reduction for *Giardia* and viruses under the Surface Water Treatment Rule. The Smartsville WTP is currently operated to achieve 4/5-log reduction for *Giardia* and viruses, and should continue.

- In comparison to the 2016 to 2020 data, raw water *E. coli* levels have decreased at the Smartsville and Sunset WTPs, due to source water protection activities conducted at the end of the previous reporting period. For the Sunset WTP, a portion of the Caperton Canal was encased and the Caperton reservoir was eliminated in July 2020. For the Smartsville WTP, sections of the Meade Canal leading to the Smartsville WTP were encased in 2018/2019 and the Penn Valley Mobile Home Park sewer connection was completed in April 2021.

- Lake of the Pines WTP was the only water treatment plant with 10 percent or more of monthly medians (six or more during the study period) exceeding the 200 MPN/100 mL threshold, with the majority occurring in 2021. NID identified geese as the cause and have been able to deter geese overnighting on the Lake of the Pines

reservoir by placing wire across the reservoir and fencing around the reservoir. This has resulted in a decrease of raw water *E. coli* levels in 2025.

- All PCWA and NID water treatment plants are classified under Bin 1 for the second round of Long Term 2 Enhanced Surface Water Treatment Rule monitoring. However, the State Water Resources Control Board, Division of Drinking Water (DDW) would not allow Bowman WTP to reclassify to Bin 1 based on Round 2 monitoring.

Disinfection By-Product Precursors

- Average TOC levels for all water treatment plants range from 1.3 mg/L at Sunset WTP to 2.5 mg/L at Smartsville WTP.

- TOC levels did not increase consistently downstream for similar groupings of water treatment plants, except for the water treatment plants using Deer Creek downstream of Scotts Flat Reservoir

- Smartsville WTP has the highest TOC levels, likely due to exposure to a natural watercourse (Squirrel Creek) and local canals and their associated localized vulnerabilities.

- TOC levels are seasonally variable, with the peak levels typically occurring during the wet season (November to February).

Individual Intake Evaluations

All of the water treatment plants are currently in compliance with all existing drinking water regulations. PCWA and NID implement various types of treatment processes, depending on facility size and source water quality, and meet all current drinking water standards, including MCLs and treatment technology requirements. Below is a summary of the selected treatment and regulatory compliance issues.

Turbidity

All treated water turbidity standards were met at all of the water treatment plants. The average raw water turbidity at the water treatment plants varies from 1.1 NTU at Alta WTP to 11.2 NTU at North Auburn WTP; while the average treated water turbidity varies from 0.02 NTU at numerous water treatment plants to 0.06 NTU at Alta WTP. Overall, each of the water treatment plants achieves large amounts of solids removal with overall reductions varying from 94.8 to 99.8 percent removal.

Microbiological Constituents

All treated water coliform standards were met in each of the distribution systems, with the exception of one month for NID's Loma Rica system. There were two total coliform detects

that month, one of which was invalidated, and a Level One Assessment was completed resulting in no sanitary defects found. There were a few occasions of total coliform positive results in other systems, but none resulted in fecal coliform detects or violations of the Total Coliform Rule.

Disinfection By-Products

All of the water treatment plants met the alternative compliance criterion for enhanced coagulation by having raw or treated water TOC running annual average (RAA) levels less than 2 mg/L.

The treated water Stage 2 D/DBPR standards were also met in each of the distribution systems. All of the water treatment plants have DBP locational running annual average (LRAA) levels below the primary MCLs, 80 and 60 ug/L, for TTHMs and HAA5 respectively.

PCWA was required to conduct an Operational Evaluation under the Stage 2 D/DBPR for the Applegate distribution system based on a trigger in the third quarter of 2024. The system has a mixer and vents installed in treated water storage facilities to reduce DBPs, but an alarm system failed to trigger the mixer causing the exceedance.

Other Detectable Title 22 Constituents of Interest

- There were minor detections of lead and copper in the distribution system for several of the systems, but none of the 90th percentile values exceeded the respective Action Levels.
- Colfax WTP had a detect of odor at the secondary MCL and low level detects of iron, well below the secondary MCL.
- Weimar WTP had detectable aluminum in 2023 through 2025, with some exceeding the secondary MCL. Quarterly monitoring started in late 2025 and has no further detects above the secondary MCL.
- Applegate WTP had low level detects of gross alpha, below the primary MCL.
- Bowman WTP had low level detects of radium 228, below the primary MCL.
- Auburn WTP had detectable aluminum, nickel, iron, and manganese, with iron and manganese having some above the secondary MCLs.
- Foothill WTP had detectable levels of aluminum and hexavalent chromium, both below the respective MCLs.
- Elizabeth George, Loma Rica, and Lake of the Pines WTPs had detectable levels of aluminum, well below the primary and secondary MCLs.
- Loma Rica WTP also had detectable nitrate, well below the primary MCL.

Other Detectable Unregulated Constituents

PCWA sampled four of its water treatment plants (Bowman, Auburn, Foothill 1/Foothill 2, and Sunset) and NID sampled five of its water treatment plants (Elizabeth George, Loma Rica, Lake of the Pines, Lake Wildwood, and North Auburn) for unregulated constituents under

the Unregulated Contaminant Monitoring Rule 5 during the study period. All constituents were non-detectable.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the total and fecal coliform data presented in **Section 3**, 3/4-log reduction of *Giardia*/virus appears to continue to be appropriate reduction requirements for all of the water treatment plants, except the Smartsville WTP. Smartsville WTP has historically provided 4/5-log reduction and should continue to do so based on source water quality and the potential influence of upstream contaminating activities.

Based on the bin classification process for Round 2 of the LT2ESWTR all the water treatment plants were classified as Bin 1, requiring 2-log reduction of *Cryptosporidium*. DDW has approved Lake Wildwood WTP moving to Bin 1 based on the Round 2 monitoring results, however Bowman WTP remained in Bin 2 despite the lower classification in Round 2. The Weimar WTP was previously classified by DDW as a Bin 1 source, and data during this study period continues to support that classification.

The water treatment plants implement either conventional or direct filtration to receive reduction credit for *Giardia*, viruses, and *Cryptosporidium* for physical removal. Disinfection with free chlorine provides the remaining credit for *Giardia* and viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, either the Interim Enhanced SWTR (IESWTR) or the Long Term 1 ESWTR, and the LT2ESWTR.

Watershed Contaminant Sources

There are numerous types of potential contaminating activities in the watershed. Nine activities were selected for evaluation in this report based on constituents of interest and predominance in the watershed. Selected findings for each of these activities are provided below.

Canal Aquatic Herbicide Use

Although there is limited pesticide application in the Yuba/Bear River watershed, it has the potential to be significant in terms of source water quality due to the drinking water regulations for the pesticides used and its proximity of use to the water treatment plants. This evaluation focused on the seasonal algae control programs implemented by PCWA and NID.

Many of the conveyance canals, as well as Alta Forebay, Halsey Forebay and Afterbay, and Rock Creek Reservoir, are owned and operated by Pacific Gas and Electric (PG&E). PG&E does not conduct any chemical treatment of algae or aquatic plants; they use manual methods such as drawdown and pressure washing. There is limited investment in regular maintenance of these facilities with regard to protecting source water quality.

PCWA and NID apply herbicides as needed, typically sometime between April and November, which are based on chemical control using herbicides. During the study period PCWA used copper-based herbicides. During the study period NID used copper-based herbicides, a sodium carbonate peroxyhydrate algaecide, and glyphosate-based herbicides. Both agencies have coverage under a General NPDES Permit from the State Board and are in strict accordance with the permit terms. Each has submitted an Aquatic Pesticide Application Plan (APAP). The agencies are careful not to apply the copper-based chemicals near the water treatment plant intakes and water treated with glyphosate is not diverted to the intakes.

A review of water quality from the PCWA and NID water treatment plants shows that there have been no detects of organics in the source water. Also, copper levels in the treated water are either non-detectable or well below the action level of 1.3 mg/L.

Rangeland Livestock

Livestock in the Yuba/Bear River watershed primarily includes cattle and sheep and is a relatively small livestock population in the watershed, especially rangeland grazing cattle. Cattle are the livestock of more concern because they are a known host for *Cryptosporidium parvum*. Also, there are several areas in close proximity to the water treatment plants where the cattle grazing could be more significant, such as near the Auburn, Lake of the Pines, Lake Wildwood, Sunset, and Smartsville WTPs.

The total livestock population documented by the United States Department of Agriculture for Nevada County, including both rangeland and dairy cows, was just over 4,800 in 2022. This is an approximate 18 percent increase over the five-year period from 2017 to 2022, and a 4 percent decrease over the past 20 years. There are two active United States Forest Service (USFS) grazing allotment in the upper watershed; Canyon Creek and Webber Lake Allotments. In addition, NID manages a grazing lease along the Bear River below Rollins Reservoir, the Luster Lease. Three areas of particular interest are private ownership in the watershed include; Squirrel Creek watershed, along the Boardman Canal between Colfax and Auburn, and along the Ragsdale Random in Meadow Vista.

Rangeland research published during the study strongly supports the effectiveness of best management practices related to vegetated buffers and grazing intensity to reduce the impact on source water quality. The State Board is preparing a new Statewide Grazing Water Quality Guidance, rather than implement a regulatory approach for management.

A review of available *Cryptosporidium* data for the water treatment plants indicates that there are relatively low levels throughout the watershed and no consistent relationship on seasonal or geospatial trends. The impacts are expected to be highly localized.

Forest Activities

This study identified timber harvesting and wildfires as activities of significant interest. The USFS and the State Board agree that the most important source of pollution in the forests is the timber harvesting road system.

Timber harvesting can occur on both public and private lands and is regulated separately. Timber harvesting on federal lands is regulated by the USFS and by the California Department of Forestry and Fire Protection (CALFIRE) on state and private lands. There continues to be more timber harvest harvesting on state and private lands, compared with federal lands. CALFIRE is permitting more timber harvesting through the Exemption (1,164,034 acres) and Emergency (1,453 acres) Notice program than through tradition timber harvest plans (39,640 acres) on private land. The majority of the Exemption and Emergency Notices were implemented by Sierra Pacific Industries. These harvests have less management and oversight than traditional timber harvest plans.

In order to address hazardous fuels reduction and comply with the new California Vegetation Treatment Program, there were thousands of acres treated as part of the fuel reduction projects implemented in the watershed during the study period by federal, state, and local agencies.

A review of the Nevada County Agricultural Commissioner's annual crop report shows that harvesting operations were quite variable during the study period. In 2024, timber harvest peaked in Nevada County at 25 million board-feet. This could be explained by the fact that most of the timber harvesting in the Yuba/Bear River watershed is by commercial growers, such as Sierra Pacific Industries, who have plans for rotational harvesting cycles and also implement salvage harvesting after wildfires.

Wildfires cause the loss of ground cover, the chemical transformation of soil, and the reduction in soil infiltration rates which all increase the likelihood of erosion and hydrophobic soils, contributing to increased solids in the receiving water and an increase in the turbidity of the raw water at the water treatment plants. There were only three fires in the watershed (either fully or partially), all three in the Bear River sub basin. The most significant was the River Fire in August 2021, which burned along the Bear River below Rollins Reservoir. The Bear River Canal was not damaged, but NID had to implement emergency wildfire recovery actions in 2021.

A specific review of the turbidity and TOC data show that there are distinct seasonal peaks in both constituents during the wet winter months. It is possible that erosion from harvested or burned areas is contributing to those peaks.

NID implements forest best management practices to address sediment transport and fuel reduction on their lands in the watershed. During the study period NID implemented over 2,000 acres of forest management in the Deer Creek, Bear River, and Middle/South Yuba River sub basins.

PCWA and NID are both participating in the Regional Water Authority's American/Bear/Consumnes Rivers Watershed Resilience program. This program may be a vehicle to obtain Proposition 4 funding for watershed projects.

Recreation

There is a large amount of recreation that occurs in the Yuba/Bear River watershed. Recreation occurs in each of the sub basins, at varying levels. Recreation includes body and non-body contact activities. Body contact recreation includes swimming, wading, and rafting and is allowed on all major reservoirs and river reaches in all sub basins. Non-body contact recreation includes camping, boating, off-highway vehicle (OHV) and over-snow vehicle (OSV) use, fishing, hiking, biking and winter activities such as snow play, skiing and snowmobiling.

Camping occurs in both formal campgrounds, nearly 50, and dispersed in the Tahoe National Forest. A review of user statistics for NID shows that the annual use of their recreational facilities is also quite large, approximately 125,000 users annually, and is likely to have associated impacts. The Bear River Campground below Rollins Reservoir was closed after the River Fire and converted to a day-use facility.

Some of the key day-use activities that occur in the watershed include hiking, OHV use, boating, fishing, cross-country skiing, and snowmobiling. The USFS has a Travel Management Program to designate OHV and OSV vehicle roads and trails. Motorized Vehicle Use Maps have been developed for the forest.

PG&E allows access to most of its facilities for day-use including parts of the water supply system such as Deer Creek Forebay, Drum Forebay and Afterbay, Alta Forebay, Halsey Forebay and Afterbay, Rock Creek Reservoir, and Wise Forebay. Most of these are limited to on-shore fishing with limited parking available.

Day-use for the lower Bear River and Squirrel Creek does have significant use during the warm weather months of July, August, and September. Access to the Bear River is used at the Highway 174 and Dog Bar Road crossings and in the area of the Bear River Fishing Access, as well as the adjacent landowners. There are sanitation facilities near the Bear River Fishing Access, but not at any other of these areas. Squirrel Creek recreation is centered on the Western Gateway Regional Park in Penn Valley. There are sanitation facilities provided.

Recreation analysis by USFS, NID, and PG&E all indicate that activities will be expanded in the future and each agency is planning to upgrade or expand current recreational facilities.

NID implemented a Golden Mussel Program in March 2025 to require decontamination or quarantine for all motorized boats at Scotts Flat, Rollins, and Jackson Meadows reservoirs.

Studies conducted by the Central Valley Regional Water Quality Control Board (Regional Board) support that there are distinct impacts on Squirrel Creek that may be attributed to by recreationalists.

Source Water Spills

A hazardous material spill or leak into the river system could occur as a result of a vehicular traffic accident, railroad accident, pipeline leak or spill, wastewater treatment plant spill, or other incident. In the event of a leak or spill, timely notification is critical to ensure that the water treatment plant operators are provided with sufficient time and information to best respond to potential treatment concerns.

During the study period there was a significant reduction in the crude oil imports by rail into California, to less than 700,000 barrels annually.

A review of the California Office of Emergency Services (Cal OES) Hazardous Materials Spill Reports revealed 87 incidents in the watershed, similar to the last study period. The majority were petroleum spills associated with vehicular accidents, along with a few small to medium volume sewage spills. The participating water agencies did not receive notification via Cal OES/DDW for most of these events.

Due to the failure of the Cal OES/DDW formal notification process, both PCWA and NID have developed informal spill notification programs to attempt to obtain timely notification in the event that a spill threatens the source water quality for a water treatment plant. Both agencies have requested direct notification from their respective County OES in the event that a canal or receiving water is impacted. Both agencies also coordinate closely with PG&E regarding source water quality. PCWA has enhanced coordination with the California Highway Patrol and the California Department of Transportation due to frequent spill events along Interstate 80 that have the potential impact source water quality.

PCWA is conducting a Feasibility Study to investigate installation of an engineered conveyance along Interstate 80 as an alternative to Canyon Creek, to reduce vulnerability to the freeway and railroad.

Wastewater

There are three permitted NPDES wastewater treatment plants discharging to the Yuba/Bear River system; Donner Summit Public Utilities District (PUD), Cascade Shores, and City of Nevada City. These are shown on the Watershed Map, **Figure 2-1**. There are nine additional entities with collection systems located in the watershed.

The Donner Summit PUD facility is located in the upper watershed and provides full nitrification and denitrification. The Cascade Shores Wastewater Treatment Plant (WWTP) provides tertiary treatment and discharges to Gas Canyon Creek, which is a tributary to Greenhorn Creek and eventually discharges to Rollins Reservoir. The City of Nevada City WWTP also provides tertiary treatment and discharges to Deer Creek, just west of Nevada City. Donner Summit PUD and Cascade Shores WWTP had minor violations during the study period, but generally discharge in compliance with their NPDES permits. The City of Nevada City WWTP had more significant compliance issues during the study period and has been

implementing three compliance projects to improve treatment, operations, and discharge effluent quality.

There were three Category 1 Sanitary Sewer Overflows (SSOs) that reached surface water in the watershed during the study period. Two were small SSOs, less than 250 gallons, while one was significant at 15,000 gallons. This event occurred in the Penn Valley collection system and discharged to Squirrel Creek, upstream of the Smartsville WTP. A review of microbial data at the influent to the Smartsville WTP did not indicate that source water quality was impaired significantly.

In addition, although there are numerous land discharge systems and individual on-site septic systems located in the watershed there is only one land discharge facility of interest due to its proximity to Squirrel Creek. This is the Penn Valley Mobile Home Park (MHP). The Penn Valley MHP used evaporative percolation ponds located on the north side of Squirrel Creek for wastewater treatment, which was ceased in 2021 as the system was connected to the sanitary sewer. The Regional Board has not yet initiated a formal closure of the facility and the Waste Discharge Requirements (WDRs).

Urban Runoff

There is limited urbanization of the watershed upstream of the WTPs. Small cities and urban areas are regulated under the Phase II Stormwater Program. Under the Phase II Stormwater Program, Stormwater Management Plans (SWMP) were implemented with specific best management practices (BMPs) to minimize pollution, including implementation of treatment BMPs in new development. Monitoring was not required for any Phase II permittees in the Yuba/Bear River watershed.

There is one NPDES Stormwater Phase I permit; the Statewide California Department of Transportation (Caltrans). There are three Phase II permits; the cities of Grass Valley and Auburn and Placer County/North Auburn. An inventory of the Construction Stormwater Program resulted in identification of nine sites as of December 2025 in the watershed. This list varies as projects are implemented. An inventory was conducted to identify the Industrial Stormwater Permittees in the watershed, resulting in 16 permits in the watershed. There was limited ambient monitoring data conducted by these programs.

Mining

Mining has occurred in the Yuba/Bear River watershed for over 150 years. The intensity of use has decreased remarkably over that time, so that mining is now a relatively minimal activity. There have been no detections at levels of concern for constituents specific to mining at the water treatment plants. The Regional Board and Department of Toxic Substances Control manage cleanup efforts at historic mining sites and there are 19 cleanup sites in the watershed, at varying stages of remediation.

Mining occurs on both public and private lands for both metallic and non-metallic ores. Currently, there are three active surface mines, all of which quarry for sand, rock and stone.

There is also an inactive gold mine. Two of the active mines have industrial stormwater permits, the other one appears to be remiss (Sierra Boulder).

The Lava Cap Mine is an active Superfund Site where management continues. The key contaminants are arsenic, iron, and manganese. The mine remediation is being completed in two phases. The first phase, excavation and capping, was completed in 2008. The second phase includes treatment of the mine adit water, which will consist of a semi-passive wetlands treatment system, is expected to be completed in 2026.

Outdoor Cannabis Cultivation

Outdoor cannabis cultivation is present in the watershed, especially in Nevada County. Both adult personal and medical use cultivation is legal on private property, however there are county-specific requirements for legal cultivation. Only Nevada County, including the cities of Grass Valley and Nevada City, allow commercial cultivation activities. Outdoor cultivation has the potential to impact source water quality since the grow sites typically result in erosion, use of fertilizers and pesticides, and collection of trash. The outdoor cultivation period is typically April through October.

The California Department of Pesticide Regulation now permits the use of selected pesticides, primarily natural or biological products, on cannabis.

Cannabis cultivation is regulated at the State level by the State Board and Department of Cannabis Control (DCC) and locally by the three watershed counties. The State Board has permitted nearly 50 cannabis cultivation facilities during the study period. The DCC has licensed 42 individuals/organizations for commercial cannabis. Nevada County has issued 185 permits for cannabis cultivation as of 2024, with more projects in review. There is little information to quantify the presence of illegal outdoor cultivation activities.

RECOMMENDATIONS

Table 6-1 presents the recommendations developed for this 2026 Update, listed by subject area and not by priority. Development of recommendations for watershed management actions that are economically feasible and within the authority of the participating water agencies is critical. Recommendations will be implemented by the participating water agencies as they have resources available.

TABLE 6-1
2026 Update Recommendations

Water Quality and Treatment

Recommendation	Agency Impacted	Basis for Recommendation
Continue to optimize treatment during times of potentially reduced source water quality – i.e., adjust coagulant dose, optimize polymers, reduce flow if possible to increase hydraulic detention times and reduce filtration loading rates, ensure optimized disinfection practices and contact time (CT).	PCWA and NID	Based on historical treatment challenges posed by source water quality, optimization is most likely to be important during storm events or during other high turbidity periods.
Continue to optimize disinfection treatment and distribution system management practices to prevent formation of DBPs. This could include; installation of tank mixers, increased flushing at dead ends, correlating water production more closely during transitional demand periods (i.e., fall), and optimize storage volume in the tanks seasonally.	PCWA and NID	DBP levels in the distribution system have stabilized for the water systems due to ongoing efforts by both agencies. Continued implementation of optimization of both treatment and distribution during periods of higher risk (elevated TOC and temperature or increased water age) will ensure success.
Continue investigation of replacing Canyon Creek with engineered conveyance between Drum Forebay and Alta Forebay to minimize risk of spills along Interstate 80.	PCWA	The use of Canyon Creek for conveyance exposes the water supply to significant risk from vehicular and railroad accidents along Interstate 80. Installation of an alternate engineered system, such as canal or pipe, would significantly reduce risk and improve source water quality and reliability.
Continue investigation of elevated *E. coli* in raw water for Auburn WTP.	PCWA	The Auburn WTP has seen an increase in *E. coli* since September 2024. The source is unclear.

TABLE 6-1 Cont'd
2026 Update Recommendations

Recommendation	Agency Impacted	Basis for Recommendation
Continue to encourage canal protections (encasements) upstream of water treatment plants to protect source water quality. Also support opportunities for other canal protections, such as gunnite and fencing.	PCWA and NID	The voluntary encasement of canals in the watershed shows improvement in source water quality at the downstream water treatment plants. Specifically, the Smartsville WTP experienced lower raw water *E. coli* levels in 2021 to 2025 due to sections of the Meade Canal encasement in 2018/2019, and the Penn Valley Mobile Home Park connection to sewer in April 2021. Similarly, the Sunset WTP experienced lower raw water *E. coli* levels in 2021 to 2025 due to the elimination of the Caperton reservoir and encasement of Caperton Canal which was completed in July 2020. Therefore, canal protections are likely to result in source water quality improvement.

TABLE 6-1 Cont'd
2026 Update Recommendations

Watershed Contaminant Sources

Recommendation	Agency Impacted	Basis for Recommendation
Continue enhanced coordination and communication with PG&E to discuss on-going maintenance needs throughout conveyance and storage system to protect source water quality (i.e., reservoir dredging, chemical or mechanical treatment of vegetation).	PCWA and NID	PG&E does not implement a comprehensive source water quality maintenance program of its facilities. Consider working with PG&E to minimize risks to public health. Special focus on Alta Forebay, Halsey Forebay, and Rock Creek Reservoir.
Continue to use the Regional Water Authority's American/Bear/Cosumnes River Watershed Resilience Plan as a vehicle for grant funding of projects related to water quality. Consider submitting application for grant funding of source water protection projects such as canal encasement, public education along the canals, pet waste management stations along the canals, and canal fencing through vulnerable areas.	PCWA and NID	The impact of local activities is apparent in the source water quality. Implementing source water protection projects along the canals in close proximity to the water treatment plants will be more likely to impact source water quality.
Consider establishing contact with the California Department of Fish and Wildlife (DFW) staff at the Oil Spill Prevention and Response (OSPR) program to ensure that upcoming Geographic Response Plans (GRPs) for the Yuba and Bear River include all water treatment plants accurately.	PCWA and NID	DFW's OSPR program prepares GRPs to address petroleum spills to inland surface waters. As part of these plans, they identify resources to be protected in the response. Providing them location and access information for the water treatment plants will allow DFW to include them in the response plan and be protected.

TABLE 6-1 Cont'd
2026 Update Recommendations

Recommendation	Agency Impacted	Basis for Recommendation
Consider contacting Regional Board to request a formal closure plan for the Penn Valley Mobile Home Park wastewater ponds and WDRs.	NID	The closure of the wastewater ponds resulted in specific and direct improvement of water quality at the Smartsville WTP. This suggests the hydraulic connectivity between the ponds and Squirrel Creek. Formal closure of the facility and WDRs is necessary to ensure this protection is permanent.
Consider contacting the Regional Board to confirm that Deer Creek and its tributaries, specifically Squirrel Creek, are formally designated with the Municipal (MUN) Beneficial Use as part of the Sacramento River Basin Plan.	NID	Beneficial use designations listed in the Basin Plan are the basis for water body protections by the Regional Board. Ensuring the MUN beneficial use applies means that all associated water quality objectives will be considered in discharge permits.
Continue outreach to City of Nevada City, City of Grass Valley, and Nevada County Sanitation District regarding education on water supply system and request for notification of significant sanitary sewer overflows to Deer Creek or Squirrel Creek.	NID	Early notification in the event of a sewage or other hazardous material spill will ensure protection of public health. Some agencies may not be aware of which water conveyances are used for drinking water supply.

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Yuba/Bear River Watershed Sanitary Survey - 2026 Update

Nevada Irrigation District

Board Meeting

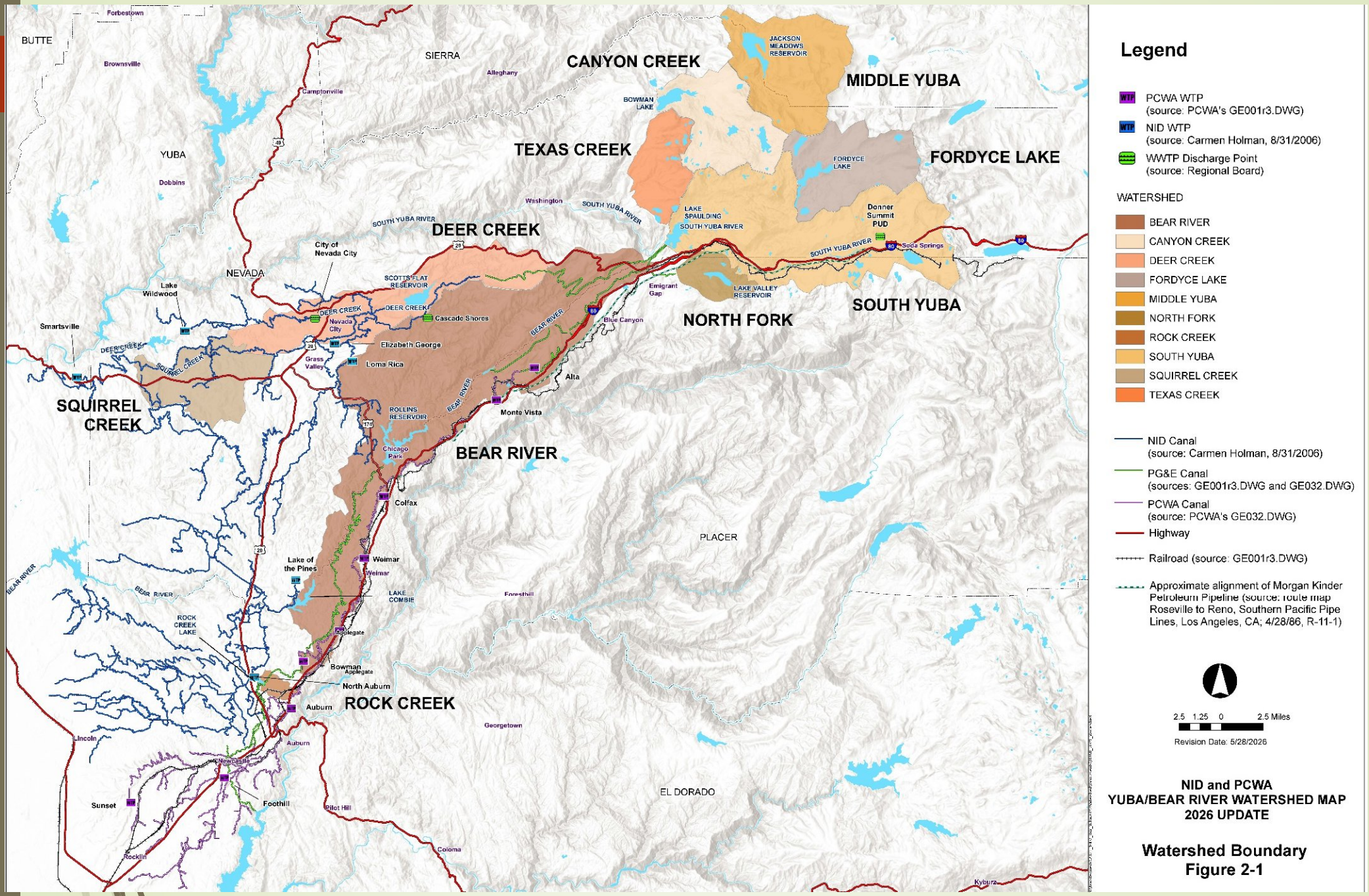
October 28, 2026

Yuba/Bear River Watershed

- Report prepared by Starr Consulting and Palencia Consulting Engineers
- Conducted jointly with Placer County Water Agency
- Study period was January 2021 through December 2025
- Surface Water Treatment Rules require public water systems to conduct update to watershed sanitary survey of all surface water supplies every five years, this is a regulatory compliance document
  - Last update was completed in December 2021

Report Objectives

Regulatory Compliance	• Fulfill California Surface Water Treatment Rule and Interim Enhanced SWTR • Submit Update to DDW by December 2026
Water Quality Evaluation	• Review and evaluate constituents of interest for study period, January 2021 through December 2025 • Identify potential water quality or treatment issues at water treatment plants
Watershed Contaminant Sources Evaluation	• Review and evaluate selected potential contaminating activities • Identify potential impacts to source water quality
Identify Watershed Management Actions	• Recommendations to protect or possibly improve source water quality • Recommendations within authority and resources of participating water agencies


Legend
PCWA WTP
(source: PCWA's GE001r3.DWG)
NID WTP
(source: Carmen Holman, 8/31/2006)
WWTP Discharge Point
(source: Regional Board)
WATERSHED
BEAR RIVER
CANYON CREEK
DEER CREEK
FORDYCE LAKE
MIDDLE YUBA
NORTH FORK
ROCK CREEK
SOUTH YUBA
SQUIRREL CREEK
TEXAS CREEK
NID Canal
(source: Carmen Holman, 8/31/2006)
PG&E Canal
(sources: GE001r3.DWG and GE032.DWG)
PCWA Canal
(source: PCWA's GE032.DWG)
Highway
Railroad (source: GE001r3.DWG)
Approximate alignment of Morgan Kinder Petroleum Pipeline (source: route map Roseville to Reno, Southern Pacific Pipe Lines, Los Angeles, CA; 4/28/86, R-11-1)
2.5 1.25 0 2.5 Miles
Revision Date: 5/28/2026
NID and PCWA
YUBA/BEAR RIVER WATERSHED MAP
2026 UPDATE
Watershed Boundary
Figure 2-1
CANYON CREEK
MIDDLE YUBA
TEXAS CREEK
FORDYCE LAKE
DEER CREEK
SOUTH YUBA
NORTH FORK
SQUIRREL CREEK
BEAR RIVER
ROCK CREEK
PLACER
EL DORADO
BUTTE
SIERRA
YUBA
NEVADA
Forbestown
Brownsville
Alleghany
Camptonville
Dobbins
Washington
Smartsville
Lake Wildwood
City of Nevada City
Nevada City
Grass Valley
Cascade Shores
Elizabeth George
Loma Rica
Alta
Monte Vista
Chicago Park
Colfax
Weimar
Lake of the Pines
LAKE COMBIE
ROCK CREEK LAKE
Applegate
Bowman
North Auburn
Auburn
Lincoln
Newcastle
Sunset
Foothill
Pilot Hill
Rocklin
Coloma
Georgetown
Foresthill
Kyburz
Blue Canyon
Emigrant Gap
Soda Springs
Donner Summit PUD
JACKSON MEADOWS RESERVOIR
BOWMAN LAKE
FORDYCE LAKE
LAKE SPAULDING
SOUTH YUBA RIVER
LAKE VALLEY RESERVOIR
SCOTTS FLAT RESERVOIR
ROLLINS RESERVOIR
DEER CREEK
SQUIRREL CREEK
BEAR RIVER

Significant Changes in Past Five Years

NID

- Relocation of post chlorination injection location to "pre-filter" for all NID water treatment plants
- Installation of additional storage tank mixers in various NID water systems
- Repacking of filters at the Elizabeth George WTP
- Installation of geese barriers and full cleaning of the raw water reservoir at the Lake of the Pines WTP
- Replacement of raw water control valve for the Combie Ophir Canal intake at the North Auburn WTP
- Conversion to aluminum sulfate for coagulation and upgrade of the sedimentation tank at the Smartsville WTP

Significant Changes in Past Five Years

Water Quality

- Failure of the South Yuba Canal and Spaulding Powerhouse 1 in February/March 2024 reduced diversions from Lake Spaulding in summer 2024 and 2025
- Source water turbidity remains similar to historic, with a slight increasing trend at Lake Wildwood WTP since 2023
- *Escherichia coli* (*E. coli*) in the source water increased at half the water treatment plants including Elizabeth George and Lake Wildwood WTPs, while Lake of the Pines and Smartsville WTPs saw decreases due to source water protection efforts
- Total organic carbon (TOC) was generally stable at the majority of water treatment plants, but the source water is less frequently lower than 2 milligrams per liter (mg/L) than historic
- Disinfection by-products in treated water have declined, due to successful operational procedures by NID
- Elevated manganese in raw water at North Auburn WTP is potentially caused by accumulated sediment in Rock Creek Reservoir

Significant Changes in Past Five Years

Watershed Contaminant Sources

- Livestock populations increased over the past five years, but have stabilized over the past 20 years
- Thousands of acres have been treated for fuel reduction, reducing the risk of wildfires
- Large amounts of timber harvesting is being conducted under Emergency or Exemption Notices, with reduced planning and inspections
- Vehicular accidents along Interstate 80 continue to occur and be a risk to the South Yuba Canal, Boardman Canal, and Rollins Lake supplies
- Crude oil imported by rail has decreased significantly, reducing the risk of a spill
- Penn Valley Mobile Home Park connected to the public sewer and significant improvements in microbial source water quality were seen at Smartsville WTP
- Outdoor cannabis cultivation is widespread, both legal and illegal. Commercial cultivation is limited to Nevada County, and nearly 200 permits have been issued

Key Findings and Conclusions Raw Water Quality for the Yuba/Bear River

Turbidity

- Seasonally variable, peaking in wet weather and associated with high river flows and precipitation
- Raw water median values range from 1.0 to 8.2 nephelometric turbidity units (NTU), reflecting an increasing trend downstream
- Highest values were seen at Smartsville and North Auburn WTPs
- Rollins Reservoir fills with turbid waters during the wet season, increasing turbidity to water treatment plants downstream

Coliform

- Seasonally variable, peaking in wet weather and associated with high river flows and precipitation
- Raw water median values for *Escherichia coli* (*E. coli*) range from 6.3 to 52 most probable number per 100 milliliters (MPN/100 mL), reflecting an increasing trend downstream
- Smartsville and Lake of the Pines WTP saw decreased raw water *E. coli* values due to source water protections implemented
- Data supports 3/4-log reduction of *Giardia*/viruses for all water treatment plants except Smartsville WTP, which operates for 4/5-log reduction

Giardia/Cryptosporidium

- Few detects of either protozoa in the Yuba/Bear River
- All WTPs placed in Bin 1 under Round 2 of the Long Term 2 Enhanced SWTR
- Data supports 3/4/2-log reduction of *Giardia*/viruses/*Cryptosporidium*

Total Organic Carbon

- Seasonally variable, peaking in wet weather and associated with high river flows and precipitation
- Raw water median values range from 1.3 to 2.5 milligrams per liter (mg/L)
- Raw water median values are less frequently lower than 2.0 mg/L than historic
- Peak levels occurred between October and April

Key Findings and Conclusions Individual Intake Evaluations

Turbidity Reduction Requirements

- All WTPs achieve excellent suspended solids removal, ranging from 94.8 to 99.8 percent overall reduction of turbidity
- The average combined filter effluent turbidity ranges from 0.02 NTU to 0.06 NTU, well below regulatory limits
- All WTPs meet the Interim Enhanced SWTR turbidity reduction requirements and are awarded 2-log reduction credit for *Cryptosporidium*

Giardia/Virus/*Cryptosporidium* Reduction Requirements

- Monthly median *E. coli* levels are less than 200 MPN/100 mL in almost all months at all WTPs
- *Giardia* and *Cryptosporidium* are infrequently detected at low levels
- All WTPs should continue to provide 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium*

Total Organic Carbon Reduction Requirements

- All WTPs can meet the alternative compliance criteria for either raw and treated water TOC levels less than 2 mg/L

Disinfection By-Products Requirements

- Distribution system levels of total trihalomethanes (TTHM) and haloacetic acids (HAA5) are well below their respective MCLs in the systems associated with all WTPs
- TTHM and HAA5 levels are generally lower than the last study period
- There are no clear trends in the data due to other parameters impacting treated water quality

Key Findings and Conclusions Potential Contaminant Sources

Canal Aquatic Herbicide Use

NID implemented an aquatic control program under permitted plan

- NID utilizes aquatic herbicides on canals to control algae and aquatic weeds as necessary
- Pacific Gas and Electric (PG&E) only utilizes physical control programs
- Copper-based herbicides are the primary herbicide, along with sodium carbonate peroxyhydrate and glyphosate
- NID avoids application near the WTP intakes and coordinate with the drinking water treatment plant staff
- No detects of any applied chemicals at the WTPs

Rangeland Livestock

Cattle population stabilized in the watershed, especially dairy cattle

- Livestock population increased during this study period, but has stablized over the past 20 years
- Limited pesticide use is associated with livestock
- Two active United States Forest Service (USFS) grazing allotments and one active NID grazing allotment in the watershed, all under grazing management plans
- State Water Resources Control Board (State Board) is developing a guidance document to identify management practices to protect water quality

Forest Activities

Timber harvesting expanded, while wildfires were limited

- Timber harvesting is conducted on private and public lands
- Timber harvesting can be for commercial or fuel reduction purposes
- Over 1 million acres in the watershed was harvested for timber during the study period
- Three wildfires burned approximately 2,700 acres in the watershed
- California Department of Foresty and Fire Protection (CALFIRE) and USFS manage separately
- Central Valley Regional Water Quality Control Board (Regional Board) manages impacts to receiving waters for Timber Harvest Plans
- Increasing use of Emergency and Exemption Notices has more limited involvement of Regional Board
- NID has implemented over 2,000 acres of forest management in the watershed during the study period

Recreation

Recreation is widespread, but well managed

- Recreation in the watershed includes a wide variety of body contact and non-body contact activities
- Facilities are operated and managed by federal, state, and local agencies
- Bear River Campground was converted to a day-use facility following the River Fire in 2021
- NID implemented a Golden Mussel Program to require decontamination or quarantine for all motorized boats at Scotts Flat, Rollins, and Jackson Meadows reservoirs

Source Water Spills

Cal OES operates the hazardous materials spill database, but few notifications are reaching PCWA and NID

- Spills can occur anywhere in the watershed, from roadways, railroads, pipelines, facilities, or other incident
- Cal OES reported 87 spill events that reached surface water in the watershed during the study period
- Majority of spill events are vehicular accidents, with many occurring along Interstate 80
- DDW/Cal OES provided few notifications to the participating water agencies
- NID coordinates with County OES and PG&E
- PCWA has enhanced coordination with California Highway Patrol and California Department of Transportation (Caltrans) for potential incidents along Interstate 80

Wastewater

Three wastewater treatment plants, nine wastewater collection systems, and numerous onsite wastewater systems exist in the watershed

- Regional Board has issued three National Pollutant Discharge Elimination System (NPDES) permits for wastewater discharge to the Yuba/Bear River
- Donner Summit Public Utilities District and Cascade Shores Wastewater Treatment Plants (WWTPs) are generally in compliance with their permits
- City of Nevada City WWTP had more significant compliance issues, resulting in three major compliance projects during the study period
- Three Category 1 Sanitary Survey Overflows occurred during the study period, only one of significant volume
- Elimination of the Penn Valley Mobile Home Park wastewater ponds has resulted in improved water quality in Squirrel Creek

Stormwater Runoff

Urban runoff occurs mostly in the lower watershed and is minimal and well managed

- Caltrans is the only Phase I Municipal Storm Sewer System (MS4) systems permitted in the watershed, implementing stormwater management plans and pollution reduction programs and conducting monitoring
- Three Phase II MS4 systems are permitted, cities of Grass Valley and Auburn and Placer County/North Auburn, with fewer stormwater management requirements than Phase I
- 16 Industrial Stormwater permittees exist throughout the watershed
- 9 Construction Stormwater permits were active as of December 2025

Mining

Both legacy and active mining exists in the watershed

- Mining occurs on public and private lands, for both metallic and non-metallic ores
- 19 legacy mining sites are are in various states of remediation under State agency management
- Three active surface mines quarry for sand, rock, and stone, two of which have industrial stormwater permits
- One inactive gold mine exists
- Lava Cap Mine is an active Superfund Site that has completed Phase 1 of remediation (2008) and Phase 2, mine adit water treatment, is expected to be implemented in 2026

Outdoor Cannabis Cultivation

Outdoor cannabis cultivation is present in the watershed, most significantly in Nevada County

- Cannabis cultivation occurs both legally, and illegally, on private lands
- Cultivation on public lands is not permitted
- Nevada County, including the cities of Grass Valley and Nevada City, permit commercial cannabis cultivation
- Selected pesticides are now permitted to be applied to cannabis crops
- Cannabis cultivation regulation includes State level permitting through the State Board and the Department of Cannabis Control (DCC) and locally by Nevada County.
- The State Board issued 50 cannabis cultivation permits during the study period, the DCC licensed 42 individuals/organizations during the study period, and Nevada County permitted 185 cannabis cultivation applications

Recommendations for NID

Water Quality and Treatment	
Continue to optimize treatment during times of potentially reduced source water quality – i.e., adjust coagulant dose, optimize polymers, reduce flow if possible to increase hydraulic detention times and reduce filtration loading rates, ensure optimized disinfection practices and contact time (CT).	PCWA and NID
Continue to optimize disinfection treatment and distribution system management practices to prevent formation of DBPs. This could include; installation of tank mixers, increased flushing at dead ends, correlating water production more closely during transitional demand periods (i.e., fall), and optimize storage volume in the tanks seasonally.	PCWA and NID
Continue to encourage canal protections (encasements) upstream of water treatment plants to protect source water quality. Also support opportunities for other canal protections, such as gunnite and fencing.	PCWA and NID

Watershed Contaminant Sources	
Continue enhanced coordination and communication with PG&E to discuss on-going maintenance needs throughout conveyance and storage system to protect source water quality (i.e., reservoir dredging, chemical or mechanical treatment of vegetation).	PCWA and NID
Continue to use the Regional Water Authority's American/Bear/Cosumnes River Watershed Resilience Plan as a vehicle for grant funding of projects related to water quality. Consider submitting application for grant funding of source water protection projects such as canal encasement, public education along the canals, pet waste management stations along the canals, and canal fencing through vulnerable areas.	PCWA and NID
Consider establishing contact with the California Department of Fish and Wildlife (DFW) staff at the Oil Spill Prevention and Response (OSPR) program to ensure that upcoming Geographic Response Plans (GRPs) for the Yuba and Bear River include all water treatment plants accurately.	PCWA and NID
Consider contacting Regional Board to request a formal closure plan for the Penn Valley Mobile Home Park wastewater ponds and WDRs.	NID
Consider contacting the Regional Board to confirm that Deer Creek and its tributaries, specifically Squirrel Creek, are formally designated with the Municipal (MUN) Beneficial Use as part of the Sacramento River Basin Plan.	NID
Continue outreach to City of Nevada City, City of Grass Valley, and Nevada County Sanitation District regarding education on water supply system and request for notification of significant sanitary sewer overflows to Deer Creek or Squirrel Creek.	NID

Questions