American River

Watershed Sanitary Survey

2023 Update Report

December 2023

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AMERICAN RIVER WATERSHED SANITARY SURVEY
2023 UPDATE

December 2023

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List of Abbreviations

af – acre feet
AB – Assembly Bill
ACL – Administrative Civil Liabilities
ADONA – 4,8-dioxia-3H-perfluorononanoic acid
Aerojet – Aerojet Rocketdyne Holdings, Inc.
ALT – Auburn Lake Trails
ARBS – American River Basin Study
ARGET – American River Groundwater Extraction and Treatment
ARPS – American River Pump Station
ARSWPP – American River Source Water Protection Program
ARWTC – American River Watershed Technical Committee
AWWA – American Water Works Association

BAER – burned area emergency response
BMP – Best Management Practice
BNSF – Burlington Northern and Santa Fe Railway

CAAP – climate action and adaptation plan
CABY – Cosumnes, American, Bear, and Yuba Rivers
CAL FIRE – California Department of Forestry and Fire Protection
Cal OES – California Office of Emergency Services
Caltrans – California Department of Transportation
CalVTP – California Vegetation Treatment Program
CAO – Cleanup and Abatement Order
CAP – *Cryptosporidium* Action Plan
CCBN – California Clean Boating Network
CCC – California Coastal Commission
CCR – Consumer Confidence Report
CDO – Cease and Desist Order
CEC – constituents of emerging concern
CEQA – California Environmental Quality Act
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
CFE – combined filter effluent
cfs – cubic feet per second
CHP – California Highway Patrol
CIWQS – California Integrated Water Quality System
CNRA – California Natural Resources Agency
COC – Contaminant of Concern
Corps – United States Army Corps of Engineers

CRC – Climate Readiness Collaborative
CRRIC – California Rangelands Research and Information Center
CRWL – California Rangelands Watershed Laboratory
CT – Disinfection Contact Time
CUPA – Certified Unified Program Agency
CWA – Clean Water Act
CWD – Carmichael Water District

DBP – disinfection by-product
DBW – California Department of Boating and Waterways
DCC – California Department of Cannabis Control
D/DBP – Disinfectants/Disinfection By-Products
DDW – State Water Resources Control Board, Division of Drinking Water
DEIR – Draft Environmental Impact Report
DLR – detection limit for reporting
DOC – dissolved organic carbon
DPR – California Department of Pesticide Regulation
DTSC – California Department of Toxic Substances Control
DWR – California Department of Water Resources

EBMUD – East Bay Municipal Utility District
E. coli – Escherichia coli
EDH – El Dorado Hills
EID – El Dorado Irrigation District
EIR – Environmental Impact Report
EIS – Environmental Impact Statement
ENF – Eldorado National Forest
EOC – Emergency Operations Center
ERA – Exceedence Response Action

°F – degrees Fahrenheit
FERC – Federal Energy Regulatory Commission
FIRO – forecast informed reservoir operations
FSA – Farm Service Agency
FSP – Folsom State Prison
FY – fiscal year

GAC – granular activated carbon
GDPUD – Georgetown Divide Public Utility District
GET – Groundwater Extraction and Treatment
GHG – greenhouse gases
GIF - Geospatial Innovation Facility
GIS – Geographic Information System

gpm – gallons per minute
GRP – geographic response plan
GSWC – Golden State Water Company

HA – USEPA Health Advisory
HAA5 – five haloacetic acids
HAA6Br – six brominated haloactic acids
HAA9 – HAA5 plus four additional brominated haloacetic acids
HFPO-DA – hexafluoropropylene oxide dimer acid
HHAP – homeless housing, assistance, and prevention
HOT – Homeless Outreach Team
HSC – Health and Safety Code

IDSE – Initial Distribution System Evaluation
IESWTR – Interim Enhanced Surface Water Treatment Rule
IFE – individual filter effluent
IOC – inorganic compound
IPCC – Intergovernmental Panel on Climate Change
IRWMP – Integrated Regional Water Master Plan

JFP – Joint Federal Project

KOWC – Keep Our Waters Clean

LAMP – Local Agency Management Plan
LEPC – Local Emergency Planning Committee
LHAP – Local Homeless Action Plan
LID – low impact development
LRAA – locational running annual average
LT1ESWTR – Long Term 1 Enhanced Surface Water Treatment Rule
LT2ESWTR – Long Term 2 Enhanced Surface Water Treatment Rule

MCL – Maximum Contaminant Level
MEP – maximum extent practicable
MF – Middle Fork
mg – million gallon
mgd – million gallons per day
mg/L – milligrams per liter
MMRSA – Medical Marijuana Regulation and Safety Act
mph – miles per hour
MPN/100 mL – most probable number per 100 milliliters
MRAA – maximum running annual average
MRP – Monitoring and Reporting Program

MS4 – Municipal Separate Storm Sewer System
MST – microbial source tracking
MVUM – Motor Vehicle Use Map
MWQI – Municipal Water Quality Investigations
MX – motocross

NAL – Numeric Action Level
ND – non-detect
NDMA – n-Nitrosodimethylamine
NEL – Numeric Effluent Limitation
NEMDC – Natomas East Main Drainage Canal
NEPA – National Environmental Policy Act
NF – North Fork
ng/L – nanograms per liter
NIMS – National Incident Management System
NL – Notification Level
NMFS – National Marine Fisheries Service
NOI – Notice of Intent
NPDES – National Pollutant Discharge Elimination System
NPLH – No Place Like Home
NPS – non-point source
NRC – National Response Center
NRCS – Natural Resources Conservation Service
NTU – nephelometric turbidity unit
NWQI – National Water Quality Initiative

OEHHA – California Office of Environmental Health Hazard Assessment
OEL – operational evaluation level
OHV – Off-Highway Vehicle
OU – Operable Unit
OSPR – DFW Office of Spill Prevention and Response
OSV – Over-Snow Vehicle
OWTS – Onsite Wastewater Treatment System

PCD – Partial Consent Decree
PCE - tetrachloroethylene
PCWA – Placer County Water Agency
PFAS – per- and poly- fluoroalkyl substances
PFBS – perfluorobutane sulfonic acid
PFDA – perfluorodecanoic acid
PFHpA – perfluoroheptanoic acid
PFHxA – perfluorohexanoic acid
PFHxS – perfluorohexane sulfonic acid

PFNA – perfluoronanoic acid
PFOA – perfluorooctanoic acid
PFOS – perfluorooctane sulfonate
PG&E – Pacific Gas and Electric
PHG – Public Health Goal
PIER - Public Interest Energy Research
PIT – point in time
PLC – programmable logic controller
PPCP – pharmaceutical and personal care products
PWQC – priority water quality constituent

QSE – qualifying storm event

RAA – running annual average
RAP – Remedial Action Plan
RCMP – River Corridor Management Plan
RCPP – Regional Conservation Partnership Program
RD/RA – Remedial Design/Remedial Action
Reclamation – United States Department of Interior Bureau of Reclamation
Regional Water Board – Central Valley Regional Water Quality Control Board
RI/FS – Remedial Investigation and Feasibility Study
RIMS – Response Information Management System
RL – Response Level
RMAC – Rangeland Management Advisory Committee
ROD – Record of Decision
ROWD – Report of Waste Discharge
RMP – Regional Monitoring Program
RPA – Reasonable Potential Analysis
RPF – Registered Professional Forester
RTMP – Rubicon Trail Master Plan
RWA – Regional Water Authority
RWQMP – Rangeland Water Quality Management Plan

SASD – Sacramento Area Sewer District
SB – Senate Bill
SCADA – Supervisory Control and Data Acquisition
SCRSD – Sacramento County Regional Sanitation District
SCWA – Sacramento County Water Agency
SDWA – Safe Drinking Water Act
SEA/EIR – Supplement Environmental Assessment/Environmental Impact Report
SEMS – Standardized Emergency Management System
sf – square foot
SF – South Fork

SHP – State Historic Park
SJWD – San Juan Water District
SMARTS - Stormwater Multiple Application and Report Tracking System
SMUD – Sacramento Municipal Utility District
SNC – Sierra Nevada Conservancy
SOC – synthetic organic compound
SPD – City of Sacramento Police Department
SQIP – Stormwater Quality Improvement Plan
SRA – State Recreation Area
SSMP – Sewer System Management Plan
SSO – sanitary sewer overflow
SSQP – Sacramento Stormwater Quality Partnership
SSWQPP – Saturated Soil Water Quality Protection Plan
State Parks – California Department of Parks and Recreation
State Water Board – State Water Resources Control Board
sVGP – small Vessel General Permit
SVWQC – Sacramento Valley Water Quality Coalition
SWAMP – Surface Water Ambient Monitoring Program
SWMP – Stormwater Management Plan
SWPPP – Stormwater Pollution Prevention Plan
SWTR – Surface Water Treatment Rule

TAC – Technical Advisory Committee
TC – Technical Committee
TCD – Temperature Control Device
TCE – trichloroethylene
TCSI – Tahoe-Central Sierra Initiative
THC – tetrahydrocannabinol
THP – Timber Harvest Plan
TMDL – Total Maximum Daily Load
TNF – Tahoe National Forest
ToC – Top of Conservation
TSS – total suspended solids
TTHM – total trihalomethanes

UAO – Unilateral Administrative Order
UC – University of California
UCCE – University of California Cooperative Extension
UCMR –Unregulated Contaminant Monitoring Rule
µg/L – micrograms per liter
UPRR – Union Pacific Railroad Company
USBLM – United States Bureau of Land Management
USDA – United States Department of Agriculture

USEPA – United States Environmental Protection Agency
USFS – United States Department of Agriculture Forest Service
USFWS – United States Fish and Wildlife Service
UV – ultraviolet light

VA/AP – Vulnerability Assessment and Adaptation Plan
VGP – Vessel General Permit
VOC – volatile organic compound

WDRs – Waste Discharge Requirements
WIP – Watershed Improvement Plan
WQMH - Water Quality Management Handbook
WQMP – Water Quality Management Plan
WRF – Water Reclamation Facility
WSS – watershed sanitary survey
WTP – water treatment plant
WWTP – wastewater treatment plant

INTRODUCTION

One of the primary uses of the American River is as a source of drinking water supply. The State Water Resources Control Board, Division of Drinking Water (DDW) requires that all public water systems using surface water conduct a watershed sanitary survey and then update that study every five years. This report; presents the information collected and the evaluations conducted, highlights key changes over the past five years, identifies key findings, and presents recommendations for source and treated water protection.

Twelve participating water utilities have jointly conducted this 2023 Update to the American River Watershed Sanitary Survey. The water diversion and treatment facilities of participating water utilities are located throughout the watershed, from the headwaters in the high Sierra Nevada Mountains down to the confluence with the Sacramento River in the City of Sacramento. **Figure 2-1** is a watershed map that shows the boundary of the watershed as well as the location of the water diversion facilities.

PARTICIPATING WATER UTILITIES

Placer County Water Agency (PCWA)
Georgetown Divide Public Utility District (GDPUD)
El Dorado Irrigation District (EID)
San Juan Water District (SJWD)
City of Roseville
City of Folsom
Folsom State Prison
Golden State Water Company (GSWC)
Carmichael Water District (CWD)
City of Sacramento
Sacramento County Water Agency (SCWA)
East Bay Municipal Utility District (EBMUD)

The study focuses on constituents of interest for drinking water purposes, including; turbidity, total coliform, *Escherichia coli* (*E. coli*), protozoa, total organic carbon (TOC), disinfection by-products (DBPs), other detected constituents that have a drinking water standard, and selected unregulated constituents of interest.

There are numerous activities in the watershed that have the potential to impact source water quality; these are referred to as watershed contaminant sources. For this study seven activities were identified to be investigated, including: creek and river corridor activities, forest activities, Aerojet Rocketdyne Holdings, Inc. industrial facility (Aerojet), recreation, watershed spills, stormwater runoff, and wastewater.

In addition, five special topics were identified for limited investigation and summary. This included projected population growth in the watershed, an upper watershed management program, the Central Valley Regional Water Quality Control Board's (Regional Water Board) Drinking Water Policy, climate change, and Folsom Lake operations. Finally, a brief review of three additional topics was conducted. This included irrigated agriculture in Placer and El Dorado counties, outdoor cannabis cultivation, and selected mine facilities. All of these topics are summarized only for informational purposes.

Goals of the 2023 Update to the Watershed Sanitary Survey

This 2023 Update to the American River Watershed Sanitary Survey (2023 Update) includes a review and evaluation of source and treated water quality and a review and evaluation of watershed contaminant sources. The primary goals of the 2023 Update are to:

- Confirm the appropriate level of treatment of the source water and evaluate regulatory compliance for the water treatment plants,
- Identify relationships between contaminant sources and source water quality, and
- Make reasonable recommendations to protect or improve source and treated water quality.

Significant Changes During Past Five Years

During the past five years, new information has been generated that was used to evaluate source water quality, treatment capabilities, and watershed contaminant sources. Five participating water utilities modified seven water treatment plants. These modifications ranged from improved diversion structures to entire water treatment plant replacement. Source water quality is still of the highest quality, but drought conditions persisted during much of the study period and resulted in unusual hydrologic conditions throughout the watershed that triggered atypical source water quality conditions for the American River supply. The United States Bureau of Reclamation (Reclamation) completed significant improvements and operational revisions at Folsom Lake. Operations can now be forecast-informed, allowing for new variations in storage and releases. This was first operational in 2021, and coincided with significant hydrologic conditions in the fall (i.e., low Folsom Lake level and cyclone bomb storm) that resulted in unprecedented impacts to source water quality.

There has been a surge in homelessness in Sacramento County, including the American River Parkway. There was a 250 percent increase in the number of homeless in the County and an increasing shift toward unsheltered homeless. Local governments are working diligently to prohibit illegal camping in the American River Parkway to protect public safety. The Lower American River was investigated by the Regional Water Board related to the Clean Water Act (CWA) 303(d) listing for indicator bacteria. Initial studies confirm that elevated levels in dry weather occur downstream of the participating water utilities' intakes and appear to be heavily contributed by bird populations.

Wildfire continued to have a severe impact on the American River watershed, with over 200,000 acres burned during the study period. State and Federal agencies are restructuring many aspects of forest management to accelerate wildfire and forest resiliency and protect the headwaters for our drinking water supplies. An important example in the American River watershed is the French Meadows Restoration Project.

Discharge from the Aerojet groundwater extraction and treatment system continued at 50 million gallons per day (mgd) to the American River or its tributaries. Per- and poly- fluoroalkyl substances (PFAS) have been extensively detected in the source wells, but the groundwater treatment facilities are reducing the effluent. Investigations are showing possible offsite transport of contaminants via groundwater seeps to Alder Creek, which is tributary to the American River.

Over 230 spills were reported to the California Office of Emergency Services (Cal OES) in the American River watershed that reached surface water during the study period, however very few notifications were received via the formal notification process from DDW. The American River Watershed Technical Committee (ARWTC) Voluntary Spill Notification Program serves as a critical stopgap measure for this failure in the notification system, but is not a complete replacement.

Sanitary sewer collection system spills occur regularly, especially during the wet months when infiltration and inflow can occur. Over 4,000,000 gallons of raw sewage was discharged into the American River watershed during the study period. This was especially profound in December 2022 during a period of sustained winter storms.

FINDINGS

Water Quality

Overall, the American River continues to provide excellent quality water. The source (or raw) water can be treated to meet all drinking water standards using conventional, direct, or membrane treatment processes. No persistently present constituents that require additional treatment processes have been currently identified in the source water.

Source Water Quality

Turbidity represents the overall clarity of the water, indicating the amount of solids present that require removal through water treatment. The monthly average raw water turbidities for all but one of the water treatment plants (EID's Reservoir One Water Treatment Plant [WTP]) were below 10 nephelometric turbidity units (NTU), generally between 2 and 5 NTU, except during storm events. Turbidity levels generally increase during the winter storm season and correlate with precipitation. GSWC's Coloma and Pyrites WTPs and EID's Reservoir One WTP have unique seasonal patterns, likely attributable to their off-stream supply canals. Almost all of the water treatment plants had slightly lower median turbidity levels during this study period (2018 to 2022) as compared with the previous period (2013 to 2017), and it was more similar to the 2008 to 2012 pre-drought period.

E. coli is used as a surrogate to represent the overall microbial quality of the source water and identify the level of water treatment required. The median *E. coli* values for the raw water data continue to be low, ranging from non-detectable to 46 most probable number per 100 milliliters (MPN/100 mL). Median *E. coli* values generally appear to increase from upstream to downstream. Similar to previous Update results, average *E. coli* values are higher than the median, emphasizing the influence of peak bacteria counts associated with peak storm events. GSWC's Coloma and Pyrites WTPs and EID's Reservoir One WTP have unique seasonal patterns similar to turbidity, likely attributable to localized impacts at their diversions. The source water *E. coli* monthly medians are low and the current level of treatment of 3/4-log reduction for *Giardia* and viruses appears appropriate for all but two of the water treatment plants. GSWC's Coloma and Pyrites WTPs determine level of treatment based on a total coliform trigger and a majority of those results triggered the need to provide 4/5-log reduction for *Giardia* and viruses. All water treatment plants completed their second round of monitoring as required under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) and were classified as Bin 1, except for CWD's Bajamont WTP. The Bajamont WTP achieves the extra log *Cryptosporidium* action through its membrane filtration process.

TOC is a critical precursor to development of DBPs in the treated water. The water treatment plant intake TOC average levels are very low, ranging from 1.1 to 1.8 milligrams per liter (mg/L). Similar to turbidity, the majority of water treatment plants saw a decrease in the average and median values of TOC in the source water compared to the last study period (2013 to 2017). Also similar to turbidity, the peak levels of TOC in the source water are associated with storm events.

Some of the participating water utilities have monitored for unregulated constituents of interest, due to pending regulation or significant presence in the watershed, including; hexavalent chromium, n-Nitrosodimethylamine (NDMA), 1,4-dioxane, PFAS, and cyanotoxins. All hexavalent chromium detects were well below the recently proposed Maximum Contaminant Level (MCL) of 10 micrograms per liter (µg/L). All NDMA results were non-detect, well below the current DDW Notification Level of 10 nanograms per liter (ng/L). All 1,4-Dioxane results were non-detect, below the current DDW Notification Level of 1 µg/L. Monitoring for 18 PFAS resulted in none detected, with reporting limits below the existing or proposed regulatory thresholds. Cyanotoxin monitoring resulted in only the detection of anatoxin-a on the Lower American River, at levels well below the current DDW Notification Level of 4 µg/L.

Treated Water Quality

All of the water treatment plants are currently in compliance with all existing drinking water regulations. The participating water utilities 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.

All the water treatment plants met the combined filter effluent turbidity standard of less than 0.3 NTU in 95 percent of measurements and never exceeding 1 NTU. Therefore, all conventional and direct filtration plants should be awarded 2-log reduction credit for *Cryptosporidium* under the Interim Enhanced Surface Water Treatment Rule (IESWTR). The average percent solids removal through the water treatment plants ranged from 97.6 to 99.8 percent, well exceeding the required 80 percent.

The treated water coliform standards were met in each of the distribution systems. A few participating water utilities had occasions of total coliform positive results, but none resulted in fecal coliform detects or a sufficient number of detections in a month to cause a violation of the Total Coliform Rule or its revisions.

The treated water DBP standards were met in each of the distribution systems. All the participating water utilities have DBP levels below the primary MCLs for total trihalomethanes (TTHM) and haloacetic acids (HAA5), respectively, based on locational running annual averages (LRAAs). The distribution systems saw the highest levels of DBPs in late 2021 and into 2022, during and following an intense storm period that caused a significant impact to the source water quality at Folsom Lake. EID's Strawberry and Main water systems each had to complete an Operational Evaluation Level report related to HAA5 in 2018. EID continued to implement numerous actions for managing DBP formation to meet drinking water standards, bringing DBP levels down in both systems. Unregulated Contaminant Monitoring Rule 4 data for brominated haloacetic acids indicates that there is very little presence of these constituents in the treated water from the American River.

Several participating water utilities reported individual distribution system detections of lead above the Action Level of 15 µg/L, but all the 90^{th} percentiles were below the Action Level.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* data presented in this 2023 Update, 3/4-log reduction of *Giardia*/virus appears to continue to be appropriate reduction requirements for all of the water treatment plants. *E. coli* monthly median values are well below 200 MPN/100 mL at almost all times. Total coliform evaluation for GSWC's Coloma and Pyrites WTP was conducted, in accordance with their DDW Water Supply permit, and it results in increased log reduction requirements.

Under the LT2ESWTR, water treatment plants were classified in bins based on source water characterization. All the water treatment plants in the American River watershed participating in this study have received a second round Bin 1 classification from DDW, except for CWD. CWD's Bajamont WTP data results placed them in Bin 2 under the second round of monitoring. Compliance is achieved through their membrane filtration process.

The water treatment plants implement either conventional, direct, alternative, or membrane 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 Surface Water Treatment Rule (SWTR) and either the IESWTR or the Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR).

Watershed Contaminant Sources

There are numerous types of potential contaminating activities in the watershed. Seven activities were selected for evaluation in this report based on constituents of interest and predominance in the watershed.

Creek and River Corridor Activities

Activities along the creeks and river of interest include; bird management at Lake Natoma, pet waste management, equestrian waste management, and illegal camping/homelessness along the Lower American River. Lake Natoma has a large population of resident and migratory geese leading to fecal waste issues at Nimbus Flat. California Department of Parks and Recreation (State Parks) has not initiated any efforts to control the waterfowl population at Lake Natoma. Coliform data from the GSWC's Coloma WTP continue to indicate peak levels occur in the late spring and early summer, which do not correlate with any other known source of fecal matter. Dog walking along the American River Parkway is a popular past-time. Some of the participating water utilities support the "Pups in the Park" program that funds 22 pet waste stations distributing between 65,000 and 80,000 Mutt Mitts® each year between Sunrise Avenue and Discovery Park, primarily above Paradise Beach, to encourage owners to clean up after their pets. Equestrian use in the American River Parkway occurs from both two adjacent stables and day use at seven equestrian staging areas. The number of riders is undocumented, but is most prevalent in the middle reach of the Lower American River. Horse manure removal is not required.

Illegal camping primarily occurs in the lower three miles of the Lower American River, below the participating water utilities' intakes. Between 2018 and 2022 there was a more than tripling of the unsheltered homeless population in Sacramento County, and subsequently in the American River Parkway. The City and County of Sacramento are working diligently to address multiple aspects of homelessness, including banning encampments in the American River Parkway and using law enforcement to remove illegal campsites from the American River Parkway. The Regional Water Board's Lower American River Bacteria study includes microbial source tracking (MST) to identify sources of coliform during dry weather on the lower six miles of the river. The MST results indicate that the majority of the coliform is sourced from birds. There is some coliform sourced from dogs, and very little from humans. The dog sources are most prevalent just downstream of Paradise Beach, where substantial dog walking activities occur and few pet waste stations exist.

Forest Activities

This 2023 Update identified timber harvesting and pesticide use, wildfires, off-highway vehicle (OHV) use, and upper watershed grazing as activities of significant interest. The State of California and the United States Department of Agriculture Forest Service (USFS) are working cooperatively to increase wildfire and forest resiliency statewide. This includes treating 1,000,000 acres per year, such as the French Meadows Restoration Project in the American River watershed. The California Vegetation Treatment Program will increase funding opportunities for local agencies to implement fuel reduction and forest treatments. 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 on state and private lands by the California Department of Forestry and Fire Protection (CAL FIRE). A review of the Placer and El Dorado County Agricultural Commissioners' annual crop reports shows that there were nearly 400,000,000 board feet of timber harvested during the study period, less than the last study period. CAL FIRE issued over 2,500 Timber Harvest Plans (THPs) on over 50,000 acres in the watershed. A new trend is the use of Emergency and Exemption Notices for these types of timber activities, which resulted in over 625,000 acres being "treated" in the watershed during the study period. These notices are exempt from coverage through the Regional Water Board THP program. The Regional Water Board issued 149 THP permits as well, requiring protection of surface water bodies.

Wildfires cause the loss of ground cover, the chemical transformation of soil, and the reduction in soil infiltration rates; these all increase the likelihood of erosion and hydrophobic soils contributing to increased solids (including organics, nutrients, and metals) in the receiving water, resulting in adverse effects to the source water quality of the water treatment plants. There were five major fires during the study period: the Caldor Fire, the Mosquito Fire, the Caples Fire, the Fork Fire, and the North Fire. Combined, these fires burned over 200,000 acres in the American River watershed.

Both the Tahoe and Eldorado National Forests have completed OHV and Over-Snow Vehicle (OSV) trail designation programs. El Dorado County, Eldorado National Forest, and State Parks work together extensively to implement a trail management program for the Rubicon Trail. Grazing occurs in the upper watershed. The livestock population is relatively low and has remained stable during the study period. There are 22 grazing allotments on USFS land and one on United States Bureau of Land Management (USBLM) land in the watershed, only eight of these are active. There is substantial environmental review required for grazing allotments, making stocking rates very low and with limited potential for impact to source water quality.

Aerojet Rocketdyne Holdings, Inc. Industrial Facility

A review of the Aerojet Superfund Site confirms that discharges to the American River continued to be expanded over the study period. There are currently 11 Groundwater Extraction and Treatment (GET) facilities that treat and discharge nearly 50 mgd to the American River or its tributaries. The principal constituents of interest include perchlorate, NDMA, 1,4-dioxane, VOCs, and PFAS. Aerojet ceased industrial operations at the site in December 2019, leaving only the environmental remediation group. Subsequently, the Regional Water Board rescinded the industrial stormwater permit for runoff from the site in June 2020. However, the Regional Water Board has continued to require monitoring and investigation related to detectable perchlorate in Alder Creek, tributary to the American River, during the summer months. The levels of perchlorate are well above the primary MCL and the source is unknown.

Recreation

There is a substantial amount of recreation that occurs in the American River watershed. Whitewater rafting has historically been an intensive use in the upper watershed. User statistics from El Dorado County indicate that annual use of the South Fork American River below Chili Bar Reservoir decreased from peak historic levels and has shifted to more commercial operations. State Recreation Areas (SRA) in the American River watershed provide numerous recreational opportunities in the Foothills. Use statistics from State Parks indicates that use in Auburn SRA declined significantly during the study period. The Marshall Gold Discovery State Historic Park use was stable, while Folsom Lake SRA visitorship saw a dramatic increase during the study period.

Most recreation managers in the watershed indicate that there is insufficient recreation facilities for the growing demand. There are numerous potentials for expansion of recreation facilities in the watershed. The American River Parkway continues to be a heavily used recreation area in the watershed. The “Keep Our Waters Clean” and “Pups in the Park” campaigns have been instrumental in providing public education and outreach materials on sanitation facilities between Folsom Lake and the American River Parkway and the location of pet waste stations in the American River Parkway.

Watershed 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 and plan measures to protect the water supply. A review of the Cal OES spill database revealed 230 incidents that reached surface water throughout the watershed during the study period. Half of these were related to wastewater and of the non-wastewater spills, 23 were considered potentially significant. Most of these spills were related to vehicle or vessel accidents that release petroleum products. Several were related to substantial amounts of fire-fighting flows. Of the 23 spills of potential significance noted above, only two notifications were received from DDW by the participating water utilities. This is a significant failure of the standard procedure.

The participating water utilities continued a voluntary spill notification program through the ARWTC to ensure timely notification in the event that a spill threatens the source water quality.

Stormwater Runoff

There is little urban runoff in the upper watershed. In the lower watershed there is significant urban runoff. Stormwater runoff is managed through several regulatory programs. The Region-Wide General Permit for Discharges from Municipal Separate Storm Sewer System (MS4) enrolls all the Sacramento area municipalities individually. They work together as part of the

Sacramento Stormwater Quality Partnership (SSQP) to comply with aspects of the General Permit, such as implementation of monitoring programs and preparation of reports. The SSQP has significant regional activities, including: target pollutant reduction strategies, a water quality monitoring program, special studies, regional public outreach and education, regional development standards, industrial/commercial sites program, and program effectiveness evaluation. There are numerous BMPs implemented that address drinking water constituents of interest. A review of the urban tributary and urban runoff data shows that there were few constituents of interest that had detectable levels. High levels of *E. coli*, organic carbon, and total iron (which was detected at average levels exceeding the secondary MCL) continue to be of interest in urban runoff discharge.

Smaller municipalities and special systems are regulated under Phase II. There are currently eight NPDES Stormwater Permit Phase II permits within the American River watershed. The Phase II permittees have Stormwater Management Plans and implemented the standard six program elements during the study period. Also permitted in the watershed are industrial sites, construction sites, and the California Department of Transportation (Caltrans). Industrial and construction activities are covered under separate general orders which have specific requirements focused on BMPs. Caltrans is covered under a statewide general permit, addressing Caltrans' Phase I MS4 and construction requirements.

Wastewater

There are two permitted NPDES wastewater treatment plants in the American River watershed: the City of Colfax Wastewater Treatment Plant (WWTP) and the City of Placerville Water Reclamation Facility (WRF). The City of Colfax WWTP discharges 0.275 mgd to Bunch Canyon, which is tributary to the North Fork American River. There were no violation notices issued or spill events during the study period. The City of Placerville WRF discharges 2.3 mgd to Hangtown Creek, which is tributary to the South Fork American River. There was one violation notice issued to the City for minor exceedances, but no recorded spill events. The presence of septic systems along the South Fork American River upstream of the Strawberry WTP, along Main Canal upstream of Reservoir One WTP, and along the GDPUD canal system continues to be a potential concern. All of these locations are in El Dorado County, where there is little on-going maintenance and inspection of septic systems. There are 19 sanitary sewer collection systems in the American River watershed and 13 of these had at least one Category 1 sanitary sewer overflow that reached surface water. These collection systems discharged over 4 million gallons of untreated wastewater to surface water during the study period, primarily during significant rainfall events. Much of this total volume was discharged in late December 2022.

RECOMMENDATIONS

The American River Watershed Sanitary Survey 2023 Update developed recommendations based on the findings of the study, which are presented in **Table ES-1**. The findings focus on assisting the participating water utilities with meeting all drinking water treatment and regulatory compliance goals, identify opportunities for coordination with outside agencies to address potential source water quality impacts, and encourage the implementation of effective stakeholder activities to protect source water quality. Recommendations may be implemented by the participating water utilities at their discretion as they have resources available.

TABLE ES-1
2023 Update Recommendations

Water Quality Recommendations	**Applies To**
Continue to optimize treatment and distribution processes. Optimization may include: ➢ Monitoring source water quality. ➢ Conducting regular equipment inspection and maintenance. ➢ Optimizing facility controls such as; flow, coagulant type, loading rates, backwash procedures, and disinfection. ➢ Coordinating with distribution system operations and maintenance to preserve treated water quality and minimize degradation.	All Participating Utilities
Consider tracking the Regional Water Board's efforts on the Lower American River Bacteria Study.	CWD, City of Sacramento, Sacramento County Water Agency (SCWA), East Bay Municipal Utility District (EBMUD)
Watershed Contaminant Sources Recommendation	**Applies To**
Continue to maintain voluntary direct notification and inter-notification procedures established by the ARWTC and supplemented on the Lower American River. Periodically check the currency of the contacts and notification agreements and conduct periodic dry-runs to test and improve the procedures.	American River - All Participating Utilities Lower American River – CWD, City of Sacramento, SCWA, EBMUD (Future Consideration for GSWC)

TABLE ES-1 Continued
2023 Update Recommendations

Watershed Contaminant Sources Recommendation	**Applies To**
Continue to support the Keep Our Waters Clean (KOWC) campaign.	City of Folsom, SJWD, City of Roseville, CWD, City of Sacramento, EID, Folsom State Prison, GSWC, PCWA, SCWA, and EBMUD
Continue to support the Pups in the Park program. Consider advocate for installation of more pet waste stations at and downstream of Paradise Beach.	GSWC, CWD, City of Sacramento, PCWA, SCWA (Future Consideration for EBMUD)
Continue to track events at the Aerojet site, receive notification for discharges, and act as an active stakeholder with regard to USEPA, Department of Toxic Substances Control, and Regional Water Board permitting, as applicable.	CWD, City of Sacramento, SCWA, EBMUD, GSWC
Continue stakeholder participation in the Cosumnes, American, Bear, and Yuba Rivers Integrated Regional Water Master Plan (CABY IRWMP) and consider development of source water protection projects to implement. Consider coordinating efforts with the ARWTC.	PCWA, GDPUD, EID
Continue coordination with CAL FIRE and USFS when wildfires impact drinking water sources.	PCWA, GDPUD, EID
Consider further discussion of these topics within the American River Watershed Technical Committee: • Communicate with the United States Bureau of Reclamation (Reclamation)/ California Department of Parks and Recreation (State Parks) on impacts to drinking water supplies of operations and activities at Folsom Lake. • Consider options for better understanding wildfire impacts to local source water quality. • Track and consider potential impacts from climate change on American River.	Varies by Topic
Continue to conduct cyanotoxin monitoring in raw water during peak vulnerable periods (i.e., summer and fall).	City of Sacramento

TABLE ES-1 Continued
2023 Update Recommendations

Watershed Contaminant Sources Recommendation	Applies To
Consider using San Francisco Estuary Institute Harmful Algal Bloom Satellite Analysis Tool to track bloom activity in waterbodies of interest (Folsom Lake, French Meadows, Hell Hole, Loon Lake, Union Valley).	All
Continue to include climate change as a special topic in the watershed sanitary survey updates.	All
Remove Agriculture, Regional Water Board Drinking Water Policy, Outdoor Cannabis Cultivation, and Mining as special topics for investigation in the 2028 Update. These are low intensity activities that are well regulated with limited detections of constituents of concern in source water.	All

This report presents the findings of the 2023 Update to the American River Watershed Sanitary Survey (2023 Update). This sixth update covers the period of January 2018 through December 2022. The initial watershed sanitary survey was completed in 1993 (1993 Survey), the first update was completed in 1998 (1998 Update), the second update was completed in 2003 (2003 Update), the third update was completed in 2008 (2008 Update), the fourth update was completed in 2013 (2013 Update), and the fifth update was completed in 2018 (2018 Update) in accordance with the California Surface Water Treatment Rule (SWTR).

This section provides a list of the participating water utilities, identifies the objectives of the study, presents the constituents and topics covered in the update, generally describes the conduct of the study, and provides the outline of the report.

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

OBJECTIVES OF THE UPDATE

The overall objective of this 2023 Update is to assess the source water quality of the American River to ensure that the existing water treatment plants for the participating water utilities continue to produce drinking water that meets all drinking water standards.

A watershed sanitary survey focuses on the first barrier to contamination of the drinking water supply, namely 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. An evaluation of water treatment plant capabilities and treated water quality provides an assessment of the ability of the participating water utilities to treat the American River source water. Therefore, certain aspects of the second barrier (water treatment plant) are also evaluated in relationship to water quality.

This 2023 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 utilities conduct a watershed 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 for the study period, 2018 through 2022, 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 the current regulatory framework. Development of recommendations for water treatment plant actions to address water quality or treatment issues and/or address planning needs to meet anticipated future regulations.

- Review and evaluate selected potential contaminating activities to identify potential 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. Development of recommendations for watershed management actions that are economically feasible and within the authority of the participating water utilities to implement is critical. Of importance is to focus on 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.

PARTICIPATING WATER UTILITIES

The 2023 Update was jointly conducted by twelve participating water utilities. These utilities are listed in **Table 1-1**. Together these utilities are herein referred to as the participating water utilities.

Table 1-1
List of Participating Water Utilities

Participating Water Utility	Water Treatment Plant (WTP) or Diversion Included
Placer County Water Agency	Foothill WTP/ American River Pump Station
Georgetown Divide Public Utility District	Walton Lake WTP
	Auburn Lake Trails WTP/Sweetwater WTP
El Dorado Irrigation District	Strawberry WTP
	Reservoir One WTP
	El Dorado Hills WTP
San Juan Water District	Sidney N. Peterson WTP
City of Roseville	Roseville WTP
City of Folsom	Folsom WTP
Folsom State Prison	Folsom State Prison WTP
Golden State Water Company	Coloma WTP
	Pyrites WTP
Carmichael Water District	Bajamont WTP
City of Sacramento	E. A. Fairbairn WTP
Sacramento County Water Agency	Freeport Diversion
East Bay Municipal Utility District	Freeport Diversion

The participating water utilities confer informally in the American River Watershed Technical Committee (ARWTC). The ARWTC is utilized for coordination and planning of the American River Watershed Sanitary Survey updates. The ARWTC also meets approximately a few to several times per year to share information and discuss source water protection and water quality. This group implements the American River Water Utilities Voluntary Spill Notification Program.

Another subset is the Lower American River partners which implement the Lower American River Source Water Protection Program, including Carmichael Water District, the City of Sacramento, Sacramento County Water Agency, and East Bay Municipal Utility District. These agencies work together to implement various follow up activities to the Watershed Sanitary Surveys.

CONSTITUENTS AND TOPICS COVERED IN THE 2023 UPDATE

Several water quality constituents were selected for evaluation as part of the 2023 Update. **Table 1-2** presents a summary of the water quality constituents selected and the reason for selection.

Seven potential contaminating activities were selected for review as part of the 2023 Update:

- Creek and river corridor activities, including bird management at Lake Natoma, pet waste management, equestrian waste management, and illegal camping along the Lower American River,
- Forest activities, including timber harvesting and pesticide use, wildfires, off-highway vehicle use, and selected grazing allotments,
- Aerojet Rocketdyne Holdings, Inc. industrial facility,
- Recreation, including body and non-body contact,
- Watershed spills,
- Stormwater runoff, and
- Wastewater collection and treatment facilities.

Each of these activities is a potential source for at least one of the constituents identified in **Table 1-2**. There is also a discussion on watershed management programs that support source water protection, and in which the participating water utilities may have the opportunity to network or participate.

In addition, five special topics were identified for limited investigation and summary. This included projected population growth in the watershed, upper watershed management programs, the Central Valley Regional Water Quality Control Board's (Regional Water Board) Delta Drinking Water Policy, climate change, and Folsom Lake operations. Finally, a brief review of three additional topics was conducted. This included irrigated agriculture in Placer and El Dorado counties, outdoor cannabis cultivation, and selected mine facilities. All of these topics are summarized only for informational purposes.

Table 1-2
Water Quality Constituents Selected for Evaluation as Part of the 2023 Update

Constituent	**Reason for Inclusion in 2023 Update**
Turbidity	Turbidity is a measurement of suspended solids in water. Treated water turbidity levels are regulated in the SWTR and the IESWTR.
Fecal Coliform	Source water fecal coliform is a surrogate for fecal contamination.
Escherichia coli (E. coli)	The United States Environmental Protection Agency (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. Actual source water levels of *Cryptosporidium* are used to determine treatment requirements as part of 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 in the Stage 1 Disinfectant/Disinfection By-Product (D/DBP) Rule.
Total Trihalomethanes	Total trihalomethanes (TTHM) are disinfection by-products formed in treated water. Treated water levels are regulated by the Stage 1 D/DBP Rule and the Stage 2 D/DBP Rule.
Haloacetic Acids	Haloacetic acids (HAA5) are disinfection by-products formed in treated water. Treated water levels are regulated by the Stage 1 D/DBP Rule and the Stage 2 D/DBP Rule.
Volatile and Synthetic Organic Compounds	Participating water utilities and ambient monitoring program data were reviewed to identify detectable organic constituents which are regulated for drinking water.
Other Detectable Title 22 Constituents and Unregulated	Participating water utilities monitoring program data were reviewed other detectable Title 22 constituents, USEPA Unregulated Contaminant Monitoring Rule 4 constituents, as well as hexavalent chromium, 1,4-dioxane, n-Nitrosodimethylamine (NDMA), per- and poly-fluoroalkyl substances (PFAS), and cyanotoxins.

SUMMARY OF HOW THE 2023 UPDATE WAS CONDUCTED

The project team consisted of a Technical Committee (TC) comprised of representatives from all the participating water utilities and the consultant team of Starr Consulting, Palencia Consulting Engineers, and Rincon Consultants, Inc. The TC reviewed data evaluation, key findings, and recommendations.

The consultant team obtained information from all water treatment plants through a utility survey that addressed each treatment plant's processes, including a discussion of treatment challenges and changes since the 2018 Update. The participating water utilities provided raw and treated water data as well as information on their actions relevant to recommendations from the 2018 Update. Water quality data was also obtained from several ambient monitoring programs to supplemental information from the water treatment plants.

The consultant team collected information on the potential contaminating activities reviewed in this report through literature reviews, Internet searches, and discussions with various agencies' staff. A list of agency contacts and a bibliography are provided in **Appendix A**. This data was reviewed to identify conditions of interest and relationships to source water quality, review source water protection activities, and identify significant changes since the 2018 Update.

REPORT ORGANIZATION

Section 1 - Introduction

This section identifies the participating water utilities that funded the study, describes the objectives of the 2023 Update, lists the main topics and constituents covered in the 2023 Update, describes how the 2023 Update was conducted, and includes a description of the basic report organization. **Appendix A** provides a list of contacts and a bibliography.

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. For more detailed descriptive information on watershed characteristics, the reader is referred to the 1993 Survey and the 1998 Update.

Section 3 – American 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. This includes the ambient monitoring data from other organizations. 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' intake 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 seven potential contaminating activities that were reviewed as part of this 2023 Update, as well as an update on the participating water utilities related source water protection efforts. Also included are discussions on the five special topics and three brief topics identified for this study. **Appendix D** contains materials related to the potential contaminating activities and watershed management programs.

Section 5 - Individual Intake Evaluations

This section contains an evaluation of the 15 included water treatment plants' treated water quality, as well as an evaluation of each water treatment plant's ability to meet the SWTRs as well as other existing regulations and selected future regulations.

Section 6 - Findings and Recommendations

This section presents the key findings for the 2023 Update report and a list of recommendations for the participating water utilities. Significant changes since the 2018 Update are summarized at the beginning of this section.

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 1993 Survey. For a more detailed account of this information, the reader is referred to the 1993 Survey and the 1998 Update. This section provides a brief description of the overall watershed, both upper and lower, and the water diversion and treatment facilities, including a summary of significant changes since the 2018 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

All of the participating water utilities utilize water from the American River. The watershed has a total area of 1,975 square miles and is located on the western slope of the Sierra Nevadas in Nevada, Placer, El Dorado, Alpine, Amador, and Sacramento counties. An updated Geographic Information System (GIS) watershed map was developed as part of the 2018 Update and since there were no changes in the watershed it is provided as **Figure 2-1;** see following page.

The American River watershed climate is temperate and is characterized by wet winters and dry summers. Most of the annual precipitation occurs between November and April as both rain and snow. Annual precipitation varies throughout the watershed depending on elevation; peak amounts occur in the high Sierras at over 80 inches to less than 20 inches in Sacramento. The annual snowpack at the higher elevations acts as a natural reservoir, releasing water over the spring and summer months. However, climate change is resulting in a reduced snowpack in the watershed. Water is collected and transported in a variety of creeks, rivers, reservoirs, and canals. The water is currently distributed from various locations throughout the watershed to the 15 water treatment plants for the participating water utilities.

The watershed is principally divided into an upper and lower watershed. The upper watershed consists of the area located upstream of Folsom Lake, and the lower watershed is the area located downstream of Folsom Lake. Provided below is a brief description of the upper and lower watersheds.

Upper Watershed

The American River above Folsom Lake has a watershed that is approximately 1,860 square miles, with elevations ranging from 484 feet at Folsom Lake to over 10,000 feet in the high Sierras. It is located in Nevada, Placer, El Dorado, Alpine, and Amador counties. Vegetation varies throughout the upper watershed primarily due to elevation changes. From west to east, the vegetation at Folsom Lake is characterized by grasslands which lead to oak-studded grasslands and then into coniferous forests. The highest elevations of the watershed are above the tree line. Large portions of the upper watershed are National Forests (Tahoe and Eldorado). There is limited urbanization in the upper watershed and significant open space. The principal

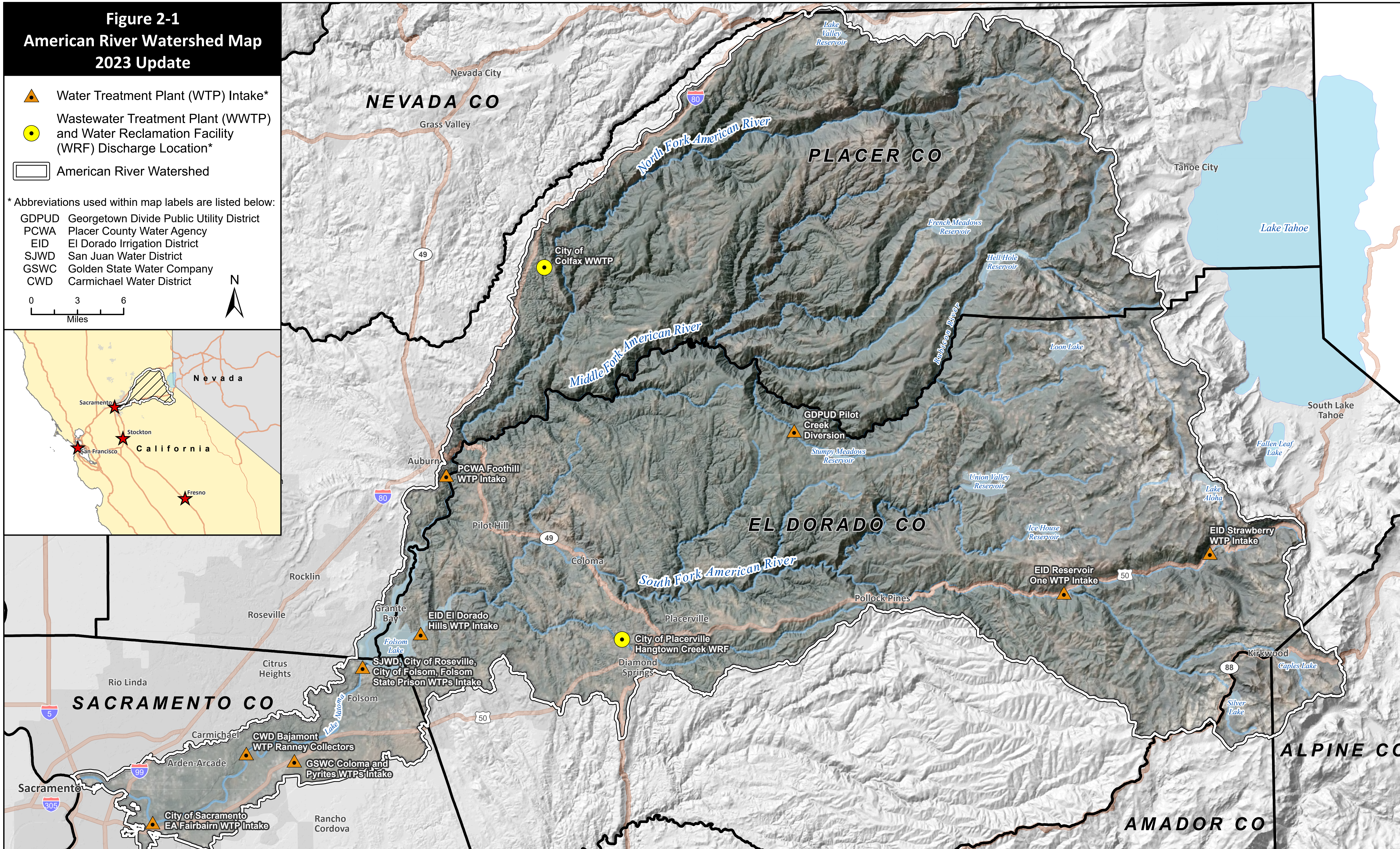


Figure 2-1
American River Watershed Map
2023 Update

Imagery provided by Google and its licensors © 2023. Additional Data Provided by ESRI, 2023, City of Sacramento watersheds, County of Sacramento watershed and CalWater (v.2.2.1) as part of American River Watershed Sanitary Survey 2023 Update.

potential contaminating activities in the upper watershed are related to forest activities, such as timber harvesting, year-round recreation, and wildfires.

The upper watershed includes several large lakes (French Meadows, Hell Hole, Loon, Union Valley, Ice House, and Folsom), numerous small lakes (Lake Valley, Clementine, Stumpy Meadows, Caples, and Silver), and several key rivers and creeks (North, Middle, and South forks of the American River, the Rubicon River, and Pilot Creek). In addition to providing drinking water supply, these water facilities are used for other purposes including flood control, power generation, and/or recreation.

Lower Watershed

The American River below Folsom Lake has a watershed that is approximately 115 square miles, with elevations ranging from 18 feet at the confluence with the Sacramento River to 484 feet at Folsom Dam. It includes drainage areas in El Dorado and Sacramento counties. Urban landscaping dominates the lower watershed with little native grasslands remaining below Folsom Lake. The principal uses in the lower watershed are urbanization (including residential, commercial, and industrial uses) and year-round recreation (especially within Lake Natoma and the American River Parkway).

The lower watershed is centered on the Lower American River, which consists primarily of releases from Folsom Lake. The releases are controlled by the United States Bureau of Reclamation (Reclamation) and pass through Lake Natoma prior to passing onto the Lower American River and Folsom South Canal. Lake Natoma and the Lower American River also receive local drainage from numerous urban creeks (Willow, Alder, Buffalo, Minnesota, Carmichael, Strong Ranch Slough, and Chicken Ranch Slough), as well as direct urban runoff and runoff from undeveloped land along the river and in the American River Parkway. The watershed defined for the American River Watershed Sanitary Survey has never included the drainage area for the Natomas East Main Drainage Canal (NEMDC, also known as Steelhead Creek). This waterbody normally enters the north side of the American River Parkway near Northgate Boulevard and then travels west until it enters the Sacramento River near the confluence with the American River. This drainage area is included in the Sacramento River Watershed Sanitary Survey analysis. Under rare flood conditions the American River Parkway can be inundated by the American River which results in the NEMDC flows entering the American River near Northgate Boulevard; however, this is over six miles downstream of the City of Sacramento's E. A. Fairbairn Water Treatment Plant and not of concern to the water treatment plants using the American River as a source water.

THE WATER DIVERSION AND TREATMENT SYSTEMS

Placer County Water Agency (PCWA)

PCWA owns and operates two water treatment plants that utilizes American River water supply seasonally, the Foothill 1 and 2 Water Treatment Plants (WTPs). Water from the American

River is diverted a few miles downstream of Auburn at the American River Pump Station and pumped into Pacific Gas and Electric's (PG&E) South Canal at Ophir Road which flows to the intake of the Foothill 1 and 2 WTPs. Raw water can also be pumped directly to the water treatment plant via the newly commissioned Foothill Raw Water Pipe. This conveyance uses pumps located at the Ophir Road Pump Station to move American River water out of the Auburn Tunnel, up to a standpipe at Indian Hill Road and down through Glenview Pressure Relief Valve to the Foothill facility where it breaks head and flows into Foothill 1 or Foothill 2. The Foothill 1 and 2 WTPs feed water into the Foothill distribution system.

Foothill 1 Water Treatment Plant

Under normal operating conditions, the plant is fed raw water from PG&E's South Canal which carries Yuba/Bear River water. The plant can also be fed from the Boardman Canal, also carrying Yuba/Bear River water, or from the American River via the South Canal during periods when the PG&E Bear River canal is down for maintenance. Foothill 1 WTP is a ballasted clarification water treatment plant that consists of two individual Actiflo® trains. The plant design flow is 40 million gallons per day (mgd), with an average winter flow of 10 mgd and an average summer flow of 30 mgd.

Foothill 2 Water Treatment Plant

The Foothill 2 WTP is supplied the same water supply as Foothill 1 WTP. During the study period PCWA completed a three-phase upgrade project to; change from horizontal shaft to vertical shaft flocculators, convert to mono-media deep bed filters, and add plate settlers to the sedimentation basins. Foothill 2 WTP is classified as a conventional water treatment plant for flows up to 21 mgd, consisting of pre-chlorination, coagulation/ flocculation, sedimentation, gravity filtration, and post-chlorination. The plant design flow is 21 mgd, with an average winter flow of 7 mgd and an average summer flow of 15 mgd.

El Dorado Irrigation District (EID)

EID owns and operates three water treatment plants that utilize American River water supply: Strawberry WTP, Reservoir One WTP, and El Dorado Hills WTP. A summary of each of these is presented below. Strawberry WTP serves the Strawberry water system, while the Reservoir One and El Dorado Hills WTPs both serve EID's Main water system.

Strawberry Water Treatment Plant

The Strawberry WTP is located adjacent to the South Fork of the American River and diverts directly off the river in the community of Strawberry. Strawberry WTP is a membrane microfiltration water treatment plant, utilizing membrane microfiltration and post-chlorination. The plant design flow is 100 gallons per minute (gpm), with flows normally varying from 70 to 90 gpm. During the study period EID installed new raw water screens to improve source water quality and reduce maintenance and cleaning requirements.

Reservoir One Water Treatment Plant

The Reservoir One WTP is located in the community of Pollock Pines. Water is diverted from the South Fork of the American River near Kyburz into the El Dorado Canal. It travels approximately 22 miles to Forebay Reservoir in Pollock Pines and then into the Main Canal approximately three miles to the Reservoir One WTP. During the study period, the Main Canal was converted from an open ditch to a pipeline. Reservoir One WTP is a conventional filtration water treatment plant, utilizing pre-chlorination, coagulation/sedimentation, filtration, and post-chlorination. The plant design flow is 26 mgd, with winter flows ranging from 6 to 13 mgd and summer flows ranging from 20 to 26 mgd.

El Dorado Hills Water Treatment Plant

The El Dorado Hills WTP is located in the community of El Dorado Hills, just south of Folsom Lake. Water is diverted from Folsom Lake near the confluence with the South Fork of the American River. During the study period a new 16 mgd raw water intake with a temperature control device was completed to allow for flexibility in diversion elevation. El Dorado Hills WTP is an approved alternative filtration technology water treatment plant, utilizing pre-chlorination, ballasted media upflow clarification, filtration, and post-chlorination. The plant design flow is 19.5 mgd, with winter flows ranging from 2 to 3 mgd and summer flows ranging from 3 to 19.5 mgd.

Georgetown Divide Public Utility District (GDPUD)

GDPUD owns and operates two water treatment plants that utilize American River supply: Walton Lake WTP and Auburn Lake Trails (ALT) WTP, which was replaced by the Sweetwater WTP during the study period. Water from Stumpy Meadows Reservoir is released into Pilot Creek and then diverted a few miles downstream into the GDPUD canal system. It is then transported to Walton Lake, where it feeds the Walton Lake WTP, and continues in the canal system to an impoundment, where it feeds the ALT WTP/Sweetwater WTP. Walton Lake WTP feeds the GDPUD water system near Georgetown, and ALT WTP/Sweetwater WTP feeds the GDPUD water system near Cool. A summary of each of these is provided below.

Walton Lake Water Treatment Plant

The Walton Lake WTP is a direct filtration plant located on Walton Lake in Georgetown. The facility includes coagulation, flocculation, and pressure filtration followed by disinfection with sodium hypochlorite. The plant permitted flow is 3 mgd, with flows ranging from 0.56 mgd in the winter to 0.99 mgd in the summer.

Auburn Lake Trails Water Treatment Plant/Sweetwater Water Treatment Plant

The ALT WTP was an inline filtration WTP located near Cool. The facility included coagulation and pressure filtration. The plant permitted flow was 3 mgd, with flows ranging from 0.42 mgd in the winter to 1.02 mgd in the summer. In 2004, the State Water Resources Control Board, Division of Drinking Water (DDW) issued an administrative order (No.01-09-04CO-002) to GDPUD requiring upgrade because in-line filtration is not among those filtration technologies listed in the Surface Water Treatment Regulations. GDPUD completed construction of a new replacement water treatment plant in August 2019, known as the new ALT WTP. The name was changed to Sweetwater WTP in December 2020. The Sweetwater WTP is an alternative treatment process, including upflow clarification, filtration and disinfection with sodium hypochlorite. The plant design flow is 2 mgd and the maximum flow is 3 mgd.

City of Folsom

The City of Folsom owns and operates one water treatment plant that utilizes American River water supply, Folsom WTP. Water from the Folsom Lake is diverted at the Folsom Dam through the Temperature Control Device (TCD) and pumped direct to the water treatment plant. The Folsom WTP consists of conventional filtration and sodium hypochlorite disinfection; see below. The Folsom WTP feeds water into the City of Folsom's distribution system.

Folsom Water Treatment Plant

The Folsom WTP is located in the City of Folsom. Water is diverted from Folsom Lake at the Dam. Folsom WTP is a conventional filtration water treatment plant. The plant utilizes pre-chlorination, coagulation/sedimentation, filtration, and post-chlorination. The plant design flow is 50 mgd, with an average winter flow of 14 mgd and an average summer flow of 32 mgd. During the study period the City of Folsom installed plate settlers to the sedimentation basins to improve settling. In addition, two mixers and blowers were added to distribution system tanks to reduce disinfection by-product formation.

Folsom State Prison (FSP)

FSP owns and operates one water treatment plant that utilizes American River water supply, Folsom State Prison WTP. Water from the Folsom Lake is diverted at Folsom Dam through the TCD and pumped direct to the water treatment plant. The Folsom State Prison WTP consists of direct filtration and chlorine disinfection; see below. The Folsom State Prison WTP feeds water into the Prison's distribution system.

Folsom State Prison Water Treatment Plant

The Folsom State Prison WTP is located at the Prison, located in Represa, which is located on the south side of Lake Natoma below Folsom Dam. Water is diverted from Folsom Lake at the Dam. Folsom State Prison WTP is a direct filtration water treatment plant. The plant utilizes a two-stage Micro-floc package plant with chlorine disinfection. The plant design flow is 4 mgd, with an average winter flow of 1.5 mgd and an average summer flow of 1.9 mgd.

San Juan Water District (SJWD)

SJWD owns and operates one water treatment plant that utilizes American River water supply, Sidney N. Peterson WTP (Peterson WTP). Water from the Folsom Lake is diverted at Folsom Dam through the TCD and flows by gravity or is pumped directly to the water treatment plant. The Peterson WTP is a conventional water treatment plant complete with conventional filtration and chlorine disinfection; see below. The Peterson WTP feeds water into the SJWD distribution system and several consecutive systems.

Sidney N. Peterson Water Treatment Plant

The Peterson WTP is located in the community of Granite Bay, just north of Folsom Lake. Water is diverted from Folsom Lake at the Dam. The plant design flow is 120 mgd, which applies from October 1 through May 14 of each year, and with DDW approval, a flow of 150 mgd from May 15 through September 30 of each year. The average winter flow is 29 mgd and the average summer flow is 73 mgd. Peterson WTP is classified as a conventional filtration water treatment plant. The plant utilizes pre-chlorination, coagulation/sedimentation with tube settlers, filtration, and post-chlorination.

City of Roseville

The City of Roseville owns and operates one water treatment plant that utilizes American River water supply, Roseville WTP. Water from the Folsom Lake is diverted at Folsom Dam through the TCD and pumped direct to the water treatment plant. The Roseville WTP consists of conventional filtration and chlorine disinfection. The Roseville WTP feeds water into the City of Roseville’s distribution system.

Roseville Water Treatment Plant

The Roseville WTP is located in proximity to the City of Roseville, in the community of Granite Bay. Water is diverted from Folsom Lake at the Dam. Roseville WTP is a conventional filtration water treatment plant. The plant has two parallel process trains. Both utilize pre-chlorination, one train implements horizontal flow coagulation/sedimentation while the other train implements upflow clarification, and both trains provide filtration, post-chlorination and fluoridation. The plant design flow is 100 mgd, with an average winter flow of 16 mgd and an average summer flow of 36 mgd.

Golden State Water Company (GSWC)

GSWC owns and operates two water treatment plants that utilize American River water supply: Coloma and Pyrites WTPs. Water from the American River is diverted out of the Folsom South Canal and feeds both water treatment plants. The water in the Folsom South Canal is diverted out of Lake Natoma just upstream of Nimbus Dam. The Coloma and Pyrites WTPs are located on the same property but are independent processes which are treated as separate plants; see below. Both water treatment plants feed water into the Cordova distribution system. During the study period a new intake rake was installed to clear trash and algae more effectively.

Coloma Water Treatment Plant

The Coloma WTP is located in Rancho Cordova. Water is diverted from the Folsom South Canal downstream of the diversion from Lake Natoma. The plant utilizes coagulation/sedimentation and pressure filtration followed by chlorine disinfection. Coloma WTP is classified as an alternative technology because of undersized sedimentation basins that do not fall under either traditional direct or conventional treatment. The plant design flow is 10.7 mgd, with summer flows averaging 8.9 mgd and being off-line during the winter months.

Pyrites Water Treatment Plant

The Pyrites WTP is located in Rancho Cordova. Water is diverted from the Folsom South Canal downstream of the diversion from Lake Natoma. Pyrites WTP consists of two US Filter Actifloc® package plants operating in parallel which are considered by DDW as alternative technology that is equivalent to direct filtration. Each package plant employs a four stage microsand ballasted clarification pretreatment process followed by rapid sand gravity filtration. The plant design flow is 3,500 gpm, with average flows ranging from 1,750 to 3,500 gpm.

Carmichael Water District (CWD)

CWD owns and operates one water treatment plant that utilizes American River water supply, Bajamont WTP. Water from the American River is diverted near Rossmoor Bar on the Lower American River using Ranney Collectors. The Bajamont WTP consists of membrane filtration and sodium hypochlorite disinfection; see below. The Bajamont WTP feeds water into the CWD distribution system.

Bajamont Water Treatment Plant

The Bajamont WTP is located in the community of Carmichael and diverts off the Lower American River using Ranney Collectors. Bajamont WTP is a membrane microfiltration water treatment plant, utilizing membrane microfiltration, post-disinfection with sodium hypochlorite, and caustic soda for corrosion control in the distribution system. The plant design flow is 22 mgd, with an average winter flow of 8.4 mgd and an average summer flow of 11 mgd.

City of Sacramento

The City of Sacramento owns and operates one water treatment plant that utilizes American River water supply, E.A. Fairbairn WTP (Fairbairn WTP). Water from the American River is diverted directly out of the Lower American River and into the water treatment plant. The Fairbairn WTP consists of conventional filtration and chlorine disinfection; see below. The Fairbairn WTP feeds water into the City's main distribution system.

E.A. Fairbairn Water Treatment Plant

The Fairbairn WTP is located in the City of Sacramento. Water is diverted directly from the Lower American River. Fairbairn WTP is a conventional filtration water treatment plant. The plant utilizes pre-chlorination, coagulation/sedimentation, filtration, post-chlorination, and fluoridation. The current plant capacity is 80 mgd, with a permitted capacity of 160 mgd. The average winter flow is 44 mgd and with an average summer flow of 66 mgd.

Sacramento County Water Agency (SCWA) and East Bay Municipal Utility District (EBMUD)

SCWA and EBMUD jointly own and operate (as members of a separate, public entity called the Freeport Regional Water Authority) a surface water diversion off the Sacramento River at Freeport, which is located downstream of the confluence with the American River. SCWA diverts water to the Vineyard Surface WTP where it receives conventional treatment, filtration, and chlorine disinfection. The treated water feeds into the SCWA Laguna/Vineyard distribution system. EBMUD can divert the raw water to the Folsom South Canal for conveyance to the Mokelumne Aqueducts and further conveyance to their terminal reservoirs in the East Bay. This water can be blended with water from the Mokelumne River source and local sources prior to treatment at EBMUD's local water treatment plants.

This section provides an overall review of the American River water quality data available within the focus area of this study. Primarily, this includes all of the source (raw) water data collected by the participating water utilities. In addition to those data sets, there were three ambient water quality monitoring programs/studies with relevant water quality data during the study period. **Table 3-1** shows the ambient monitoring programs from which 2018 through 2022 data was collected for this review. **Appendix B** contains summaries of the water treatment plants' intake data used for this review.

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 2018 through 2022. For assistance with abbreviations and acronyms, the reader is referred to the List of Abbreviations at the front of the Report.

Table 3-1
Summary of Water Quality Data Sources

Agency	Data Collected	Sampling Location	Period of Record
Regional Water Board – Lower American River Bacteria Study	*E .coli*, microbial source tracking	Various	2019-2022
Delta Regional Monitoring Program	Constituents of Emerging Concern	American River at Discovery Park	2020- 2022
California Department of Water Resources	TOC and DOC	American River at Fairbairn Water Treatment Plant (WTP)	2018-2022

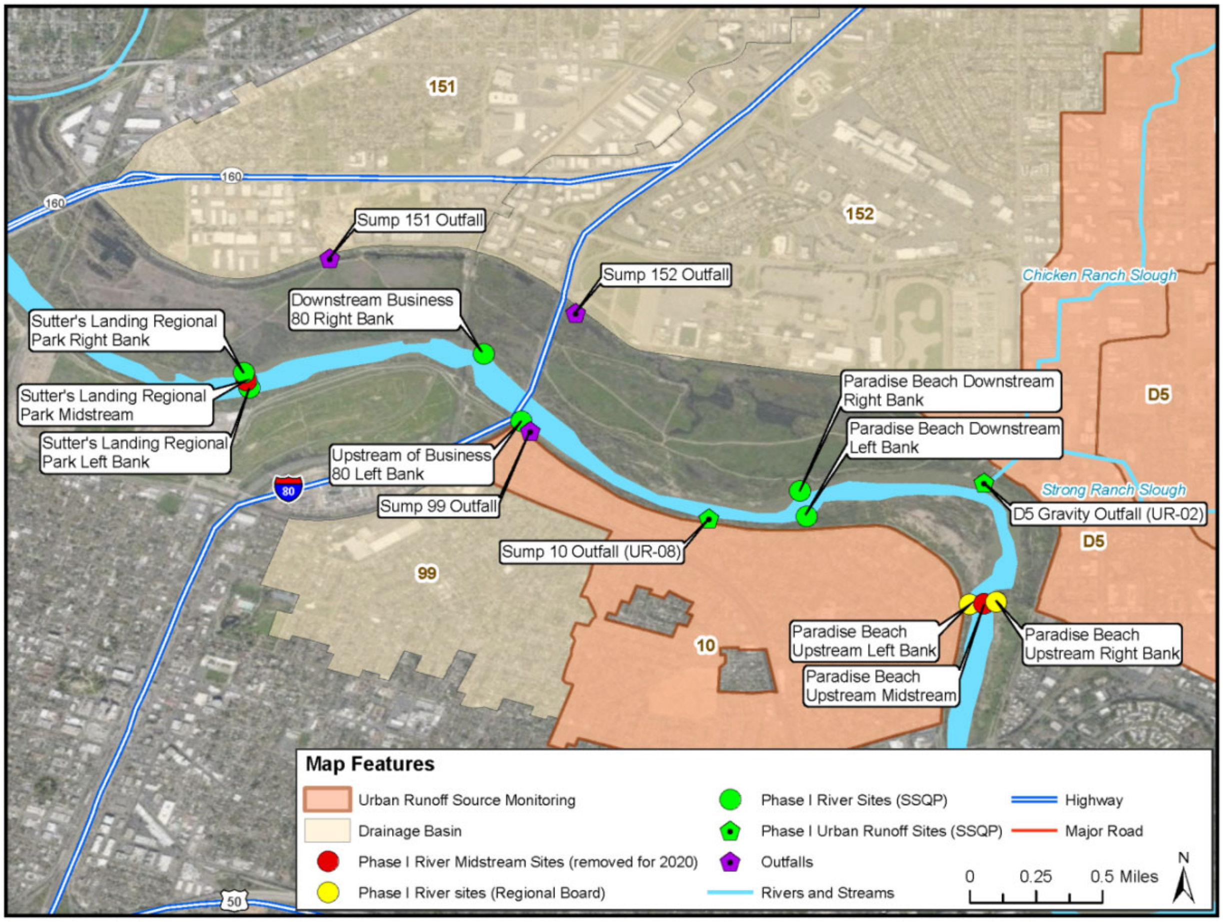
AMBIENT MONITORING PROGRAM DESCRIPTIONS

Central Valley Regional Water Quality Control Board – Lower American River Bacteria Study

The Central Valley Regional Water Quality Control Board (Regional Water Board) previously conducted extensive monitoring on the Lower American River to assess the protection of recreational use. The sampling showed that fecal indicator bacteria results in the lower six miles of the reach frequently exceeded recreational water quality objectives. The Regional Water Board, Sacramento County Regional Sanitation District (SCRSD), Sacramento Area Sewer District (SASD), Sacramento Stormwater Quality Partnership (SSQP), and Sacramento County Parks Department initiated this study to identify the sources of dry weather fecal pollution in this section of the Lower American River.

Phase 1 of the source tracking study focused on the 3-mile reach of the Lower American River from the upstream end of Paradise Beach to Sutter's Landing Regional Park. The Phase 1 study area and monitoring locations are shown in **Figure 3-1.**

Figure 3-1. Monitoring Sites for Phase 1 Lower American River Bacteria Study



Twelve locations were monitored during Phase 1 to provide information on spatial trends and potential sources of fecal pollution. Since there is unlikely complete mixing of sources from one bank to the other given the size and hydrology of river, monitoring sites were distributed on the south (river left) and north (river right) banks, as well as two midstream locations at the upstream and downstream ends of the study reach. In addition, two storm drainage outfalls were monitored to characterize *Escherichia coli* (*E. coli)* sources in dry weather urban runoff.

Phase 1 sampling was conducted approximately weekly during dry weather conditions in the summer of 2019 (August 13 through October 1) and 2020 (May 21 through September 29). All samples were analyzed for the indicator bacteria *E. coli*. Samples with *E. coli* greater than a pre-determined level (100 most probable number per 100 milliliters [MPN/100 mL]) were selected for microbial source tracking (MST) analysis. MST samples were analyzed for genetic markers chosen to identify human, dog, and bird sources. **Table 3-2** shows *E. coli* data for all sites, excluding the two storm drainage outfalls. Locations with *E. coli* values greater than 200 MPN/100 mL are bolded in red. The 200 MPN/100mL is the level at which the State Water Resources Control Board (State Water Board), Division of Drinking Water (DDW) can require increased log reduction for *Giardia* and viruses based on *E. coli* monthly median values in the source water.

Table 3-2
***E. coli* Results for Phase 1 Lower American River Bacteria Study, MPN/100 mL**

Site	Aug-19	Sep-19	Oct-19	May-20	Jun-20	Jul-20	Aug-20	Sep-20
Paradise Beach Upstream Right Bank	13.4	13.5	38.4	34.7	44.1	18.7	25.9	27.5
Paradise Beach Upstream Left Bank	11	18.7	65	11.2	24.7	17.3	16.1	21.5
Paradise Beach Upstream Midstream	21.8	11						
Paradise Beach Downstream Right Bank	32.3	14.5	160.7	71.8	50.1	18.5	54.6	42.2
Paradise Beach Downstream Left Bank	29.8	43.5	101.7	59.3	34.3	37.9	50.4	46.5
Downstream Business 80 Right Bank	9.7	9.7	34.5	56.6	30.1	13.2	33.6	31.7
Upstream of Business 80 Left Bank	17.5	17.1	**307.6**	20.1	34.1	15.5	129.1	22.2
Sutters Landing Left Bank	18.5	42	40.4	177.1	76.7	12.6	39.5	26.6
Sutters Landing Midstream	13.2	18.5	59.4					
Sutters Landing Right Bank	**770.1**	49.5	193.5	**250.9**	155.3	113	**1046.2**	**235.6**

According to the data summary posted on the Regional Water Board website, the increase on the right bank between Business 80 and Sutter's Landing sites is the most consistent and significant increase of *E. coli* in the Phase 1 sample area. Potential sources in this section include waterfowl, the outfalls for sumps 151 and 152, dogs, and sporadic encampments. Visual inspections of the channels draining from the outfalls indicate no runoff reached the river during the study period. MST marker results suggest birds are the dominant source of contamination, with a small contribution from dogs. It should be noted that Paradise Beach is a popular dog-walking area for local residents from both the north and south side of the river, with limited pet waste station access.

Phase 2 of the study focused on dry weather conditions in the 3-mile river reach from Sutter's Landing Regional Park to the confluence with the Sacramento River. The Phase 1 study area and monitoring locations are shown in **Figure 3-2**, and monitoring results in **Table 3-3**. Locations with *E. coli* values greater than 200 MPN/100 mL are bolded in red.

Figure 3-2. Monitoring Sites for Phase 2 Lower American River Bacteria Study

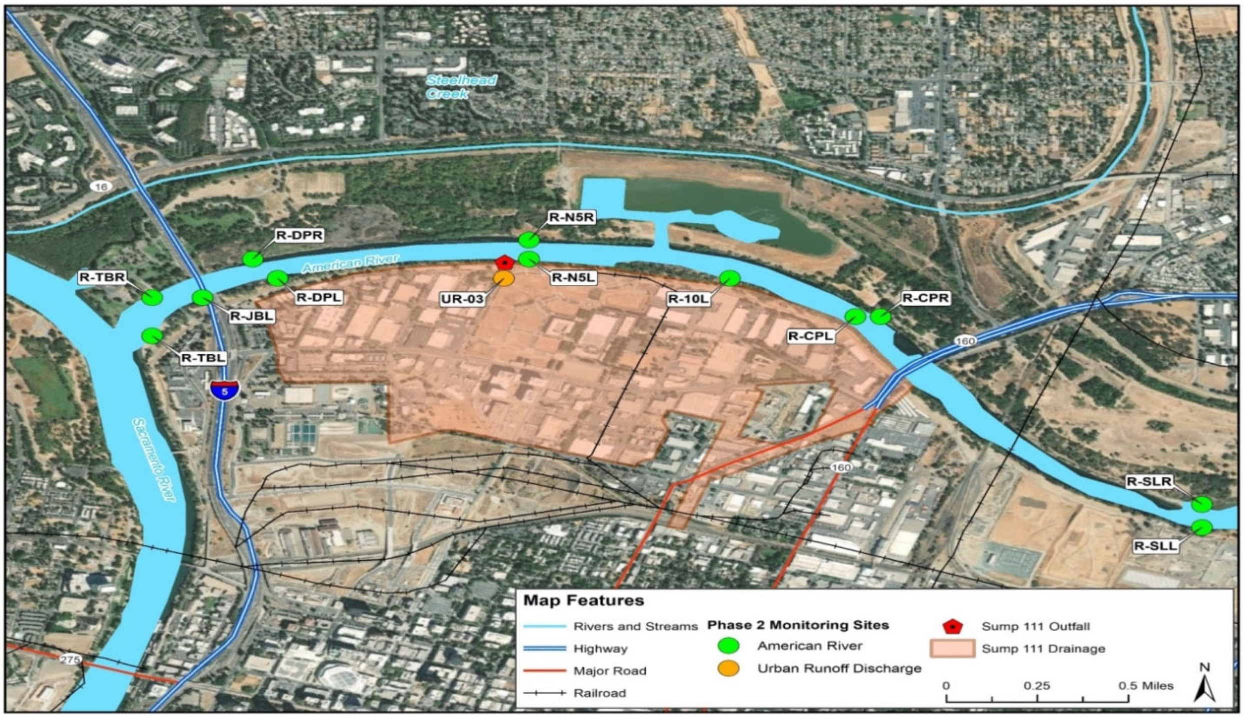


Table 3-3
***E. coli* Results for Phase 2 Lower American River Bacteria Study, MPN/100 mL**

Site		Jul-21	Aug-21	Sep-21	May-22	Jun-22	Jul-22	Aug-22	Sep-22
R-SLL	Sutters Landing Left Bank	56.8	38.3	40.3	45.7	**965.2**	18.3	19.7	161.6
R-SLR	Sutters Landing Right Bank	162	75.9	49	65.7	**502.8**	124.9	59.9	149.9
R-CPL	Camp Pollock Left Bank	130.9	78.9	86	**250**	**223.3**	32.3	27.7	43.7
R-CPR	Camp Pollock Right Bank	62.7	150	158.6	**1230**	**404.5**	80.5	20.8	21.9
R10L	North 10th Street Left Bank	**583**	**228.2**	187	**407.3**	**1041.1**	48	193.5	**391.8**
R-N5L	North 5th Street Upstream Left Bank	137.9	**547.5**	**593.9**	**510.8**	**1293**	129.6	**286.2**	**1216.5**
R-N5R	North 5th Street Upstream Right Bank	55.9	44.1	27.4	35	**219.6**	16.1	14.6	**299.1**
R-DPL	Discovery Park Left Bank	**272.9**	53.7	81.6	112.7	**214.3**	52.9	162.2	67.8
R-DPR	Discovery Park Right Bank	76.7	56.3	24.7	53.6	88.3	17.3	16.6	**1213.5**
R-JBL	Jibbom Street Bridge Left Bank	**795.3**	**435.2**	**321.8**	54.2	174.4	**275.5**	**1986.4**	**205**
R-TBL	Tiscornia Beach Left Bank	**2419.6**	**2419.6**	**265**	142.6	82.3	67.7	**726.1**	82.2
R-TBR	Tiscornia Beach Right Bank	74.1	60.9	41.7	78.4	93.8	26.2	15.1	23

In comparing data from Phase 1 to Phase 2, there are higher levels of *E.coli* in the Phase 2 monitoring sites, which are downstream of the Phase 1 sites. Additionally, the left bank of the Phase 2 sites are higher than the right bank.

Microbial source tracking results from Phase 1 showed that:

- Birds are the largest and most consistent source of contamination in this section of the river.
- Dogs are also a consistent source of fecal contamination in some areas, particularly on the left bank of Paradise Beach downstream. At this location, the dog marker was detected in over 60 percent of samples tested. It should be noted that there are no pet waste stations in this area.
- Humans were not a significant or consistent source of fecal contamination.

Microbial source tracking results from Phase 2 showed that:

- Birds were still the largest and most consistent source of contamination in this section of the river.
- There was a weak DNA signal in urban runoff from the sources evaluated.
- Humans were still not a significant or consistent source of fecal contamination.

Overall, human sources have not been confirmed along the Lower American River. However, avian sources are consistent. Canine sources have been sporadically detected in certain locations. Currently, the next steps for the study are to be determined.

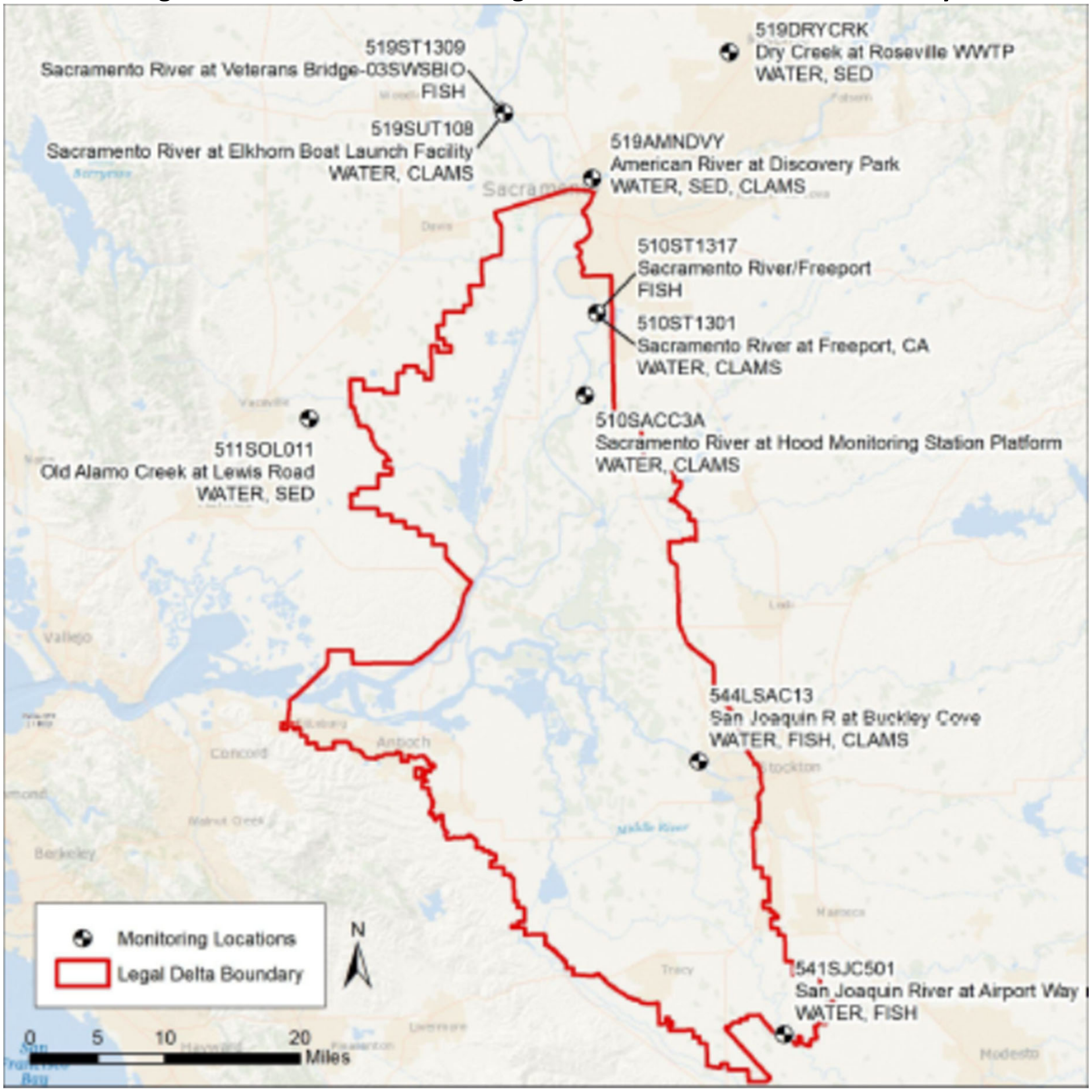
Delta Regional Monitoring Program – Constituents of Emerging Concern Pilot Study

A pilot study for the monitoring of Constituents of Emerging Concern (CECs) in the Sacramento-San Joaquin River Delta (the Delta) by the Delta Regional Monitoring Program (Delta RMP) was conducted beginning in 2020.

The stated goals for the study in the statewide guidance document from the State Water Board (Tadesse 2016) are to gather data to determine the occurrence and biological impacts of CECs. The result of this pilot study will help the State Water Board to develop a statewide CEC monitoring strategy and control action. The objective of the CEC statewide pilot study monitoring plan is to generate statewide data to inform Water Board managers of the status and trends of CECs.

In 2020, the Delta RMP initiated CEC monitoring of water, sediment, fish and bivalves. Quarterly sampling of Per- and Polyfluoroalkyl Substances (PFAS) (i.e., perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), Pharmaceuticals and Personal Care Products (PPCPs) (including estrone, 17-beta-estradiol, ibuprofen, diclofenac, triclosan, and bisphenol A), galaxolide, and ancillary parameters in water, at eight sites (shown in **Figure 3-3**), began in September 2020. Further sampling was conducted in April 2021, June 2021, October 2021 (storm), October 2021 (dry), March 2022, and June 2022. Please note that data on fish, bivalves and sediment will not be included in this report. Additionally, only one storm event was monitored for the study. Sampling results for American River at Discovery Park are shown in **Table 3-4.** The red text highlights when a CEC was detected.

Figure 3-3. Ambient Monitoring Sites for Delta RMP CEC Pilot Study



Galaxolide, a synthetic musk, was detected in all samples at Discovery Park. The second most frequently detected was bisphenol A, detected in five out of seven samples, with a notable increase in the October 21, 2021 storm sample. Triclocarban, ibuprofen, and naproxen were detected, but not consistently. PFOS and PFOA were not detected in any samples. It should be noted that there are many CECs in existence, with this pilot study only sampling a small number.

Table 3-4
CEC Results for American River at Discovery Park, nanograms per liter (ng/L)

	9/29/2020	4/13/2021	6/15/2021	10/21/2021 (storm)	10/26/2021	3/28/2022	6/8/2022
Bisphenol A	14	ND	21	670	25	ND	39
Diclofenac	ND	ND	ND	ND	ND	ND	ND
Estradiol, 17beta-	ND	ND	ND	ND	ND	ND	ND
Estrone	ND	ND	ND	ND	ND	ND	ND
Galaxolide	251	91.3	67.5	94.4	126	229	272
Ibuprofen	ND	ND	ND	ND	14	ND	ND
Perfluorooctanesulfonic acid (PFOS)	<1.95	<2.11	<1.98	<2.02	<1.99	<2.01	<2.01
Perfluorooctanoic acid (PFOA)	<1.95	<2.11	<1.98	<2.02	1.17J	<2.01	<2.01
Suspended Sediment Concentration	<5	ND	ND	ND	ND	ND	ND
Triclosan	ND	ND	ND	ND	ND	ND	ND
Triclocarban				1.3J	90.8	390	ND
Ethynylestradiol, 17alpha-	ND	ND	ND	ND	ND	ND	ND
Gemfibrozil	ND	ND	ND	ND	ND	ND	ND
Iopromide	ND	ND	ND	ND	ND	ND	ND
Naproxen	ND	ND	ND	ND	11	ND	ND
Progesterone	ND	ND	ND	ND	ND	ND	ND
Salicylic Acid	ND	ND	ND	160J	ND	ND	ND
Testosterone	ND	ND	ND	ND	ND	ND	ND

California Department of Water Resources – Municipal Water Quality Investigations Study

The California Department of Water Resources (DWR) Municipal Water Quality Investigations (MWQI) group collects water quality samples on a monthly basis from the American River at the City of Sacramento's E.A. Fairbairn Water Treatment Plant (Fairbairn WTP) sample site. Samples are collected for total organic carbon (TOC), dissolved organic carbon (DOC), minerals, nutrients, and physical parameters. **Table 3-5** provides a summary of the TOC and DOC data. The American River source water has very low organic content.

Table 3-5
Summary of Data Collected at American River at Fairbairn WTP Sample Site, DWR MWQI Monitoring, 2018-2022

	DOC, mg/L	TOC, mg/L
Average	1.8	1.9
Median	1.8	1.8
90th Percentile	2.3	2.4

OVERALL WATER QUALITY REVIEW

The review of overall water quality is largely based on comparison of the participating water utilities' 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. Compliance with MCLs and Notification Levels is ultimately based on treated water sample results. **Appendix C** provides the Regulatory Framework used as the basis for evaluation and contains a summary of each of the contaminants currently regulated in drinking water by the United States Environmental Protection Agency (USEPA) and the DDW.

Overall, the American River provides excellent quality water. The raw water can be treated to meet all drinking water standards using conventional, direct, or membrane filtration processes. There are no constituents present in the raw water that necessitate additional treatment processes at this time.

Summary tables of selected raw water intake data, tabulated from the water systems treating American River water, are discussed later in this section. Consumer Confidence Reports (CCR) for all of the participating water utilities were reviewed and any MCL violations were summarized. The individual water treatment plant intake evaluations for treated water and regulatory compliance are presented in **Section 5**.

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, fecal coliform, *E. coli*, *Giardia*, *Cryptosporidium*, and TOC. Total coliform was evaluated only for the Golden State Water Company (GSWC) water treatment plants due to their DDW water supply permit condition requiring increased log reduction based on total coliform monthly median values. All other water treatment plants were evaluated for *E. coli*. 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**. In addition, there is discussion of five additional unregulated constituents of interest that were monitored in the source water.

In order to efficiently show graphical results for all the water treatment plants, the turbidity and TOC data are graphically presented in four categories: 1) North and Middle Fork water treatment plants, 2) South Fork water treatment plants, 3) Folsom Lake water treatment plants, and 4) Lower American River water treatment plants.

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 3-6** shows the relationship between potential contaminating activities reviewed in this report and water quality constituents.

Table 3-6
Relationship Between Potential Contaminating Activities and Water Quality

Constituent	Turbidity	Microbial Constituents	TOC	Selected Unregulated
River Corridor	√	√	√	√
Forest Activities	√	√	√	√
Industrial Activities	√			√
Recreation	√	√	√	√
Watershed Spills	√	√	√	√
Stormwater	√	√	√	√
Wastewater	√	√	√	√
Climate Change	√	√	√	√
Reservoir Operations	√		√	√
Agriculture	√		√	√
Cannabis	√		√	√
Mining	√			

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 optimize pretreatment processes to maximize 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 water treatment plants to ensure that particles are removed. Turbidity has been assumed to be an indicator parameter 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 nephelometric turbidity units (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 (typically 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 or in-water events such as re-suspension of solids or algal blooms, and are undesirable because high turbidity can mask the presence of harmful pathogens. The principal source of turbidity is general watershed runoff, and it can also be contributed by other potential contaminating activities such as urban runoff and wastewater, if not properly managed. In addition, management of water storage facilities can cause releases that lead to increased turbidity. It is common for turbidities to vary seasonally as a result of precipitation intensity 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 treatment plant performance. Monthly averages of the peak daily raw water turbidities were used to calculate a range, average, and median for each water treatment plant and these have been summarized and are presented in **Table 3-7**. **Table 3-7** also includes a comparison to 2008 to 2012 and 2013 to 2017 periods data.

Time series plots have been developed for raw water turbidity over the study period for each of the water treatment plants (**Figures 3-4** through **3-7**).

Table 3-7
Monthly Average of Peak Daily Raw Water Turbidity Summary Statistics, NTU

Sample Location	2008-2012			2013-2017			2018-2022		
	Range	Average	Median	Range	Average	Median	Range	Average	Median
North Fork (PCWA)[1] only when AR in use	0.57 – 71.8	4.8	3.1	1.2 – 19.8	5.4	4.2	1.3 – 6.1	3.3	2.8
South Fork at Strawberry WTP (EID)	1.8 – 10.8	4.6	4	1.3 – 15.8	3.9	3.0	0.9 – 20.5	3.4	1.9
Main Canal at Reservoir 1 WTP (EID)	9.5 – 42.9	23.1	22.2	3.3 – 48.3	14.2	9.8	8.1 – 51.1	25.9	26.4
Folsom Lake at El Dorado Hills WTP (EID)	2.5 – 22.3	6.8	5.8	1.8 – 17.6	5.9	4.8	2.8 – 13.7	6.5	6.0
Middle Fork – Walton Lake WTP[2] (GDPUD)				0.6 - 6	2.6	2.4	1.1 – 4.3	2.5	2.4
Middle Fork – Auburn Lake Trails WTP[2](GDPUD)				0.7 – 11.9	3.3	2.3	1.1 – 13.1	4.6	3.5
Middle Fork – Sweetwater WTP [3](GDPUD)							1 – 7.6	2.3	1.4
Folsom Dam (City of Folsom)	1.9 – 15.4	4.1	3.7	1.9 – 57.4	6.6	4.6	2.4 – 15.7	3.9	3.4
Folsom Dam (Folsom State Prison)	1.2 - 9.7	2.74	2.3	1 – 43.9	4.2	2.4	1.7 - 11	3.5	2.8
Folsom Dam (San Juan Water District)	0.59 – 11.0	1.97	1.55	0.8 – 58.6	4.6	2.3	1.2 – 12.8	3.0	2.4
Folsom Dam (City of Roseville East Train)	0.7 – 12.3	2.0	1.7	0.8 – 45.4	3.7	2.2	0.6 – 11.3	1.7	1.2
Nimbus Dam into Folsom South Canal (Coloma WTP and Pyrites WTP)	1.05 – 13.79	4.6	3.5	2.1 -11.3	5.2	4.2	1.0 – 14.2	2.4	1.7
Lower American River near Mile 17.5 (CWD)	0.74 - 10.5	1.9	1.3	0.8 – 46.3	3.3	1.5	0.6 – 6.5	1.5	1.0
Lower American River at Fairbairn WTP (City of Sacramento)	1 – 10.3	2.3	1.8	1.1 – 8.9	2.4	2	0.7 – 6.9	1.5	1.2

[1] Based on periods of American River usage, which is generally October through December at the Foothill 1 WTP; 10/17/18-11/16/18, 10/15/19-11/18/19, 10/15/20-11/19/20, 6/7/21-11/18/21, 10/16/22-11/18/22
[2] WTP not previously included in this report so no data included prior to 2013; ALT WTP was in operation from January 2018 – November 2020
[3] Sweetwater WTP began operation in December 2020

Figure 3-4 shows that the monthly average of peak daily raw water turbidities stays generally below 10 NTU in the North and Middle Fork area. Monthly precipitation totals were plotted from a rain gauge in Georgetown (GTW), which is located in this area of the watershed. It can be seen that many turbidity peaks are correlated with precipitation, particularly at the Auburn Lake Trails (ALT) WTP/Sweetwater WTP. Heavy precipitation occurred in February 2019 and December 2022.

Figure 3-4. Raw Water Turbidity, North and Middle Fork WTPs, 2018-2022

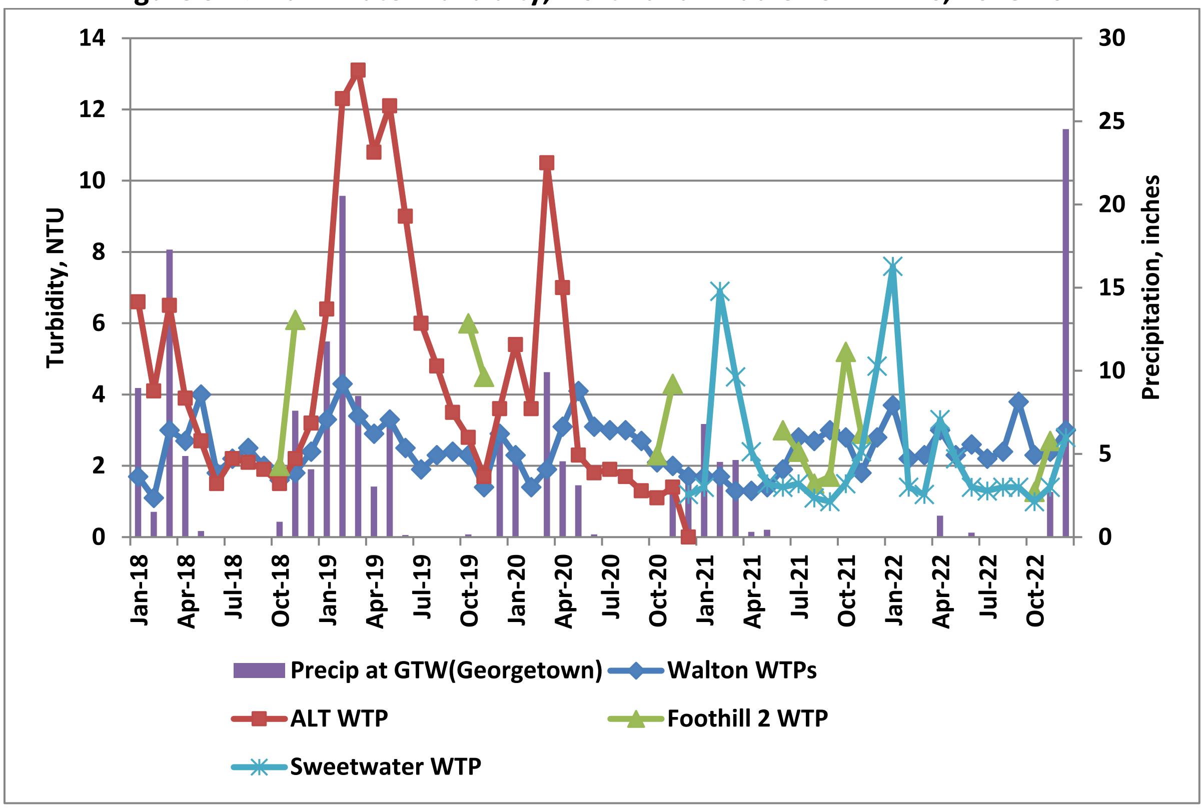


Figure 3-5 shows that the El Dorado Irrigation District (EID) Strawberry WTP has the lowest monthly average turbidity for all three South Fork water treatment plants. Monthly average turbidities for EID El Dorado Hills (EDH) WTP are occasionally over 10 NTU and over 30 to 50 NTU for the EID Reservoir One WTP. Monthly precipitation totals were also plotted from a rain gauge in Forni Ridge (FRN), located in this area of the watershed. Turbidity peaks at the EDH WTP are associated with precipitation as shown in **Figure 3-5.** The Reservoir One WTP is a seasonal water treatment plant and is generally not in service from October to early spring. For the data available, the turbidity peaks at Reservoir One WTP in the summer are likely due to higher flows, algal blooms, as well as recreation in the summertime, in the canal supplying Reservoir One WTP that causes sediment to be re-suspended. EID staff notes that the canal supplying the Reservoir One WTP is unlined. However, in 2022, approximately three miles of the canal from the Forebay Reservoir (end of the canal/flume system of Project 184) to the headworks of Reservoir One WTP was changed from open canal to a pipeline. The Main Ditch Pipeline became operational for the

Reservoir One WTP in April 2022. The completion of the Main Ditch Pipeline is likely the reason for significantly lower turbidities for the Reservoir One WTP in the summer of 2022.

Figure 3-5. Raw Water Turbidity, South Fork WTPs, 2018-2022

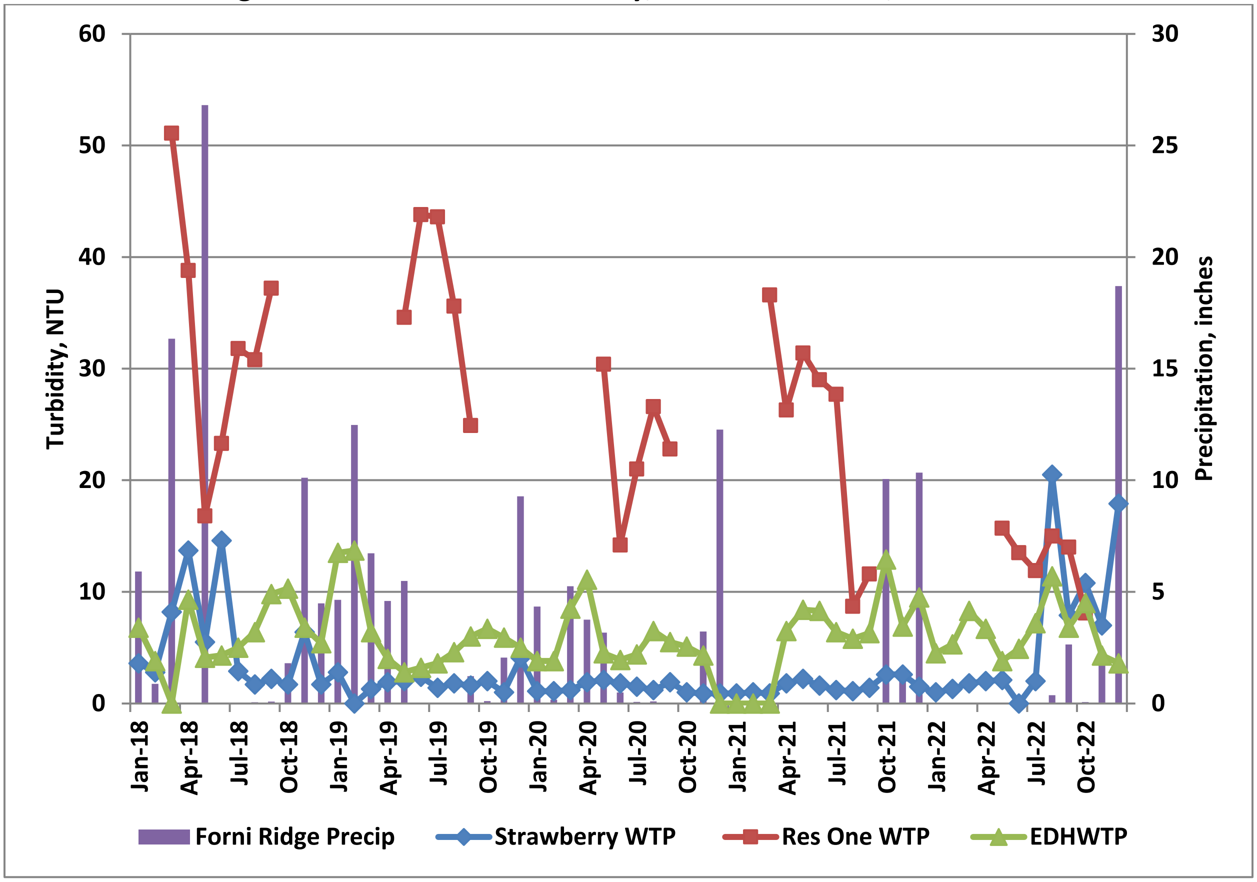


Figure 3-6 shows that the monthly average of peak daily raw water turbidity for all of the Folsom Lake water treatment plants was generally below 10 NTU, except in April 2018. Monthly precipitation totals were plotted from a rain gauge near Folsom Lake (FOL), located just downstream of the dam. Turbidity is generally the lowest during the summer months. A 500-year storm occurred in October 2021, however, the turbidity peak was short-lived, was not an extreme turbidity event, and does not show in monthly average data.

Figure 3-7 shows that on the Lower American River the Bajamont WTP, Coloma WTP and Fairbairn WTP turbidities are below 10 NTU all of the time. Monthly precipitation data was obtained from the California State University at Sacramento (CSU) station. Higher turbidities during the summer months at the Coloma WTP are likely caused by algal growth in the Folsom South Canal, especially during periods of low flow.

Figure 3-6. Raw Water Turbidity, Folsom Lake WTPs, 2018-2022

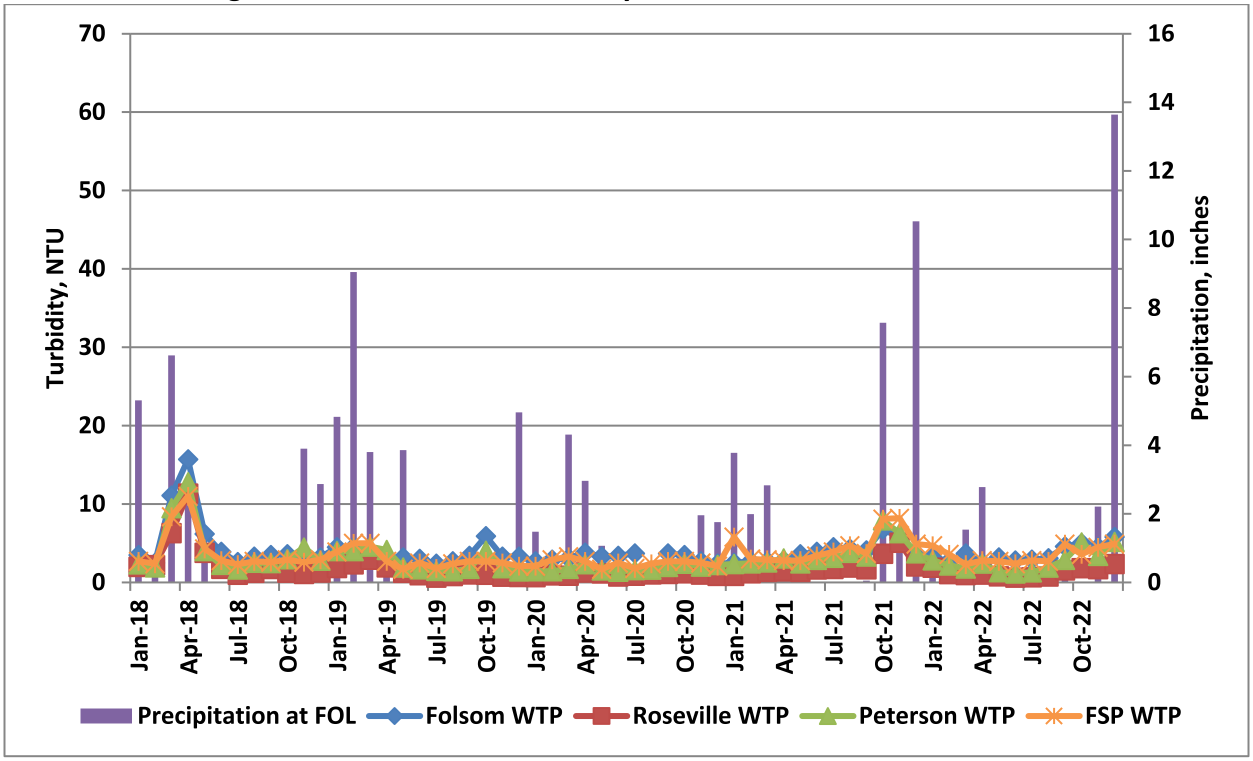
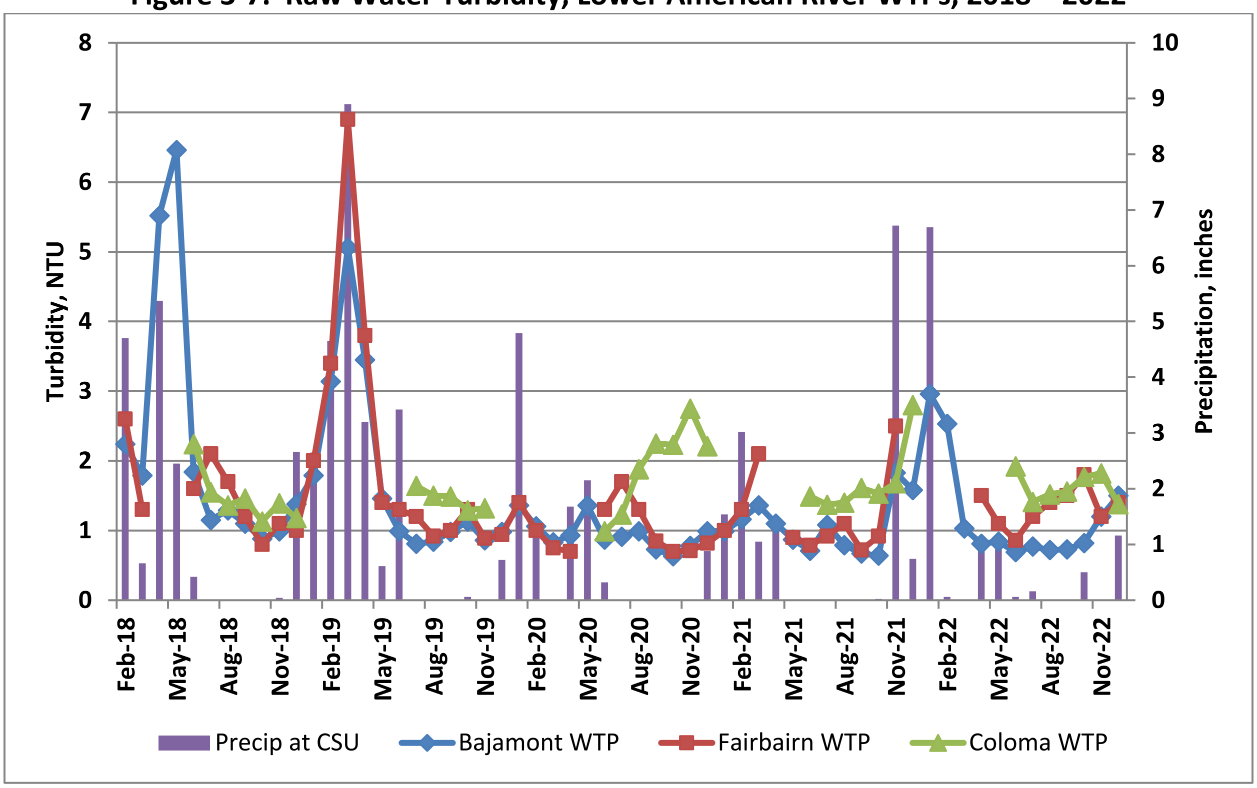


Figure 3-7. Raw Water Turbidity, Lower American River WTPs, 2018 – 2022



Summary of Results for Turbidity

- From 2018 to 2022, the average of the monthly average of peak daily raw water turbidities ranged from 1.5 NTU at the Fairbairn WTP to 25.9 NTU at the Reservoir One WTP.
- Turbidity does not necessarily increase from upstream to downstream.
- Most of the time, peak daily raw water turbidity was less than 10 NTU for all water treatment plants, except for Reservoir One WTP. Reservoir One WTP had the highest monthly average turbidity over the entire study period, at 25.9 NTU. Turbidity peaks at Reservoir One WTP in the summer are likely due to local effects on the canal system, such as higher flows, algal blooms, as well as recreation. However, the Main Ditch Pipeline has improved water quality (lower turbidity) for the Reservoir One WTP beginning in the summer of 2022.
- Turbidity levels in the raw water generally increased during the winter storm season, particularly during the large storms in April 2018, February 2019, October 2021, and December 2022. The Coloma WTP has a unique seasonal turbidity patterns, like the Reservoir One WTP. The Coloma WTP has higher turbidities during the April to July time period, which may be due to algal growth in the Folsom South Canal.

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, though detected pathogens and pathogen indicators may not be capable of infecting humans.

Fecal coliform and *E. coli* have been used to indicate the potential presence of pathogenic microorganisms in source waters. Although coliform levels do not 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 in the American River watershed include general watershed runoff, recreation, wastewater, urban runoff, homeless populations, and animal populations, including pets, livestock, and wild and feral animals. Coliform levels in treated water are currently regulated directly through the Total

Coliform Rule and its revisions, to ensure the effectiveness of the disinfection process throughout the distribution system. Treated water is discussed in **Section 5**.

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 human or animal defecation, including both wild and domestic animals.

Giardia lamblia is currently regulated by the Surface Water Treatment Rule (SWTR) and the Interim Enhanced Surface Water Treatment Rule (IESWTR). Surface water supplies must provide for 3-log reduction of *Giardia* through physical removal and chemical inactivation. Additional reduction may be required for impaired water supplies. The DDW guidance provides that 3-log reduction is appropriate when monthly median levels of total coliform are less than 1,000 MPN/100 mL, fecal coliform or *E. Coli* levels are less than 200 MPN/100 mL, or when directly measured confirmed *Giardia* levels are less than 0.01 cysts per liter.

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 true 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, including both wild and domestic animals.

Cryptosporidium is currently regulated through the IESWTR and the Long Term 1 ESWTR (LT1ESWTR), which require 2-log reduction, and the LT2ESWTR which potentially requires additional log action based on source water monitoring results for *Cryptosporidium*. Under the IESWTR (applicable to public water systems serving at least 10,000 population) and LT1ESWTR (applicable to public water systems serving fewer than 10,000 population) well-operated conventional and direct water treatment plants are granted a 2-log removal credit for *Cryptosporidium* if they meet all treated water turbidity standards. The LT2ESWTR (applicable to all public water systems) further regulates *Cryptosporidium* and requires additional action (treatment or protection) if the source water quality is determined to be impaired based on the required direct *Cryptosporidium* monitoring of the source (as discussed in **Appendix C**), if running annual average levels are greater than 0.075 oocysts per liter.

The DDW also developed the *Cryptosporidium* Action Plan (CAP) in the mid-1990s 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 and Total Coliform

Table 3-8 is a summary of *E. coli* monitoring results for all participating water utilities over the study period and also provides a comparison to the 2008 to 2012 dataset, as well as the 2013 to 2017 dataset. Please note that the 2013 to 2017 and 2018 to 2022 data reported for the Folsom State Prison WTP is for fecal coliform. An examination of **Table 3-8** indicates that *E. coli* levels generally increase from upstream to downstream, but only by a single order of magnitude.

Over the study period, the highest *E. coli* median was at the Middle Fork (Georgetown Divide Public Utility District [GDPUD] intake for the Auburn Lakes Trail [ALT] WTP/Sweetwater WTP) at 46 MPN/100 mL, followed by the GDPUD's intake for the Walton WTP at 32 MPN/100 mL, followed by the Main Canal at Reservoir One WTP at 23 MPN/100 mL. Graphs of *E. coli* were prepared for the applicable water treatment plants, as shown in **Figures 3-8** through **Figure 3-11**.

Figure 3-8 shows that *E. coli* levels in the source water to the Walton WTP and the ALT WTP/Sweetwater WTP is generally in the 10 to 100 MPN/100 mL range, while the Foothill WTP is generally less than 10 MPN/100 mL.

Figure 3-9 shows that the Reservoir One WTP is normally above 10 MPN/100 mL, but rarely above 100 MPN/100 mL. Source water *E. coli* levels for the Strawberry WTP peaked in September 2020 and 2022. EID staff indicates this is due to discharges for recreational purposes from Echo Lake for three weeks every September, as seen in the water flow pattern in the South Fork American River. The September peak for the Strawberry WTP was lower in 2018, 2019, and 2021.

Table 3-8
***E. coli* Summary Statistics, MPN/100 mL**

Sample Location	2008 - 2012 *E. coli*, MPN/100 mL			2013-2017 *E. coli*, MPN/100 mL			2018-2022, *E. coli*, MPN/100 mL		
	# Samples	Average	Median	# Samples	Average	Median	# Samples	Average	Median
North Fork (PCWA)	60	12	4	60	27.1	1	60	9.7	5.2
South Fork at Strawberry WTP (EID)	76	5.2	2	63	10.8	3	71	7.7	2
Main Canal at Reservoir 1 WTP (EID)	43	26.9	14.6	40	37	25	27	31	23
Folsom Lake at El Dorado Hills WTP (EID)	52	8.2	4.1	58	17.3	3.1	60	19	1
Middle Fork - Walton Lake WTP [1] (GDPUD)				59	62.9	23	74	49	32
Middle Fork - Auburn Lake Trails WTP/Sweetwater WTP [1] (GDPUD)				59	69.3	9	74	56	46
Folsom Dam (City of Folsom)	260	7.1	2	239	18.8	4.5	254	12.7	4.1
Folsom Dam (Folsom State Prison)[2]	13	10.5	4.5	43	21	6.3	59	13.6	2
Folsom Dam (San Juan Water District)	126	16.3	4	122	27.4	7.8	120	14.9	4.5
Folsom Dam (City of Roseville)				55	18	6.4	60	51.7	4.7
Nimbus Dam into Folsom South Canal (GSWC)	238	14	8.6	195	48.8	32.7	132	68.6	13.4
Lower American River near Mile 17.5 (CWD)	60	54.7	23	57	5.4	<2	55	0.3	ND
Lower American River at Fairbairn WTP (City of Sacramento)	218	55.7	17	249	37.2	19	227	68.9	20

[1] ALT WTP not previously included in this report so no data included prior to 2013. ALT WTP was replaced in December 2020 with Sweetwater WTP
[2] 2013-2022 data is fecal coliform, not *E. coli*

Figure 3-8. Raw Water *E. coli* Levels, North and Middle Fork WTPs, 2018-2022

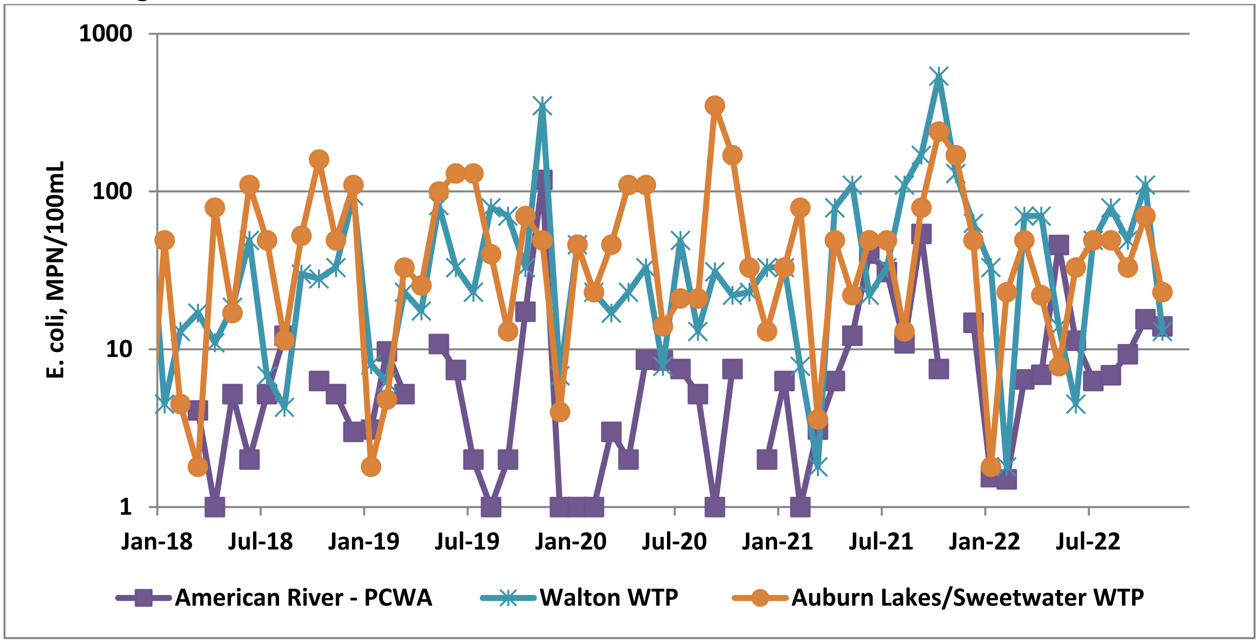


Figure 3-9. Raw Water *E. coli* Levels, South Fork WTPs, 2018-2022

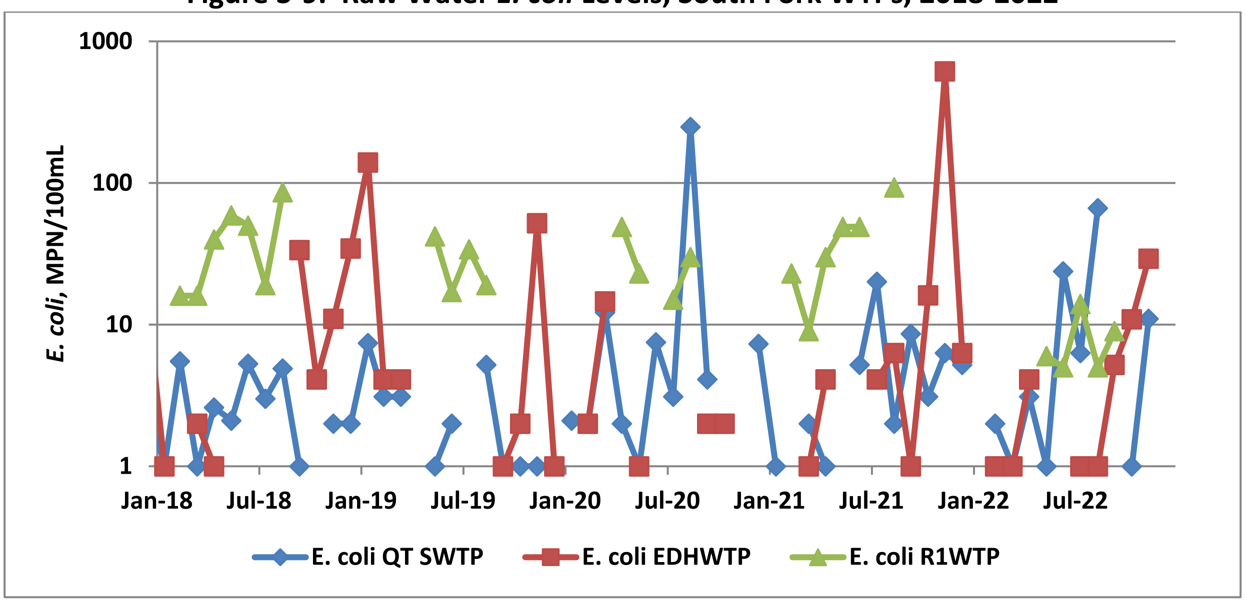


Figure 3-10 shows that *E. coli* levels at the Folsom Lake water treatment plants have a strong seasonal trend that peaks during storm events (November to March) and remain low during the summer.

This is generally true for the Lower American River water treatment plants also, as shown in **Figure 3-11,** with the exception of the Coloma WTP which has a unique seasonal trend, as the highest *E. coli* levels only occur in the month of May. This is the same trend that has been identified in previous Updates, but the cause is unknown. It is possible that the presence of migratory birds in Lake Natoma during the spring may contribute to this, but insufficient information on waterfowl population and more specific monitoring data is available to make any determination. GSWC staff also indicated that May is typically the month that the Coloma and Pyrites WTP begin operation after being shut-down in the winter, and this may also contribute to the elevated *E. coli* levels.

Figure 3-10. Raw Water *E. coli* Levels, Folsom Lake WTPs, 2018-2022

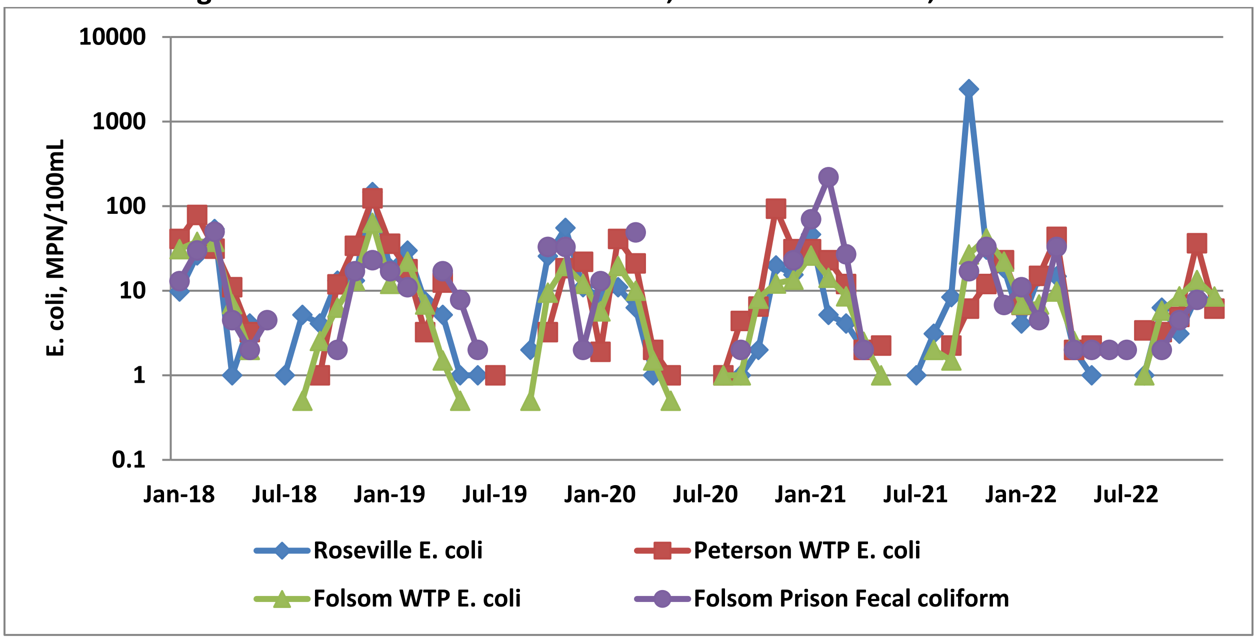
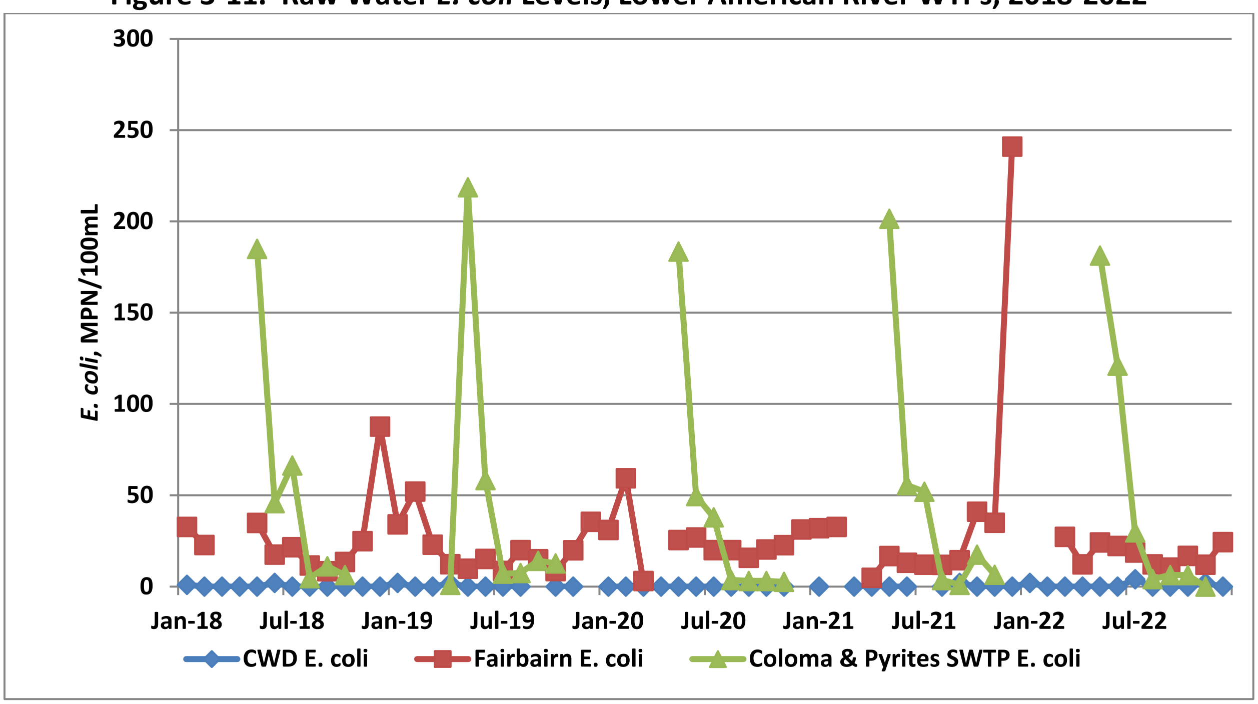


Figure 3-11. Raw Water *E. coli* Levels, Lower American River WTPs, 2018-2022



Monthly medians for *E. coli* were also examined, as DDW may require an additional log reduction for *Giardia* and viruses if the monthly median for fecal coliform or *E. coli* is 200 MPN/100 mL or greater. Alternatively, if no fecal coliform or *E. coli* data is available then monthly median total coliform levels greater than 1,000 MPN/100 mL could trigger increased log reduction. The GSWC Cordova system is the only participating water utility where DDW requires an additional log reduction for *Giardia* and viruses in their water supply permit if either the monthly median for *E. coli* is greater than 200 MPN/100 mL or the monthly median for total coliform is greater than 1,000 MPN/100 mL. The following water treatment plants had at least one monthly median for *E. coli* greater than 200 MPN/100 mL over the study period, but all were very low occurrences at around two percent of months:

- Strawberry WTP had one monthly median greater than 200 MPN/100 mL in September 2020,
- EDH WTP had one monthly median greater than 200 MPN/100 ml in December 2021,
- Walton Lake WTP had one monthly median greater than 200 MPN/100 mL in November 2021,
- Sweetwater WTP had one monthly median greater than 200 MPN/100 mL in November 2021,
- Roseville WTP had one monthly median greater than 200 MPN/100 mL in October 2021,
- Coloma WTP had two monthly medians greater than 200 MPN/100 mL in May 2019 and May 2021, and
- Fairbairn WTP had one monthly median greater than 200 MPN/100 mL in December 2021.

It is important to note that the occurrences for the Walton WTP, Sweetwater WTP, Roseville WTP and Fairbairn were based on one monthly sample. In other words, these water treatment plants sample once a month for *E. coli* in accordance with regulatory requirements. (Fairbairn WTP typically samples weekly, but only reported one sample in December 2021).

Total coliform is evaluated only for Coloma/Pyrites WTPs, since they have a permit condition requiring increased log reduction based on total coliform monthly median values. Thirty-two out of thirty-four total coliform monthly medians exceeded 1,000 MPN/100 mL in the raw water for this diversion, indicating that 4/5-log reduction for *Giardia* and viruses would be required. As the median total coliform count exceeded 1,000 MPN/100 mL for several months during most years, GSWC has elected to provide 4- and 5-log reduction on a routine basis, year-round.

Summary of Results for E. coli and Total Coliform

- Median *E. coli* values range from 1 MPN/100 mL at the EDH WTP, to 46 MPN/100mL at the ALT WTP/Sweetwater WTP.

- Median *E. coli* values generally appear to increase from upstream to downstream. For example, the source water *E. coli* values at the Fairbairn WTP are higher than the Folsom Lake water treatment plants. It is difficult to compare the water treatment plants above

Folsom Lake to each other, as the water treatment plants are located on different forks of the American River.

- As expected, average *E. coli* values are higher than the median (skewed right), indicating the influence of peak storm events.

- *E. coli* monthly medians are below 200 MPN/100 mL at almost all times for all the water treatment plants, except the Coloma WTP had two out of 34 monthly medians above 200 MPN/100 mL. Therefore, the current level of treatment of 3/4-log reduction for *Giardia* and viruses appears to continue to be appropriate for all water treatment plants.

- GSWC's Cordova system is the only participating water utility where DDW requires an additional log reduction for *Giardia* and viruses in their water supply permit if either the monthly median for *E. coli* is greater than 200 MPN/100 mL or the monthly median for total coliform is greater than 1,000 MPN/100 mL. Since 94 percent of the total coliform monthly medians were greater than 1,000 MPN/100 mL, GSWC provides 4- and 5-log reduction for *Giardia* and viruses on a routine basis, year-round.

- In general, *E. coli* levels are impacted by winter storm events and first flush events. Two of the water treatment plants have localized, seasonal impacts. The Strawberry WTP has higher *E. coli* levels in September, potentially due to discharges from Echo Lake that occur three weeks every September. The Coloma/Pyrites WTP has *E. coli* increases every May, but the cause of the increase cannot be confirmed.

Evaluation for Giardia and Cryptosporidium

As discussed in the 2018 Update, the majority of the water treatment plants completed (or initiated) the second round of monitoring for the LT2ESWTR Rule in the 2013 to 2017 reporting period, except for GDPUD's Walton and ALT WTP/Sweetwater WTP. Folsom State Prison was given a waiver for both the first and second round of LT2ESWTR monitoring based on sufficient data from other Folsom Lake water treatment plants.

- Placer County Water Agency (PCWA) conducted the LT2ESWTR second round compliance monitoring by collecting monthly samples from the American River from October 2015 to September 2017. Out of the 24 samples, *Cryptosporidium* was detected once and *Giardia* was detected once. The maximum running annual average was 0.017 oocyst/L for *Cryptosporidium* and 0.017 cyst/L for *Giardia*, classifying the source as Bin 1.

- GDPUD began *E. coli* monitoring in June 2018 and sampled once every two weeks for 12 months to comply with the requirement for small systems. Based on *E. coli* samples collected from June 2018 to June 2019, the annual mean for the Walton WTP was 27.4 MPN/100 mL and the annual mean for the ALT WTP/Sweetwater WTP was 52.4 MPN/100 mL, which classifies both water treatment plants under Bin 1.

- The Strawberry WTP conducted small system monitoring for second round LT2ESWTR from October 2017 to September 2018, with total coliform and *E. coli* monitoring every two weeks. The maximum running annual average for *E. coli* was 7.5 MPN/100 mL, classifying the source as Bin 1 and no further *Cryptosporidium* sampling needed.

- EID conducted the LT2ESWTR second round compliance monitoring by collecting monthly samples for the EDH WTP from April 2015 to April 2017. *Cryptosporidium* was detected once, and the maximum running annual average was 0.033 oocyst/L, classifying the source as Bin 1. There were no detections for *Giardia*.

- For the Reservoir One WTP, sixteen *Cryptosporidium* samples were taken during the months of April through September 2015, June through September 2016, and July through September 2017. There were no detects of *Cryptosporidium,* classifying the source as Bin 1. *Giardia* was detected four times.

- The City of Folsom conducted the LT2ESWTR second round compliance monitoring by collecting monthly samples for *Cryptosporidium* and *Giardia* from October 2015 to September 2017. There were no detections of *Cryptosporidium* or *Giardia*, classifying the source as Bin 1.

- The City of Roseville conducted the LT2ESWTR second round compliance monitoring by collecting monthly samples for *Cryptosporidium* and *Giardia* from June 2015 to May 2017. There was one detection of *Cryptosporidium* and one detection of *Giardia*. The maximum running annual average was 0.0077 oocyst/L for *Cryptosporidium* and 0.0077 cyst/L for *Giardia*, classifying the source as Bin 1.

- San Juan Water District conducted the LT2ESWTR second round compliance monitoring by collecting monthly samples for *Cryptosporidium* and *Giardia* from April 2015 to March 2017. There were no detections of *Cryptosporidium,* classifying the source as Bin 1. There was one detection of *Giardia*.

- GSWC initiated the LT2ESWTR second round compliance monitoring in October 2016 for Coloma/Pyrites WTPs. Samples were only required to be collected when the plants were in operation. For the 12 monthly samples collected through September 2018, there were no detections of *Cryptosporidium* and *Giardia*, classifying the source as Bin 1.

- Carmichael Water District conducted the LT2ESWTR second round compliance monitoring by collecting monthly samples for *Cryptosporidium* and *Giardia* from October 2016 to September 2018. *Cryptosporidium* was detected in seven out of 24 samples, with a maximum running annual average of 0.075 oocysts/L, classifying the source as Bin 2 and requiring one additional log of action for *Cryptosporidium* that is achieved through the membrane treatment process.

- The City of Sacramento conducted the LT2ESWTR second round compliance monitoring by collecting monthly samples for *Cryptosporidium* and *Giardia* from April 2015 to March 2017 for the Fairbairn WTP. There were no detections of *Cryptosporidium,* classifying the source as Bin 1. There were nine detections of *Giardia*, with a maximum running annual average of 0.083 cysts/L.

Summary of Results for Giardia and Cryptosporidium

- All of the water treatment plants were classified as Bin 1 for the second round of LT2ESTWR, except for the Bajamont WTP which was classified as Bin 2.

Disinfection By-Product Precursors (Total Organic Carbon)

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. These are discussed in **Appendix C**. Since the American River does not have detectable levels of bromide, TOC is the key precursor for DBPs. Potential sources of these organic precursors are plant matter, animal matter (including pets, livestock, and wild and feral animals), and soil, which can be contributed by general watershed runoff, urban runoff, recreation, wastewater sources, as well as additional natural sources such as wildlife and in-stream growth, in the American River watershed. The most common DBPs are total trihalomethanes (TTHM), which can cause liver, kidney, or central nervous system problems, as well as an increased risk of getting cancer. Other DBPs, including haloacetic acids (HAA5), are suspected mutagens and teratogens.

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

Evaluation

Table 3-9 provides a summary of TOC data at each of the plant intake locations, including a comparison to the 2008 to 2012 and 2013 to 2017 periods. **Table 3-9** shows that the average water treatment plant intake TOC levels range from 1.1 mg/L at the PCWA's North Fork American River Pumping Station (ARPS) to 1.8 mg/L at Main Canal (Reservoir One WTP) and Folsom Lake (EDH WTP).

Table 3-9
Total Organic Carbon Summary Statistics, mg/L

	2008-2012		2013-2017		2018-2022	
	Average	**Median**	**Average**	**Median**	**Average**	**Median**
North Fork at ARPS (PCWA)	0.97	0.96	1.5	1.1	1.1	1.1
South Fork at Strawberry WTP (EID)	1.87	1.78	2.1	1.9	1.7	1.7
Main Canal at Reservoir One WTP (EID)	1.8	1.76	1.8	1.7	1.8	1.6
Folsom Lake at El Dorado Hills WTP (EID)	1.68	1.58	2.1	2.0	1.8	1.6
Middle Fork at Walton Lake WTP (GDPUD)	Direct Filtration					
Middle Fork at Auburn Lake Trails/Sweetwater (GDPUD)	In-line Filtration				Alternative Filtration as of December 2020	
Folsom Dam (City of Folsom)	1.39	1.4	1.5	1.5	1.4	1.4
Folsom Dam (Folsom State Prison)	Direct Filtration					
Folsom Dam (San Juan Water District)	1.5	1	1.9	1.8	1.7	2.0
Folsom Dam (City of Roseville)	1.5	1.4	1.6	1.5	1.4	1.3
Nimbus Dam into Folsom South Canal (GSWC)	1.6	1.5	1.8	1.8	1.7	1.7
Lower American River at Bajamont WTP (CWD)	Membrane Filtration					
Lower American River at Fairbairn WTP (City of Sacramento)	1.49	1.42	1.8	1.7	1.5	1.5

[1] ALT WTP was replaced in December 2020 with Sweetwater WTP

Figure 3-12 shows that for the WTPs above Folsom Lake source water TOC levels are higher at Reservoir One, Strawberry, and EDH WTPs on the South Fork, as compared with the Foothill WTP on the North Fork. Walton Lake WTP and ALT WTP/Sweetwater WTP are not required to monitor for TOC as they do not employ conventional filtration; Walton Lake WTP uses direct filtration, Sweetwater WTP uses alternative filtration.

Figure 3-12. Total Organic Carbon, WTPs Above Folsom Lake, mg/L

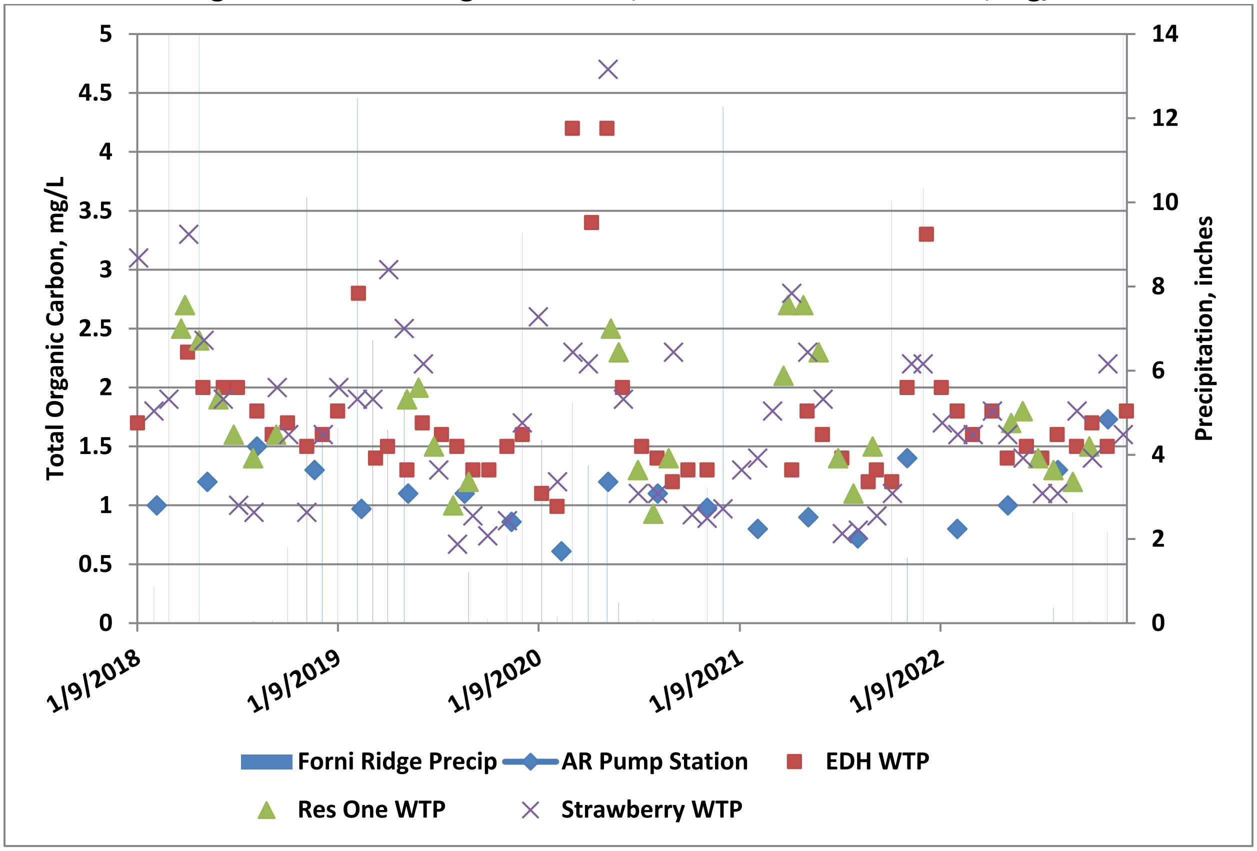


Figure 3-13 shows that TOC levels also peak during storm events for the Folsom Lake water treatment plants. For example, an early cold storm in late October 2021 increased TOC concentrations in the lake possibly due to lake turnover and a significant first flush storm event occurring at the same time. This water quality event was very extreme and unlike other storm events during the study period. As a result, the highest Folsom WTP TOC concentration was 3.4 mg/L in November 2021, the highest Roseville WTP TOC concentration was 3.2 mg/L in November 2021, and the highest Peterson WTP TOC concentration was 3.7 mg/L in November 2021. Folsom State Prison is not required to monitor for TOC as the Folsom State Prison WTP uses direct filtration.

Figure 3-13. Total Organic Carbon, Folsom Lake WTPs, mg/L

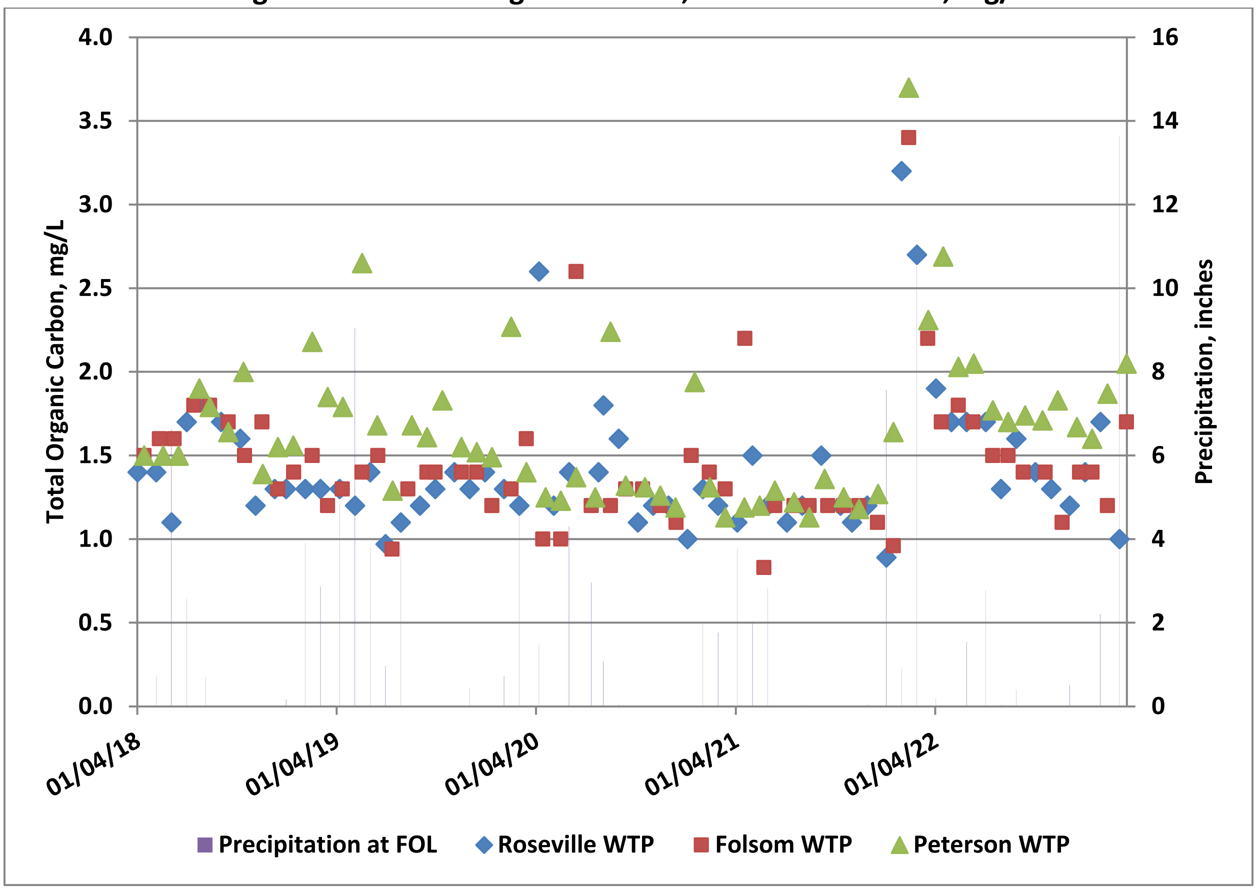
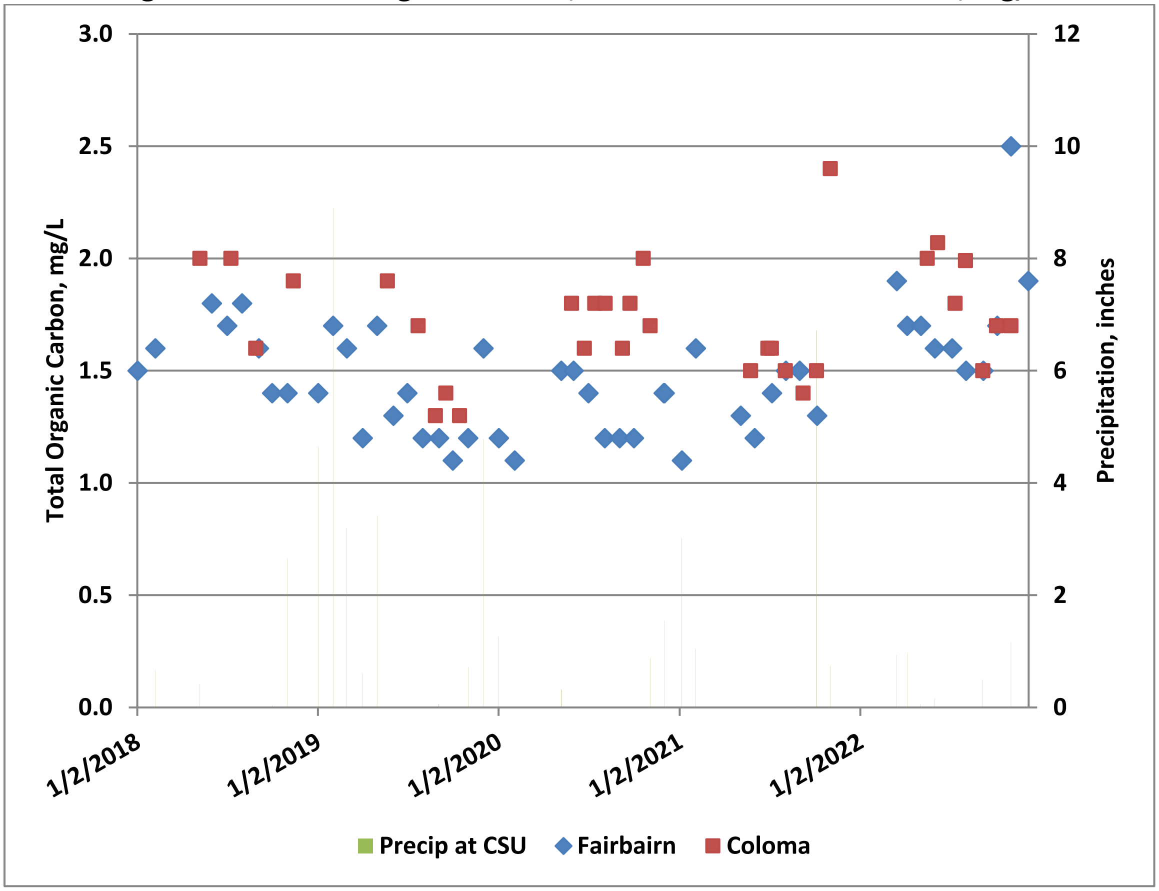


Figure 3-14 shows that TOC concentrations along the Lower American River were generally at or below 2.0 mg/L, with the exception of three samples. Source water TOC for the Coloma WTP was 2.4 mg/L in November 2021 and 2.1 mg/L in May 2022. The Fairbairn WTP was only above 2.0 mg/L in November 2022, with a concentration of 2.5 mg/L.

Figure 3-14. Total Organic Carbon, Lower American River WTPs, mg/L



Summary of Results for Disinfection By-Product Precursors (TOC)

- Average water treatment plant intake TOC levels range from 1.1 mg/L to 1.8 mg/L.
- With the exception of Reservoir One WTP, all water treatment plants had a lower percent occurrence of source water TOC concentrations at or above 2.0 mg/L, compared to the 2013 to 2017 time period. In other words, the source water TOC concentrations were higher in the 2013 to 2017 time period, compared to 2018 to 2022.
- Peaks in TOC data are typically associated with storm events.

Selected Unregulated Constituents of Interest

A review of the CCRs and Public Health Goal (PHG) Reports was conducted for each participating water utility to identify detectable constituents of interest in the source water. There were no detectable levels of other regulated constituents of interest in the source water. There was monitoring for a few unregulated constituents of potential interest and data summaries are presented below.

Hexavalent Chromium

DDW published a Final Hexavalent Chromium Regulation in May 2014 with an MCL of 10 microgams per liter (µg/L); effective July 1, 2014. This was based on the Office of Environmental Health Hazard Assessment (OEHHA) PHG of 0.02 µg/L, which was finalized in July 2011. The hexavalent chromium MCL was repealed on September 11, 2017. On June 16, 2023 DDW gave notice of proposed rulemaking for a proposed MCL of 10 µg/L, and a Detection Limit for Reporting (DLR) of 0.1 µg/L.

Hexavalent chromium data for City of Folsom, City of Roseville, San Juan Water District (SJWD), and the City of Sacramento in the raw water during the study period is presented in **Table 3-10**. None of the results are at levels above the proposed MCL of 10 µg/L.

Table 3-10
Hexavalent Chromium Sampling Results for Raw American River, 2018-2022

Year Sampled	Agency	Result (µg/L)	DLR (µg/L)
7/5/2018	City of Folsom WTP Raw Water	0.069	0.05
7/1/2019	City of Folsom WTP Raw Water	0.054	0.05
7/1/2020	City of Folsom WTP Raw Water	0.088	0.05
7/7/2021	City of Folsom WTP Raw Water	0.064	0.05
10/2/2019	Roseville WTP Raw Water	ND	1
9/2/2020	Roseville WTP Raw Water	ND	1
9/7/2022	Roseville WTP Raw Water	0.082	0.05
10/23/2018	SJWD – Peterson WTP Raw Water	ND	1
10/2/2019	SJWD – Peterson WTP Raw Water	ND	1
10/20/2020	SJWD – Peterson WTP Raw Water	ND	1
10/4/2022	SJWD – Peterson WTP Raw Water	ND	1
8/7/2018	City of Sacramento – Fairbairn WTP Raw Water	ND	1
8/6/2019	City of Sacramento – Fairbairn WTP Raw Water	ND	1
8/4/2020	City of Sacramento – Fairbairn WTP Raw Water	ND	1
8/10/2021	City of Sacramento – Fairbairn WTP Raw Water	0.061	0.02
8/16/2022	City of Sacramento – Fairbairn WTP Raw Water	ND	1

n-Nitrosodimethylamine (NDMA)

NDMA is an unregulated chemical without an established MCL. There is a DDW Notification Level (NL) of 10 ng/L and a PHG of 3 ng/L. NLs are a non-regulatory, precautionary health-based measure set by DDW for concentrations of unregulated contaminants in drinking water that warrant public notification and further monitoring and assessment. Public water systems are encouraged to test their water for contaminants with NLs. As shown in **Table 3-11**, GSWC has sampled for NDMA in the American River prior to treatment, with no detects (ND).

Table 3-11
NDMA Sampling Results for Raw American River, 2018-2022

Year Sampled	Agency	Result (ng/L)	DLR (ng/L)
5/15/2018	GSWC- Coloma/Pyrites WTP	ND	2
7/10/2018	GSWC - Coloma/Pyrites WTP	ND	2
10/16/2018	GSWC - Coloma/Pyrites WTP	ND	2
5/22/2019	GSWC - Coloma/Pyrites WTP	ND	2
7/9/2019	GSWC - Coloma/Pyrites WTP	ND	2
10/8/2019	GSWC - Coloma/Pyrites WTP	ND	2
5/28/2020	GSWC - Coloma/Pyrites WTP	ND	2
7/28/2020	GSWC - Coloma/Pyrites WTP	ND	2
10/20/2020	GSWC - Coloma/Pyrites WTP	ND	2
6/15/2021	GSWC - Coloma/Pyrites WTP	ND	2
7/20/2021	GSWC - Coloma/Pyrites WTP	ND	2
11/2/2021	GSWC - Coloma/Pyrites WTP	ND	2
5/17/2022	GSWC - Coloma/Pyrites WTP	ND	2
7/26/2022	GSWC - Coloma/Pyrites WTP	ND	2.1
11/1/2022	GSWC - Coloma/Pyrites WTP	ND	2

1,4-dioxane

There is no MCL for 1,4-dioxane, but there is an NL of 1 µg/L. As shown in **Table 3-12**, GSWC has also monitored the American River supply for 1,4-dioxane, with no detects.

Table 3-12
1,4-Dioxane Sampling Results for Raw American River, 2018-2022

Year Sampled	Agency	Result (µg/L)	DLR (µg/L)
5/15/2018	GSWC- Coloma/Pyrites WTP	ND	1
7/10/2018	GSWC- Coloma/Pyrites WTP	ND	1
10/16/2018	GSWC- Coloma/Pyrites WTP	ND	1
5/22/2019	GSWC- Coloma/Pyrites WTP	ND	1
7/9/2019	GSWC- Coloma/Pyrites WTP	ND	1
10/8/2019	GSWC- Coloma/Pyrites WTP	ND	1
5/28/2020	GSWC- Coloma/Pyrites WTP	ND	1
10/20/2020	GSWC- Coloma/Pyrites WTP	ND	1
6/15/2021	GSWC- Coloma/Pyrites WTP	ND	1
7/20/2021	GSWC- Coloma/Pyrites WTP	ND	1
11/2/2021	GSWC- Coloma/Pyrites WTP	ND	1
5/17/2022	GSWC- Coloma/Pyrites WTP	ND	1
7/26/2022	GSWC- Coloma/Pyrites WTP	ND	0.99
11/1/2022	GSWC- Coloma/Pyrites WTP	ND	0.07

Per- and Poly-Fluoroalkyl Substances (PFAS)

In October 2019, OEHHA announced the initiation of PHG assessments for PFOA and PFOS. These were published in July 2021 with proposed PHGs of 0.007 ng/L (or parts per trillion [ppt]) for PFOA and 1 ng/L for PFOS, based on the one in a million cancer risk estimate. Non-cancer risks concentrations would be 3 ng/L for PFOA and 2 ng/L for PFOS. These draft PHGs are not final.

In March 2023, USEPA announced the proposed primary MCLs for six PFAS including PFOA, PFOS, perfluorononanoic acid (PFNA), hexafluoropropylene oxide dimer acid (HFPO-DA), perfluorohexane sulfonic acid (PFHxS), and perfluorobutane sulfonic acid (PFBS). The proposed MCL for PFOA is 4 ng/L and also for PFOS. The MCL for PFNA, PFBS, PFHxS and HFPO-DA uses a hazard index which is made up of a sum of fractions, as follows:

Hazard Index = (HFPO-DA concentration/10 ppt) +(PFBS concentration/2000 ppt) + (PFNA concentration/10 ppt) + (PFHxS/9 ppt)

If the running annual average for the Hazard Index is greater than 1.0, it is an MCL violation. The USEPA anticipates finalizing the regulation by the end of 2023.

As part of the fifth Unregulated Contaminant Monitoring Rule (UCMR5), USEPA will require many public water systems to monitor for 29 PFAS between 2023 and 2025.

In August 2019, DDW established NLs at concentrations of 6.5 ng/L for PFOS and 5.1 ng/L for PFOA. In February 2020, DDW asked OEHHA to develop recommended NLs for seven PFAS that have been detected in California drinking water supplies. Subsequently, in March 2021 DDW issued a NL and Response Level (RL) for PFBS at 0.5 µg/L, and 5 µg/L, respectively. In October 2022, DDW issued a NL and RL for PFHxS at 3 ng/L, and 20 ng/L, respectively. The remaining PFAS with an impending NL include:

- PFNA
- perfluorohexanoic acid (PFHxA)
- perfluoroheptanoic acid (PFHpA)
- perfluorodecanoic acid (PFDA)
- 4,8-dioxia-3H-perflourononanoic acid (ADONA)

Every constituent that has an NL has a companion RL, which if exceeded triggers responses by a local water system. Under California law (Assembly Bill 756), if a water system receives a State Water Board order for testing and finds that the PFOA or PFOS concentration exceeds their RL, the system is required to take the water source out of service, provide treatment, or notify their customers in writing. On February 6, 2020, DDW set revised RLs at 10 ng/L for PFOA and 40 ng/L for PFOS based on a running four quarter average.

The City of Sacramento has collected PFAS data for raw American River water over the reporting period. **Table 3-13** indicates the 18 PFAS which have been monitored on a quarterly basis since May 2019. Samples were collected at the Fairbairn WTP raw and treated taps in May 2019, August 2019, November 2019, February 2020, October 2020, January 2021, April 2021, July 2021, October 2021, March 2022, April 2022, July 2022, and October 2022. All raw and treated water samples have been non-detect to date.

Table 3-13
PFAS Monitored by City of Sacramento in Raw Water, 2019-2022

Chemical Name	Acronym	DLR, µg/L
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	0.0003
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	9Cl-PF3ONS	0.0003
4,8-dioxa-3H-perfluorononanoic acid	ADONA	0.0006
Hexafluoropropylene oxide dimer acid	HFPO-DA	0.001
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA	0.00042
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA	0.00058
Perfluorobutanesulfonic acid	PFBS	0.00037
Perfluorodecanoic acid	PFDA	0.00031
Perfluorododecanoic acid	PFDoA	0.00054
Perfluoroheptanoic acid	PFHpA	0.00039
Perfluorohexanoic acid	PFHxA	0.00046
Perfluorohexanesulfonic acid	PFHxS	0.00032
Perfluorononanoic acid	PFNA	0.0004
Perfluorooctanoic acid	PFOA	0.00038
Perfluorooctanesulfonic acid	PFOS	0.00043
Perfluorotetradecanoic acid	PFTA	0.00054
Perfluorotridecanoic acid	PFTrDA	0.00036
Perfluoroundecanoic acid	PFUnA	0.00042

Cyanotoxins

In June 2015, the USEPA established a 10-day Health Advisory (HA) for microcystin at 0.3 µg/L for children younger than school age and 1.6 µg/L for all other age groups. A 10-day HA for cylindrospermopsin was also established at 0.7 µg/L for children younger than school age and 3.0 µg/L for all other age groups.

In May 2021, OEHHA submitted recommendations for short-term NLs for microcystins at 0.03 µg/L, cylindrospermopsin at 0.3 µg/L, anatoxin-a at 4 µg/L, and a one-day NL for saxitoxin at 0.5 µg/L as shown in **Table 3-14**. In May 2022, OEHHA submitted acute (one day) NLs, which are the recommended maximum water concentrations that humans can consume over a 24-hour period but not longer.

OEHHA recommends that the NLs for microcystins, saxitoxins, and cylindrospermopsin are interim NLs, as OEHHA will complete review of additional recent toxicity studies and derive final recommendations.

Table 3-14
Recommended Notification Levels for Cyanotoxins, µg/L

Chemical	Short-Term Notification Level, µg/L	Acute (One day) Notification Level, µg/L
Saxitoxins	NA	0.5
Microcystins	0.03 (up to 3 months)	3
Cylindrospermopsin	0.3 (up to 3 months)	3
Anatoxin-a	4 (up to one month)	8

The City of Sacramento has collected cyanotoxin data for raw American River water over the reporting period. Samples are generally collected on a weekly basis from May/June through October/November for anatoxin-a, cylindrospermopsin, and six congeners of microcystin. The only toxin detected from 2018 to 2022 samples was anatoxin-a, and it was not detected in 2021 and 2022. The highest concentration of anatoxin-a was 0.12 µg/L on September 20, 2018, which is well below both the acute and short-term NLs.

Summary of Results for Selected Unregulated Constituents of Interest

- All hexavalent chromium detects were well below the recently proposed MCL of 10 µg/L.
- All NDMA results were non-detect and below the current DDW Notification Level of 10 ng/L.
- All 1,4-Dioxane results were non-detect and below the current DDW Notification Level of 1 µg/L.

- The City of Sacramento has collected PFAS data for raw American River water over the reporting period. Quarterly sampling was initiated in May 2019. All raw and treated water samples have been non-detect for the 18 PFAS monitored to date. DLRs are sufficiently below existing and proposed regulatory thresholds.

- The City of Sacramento has collected cyanotoxin data for raw American River water over the reporting period. Samples are generally collected on a weekly basis from May/June through October/November for anatoxin-a, cylindrospermopsin, and six congeners of microcystin. The only toxin detected from 2018 to 2022 samples was anatoxin-a, and it was not detected in 2021 and 2022. The highest concentration of anatoxin-a was 0.12 µg/L on September 20, 2018, which is well below the acute and short-term Notification Levels.

This section contains an evaluation of the seven watershed potential contaminant sources selected for review for the 2023 Update. The potential contaminating activities that were selected for review as part of the 2023 Update include:

- Creek and river corridor activities, including bird management at Lake Natoma, pet waste management, equestrian waste management, and illegal camping along the Lower American River,
- Forest activities, including timber harvesting and pesticide use, wildfires, off-highway vehicle use, and selected grazing allotments,
- Aerojet Rocketdyne Holdings, Inc. industrial facility,
- Recreation, including body and non-body contact,
- Watershed spills,
- Stormwater runoff, and
- Wastewater collection and treatment facilities.

In addition, five special topics were identified for limited investigation and summary. This included projected population growth in the watershed, upper watershed management programs, the Central Valley Regional Water Quality Control Board's (Regional Water Board) Delta Drinking Water Policy, climate change, and Folsom Lake operations. Finally, a brief review of three additional topics was conducted. This included irrigated agriculture in Placer and El Dorado counties, outdoor cannabis cultivation, and selected mine facilities. All of these topics are summarized only for informational purposes.

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.

CREEK AND RIVER CORRIDOR ACTIVITIES

Background

There are four creek and river corridor activities of interest along the Lower American River: bird management at Lake Natoma, pet waste management, equestrian waste management, and illegal camping/homelessness.

There is a significant population of waterfowl along the south shore at Lake Natoma, known as Nimbus Flat, that has become resident and is of concern to water quality. Feeding waterfowl at Nimbus Flat has become a popular recreational past-time for many people in the area and has resulted in the persistence of a resident waterfowl population.

The 2013 Update also noted that there was a significant amount of pet waste, particularly dog waste, accumulating in the American River Parkway and possibly being transported to the Lower American River during storm events.

The 2018 Update identified the potential concern for equestrian waste in the Lower American River Parkway, due to increased presence of the activity and limited regulation for waste removal.

Another river corridor activity of interest to source water quality is illegal camping and homelessness. There is a continuous, though shifting, population of homeless people and illegal encampments in the river corridors, especially in the lowest three miles of the Lower American River. The illegal camps become littered with debris, garbage, sewage, litter, used toilet paper, human waste, discarded syringes, food wrappers, old clothes, etc. and are a potential source of contamination in the watershed.

Seasonal Patterns

The waterfowl population at Lake Natoma consists of both resident (year-round) and migratory (spring and fall) populations of geese. The Canada Geese that are migratory are a protected species.

The American River Parkway is used year-round by local residents for walking and exercising dogs and riding horses. During these processes, many dogs and horses make waste, and historically it has frequently been left behind by the owners. Depending on the season, pet and equestrian waste left on the ground near waterways can be carried by rain and irrigation waters and contribute to pollution in the Lower American River.

Illegal camping and homelessness are a storm source with the principal concern being wash off caused by rain runoff that may pick up waste from the camps. The illegal camping is typically located within the flood plain. For this reason, the principal concern is that contaminants associated with the sites, including human waste, may be washed off during storm events and transported to the Lower American River.

Related Constituents

The waterfowl, pet, and equestrian populations are potential sources of fecal waste. Illegal camps are also of potential concern as a source of fecal waste. Fecal waste is a source of turbidity, organic matter, and microbial constituents. Human waste from homeless populations may have a disproportionately high load of disease-causing organisms since, as noted in the Sacramento County and Cities Board on Homelessness' Five Year Plan, there is "substantial documentation of high incidence of diseases among the homeless population." The illegal camps may also include other illegal trash that could contribute a wide array of contaminants and have potential for initiating fires.

Presence in the Watershed

The waterfowl population of concern is located at Lake Natoma, and is principally concentrated at Nimbus Flat. There is a growing concern that the feces from these waterfowl will degrade water quality and cause elevated fecal coliform levels, excessive algae growth, and eutrophication. There has been no official study on the waterfowl population at the lake. California Department of Parks and Recreation (State Parks), Gold Fields District staff indicates that there is a large resident goose population and an additional migratory population that is present in the spring and fall at Lake Natoma. There has been no official evaluation or assessment of the goose population. The continued population growth and associated pollution is exacerbated by people feeding the geese and attracting more individuals to the area.

Dog walking and exercising occurs throughout the American River Parkway. Some of the heaviest use areas are those near neighborhood enclaves, generally between Sunrise Avenue and Paradise Beach.

According to State Parks, there are two privately-owned stables which have an agreement with State Parks. The Shadow Glen Stables, located near Lake Natoma at 4854 Main Ave, Fair Oaks, CA 95628 are a concessionaire with the Folsom Lake State Recreation Area (SRA), and they have a concessionaire’s permit with State Parks to operate the stable. According to State Parks, the permit specifies that the stables must be cleaned daily and that manure must be moved to an off-site facility weekly. The second facility called “Boarding on the Lake”, located at 9095 Auburn Folsom Road, Granite Bay, is a stable on private property and the property is directly adjacent to State Parks property. Due to group trail rides which lead into the Folsom SRA, they have an agreement with State Parks to remove manure on State Park’s property, which is directly adjacent to their property. According to State Parks, there are about a dozen other private stables near the Folsom SRA, but State Parks does not have any agreements with these stables.

In addition to stables, there are currently seven equestrian staging areas for the Folsom SRA, as shown on the attached brochure for the Folsom SRA (**Appendix D**). The first two areas listed below are located near Lake Natoma, with the remainder around Folsom Lake.

- Negro Bar (Lake Natoma)
- Snowberry Trailhead and Shadow Glen Stables (Lake Natoma)
- Granite Bay
- Rattlesnake Bar
- Brown’s Ravine
- Old Salmon Falls/Falcon Crest
- Sterling Point

These areas are designed to allow access for horse trailers to unload and park. Most of the staging areas have hitching rails or posts, water troughs, drinking fountain, and chemical toilets.

According to State Parks, manure is generally left to naturally degrade on the trail. However, manure is removed from the trail if there is a large horse event. The Folsom Lake Trail Patrol is a volunteer Mounted Assistance Unit operating within the State Parks. They conduct trail maintenance, but not manure pickup.

Illegal camps are created largely in the American River Parkway, predominately downstream of the Business 80 bridge crossing, close to social services in downtown Sacramento. This is downstream of all of the drinking water intakes on the Lower American River. There is a stable homeless population of 500 to 600 people living in the furthest downstream three-mile reach of the Lower American River, and this population is predominantly a service-resistant population. The vast majority of this population is single adults over the age of 25. There is a "no-alcohol" area from the Capital City Freeway Bridge crossing to Discovery Park. Sacramento County Director of Regional Parks has noted that alcohol is destroyed on scene after citations are issued. Sacramento County Park Rangers also cite individuals for other code violations and arrest those with outstanding warrants.

There are County and City ordinances which ban illegal camping in the American River Parkway (discussed later); enforcement of these ordinances within the American River Parkway was primarily completed by Sacramento County Park Rangers, supported at times by the City of Sacramento Park Services and other law enforcement, during the study period. Illegal encampments on public property were posted with notices to vacate, and occupants were forced to move so the encampment area could be cleaned.

There is other land within the floodplain which is either owned by the City of Sacramento or privately owned where homeless populations illegally camp. Most of the camps are located in close proximity to the river. The City of Sacramento Park Services enforced illegal camping bans on City or privately owned lands within the City limits located within the American River floodplain, but which are not officially Parkway designated lands.

In late 2018 a court ruling (Martin v. City of Boise) determined that it is unconstitutional for local governments to cite or arrest a homeless person for sleeping, sitting, or lying outside in public places if there is no available shelter. The City and County of Sacramento temporarily ceased issuing citations for illegal camping in late 2018, as well as ceased posting encampments with notices to vacate, but continued their enforcement of other code violations associated with homeless encampments, such as dumping, fires, drug possession, or other offenses. However, the decision does not permit a homeless person to indefinitely reside at a single location on public property, and the decision does not preclude enforcement to avoid or mitigate determinantal consequences associated with homeless encampments, such as: accumulated debris, environmental degradation, and health and public safety issues including degradation of public infrastructure such as levees. Starting in 2019, encampments that were found to be creating these negative impacts to the environment and public health and safety were posted with notices to vacate, so that the areas could be cleaned and degradation to public infrastructure could be repaired.

The Sacramento Continuum of Care, in partnership with Sacramento Steps Forward, conducts "Point-in-Time" (PIT) Homeless Counts every other year in Sacramento County. The 2022 PIT Homeless Count conducted for Sacramento County reported 9,278 individuals experience homelessness on a single night. Less than 30 percent of homeless individuals were considered sheltered at the time of the report. This represents an over 250 percent increase in overall homelessness over the study period. **Table 4-1** presents the findings from the 2018 through 2022 PIT Homeless Count reports.

Table 4-1
Homeless Count Results

Category	2018	2019	2020	2021	2022
Sheltered	1,569	1,661	1,661	1,885	2,614
Unsheltered	2,052	3,900	3,900	NA[1]	6,664
Total Homeless	3,621	5,561	5,561	1,885	9,278

[1] No unsheltered statistics were collected due to COVID pandemic

According to the 2022 PIT Homeless Count report the number of chronically homeless has grown consistently since 2013, especially through the COVID pandemic. At the time of the 2022 count, approximately 72 percent of homeless individuals were unsheltered, which reflects a continued increase in the percent of homeless who are unsheltered. Some portion of the unsheltered homeless resides in the river corridor in illegal camps. There was a significant increase in the number of tents and vehicles used by homeless individuals during the COVID pandemic. There was also a significant increase in the percent of individuals considered chronically homeless, meaning longer periods of homelessness, with 59 percent of respondents being homeless for more than three years. The 2022 PIT Homeless Count report indicates that most of the homeless population in Sacramento County, 95 percent, have been living in the region for at least one year.

Regulation and Management

Since the river corridor activities are largely non-point source in nature, management of the river corridor activities is led by local efforts; there is limited state regulatory assistance with respect to pollution prevention and control. The existing local efforts exist on both the north and south sides of the Lower American River.

California Department of Parks and Recreation

Currently, there is an ordinance by State Parks to prohibit feeding of the wildlife at Lake Natoma; however, there is limited enforcement by Park Rangers due to limitations on resources. This ordinance was updated in the 2010 Folsom Lake State Recreation Plan and Folsom Powerhouse State Historic Park General Plan/Resource Management Plan under the resource management guidelines for Nimbus Flat and it still applies. There is signage at Nimbus Flat to dissuade recreators from feeding the geese, but the sign is only in English and is not widely displayed. The signage strategy has not yet proved to be effective, and State Parks may also consider obtaining a permit from the United States Fish and Wildlife Service (USFWS) to control the waterfowl populations further. Since the Canada Goose is a protected species under the Migratory Bird Treaty Act, State Parks is not allowed to cull the birds, collect their eggs, or harass them into relocating without a “Take Permit” from the USFWS.

Central Valley Regional Water Quality Control Board

303d Listing and Total Maximum Daily Load (TMDL) Development

The Regional Water Board adopted the 2014-2016 Integrated Report in December 2016, which included a new 303(d) listing for indicator bacteria on the Lower American River due to elevated concentrations from the Safe-to-Swim summer sampling program. This listing is based on exceedances of the USEPA 2012 Recreation Water Quality Criteria for protection of water contact recreation. This was approved by the State Water Board in October 2017 and the USEPA in April 2018. The Regional Water Board listing is a Category 5A, which means a TMDL must be developed and it is scheduled for completion by 2027. The Regional Water Board kept the listing as part of the approved 2020-2022 Integrated Report as well and did not indicate a delisting in the current draft 2024 Integrated Report. The sources are listed as “unknown” so the Regional Water Board is required develop an understanding of the possible sources of the impairment as part of the TMDL development.

The Regional Water Board conducted two monitoring programs, but has not initiated the TMDL development process for the new indicator bacteria listing on the Lower American River. The Regional Water Board Surface Water Ambient Monitoring Program (SWAMP) conducts an *Escherichia coli* (*E. coli)* monitoring program along the Lower American River and completed a two phase microbial source tracking Bacteria Study. As per Regional Water Board staff (personal communication, Jennifer LaBay, July 23, 2023) this TMDL is not currently prioritized for development and unlikely to occur by 2027. Regional Water Board staff working on TMDLs and other Basin Plan items will wait for SWAMP staff to finalize the Phase 2 Bacteria Study report (discussed below) to determine a path forward on managing bacteria loads in the Lower American River.

Regional Water Board SWAMP *E. coli* Monitoring Program

In September 2017, the Regional Water Board received complaints from the public regarding homeless encampments and associated trash/debris along the Lower American River and its tributaries. The complaints included concern that this trash/debris would be transported into the river system during wet weather. The Regional Water Board initiated a monitoring program to investigate indicator bacteria in the Lower American River. In April 2018, the Regional Water Board announced that they had begun weekly monitoring for *E. coli* at nine sites on the Lower American River on January 11, 2018. Three of those sites are located near or above the EA Fairbairn WTP (Fairbairn WTP); Lower Sunrise Area (Sunrise Bridge crossing), River Bend Park (downstream of Ancil Hoffman Park), and Howe Avenue (Howe Avenue Bridge crossing). Three additional sites are downstream of Fairbairn WTP and above the Highway 160 bridge crossing:

Paradise Beach (just below the Fairbairn WTP intake), Paradise Beach Downstream (downstream of Paradise Beach), and Sutter's Landing Park (near the Business 80 bridge crossing). Four additional sites are downstream of Highway 160 Bridge crossing; Camp Pollock (near Highway 160 Bridge crossing), North 10th Street (near the end of North 10th Street), Discovery Park (upstream of the I5 Bridge crossing), and Tiscornia Beach (downstream of the I5 Bridge crossing at the confluence with the Sacramento River).

Table 4-2 presents a summary of all the individual *E. coli* data for the Lower American River sites through July 18, 2023. Only one site, Tiscornia Beach, had a median value above the recreation-based water quality objective of 235 most probably number per 100 milliliters (MPN/100 mL) and the advanced drinking water treatment threshold of 200 MPN/100 mL. The *E. coli* levels range significantly, with individual results at or below the recreation-based water quality objective and the advanced drinking water treatment threshold for sites at or upstream of Camp Pollock. There is an increase in average and median *E. coli* concentrations from upstream to downstream. The highest median values occur at Confluence and Discovery Park on the American River and in Steelhead Creek, where there is heavy recreational use and contribution of urban runoff. The next highest concentrations are at North 10th Street, Camp Pollock, and Sutter's Landing Park, which could be influenced by river corridor activities such as pet waste, illegal camping/homelessness, urban runoff, and septic systems. The median values of all individual data points at each site are shown on **Figure 4-1**.

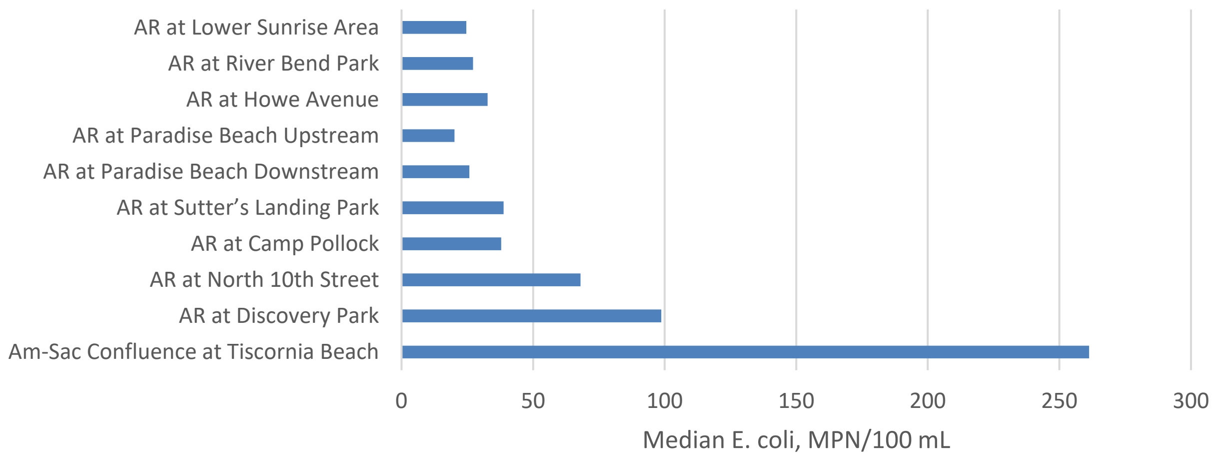
Table 4-2
Regional Water Board *E. coli* Monitoring on the Lower American River, January 2018 – July 18, 2023

Site Name	*E. coli* (MPN/100 mL)				
	No. Samples	Minimum	Maximum	Average	Median
AR at Lower Sunrise Area	159	1.2	2419.6	62.6	24.6
AR at River Bend Park	154	6.3	2419.6	57.9	27.2
AR at Howe Avenue	261	0.1	1986.3	76.1	32.7
AR at Paradise Beach Upstream	208	2	1553.1	47.7	20.1
AR at Paradise Beach Downstream	124	2	2419.6	102.4	25.8
AR at Sutter's Landing Park	267	5.2	2419.6	149.6	38.8
AR at Camp Pollock	255	1	2419.6	123.6	37.9
AR at North 10th Street	248	4.1	2419.6	223.4	68
AR at Discovery Park	259	3.1	2419.6	336.8	98.7
American-Sacramento Confluence at Tiscornia Beach	257	9.8	2419.6	723.9	261.3
Steelhead Creek at Discovery Park Boat Ramp	253	6.3	2419.6	333.9	129.6
Steelhead Creek at Discovery Park Entrance	96	27.5	2419.6	487.4	208.1

[1] Lower Sunrise Area, River Bend Park, and Howe Avenue are upstream of Fairbairn WTP Intake, all others downstream

[2] Method upper limit for reporting is 2419.6 MPN/100 mL

Figure 4-1. *E. coli* Median Values for the Lower American River



Further investigation of the individual data was conducted to look at the seasonality of the data. **Figure 4-2** presents a time series plot of the individual *E. coli* results over the study period for all sites. It can be seen that there is generally an increasing trend during the summer months, but due to the number of sites it is difficult to ascertain validity at all sites. For this reason, the sites were broken into three river reaches; at and upstream of Fairbairn WTP, between Fairbairn WTP and Highway 160 Bridge crossing, and downstream Highway 160 Bridge crossing.

Figure 4-2. *E. coli* Data – All Sites (January 2018 – July 2023)

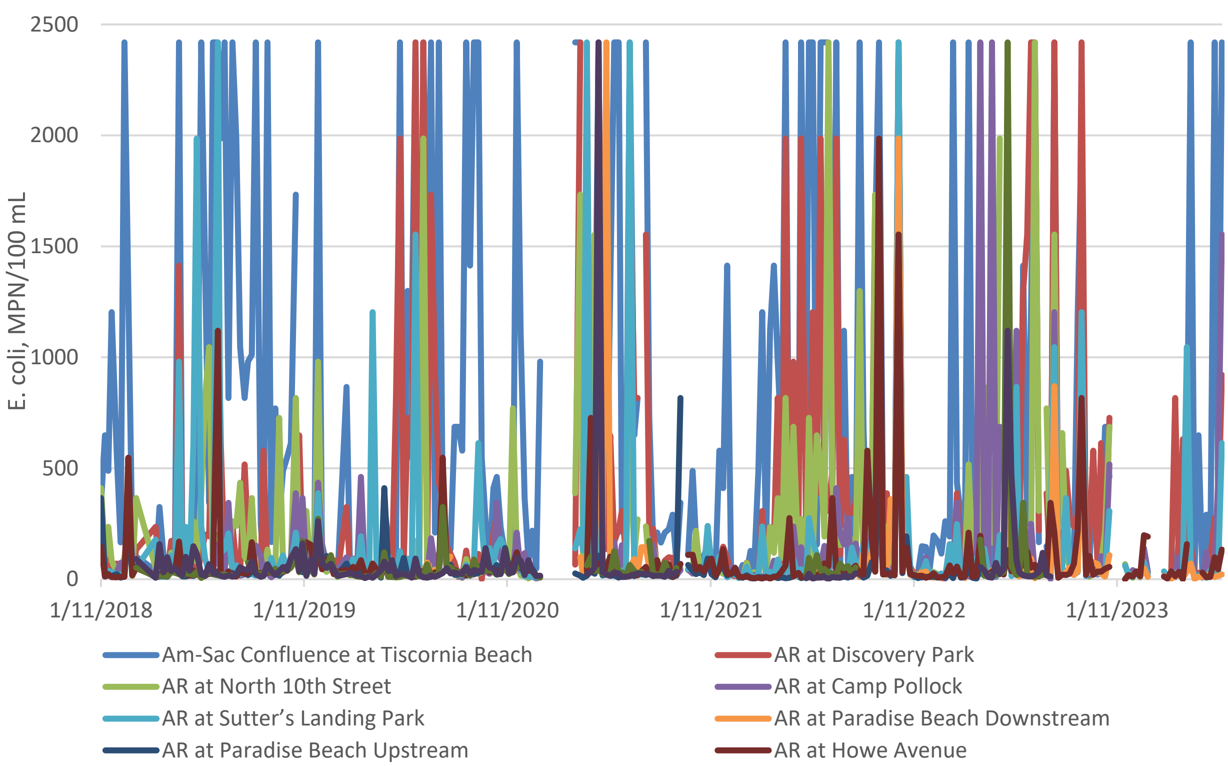


Figure 4-3 presents the timeseries plot for sites at and upstream of Fairbairn WTP, **Figure 4-4** presents the timeseries plot for sites between Fairbairn WTP and Highway 160 Bridge, and **Figure 4-5** presents the timeseries plot for sites downstream Highway 160 Bridge.

Figure 4-3. *E. coli* Data – Sites At or Above Fairbairn WTP (January 2018 – July 2023)

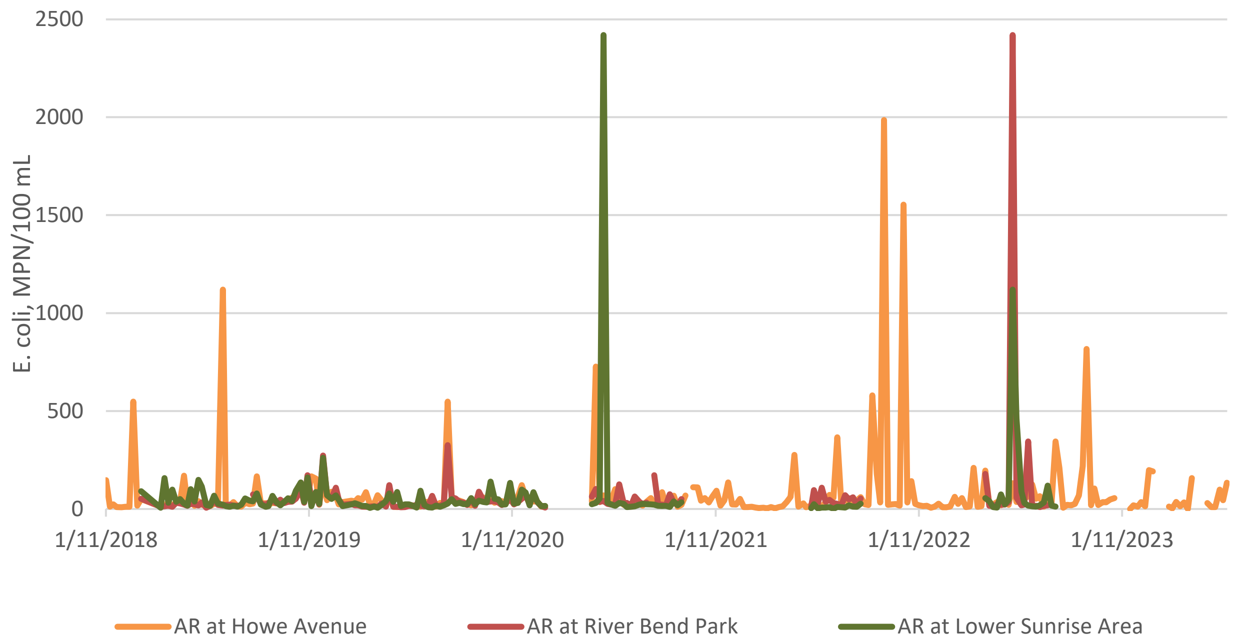


Figure 4-4. *E. coli* Data – Sites Between Fairbairn WTP and Highway 160 Bridge (January 2018 – July 2023)

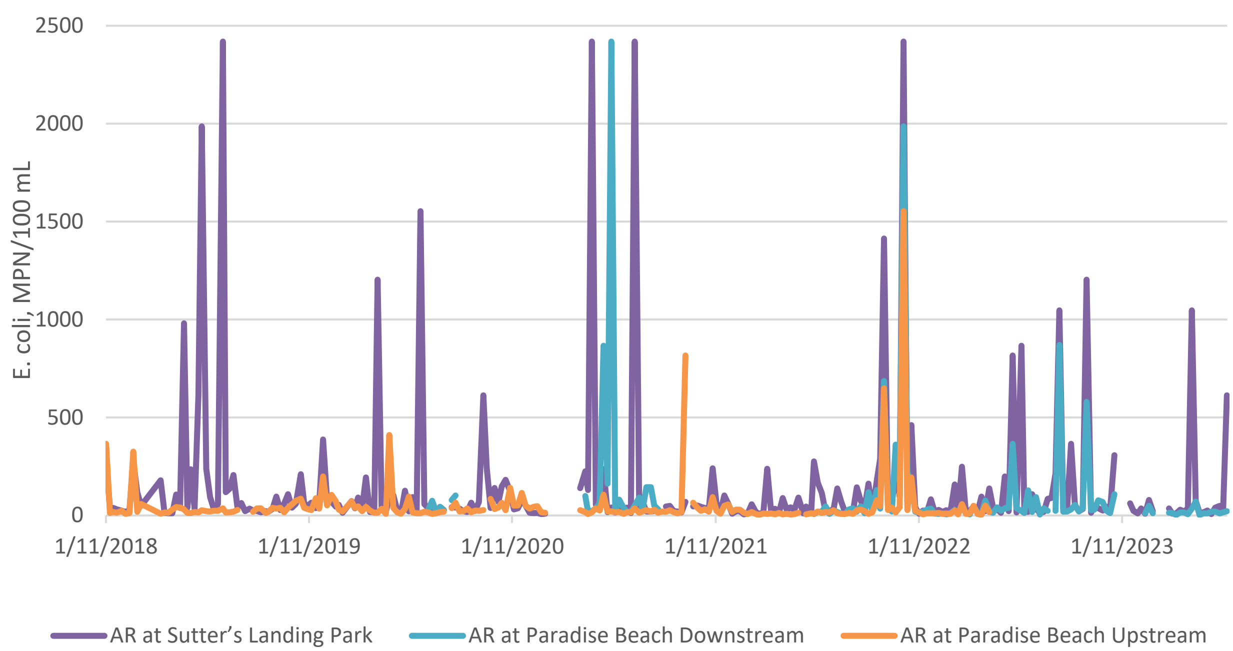


Figure 4-5. *E. coli* Data – Sites Downstream Highway 160 Bridge (January 2018 – July 2023)

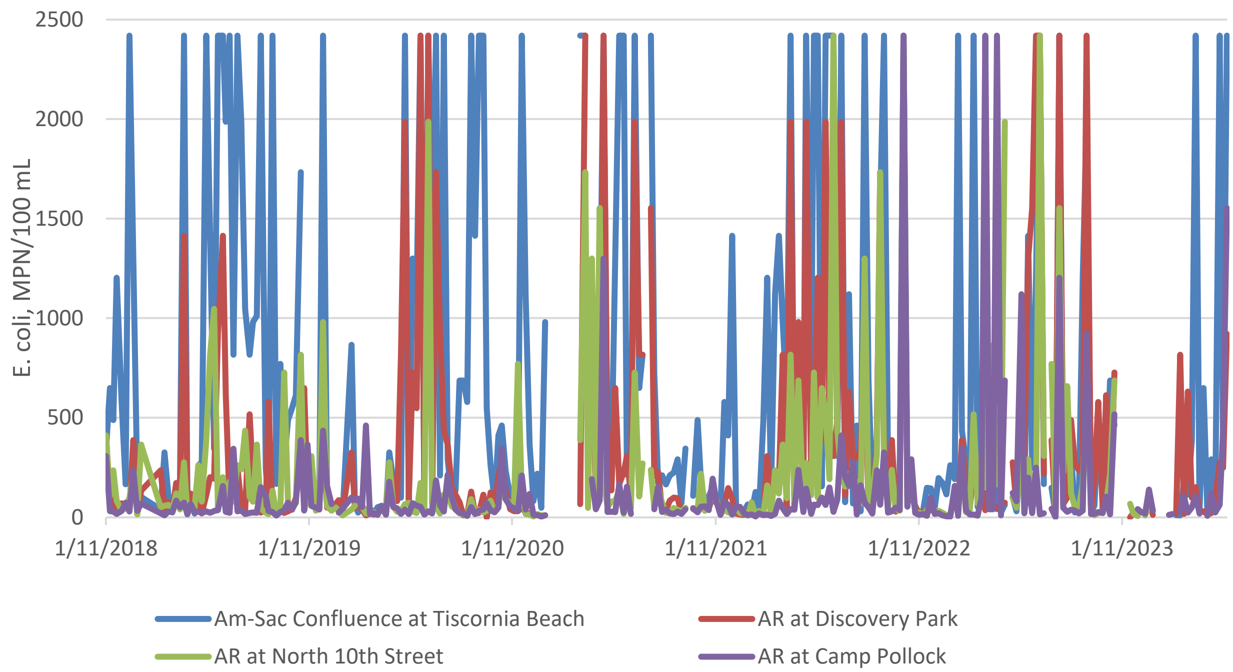


Figure 4-3 indicates there were very few peak *E. coli* events during the study period and they occurred during multiple seasons, lacking a trend and clear evidence of any single source. **Figure 4-4** shows an increased occurrence of peak *E. coli* events, with many occurring during the summer months but some still occurring during the wet season. **Figure 4-5** exemplified numerous peak *E. coli* events occurring, primarily during the summer months but also evident during the wet season. These charts show that the three reaches of the Lower American River have very different levels of *E. coli* and seasonality for elevated coliform. This likely indicates that the predominant sources of *E. coli* vary between the reaches as well.

In order to evaluate the *E. coli* data in accordance with drinking water standards, the monthly median was calculated for each site during the study period. This is summarized in **Table 4-3**. The monthly median values varied widely between the sites, but follow the same general trends as the individual data. The sites further downstream had the highest levels. The sites at and upstream of Fairbairn WTP never had a monthly median value exceed 200 MPN/100 mL (the threshold for considering advanced drinking water treatment).

Looking at the seasonality of the monthly median calculations shows similar trends to the individual data, but more pronounced. **Figures 4-6, 4-7, and 4-8** present the monthly median calculations for sites in the three reaches of the Lower American River. The monthly median values for sites at or upstream Fairbairn WTP (**Figure 4-6**) show the lowest *E. coli* values, with none above the 200 MPN/100 mL drinking water threshold, and a clear seasonal trend for increasing during the wet weather months. The monthly median values for sites between Fairbairn WTP and Highway 160 Bridge (**Figure 4-7**) show slighter higher *E. coli* values and peaks occurring in both dry/recreation and wet seasons. Only Sutter's Landing Park had monthly medians exceed the 200 MPN/100 mL drinking water threshold (2.5 percent of months).

Table 4-3
Monthly Median *E. coli* Calculation Summary (January 2018 – July 18, 2023)

Site	Minimum	Maximum
AR at Lower Sunrise Area	7.3	90.5
AR at River Bend Park	11	88.5
AR at Howe Avenue	4.7	191.8
AR at Paradise Beach Upstream	6.3	117.6
AR at Paradise Beach Downstream	8.6	195.6
AR at Sutter's Landing Park	7.5	278.6
AR at Camp Pollock	7.5	435.2
AR at North 10th Street	9.2	517.2
AR at Discovery Park	6.4	1986.4
Am-Sac Confluence at Tiscornia Beach	10.3	2419.6

Figure 4-6. *E. coli* Monthly Median Calculation – Sites At or Above Fairbairn WTP (January 2018 – July 2023)

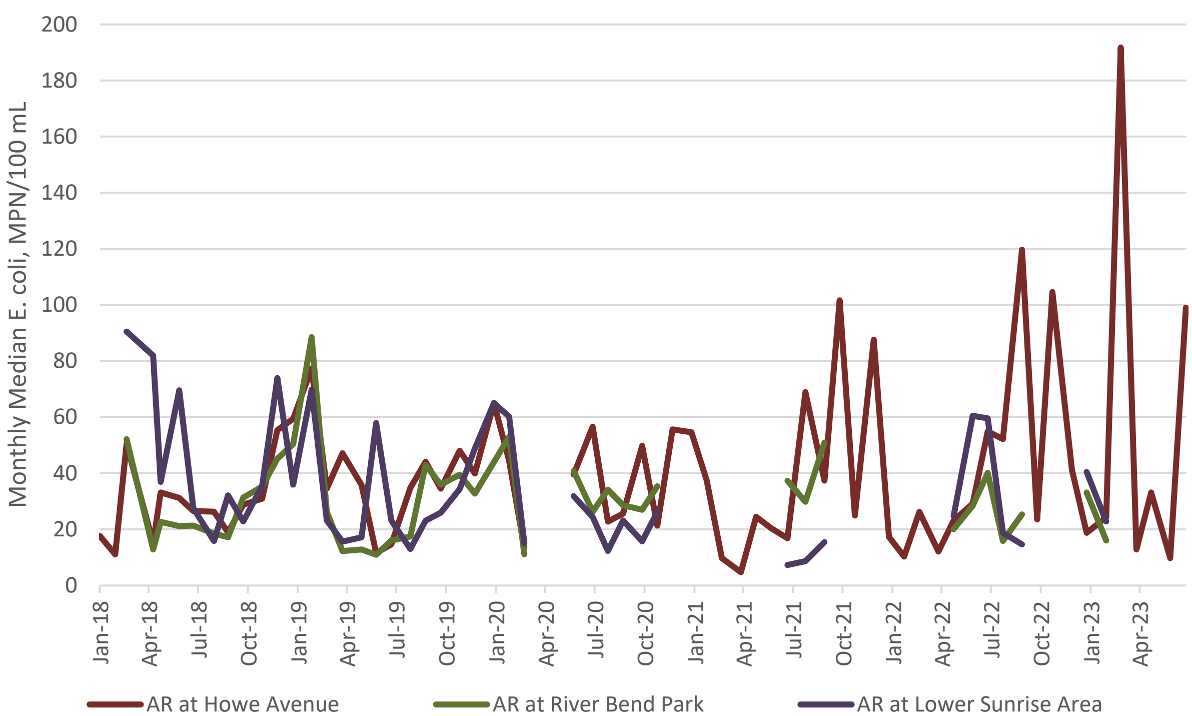


Figure 4-7. *E. coli* Monthly Median Calculation – Sites Between Fairbairn WTP and Highway 160 Bridge (January 2018 – July 2023)

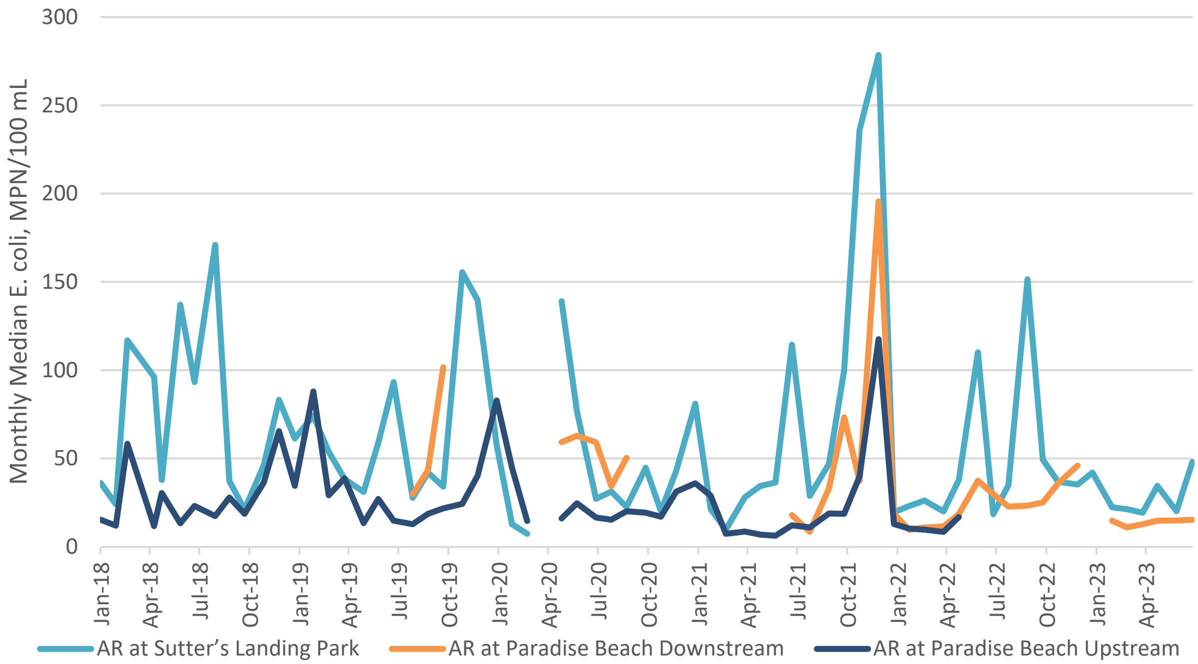
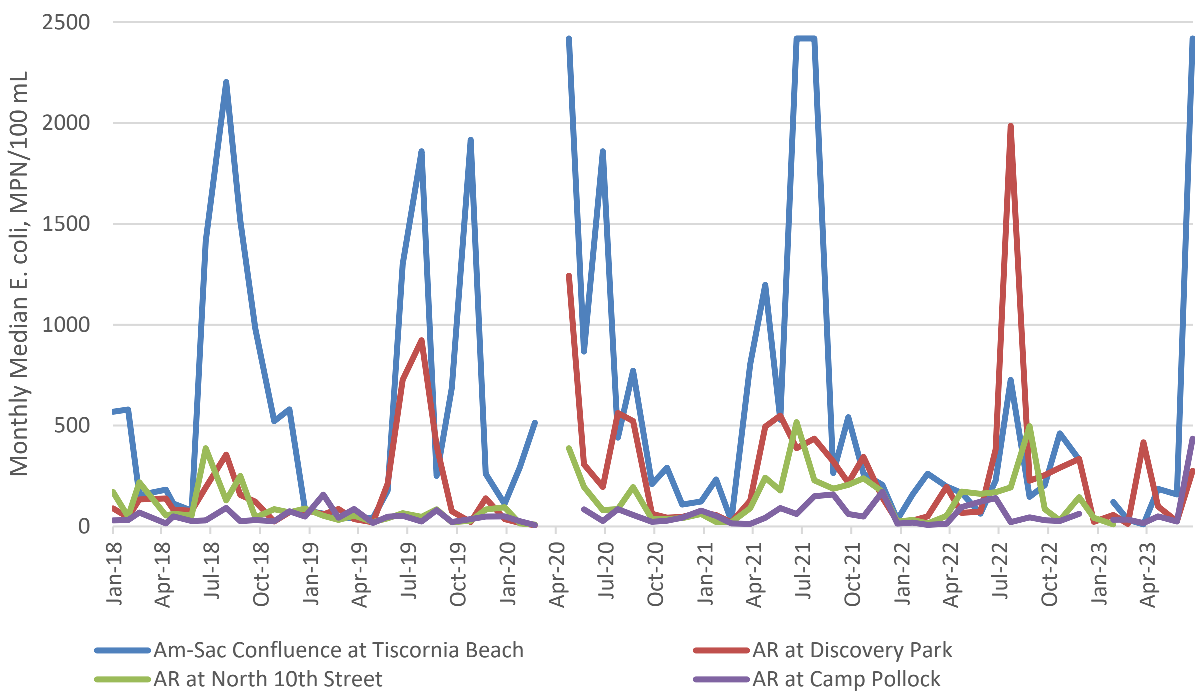


Figure 4-8. *E. coli* Monthly Median Calculation – Sites Downstream Highway 160 Bridge (January 2018 – July 2023)



The monthly median values for sites downstream of the Highway 160 Bridge (**Figure 4-8**) show a significantly wider range of monthly median values and higher peak *E. coli* values than sites upstream of the Highway 160 Bridge and a clear seasonal trend for increasing during the dry/recreation season. There were more frequent exceedances of the 200 MPN/100 mL drinking water threshold; 1.5 percent of months at Camp Pollock, 16 percent of months at North 10th Street, 36.5 percent of months at Discovery Park, and 62 percent of months at Confluence at Tiscornia Beach.

For each reach of the river, the most downstream site reflected the highest values and the most extreme variability by season. Three sites were further evaluated for seasonal impacts to the monthly median *E. coli* levels; Howe Avenue, Sutter's Landing Park, and Confluence at Tiscornia Beach. The monthly medians were sorted into wet season months (October through April) and dry/recreation months (May through September) to look at the average and median of the monthly medians at each site, see **Table 4-4**.

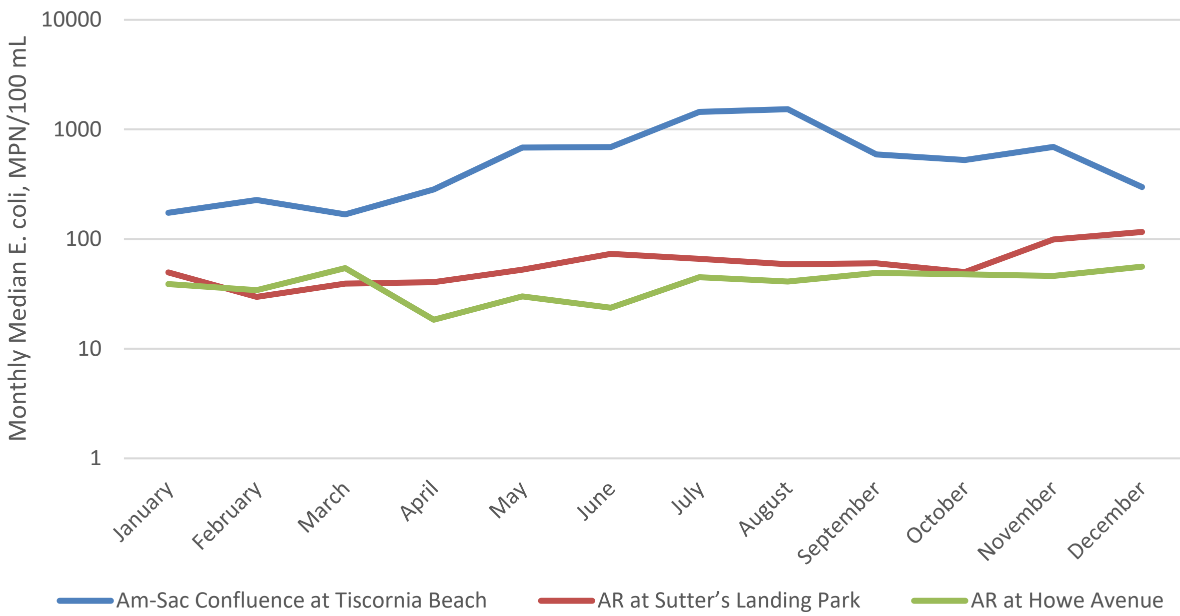
Table 4-4
Average and Median of the Monthly Median *E. coli* at Selected Sites by Season
(January 2018 – July 18, 2023)

Site	Wet Season (October through April)		Dry/Recreation Season (May through September)	
	Average	Median	Average	Median
AR at Howe Avenue	42.2	34.5	37.4	31.2
AR at Sutter's Landing Park	58.9	37.7	62.3	37.9
Am-Sac Confluence at Tiscornia Beach	325.8	207.9	964.7	726.1

The data show distinct characteristics at the three sites, consistent with the assessments above. The monthly medians in both seasons show the downstream increasing trend, with more pronounced increases at Tiscornia Beach. All sites, during both seasons, show average values higher than median values indicating the occurrence of high individual peak values of *E. coli*. For the Howe Avenue site, the average and median values during the wet season were higher than the dry/recreation season, indicating more significant sources during the wet season. For the Sutter's Landing Park site, the average and median values were nearly identical between the two seasons, indicating impacts from multiple sources throughout the year. For the Tiscornia Beach site, the average and median values during the dry/recreation season were significantly higher than during the wet season, emphasizing the impact of activities occurring during the dry/recreation season.

The variability of the average of the monthly medians over the study period between these three sites is show in **Figure 4-9**. It is evident that the upstream reaches of the Lower American River generally do not have *E. coli* present at levels of drinking water concern, with none of the monthly medians at Howe Avenue above the threshold during any season. The Sutter's Landing Park site had no monthly medians above 200 MPN/100 mL during the dry season and only four percent of them above it during the wet season. The Confluence at Tiscornia Beach site exceeds the threshold more frequently during the dry season, in 71 percent of samples, than during the wet season, when 55 percent of samples exceed it.

Figure 4-9. Average of the Monthly Median *E. coli* at Selected Sites (January 2018 – July 2023)



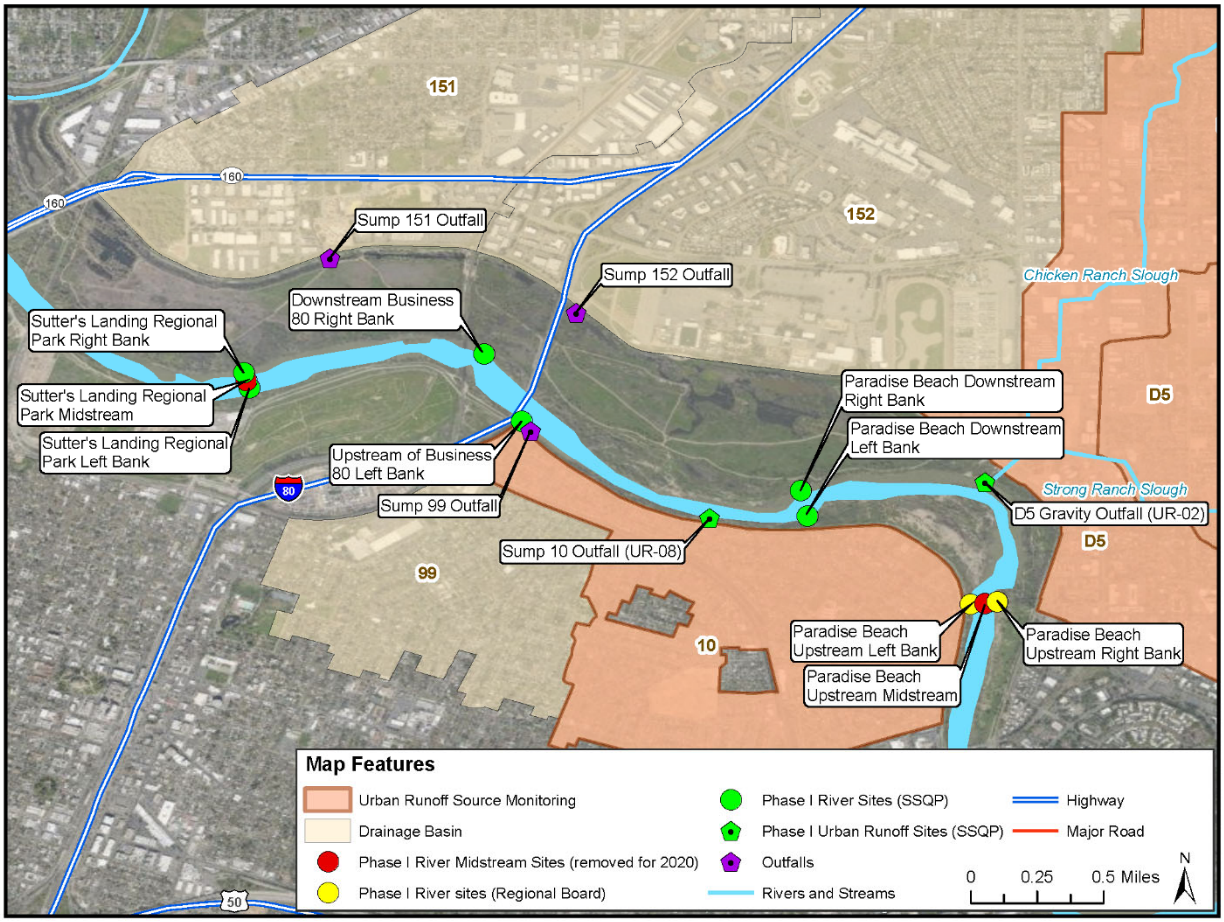
Regional Water Board SWAMP Bacteria Study

In addition to the weekly *E. coli* monitoring, the Regional Water Board conducted a Bacteria Study for the Lower American River to better characterize fecal bacteria and identify sources (August 2019). The purpose of the study was to verify impairment, characterize spatial and temporal trends, identify sources of fecal bacteria, assess the risks to public health, and determine management actions needed to address the impairment.

The study included continued monitoring of *E. coli* along the Lower American River and a companion microbial source tracking (MST) phased study to identify the specific sources of fecal pollution in different reaches of the river to determine if the bacteria are from human, dog, or bird sources. Historic data indicates that the majority of samples above the recreational water quality objective were on the lower three miles of the river, below Sutter's Landing. The MST phased study focused on sources in the lowest reach of the river. The project was funded by Regional Water Board in partnership with Sacramento Regional County Sanitation District, Sacramento Stormwater Quality Partnership (SSQP) member agencies, and Sacramento County Parks Department. The MST study included two phases of work to date, including the lower six miles of the river below Paradise Beach.

Phase 1 sampling was conducted weekly during dry weather conditions, May/June through September, at 10 sites along the Lower American River between Paradise Beach and Sutter's Landing and two urban runoff discharge sites (D5 Outfall for Strong Ranch Slough/Chicken Ranch Slough and Sump 10). The sites on the Lower American River were targeted to potential source areas and are shown on **Figure 4-10**. Phase 1 was initiated in late 2019, resulting in seven samples collected, and continued in 2020 with an additional 23 samples collected. The data includes *E. coli* and MST results. MST samples were analyzed for human, dog, and bird species. The results of Phase 1 determined the Phase 2 activities of the study.

Figure 4-10. MST Phase 1 Sample Sites



The key findings of the Phase 1 study included:

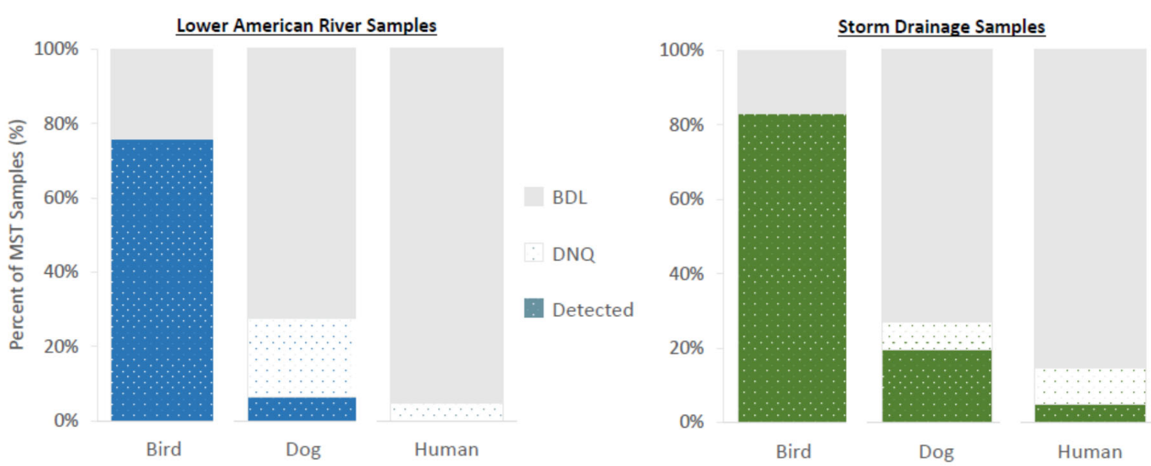
> *"Monitoring results for Phase 1 of the Lower American River Bacteria Study indicate most sample locations generally meet the statewide bacteria water quality objectives. The bacteria objectives were developed to protect recreational users from effects of pathogens in California water bodies. The exception is the right bank at Sutter's Landing, where 100% of samples exceeded the bacteria objective (six-week rolling geometric mean of 100 MPN2/100mL). Microbial source tracking (MST) analysis of samples with elevated E. coli indicates that*

birds are the largest and most consistent source of contamination in this section of the river. Dogs are also a consistent source of fecal contamination in some areas, particularly on the left bank at Paradise Beach Downstream where the dog marker was detected in over 60% of tested samples. Humans were not a significant or consistent source of fecal contamination in this reach during the study period.

Mid-river sampling locations show that the main channel is of high quality and meeting the bacteria objectives. Overall, the results indicate that fecal matter from birds and dogs are causing high bacteria levels along the bank and in shallow water areas."

The Phase 1 study looked at the potential sources of microbial constituents (including human recreation, dogs, waterfowl, urban runoff, and homeless encampments) in the study area. Generally, the concentrations of *E. coli* were higher in the two storm drainages (Sump 10 and Strong Ranch Slough) than in the mainstem American River. The Phase 1 results were sorted by river samples and storm drainage samples, see **Figure 4-11**, and generally it was found that birds are the most significant source of bacteria in both the river and storm drainage. Human sources were not quantified within the river, but they were infrequently quantified in the storm drainage. Dog sources were confirmed in both, more so in the storm drainage sample. It should be noted that the Paradise Beach downstream left bank site had very high levels of dog samples, which is near the River Park neighborhood. Only these three sources were evaluated so it is possible that there are other sources of microbial contaminants.

Figure 11. Percent of MST in River and Storm Drainage Samples

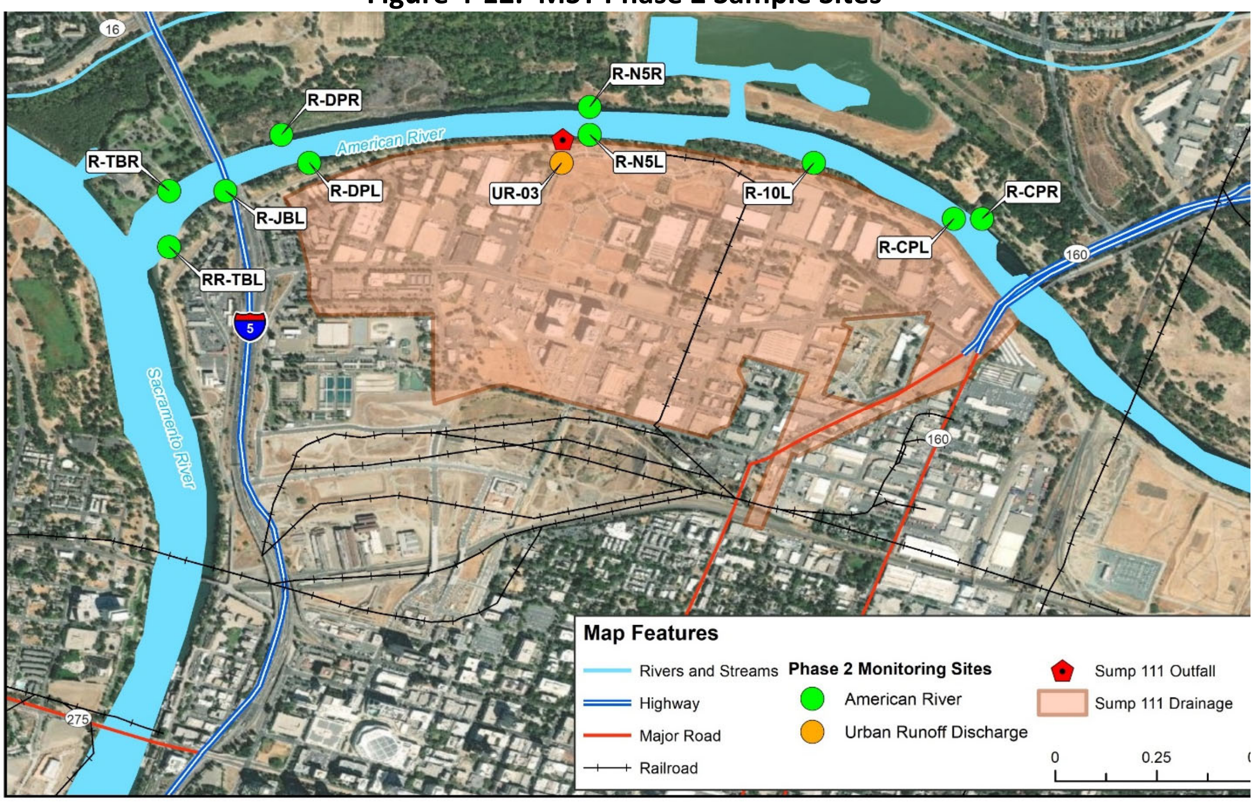


The "Pups in the Park" Mutt Mitt program has a pet waste station at Paradise Beach (directly across from Carlson Dr), but the staff at American River Parkway Foundation (Dianna Poggetto, personal communication 7/19/23) note that there is extremely heavy dog use from the neighboring River Park in this area along with a strong homeless population with dogs as well.

Phase 2 sampling was also conducted weekly during dry weather conditions, July through September, over two summers (2021 and 2022) for a total of 30 sample events. Data results for 2021 have been preliminarily summarized. Data results for 2022 have not yet been released. Once that data is released the Regional Water Board will prepare a final Phase 2 data summary.

Monitoring was completed at 10 sites along the Lower American River between Sutter's Landing and the Confluence with the Sacramento River, as well as one urban runoff discharge sites (Sump 111). The sites on the Lower American River were targeted to potential source areas and are shown on **Figure 4-12**. MST samples were again analyzed for human, dog, and bird species.

Figure 4-12. MST Phase 2 Sample Sites

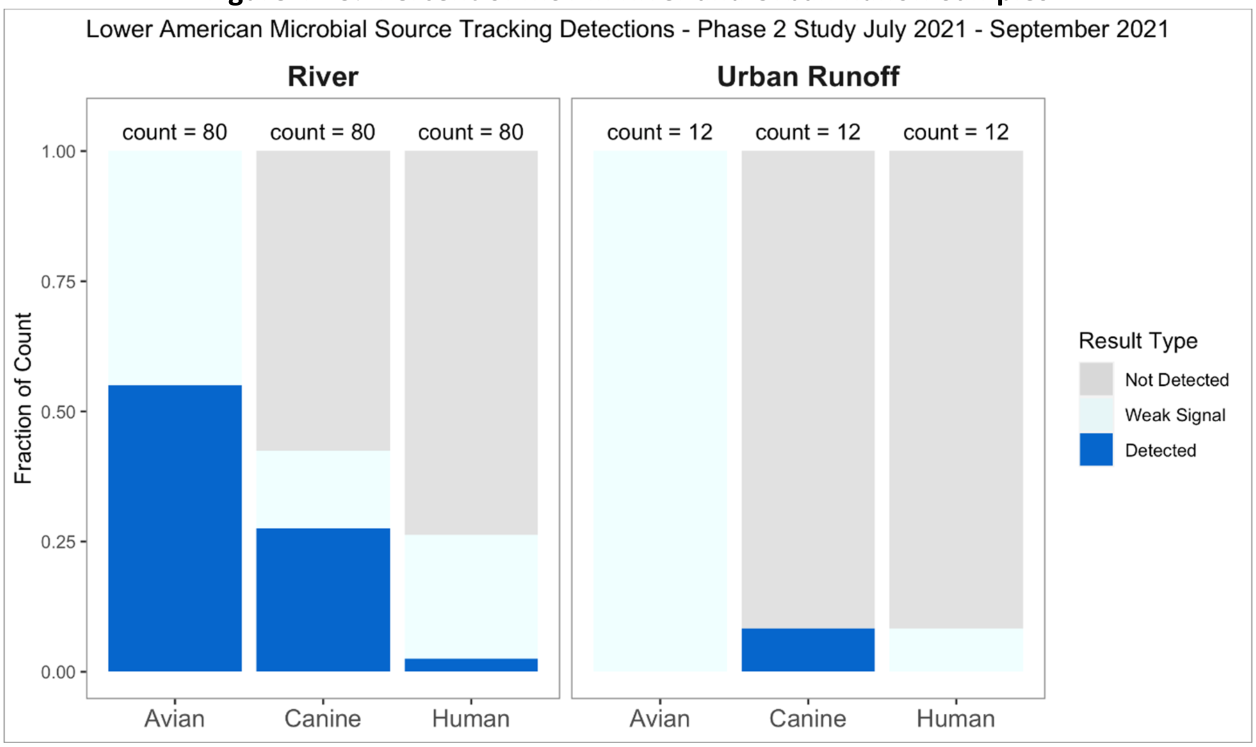


The preliminary findings of the Phase 2 study include:

> *"Samples with elevated E. coli levels were submitted for microbial source tracking (MST) analysis. MST samples were analyzed for genetic markers chosen to identify human, dog, and bird sources of fecal contamination. The percentage of detections for each marker are shown in Figure 2. Initial MST results indicate that birds are the largest and most consistent source of fecal contamination in the Phase 2 study reach. Dogs are also a consistent source of fecal contamination in some areas. Humans were not a significant or consistent source of fecal contamination during the 2021 sampling period."*

The Phase 2 2021 results were sorted by river samples and urban runoff to see the MST results, as shown in **Figure 4-13**. It can be seen that human sources were not quantified in the urban runoff and were only quantified at low frequency in the river samples. Birds appear to account for a majority of the microbial contaminants in both the river and urban runoff, while canine sources are slightly lower. The canine source appears to be more significant in the river in this reach than the upstream reach completed as part of Phase 1 and less significant in the urban runoff from Sump 111 (a highly industrial/commercial watershed).

Figure 4-13. Percent of MST in River and Urban Runoff Samples



Overall Findings and Recommendations

To date, monitoring results from the Regional Water Board SWAMP program confirm the potential for elevated coliform levels in the Lower American River. The monitoring programs have clarified a few key findings:

- *E. coli* levels display a clear increasing trend from upstream to downstream.
- *E. coli* levels at and upstream of Fairbairn WTP are well under the drinking water treatment threshold trigger of 200 MPN/100 mL.
- *E. coli* levels at and upstream of Fairbairn WTP peak during the wet weather season and do not appear to be driven by recreational activities, rather peaks are driven by storm events and winter runoff.
- *E. coli* levels between Fairbairn WTP and the Highway 160 Bridge are slightly higher than the upstream values. Peak levels can occur throughout the year, with both wet season

and dry/recreation season impacts possible. During dry weather, most increases appear to be related to bird populations and dogs. There is no confirmed coliform related to human sources in this river reach during the dry/recreation season.

- *E. coli* levels between Highway 160 Bridge and the Confluence are the highest along the river. Peak levels clearly occur during the dry/recreation season, with impacts related to dry season activities. During dry weather, peaks appear to be related to bird populations and dogs. There is some evidence of human sources in this reach, but they are very minor.
- *E. coli* levels in urban runoff are higher than levels in the mainstem rivers, but the sources during dry weather appear to be primarily bird populations and dogs with little evidence of human sources.
- The increase in canine derived microbials occurs downstream of Paradise Beach, where there are significantly few pet waste stations installed.
- The presence of bird populations, specifically Canada geese, are significant contributors to the *E. coli* levels along the Lower American River and have been identified for many years as a potential source with limited ability for population control.

Sacramento Steps Forward

Sacramento Steps Forward is a non-profit organization that partners with the City and County of Sacramento to create a strategic plan to address homelessness in the Sacramento region. The Sacramento Housing and Redevelopment Agency created Sacramento Steps Forward to manage work efforts to implement the *10 Year Plan to End Homelessness in Sacramento County*. The Plan describes innovative new strategies to address chronic homelessness. The essential components of the Plan to solving the problems of homelessness are:

- Housing First
- Outreach and Central Intake
- Prevention
- Leadership
- Evaluation and Reporting to the Community

Sacramento Steps Forward works with the City and County and private businesses to find long term solutions for chronically and temporarily homeless; offers emergency shelter, housing assistance, food, health care, transportation, and employment assistance; hosts the winter sanctuary; and conducts the biennial point in time homeless counts and interviews. This includes overseeing approximately $18 million in federal funding for housing and service programs for homeless. The winter sanctuary provides rotating winter shelter at houses of worship mid-November through March, with an average of 450 to 550 guests per season.

The Homeless Housing, Assistance and Prevention (HHAP) program was signed into law on July 31, 2019 by Governor Gavin Newsom and is being administered by the California Homeless Coordinating and Financing Council. HHAP is a $650 million one-time block grant that provides local jurisdictions with funds to support regional coordination and expand or develop local capacity to address their immediate homelessness challenges. Agencies in the Sacramento region that will receive HHAP allocations including the Continuum of Care, City of Sacramento, and County of Sacramento.

The Sacramento Local Homeless Action Plan (LHAP) was initiated in mid-2022 to meet the requirement of the HHAP application, and to create a cross-jurisdictional unified approach to addressing homelessness across Sacramento County. This three-year plan, from July 1, 2022 through June 30, 2025, was developed in partnership with Sacramento Steps Forward, Sacramento City and County Continuum of Care, Sacramento County, City of Sacramento, and the Sacramento Housing and Redevelopment Agency.

The LHAP provides a roadmap for future funding. Outlined in the plan are key system components that are in alignment with national best-practices. Implementation of this plan is supported by guiding principles. Once adopted by local governing bodies, the plan's partners will continue to work with the community to develop an annual slate of activities toward the advancement of the strategies and sub-strategies and quantify milestones. The LHAP will be measured through consistent review of system level performance goals and implementation.

City of Sacramento

There is a City ordinance (Chapter 12.52) that bans illegal, or public, camping within City limits. This is enforced by the City of Sacramento Park Services, but involvement is limited to the City or the privately owned lands located within the American River floodplain within the City limits. In April 2022, the City expanded its camping ban on public lands through adoption of Ordinance 2022-0011 and creation of Chapter 12.100. This ordinance bans camping in public spaces that is a threat to public health, safety, and welfare.

The City of Sacramento has a Homeless Services Coordinator that works in the City Manager's Office. The coordinator oversees approximately $2.5 million of general funded contracts to non-profit providers of outreach, shelter and permanent housing; works with Sacramento City Council, Fire, and Police departments to address needs of homeless; and works with regional partners (Sacramento County, Sacramento Housing Authority, and Sacramento Steps Forward) on policy and program development.

<u>City of Sacramento Housing</u>

In September of 2017, the Sacramento City Council voted to open an emergency shelter for the winter months that would accommodate up to 200 people nightly. This was in response to the growing unsheltered homeless population that was estimated by the 2017 PIT Count to have increased by 85 percent since 2015. The shelter is by referral only. Therefore, the City's Police IMPACT Team (See City of Sacramento Police Department below) and outreach partners through the City's Pathways to Health and Home Program must first identify people in need of shelter and arrange for intake. The shelter operates 24 hours a day, seven days a week and was originally set to close in March 2018, but was approved to stay open through May 31, 2018 with additional funding.

On April 23, 2019, City Council approved more than $23 million in funding to open a 180-bed temporary homeless shelter at the Capitol Park Hotel downtown. The City will be reimbursed for the full $13 million by Mercy Housing at the end of the 18 months the shelter is open, before Mercy converts it to permanent supportive housing. The City has previously committed to spending about $14 million to open a shelter on Cal Expo property at the southeast end of Ethan Way; a 12-bed shelter for youth in midtown; single family home shelters for youth; adding triage services to existing services; hiring more city homeless staff; and a downtown streets team for cleanup, the staff report said. The City will also spend about $1 million in private funds to open four single-family home shelters with five beds each.

In August 2021, City Council approved a Comprehensive Siting Plan that listed 20 sites for various types of shelters for people experiencing homelessness. The City opened its first "safe ground" site in July 2021 in a parking lot near W and Sixth streets in downtown Sacramento. The site is open 24 hours a day, seven days a week and can host approximately 100-150 people experiencing homelessness. The lot has a space for tent camping and safe parking for vehicles. The site, which is staffed around the clock, offers port-a-potties and cleaning stations. Case managers work out of trailers on site, providing support for mental-health needs and substance-use disorders as well as housing coordination. Between July and November of 2021, 500 people were served at this location with 134 exiting into positive situations, such as reunification with family, indoor shelters, and supportive housing. Everyone utilizing the safe ground site is entered into the Homeless Management Information System, connecting them with additional service providers in the area. This site was scheduled to close at the end of 2021, but the closure date remains fluid.

The City of Sacramento launched a "Safe Parking" site in a parking lot on the southern section of Front Street. Known as South Front Street Safe Parking, the site is open 24 hours a day, seven days a week and can host approximately 60 vehicles. The staffed site offers port-a-potties, storage, and meal access. Case managers work out of a trailer on site, offering social-services support and housing coordination. Similar to the site above, everyone utilizing the safe parking site will be entered into the Homeless Management Information System, connecting them with additional service providers in the area.

City of Sacramento Whole Person Care Pilot Program

This is a statewide pilot program for vulnerable Medi-Cal patients to improve the health outcomes and reduce utilization of high-cost services. The City of Sacramento began implementing a five year pilot program in January 2017 to improve outreach to individuals in need, assess care and housing needs, and provide services. The planning is complete and service delivery began in January 2018 and was continued through December 2020.

City of Sacramento Police Department

The City of Sacramento Police Department (SPD) is a critical component of the City of Sacramento's approach to managing homelessness. The SPD created the IMPACT team to provide outreach and engagement services throughout the City of Sacramento. They are the City of Sacramento's initial point of contact with chronic homeless living on the streets. The team seeks out and engages chronically homeless persons and, for those who are willing, gets them in contact with service providers who can provide housing and other services. The teams work together to assess the homeless person's problems, and identify how to help them from a range of solutions. Whether their homelessness had been caused by loss of income, psychological problems, substance abuse, lack of job training, or other problems, multiple options are available to assist each person. The IMPACT team consists of two areas of focus: Mobile Crisis Support Team (on-scene crisis response team) and Homeless Outreach Team (HOT).

The SPD published metrics associated with law enforcement related to homeless from January 2018 through April 2019. This presents a monthly summary of enforcement statistics, including illegal camping enforcements and homeless camp trash removal. **Table 4-5** provides monthly statistics, which encompasses the entire City limits. It is uncertain how much is directly attributable to the American River watershed, but the general scope of the local law enforcement effort is evident with 136 camps closed and over 7,000 cubic yards of trash removed in the 16 month period.

Table 4-5
City of Sacramento Police Department, Illegal Camping Metrics, January 2018 – April 2019

Year	Month	# Illegal Camping Enforcements	Cubic Yards Trash Removal
2018	January	11	703
2018	February	27	480
2018	March	26	319
2018	April	9	343
2018	May	12	474
2018	June	8	525
2018	July	10	428
2018	August	11	447
2018	September	11	380
2018	October	0	377
2018	November	0	315
2018	December	0	358
2019	January	4	273
2019	February	3	281
2019	March	4	815
2019	April	0	619
TOTAL		**136**	**7,137**

County of Sacramento

There is a County ordinance (Title 8.36) that bans illegal, or public, camping within County limits. This is enforced by Sacramento County Park Rangers. All static camps on County property are dismantled and occupants are forced to move. In the American River Parkway (specifically the property owned by Sacramento County), park rangers clean up the camps and also direct County Sheriff work crews in cleanup efforts. “Grabber sticks” are used to pick up toilet paper where possible, but human waste and decomposing paper are left on the ground due to health and aesthetic concerns with close handling of the waste. The County budget for funding work associated with camp cleanup efforts varies greatly annually.

In August 2022, the County approved two ordinances to address illegal camping near critical infrastructure, such as levees, wildfire and flood risk areas during severe weather, and prohibiting all camping in the entire stretch of the American River Parkway. The focus of the ordinances is to give County managers additional tools to address illegal camping and protect critical infrastructure for public health, safety, and welfare. A new chapter (9.120) was added to the County Code to prohibit camping in priority areas, with these key provisions:

- In, on or within 25 feet of critical infrastructure or the entrance/exit of critical infrastructure;
- Up to 1,000 feet of a location providing year-round overnight shelter to people experiencing homelessness and the entrance/exit to such locations;
- Inside of, or within 30 feet of wildfire and flood risk areas during severe weather; and
- Within 25 feet of a youth-serving facility, defined as public or private primary or secondary schools and public libraries.

The second ordinance is focused on illegal camping and the proliferation of unpermitted structures used as makeshift shelters in the American River Parkway, along with reducing the risk of combustible materials that can lead to wildfires. The following are key provisions of the ordinance:

- Prohibition on camping or constructing, maintaining or inhabiting any structure or camping facility in the American River Parkway or Dry Creek Parkway, except with written permission from the Director.
- Prohibition on modifying the parklands (e.g., dirt, landscaping) or accumulating furniture, household goods, or other items in order to create a structure.
- Bans the use or maintenance of a container with flammable or combustible liquid or a generator, except when issued a permit by the Regional Parks Director.

In conjunction with public, private and community partners, Sacramento County prepared the Sacramento County Homeless Plan in December 2018 to identify key needs and propose strategies to address and reduce homelessness in Sacramento County. The plan allows Sacramento County to participate in California No Place Like Home (NPLH) funding. NPLH funding supports new permanent supportive housing developments for persons with serious mental illness who are also experiencing homelessness. The plan is jointly sponsored by the County Executive, Department of Human Assistance, and Department of Health Services. The process engaged a variety of stakeholders to identify core needs and gaps, inventory current efforts underway, and help establish goals and strategies to impact homelessness and make it non-recurring.

The plan includes the following key elements:

- Describe the magnitude of homelessness and chronic homelessness, characteristics of the homeless population, and special needs of the NPLH target population,
- Inventory existing efforts and partners in ending homelessness,
- Describes resources currently invested in addressing and ending homelessness and identify critical gaps, and
- Lay out County and stakeholder plans to address unmet needs in key focus areas

Over the study period Sacramento County has implemented a variety of activities to help manage the homeless crisis, including activities related to mental health and housing solutions;

- Mental health crisis residential centers - The County has invested nearly $6 million to open three centers that will reduce reliance on hospitalization and emergency room use.
- Collaboration with law enforcement – The County has invested $1 million for in-the-field coordination with law enforcement to direct persons with mental illness to appropriate services rather than emergency rooms.
- Mental health urgent care center – With a capacity to service 300-400 people, this will offer a better alternative to hospitalization and emergency room use.
- Residential drug abuse treatment and detoxification – The County is pursuing a major new federal waiver that will pay for increased capacity for these service programs. With more services, individuals who are homeless and have substance abuse issues will be more likely to stabilize so they can achieve and maintain successful housing.
- Increasing capacity at the Mental Health Treatment Center – The County is implementing increased options such as sub-acute residential treatment beds and an off-site criminal justice trial competency restoration program. These options will open up inpatient mental health treatment beds for individuals who would otherwise be on the street or in hospital emergency rooms.
- Mental health services to children – The County is working to expand short-term residential treatment for foster children to implement the statewide Child Welfare Continuum of Care reform program. This will enable the County to place foster children in foster homes as expeditiously and safely as possible and increase their likelihood for long-term success, preventing future homelessness.
- Full-service re-housing shelter – This will provide 24-hour dormitory-style shelter for up to 75 people, with accommodations for partners, possessions, and pets, mental health and substance abuse services, and re-housing assistance.

- Flexible supportive re-housing services – The County will target individuals and families experiencing long-term homelessness who frequently utilize costly services (such as behavioral health, emergency response, or jail), but who could, with the right assistance, stabilize in permanent supportive housing.
- Redesigned family shelter system – The County is changing its investment plan to provide up to 33 families each night a safe place to stay and receive services toward stable permanent housing.
- Transitional housing – This will provide safe shelter to high-risk, unsheltered families who cannot be diverted from homelessness immediately, while assisting them in finding housing.

County of Sacramento Department of Regional Parks, Recreation and Open Space

The land in the American River Parkway (Parkway), along the Lower American River between Nimbus Dam and the confluence with the Sacramento River, is operated and managed by the Sacramento County Department of Regional Parks (Sacramento County Parks Department). The Lower American River parkway has an unpaved trail that is for hiking and equestrian use, as shown in **Appendix D.** The unpaved trail roughly parallels the Jedediah Smith Bicycle Trail through the Parkway. There are equestrian staging areas at Discovery Park, William B. Pond, Ancil Hoffman Park, Sailor Bar, River Bend Park, and Lower Sunrise.

Sacramento County Parks Department manages three of the river corridor activities: pet waste, equestrian waste, and illegal camping. There have been no changes to either the 2002 River Corridor Management Plan or the 2006 American River Parkway Plan which guide the ongoing activities in the parkway. The Lower American River Task Force prepared the River Corridor Management Plan (RCMP) in 2002 to provide guidance for management along this reach of the river. In 2015 a Draft Three Year Action Plan to update the RCMP was prepared and outlines goals to reduce human waste produced by illegal camping. Additionally, the updated 2008 American River Parkway Plan provides additional guidelines for the preservation, recreational use, development and administration of the parkway.

Sacramento County Park Rangers are organized so that each Ranger has ownership and provides stewardship of a particular area of the American River Parkway. Rangers are available by email if someone wants to communicate a concern or an issue or point out a problem along their section of the Parkway.

Pet Waste Management

The Sacramento County Parks Department implemented the Pups on the Parkway program in 2003, which now provides 22 pet waste stations along the American River Parkway. The American River Parkway Foundation has served as the program administrator and coordinator for purchasing stations and Mutt Mitts®, which are installed and maintained by the County Parks Department. The American River Parkway Foundation distributed 65,000 to 80,000 Mutt Mitts® annually to pet waste stations in the area. County Park Ranger staff included water quality stewardship messages (including dog waste pickup) on County message boards installed along the Parkway. Stations with Mutt Mitts® can be found at the following locations along the American River Parkway:

- Discovery Park (two stations North)
- Sutter's Landing Park (two stations South)
- Paradise Beach
- Howe Ave. (two stations, North and South)
- Kadema Drive
- Watt Ave. (two stations, North and South)
- Estates Drive
- Jacob Lane
- Mira Del Rio Dr. (Gristmill)
- William B. Pond Park
- River Bend Park
- Sarah Court
- Ancil Hoffman Park
- Rossmoor Bar
- Sacramento Bar
- Upper Sunrise Blvd. River Access
- Gold River (near mile 21)
- Sailor Bar

The Sacramento County Stormwater Quality Program established in 2006 a program called "Scoop the Poop" aimed at effectively managing pet waste that may contribute to increased pollutant levels in urban streams and the American River. The program was developed to manage and reduce improper disposal of pet waste in public parks and recreational areas. The "Scoop the Poop" program provides convenient pet waste bag locations in various public parks that are stocked with plastic grocery bags by members of the community. The goal is to encourage environmental stewardship and community cooperation in facilitating proper waste management in local parks. These community maintained bag locations can be found in several recreation and park districts within Sacramento County, including Arcade Creek, Arden Manor, Arden Park, Mission Oaks, and Rio Linda/Elverta.

Equestrian Waste Management

According to staff at the American River Parkway Foundation, a non-profit organization that works with Sacramento County Parks Department to preserve the Parkway, the most popular stretch of trail for equestrian use is from Watt Avenue to El Manto Drive (mile marker 10 to 18 on the Parkway). Additionally, American River Parkway Foundation staff noted there have not been any special equestrian events in the American River Parkway in recent years.

Based on recent information for annual parking passes, the number of equestrian users also appears to be low. American River Parkway Foundation staff notes approximately 16 to 24 annual horse trailer passes were sold in recent years, however in 2022 Sacramento County Parks Department stopped issuing horse trailer passes in favor of a general trailer pass. In 2022, the number of annual automobile parking passes purchased from the American River Parkway Foundation was 10,637 and the number of annual trailer passes purchased was 1,118, the vast majority for boat trailers.

The equestrian trails are not cleaned for manure removal. In fact, the Sacramento County Park Ordinances (dated May 2021) state that equestrian riders are exempt from removing animal feces from roads or trails. The exact language from Ordinance 9.36.061 Animals is:

> "No person shall permit or suffer any animal owned by him or her, or in his or her possession, custody, or control, to defecate upon park property without immediately removing such animal feces, placing said feces in a sealed bag or other sealed container, and placing such bag or container with feces in a proper refuse receptacle. Persons with horses in their possession, custody, or control, at times and upon roads or trails designated for the riding of such animal, and, unsighted persons while relying on a guide dog, are exempt from the provisions of this subsection."

Other related ordinances to equestrian use are:

- "No person shall permit cattle, sheep, goats, horses or other animals owned by him or her or in his or her possession to graze within boundaries of any park facility without express approval of the Board of Supervisors."
- "No person shall ride a horse, pony, mule, burro, or any other animal upon, over or across any park facility, except at times and upon roads or trails designated for the riding of such animals."

Illegal Camping

In the American River Parkway (specifically the property owned by Sacramento County), Park Rangers clean up the illegal camps and direct County Sheriff work crews in cleanup efforts. "Grabber sticks" are used to pick up toilet paper where possible, but human waste and decomposing paper are left on the ground due to health and aesthetic concerns with close handling of the waste. Sacramento County Regional Parks has created a Homeless Liaison Officer whose primary focus is to identify and manage illegal encampments in the American River Parkway. The Officer works with law enforcement to provide notice to vacate to campers and also with Sacramento County Department of Human Assistance to identify shelter and services for the homeless population. The Officer then coordinates the cleanup and remediation effort for the encampments.

Sacramento County Parks Department now tracks monthly, and then compiles annually, statistics for ranger activity including citations for illegal camping. **Table 4-6** presents a summary of the number of occupied illegal camps that were cited, noticed to vacate, and how much debris removal occurred. Some of the cleared camps involved work crews of significant size. In 2020, a County Health Order limited Ranger work to unoccupied camps due to the COVID pandemic, unless it was an emergency or critical infrastructure project.

Table 4-6
Sacramento County Parks Department, Illegal Camping Statistics

Year	No. Camps Cleared	Tons Debris Removed
2018	5,639	1,612
2019	5,294	1,397.5
2020	1,568	926.5
2021	1,658	1,303.5
2022	1,391	1,113

Sacramento County Stormwater Quality Program

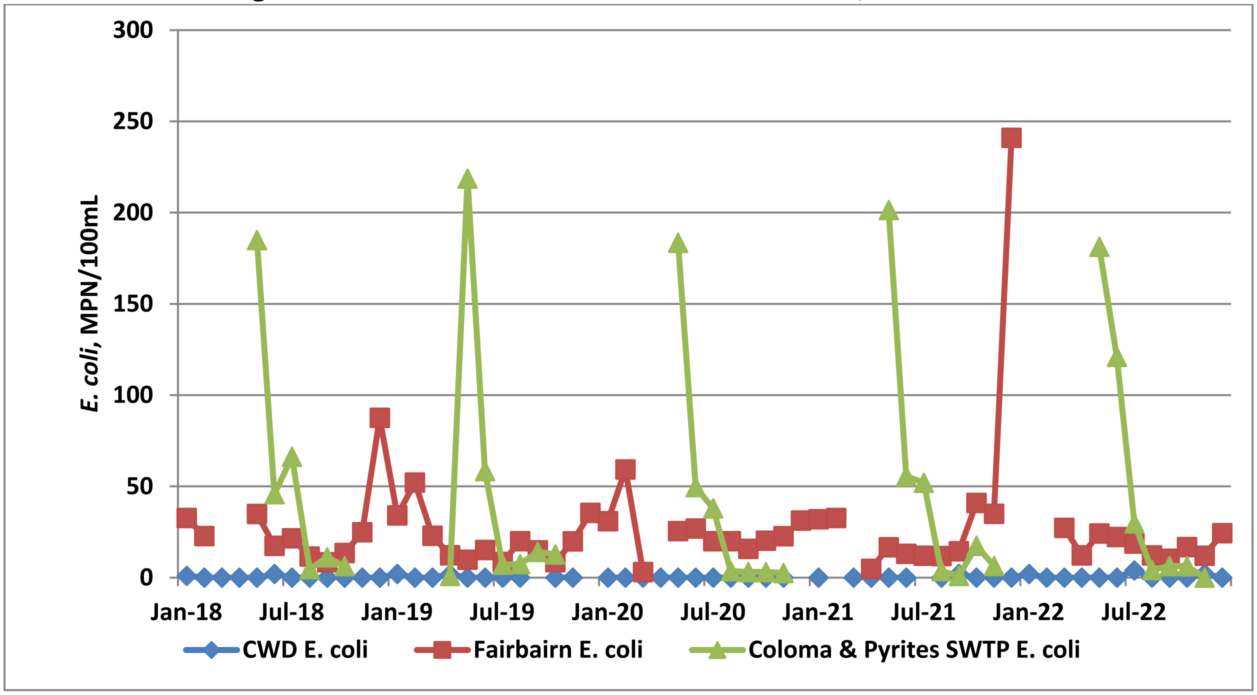
The Sacramento County Stormwater Quality Program established in 2006 a program called "Scoop the Poop" aimed at effectively managing pet waste that may contribute to increased pollutant levels in urban streams and the American River. The program was developed to manage and reduce improper disposal of pet waste in public parks and recreational areas. The "Scoop the Poop" program provides convenient pet waste bag locations in various public parks that are stocked with plastic grocery bags by members of the community. The goal is to encourage environmental stewardship and community cooperation in facilitating proper waste management in local parks. These community maintained bag locations can be found in several recreation and park districts within Sacramento County, including Arcade Creek, Arden Manor, Arden Park, Mission Oaks, and Rio Linda/Elverta.

Water Quality Issues and Data Review

Golden State Water Company's (GSWC) Coloma WTP, City of Sacramento's Fairbairn WTP, and Carmichael Water District's Bajamont WTP all collect *E. coli* data on a weekly basis from the raw water. GSWC's raw water is diverted from the Folsom South Canal, which originates from the south side of Lake Natoma near Nimbus Flat. Carmichael Water District's raw water is diverted via Ranney Collectors, near Rossmoor Bar. The City of Sacramento's raw water is diverted near the Howe Avenue Bridge. Monthly medians were calculated for each month during the study period, and then an average of each month's medians was calculated. **Figure 4-14** presents the *E. coli* values for all three water treatment plants.

The graph shows that the lowest levels were consistently seen at Carmichael Water District's intake, which are subsurface Ranney Collectors and therefore filter the surface water. All of the results were less than 20 MPN/100 mL. The City of Sacramento's intake generally sees the highest concentrations of *E. coli* during the winter months, between October and March. This could be associated with runoff in the watershed, and therefore impacted by pet and equestrian waste or illegal camps. Finally, it can be seen that the peak levels at GSWC's intake occur generally between April and June. This peak does not correlate with any documented spills or discharges and do not correlate to recreational activities in the watershed. It is possible that the levels may be impacted by waterfowl population waste at Lake Natoma, but a comprehensive evaluation of waterfowl migratory counts and timing of presence has not been conducted to inform this determination.

Figure 4-14. Lower American River WTPs *E. coli*, 2018 - 2022



Pet waste, equestrian waste, and illegal camping have the potential to contribute coliform, pathogens, and solids to the source water. This would typically occur during storm events when runoff picks up waste and debris, such as evident for the Fairbairn WTP. Turbidity and coliform levels on the Lower American River do show peak events during the wet season, but how much these activities contribute is uncertain.

Source Water Protection Efforts

The American River Source Water Protection Program (ARSWPP) has previously identified elevated microbial levels related to bird (specifically Canada geese at Nimbus Flats) and dog waste in the American River Parkway as a concern as part of the American River Watershed Sanitary Survey. The ARSWPP has coordinated with the State Parks to understand the limited ability to influence the population of Canada geese at Nimbus Flats (near Lake Natoma). There is no permission to cull or harass the birds or eggs, and State Parks would need to obtain a "Take Permit" from USFWS in order to control the population. State Parks does have an ordinance prohibiting the feeding of wildlife, but there is limited enforcement of the ordinance and no plan for additional investigation or management.

When the “Pups on the Parkway” campaign was initiated in 2004 to install dog waste bag dispenser stations at selected locations along the parkway and promote dog waste pickup, several participating water utilities became sponsors. GSWC, Carmichael Water District (CWD), the City of Sacramento, and Sacramento County Water Agency (SCWA) continue to fund the program. These participating water utilities provide funding to the American River Parkway Foundation for purchase of dog waste stations and Mutt Mitts®. County Parks staff report that approximately 65,000 to 80,000 Mutt Mitts® are used per year, and they believe the stations have provided a significant reduction in presence of dog waste in the Parkway.

The elevated levels of canine derived microbials at and downstream of Paradise Beach is interesting because there are significantly fewer pet waste stations installed along the American River Park in this lowest reach of the river. There is one pet waste station at Paradise Beach (located at the entrance near Glen Hall Park) and there are two pet waste stations at Sutter’s Landing Park (locations are uncertain) that are maintained by Sacramento County Parks Department. There are none downstream of Sutter’s Landing Park. It is known that there is heavy dog use at and west of Paradise Beach, primarily from residents living near Sacramento State University on the north side of the river and the River Park neighborhood on the south side of the river. Currently, the City of Sacramento is beginning construction on Phase II of the Two Rivers Trail, between Sutter’s Landing Park and H Street (near Sacramento State). This will formalize a multi-use trail between River Park and Downtown Sacramento. The ARSWPP is planning to advocate to install a pet waste stations along the 2.5 mile route, instead of relying on the existing stations at Paradise Beach and Sutter’s Landing Park.

FOREST ACTIVITIES

Since much of the watershed is covered by coniferous forest and a large portion of the upper watershed is part of the Tahoe and Eldorado National Forests, the activities occurring on these lands are critical to the long-term quality of the water supply. This study identified timber harvesting and pesticide use, wildfires, off-highway vehicle use, and selected grazing allotments in the National Forests 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 pesticides for silviculture or revegetation. Indirect impacts include increased access for other forest users, increased soil erosion, and increased nutrient loading to the tributary waterways. The United States Department of Agriculture Forest Service (USFS) and the State Water 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 based on type of ownership.

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 these activities 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, total organic carbon (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[1]. 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 upper American River watershed, above Folsom Lake, is covered with coniferous forest. Harvesting activities can occur in much of the upper watershed, but these activities occur more commonly in those locations greater than 3,000 feet of elevation. Timber harvesting on federal lands is regulated by the USFS and by the California Department of Forestry and Fire Protection (CAL FIRE) 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 extended drought during the study period 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, there have been numerous large wildfires in the

[1] 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.

watershed, discussed in the Wildfires subsection below, that have warranted salvage timber harvesting operations.

The Placer and El Dorado counties Agricultural Commissioners track 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 it can provide an idea on the relative scale of timber harvesting operations over time in the counties. **Table 4-7** provides a summary of the annual timber harvest between 2018 and 2022, as available by the county crop reports.

This table shows that over the study period nearly 400,000,000 board feet of timber was harvested in the upper watershed, even without the 2022 El Dorado County estimate. This is less than what was harvested during the last study period (625,000,000 board feet). The majority continues to occur in El Dorado County (this study period nearly 75 percent). Typically, a large amount of the timber harvesting in the American River watershed is by commercial growers, such as Sierra Pacific Industries, who have management plans for regular harvesting under permitted Timber Harvest Plans.

Table 4-7
Timber Harvested in Placer and El Dorado Counties, board feet

	2018	2019	2020	2021	2022
Placer	20,800,000	32,000,000	35,438,000	8,840,000	9,670,000
El Dorado	93,876,000	74,278,000	84,793,000	38,901,000	Not Available

CAL FIRE 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 (Placer, El Dorado and Alpine), and may be beyond the American River watershed. During the study period, 2018 through 2022, there were 2,553 active THPs, ranging from less than 0.1 acres to greater than 1,400 acres, covering over 50,557 acres in total. Sierra Pacific Industries accounted for over 2,000 of those THPs for a total of 37,215 acres (74 percent of THP acreage). Additionally, one Non-Industrial Timber Management Plan was approved in El Dorado County in 2019, covering just over 108 acres.

In addition, CAL FIRE has modified its Forest Practice Rules to expand the use of Emergency and Exemption Notices for timber harvesting under specific scenarios. Emergency Notices are reserved for hazardous fuel removal only and a form must be completed and approved by CAL FIRE to proceed with the harvest. During the study period, 2018 through 2022, there were 109 Emergency Notices approved in the watershed counties for a total of 26,275 acres. Eighty-three percent of the acreage was in El Dorado County. Ninety-six percent of the Notices were to address post-fire salvage operations, 23 were for beetle infestation, 14 were from drought, and the rest were miscellaneous. Two-thirds of the fire notices were related to the Caldor Fire, so possibly out of the American River watershed, while 15 of the notices were related to the Mosquito Fire at 4,700 acres. 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 CAL FIRE to proceed with harvest. During the study period, 2018 through 2022, there were 228 Exemption Notices approved in the watershed counties, ranging from less than 0.1 acres to almost 114,000 acres, for a total of 605,000 acres. This is nearly 12 times the acreage approved under THPs. The median size of an Exemption Notice is 3 acres. Sierra Pacific Industries accounted for 25 Exemption Notices for a total of nearly 595,000 acres (98 percent of Exemption Notice acreage), which seems like they are utilizing this process much more heavily than the THP process. It should be noted that Emergency and Exemption Notices are not nearly as well vetted for protection to receiving waters and the Regional Water Board is not involved in any pre- or post-harvest inspections on these permits.

The Regional Water Board also tracks THPs and according to California Integrated Water Quality System (CIWQS), there were 149 THPs permitted to harvest in watershed counties during the study period, under two different Waste Discharge Requirements (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 WDRs is provided in **Table 4-9**. The majority of the THPs approved were from the Regional Water Board and those WDRs General Orders are discussed below.

Table 4-8
Number of THPs Approved by Watershed Counties, 2018 - 2022[1]

Order Number	Number of THPs Approved
El Dorado	88
Placer	61

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

Table 4-9
Number of THPs Approved by Order, 2018 - 2022[1]

Order Number	Number of THPs Approved
R5-2014-0144	100
R5-2017-0061	49

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

A review of the California Department of Pesticide Regulation (DPR) Pesticide Use database was conducted to identify which pesticides are used on forested lands, as well as to approximate the amount of pesticides applied in the American River watershed for this use. **Table 4-10** presents a summary of the pesticide use information from 2017 through 2021 for forested lands, for all pesticides applied more than 10 pounds in two years during the study period.

Table 4-10
DPR Pesticide Use Reporting for Forested Lands, Pounds Applied

Chemical	2017	2018	2019	2020	2021
Glyphosate	20,217	18,789	40,401	56,510	46,042
Clopyralid	26	560	626	5,262	2,856
Imazapyr	380	656	1,820	948	2,442
Hexazinone		260	33	7	1,887
Triclopyr	1,510	195	228	745	1,169
Oxyfluorfen	31	166	269	932	417
Aminopyralid	43	80	126	656	412
2,4-D		1	92	174	361
Indaziflam				177	92
Mineral Oil				52	61
Penoxsulam	1	4	6	19	9
Pendimethalin	18		28	5	8
Disodium Octaborate Tetrahydrate			24	98	
Sulfur			114	3	
Atrazine	21	18			
Borax		43	16		

[1]Source is California Department of Pesticide Regulation

The data show that the highest use pesticide on forested lands is glyphosate (herbicide), followed by clopyralid, imazapyr, hexazinone, and triclopyr (all herbicides). Of the pesticides used on forested lands, only glyphosate, 2,4-D, and atrazine have drinking water Maximum Contaminant Levels (MCLs).

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 CAL FIRE 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 Water 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 National Environmental Policy Act (NEPA) procedures as a complete discovery document. The THPs are reviewed by the USFS, as well as the Regional Water 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 Tahoe and Eldorado 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.

An important example is the French Meadows Restoration Project, which was initiated in 2021. Tahoe National Forest has partnered with five other entities including Placer County Water Agency (PCWA) and several conservancy organizations to improve forest health through landscape-scale restoration projects (see discussion of Sierra Nevada Conservancy in the Wildfire subsection below). The goals are to restore forest health and resilience in the American River headwaters through treating the land to reduce forest fuels which can lead to severe wildfires. The project plans to treat 12, 138 acres in total. In 2021, just over 1,000 acres was restored through mastication, mechanical thinning, and hand thinning. This resulted in removal of 1,480,000 board feet of lumber. In 2022, over 450 acres was restored resulting in the removal of 1,066,000 board feet of lumber. Academic institutions are participating to quantify the impact of the restoration efforts on water quantity and quality.

California Department of Forestry and Fire Protection

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 best management practices (BMPs) by the CAL FIRE and DPR.

The CAL FIRE 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 CAL FIRE, as well as the Regional Water 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 CAL FIRE and other related state regulatory agencies (conducted for 95 percent of THPs).

CAL FIRE 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 Water Board review since the exemptions are acted upon so quickly.

State Water Resources Control Board

The State Water 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 Water Board and Regional Water 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.

The Central Valley Regional Water Board and the Lahontan Regional Water Board were working together with USFS and US Bureau of Land Management (USBLM) to develop a Non-Point Source (NPS) permit to ensure regulatory compliance and water quality protection on USFS and USBLM managed lands. Land management activities that may be regulated under the proposed NPS permits include timber harvest and vegetation management, transportation management, recreation facilities management, wildfire management and recovery, and restoration activities. The two Regional Water Boards were working together to maximize consistency and facilitate implementation across approximately 20 million combined acres of federally managed lands. In summer 2021 the Lahontan Regional Water Board announced that they did not have the resources to continue participating in the joint project and that the Central Valley Regional Water Board would continue to prepare independently for its nearly 11 million acres. Ultimately each Regional Water Board will adopt its own permit, however the goal is for the permitting approach – including the permitted activities, goals, milestones, and outcomes – to be similar. Central Valley Regional Water Board staff continues to evaluate and refine the draft permit and Draft Environmental Impact Report (DEIR) produced by contracted CEQA consultants. A contractor has been selected to create the training modules that will accompany the permit, once adopted, with the expectation that the finished product will be ready in the summer of 2024.

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 Water 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 Water Board adopted the Conditional Waiver of Waste Discharge Requirements Related to Timber Harvest Activities. The Conditional Waiver was subsequently renewed by the Regional Water Board in 2010 (R5-2010-0022) and modified by the State Water 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 apply to all federal and state lands. 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 CAL FIRE 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 Water Board has developed guidance documents to assist with implementation of the WDRs, specifically related to monitoring requirements.

Water Quality Issues and Data Review

A review of the ambient water quality for the water treatment plants in **Section 3** for turbidity and total organic carbon (TOC) continues to show that the water treatment plants show a distinct seasonal trend with most peaks occurring during the wet weather season. This could be contributed to by timber harvesting and associated activities, such as storm runoff from dirt access roads and water crossings. It should be noted that most of the water treatment plant intakes are downstream of reservoirs that serve to buffer many water quality impacts downstream, including turbidity.

As noted in **Sections 3** and **5**, there were again no detects of pesticides in the source or treated water for any water treatment plants. Also, there are no nutrient water quality concerns either at this time.

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.

It should be noted that 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 fall in the American 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 that fire impacts to source water quality can be seen for up to 15 years after the event.

Related Constituents

The loss of ground cover and the chemical transformation of soil from wildfires results in reduced infiltration of water, increased overland flow, increased velocity, and increased erosion. These all can contribute to increased solids migrating to the receiving water and an increase in the turbidity and associated contaminants of the raw water at the water treatment plants, especially from the first rains after significant wildfires. Since erosion is the key concern associated with wildfires; turbidity, organic matter, nutrients, metals (especially aluminum, iron, and manganese), and possibly organic compounds (such as pesticides) are the primary constituents of concern[2]. Most studies on the effects of wildfires are related only to direct runoff or receiving waters upstream of lakes or reservoirs, there is little research conducted on the impacts of wildfire erosion on downstream storage reservoirs.

Studies indicate that site-specific conditions of the watershed, wildfire, and subsequent hydrologic events will dictate the quality of the runoff from the burn area. 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.

Presence in the Watershed

There were 29 fires in the watershed during the study period, as shown in **Table 4-11**. They burned a total of over 204,000 acres in the American River watershed. There were only five significant wildfires, greater than 500 acres, in the watershed during the study period: Caldor, Mosquito, Caples, Fork, and North.

The only significant fire in the North Fork American River watershed was the North Fire, burning 1,120 acres near Emigrant Gap on both the Tahoe National Forest and private lands. The Middle Fork American River watershed had two significant fires; Mosquito and Fork. Together, these burned over 78,000 acres on both Tahoe and Eldorado National Forests and private lands. The Mosquito Fire is discussed in more detail below. The South Fork American River watershed also had two significant fires; Caldor and Caples. Together, these burned over 123,000 acres on both Eldorado National Forest and private lands. The Caldor Fire is discussed in more detail below.

<u>Mosquito Fire</u>

The Mosquito Fire started on September 6, 2022 near Oxbow Reservoir, predominantly on the Tahoe and Eldorado National Forests, until officially being declared out on October 22, 2022.

[2] Kevin D. Bladon, Monica B. Emelko, Uldis Silins, and Micheal Stone, Wildfire and the Future of Water Supply, *Environmental Science & Technology,* **2014** *48* (16), 8936-8943.

The fire burned intensely until September 18, 2022 when an early season storm brought the first fall rainfall to the region. The fire burned 76,788 acres and the cause is unknown.

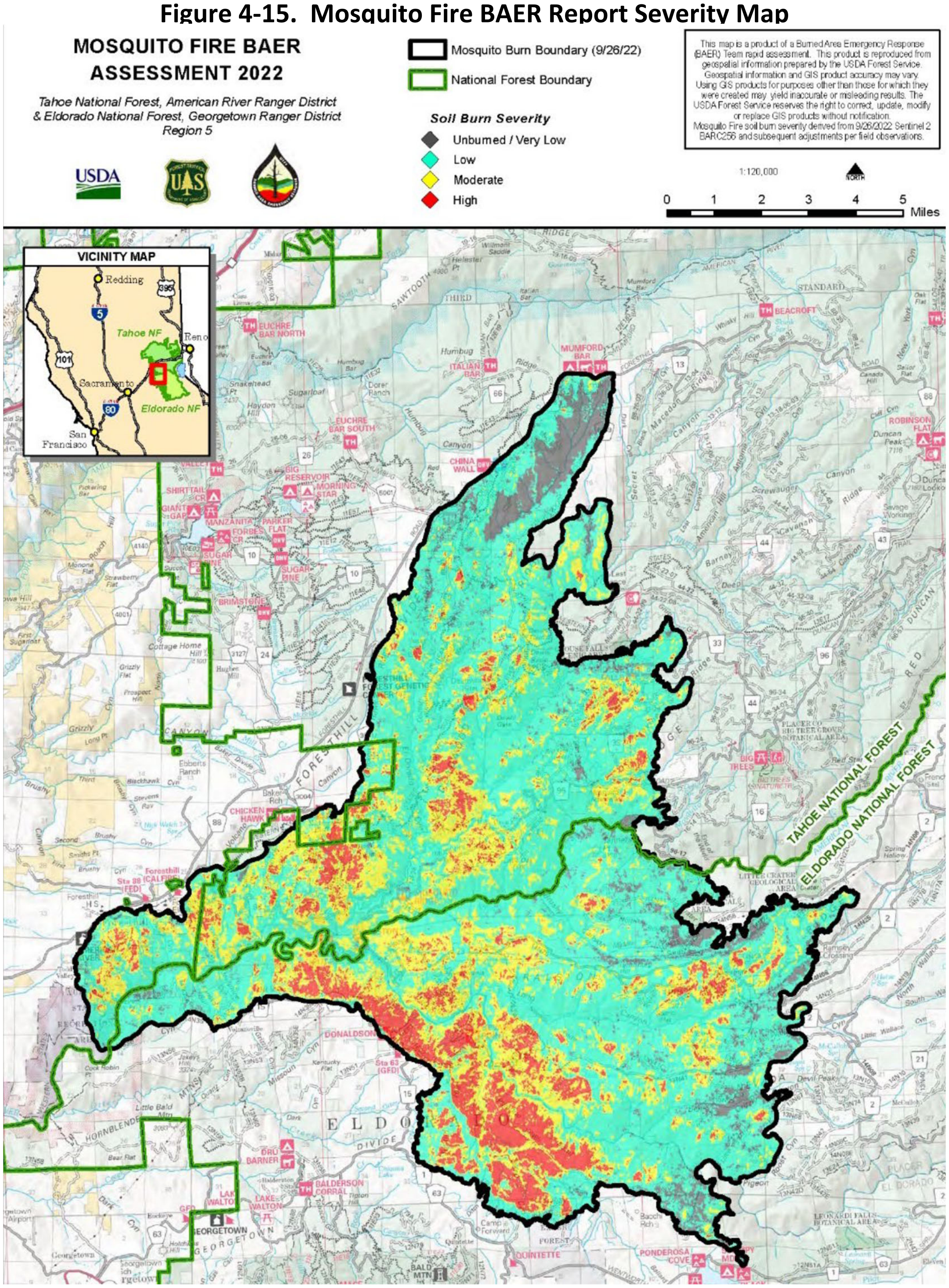
Table 4-11
Wildfires in the American River Watershed, 2018 – 2022

Name	Location	River Reach	Acreage	Date Started
Caldor Fire	Along Highway 50	South Fork	221,835/120,000[1]	8/14/2021
Mosquito Fire	Foresthill	Middle Fork	76,788	9/6/2022
Caples Fire	Caples Creek	South Fork	3,435	10/11/2019
Fork Fire	NE Pollock Pines	Middle Fork	1,673	9/8/2020
North Fire	Emigrant Gap	North Fork	1,120	9/3/2018
Bridge Fire	Auburn	North Fork	411	9/5/2021
Sliger Fire	NW Georgetown	Middle Fork	150	9/4/2018
Point Fire	Placer County	Middle Fork	93	10/26/2020
Country Fire	Cool	South Fork	85	9/3/2019
Omega Fire	Pilot Hill	South Fork	66	8/1/2018
Sugar Fire	NE Foresthill	North Fork	66	5/10/2019
Dutch Fire	Dutch Flat	North Fork	48	9/13/2022
Sophia Fire	El Dorado Hills	South Fork	36	8/2/2020
Salmon Fire	Salmon Falls	South Fork	32	5/1/2021
Cronan Fire	Pilot Hill	South Fork	29	6/9/2020
Oak Fire	Weimar	North Fork	22	8/15/2022
Union Fire	ENF	South Fork	20	1/19/2021
Sierra2 Fire	Emigrant Gap	North Fork	20	2019
Cable Fire	Pollock Pines	South Fork	20	7/26/2022
Greenstone Fire	Placerville	South Fork	16	8/14/2019
Paymaster Fire	ENF	Middle Fork	15	2022
Cameron Fire	Cameron Park	South Fork	15	10/18/2020
Murphy Fire	Garden Valley	South Fork	14	8/17/2020
Carson Fire	Camino	South Fork	13	7/30/2019
Meyers Fire	Camino	South Fork	12	9/20/2018
Hill Fire	Iowa Hill	North Fork	11	9/6/2022
Rubicon Fire	Foresthill	Middle Fork	10	9/25/2021
Equestrian Fire	Pilot Hill	South Fork	10	6/16/2021
Ramsey Fire	ENF	Middle Fork	7	7/14/2021

[1]Total burn/American River watershed burn

The USFS conducted a Burned Area Emergency Response (BAER) effort to assess the overall severity and impact of the fire and the need for emergency treatments. An important characteristic of a fire is the severity of burn, which was assessed in the BAER. It was found that 65.8 percent of the burn area was considered unburned or low severity, indicating fewer impacts to erosion potential. The remaining portion of the burn area, 34.2 percent, is either moderate or severe and is expected to result in water repellent soils that cause higher runoff flows and erosion potential. **Figure 4-15** is from the BAER Report and shows the perimeter of the burn and the severity of burn. The BAER Report indicates that treatment of channels is not proposed, but hazard tree mitigation and invasive species survey and treatment will be conducted.

Figure 4-15. Mosquito Fire BAER Report Severity Map

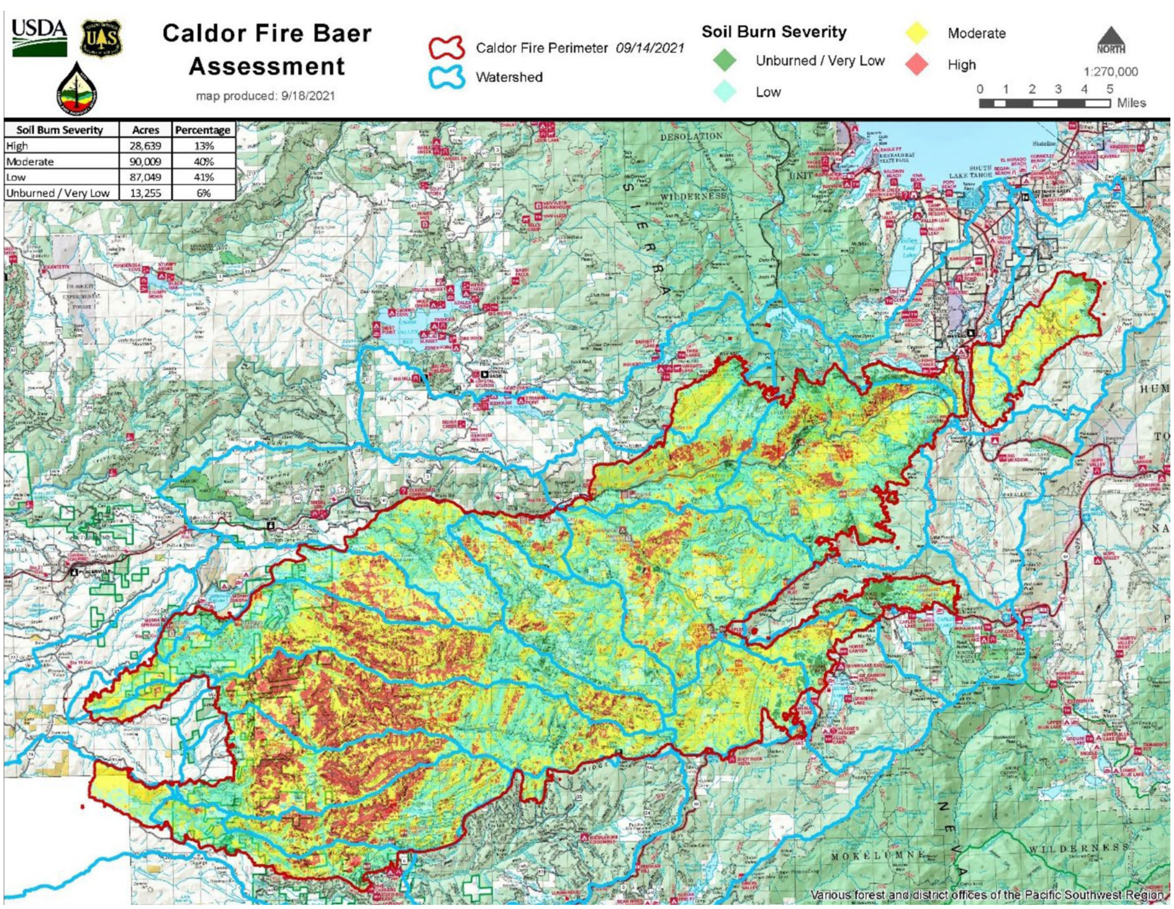


Caldor Fire

The Caldor Fire was detected on August 14, 2021 south of Grizzly Flat in the Cosumnes River watershed. Extreme weather, with hot temperatures and high winds, drove the fire into the American River watershed near Kyburz. The fire burned a total of 221,835 acres, but an assessment of the perimeter indicates that approximately 120,000 acres burned in the American River watershed.

The USFS conducted a BAER effort to assess the overall severity and impact of the fire and the need for emergency treatments. An important characteristic of a fire is the severity of burn, which was assessed in the BAER. It was found that 52.5 percent of the burn area was considered unburned or low severity, indicating fewer impacts to erosion potential. The remaining portion of the burn area, 47.5 percent, is either moderate, severe, or very severe and is expected to result in water repellent soils that cause higher runoff flows and erosion potential. Most of this was located south of the American River watershed. **Figure 4-16** is from the BAER Report and shows the perimeter of the burn and the severity of burn. The BAER Report indicates that treatment of channels is not proposed, but hazard tree mitigation, invasive species survey and treatment, and road drainage stabilization will be conducted.

Figure 4-16. Caldor Fire BAER Report Severity Map



Regulation and Management

Wildfire response and management is led either by the USFS or by the State of California, often by CAL FIRE, depending on the fire location. The agencies usually end up working 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 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.

<u>US Forest Service</u>

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. The American River has been identified as a high priority fireshed. The French Meadows Project, in the Middle Fork American River, is an example of the new approach by USFS (see discussion below under Sierra Nevada Conservancy).

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 (<u>http://www.fs.fed.us/rm/fire</u>). 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.

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.

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.

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 upper American 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. The SNC is funded by the California Environmental License Plate Fees and is awarded Proposition 1, 68, and 84 funds for regional projects. Example projects include; Fire Adapted 50 (wildfire resilience project along southern boundary of King Fire), Caples Creek Watershed Ecological Restoration Project (use of prescribed burn for fuel reduction), South Fork American River

Cohesive Strategy (improving fire resiliency), and King Fire Restoration project (restoration to control competing vegetation).

The Sierra Nevada Watershed Improvement Plan (WIP) was adopted in March 2015, along with a Strategic Plan for 2016 through 2019. This lead 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 has led to creation of the French Meadows Project, which was catalyzed by the 2014 King Fire. PCWA and USFS are working with other local partners to implement restoration of 28,000 acres around French Meadows Reservoir. Environmental planning was completed in 2018 and work was initiated in 2019, expecting to take nine to eleven years. This project also includes research work by the University of California to compare untreated and treated areas for impact on headwaters quality.

A new 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.

California Forest Improvement Program

CAL FIRE has continued implementation of a fuels reduction program funded by Proposition 40, the California Clean Water, Clean Air, Safe Neighborhood Parks, and Coastal Protection Act of 2002. The goal of the program is to reduce wildland fuel loadings that pose a threat to watershed resources and water quality. Non-federal lands in fifteen Sierra Nevada counties are eligible for the program, including Placer and El Dorado. A large portion of the American River watershed has been ranked as high priority. The county lands have been prioritized for risk, but projects outside of the priority areas will be considered for funding as long as the applicant can demonstrate the project's watershed and/or water quality protection values. Participants can be reimbursed up to 90 percent for the costs of forest improvement and fuel reduction, such as management plans, site preparation, tree purchase and planting, timber stand improvements, habitat improvements, and land conservation practices. Applicants must have 20 to 5,000 acres, and reimbursements cannot exceed $50,000.

<u>County of Sacramento Department of Regional Parks, Recreation and Open Space</u>

As part of protecting the Lower American River Parkway, Sacramento County Parks Department has implemented a Fire Risk Reduction strategy. This includes communicating with adjacent land owners to implement fuel and fire breaks, communicating risk to visitors, and implementing an annual Action Plan in the American River Parkway. For 2022, the Action Plan included; weed control (chemical, mechanical, grazing), installing signage, fire-resistant plantings, and prescribed burns.

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 water treatment plants show a distinct seasonal trend with most peaks occurring during the wet weather season. This was most evident in October 2021, when a significant early storm event occurred and triggered a significant source water quality incident at Folsom Lake. Direct impacts from wildfires are limited to the upper watershed diversions, such as PCWA, Georgetown Divide Public Utility District (GDPUD), and El Dorado Irrigation District (EID). For the downstream participating water utilities, Folsom Lake serves as an intermediary between burn area runoff and their intakes.

All of the participating water utilities see winter peaks of turbidity and TOC following storms, but it is difficult to ascertain the cause. These could be attributable to individual wildfire events; however, since they occurred during a storm event, it is hard to determine how much was caused by the fire as compared with general watershed erosion. Over the past decade, there has been a tremendous amount of wildfire occurring in the American River watershed. This compounded effect could be impacting not just the diverted quality of burn area runoff, but also increased sedimentation in storage reservoirs and creation of in-reservoir water quality issues.

Source Water Protection Efforts

The upper watershed is most vulnerable to wildfires. These wildfires have the potential to impact source water quality, as well as the hydroelectric power facilities located along the rivers. For this reason, PCWA, GDPUD, and EID conduct regular coordination with the USFS and CAL FIRE in the event of a wildfire that has the potential to impact utility facilities. In addition, PCWA has been working with USFS and other stakeholder groups in the Middle Fork American River watershed to implement the French Meadows Project, as a pilot program of what forest management may look like in the future.

Off-Highway Vehicle Use

Background

Off-Highway Vehicle (OHV) use in the watershed continues to be a significant activity according to the Tahoe and Eldorado National Forests. Unmanaged recreation, which includes unmanaged OHV use, has been identified by the USFS as one of the four greatest threats to the National Forests. USFS noted during the study period that an uncharacteristically high amount of use is occurring in Tahoe and Eldorado National Forests, resulting in subsequent damage. Many OHV trails were historic mining or logging roads that were not designed for long-term use. The USFS is not able to maintain all of the roads; the USFS has prioritized management of this activity to prevent damage to the land and its resources, such as water bodies. The USFS has created management systems in each National Forest as part of the Travel Management

Program to address design and maintenance concerns associated with use, as well as prohibit use on non-designated areas (as discussed below).

Seasonal Patterns

Generally, wheeled motorized vehicle use on land in the watershed occurs from spring through fall when snow melts in the upper portions of the watershed and the trails are accessible. During the winter months there is over-snow vehicle (OSV) use at the higher elevations.

Related Constituents

Wheeled motorized vehicles can result in a variety of contamination issues from a drinking water quality perspective. The vehicles use dirt or rock trails and the use often causes soil compaction and rutting that can result in the increased erosion potential of these trails, which results in more solids transport to the waterways. Also, many vehicles directly cross through waterways which can result in petroleum hydrocarbon and metals contamination in and adjacent to the creeks, streams, rivers, and lakes. Finally, since this type of use often results in recreation away from sanitation facilities it can result in human fecal waste deposition along the trails. OSV use has some similar potential impacts to water quality.

Presence in the Watershed

There are 4,200 miles of trails and roads used by OHVs in the Tahoe National Forest (TNF) and 2,200 miles of road and trails in the ENF. In addition, there are numerous trails through private lands within Placer and El Dorado counties. The most significant is the Rubicon Trail area in El Dorado County. Another area within the TNF is the Foresthill Divide OHV Area that has over 100 miles of trails, which includes three staging areas: China Wall, Parker Flat, and Sugar Pine. The Eldorado National Forest (ENF) has two significant OHV use areas: Barrett Lake and Mace Mill/Rock Creek. The California State Park system includes Mammoth Bar OHV area in the Auburn State Recreation Area on the Middle Fork American River.

Regulation and Management

<u>United States Department of Agriculture Forest Service</u>

One management activity of note is the USFS Travel Management Plan. The Travel Management Plan consists of three Subparts: A – Forest-Wide Road Analysis, B-OHV road and trail designation, and C-OSV road and trail designation. The purpose is to enhance management of National Forest System resources including motorized transportation systems. The Route Designation Project resulted in designation of selected routes for motorized travel in the National Forests as well as seasonal restrictions placed on some routes or areas. Subpart A was completed in 2005, and is supposed to be updated every five years thereafter. The most recent Travel Analysis Report was published in 2015. The Report assesses the USFS' 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 TNF completed Subpart B, the designation process, and finalized an Environmental Impact Statement (EIS) for the project in September 2010 with minor modifications in 2016, including a Motorized Vehicle Use Map (MVUM) that shows the roads and trails approved for use. The MVUMs were updated in 2020 to make them mobile friendly, easier to view, and provide more notes. It states that possessing or using a motorized wheeled vehicle off National Forest System roads is prohibited, except for the non-system routes, open areas, and National Forest System trails shown on regional maps. The Travel Management Plan has a defined area for OHV use, including approximately 650 miles of roads and trails, and calls for wet weather closure of some paved and dirt trails. Subpart C of the Travel Management Plan, OSV road and trail designation, was completed in March 2022. There are 300 miles of groomed OSV trails in the TNF. An OSV Use Map was created, identifying OSV use areas and several key groomed trails. The MVUM and OSV Use Map both indicate key closure areas in the American River watershed; North Fork American River, Onion Valley, and Granite Chief Wilderness.

The ENF also completed Subpart B, the designation process, and has a final Travel Management Plan for wheeled motorized vehicle use, along with a MVUM. The Record of Decision (ROD) was published on April 2, 2008 and allows for motorized vehicle use on 1,847 miles of roads and trails. Three of the four districts within the ENF are located within the American River watershed. The MVUM was updated based on the final Travel Management Plan for the Forest, and it is available in both electronic and hardcopy. The map is updated annually to reflect any revisions to the program. The plan includes a wet season closure requirement (January 1 to March 31) for dirt roads and trails to protect drainage structures, such as earthen mounds placed across roads to channel water off the road, to protect the road or trail tread from rutting or other damage, and to minimize impacts to water quality. This closure could be extended if the roads are still wet and susceptible to damage. It also specifically prohibits all motor vehicle cross-country travel. The MVUM was updated to include revisions to trail routes that included meadow crossings, and remove trails that were closed due to a court order. ENF is still addressing Subpart C of the Travel Management Plan, OSV road and trail designation. The USFS estimates that OSV use would be permitted in over 337,100 acres of the ENF. As part of the planning effort, a draft OSV Use Map has been created, to show alternatives for OSV use and key groomed trails. A Draft Environmental Impact Statement (EIS) was published in June 2018 and finalized in October 2018, along with a Draft ROD, but this was not finalized. The final selected alternative is relatively small and excludes significant portions of the American River watershed, including Desolation Wilderness.

<u>California Department of Parks and Recreation</u>

State Parks operates the Auburn State Recreation Area (SRA) in the American River watershed. This is located along the Middle Fork American River. This includes the Mammoth Bar OHV area, which has 12 miles of OHV riding trails along the river. OHV use is restricted to the designated trail areas and two motocross (MX) tracks. The facility is designed and maintained by the State parks OHV Division, which implements BMPs for erosion and sediment control. Riders must be compliant with Federal and State law and possess either a red or green sticker. All vehicles must have a spark arrestor.

El Dorado County – Rubicon Trail

The Rubicon Trail is located due west of Lake Tahoe, approximately 35 miles east of Placerville. This four-wheel drive “road” leads from Georgetown (at Highway 49) to Lake Tahoe (near Tahoma), a distance of approximately 22 miles. The trail is located in El Dorado and Placer counties. Parts of the trail pass through the ENF, TNF, and portions of private lands, but it is not considered part of the travel management plan described above.

The El Dorado County Airports, Parks and Grounds Division of the General Services Department originally managed the trail and proposed a Rubicon Trail Master Plan (RTMP) to guide El Dorado County’s management of off-highway vehicle operations and other activities on the El Dorado County portion of the Rubicon Trail. A DEIR was finalized in September 2008, but was rejected by the County due to insufficient funding.

The Regional Water Board issued a Cleanup and Abatement Order (CAO), R5-2009-0030, to El Dorado County and the USFS in April 2009 to cease the discharge of sediment and other wastes (including human fecal matter and petroleum fluids) to the waters of the state. The CAO required these entities to prepare a *Rubicon Trail Saturated Soil Water Quality Protection Plan (SSWQPP)* to evaluate and propose a means to address water quality impacts caused by vehicle use during saturated soil conditions, specifically erosion, and identify processes to enforce closures and re-openings. The SSWQPP was completed in December 2010. The CAO also required formal maintenance plans and agreements for the Trail and a long-term management plan for the Trail. In response to the CAO, the County Department of Transportation implemented a trail maintenance program in 2009 and 2010 jointly with the State Parks. This included survey of the trail and development of trail locations and maps. The maintenance program was subsequently adopted by the County Board of Supervisors in January 2010.

The Rubicon Trail Foundation, a volunteer organization supporting the trail, has developed an extensive public education and outreach campaign focused on four major topics: safety, sanitation, spills, and sedimentation. This includes a colored bandana for each topic which highlights key words related to prevention of issues associated with each one. The sanitation bandana originally included “Eradicate the white flowers of the Rubicon”, meaning to stop leaving toilet paper behind, and was updated in 2022 to educate users on items to avoid in restroom units along the trail. The spills bandana includes “Get Every Last Drop”. The sedimentation bandana includes “Stay on the Trail to Save the Trail”, to prevent erosion. The safety bandana was updated in 2021 to address wildfire safety and includes “Drown, Stir, Feel”.

In October 2014 the Regional Water Board issued Order R5-2014-0123 to rescind the CAO in response to the significant improvements made by the County and associated groups. This includes all the submittals above, secured funding for bridge crossings, installation of vault toilets, education and outreach, and increased law enforcement.

In April 2012 the USFS issued a ROD for an EIS on the Rubicon Trail. This is an agreement with El Dorado County to provide for an easement for the trail and resources to assist the County with maintenance and management. This includes numerous components; of interest are a new Friends of the Rubicon bridge, a new bridge at Ellis Creek, closure of three miles of the route in sensitive areas, installation of vault toilets along the Trail, and additional of erosion control elements near waterbodies. In August 2012 the ENF granted a public road easement to El Dorado County and required ongoing implementation of the SSWQPP and annual trail monitoring. El Dorado County moved management of the trail to its Parks Department to implement these activities. A monitoring protocol was developed in 2014 and updated in 2016. An annual report is prepared each year summarizing all activities and compliance with the USFS easement agreement, including; identification of trail projects, Adopt-A-Trail activities, sediment removal tracking, sanitation pumping, and a summary of law enforcement activities.

In 2019 and 2020 El Dorado County signed a Memorandum of Understanding with Placer County and Tahoe National Forest to improve work on portions of the trail located in those jurisdictions.

Water Quality Data and Issues Review

A review of the ambient water quality for the water treatment plants in **Section 3** for turbidity and TOC confirms that the water treatment plants show a distinct seasonal trend with most peaks occurring during the wet weather season. It is undetermined what measure of impact OHV use has on these constituents, but in addition to other sources it is likely that it also contributes to the overall levels.

Grazing in Upper Watershed

Background

There is a small livestock population in the watershed, including 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. Grazing activities can also cause erosion and lead to increased turbidity and organic carbon, and contribute pesticides.

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 American River watershed on USFS lands and is managed under lease conditions set by those agencies or on other private lands.

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 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[3]), 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[4]. 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 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[2].

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 American River appear to be associated with precipitation, as discussed in **Section 3**. Even though coliform are not considered a good indicator for *Cryptosporidium* and *Giardia*, the bacteria data available for the river system supports the theory that storm events are the time of highest risk with respect to microbial 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.

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[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_Crypto_window.html. May 13, 2015.
[4] www.Rangelandwatersheds.ucdavis.edu/MWQIC/MWQIC/Indicators_Crypto_window.html

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*[5]. 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 rangeland through the study period. There is no drinking water standard for triclopyr.

Presence in the Watershed

The population of cattle in the American River watershed can be approximated through the Placer and El Dorado County Agricultural Commissioner annual reports, see **Table 4-12**. This is likely an overrepresentation of cattle present in the American River watershed as it represents total county counts, which would include western Placer County outside the watershed. The cattle count in El Dorado County has remained relatively stable over the study period, and similar to the counts from the 2018 Update. The cattle counts in Placer County were generally

[5] 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.

stable over the study period, but were significantly higher than those from the 2018 Update. This is likely from the western portion of Placer County, not in the American River watershed.

Table 4-12
Cattle Count in Watershed Counties, 2018-2022

Year	Placer	El Dorado
2018	16,100	6,300
2019	15,300	5,986
2020	16,000	5,745
2021	15,900	6,195
2022	15,900	Not Available

The USBLM has grazing allotments on federal lands and there is one permitted in the American River watershed, the Bacchi Valley allotment located north of Coloma on 354 acres.

USFS information was obtained for all of the allotments permitted in the American River watershed, as well as details regarding those allotments. A summary is presented in **Table 4-13**. Of the 22 allotments in the American River watershed, only seven are actively grazed including just over 240,000 acres.

Regulation and Management

US Bureau of Land Management

Grazing on 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.

United States Department of Agriculture

The USFS requires completion of a 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).

Table 4-13
USFS Grazing Allotments in the American River Watershed

National Forest	Ranger District	Allotment Name	Subwatershed[1]	Current Status	Acreage	Animal	NEPA Complete[2]	Active Acreage
Tahoe	Yuba River	Devil's Peak	NF	Vacant	27,964 [3]	-	None	
	American River	Sugar Pine	NF	Vacant	22,333	-	None	
		Volcano	MF	Vacant	11,061	-	None	
		Deadwood	MF	Vacant	11,417	-	None	
		Mosquito	MF	Active	27,905	Cattle	2016	27,905
		Duncan Sailor	NF and MF	Vacant	23,836	-	None	
		Chipmunk	MF	Active	34,321	Cattle	2009	34,321
Eldorado	Georgetown	Chipmunk	MF	Active	38,206	Cattle	2009	38,206
		Nevada Point	MF	Vacant	31,774	-	None	
		Old Pino	MF and SF	Active	79,637	Cattle	2012	79,637
	Pacific	Rodoni	MF and SF	Vacant	33,585	-	None	
		Soldier Creek	SF	Vacant	14,836	-	None	
		Tells Peak	MF and SF	Vacant	14,621	-	None	
		Pearl Lake	SF	Vacant	13,134	-	None	
		Big Hill	SF	Vacant	44,002	-	1998	
		Wrights Lake	SF	Vacant	16,836	-	1998	
	Placerville	Pyramid	SF	Vacant	6,470	-	None	
		Neilsen	SF	Active	35,129	Cattle	2015	35,129
		Sherman	SF	Active	17,927	Cattle	2007	17,927
		Cody Meadow	SF	Vacant	33,555	-	2007	
		Bryan Meadow	SF	Vacant	3,597	-	None	
	Amador	Pardoe	SF	Active	36,886 [3]	Cattle	2006	9,000
Total Active Allotment Acres								**242,125**

[1] NF - North Fork, MF - Middle Fork, SF - South Fork American River
[2] NEPA Complete means a NEPA analysis was conducted by USFS and an allotment permit can be issued
[3] Only partially in American River watershed, approximately 9,000 acres

In addition, the US Department of Agriculture (USDA) has two services that implement assistance programs for farmers and ranchers. One is the Farm Service Agency (FSA) and the other is the Natural Resources Conservation Service (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.
- Grassland Reserve Program – This program works to prevent grazing and pasture land from being converted into cropland or used for urban development. In return for voluntarily limiting the future development of their land, farmers receive a rental payment.
- 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.

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 – 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 – 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.

- 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.

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 NWQI 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. RCPP projects include conservation activities implemented by farmers, ranchers, and forest landowners. Each State was required to identify local priority areas for drinking water protection by September 30, 2020. The American River watershed is within the Western Waters critical conservation area.

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, or follow-up of installed practices. 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 – 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.

State Water Resources Control Board

Runoff from rangeland is considered a non-point source of pollution and it is covered under the State Water Board's 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 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 CAL FIRE Board of Forestry on issues related to rangeland management. The RMAC worked with the State Water Board to create a rangeland water quality management program to comply with Tier 1 for the NPS program.

As discussed previously (see Timber Harvest subsection) the State Water Board has been working with federal agencies to develop statewide standards and waivers for USFS and USBLM activities, which may include range management and grazing. In addition, the Regional Water Boards implementing specific permits for selected activities on federal lands, however it is unclear if this will specifically address grazing.

In September 2015, the State Water 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. In accordance with this instruction, the State Water Board is developing a non-regulatory guidance document on livestock grazing management in California. This will be completed through an update to the 1995 Rangeland Water Quality Management Program, see discussion below. In 2020 the State Water Board sought public input on water quality impacts of grazing and BMPs. It was expected that a new Statewide Grazing Guidance would be available in 2021, but nothing has been published yet.

Rangeland Water Quality Management Program

The Rangeland Water Quality Management Program (RWQMP), developed in 1995 by the University of California Cooperative Extension (UCCE), the Cattlemen's Association, and the USDA's NRCS for the State Water Board as a Tier 1 approach, 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 module, as of August 2020.

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. 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.

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 participating water utilities. The data presented are the presumptive sample results (total immunofluorescence assay). Under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) Round 2 monitoring, 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.

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 American River water supply. Triclopyr is not regulated in drinking water; therefore, there is no monitoring data available at the water treatment plants.

AEROJET ROCKETDYNE HOLDINGS, INC. INDUSTRIAL FACILITY

Background

The Aerojet site covers 5,900 acres near Rancho Cordova, 15 miles east of Sacramento, California. The northeastern edge of the site is about one half mile south of the American River. Aerojet developed, manufactured, and tested liquid and propulsion systems at this site from the early 1950s through 2019. In addition, the facility manufactured chemicals such as rocket propellants, agricultural chemicals, pesticides (including pendimethalin), aqueous fire-fighting foam, and pharmaceuticals. Aerojet relocated its rocket propulsion manufacturing group to Alabama in December 2019, ending industrial operations at the Rancho Cordova site. Located on the site currently is Aerojet Rocketdyne, only the staff associated with site remediation; AMPAC Fine Chemicals, which manufactures bulk pharmaceutical chemicals; Wesco Aircraft/Incora, which offers supply chain management services for aerospace and pharmaceutical industries; Folsom Lake Honda, which leases land to store vehicles; American Integrated Services, which offers environmental remediation and construction services; the State of California, which is the Department of Corrections fuel storage; Cafe Express, which offers food services; and SK Pharmteco, which is a contract manufacturing operation that is the parent company of AMPAC Fine Chemicals. Superfund cleanup efforts at the site are jointly administered by the USEPA, the Regional Water Board, and the California Department of Toxic Substances Control (DTSC) for soil contamination sites and redevelopment activities.

Environmental investigations at the site began in 1979. Groundwater contamination has been defined in a number of discrete plumes. Aerojet periodically prepares contaminant plume maps showing the general geographic extent of the overall plume. The major contaminants found both onsite and offsite are solvents such as trichloroethylene (TCE) and chloroform, rocket fuel by-products such as n-Nitrosodimethylamine (NDMA) and perchlorate, and per- and poly-fluoroalkyl substances (PFAS). **Figures 4-17** and **4-18** provide site and facility maps. **Figure 4-19** presents a contaminant contour map for Layer D of the groundwater. It should be noted that although the solvents are generally volatile and therefore less persistent in the environment, NDMA, perchlorate, and PFAS are not volatile and are very water soluble and persistent in the environment.

In 1989, Aerojet, USEPA, the Regional Water Board, and DTSC signed a Partial Consent Decree (PCD) to complete a comprehensive Remedial Investigation and Feasibility Study (RI/FS). The RI is a report detailing the nature and extent of contamination and the FS describes alternatives to address the contamination), maintain the current Groundwater Extraction and Treatment (GET) systems, and take any necessary removal actions. In July of 1998, the PCD was modified to include monitoring public water supplies (local groundwater and the American River sources) for the chemical perchlorate, replacing water supplies impacted by high levels of perchlorate, annual updates to the monitoring plan for public water supplies, and reducing the discharge limit for NDMA at currently operating groundwater extraction and treatment facilities.

Figure 4-17. Aerojet Rocketdyne Site Plan

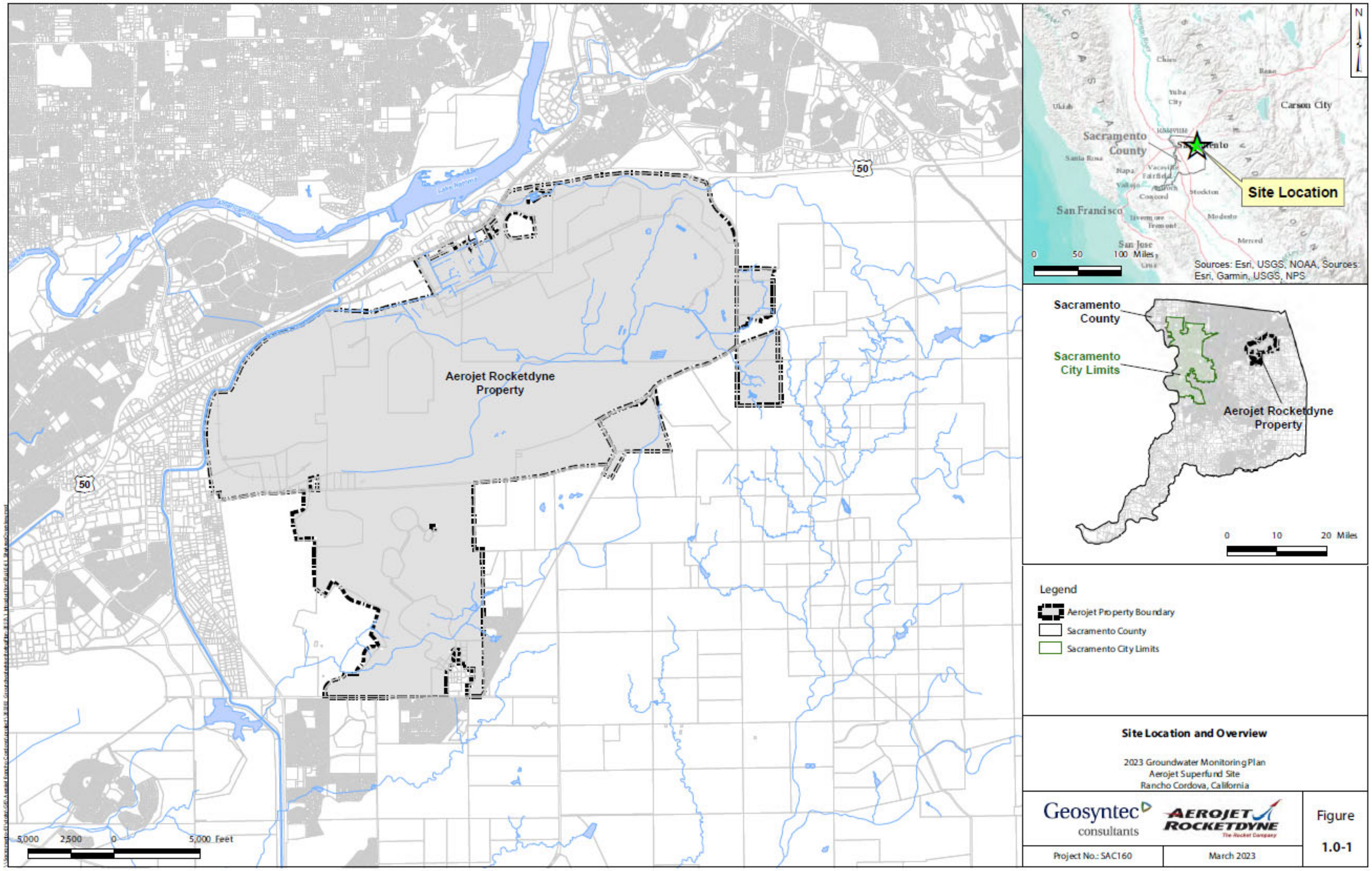


Figure 4-18. Aerojet Rocketdyne Facility Map

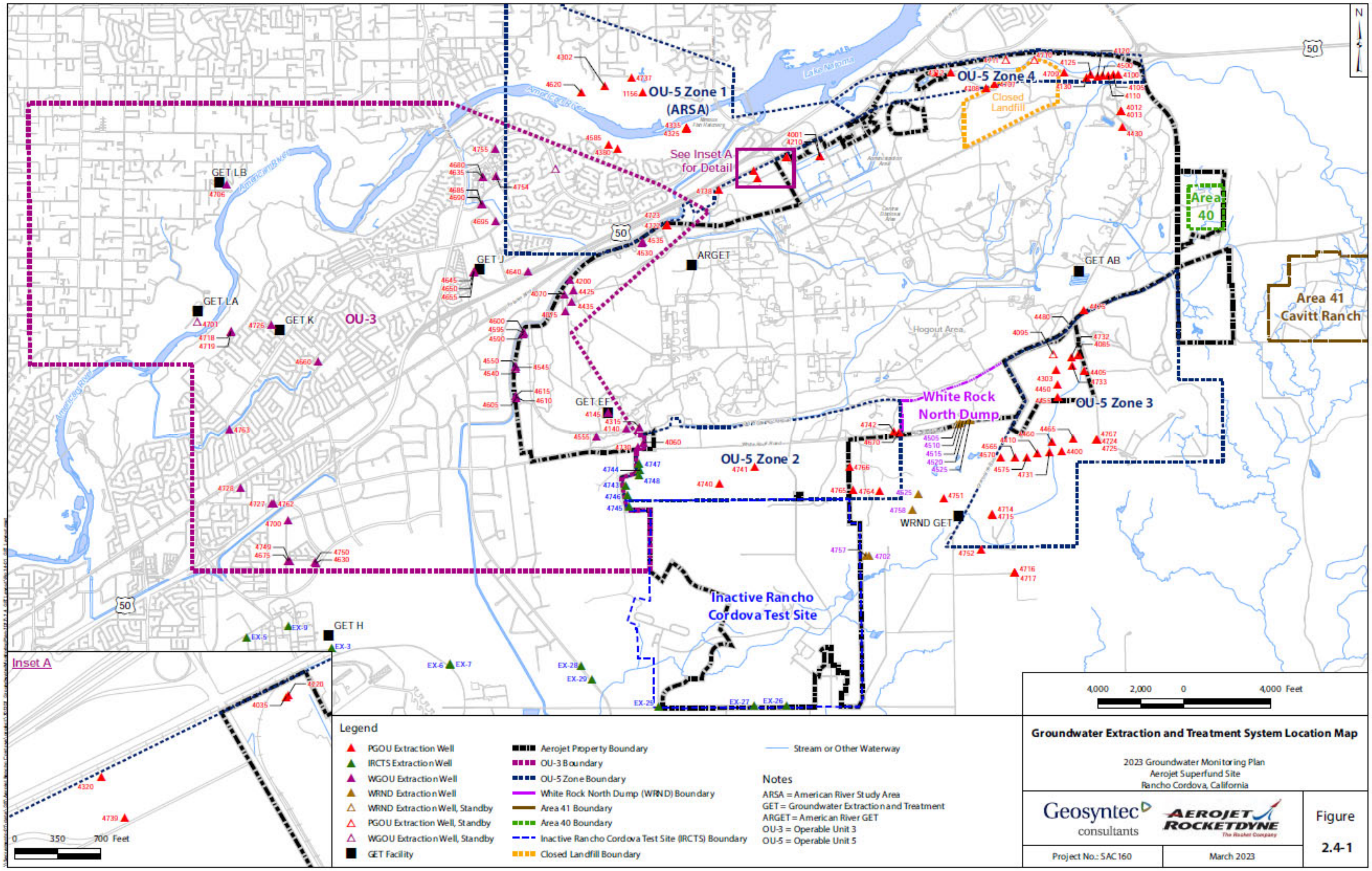
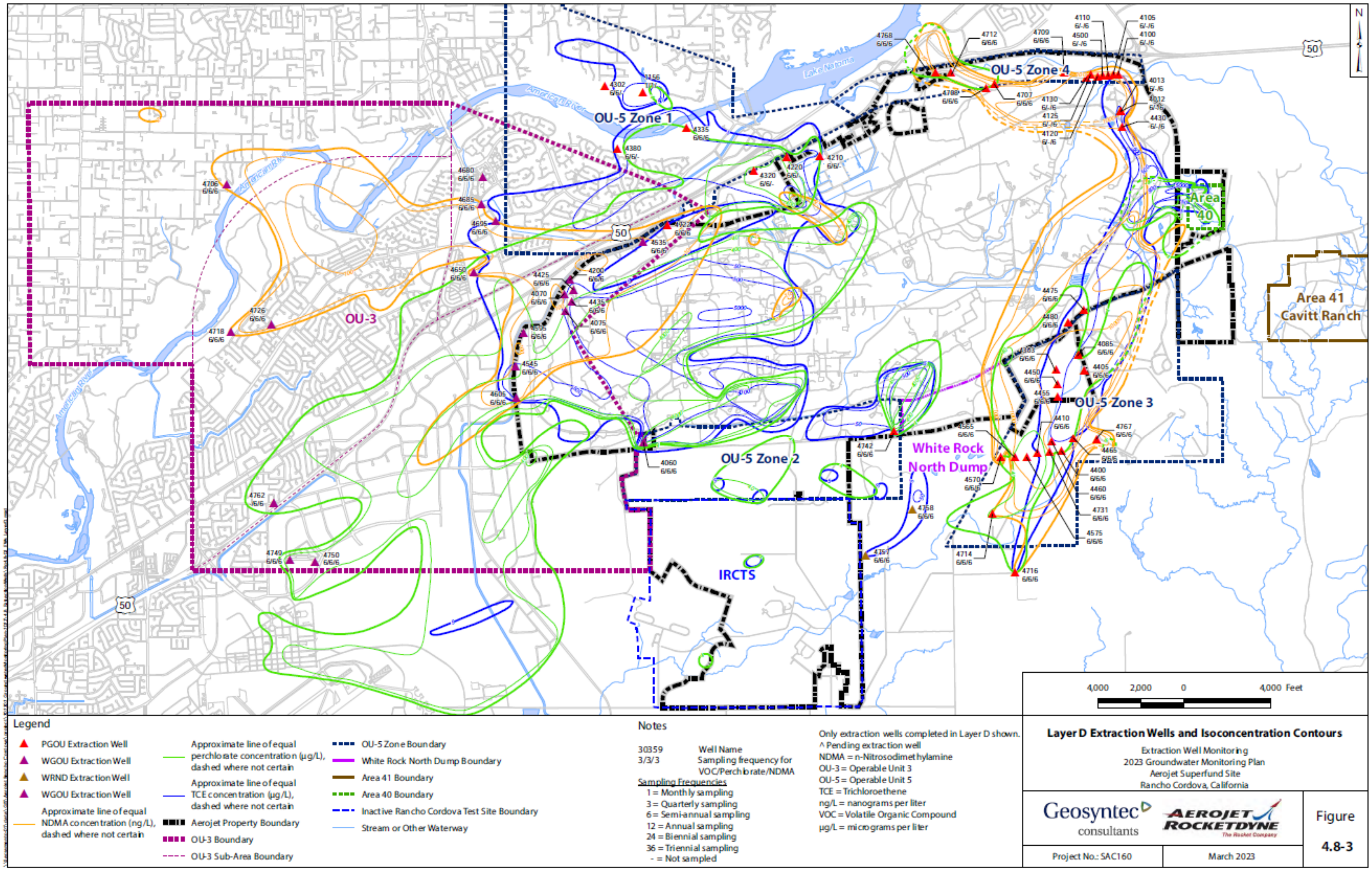


Figure 4-19. Aerojet Rocketdyne Contaminant Layer D Contour Map



In 2001, USEPA, DTSC and Regional Water Board sought public comment to modify their PCD with Aerojet again. This modification included dividing the site into different areas called operable units (OUs) to help speed up the cleanup. The PCD modification was completed in 2002. The cleanup approach for the Aerojet site under the modified PCD is to first control groundwater contamination moving across the facility boundary with two OUs (Western Groundwater and Perimeter Groundwater OUs) and then remediate soil and groundwater contamination at source areas (Boundary, Island, Area 40, Eastern, Central, and Cavitt Ranch OUs).

An RI/FS must be completed for each Operating Unit. The RI and the FS are conducted concurrently. The RI serves as the mechanism for collecting data to characterize site conditions, determining the nature of the waste, assessing risk to human health and the environment, and conducting treatability testing to evaluate the potential performance and cost of the treatment technologies that are being considered. The FS is the mechanism for the development, screening, and detailed evaluation of alternative remedial actions. Aerojet must conduct a separate RI/FS for each OU.

Risk assessment is defined by the USEPA as “qualitative and quantitative evaluation of the risk posed to human health and/or the environment by the actual or potential presence and/or use of specific pollutants.” Aerojet is conducting each OU risk assessment using the assumption that there is 100 percent use for all receptors. Receptors are ecological entities that are exposed to a stressor. This assumption is most conservative and does not assume that risk can be mitigated by surrounding lands or off-site receptors (those receptors located off of the Aerojet property).

The OUs/remedies have been prioritized to capture and treat contaminated groundwater in the early phases to try and minimize the migration of contamination off the site. It should be noted that the groundwater remedies are considered interim since they are dependent on the control of the source areas in other OUs that are in earlier stages of planning and remedy.

- OU1 is the Sitewide OU and it will be assessed once all the individual OU remedies have been installed. The first Five-Year Review was released by USEPA in September 2016 and the second in September 2021, including OUs 3 and 5, and thereafter on five-year cycles. Once all the OU remedies are approved, then an entire sitewide analysis will be conducted. This will include an overall risk assessment, and will be available for public review.

- The first OU to be addressed is the Western Groundwater OU (also known as OU3). This OU includes all groundwater west of Aerojet's main facility. It extends just south of International Drive, west to Mather Field Road, north just beyond the American River, and east to include much of the Gold River development. Principal contaminants include TCE, perchlorate, and NDMA. The final RI/FS was published in October 2000, with a Proposed Plan published for comment in December 2000. The City of Sacramento submitted comments to USEPA on the Proposed Plan. The final ROD was recorded in July 2001. The Construction Completion was approved by USEPA in July 2011. The first Five-Year Review was finalized in September 2016 and the second in September 2021, and is discussed later. OU5, Perimeter Groundwater, also has a completed ROD and Workplan so it was included in that review. USEPA now requires quarterly Effectiveness Evaluation Reports for monitoring data from the outer hydraulic barrier and the inner hydraulic barrier to allow for reassessment of the current remedy for OU3. The first reports were submitted in 2012, respectively, and are now submitted March, June, September, and December. These reports are from Aerojet to the USEPA and are designed to assess the current effectiveness of the remedy to determine if modifications should be made to optimize the remedy (i.e., selection of operating wells). These evaluations have resulted in modifications to the remedy and subsequently the GET facilities and discharges.

- The second OU to be addressed is the Perimeter Groundwater OU (also known as OU5). This includes all remaining groundwater leaving the Aerojet facility to the north or south not included in the Western Groundwater OU. It includes OU2 (American River). Principle contaminants include TCE and other volatile organic compounds (VOCs), perchlorate, and NDMA. The final RI/FS was submitted in 2008 and accepted in August 2010, with a Proposed Plan published for comment in September 2009. The City of Sacramento conducted a detailed review of the Proposed Plan and submitted comments to the USEPA. The final ROD was recorded in February 2011. The Unilateral Administrative Orders (UAOs) were issued with the ROD and included a Statement of Work for the Remedial Design/Remedial Action (RD/RA). Aerojet is working on the RD, and construction has been completed. USEPA has requested that Perimeter Groundwater OU be included in the quarterly Effectiveness Evaluations to integrate the remedies for OU3 and OU5, since the groundwater component is physically interconnected. This OU remedy was also assessed as part of the Five-Year Reviews.

- Boundary OU (also known as OU6) includes areas adjacent to or within the 2002 Carve-Out Lands. OU6 includes nine management areas that are scattered and include the Magazine Area, Chemical Plant 2, portions of Chemical Plant 1, the Administration Area, and along Buffalo Creek. Investigation work to define source areas began in 2005. The RI/FS was finalized in September 2012. The City of Sacramento conducted a detailed review of the Proposed Plan and submitted comments to the USEPA. A final Proposed Plan and ROD were published in July 2015. The Design/Implementation Workplan was completed 2020. This OU was not included in the second Five-Year Review in September 2021 since the remedy was not substantially implemented, but it will be included in the third review.

- Island OU (also known as OU7) is located in the central part of the Aerojet site and includes the most significant groundwater contamination source areas at the facility. It has eight management areas. Data for the Area 39 (a heavy contamination area with groundwater springs draining to Alder Creek) RI has been collected and evaluated and the revised draft RI was finalized in 2016. A final RI for Island OU will be prepared using supplementary data being collected now and is expected in 2024. The FS for Island OU, with a Proposed Plan, is expected in 2026 and a final ROD later in 2028. The Design/Implementation Workplan will follow the ROD.

- Area 40 (also known as OU10) is managed by DTSC and the Regional Water Board. The area is located east of Prairie City Road, and portions of the site drain to the American River. It is known for shallow groundwater contamination with VOCs, perchlorate, and heavy metals. The Site was separated out from Boundary OU in 2017 to allow DTSC to prepare a Remedial Action Plan (RAP) under California Environmental Quality Act requirements. The City provided a detailed review and submitted comments on the Draft RAP in July 2018, which continued to request consideration of the downstream surface water impacts to the Lower American River as well as continued re-evaluation of monitoring programs. The RAP was finalized in August 2018. Remedial work began immediately after and a Remedial Action Completion Report is expected in 2024 with Certification to follow in 2025. This should be included in the next Five-Year Review in September 2026.

- Eastern OU (also known as OU8) is a soil and groundwater OU which includes most of the liquid and solid rocket testing areas on the eastern side of the facility. Sampling for the data collection is complete and Aerojet is preparing the RI/FS. The Draft RI/FS is expected in 2026, followed by a Feasibility Study/Proposed Plan in 2028, and a ROD in 2029. The Design/Implementation Workplan is also expected in 2029.

- Central OU (also known as OU9) contains most of Chemical Plant 1 and associated rocket manufacturing and is generally in the central portion of the facility. The Sampling Plan is complete and Aerojet is preparing the RI/FS. The Draft RI/FS is expected in 2029, followed by a Proposed Plan in 2029, and a ROD in 2030.

- Cavitt Ranch OU (also known as OU4 and described as Area 41 OU) is a 550 acre site situated 1.5 miles east of Aerojet's main facility and south of White Rock Road. This site was used for drying and burning old solid rocket fuel. Soil and groundwater are contaminated primarily with TCE and perchlorate but also contain other VOCs, dioxan/furans and some elevated metals. This was determined to be the lowest priority OU. The Sampling and Analysis Plan was submitted in 2014, which outlines the plan for data collection to support the RI/FS. It is expected that this will be revised prior to commencing work. The RI/FS is expected in 2030, followed by a Proposed Plan in 2030, and a ROD in 2031.

The risk assessments address human health (both cancer and non-cancer), ecology, and water quality (both on/off site – residual remaining and discharge). Aerojet has plans to redevelop as much of the property as is permitted by USEPA. There is a study being conducted to assess the potential reuse of these carve out lands (not covered under the Superfund Cleanup) as well as in the Perimeter Groundwater OU and some Source OUs.

In 2003, analyses revealed that a portion of the groundwater just north of the American River in Carmichael was contaminated with NDMA. Soon after, TCE and perchlorate were detected. Aerojet prepared a modification to the Western Groundwater OU design in 2004 to begin extraction and treatment of the plume.

There are two major receiving waters tributary to the American River that pass through the Aerojet site: Alder Creek and Buffalo Creek. Alder Creek currently receives storm runoff and cooling water discharges (which are no longer permitted since 2020), as well as artesian groundwater seeps in the northeast region of the Aerojet property. Buffalo Creek receives storm runoff, a small amount of industrial process water (which was significantly reduced in 2020), and treated groundwater discharge. Buffalo Creek has been modified, realigned, and impounded in three areas: from upstream to downstream. These are F-Area Lake (located on the east end of the Aerojet property), East and West retention ponds, and West Lake. As site redevelopment occurs, the impoundments are expected to be eliminated and alternate storm water management infrastructure will be developed for those portions of the site by the applicable governing entity (City of Folsom, City of Rancho Cordova, and Sacramento County).

No new GET facilities are planned for Western Groundwater or Perimeter Groundwater OUs at this time, but more flow will be supplied to existing facilities to go up to design limits and incorporate more waters associated with modifications to the proposed remedies. Source Area OUs may result in additional flows directed to the GET facilities or creation of new GET facilities. Aerojet does not plan to fully implement the remedy for the Source Area OUs prior to Record of Decision/Administrative Order from USEPA.

Superfund law requires that remedial actions that result in any contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure be reviewed every five years to ensure protection of human health and the environment. The USEPA completed the first Five-Year Review of the Aerojet Superfund Site in September 2016, covering the Western Groundwater Operable Unit (OU3) and Perimeter Groundwater OU (OU5), and a second Five-Year Review in September 2021 covering just these two OUs.

The first Five-Year Review found that there were containment gaps, land use restrictions have not been completed, assumptions have changed (for example, the chloroform MCL has been lowered), and there was incomplete information to complete the vapor intrusion assessment. Therefore, USEPA permanently deferred making a protectiveness statement for OU3 and OU5 (as well as OU6) until more information is available. There were six recommendations from the first Five-Year Review Report, including:

- Update the groundwater risk assessment to include the chloroform MCL for OU3 by 9/30/18.
- Assess groundwater containment issues in OU3 and OU5 and address gaps by 9/30/19.
- Evaluate migration of constituents of concern in groundwater and investigate the need to update treatment at GET K (for perchlorate) and GET H (for NDMA) by 9/30/20.
- Reassess the vapor intrusion activities in OU3, OU5, and OU6 by 9/30/17.
- Implement land use controls for various soil contamination areas by 9/30/17.
- Update the soil and soil vapor risk assessment for mercury, cadmium, and 1,1,1-trichloroethane by 9/30/18.

In addition to the recommendations above, there were several other findings related to the groundwater contamination and treatment, including:

- More sampling was needed to find the source of perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) to GETs AB and E/F. This was included as part of the National Pollutant Discharge Elimination System (NPDES) program.
- Deficiencies in the monitoring programs existed and they needed to be addressed.
- Activities and performance of wells AC-6 and AC-18 were not well documented and needed to be improved in order to assess performance and this should be included in the OU3 Performance Evaluation Report.

In the second Five-Year Review, USEPA made the determination that the Western Groundwater OU is protective of human health and that the Perimeter Groundwater OU is short-term protective of human health. Five of the six recommendations were completed, with one still ongoing. PFOA and PFOS monitoring has been conducted under the NPDES permit as well as other improvements to the overall monitoring program, including annual reviews and updates. There were only two recommendations; one for implementation of additional land use covenants and one for a USEPA site inspection. There was an additional finding for Aerojet to expand vapor mitigation for future site development. The City of Sacramento submitted comments to USEPA on the draft document requesting evaluation of treated groundwater discharges to the American River, groundwater seeps in Alder Creek, and stormwater runoff from the site. USEPA did not acknowledge the comments in the final document due to an error in comment receipt, so they have been meeting with City staff to further discuss these topics.

Seasonal Patterns

There are two types of discharges from the Aerojet property: treated groundwater and stormwater. The GETs are operational year-round and result in constant discharges throughout the year. The stormwater system includes both wet and dry weather flows. Typically, there is limited discharge during the summer months, with most stormwater runoff occurring during the wet season.

Related Constituents

Table 4-14 provides a list of the principal contaminants and their associated sources, human health thresholds, and treatment options. Recently, monitoring has detected the presence of PFOA/PFOS in some wells on the site. It should be noted that many of these constituents of interest are volatile compounds. This means that after treatment and discharge to surface water, there is opportunity for these constituents to be further reduced in the environment via volatilization. There are five compounds, NDMA, perchlorate, 1,4-dioxane, PFOA, and PFOS, which are not volatile. All five are considered as very water soluble and do not biodegrade in the natural environment. These constituents are persistent in the environment and would likely not be reduced, but would be diluted, in the American River.

Table 4-14
Principal Groundwater Contaminants at the Aerojet Superfund Site

Contaminant	Source	MCL, μg/L	PHG, μg/L	Groundwater Treatment at Aerojet	Conventional Water Treatment Effectiveness[1]
Perchlorate - Inorganic anion	Component of solid rocket propellant	6	1	Biological reduction and ion exchange reduce perchlorate to <4 μg/L	Not effective
N-nitrosomodimethylamine – Semi volatile organic compound	Combustion product of liquid rocket fuel	0.01 [2]	0.003	UV light/peroxide oxidation removes NDMA to < 0.002 μg/L	Not effective
1,4-dioxane	Stabilizer in solvents	1 [2]	None [3]	UV light/peroxide oxidation removes 1,4-dioxane to < 3 μg/L	Not effective
Trichloroethylene (TCE)	Solvent	5	1.7	Air stripping and/or GAC removes VOCs to < 0.5 μg/L	Minimally effective, <20 percent removal
Tetrachloroethylene (PCE)	Solvent	5	0.06	Air stripping and/or GAC removes VOCs to < 0.5 μg/L	Minimally effective, <20 percent removal
1,1-dichloroethene (1,1-DCE)	Solvent	6	10	Air stripping and/or GAC removes VOCs to < 0.5 μg/L	Minimally effective, <20 percent removal
cis-1,2 – dichloroethene (1,2-DCE)	Solvent	6	13	Air stripping and/or GAC removes VOCs to < 0.5 μg/L	Minimally effective, <20 percent removal
trans-1,2 – dichloroethene (1,2-DCE)	Solvent	10	50	Air stripping and/or GAC removes VOCs to < 0.5 μg/L	Minimally effective, <20 percent removal
1,1-dichloroethane (1,1-DCA)	Solvent	5	3	Air stripping and/or GAC removes VOCs to < 0.5 μg/L	Minimally effective, <20 percent removal
1,2-dichloroethane (1,2-DCA)	Solvent	0.5	0.4	Air stripping and/or GAC removes VOCs to < 0.5 μg/L	Minimally effective, <20 percent removal
1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113)	Solvent	1,200	4,000	Air stripping and/or GAC removes VOCs to < 0.5 μg/L	Minimally effective, <20 percent removal
Carbon tetrachloride (CCl4)	Solvent, refrigerant, propellant	0.5	0.1	Air stripping and/or GAC removes VOCs to < 0.5 μg/L	Minimally effective, <20 percent removal
Chloroform	Solvent	80 [4]	0.4	Air stripping and/or GAC removes VOCs to < 0.5 μg/L	Minimally effective, <20 percent removal
Vinyl chloride	VOC degradation product	0.5	0.05	Air stripping and/or GAC removes VOCs to < 0.5 μg/L	Minimally effective, <20 percent removal

Table 4-14 Cont'd
Principal Groundwater Contaminants at the Aerojet Rocketdyne Superfund Site

Contaminant	Source	MCL, µg/L	PHG, µg/L	Groundwater Treatment at Aerojet	Conventional Water Treatment Effectiveness[1]
Perfluorooctanoic acid (PFOA)	Surfactant and fire-fighting foam	0.0051 [5,6]	None	GAC, ion exchange, and/or membrane could be considered if necessary	Not effective
Perfluorooctane sulfonate (PFOS)	Surfactant and fire-fighting foam	0.0065 [5,6]	None	GAC, ion exchange, and/or membrane could be considered if necessary	Not effective

MCL – Maximum Contaminant Level: Primary MCLs are set as close to the Public Health Goals (PHGs), or MCLGs, as is economically and technologically feasible.

PHG – Public Health Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health.

[1] Effectiveness of VOCs based on AWWA Water Quality and Treatment 4th Edition

[2] State Water Resources Control Board, Division of Drinking Water (DDW) Notification Level

[3] DDW Response Level for 1,4-dioxane set at 35 µg/L, USEPA Lifetime Health Advisory set at 200 µg/L

[4] The MCL is 80 µg/L for the sum of total trihalomethanes (as disinfection by-products) chloroform, dibromochloromethane, bromodichloromethane, and bromoform

[5] DDW Notification Levels for PFOA/PFOS were updated in August 2019

[6] DDW Response Level for PFOA set at 0.01 µg/L and PFOS set at 0.04 µg/L, USEPA Lifetime Health Advisories set at 0.070 µg/L (either individually or combined)

PFOA and PFOS

Aerojet initiated a comprehensive PFAS monitoring program under the NPDES GET permit in 2016 and it has been consistently expanded due to the detectability of a wide number of PFAS compounds, some at levels of interest. Originally, only GET E/F and GET AB were thought to be impacted. The current GET NDPES permit (R5-2020-0051-001) includes influent and effluent quarterly sampling only for those two GETs under EPA Method 537.1, with a reporting limit of 2 nanograms per liter (ng/L). There are no effluent limits in the NPDES permit for these constituents since no MCLs exist yet.

As required under the NPDES GET Permit from the Regional Water Board, Aerojet has performed a multi-year PFAS monitoring program. The monitoring includes sampling of GET facilities (influent, process, effluent), extraction wells feeding the GET facilities, and monitoring wells tracking plume concentrations throughout the Aerojet site.

From 2016 through second quarter 2022 Aerojet was using EPA Method 537 basic list to report 14 PFAS compounds. This includes all the compounds listed under DDW/USEPA Notification Level/Health Advisories, except ADONA and HFPO-DA (also known as GenX). In the third quarter 2022 (July 2022) Aerojet implemented an expanded list of 25 PFAS compounds under EPA Method 537 to add a larger suite of constituents to evaluate.

The data results for all PFAS monitoring is presented in **Table 4-15**. The data indicates that all of the GETs discharging to the American River had some detectable PFAS compound in the influent or effluent. The summary table below provides the maximum value detected for each GET. It should be noted that when sufficient GET effluent sample results existed (more than 8), only the effluent is listed in the summary table below. GETs HA, K, and LB effluents only had 2 or 3 samples, all prior to 2020, so the influent data is listed for these as well. GET LA has not been operated since 2020 so no data was provided by Aerojet.

Concentrations above the reporting limit are highlighted in orange, while those that are above the detection limit, but below the reporting limit, are shown as estimated concentrations and are highlighted in yellow. Plain boxes are considered non-detects at the concentration listed. The detection limits for the constituents with existing Notification Levels (NL) or Health Advisories appear to be sufficiently low to determine risk. It is unclear for the constituents with no regulatory standard.

The specific PFAS detected and the concentrations vary between GET facilities, dependent on the source water extraction well region. The most frequently detected compounds are PFOS and PFHxA. HFPO-DA (GenX), PFNA, and ADONA were not detected in any influent or effluent samples associated with the GET facilities and appear to be of lower concern. PFHpA and PFDA were only detected in few effluents, all at very low estimated concentrations. These also appear to be of lower concern. The future development of Notification Levels for these compounds will clarify if the detection limits are sufficiently low and represent no risk.

Table 4-15
Aerojet PFAS Monitoring Summary

GET	Max Value Detected (ng/L)*									
	PFOA	PFOS	PFBS	PFHxS	HFPO-DA (GenX)	PFHxA	PFHpA	PFNA	PFDA	ADONA
Regulatory Standard (NL/HA)	***5.1/ 0.004***	***6.5/ 0.02***	***500/ 2000***	***3/-***	***-/10***					
ARGET Effluent (7069)	1j	3.2	0.5j	1.1j	1.4u	0.96j	1.7u	0.54u	0.3j	0.37u
GET EF Effluent (7092)	0.9u	2.1	0.23j	1.3j	1.4u	0.93j	1.7u	0.66u	0.44u	0.37u
GET AB Effluent (7321)	0.86u	2.5	1.7u	1.3j	1.3u	21	0.41j	0.65u	0.34j	0.29u
GET J Effluent (7219)	0.79u	1.7j	0.85u	1.8u	1.3u	3.5	1.8u	0.61u	0.29u	0.36u
WRND Effluent (7106)	4.4	0.49j	0.47j	0.69j	1.3u	2.5	0.72j	0.62u	0.29u	0.36u
Sailor Bar Effluent (7072)	0.79u	1.2u	0.34j	1.8u	1.4u	0.54u	1.8u	0.63u	0.29u	0.37u
GET HA Influent (7181)	0.88j	2	0.2j	2.7	1.2u	0.66j	0.25j	0.63u	0.29u	0.32u
GET HA Effluent (7194)	0.88j	1.9	0.88u	0.93j	-	0.5u	0.77u	0.62u	0.27u	-
GET K Influent (7228)	0.93j	0.71j	0.34j	1.7j	1.2u	0.77j	0.38j	0.61u	0.29u	0.32u
GET K Effluent (7229)	0.76u	0.67j	0.24j	1.1j	-	0.52u	0.34j	0.62u	0.28u	-
GET LB Influent (7198)	0.8u	0.52j	0.84u	1.8u	1.2u	0.55u	0.73u	0.6u	0.29u	0.33u
GET LB Effluent (7209)	0.76u	1.2u	0.86u	1.8u	-	0.52u	0.75u	0.61u	0.28u	-

(yellow)	Estimated concentration, above detection limit but below reporting limit
(orange)	Detected concentration, above reporting limit

*j-estimated, u-undetected

Generally, the GET facilities are able to remove the PFAS compounds to below the associated Notification Levels and many to non-detectable, or estimated, concentrations. However, the efficiency of reduction varies by GET facility and PFAS compound. Ion exchange is likely the most effective process for removing PFAS and the current resin change frequencies appear to be sufficient to ensure this continues. However, it is noted that all sites showed increasing concentration trends so there is a potential for the resin change frequencies to need to be monitored carefully.

Aerojet has also monitored extraction and monitoring wells for PFAS and the data show that there is widespread PFAS compounds in the groundwater under the Aerojet site. There are distinct areas where the PFAS compounds vary in species and concentration. Generally, the highest levels of PFAS compounds are found in the groundwater near the northeast side of the site, near Alder Creek and Highway 50. Peak levels are also seen in the southern portion near White Rock area. This well monitoring data makes it clear that risks to Alder Creek from PFAS compounds exist if there is found to be artesian seeps impacting the creek, and subsequently the Lower American River.

A Mann-Kendall non-parametric analysis was conducted on the data to identify areas where there were increasing trends in concentrations of PFAS compounds. There were numerous increasing trends identified, including at both influent and effluent locations for various GETs. The key ones include:

- ARGET Effluent, PFBS concentration trend is increasing, however, it should be noted this calculated trend is based on J-flag (trace level or estimated concentration).
- WRND GET Effluent, PFOA concentration trend is increasing, and while the NL has not been exceeded it is approaching the NL.
- GET J Influent, increasing concentration trend calculated for PFHxS, PFOS, PFOA. However, it should be noted there have been no NL exceedances.
- GET D Influent, PFOS consistently exceeds the NL and compounds PFBS, PFHpA, PFHxS, and PFOA are detected.
- Sailor Bar Influent, PFOS concentration trend is increasing, but NL has not been exceeded.

This data shows that the PFAS compounds are moving through the groundwater and are susceptible to increasing influent (and thus likely effluent) concentrations. Also, it's likely that the GET effluent concentrations are heavily dependent on timing within a resin change cycle.

Presence in the Watershed

The Western Groundwater OU ROD was completed in 2001 and specified the selected cleanup plan, or remedy, for this portion of the site. The ROD directed Aerojet to contain contaminated groundwater on the western side of Aerojet and restore the aquifer between the on- and off-property containment systems. There are fifteen contaminants of concern (COCs) in Western Groundwater OU groundwater, but the primary contaminants are TCE, perchlorate, and NDMA.

The Perimeter Groundwater OU covers the north, east, and south boundaries of the site. The investigation was completed in 2006, and a proposed plan was presented for public comment in 2009. This OU has five treatment facilities, with three currently discharging to the American River: the American River GET (ARGET), GET AB, and White Rock GET.

A summary of the GETs supporting the Western and Perimeter Groundwater OUs is provided in **Table 4-16**, including the discharge locations for each facility. On-property perchlorate is removed from the contaminated groundwater at the combined GET E/F using a biological system developed by Aerojet. Off-property, the lower concentration perchlorate is removed by commercially-available ion exchange. This occurs at GETs J, K-A, LA, and LB. Both on- and off-property NDMA and high concentration VOCs are removed by ultraviolet light treatment. VOC treatment consists of on-property air stripping and off-property use of granular activated carbon.

Table 4-16
Summary of Operating Units and GET Facilities at the Aerojet Superfund Site

Operating Unit	Name of Facility	Target Contaminants	Treatment Processes[1]	Permit Flow	Discharge Location
Western Groundwater – OU3	GET E/F[2]	Perchlorate, NDMA, VOCs	Bioreactor/sand filtration (biological reduction), H_2O_2/UV, Ion Exchange, Air Stripping	11.52 mgd	Buffalo Creek/ American River
	GET H-A	Perchlorate, VOCs	Bag Filters, Ion Exchange, GAC	3.9 mgd	Morrison Creek or Boyd Station Channel/ American River
	GET J[3]	Perchlorate, NDMA, VOCs	Bag Filters, Ion Exchange, O_3/UV, GAC	6.75 mgd	Buffalo Creek/ American River
	GET K-A	NDMA, VOCs, Perchlorate	Basket Strainers, H_2O_2/UV, Ion Exchange	5.11 mgd	American River
	GET LB (Bajamont)	NDMA, VOCs	Bag Filter, UV	1.44 mgd	American River
	GET LA (Ancil Hoffman)	NDMA	Bag Filter, H_2O_2/UV	2.88 mgd	American River/ Irrigation
Perimeter Groundwater – OU5	Sailor Bar Park	VOCs	GAC	0.58 mgd	Sailor Bar Park Pond
	GET AB	Perchlorate, NDMA, VOCs	Bag Filters, Ion Exchange, H_2O_2/UV, Air Stripping	5.76 mgd	Buffalo Creek/ American River or Aerojet Industrial Supply[4]
	White Rock GET	Perchlorate, NDMA, VOCs	Bag Filters, Ion Exchange, UV, Air Stripping	2.88 mgd	Buffalo Creek/ American River
	ARGET[5]	VOCs, 1,4-Dioxane, Perchlorate	HiPOx (H2O2/Ozone), Ion Exchange, Air Stripping	5.04 mgd	Buffalo Creek/ American River
Golden State Water Company	AC-6	Perchlorate	Ion Exchange	1.08 mgd	American River
	AC-18	Perchlorate	Ion Exchange	2.59 mgd	Morrison Creek
All Areas	Low Threat Discharges	Varies	Treatment if Practical	No Limit	Any

[1] All media filtration beds have pre-filters.
[2] Now includes flows from GET E/F Sprayfield and Propellant Burn Area (PBA) and Inactive Rancho Cordova Test Site (IRCTS), treatment expanded for perchlorate removal by ion exchange.
[3] Now includes flows from Well 4665.
[4] Up to 1,200 gallons per minute (gpm) can be supplied to the Aerojet Industrial System, expected to decrease with industrial operations ceased
[5] Now includes flows from GET D, treatment expanded for perchlorate removal by ion exchange.

The remedy includes both extraction wells and sentinel wells. Extraction wells are monitored to make sure they are containing the groundwater plume, and the sentinel plumes are located further downstream to ensure that the plume is not migrating ahead of the extraction wells.

Aerojet must implement the remedy, including obtaining all necessary permits. They must obtain a NPDES permit from the Regional Water Board to discharge the treated water from GET facilities to surface waters. The permits are discussed below in the Regulation and Management subsection.

Regulation and Management

Historically, Aerojet has been regulated under two NPDES permits; one for the GET discharges and one for stormwater discharges. Both of these permits discharge to the American River or its tributaries. During this study period, Aerojet ceased industrial operations at the site so the Regional Water Board rescinded the individual stormwater NPDES permit as described below.

GET System Waste Discharge Requirements

The current NPDES GET permit, Order No. R5-2017-0095, was issued on August 11, 2017 and replaced Order No. R5-2014-0126. This order was replaced in October 2020 with Order No. R5-2020-0051, which was amended in February 2021 by Order No. R5-2021-0002. These Orders continue to permit treatment and discharge of over 50 million gallons per day (mgd) of groundwater to surface water. The permits includes nearly 48 mgd of treated groundwater discharging to the American River or its tributaries.

The current permit includes effluent discharge from 10 GET facilities to the American River; ARGET, GET E/F, GET J, GET K-A, GET L-A, GET L-B, AC-6 Well, GET AB, and White Rock GET. Between 2018 and 2022 there were two modifications to this NPDES permit, summarized below.

- Order No. R5-2020-0051 replaced Order No. R5-2017-0095 in October 2020. Key revisions to the permit included: removal of Well AC-23, increased permitted flow for GET HA, GET KA and White Rock GET, and addition of UV treatment for NDMA at White Rock GET.
- Order No. R5-2021-0002 amended Order No. R5-2020-0051 by making corrections to unintended revisions completed as part of the Americans with Disabilities Act reformatting.

As part of this permit, discharge points are identified for each GET facility. The location of each GET facility and their associated discharge locations were provided in the NPDES permit as Attachment B-1; this is shown in **Figure 4-20**. In the permit, each discharge point is described and final effluent limitations are set for each GET effluent discharge. The effluent limitations are based on the source water contamination issues. **Table 4-17** provides a list of the general effluent limitations of concern for drinking water purposes.

Figure 4-20. Aerojet GET and Discharge Locations

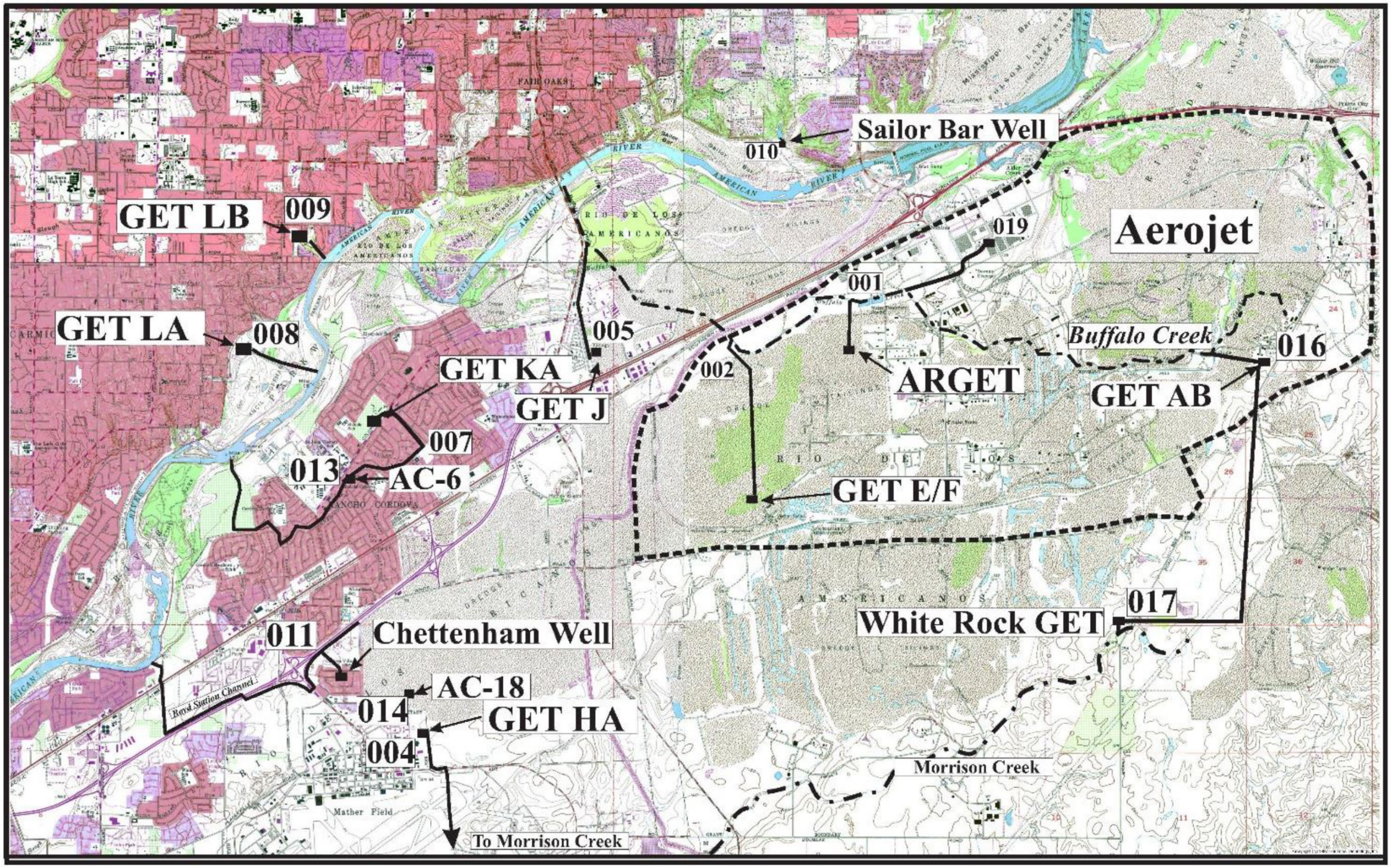


Table 4-17
General GET Effluent Discharge Limitations

Constituent	Units	Average Monthly	Maximum Daily
VOCs [1]	µg/L	0.5	0.7 [2]
1,2-Dichloroethane (1,2-DCA)[3]	µg/L	0.38	0.5
Chloroform [4]	µg/L	3.0	5.0
Tetrachloroethene (PCE) [5]	µg/L	5.0	5.0
Trichloroethene (TCE) [6]	µg/L	1.5, 3.0	1.5, 3.0
cis-1,2-dichloroethylene [7]	µg/L	1.5	1.5
1,4-Dioxane [8]	µg/L	3	6, 10
NDMA	µg/L	0.002/0.003/0.007 [9]	0.010 [10]
Perchlorate [11]	µg/L	4, 6	6, 10, 12 [12]
Acetaldehyde [7]	µg/L	5	5
Formaldehyde [7]	µg/L	50	50
Acrylamide [7]	µg/L	0.05	0.05
Chlorine Residual [13]	mg/L	0.01	0.02
pH [14]	Units	6.5	8.5

[1] Selected VOCs are specific to each GET facility, based on presence in influent waters unless noted below. Low threat discharges shall comply with all constituents on EPA Method 8260B short list. Each shall meet limit.
[2] Low Threat Discharges only have maximum daily limit of 5 µg/L.
[3] Applies only to GETs E/F and AB.
[4] Applies only to GETs J, and AC-6.
[5] Applies only to AC-6.
[6] GET E/F has a TCE maximum daily limit of 1.5 µg/L, with an upper limit of 3 µg/L (for periods of operational changes to correct exceedances, as approved by the Executive Officer).
[7] Applies only to GET E/F.
[8] Applies only to ARGET, GET E/F, and Low Threat Discharges (this only has a maximum daily limit of 10 µg/L).
[9] NDMA limit is 0.003 µg/L for GETs AB and White Rock, 0.007 µg/L for GETs J, K-A, L-A, and L-B, and does not apply to Sailor Bar Park, GET HA, AC-6, and AC-18. All others 0.002 µg/L.
[10] Low Threat Discharges only have a maximum daily value at 0.020 µg/L.
[11] GET E/F has a perchlorate average monthly limit of 6 µg/L and a maximum daily limit of 10 µg/L.
[12] Low Threat Discharges only have a maximum daily value at 12 µg/L.
[13] Applies only to GET AB.
[14] Listed values represent instantaneous minimum and maximum.

Under the NPDES permit for discharge of treated groundwater, Aerojet is required to monitor the influent and effluent for each GET facility, for a total of 12 influent sample points and 13 effluent sample points (including the low-threat discharge). The influent sites are required to be monitored monthly for the applicable constituents of concern in the contaminated groundwater, which varies between facilities. Semi VOCs and perfluorinated compounds (as applicable) are required to be monitored quarterly at several of the GET facilities. The effluent sites are required to be monitored monthly for a larger suite of constituents to ensure compliance with all effluent limitations.

In addition, the Regional Water Board has identified 13 receiving water sites on the American River, or Alder Creek, that are also monitored monthly. These sites are monitored for VOCs, NDMA, perchlorate, temperature, dissolved oxygen, turbidity, specific conductivity, pH, and total dissolved solids.

The treated groundwater discharges generally meet the NPDES permit effluent limits, which the Regional Water Board typically set at or below the drinking water MCLs or Notification Levels set by the DDW. Permit effluent limit violations are reviewed by the Regional Water Board periodically and Administrative Civil Liabilities (ACL) are issued when appropriate. During the update period, the Regional Water Board issued two ACLs to Aerojet to address effluent violations from the GET facilities between December 1, 2017 and December 31, 2022. This included ACL R5-2020-0533 and ACL R5-2023-0522.

The Aerojet NPDES permit for discharge of treated groundwater includes several requirements of interest:

- Higher frequency (weekly versus quarterly) receiving water monitoring under low flow (1,500 cubic feet per second) conditions in the American River.
- Cessation of discharges and re-opening of the permit if perchlorate is detected in the American River at levels greater than the 6 µg/L primary MCL.
- Notification to downstream water utilities, including the City of Sacramento, CWD, and Freeport Regional Water Authority within 24-hours after Aerojet has received information that its discharge exceeds effluent limitations, or if operational monitoring of the treatment facilities indicates that there is a potential for effluent limitations to be exceeded. GSWC and Reclamation to be notified if the discharge that is in violation is to Alder Creek, tributary to Lake Natoma.
- The permit also has a special provision which now requires an operations and maintenance manual for any new GET.
- Prepare a safeguard to an electric power failure to assure that all requirements of the permit can be met in the event of the loss of power. This can include alternate sources of power, standby generators, retention capacity, operating procedures, or other means.

Also of note is the comprehensive Supervisory Control and Data Acquisition (SCADA) system that Aerojet has installed for the GET facilities. This includes alarms and set points. The operations staff visit all GET facilities daily during the work week. There is no requirement in the Regional Water Board permit for there to be backup supply for power. However, when power is out to a GET, the system is controlled to turn off. When the facility is brought back on-line there is a startup mode which requires recirculation to ensure operations are working correctly. During off-hours, alarms from the GET facilities are sent to the Aerojet security office and then forwarded to the operations group as required.

Stormwater and Industrial Process Water Waste Discharge Requirements

NPDES permit Order No. R5-2013-0156 was adopted on December 6, 2013 and covered stormwater discharges from the site, a small amount of operational and process water, and industrial supply excess flows. Aerojet ceased industrial operations at the site in December 2019 and in June 2020 the Regional Water Board rescinded this permit.

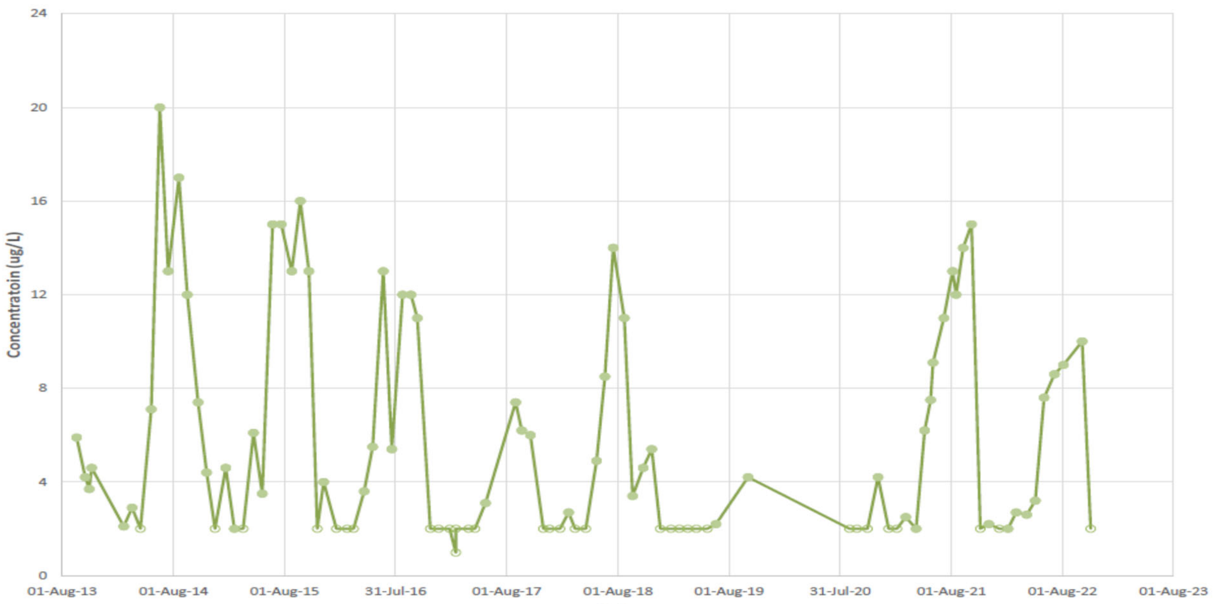
Four of the six discharge points had effluent limitations associated with them. Stormwater was historically collected on-site and stored in one of five impoundments on the Aerojet site. Water was kept in the impoundments for evaporation and percolation, but it could be discharged to one of the receiving waters on the property, Alder and Buffalo creeks, if inflows exceeded the storage capacity.

Under the stormwater NPDES permit, Aerojet was required to monitor four discharge locations around the property for a variety of constituents, including perchlorate, during discharge events. Aerojet was also required to monitor five receiving water locations on Buffalo and Alder creeks during those discharge events. Perchlorate has been detected in Buffalo Creek upstream of the impoundments, as well as in Alder Creek. The source of perchlorate is uncertain, but could include GET facility discharge, surface scouring to both creeks, and possible upwelling of shallow groundwater contamination to Alder Creek via seeps. The permit included an effluent limitation for a maximum daily value of 6 µg/L of perchlorate, set at the current primary MCL for perchlorate. By limiting the discharge effluent to the MCL, it reduces the likelihood of detectable perchlorate in the American River from this source from their regular operations due to dilution. However, this does not preclude detection from occurring, such as under high discharge concentrations or low flow scenarios in the Lower American River. The permit required Aerojet to notify the City of Sacramento before beginning discharge from the stormwater detention basins. A notification of release was received by the City in February 2019.

Order No. R5-2013-0156 required Self-Monitoring Reports to be submitted to CIWQS, so Discharge Monitoring Reports were submitted electronically to the Regional Water Board so the discharge reports could be reviewed on the CIWQS database. This data consistently confirmed that there is definitely a source of perchlorate tributary to Alder Creek downstream of Prairie City Road, which could be upwelling groundwater and/or Aerojet stormwater runoff. Detects of perchlorate occurred during all seasons, with the highest levels occurring during the summer months, above the MCL, when stormwater runoff is at its lowest.

In July 2020, the Regional Water Board directed Aerojet to continue with the seasonal monitoring of Alder and Buffalo creeks and in August 2020 a Monitoring Plan was approved for 2021 and 2022. This monitoring program consistently shows detection of perchlorate in Alder Creek in the summer months, at levels of concern. **Figure 4-21** shows the results in the downstream location on Alder Creek, with many well above the MCL of 6 µg/L.

Figure 4-21
Summary of Alder Creek Perchlorate Monitoring



Due to the strong detectability of perchlorate, the monitoring program will be continued and expanded into the summer of 2023. Regional Water Board is also requesting investigation into the potential for Alder Creek to be a gaining stream and what other contaminants may be present.

Although industrial operations have ceased, there is still sitewide runoff on the property. During significant rainfall events, stormwater flows are collected and discharged via Alder and Buffalo Creeks to the American River. Aerojet operated two large retention ponds to hold flows from Buffalo Creek, but these will be removed as part of sitewide redevelopment. The Regional Water Board staff have indicated that the stormwater monitoring during the wet season for perchlorate will be incorporated into the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or Superfund, monitoring program.

Water Quality Issues and Data Review

The required monitoring by Aerojet has resulted in various exceedances of the GET permit effluent limits during the study period; these were discussed previously. However, it should be noted that the companion samples for the receiving waters did not result in detects above the receiving water limits. In addition, there has been no detection of perchlorate, NDMA, PFAS, or 1,4-dioxane in the Lower American River by the participating water utilities, as noted in **Section 3**.

Source Water Protection Efforts

The City of Sacramento and CWD have been active in tracking the permitting and discharge events at Aerojet. These efforts include providing comments to USEPA on the proposed plan to address groundwater contamination in the source OUs of the Aerojet site, reviewing and commenting on proposed changes to the NDPES permits for the GET facility discharges, providing input to the USEPA and Regional Water Board on concerns related to drinking water impacts on the Lower American River, tracking the Aerojet Superfund Site Community Advisory Group, and follow up with Aerojet when spill events occur.

In addition, the City of Sacramento has conducted a parallel Aerojet tracking effort to obtain an understanding of the proposed changes and redevelopment at the site, which has included site tours and communications with Aerojet staff to better understand the GET treatment facilities and their operations and maintenance.

RECREATION

Background

There is a large amount of recreation that occurs in the American River watershed. Recreation occurs from the headwaters in the Sierra Nevada to Sacramento, at varying levels. Recreation includes body and non-body contact activities. Body contact recreation includes swimming, wading, and rafting; it is allowed on all major reservoirs and river reaches in the watershed. 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, fishing, hiking, biking, snow play, and skiing. (OHV use and snowmobiling were previously discussed under the Forest Activities subsection). Non-body contact recreation is more prevalent in the upper watershed.

Seasonal Patterns

Body contact recreation occurs primarily between Memorial and Labor days. Most non-body contact recreation can occur throughout the year. A substantial amount of recreational 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 snowplay primarily occur in the upper watershed only. Recreation in the lower watershed consists of more day-use activities focused around the Folsom SRA and the American River Parkway. Activities such as boating, fishing, hiking, and biking can occur throughout the year, but are 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 that can be 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 or other proper disposal.

Non-body contact recreation can also contribute to pathogen levels in the watershed. The more significant concern is associated with erosion caused by land-based recreation activities that 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' intakes.

Presence in the Watershed

Multiple agencies own and manage recreational facilities in the American River watershed, including the USFS, State Parks, Pacific Gas and Electric (PG&E), and Sacramento County Department of Regional Parks, Recreation and Open Space. Recreational facilities are located from the headwaters down to the lower reaches of the watershed. The major reservoirs and river reaches and their recreational operators are shown in **Table 4-18**. Most of these waterbodies are designated for multiple uses including water supply, recreation, flood protection, and power generation.

Upper Watershed

A majority of the Upper Watershed includes recreational facilities in the Tahoe and Eldorado National Forests. These activities are closest to the intake facilities for PCWA, GDPUD, and EID on the North, Middle, and South Forks of the American River, upstream of Folsom Lake. There are limited user statistics available from the USFS. TNF conducted Visitor Use Monitoring in FY2020, showing 2,078,000 visitors. This was significantly increased from the FY2010 and FY2015 counts. ENF conducted Visitor Use Monitoring in FY2017, showing 1,525,000 visitors. This is also significantly increased from FY2007 and FY2012 counts.

Overnight camping occurs throughout the upper watershed. 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.

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

Table 4-18
Characteristics of Major Reservoirs and River Reaches

River Reach/ Reservoir	Recreational Operator(s)
North Fork American River	State Parks Auburn SRA
Lake Valley Reservoir	Pacific Gas & Electric
Lake Clementine	State Parks Auburn SRA
Middle Fork/Rubicon River	State Parks Auburn SRA
Loon Lake	USFS Eldorado National Forest
Hell Hole Reservoir	USFS Eldorado National Forest/PCWA
French Meadows Reservoir	USFS Tahoe National Forest/PCWA
Stumpy Meadows Reservoir	USFS Eldorado National Forest
South Fork American River	El Dorado County
Caples Lake	USFS Eldorado National Forest/EID
Silver Lake	USFS Eldorado National Forest/EID
Ice House Reservoir	USFS Eldorado National Forest
Union Valley Reservoir	USFS Eldorado National Forest/Sacramento Municipal Utility District
Slab Creek Reservoir	USFS Eldorado National Forest
Folsom Lake	State Parks Folsom Lake SRA
Lake Natoma	State Parks Folsom Lake SRA
Lower American River	County of Sacramento Department of Regional Parks, Recreation and Open Space

Whitewater Rafting

On the North Fork, whitewater rafting occurs on about 37 miles of river, from Euchre Bar to Upper Lake Clementine. This reach of the river has four boat access points and three restroom facilities. On the Middle Fork, rafting occurs on about 20 miles of river from the Oxbow Access to the confluence with the North Fork, with five boat access points and three restroom facilities. There is also whitewater rafting on about 20 miles of the Rubicon River. Over 25 private outfitters are licensed to offer whitewater trips in the Auburn SRA. Overnight camping is available for rafters on both these tributaries in restricted areas.

The most significant amount of whitewater rafting in the watershed is along the South Fork American River below Chili Bar Reservoir. There is a total of 86 miles of river that rafting occurs on, but the heaviest use is the lower 20 miles between Chili Bar Reservoir and Folsom Lake. The lower 20 miles includes four camping areas and 12 restroom facilities. El Dorado County manages the rafting use on the South Fork of the American River under the River Management Plan adopted in November 2001 and updated in February 2018.

User statistics were obtained from El Dorado County River Management Plan Annual Reports during the study period. User statistics obtained from El Dorado County for whitewater rafting along South Fork American River show that total use (commercial, non-commercial [personal], and institutional [universities]) decreased through the study period, see **Table 4-19**.

Table 4-19
South Fork American River Whitewater Rafting User Statistics, 2003 - 2022

Year	Use Type			TOTAL USE
	Non-Commercial	Commercial	Institutional	
2003	28,024	59,450	2,376	89,850
2004	25,649	65,343	2,556	93,548
2005	29,850	71,814	-	101,664
2006	27,388	71,494	4,165	103,047
2007	24,858	65,541	4,381	94,780
2008	28,382	70,607	4,282	103,271
2009	31,554	61,612	4,198	97,364
2010	31,413	66,925	3,759	102,097
2011	31,324	79,935	2,625	113,884
2012	33,611	73,337	3,401	110,349
2013	26,350	74,645	3,565	104,560
2014	22,722	63,309	3,047	89,078
2015	21,000	65,000	3,000	89,000
2016	24,999	86,482	2,565	114,046
2017	19,649	84,464	1,528	105,641
2018	20,273	68,509	1,495	90,277
2019	13,741	72,184	-	85,925
2020	17,500	39,458	-	56,958
2021	17,600	71,102	-	88,702
2022	-	73,097	-	73,097

Institutional users were incorporated into commercial users in 2019. In addition, over the past five years there has been an increasing diversity in watercraft and a shift away from traditional rafting making it very difficult to estimate non-commercial, or personal users, and no estimates were available for 2022. Annual use decreased over the study period compared to historic highs. The COVID pandemic resulted in significant decreases in 2020, but it rebounded in 2021. There has also been continued strength in the commercial rafting market.

Auburn State Recreation Area

The Auburn SRA includes 38,000 acres and 40 miles of the North and Middle Forks American River. Major recreational uses include hiking, swimming, boating, fishing, camping, mountain biking, gold panning, equestrian riding, whitewater rafting, and off-highway motorcycle riding. Over 100 miles of hiking, biking and equestrian trails are located in the Auburn SRA. There are two primitive campgrounds, Mineral Bar (15 sites) and Ruck-A-Chucky (5 sites), in the Auburn SRA with a total of 20 sites. In addition, there are 15 boat-in campgrounds on Lake Clementine open seasonally from May 1 through October 15.

The marina facilities on Lake Clementine include 50 boat slips and a gas pump, and are only operated seasonally from May 1 through October 15. Three floating toilets are located on the lake, and three pit toilets and five portable toilets are located around the lake. Only 25 motorized boats are allowed on the lake at any given time. There is one OHV area, Mammoth Bar, in the Auburn SRA that includes 12 miles of trails (see discussion in Forest Activities subsection above). The Auburn Equestrian Staging Area is just downstream of the PCWA intake facility. The staging area provides parking and toilet facilities for horseback riders. **Table 4-20** provides a summary of the use statistics over the study period. The data show that the Auburn SRA had a significant reduction in the number of day use and overnight camping visitors between 2016 and 2019.

Table 4-20
Recreational Use Statistics for Auburn SRA

Type of Use	Fiscal Years		
	16/17	**17/18**	**18/19**
Day Use Visitors	546,914	487,065	311,151
Overnight Camping	5,834	4,877	3,436

Marshall Gold Discovery State Historic Park

The South Fork includes recreational facilities in Marshall Gold Discovery State Historic Park (SHP). Activities at the SHP include picnicking, wading, fishing, and hiking. **Table 4-21** provides a summary of the use statistics over the study period. The data show that the Park appears to have variable annual day-use visitors during the study period.

Table 4-21
Recreational Use Statistics for Marshall Gold Discovery State Historic Park

Day Use Visitors	Fiscal Years		
	16/17	**17/18**	**18/19**
Marshall Gold Discovery SHP	172,540	179,170	161,423

Folsom Lake State Recreation Area

Folsom Lake SRA includes Folsom Lake and Lake Natoma. It supports swimming and boating activities (i.e., water-skiing, sailing, cruising, fishing, and jet-skiing). There are about 100 miles of trails around the lake used for hiking, horseback riding, and mountain biking. Major shoreline use areas include Beals Point, Granite Bay, Rattlesnake Bar, Mormon Island, Brown's Ravine, and the Peninsula Area. Folsom Lake also has two on-shore campgrounds with 154 campsites, three group campsites for a total of 125 people, and allows overnight boat camping.

The Folsom Lake Marina, located in Brown's Ravine, has 685 wet boat slips, 175 dry boat slips, boat launches, concessions, and a gas pump. The slips can accommodate boats up to 26 feet long. There is a sewage pumpout station for boats with on-board sanitary facilities next to the marina. State Parks maintains the pumpout station, and the marina concessionaire operates it. Folsom Lake is equipped with three floating toilets. Boat campers on Folsom Lake must register either at the Granite Bay entrance or at Folsom Lake Marina at Brown's Ravine. During registration, the vessel is inspected by the State Parks staff to verify that it meets all requirements, including the presence of a self-contained sanitary unit that is U.S. Coast Guard-approved and having a holding tank with tight and perfect closure.

Table 4-22 provides a summary of the use statistics over the study period. The data show that the day use and overnight camping at Folsom Lake SRA has increased tremendously over the study period.

Table 4-22
Recreational Use Statistics for Folsom Lake SRA

Type of Use	Fiscal Years		
	16/17	17/18	18/19
Day Use Visitors	1,285,050	1,455,861	1,826,608
Overnight Camping	30,827	34,121	41,562

Lower Watershed

Lake Natoma

Lake Natoma is particularly known for fishing and non-motorized boat recreation. Power boats are allowed at the upstream end of the lake as long as they do not interfere with the more passive recreational pursuits that are the focus of Lake Natoma. There is one boat launch on the lake. There are three restroom facilities located around the lake. There are three group campsites at Black Miners Bar on the north shore of Lake Natoma. These sites can accommodate up to a total of 125 people. The California State University Sacramento Aquatic Center is located on the south shore of Lake Natoma and offers a wide variety of flatwater sports, such as rowing, wind-surfing, and canoeing.

American River Parkway

The American River Parkway is a 4,600 acre open space area that borders the 23 miles of the Lower American River. There are 14 paved trails throughout the Parkway. The Parkway contains several community parks, numerous access points for the general public, a bike and walking trail, and a horseback riding trail. Recreational activities along the Lower American River include fishing, wading and swimming, canoeing, kayaking, rafting, trail use, and picnicking. The most popular reach for rafting is from Sunrise Avenue to Watt Avenue. These activities are close to the intake facilities of CWD, the City of Sacramento, and the confluence with the Sacramento River. The following is a summary of key recreational facilities and activities along various reaches of the American River Parkway.

Nimbus Dam to CWD:

- Six restrooms and two boat ramps;
- Low to medium swimming use; medium to high fishing use; high kayaking, rafting and canoeing use; medium equestrian use; and medium to low boat use; and
- Access points at Hazel Avenue, Sailor Bar, Upper and Lower Sunrise Recreation Areas, Sacramento Bar, El Manto, and Rossmoor Bar.

CWD to the City of Sacramento E.A. Fairbairn Water Treatment Plant:

- Seven restrooms and three boat ramps;
- Medium to low swimming use; medium to high fishing use; medium to high kayaking, rafting and canoeing use; medium equestrian use; and medium boat use; and
- Access points at Sarah Court, Chase Drive, Ancil Hoffman Park (including Golf Course), Effie Yeaw Nature Center, William B. Pond Recreation Area, River Bend Park, Waterton Way, Rogue River Way, Gristmill Dam, Harrington Park, Watt Avenue, Northrop Avenue, Northgate Boulevard, and Howe Avenue.

The E.A Fairbairn Water Treatment Plant to the confluence with the Sacramento River:

- Three restrooms and one boat ramp;
- Medium to high swimming use; medium to high fishing use; medium to high kayaking, rafting and canoeing use; low to medium equestrian use; and high boat use; and
- Access points at Paradise Beach, Bushy Lake, and Discovery Park.

Regulation and Management

There is overall limited regulation over recreation in the American River watershed. As described previously, the owners and operators of the developed recreational facilities are required to conduct on-going maintenance and operations, and they appear to be vigilant in their activities.

Tahoe and Eldorado National Forests

The USFS has completed Recreation Facility Analyses for developed recreation sites in both the TNF and ENF. This included a review of the developed recreation sites, nearly 150 in the TNF and over 100 in the ENF, to identify which sites would be prioritized for investment. The USFS completed inventories of the developed sites, identified capital and operations and maintenance costs for each site, and rated the sites. The ratings were used to develop Programs of Work (a five year workplan) for each National Forest to implement management options and priorities on recreational facilities. This will govern operational and maintenance operations, such as facility closure, fee changes, seasonal use changes, repairs, construction of new facilities, or revisions to facility uses.

California Department of Parks and Recreation

State Parks and Reclamation approved the Folsom Lake General Plan/Resource Management Plan Update (General Plan) on October 8, 2009. The Update is a comprehensive revision of the General Plan. The purpose of the General Plan is to provide a purpose and management direction for the Folsom Lake SRA as well as Lake Natoma. The General Plan guides the day-to-day decision making and help with developing specific project plans. Some of the key guidelines of interest to drinking water supply are marina capacity, motorized boating at Lake Natoma, Mississippi Bar, and OHV use.

In 2022, State Parks finalized a Road and Trail Management Plan for Folsom Lake SRA, which includes programmatic goals and guidelines to provide overarching recommendations on the park trail system, such as alternations, removal or adoptions, maintenance, partnerships, and user education programs.

<u>Marina Capacity</u>

The General Plan outlines a 30-50 percent expansion in slip capacity at Folsom Lake Marina, which is between 200 and 340 additional slips. It also indicates the need for “necessary upland facilities” to support such expansion. Necessary upland facilities would include additional parking and restrooms. Dredging of Brown’s Ravine is still being considered as an alternative to allow for extension of the boating season at Folsom Lake Marina (when water levels are low). Due to the State’s budget crisis followed by an extended drought with low lake levels, there has been no activity on the expansion or dredging and there are no current plans to implement these actions.

<u>Motorized Boating at Lake Natoma</u>

The final General Plan states that personal water craft at Lake Natoma is prohibited, and that the use of two-stroke engines will be phased out, according to California Air Resources Board emissions standards. However, there is no limit on motorized boats on Lake Natoma at this time. Boat speed is limited to 5 miles per hour (mph), so it discourages most power boating.

<u>Redevelopment of Mississippi Bar</u>

The General Plan states that it will “work with the concessionaire to improve the equestrian stable and riding facility as necessary in order to reduce the impact of operations here on area resources, and to improve the services provided to the public.” The General Plan also mentions the possibility of having a limited number of equestrian camping sites at Mississippi Bar. Again, there has been no activity on these actions.

In January 2018, State Parks issued a Trail Use Policy to clarify which trails within the Folsom Lake SRA could be used by equestrian riders. Equestrian use is allowed on all but seven of the designated routes. In addition, State parks issued an Equestrian Use Policy at the same time that specifically limits equestrian use to designated trails and prohibits shoreline access and other open areas of the park.

Reduce and Limit OHV

At several locations in the Folsom SRA, visitors drive their vehicles off designated roadways and parking areas to access the receding lakeshore. The General Plan addresses off-road vehicle use by restricting vehicles to designated roads and parking areas and by providing formal shoreline access in limited locations as appropriate. In January 2018, State Parks issued an Off Road Vehicle Policy to clarify how to operate a vehicle off paved roads and to limit vehicles below the high water mark around Folsom Lake.

The General Plan also recommends the development of a number of more detailed and specific management plans, including a trail management plan and a fire management plan. Additional project specific environmental analysis will be conducted as appropriate for facility development, management plans, or other proposed improvements. According to Reclamation staff there have been few projects completed since the General Plan was completed.

State Parks implemented an expansion of the day use fee program in the Auburn SRA. This requires users to pay a daily use fee. Some areas are self-pay, using “Iron Rangers”. The current day use fees apply to: Cherokee Bar, China Bar, Confluence Area, Cool Trailhead Parking, Drivers Flat Trailhead Parking, Grizzly Bear Parking Area (Gate 118), Lake Clementine, Long Point Trail Parking Area (8 Mile Curve - Gate 128), Upper Lake Clementine, Mammoth Bar, Mineral Bar, Ponderosa Way, Quarry Trailhead Parking, Ruck-A-Chucky, and Yankee Jims Parking Area. This has resulted in improved management and facilities at these recreation areas.

Central Valley Regional Water Quality Control Board

The Regional Water Board is implementing several management actions related to activities along the Lower American River. This includes development of a TMDL in response to the 303(d) listing for indicator bacteria and an expansive monitoring program (see previous discussion under Creek and River Corridor Activities).

The Regional Water Board’s weekly monitoring for *E. coli* on the Lower American River showed that the highest median values occur in the lowest reaches of the river where there is heavy recreational use, but according to the MST study there is little contribution from humans during dry months indicating that recreation is not likely the source of elevated levels.

County of Sacramento Department of Regional Parks, Recreation and Open Space

The County of Sacramento is the owner and operator of the American River Parkway. The Department has the responsibility for operation and maintenance of the Parkway and its facilities. There have been no changes to the Parkway Plan during the study period.

Sacramento County implemented Measure A as a sales tax (0.5 percent) for roadway and transit improvements. This is effective through 2039. The County receives monies from this fund for improvements to the American River Parkway bike path. During the study period the Department has completed numerous capital improvement projects in the Parkway, including:

- Trail repair and replacement projects,
- Bridge repair and replacement projects,
- Levee improvement projects,
- Restroom replacement projects, and
- Erosion prevention projects.

Federal Energy Regulatory Commission (FERC) Relicensing

El Dorado Irrigation District – Project 184

EID completed its FERC re-licensing in October 2006 for Project 184 for 40 years. This is a hydroelectric project on the South Fork American River and its tributaries. Water is diverted into the El Dorado Canal at Kyburz for power generation. As part of the re-licensing process, EID was required to conduct many follow up projects related to watershed efforts, including recreation. EID completed a "Recreation Implementation Plan" in April 2007 which presented the plan for coordination with the USFS on recreational issues as required in the FERC license. The plan identified four key areas where EID will work with the USFS, including:

- Conduct a recreational survey every six years,
- Meet with USFS representatives to review recreational facilities and identify maintenance, rehabilitation, and construction needs,
- Implement a list of specific recreation construction projects (related to campgrounds, boat launches, and parking) and an information kiosk , and
- Public education and information.

A recreational resources report was published in June 2018. The report summarizes use of project recreational facilities (Caples, Silver, and Echo lakes and Pacific Crest Trail and Desolation Wilderness) and indicated that recreational demand is increasing and facilities are not sufficient on weekends.

Sacramento Municipal Utility District (SMUD) and Pacific Gas and Electric

SMUD operates the Upper American River Project (FERC #2101), a hydroelectric project on the South Fork American River. PG&E operates the Chili Bar Project (FERC #2155), a hydroelectric project on the South Fork American River. These two projects are operated together since their facilities are sequential, so the operators determined to submit a Joint application to the FERC for re-licensing. The FERC approved their re-licensing in 2014 for 50 years.

Similar to EID, SMUD completed a Recreation Implementation Plan in 2015. This plan includes a provision for a recreational survey every six years, funding to provide to the USFS to manage recreational facilities, and coordination with the USFS every six years to identify maintenance, rehabilitation, and construction needs for recreational facilities within the Project. SMUD agreed to spend $155 million over 20 years to improve public recreation facilities around the reservoirs in the Crystal Basin Recreation Area, just north of Highway 50 on the west slope of the Sierra Nevada.

Placer County Water Agency – Middle Fork American River Project

PCWA initiated its FERC re-licensing effort in 2004 for the Middle Fork American River Project (FERC #2079) since their permit expired on March 1, 2013. A Pre-Application Document was submitted to the FERC in December 2007 to formally initiate re-licensing. The Final EIS was published in February 2013. As part of re-licensing, PCWA evaluated impacts on Recreation and Water Quality. Technical Study Plans to guide activities were developed.

The Recreational Resources Technical Study was finalized in 2010. This study identified all recreational facilities and uses in the project area as well as the estimated level of use (based on one year of user counts). This included a survey of recreational users. The survey determined that most users are local (within the three county region of Placer, El Dorado, and Sacramento); most are long-term users of the facilities; most users prefer these facilities because of a lack of crowding, their scenic quality, and direct access to water; and recreational use is often connected to the water surface elevation of the reservoirs.

The Water Quality Technical Study was finalized in January 2008. This investigated water quality through the Project area, including near recreation facilities. PCWA sampled twice in 2007 at designated sites. Sampling for drinking water constituents included general water quality constituents (metals, minerals, TOC, and hydrocarbons) at 46 sites and coliform at 17 sites. All data supports continued low levels of these constituents in this upper watershed.

Other Programs

Folsom Lake Bilge Oil Control Program

The El Dorado County Environmental Management Department, in cooperation with the City of Folsom, Folsom Lake Marina, and Folsom Lake Recreation Area, has developed a comprehensive marina program to educate boaters, including those using Folsom, Echo, Ice House, and Union Valley lakes. This program focuses on clean boating practices, to make users aware of the potential risk to the environment. Information is provided on the impacts of illegal disposal of used oil, operating poorly maintained watercraft, and pumping bilge water overboard. The main effort of the program is to have boat owners use oil absorbent pads and pillows. The oil absorbent pads are used to keep oil and gasoline out of the lakes during fueling. There are locations for collection and disposal of the pads and pillows at each marina, including Folsom Lake Marina. These oil absorbent pads and pillows are handed out to the public in a boat bucket kit, which also includes a bucket, a floating key chain, towel, and a ski flag. In order to receive a kit, the boat owner must fill out a survey regarding oil changing and disposal. The boaters can return the spent pad or pillow back to the marina and exchange for a new one.

State Water Resources Control Board

Marinas and recreational boating are considered non-point sources of pollution. Regulation and management falls under the State Water Board Non-Point Source Program. Management has focused on Tier 1, which means that implementation is met through implementation of self-determined non-regulated management practices. The State Water Board adopted the “Policy for Implementation and Enforcement of the Non-Point Source Pollution Control Program” in 2004. The Policy covered marinas and indicated that a non-voluntary Clean Marina Program would be developed to include 26 best management practices as well as monitoring. This was subsequently revised to continue to be a voluntary program.

The Clean Water Act prohibits untreated vessel discharges in US waters, and the Porter Cologne Act prohibits untreated sewage discharges throughout the state. The Regional Water Boards have the primary authority and responsibility in California for enforcing these acts, but they do not have the resources to operate a program to inspect or enforce their authority with respect to acts of dumping from boats.

California Coastal Commission/Department of Boating and Waterways

The Boating Clean and Green Campaign (Campaign) is a statewide boater educational and technical assistance program. The Campaign has been conducted by the California Coastal Commission (CCC) since 1997, and as of March 2006 the Campaign has been led by the California Department of Boating and Waterways (DBW), with assistance and support provided by the CCC.

Since the Campaign’s inception, the California Integrated Waste Management Board, the National Oceanic and Atmospheric Administration and the USEPA have provided funding. The Campaign assisted Contra Costa County to develop and implement its boating program called “Keep the Delta Clean. You Play in it, You Drink it too!”. The Campaign has four major components as follows.

- Networking. As part of its efforts to promote clean and safe boating, the Campaign facilitates the California Clean Boating Network (CCBN). The CCBN consists of a collaboration of government, environmental, business, boating, and academic organizations working to increase and improve clean boating education efforts in California. The CCBN and Campaign have websites providing links and resources, including a marina Geographic Information System (GIS) database with locations of marinas with pump stations.

- Research. For the last several years, the Campaign has developed research to better orient its educational messages, developed outreach materials, and identified and promoted environmental services for boaters statewide.
- Technical Assistance. Identifying and promoting environmental services for boaters (sewage and bilge pumpouts, oil absorbent pad distribution and collection, used oil and household hazardous waste collection centers), assisting marinas and local governments in identifying the need and installing pollution prevention services for boaters, and participating at conferences and trade shows.
- Education and Outreach. The Campaign is focused on a multi-faceted outreach strategy to target boat shows and events, marine supply stores, and word-of-mouth to reach boaters. This also includes “The Changing Tides” newsletter and the Clean Marina Toolkit.

Clean Marine Program

This is an independent organization for education and outreach to marinas and yacht clubs. This program was created in San Diego County in response to potential regulatory action by the San Diego Regional Water Quality Control Board. It became a statewide program in 2007 and there are over 130 marinas currently certified through the program. This is an all-voluntary program that encourages the use of BMPs to prevent and reduce pollution.

The program provides a Marina Program Manual with BMPs related to a variety of issues, including boat sewage discharge, waste management, hazardous materials, and storm runoff. Marina owners are provided a checklist to assist as they educate, train and encourage boaters and employees to protect the environment and water quality through the routine use of these BMPs. A review of each facility is performed by an independent team to determine that day-to-day activities and operations are enhancing the environment and water quality. Those meeting the Program standard and implementing a pledge to continue the use of these BMPs receive a Clean Marina designation. There is a website, www.cleanmarine.org. Neither the Folsom Lake nor Lake Clementine marinas are certified.

United States Environmental Protection Agency

There are now two USEPA general vessel permits: the Vessel General Permit (VGP) and the small Vessel General Permit (sVGP). Recreational vessels as defined in section 502(25) of the Clean Water Act (CWA) are not subject to these permits. As part of the NPDES program, USEPA regulates incidental discharges from the normal operations of vessels under the CWA, Section 402. This includes ballast water, bilge water, gray water, and anti-fouling paints.

The VGP was renewed in 2013 and it regulates discharges incidental to the normal operation of commercial vessels greater than 79 feet in length operating in a capacity as a means of transportation. The VGP includes general effluent limits applicable to all discharges: general effluent limits applicable to 27 specific discharge streams; narrative water-quality based effluent limits for seven categories of contaminants; inspection, monitoring, recordkeeping, and reporting requirements; and additional requirements applicable to certain vessel types. The sVGP was adopted in 2014 and essentially has the same requirements as the VGP, but for vessels less than 79 feet in length.

Since the majority of vessels in the American River watershed are recreational vessels, the VGP and sVGP do not apply.

Water Quality Issues and Data Review

The primary constituents of concern related to recreational activities are microbials. This includes coliforms and protozoa. A review of these data in **Section 3** does not indicate that there is clear or persistent trend in the watershed of increased risk during periods of high recreational use. The Regional Water Board MST study showed that during dry weather there was little contribution of *E. coli* from humans.

The only water treatment plants that experienced seasonal increases in *E. coli* during the summer months were EID's Strawberry WTP and GSWC's Coloma/Pyrites WTPs. The levels at Strawberry WTP are all considered low and it is uncertain what the cause of this increase is, but recreation could contribute to the increase either directly or indirectly (such as through upstream reservoir releases for recreational purposes). The levels at the Coloma/Pyrites WTPs generally peak just before and after the peak recreational period, so it seems less likely that the elevated coliform levels are attributable to recreational activities.

Source Water Protection Efforts

"Keep Our Waters Clean" (KOWC) continues to increase awareness among local recreationalists about drinking water sources and the use of sewage pumpouts and restrooms. This program is run by the City of Sacramento Department of Utilities on behalf of a group of water agencies and other local organizations along the Sacramento and American rivers. The program was started in 2000 along the Sacramento River and was extended to the Folsom Lake and the Lower American River. Agency sponsors during the study period included the cities of Sacramento, Folsom, and Roseville, San Juan Water District (SJWD), CWD, EID, Folsom State Prison, GSWC, East Bay Municipal Utility District (EBMUD), and SCWA, among others.

The program utilizes several means of sharing information with recreationalists including: maps of sewage pumpout and restroom locations, brochures, promotional items, and participation in local outreach events. A sample of materials in included in **Appendix D**. Each year upwards of 5,000 brochures are distributed to the public. The program also creates partnerships with other organizations including other counties and jurisdictions, State and County Parks, educational outlets, boating and rafting businesses, and local marinas to help distribute information.

Program updates during the study period include:

- Updated website (https://www.cityofsacramento.org/Utilities/Water/Keep-Our-Waters-Clean),
- GIS map which shows boat launch locations, public restrooms, marinas, pumpout stations, used oil filter drop off locations, and pet waste stations,
- Social media outreach via the Facebook KOWC page (https://www.facebook.com/keepourwatersclean/?ref=aymt_homepage_panel),
- On-line radio ad, and
- Educational presentations at educational outlets such as the Effie Yeaw Nature Center and Sacramento Zoo.

WATERSHED 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. 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 provided by 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. The American River Water Utilities have established voluntary direct notification agreements and procedures to create additional assurance that each of the water treatment plants will receive notification in the event of a spill upstream of its intake. Spills from wastewater treatment and collection systems are discussed further in the Wastewater subsection later.

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 or power outages affecting wastewater treatment plant operations, but they can also occur during other seasons. Wastewater treatment plants and collection system pipelines are present in the watershed, see discussion in the Wastewater subsection later for more details.

Related Constituents

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

Presence in the Watershed

There is a tremendous number of roadways in the watershed, many of which cross either the rivers, creeks, or canals associated with the American River water supply. The main truck transportation routes through the watershed are Interstate 80, Highway 50, Highway 49, and portions of the Capital City Freeway and Interstate 5, shown on **Figure 2-1**. There is almost no restriction on transport of hazardous materials in the watershed. The greatest threat is near bridge crossings because of the immediate potential for spilled material to enter the river or canal system.

Union Pacific Rail Road (UPRR) owns and operates the railroad tracks that parallel Interstate 80 on the northern boundary of the watershed and the stub line from Sacramento to Folsom that parallels Highway 50, as well as tracks that cross the Lower American River near Sacramento. These railroad lines are used by UPRR and Burlington Northern and Santa Fe (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.

During the study period there were 230 spills reported to the Cal OES State Warning Center for discharge to the American River or a tributary. A complete list of all the reported spill events in the watershed during the study period is provided in **Appendix D**. Ninety-seven of these were related to wastewater, the rest were petroleum (98 spills), chemical (16 spills), other (13 spills), and unspecified (6 spills). The wastewater spills will be discussed later in the Wastewater subsection. Twenty-three of the remaining spills were considered to potentially be significant, due to the type of material discharged, amount of material discharged, or proximity of the discharge to a drinking water intake.

- January 7, 2018: AMPAC Fine Chemicals location in Rancho Cordova has a storage tote of toluene spill, which resulted in discharge to an onsite pond. Approximately 200 gallons were discharged. All the material was reportedly captured and contained prior to leaving the premises.
- March 22, 2018: EID had a distribution system failure that resulted in discharge of 75,297 gallons of treated drinking water into Folsom Lake.
- April 18, 2018: EID had another distribution system failure that resulted in discharge of 165,000 gallons of treated drinking water into Mound Springs Creek, which is tributary to the American River.

- June 4, 2018: California Highway Patrol (CHP) reported a vehicular accident that resulted in a tanker truck carrying 800 gallons of jet fuel to turn over and leak; it was unknown the quantity released and likelihood of reaching a surface water.
- January 2, 2019: Sacramento Regional Fire and Emergency Communications Center reported a home-made airplane had crashed into the American River leaking an unknown amount of jet fuel into the waterway.
- January 14, 2019: CHP reported an overturned tanker truck carrying aviation fuel along Interstate 80, east of Dutch Flat. It was unknown how much fuel had leaked, which was tributary to an unnamed creek tributary to the American River.
- August 5, 2019: CHP reported a vehicular fire that resulted in a tanker truck carrying several hundred gallons of diesel that leaked into storm drain.
- October 11, 2019: UPRR reported a leaking fuel car between Roseville and Reno, along Interstate 80 with the loss of 1,600 gallons of fuel.
- December 25, 2020: The National Response Center (NRC) reported a submerged vessel discharging petroleum products to the American River.
- January 21, 2021: CHP reported an overturned truck on Highway 50 near Fresh Pond. It is estimated to have released 100 gallons of diesel onto the road, with potential to reach an unnamed creek tributary to the American River.
- January 23, 2021: The NRC reported a submerged vessel discharging petroleum products to the American River at Discovery Park, an oil sheen is evident.
- February 18, 2021: Sacramento County Airports reported an airplane crash at Mather Airport, significant fire suppression foam and water draining into storm drain.
- May 22, 2021: Sacramento County Environmental Health reported a warehouse fire with significant fire suppression resulting in contaminated water discharging to storm drain.
- July 10, 2021: City of Sacramento Drainage reported a green water discharge from Sump 101 to American River, discharge ceased. Believed to be soap from a car wash facility.
- July 16, 2021: The NRC reported a submerged vessel discharging petroleum products to the American River at Highway 160 bridge, an oil sheen is evident.
- July 25, 2021: City of Sacramento Police Department reported a submerged vessel discharging petroleum products to the American River at Discovery Park, an oil sheen is evident.
- August 17, 2021: CHP reported a big rig truck fire on Interstate 80 at Gold Flat. It is estimated to have released 400 gallons of diesel onto the road and to an unnamed creek tributary to the American River.
- July 1, 2022: CHP reported a vehicular accident and fire on Highway 50 at Kyburz. It is estimated to have released an unknown amount of diesel onto the road and an unnamed creek tributary to the American River.
- July 28, 2022: The NRC reported a submerged vessel discharging petroleum products to the American River at Highway 160 bridge, an oil sheen is evident.
- September 21, 2022: City of Sacramento Drainage reported an oil smell and sheen at Sump 111 to American River, pumps shut down.

- September 22, 2022: Sacramento Metropolitan Fire Department reported two vandalized truck fuel tanks resulting in 200 gallons of diesel discharged to Chicken Ranch Slough, tributary to the American River.
- October 5, 2022: The California Department of Fish and Wildlife (DFW) reported an oil sheen in Hangtown Creek in Placerville, tributary to the American River.
- October 15, 2022: The NRC reported a submerged vessel discharging petroleum products to the Lower American River, an oil sheen is evident.

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 near Colfax and Blue Canyon.

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 four CUPAs governing discharges that enter the watershed: El Dorado County Environmental Management, Placer County Environmental Health, City of Roseville Fire Department, and Sacramento County Environmental Management Department. They are responsible for the following local "unified programs":

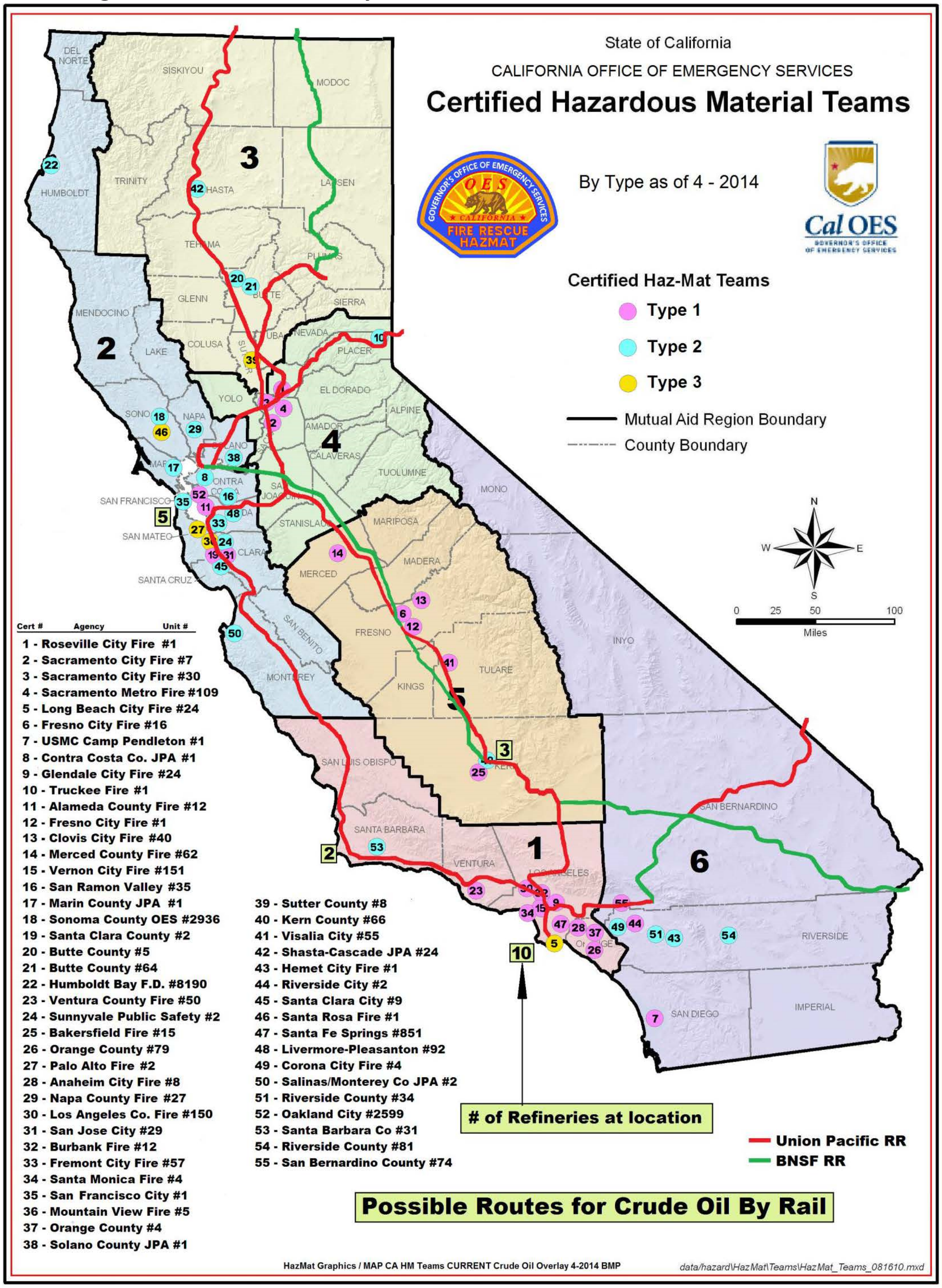
- Hazardous Materials Release Response Plans and Inventories
- California Accidental Release Prevention Program
- Underground Storage Tank Program
- Aboveground Petroleum Storage Act Program
- Hazardous Waste Generator and Onsite Hazardous Waste Treatment (tiered permitting) Programs
- California International 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. Cal OES expects a significant increase in the quantity of oil being delivered in to California by rail. The oil is coming from increased drilling in Canada and North Dakota. Cal OES projected quantities between 150 and 200 million barrels annually. The oil being shipped from Canada and North Dakota, 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 through them. 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 4-22**.

Figure 4-22. Cal OES Oil By Rail Routes and Hazardous Materials Teams



There is one transporter in the American River watershed: UPRR. 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.

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 4-23 illustrates the decision-making process for determining emergency response notification requirements if an incident occurs. **Figure 4-24** 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 4-23. Cal OES State Warning Center Notification Determination

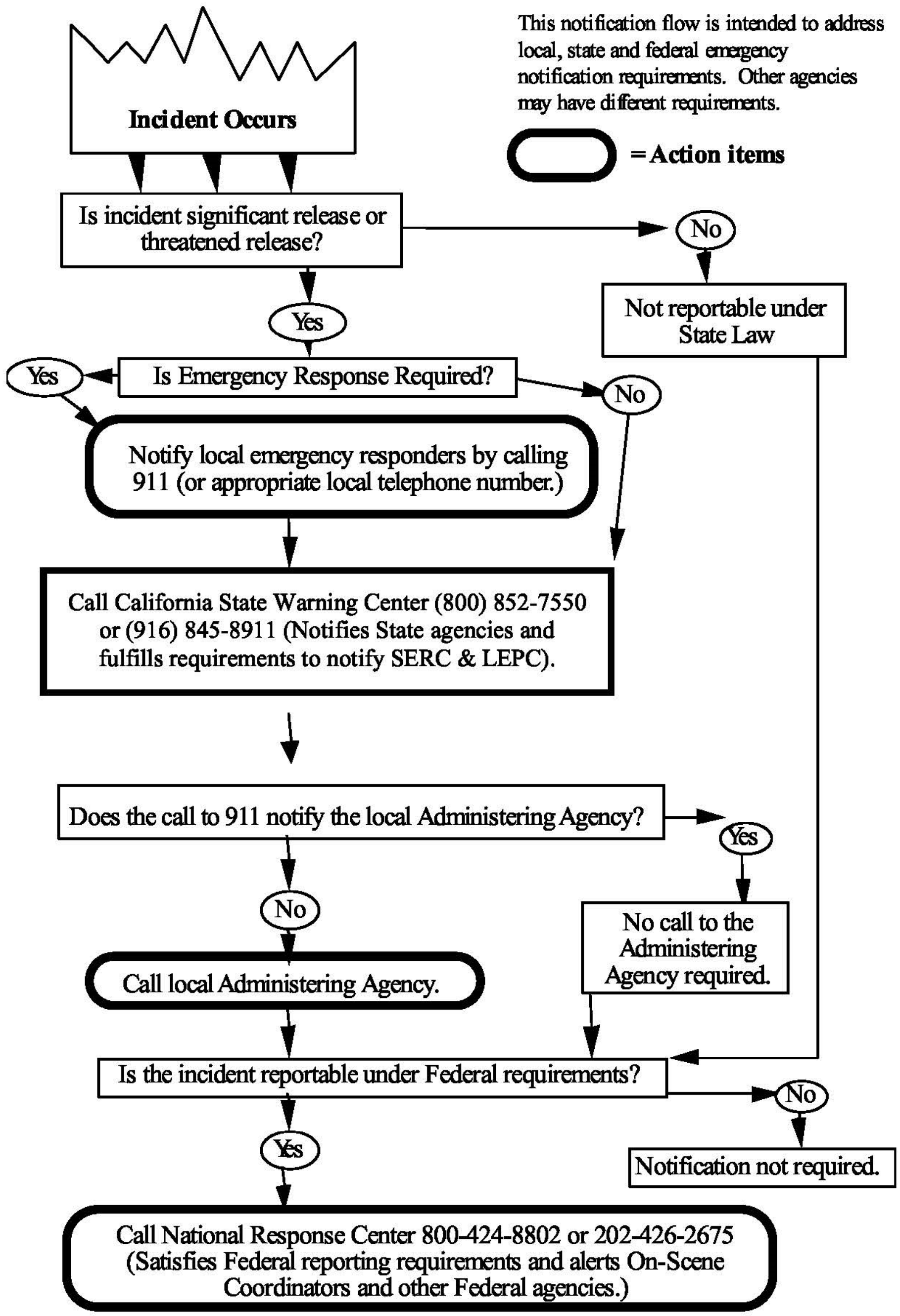


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Figure 4-24. Cal OES State Warning Center Notification Flow Decision Tree

Notification Flow Decision Tree

Spill notification to Cal OES from industry or response agencies → **California State Warning Center**

1. Receive report and copy info to a "*Spill Report Form*"
2. Notification within Cal OES → **Cal OES** Region(s), Hazardous Materials Section, Fire & Rescue Branch, & Executive Duty Officer
3. Notify via Cal EOC, email, phone, and/or page the following agencies:

Local Agencies

- CUPA/AA/PAs
- County OES
- East Bay Regional Park
- UC Santa Barbara

State Agencies

- Air Resources Board
- California Highway Patrol
- Cal FIRE
- Cal OSHA
- California Department of Transportation
- California Coastal Commission
- California National Guard
- Emergency Medical Services Authority
- Department of Fish and Wildlife, Office of Spill Prevention & Response
- Department of Food & Agriculture
- Department of Public Health - District Office
- Department of Parks & Recreation
- Department of Pesticide Regulation
- Department of Toxic Substances Control
- Department of Water Resources
- Division of Oil, Gas, & Geothermal Resources
- Public Utilities Commission
- Regional Water Quality Control Board
- State Water Resources Control Board
- San Francisco Bay Conservation & Development Commission
- State Lands Commission
- Nevada State Emergency Operations Center

Federal Agencies

- National Response Center
- U. S. Coast Guard
- U. S. Environmental Protection Agency
- U. S. Fish and Wildlife Services
- Bureau of Safety and Environmental Enforcement
- Federal Emergency Management Agency
- U.S. Department of Agriculture Forest Service
- U.S. Department of Health & Human Services
- U.S. Air Force
- U.S. Army
- U.S. Marines
- U.S. Navy

NOTE: *Agency notifications are made according to Warning Controller Procedures, which are based on current laws and regulations, pre-determined criterion, and agreements made between Cal OES and the agencies that want to be notified.*

***** Not intended to be all inclusive or applicable for all incidents *****

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State Water Board/Regional Water Board

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

Notification Requirements for Cal OES Notification to the State Water Board/Regional Water Board: Immediate verbal notification is required by the Cal OES State Warning Center to the Regional Water 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 DTSC, designate sites for disposal of hazardous materials.
- Assist DDW in advising water users of potential adverse impacts of a spill.

State Water Board, Division of Drinking Water

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 Water 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 Water 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:

http://w3.calema.ca.gov/operational/malhaz.nsf/$defaultview

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. SB 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 being 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 will be 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 impact 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 Lower American River. They plan to include information on the participating water agencies' intakes.

Water Quality Issues and Data Review

A review of the available water quality data, as presented in **Sections 3** and **5** showed that samples collected did not coincide with the watershed spills in the RIMS website. Also, none of the water treatment plants had detects of organic constituents. A separate discussion is presented in the Wastewater subsection later for the wastewater related spill events.

Source Water Protection Efforts

Subsequent to the 1998 Update, the American River Water Utilities established a voluntary river spill notification program. This is an active program and consists of direct notification and inter-notification agreements, a notification chart, and a protocol for maintaining and implementing the program. The Lower American River participating water utilities also conduct a voluntary river spill notification program, which is coordinated with the American River program. The on-going maintenance of these programs includes updating contacts and notification charts, and implementing test events. The current notification charts for both programs are provided in **Appendix D**.

Direct notification agreements have been made with the three CUPAs serving the watershed, two wastewater treatment plants, five wastewater collection systems, six other emergency response organizations, and two additional maintenance organizations. As part of the agreements with Placer County Office of Emergency Services, Sacramento City Fire and Police Departments, Sacramento Regional Fire/EMS Communications Center Dispatch, and California Department of Transportation (Caltrans), maps were developed to assist those agencies in determining if a spill was located in the areas of concern for the participating water utilities.

The City of Sacramento and CWD have created a River Travel Time tool to assist in roughly estimating travel times for spills on the Lower American River. The tool materials can also be used to estimate concentrations and provide resources for response. The tool was further developed in more recent years by the City of Sacramento for the Lower American River and the Sacramento River. In addition, the City of Sacramento has developed numerous documents and tools for its water treatment plant operators to assist in locating spills, waterways, and wastewater treatment plants. The City of Sacramento shares about these materials with other local water utilities participating in the American River, Lower American River, and Sacramento River voluntary river spill notification programs, as well as distributes many of these resources to these utilities.

STORMWATER RUNOFF

Background

There is little urban land use in the upper watershed, above Folsom Lake, while the majority of the watershed below Folsom Lake is highly urbanized. A portion of the greater Sacramento metropolitan area, including Folsom, Rancho Cordova, Fair Oaks, Carmichael, Citrus Heights, and Sacramento City and County, discharges urban runoff to the American River and its tributaries year-round. Upstream urban areas, including Auburn, Placerville, and El Dorado Hills, also discharge urban runoff to the American River and its tributaries. Future urbanization of additional land within the American River watershed will change the relative contribution of urban runoff volume compared to other land use runoff volume. Constituent loadings may also change, but these changes will be dependent on the constituent and the type of land use replaced by urbanization.

Seasonal Patterns

Runoff occurs on a year-round basis and includes wet and dry weather flows. Wet weather runoff resulting from seasonal winter 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 are one of several sources of microorganisms, turbidity, and TOC. It can contain volatile organic compounds (VOCs) and synthetic organic compounds (SOCs). Urban runoff from municipal separate stormwater 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 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

Although stormwater discharges from non-urban runoff and urban runoff occurs throughout the entire watershed, this section focuses on the permitted discharge of stormwater and urban runoff through State Water Board and Regional Water Board regulatory programs. The State Water Board's CIWQS database was queried to identify the number of currently active stormwater permittees in the watershed in the various programs.

In the American River watershed there are two NPDES Municipal Stormwater Phase I permits that manage urban runoff; the Region-Wide General Permit for Discharges from Municipal Separate Storm Sewer Systems and the Statewide Caltrans. The new Region-Wide General Permit Phase I NPDES permit has replaced the Sacramento Stormwater Quality Partnership (SSQP) NPDES permit and each participant now is an enrollee with an individual permit. The SSQP participants discharging urban runoff to the American River system, cities of Sacramento, Folsom, Citrus Heights, and Rancho Cordova, as well as Sacramento County, are individually responsible for compliance but continue to work together on some aspects of the SSQP, including: Monitoring and Target Pollutant Program, Regional Public Outreach Program, Regional Commercial/Industrial Program, New Development Element, and the Reasonable Assurance Analysis.

Under the Municipal Phase II Permit, there are eight city, county, or census designated places designated in the watershed, a decrease of two since the 2018 Update. Two El Dorado County communities were moved into the County program. **Table 4-23** provides a summary of all of the designated Phase II permittees located within, or partially within, the American River watershed upstream of the confluence with the Sacramento River.

Table 4-23
Phase II Stormwater Permittees in the American River Watershed

County, City, or Census Designated Place
City of Auburn
Placer County
City of Placerville
El Dorado County
California Department of Corrections – Folsom
California State University Sacramento
California Exposition and State Fair
California National Guard

Caltrans also had 12 individual NPDES permits under the State's Construction General NPDES Permit program in the watershed during the study period. These numbers change frequently as construction projects open and close. Under the Construction General Permit program there were 363 sites that acted upon an NOI during the study period. These ranged in size from less than 1 acre to 10,000 acres (the French Meadows Restoration Project previously discussed in the Forest Activities section), with a median size of 7.26 acres. Lists are provided in **Appendix D**. Finally, there are 203 NPDES permits under the State Water Board's Industrial General Permit program located throughout the watershed, however only 101 of these permits are recently listed as active. These ranged in size from less than 1 acre to over 13,000 acres (the terminated Big Cut Mine in El Dorado County), with a median size of 1.5 acres. A list is also provided in **Appendix D**.

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 an 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, development and 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 that disturb one or more acres of land.

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 Water 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 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.

Caltrans

The entire watershed encompasses numerous state highways and roads that are regulated for stormwater discharge by the State Water 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 Water 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 Water Board Order No. 99-06-DWQ, beginning July 1999. The permit does not establish numeric effluent limitations for stormwater. Therefore, this permit allows Caltrans to implement BMPs to comply with the requirements of this permit. Caltrans has a Stormwater 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 also received a renewal of its statewide NPDES permit on September 19, 2012 (2012-0011-DWQ). This Permit became effective in July 2013, and has been amended four times during the study period 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 Water 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. None of these are located in the American River watershed. The order is effective January 2, 2023, outside of the study period.

<u>Sacramento Stormwater Quality Partnership</u>

The greater Sacramento metropolitan area (including portions of the cities of Sacramento, Folsom, Citrus Heights, and Rancho Cordova, as well as the urban unincorporated area of Sacramento County) discharges urban runoff to the American River system. There are 43 direct discharge points within the City of Sacramento, plus additional discharges from the County of Sacramento and other private or industrial sites upstream, to the Lower American River. A few of the drainage basins with direct discharge are relatively small, self-contained basins. Many, however, include multiple sub-basins and/or a network of urban creeks.

Management of Sacramento area urban runoff began in 1989 as a cooperative effort between Sacramento County, the City of Sacramento, and the smaller cities within the County to address stormwater pollution through a county-wide NPDES Phase I stormwater permit. The permit can be renewed every five years or otherwise administratively extended. During the study period, the SSQP was permitted under three different orders; Order No. R5-2008-0142, Order No. R5-2015-0023, and General Order No. R5-2016-0040-ms4. Regional activities for the SSQP include the Monitoring Program, the Target Pollutant Program, Regional New Development Program, Regional Public Outreach, the Regional Commercial/Industrial Program, and Overall Program Effectiveness Assessments.

Order No. R5-2015-0023 was a Limited-Term NPDES permit that expired on October 17, 2016 and contained many of the same provisions as the previous order. The Monitoring and Reporting Program (MRP) of Order R5-2015-0023 included provisions that allowed the SSQP to participate in the Delta Regional Monitoring Program (RMP) and “request a reduction in some of the local water quality monitoring specified in the MRP”. The local water quality monitoring defined in the MRP includes river, urban tributary, and urban discharge monitoring. The MRP allowed the SSQP to propose an alternative monitoring plan for urban tributary and discharge monitoring that allowed modifications to the monitoring locations, sampling method and frequency, and constituents with Executive Officer approval. In August 2015, the Regional Water Board Executive Officer approved a reduction in local water quality monitoring (only applied to river and urban tributary monitoring) conducted by the SSQP in exchange for Delta RMP participation and funding. Participation in the Delta RMP also required approval from the Delta RMP Steering Committee. The approval included discontinuation of all river sample sites and a reduction in urban tributary monitoring frequency to once per five years for three sites (done in FY2017/2018 and FY2021/2022). Also in August 2015, the Regional Water Board Executive Officer approved the SSQP FY2015/2016 Alternative Monitoring Plan, as allowed in the MRP. Per the approved Alternative Monitoring Plan, a reduction in Willow Creek and Laguna Creek monitoring frequency was approved for one year with implementation of a continuous sensor pilot study at Arcade Creek. In place of monitoring of Sump 111 and Strong Ranch Slough, a continuous sensor pilot study was approved at Natomas Basin No. 4. Once the FY2015/2016 Alternative Monitoring Plan was completed, the SSQP continued long-term monitoring at five year intervals at the three urban tributary sites (Arcade, Willow, and Laguna creeks), and 2 out of 3 years for the three urban discharge sites (Sump 111, Strong Ranch Slough, and Natomas Basin No. 4).

The Region-Wide Stormwater Permit for all Phase I permittees in the Central Valley, Order No. R5-2016-0040-ms4, became effective October 1, 2016. Phase I communities can submit an NOI to comply with the new order when their existing permits expired. All of the SSQP permittees submitted NOIs in November 2016 and have converted to this new region-wide permit. Each permittee must meet all the requirements of the General Order. The new order requires each permittee to develop a SWMP and corresponding Work Plan that utilizes the pollutant prioritization approach, or else a prescriptive approach will apply. The process consists of six overarching steps: assessment, prioritization, development/ modification, implementation, effectiveness assessment and reporting, and adaptive management. The SWMP will continue to include similar elements as previously addressed: illegal connections/illicit discharges, construction runoff, industrial/commercial runoff, public involvement, and planning and land management. Monitoring requirements will be site-specific and consider historical monitoring data. Permittees outside the legal Delta are encouraged to participate in the Delta RMP.

The permittee must identify the highest priority water quality constituents (PWQCs) within its jurisdictional runoff area that will be addressed by the SWMP. Permittees are required to submit annual reports, as well as a mid-term report in year 3 and an end-term report in year 5 of the permit. The permittees submitted a Reasonable Assurance Analysis in July 2019 to identify the highest PWQCs within its jurisdictional runoff area that will be addressed by the SWMP. The Reasonable Assurance Analysis has not yet been approved by the Regional Water Board. The 2016-2019 Mid-Term Report was submitted in November 2019. The 2019-2021 End-Term Report was submitted in November 2021.

To comply with Order No. R5-2008-0142, the SSQP permittees developed a Stormwater Quality Improvement Plan (SQIP) that describes the stormwater pollution prevention activities to be undertaken. This includes permittee specific elements such as construction activities, illegal discharges, industrial activities, municipal operations, outreach, and new development. The SQIP also includes joint activities, including: target pollutant reduction strategies, a water quality monitoring program, special studies, regional public outreach and education, a regional commercial/industrial program, new development program, and program effectiveness evaluation. The permittees last revised their SQIP in 2009, with modifications in subsequent Annual Reports and Workplans. The permittees expect to update this SQIP based on the Reasonable Assurance Analysis and submit it as the SWMP under the new NPDES permit.

The SSQP completed its Stormwater Quality Design Manual in July 2018. Planning jurisdictions in the Sacramento County area began implementing these new development and redevelopment standards on July 1, 2018 to incorporate treatment control, source control, low impact development (LID), hydromodification, and trash control measures. These design standards are expected to decrease runoff generated and the export of contaminants from new development and redevelopment projects and mitigate contaminants' loading for many constituents when compared to previous land use.

The BMPs of particular interest to source water quality are:

- BMPs that seek to address pollutants at the sources, such as eliminating spills and dumping through storm drain marking, public outreach, and an illicit discharge program.
- BMPs that provide education: stormwater compliant pressure washer program through the Business Environmental Resource Center, recreational behavior through the Keep Our Waters Clean campaign, general behavior through regional media campaigns, Creek Week, Our Water Our World, and Water Smart Car Wash.
- BMPs that address fecal waste: an illicit connection program, pet waste public education and programs to maintain dog waste dispenser stations in parks developed in coordination with parks and recreation departments and districts, inspection of kennel facilities, street

sweeping, and sump cleaning. This includes funding of the "Pups in the Park" and "Scoop the Poop" pet waste cleanup programs.

- BMPs that address TOC: detention basins, bioretention planters, and grassy swales; street sweeping; sump cleaning; erosion and sediment control at construction sites; public education for landscape management (River Friendly Landscaping and Rain Garden rebate programs); and containerization of green waste in many parts of the greater Sacramento urban area. The City of Sacramento includes mandated containerized yard waste collection with loose-in-the-street pickup during the fall leaf season (November 1 through January 30) each year.
- Other BMPs to reduce constituents in urban runoff through watershed-based public education and outreach include promotion of proper pet waste disposal and use of less toxic pesticides via television ads, radio ads, online ads and billboards, participation in the Sacramento Area Creek's Council Annual Creek Week events, four workshop events focused on the use of less toxic pesticides, and funding school education programs, including the awarding-winning "Splash."
- Implementation of new development, as well as redevelopment, source controls, treatment controls, hydromodification management measures, and Low Impact Development (LID) BMPs. The goal of the source control measures is to prevent pollutants from contacting site runoff, while the treatment controls treat and remove pollutants from site runoff. LID measures are designed to help reduce the site runoff volume and supplement the hydromodification management measures, which are designed to attenuate the increased site runoff and discharge it to the receiving water body at a controlled rate. An example of LID implementation is a joint project with California State University Sacramento to retrofit areas of the campus with LID measures and river friendly landscaping.
- Funding of Community Action Grants to projects whose goal is to improve the quality of local creeks, rivers and watersheds within the City of Sacramento. This establishes working partnerships with the local community, fosters environmental stewardship to assist in meeting pollution prevention goals, and targets teachers, neighborhood and volunteer groups, environmental organizations, and other non-profit associations. Sacramento County has a similar grant program that provides financial assistance to schools within the unincorporated County.

The target pollutant reduction program has led to creation of reduction strategies for several constituents including sediment, pesticides, mercury, lead, copper, and pathogen indicators. These remain in place under the new NPDES permit for all Phase 1 permittees in the Central Valley. Sediment control is a key strategy for controlling sediment bound pollutants, including metals, and sediment is addressed through new development standards, construction BMPs, street sweeping, and basin/drain cleaning. A Partnership Sediment Strategy was finalized in 2012. In 2004, a Fecal Waste Reduction Strategy was completed which continues to be implemented. Efforts have included implementation of BMPs that help to eliminate or reduce fecal matter in the storm drain system, including investigation and elimination of sanitary sewer cross connections, control of sanitary sewer overflows, street sweeping, and cleaning of the storm drainage system infrastructure; prohibition of discharges of pet waste into the storm drain; inspection of kennels for appropriate waste handling procedures; outreach to increase appropriate disposal of pet waste; and workgroup meetings to review current status of coliform/pathogen control efforts in the state. A comprehensive Pesticides Plan, approved in 2006, is being implemented, which includes education and outreach related to integrated pest management and initiatives to better protect urban water bodies through more effective regulation of pesticides at the state and national level.

With participation in the Delta RMP, the permittees have ceased river monitoring and reduced the frequency of urban tributary (creek) monitoring under the NPDES permit required joint monitoring program during the study period. Urban tributary monitoring included sampling at one urban creek in the watershed (Willow Creek). Constituents of interest include *E. coli*, TOC/DOC, metals, organics, and pesticides. Two urban runoff characterization sites were also monitored, at reduced frequency from historic monitoring, in the watershed (Strong Ranch Slough and Sump 111). Constituents of interest include *E. coli*, TOC/DOC, metals, organics, and pesticides. The urban tributary and urban runoff data is discussed further in the Water Quality Issues and Data Review subsection.

The Statewide Trash Provisions implementation is large effort for all participants and was started in 2018. Each agency submitted an individual Trash Implementation Plan.

<u>Phase II MS4s</u>

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 American 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 Water 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. This permit generally has more extensive requirements than the previous permit, and a few significant items are:

- SWMPs will no longer be required; dischargers will use guidance documents developed by the Regional Water Board,
- Development of a program effectiveness evaluation,
- Requirements focus on post-construction water quality issues,
- Encourages the use of low impact development,
- Targets high priority waterbodies,
- Dischargers will use the Stormwater Multiple Application and Report Tracking System (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 American 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. This 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 provides 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 (application to the central City of Sacramento). This permit was set to expire in 2014, but has been administratively extended until a new order is adopted.

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 limitations for pH and turbidity at Risk Level 3 / Linear Underground/Overhead Project Type 3 construction sites contained in Order 2009-0009-DWQ are no longer in effect. These were removed on December 27, 2011 in accordance with a judgment by the Superior Court, under Order No. 2012-0006-DWQ.

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.

In 2012 the State Water Board proposed amendments to the Construction General Permit. The State Water Board began the reissuance process again in 2020, with public workshops throughout the year, and resulted in a preliminary staff draft NPDES permit published in November 2020 and a draft NPDES permit in May 2021. The draft Construction Stormwater General Permit incorporated:

- New requirements to implement existing Total Maximum Daily Loads adopted by Regional Water Boards into applicable Basin Plans;
- New regulation of passive treatment technology uses and discharges from dewatering activities;
- New criteria for Notices of Non-Applicability;
- Efficiency to the existing Notice of Termination process;
- Requirements to implement the California Ocean Plan and the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries, including the statewide Trash Provisions;
- Updated requirements for demolition activities;
- Updated water quality sampling requirements per the federal Sufficiently Sensitive Test Methods Rule; and
- Updated monitoring and reporting requirements.

The State Water Board adopted 2022 Construction Stormwater General Permit (Order No. 2022-0057-DWQ) on September 8, 2022, and has an effective date of September 1, 2023, outside of the study period.

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 Water 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 Water Board adopted an updated General Permit for Stormwater Associated with Industrial Activity (Order 2014-0057-DWQ). In 2018 the State Water 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), TOC, pH, and electrical conductivity. Additional parameters can be added based on the Standard Industry Code of the facility.

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 (ERAs): 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.

Total Maximum Daily Loads

Section 303(d) of the Clean Water Act requires states to develop a list of impaired water bodies and a priority ranking for addressing impairments. This list is updated every two years. Impairments are addressed by developing TMDLs for that water body. A constituent could be identified for a TMDL, if beneficial uses in water quality segments are impaired because of that constituent. There are two existing TMDLs of interest to drinking water that include portions of the American River watershed: Sacramento County Urban Creeks Diazinon and Chlorpyrifos TMDL and Central Valley Pyrethroid Pesticide TMDL.

There is a TMDL for diazinon and chlorpyrifos in six Sacramento area urban creeks, including Strong Ranch Slough and Chicken Ranch Slough, which are tributary to the Lower American River (Order No. R5-2014-0041). There is also a TMDL for Pyrethroids in the Sacramento and San Joaquin River basins, including Strong Ranch Slough and Chicken Ranch Slough, which are tributary to the Lower American River (Order No. R5-2017-0057). These TMDLs have been set based on aquatic life considerations. These are well below levels of concern for human health. A TMDL is adopted through a Basin Plan amendment to include site-specific numerical objectives, water quality management strategies to reduce runoff, monitoring, and a plan to reduce levels in the water bodies. Once adopted, TMDLs are also implemented by establishing requirements in regulatory instruments such as NPDES permits, including stormwater permits.

In addition, the 2016 303(d) listing from the Regional Water Board included a new listing for indicator bacteria on the Lower American River and it still persists. This will trigger development of a TMDL, which is proposed to be completed by 2027.

Water Quality Issues and Data Review

Stormwater runoff contains many types of contaminants. The extensive monitoring of Sacramento urban runoff has shown that levels of a few metals and a few pesticides in urban runoff are of concern from an aquatic toxicity viewpoint; but most metals, VOCs, and SOCs in urban runoff are generally below drinking water levels (see **Section 3** for additional discussion). Therefore, VOCs and SOCs in urban runoff are generally of lower interest from a drinking water perspective. However, the levels of coliform are definitely of concern as an indicator for fecal contamination and organic carbon, and a constituent potentially of interest is total iron.

Sacramento Stormwater Quality Partnership

The SSQP has a monitoring program that includes receiving water monitoring where rivers, creeks, and urban runoff discharge are sampled during three wet and one dry events. The urban creek site tributary to the American River (Willow Creek) had few detected concentrations above water quality objectives of interest to drinking water. The urban runoff monitoring stations that discharge to the American River are Sump 111 and Strong Ranch Slough and are monitored in two of every three years. Detections above water quality objectives are not violations of an MS4 permit. These exceedances require follow-up by the permittees to determine if urban runoff is contributing to the exceedance and if so, to identify control measures to address the exceedances unless measures are already in place.

The 2021 End-Term Report included a Cumulative Monitoring Report, which presented summary statistics for the urban tributary and urban runoff monitoring conducted between 2016 and 2021. Since this roughly corresponds to this 2023 Update study period, the summary was used to generally characterize the urban tributary and urban runoff sites.

Urban tributary monitoring included sampling at Willow Creek in FY2017/2018 and FY2021/2022. This included three wet events and one dry event, for a total of four samples. Detectable constituents of interest include *E. coli*, TOC/DOC, metals, organics, and pesticides. The urban tributary monitoring resulted in high levels of some drinking water constituents that were present, with peaks of *E. coli*, organic carbon, and iron that can be significant. **Table 4-24** presents a summary of the data collected for these constituents during this permit term. The urban tributary site had detects above water quality objective levels, but these are not permit violations.

Generally, the wet weather samples represented higher concentrations of the selected constituents. Also, it can be seen that *E. coli* levels in the urban tributary during the wet season are much higher than the mainstem Lower American River. Organic carbon is almost entirely present in the dissolved form in Willow Creek, regardless of event type. The total iron levels are above the MCL (300 ug/L) during all sample events, but significantly more during wet events.

Table 4-24
SSQP Willow Creek Urban Tributary Permit Term Summary Statistics
(2016 – 2021)

Constituent	Sample Type	Median	Mean	Minimum	Maximum
E. coli (MPN/100 mL)	All	420	550	45	1,300
	Dry	45	45	45	45
	Wet	450	720	400	1,300
DOC (mg/L)	All	3	3.7	2.3	6.5
	Dry	2.3	2.3	2.3	2.3
	Wet	3.1	4.1	2.8	6.5
TOC (mg/L)	All	3.1	3.8	2.4	6.8
	Dry	2.4	2.4	2.4	2.4
	Wet	3.2	4.3	3	6.8
Total Iron (ug/L)	All	1,200	1,300	530	2,200
	Dry	530	530	530	530
	Wet	1,500	1,500	860	2,200

Urban runoff monitoring included sampling at Strong Ranch Slough and Sump 111 in FY2017/2018, FY2018/2019, FY2020/2021, and FY2021/2022. This included 12 wet events and 4 dry events, for a total of 16 samples. Constituents of interest include *E. coli*, TOC/DOC, metals, organics, and pesticides. The urban runoff monitoring resulted in high levels of some drinking water constituents that were present, with peaks of *E. coli*, organic carbon, and iron that can be significant. **Table 4-25** and **4-26** present a summary of the data collected for these constituents during this permit term. The urban runoff sites had detects above water quality objective levels, but these are not permit violations.

The data show that the urban runoff sites have higher concentrations of contaminants than the urban tributary sites. The data show wide variability between the two urban runoff sites. Although both sites have elevated concentrations for each constituent, Strong Ranch Slough has higher concentrations of all the constituents in both dry and wet events. The same trend of wet season values being higher than dry season values in the urban tributary is evident in the urban runoff. The organic carbon is also generally present as dissolved carbon. Iron levels from Strong Ranch Slough are much higher than those from Sump 111.

Table 4-25
SSQP Strong Ranch Slough Urban Runoff Permit Term Summary Statistics
(2016 – 2021)

Constituent	Sample Type	Median	Mean	Minimum	Maximum
E. coli (MPN/100 mL)	All	9,000	130,000	450	1,600,000
	Dry	3,400	3,600	450	7,000
	Wet	12,000	170,000	2,700	1,600,000
DOC (mg/L)	All	8.3	20	4	150
	Dry	8.3	9.5	6.5	15
	Wet	8.6	24	4	150
TOC (mg/L)	All	8.8	20	4.4	140
	Dry	8.8	10	7.2	16
	Wet	9	23	4.4	140
Total Iron (ug/L)	All	1,900	2,100	140	6,400
	Dry	240	530	140	1,500
	Wet	2,200	2,600	800	6,400

Table 4-26
SSQP Sump 111 Urban Runoff Permit Term Summary Statistics
(2016 – 2021)

Constituent	Sample Type	Median	Mean	Minimum	Maximum
E. coli (MPN/100 mL)	All	3,800	41,000	200	240,000
	Dry	1,300	1,900	200	4,900
	Wet	8,600	54,000	490	240,000
DOC (mg/L)	All	5.4	17	1.9	90
	Dry	4.5	4.8	1.9	8.2
	Wet	7.4	21	2.2	90
TOC (mg/L)	All	6.2	17	2	95
	Dry	4.6	4.9	2	8.3
	Wet	7.4	22	2.2	95
Total Iron (ug/L)	All	800	1,200	150	4,200
	Dry	420	390	150	580
	Wet	960	1,500	540	4,200

The Cumulative Monitoring Report also presented some long-term charts for the constituents in urban runoff. The graphs for E. coli, DOC, TOC, and total iron are presented in **Figures 4-25 through 4-28**. The data show a slight increasing trend for *E. coli*, relatively stable levels for DOC and TOC, and a slight decreasing trend for total iron.

Figure 4-25. Long-Term Monitoring Results for *E. coli* in SSQP Urban Runoff

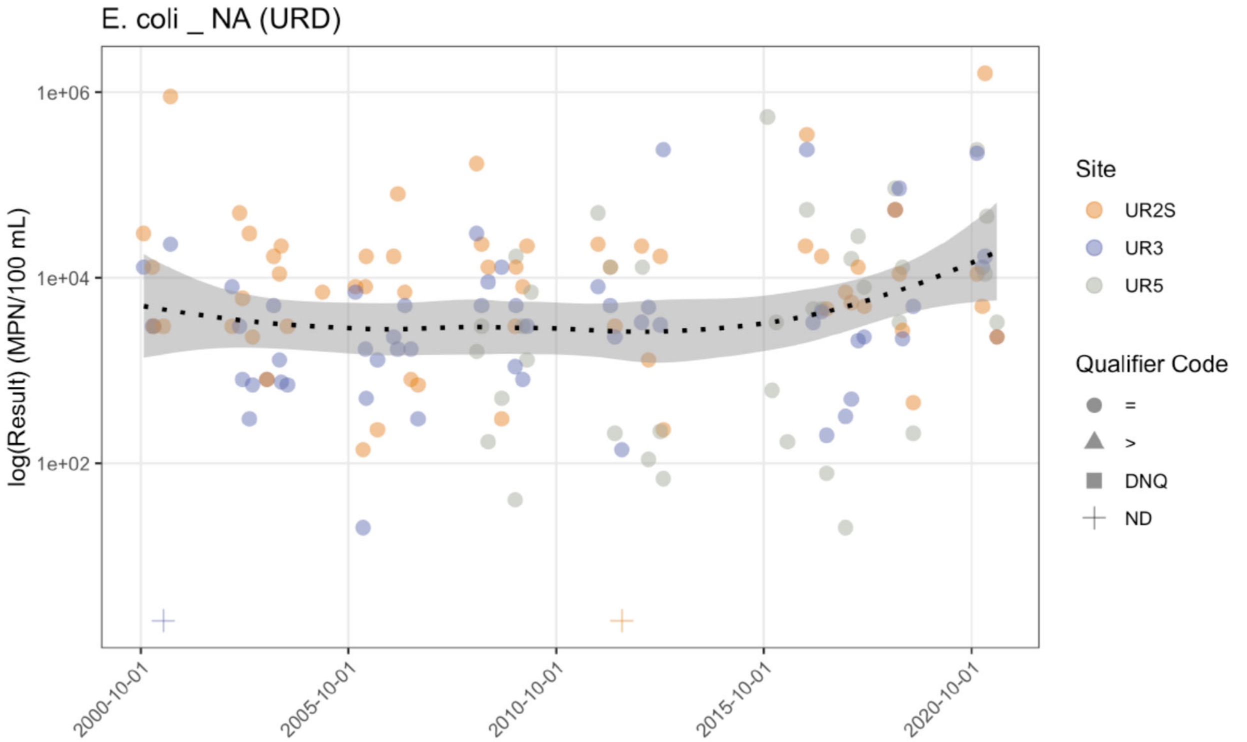


Figure 4-26. Long-Term Monitoring Results for DOC in SSQP Urban Runoff

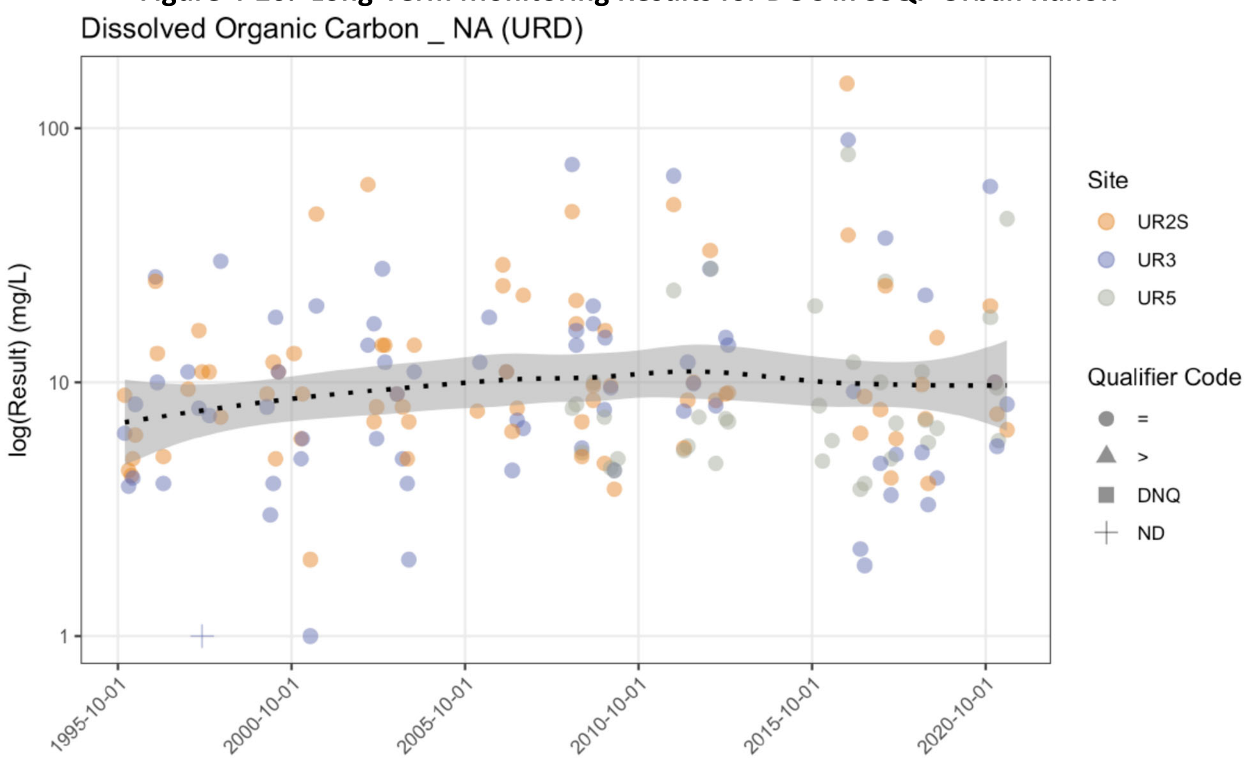


Figure 4-27. Long-Term Monitoring Results for TOC in SSQP Urban Runoff

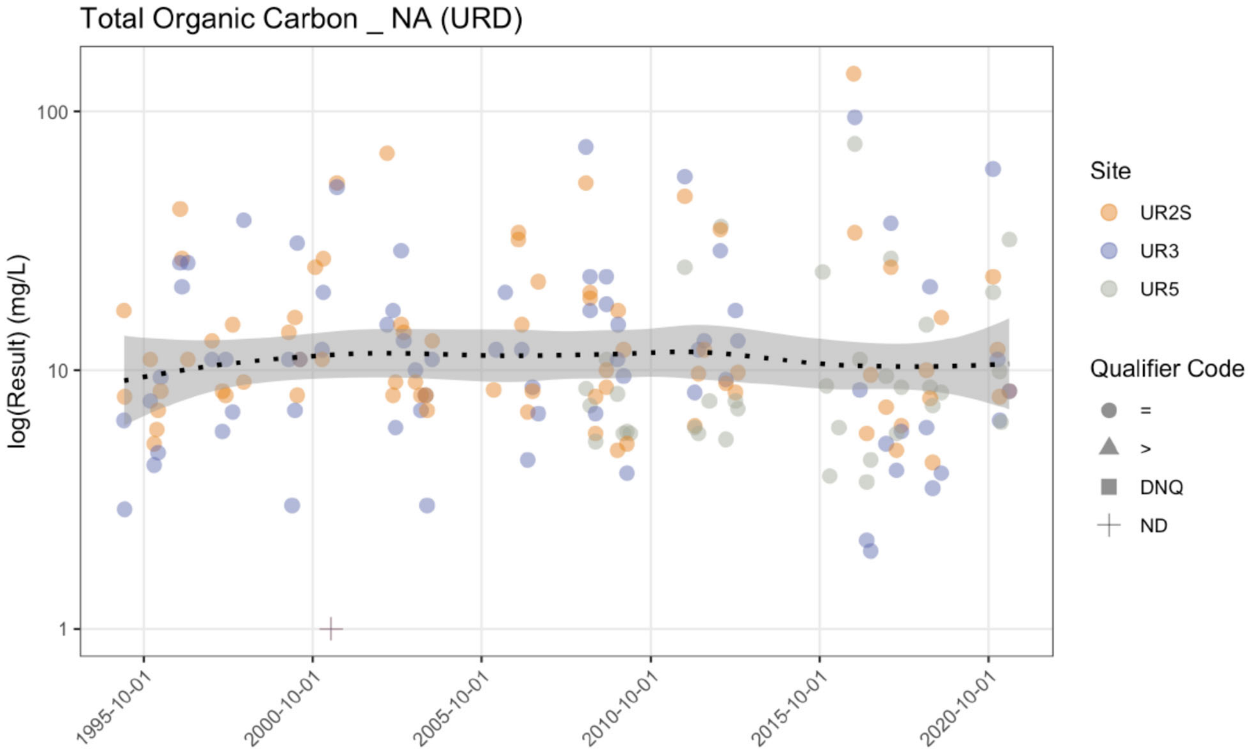
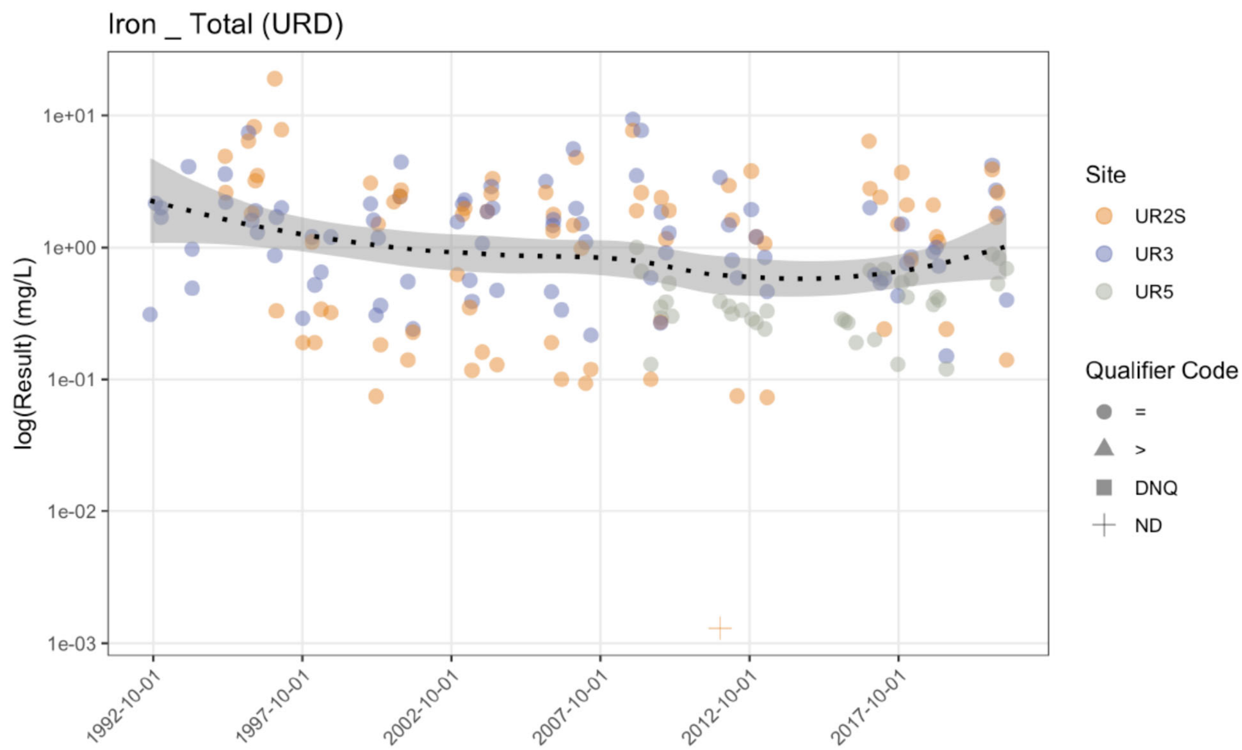


Figure 4-28. Long-Term Monitoring Results for Total Iron in SSQP Urban Runoff

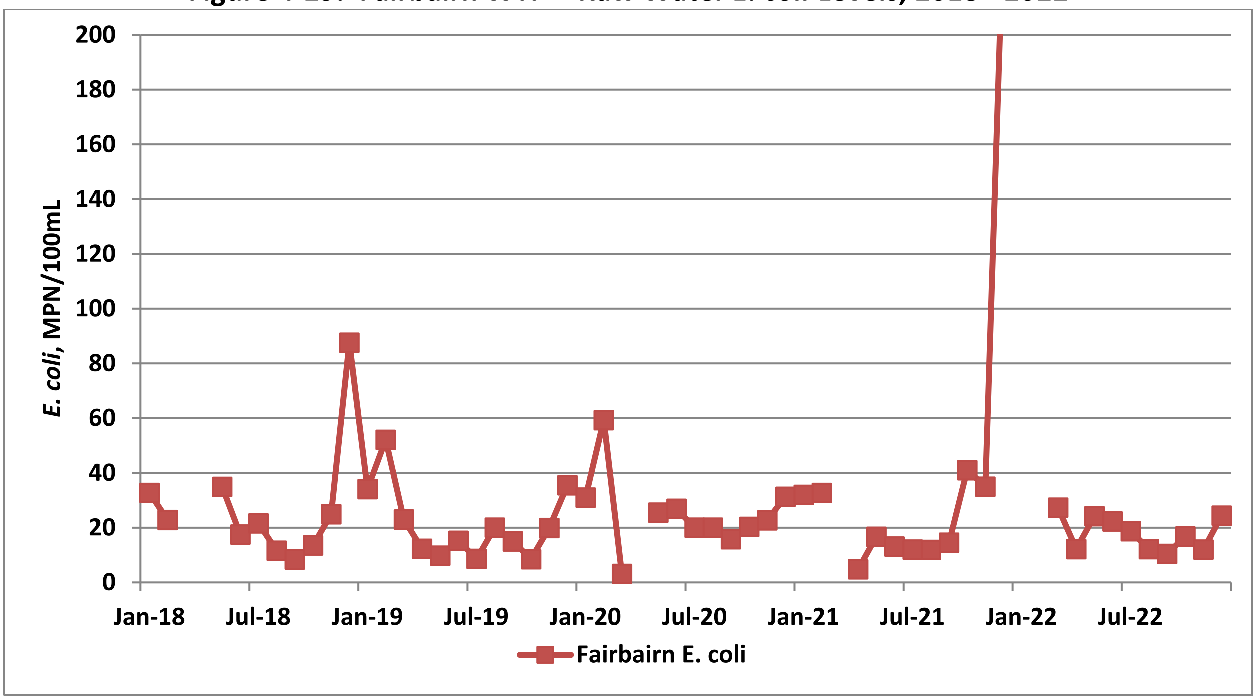


Water Treatment Plant Data

A review of the water quality data for the water treatment plants shows no detection of any of the organic constituents. Aluminum and iron are sometimes detected in the raw water and reported, but these are currently removed through treatment effectively and no MCL violations have occurred. TOC is monitored monthly at all the required water treatment plants. Fairbairn WTP had an average and median source water TOC level of 1.5 mg/L between 2018 and 2022.

E. coli is present at variable levels in all source waters. **Figure 4-29** provides a graph of *E. coli* levels at Fairbairn WTP. There is variability throughout the year, but the highest annual levels continue to consistently occur during the wet season, when general watershed runoff, the probability of sanitary sewer overflows, and the volume of urban runoff are highest.

Figure 4-29. Fairbairn WTP – Raw Water *E. coli* Levels, 2018 - 2022



Source Water Protection Efforts

The City of Sacramento and SCWA's source water protection and stormwater program staff coordinate and share information on an on-going basis.

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[6], 85 to 99 percent of heterotrophic bacteria[7], 92[8] percent of *Giardia* cysts, and 50[9] to 99[10] percent of *Cryptosporidium* oocysts. Wastewater discharges occur throughout 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. Sewage management in much of the upper watershed consists of individual onsite septic systems. 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. Septic systems are less susceptible to seasonal impacts as failures are typically related to improper design/installation, use, or maintenance and can occur throughout the year.

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[6] National Research Council, 1998. Issues in Potable Reuse: The Viability of Augmenting Drinking Water Supplies with Reclaimed Water. National Academy Press.
[7] Chauret, C. et al., 1999. Fate of *Cryptosporidum oocypts*, *Giardia cysts*, and microbial indicators during wastewater treatment and anaerobic sludge digestion. Canadian Journal of Microbiology, 45: 257-262.
[8] www.Rangelandwatersheds.ucdavis.edu/MWQIC/MWQIC/Indicators_Giardia_window.html.
[9] Robertson, L.J. et al., August 2006. Occurrence of *Cryptosporidium* oocysts and *Giardia* cysts in Sewage in Norway. Applied Environmental Microbiology, 72(8): 5297-5303.
[10] Stadterman, K.L, 1995. Removal and Inactivation of *Cryptosporidium* oocysts by activated sludge and anaerobic digestion. Water Science and Technology, 31(5-6): 97-104

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 SOCs. Many types of industrial effluent discharges are regulated by the wastewater treatment plants and must meet effluent limits set, including pretreatment if necessary.

Presence in the Watershed

There are only two permitted wastewater treatment plant dischargers in the American River watershed: the City of Colfax Wastewater Treatment Plant (WWTP) and the City of Placerville Hangtown Creek Water Reclamation Facility (WRF). These are shown on the Watershed Map; see **Figure 2-1**. There are numerous wastewater collection systems with some pipelines located within the watershed, including the cities of Colfax, Auburn, Placerville, Folsom, and Sacramento; EID; Folsom and California State Prisons; Sacramento State University; University of California (UC) Davis Health; Sacramento Regional County Sanitation District; and the Sacramento Area Sewer District.

Septic systems are potentially of concern are in El Dorado County upstream of the Strawberry WTP, along the South Fork American River, upstream of the Reservoir One WTP, along EID's canal system, and upstream of the GDPUD intakes, along their canal system.

City of Colfax Wastewater Treatment Plant

The City of Colfax owns and operates a wastewater treatment plant that discharges to an unnamed tributary of Smuthers Ravine, which discharges to Bunch Canyon, and then to the North Fork American River. The facility was covered under two NPDES permits during the study period (Order No. R5-2013-0045 and Order No. R5-2018-0012). The new permit rescinded the older permit, as well as the Cease and Desist Order (CDO) that was associated with it. The new permit further relaxed metals effluent limits by removing arsenic and manganese, as a result of the Reasonable Potential Analysis (RPA).

The City of Colfax has a biological nutrient removal treatment plant, including tertiary filters and ultraviolet (UV) light disinfection, with an average daily dry weather capacity of 0.275 mgd and a peak design capacity of 0.5 mgd. The permit approves a peak wet weather flow of 0.8 mgd for the Colfax WWTP. The facility also has a lined 59.7 million gallon (mg) storage reservoir. The City of Colfax completed a reservoir lining project to stop seepage; this included two lined equalization ponds and the lined storage reservoir. The new permit increased the average dry weather flow from 0.275 to 0.65 mgd, if the volume of storage in Pond 3 on July 1 is greater than 10 mg. This was permitted to allow further dewatering of the pond over the summer months in preparation of the following wet season.

The permit required an effluent characterization monitoring program to include four quarters of monitoring in 2020. This included a wide suite of constituents. There were no detectable results of concern for drinking water, in fact the average annual metals levels in the Colfax WWTP effluent were very low (aluminum – 21 ug/L, arsenic – 0.8 ug/L, iron – 40 ug/L, and manganese 14 ug/L). These all confirm the RPA findings for no effluent limits needed.

During the study period there were no ACLs issued to the City of Colfax for violations of effluent limits. During the study period there were no spill events that occurred from the Colfax WWTP.

City of Placerville – Hangtown Creek Water Reclamation Facility

The City of Placerville owns and operates the Hangtown Creek Water Reclamation Facility (WRF) that discharges to Hangtown Creek, which is tributary to Weber Creek, which then flows to the South Fork American River. The facility was covered under two NPDES permits during the study period (Order No. R5-2014-0015 and General Order No. R5-2017-0085-007). The City applied for coverage under the Municipal General Order in July 2018 and was issued a new order in August 2020. The older permit was rescinded by Order No. R5-2020-0036. The new permit relaxed effluent limits by removing lead and zinc and reducing other constituents, as a result of the Reasonable Potential Analysis (RPA).

Under both permits the Hangtown Creek WRF is permitted to discharge up to 2.3 mgd average dry weather flow, and 5.7 mgd wet weather flow, from the water reclamation facility. The existing treatment system provides tertiary treatment and includes upgraded primary, secondary, and tertiary treatment processes; effluent cooling; and anaerobic digesters for processing waste activated sludge.

The permit required an effluent characterization monitoring program to include four quarters of monitoring between 2021 and 2022. This included a wide suite of constituents. There were no detectable results of concern for drinking water, in fact the average annual metals levels in the Hangtown Creek WRF effluent were very low (aluminum – 12 ug/L, arsenic – <0.27 ug/L, iron – 28 ug/L, and manganese 20 ug/L). These all confirm the RPA findings for no effluent limits needed.

During the study period there was one ACL issued to the City of Placerville for violations of effluent limits, Order No. R5-2023-0512. This was for the period November 1, 2010 through December 31, 2022 and was for just a few violations related to turbidity, zinc, and ammonia. During the study period there were no spill events that occurred from the Hangtown Creek WRF.

Septic Systems

An effective septic tank and leach field system removes bacteria and other microbiological constituents within three to six feet of soil. Failing septic systems, however, can introduce microbiological constituents into the subsurface or surface environment where they can be transported to receiving streams. Septic systems are located throughout the upper watershed. El Dorado County manages septic system installations through the Liquid Waste Program under Environmental Health in the Environmental Management Department. The County reviews septic system design proposals and septic system design criteria, as well as inspects new septic system construction and repair of existing systems to determine conformance with applicable codes.

There are septic systems within El Dorado County along the Main Canal in Pollock Pines between Forebay Reservoir and Reservoir One WTP. The septic systems in this area must be sited to meet the 100 foot setback from the Main Canal, or must be concrete lined. County specifications for new septic systems require 50 feet of separation between septic tanks and streams, springs, lakes, or reservoirs. The leach lines are required to be set back 50 feet from seasonal streams and 100 feet from any flowing stream. Various tests (percolation test, soil textural analysis, saturation zone) are required as part of the installation and permitting process; at least two inspections are conducted before the installed system is approved and permitted. There are eight to nine operating septic systems within El Dorado County's jurisdiction. However, reports on routine maintenance and system failures historically have not been cataloged with individual parcel information. El Dorado County does not run a regular maintenance inspection program due to resource constraints.

In 2017 a septic system and leach field at the Auburn Lake Trails community near Cool, California recorded a violation and system failure that affected about 20 residences. The violation occurred when the alternative system, which is overseen by the GDPUD, exceeded flow requirements included in the Statewide Waste Discharge Requirements for Sanitary Sewer Systems (WQO No. 2006-003-DWQ). This requirement mandates that all public utilities districts within the Central Valley Region report all sewer system overflows. Following the Notice of Violation, the GDPUD conducted an Inflow and Infiltration Study within the Auburn Lake Trails On-Site Wastewater Disposal Zone (Zone) and submitted the report to the Regional Water Board for compliance in February of 2018. The report located problem areas by visual inspection, but did not necessarily quantify the severity of defects within the Zone. It was recommended that GDPUD staff should periodically inspect the identified areas of violation during rain events. The report also acknowledged that the GDPUD should continue to implement the inflow and infiltration reduction program already in place. GDPUD conducts quarterly and annual surveys of all septic systems within its jurisdiction, which includes the Zone that was affected by the original violation.

The community of Strawberry is of particular interest due to its proximity to the EID Strawberry WTP. The Strawberry WTP services 147 accounts in the community and is located approximately 40 miles east of Placerville along Highway 50. There are outhouses and septic systems in this community which are aged and have been constructed close to the river, primarily due to the steeper slopes along the river in this portion of the watershed. Many of these systems are for recreational residences which are on leased land from the USFS. As the USFS re-issues the 20 year land leases for many of the recreational residences in the vicinity of the South Fork American River, they require all homeowners to sign a Water Quality Agreement which states that if there is a sign of failure, then the lessee will be required to fix, repair, or replace the on-site waste system. ENF staff note that there are probably 10 to 15 outhouses along the South Fork American River in this vicinity, a greater number of redwood pits, and many septic systems. When re-issuing recreational residence permits, the ENF staff can require removal of outhouses and redwood pits, and replacement with an upgraded septic system.

There are thousands of private existing parcels in El Dorado County that have been developed for sewage disposal/treatment purposes that may now be considered substandard as a result of their development prior to the Onsite Wastewater Treatment System (OWTS) Policy. The OWTS serving these parcels will be carefully evaluated under Environmental Management Department's complaint report program, triggered by either a filed complaint or as part of a request to further develop existing parcels.

Collection Systems

There are 19 sanitary sewer collection systems in the watershed, as per the CIWQS database. The list of these is provided in **Table 4-27**.

Table 4-27
Sanitary Sewer Collection Systems

Agency	Collection System	City
Kirkwood Meadows PUD	Kirkwood Meadows CS	Kirkwood
El Dorado Irrigation District	Deer Creek CS	Placerville
Georgetown Divide PUD	Auburn Lk Trls Onsite WW Disp CS	Georgetown
El Dorado Irrigation District	Camino Heights CS	Placerville
El Dorado Irrigation District	El Dorado Hills CS	Placerville
El Dorado Irrigation District	Gold Ridge Forest Unit 3 CS	Placerville
Placerville City	Hangtown Creek CS	Placerville
Auburn City	City Of Auburn CS	Auburn
Colfax City	Colfax CS	Colfax
Placer Cnty Dept of Facility Services	SMD No. 1 CS	Auburn
CDCR	California State Prison, Sacramento CS	Represa
CDCR	Folsom State Prison CS	Represa
Sacramento City	City of Sacramento Utilities CS	Sacramento
Sacramento Area Sewer District	Sacramento Area Sewer District CS	Sacramento
City of Folsom	City Of Folsom CS	Folsom
Sacramento Regional CSD	Sacramento Regional CS	Elk Grove
UC Davis Health System	UC Davis Health System CS	Sacramento
Sacramento Cnty Dept of Regional Parks	Discovery Park	Sacramento
CSU Sacramento	California State University, Sacramento CS	Sacramento

A review of CIWQS for category 1 SSOs, those that reach surface water, was conducted for the study period. This indicates that 13 of the sanitary sewer collection systems had at least one SSO. A summary of the systems, number of SSOs, and total volume of wastewater to reach surface water is provided in **Table 4-28**. Some of these spills may have occurred outside of the American River watershed (such as with City of Auburn, EID, Placer County Department of Facility Services, and Sacramento Area Sewer District). It can be seen that over 4 million gallons of untreated wastewater was discharged from these collection systems during the study period. This is significantly less than the last study period, at 6 million gallons.

Table 4-28
Spills from Collection Systems (gallons), 2018 - 2022

Agency	Collection System	No. of SSOs	Volume Reach Surface Water (gal)
Auburn City	City Of Auburn CS	3	3,020
CSU Sacramento	California State University, Sacramento CS	1	100
CDCR	Folsom State Prison CS	8	9,873
Colfax City	Colfax CS	1	119,017
El Dorado Irrigation District	Deer Creek CS	12	2,316,791
El Dorado Irrigation District	El Dorado Hills CS	10	762,682
City of Folsom	City Of Folsom CS	6	14,027
Georgetown Divide PUD	Auburn Lk Trls Onsite WW Disp CS	3	35,060
Placer Cnty Dept of Facility Services	SMD No. 1 CS	12	49,704
Placerville City	Hangtown Creek CS	16	5,432
Sacramento Area Sewer District	Sacramento Area Sewer District CS	284	924,833
Sacramento City	City of Sacramento Utilities CS	7	56,963
Sacramento Regional CSD	Sacramento Regional CS	7	37,730

The Regional Water Board issues ACLs to these agencies for these violations, there were two found that were issued during the study period. The City of Colfax was issued ACL R5-2020-0507 for the one discharge in 2019. Sacramento Area Sewer District was issued ACL R5-2021-0522 for hundreds of dischargers to the American River watershed over several years.

Regulation and Management

National Pollutant Discharge Elimination System

Direct discharges of wastewater to surface water are regulated by the Regional Water 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, and chlorine residual. 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 Water 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 Water Board, a discharger must file a report on the measures to prevent and clean up spills.

In August 2008 the Regional Water Board issued Spill Reporting Procedures for wastewater treatment plant spills. This was issued to ensure consistency in notification procedures with the State Water Board Order for Sanitary Sewer Systems. This requires facilities to notify the Cal OES, the local health department, and the Regional Water 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 Water Board within five days.

Sanitary Sewer Overflow Program

To provide a consistent, statewide regulatory approach to address sanitary sewer overflows (SSOs), the State Water Board adopted the initial Statewide General WDRs for Sanitary Sewer Systems, Water Quality Order No. 2006-0003 (Sanitary Sewer Systems 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).

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 Systems Order and its amendments 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 Water Board’s online SSO database. SSOs in the Central Valley have been uploaded to the State Water Board’s online CIWQS database since September 2007.

The Sanitary Sewer Systems Order and its amendments 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 of the sanitary sewer system while considering risk management and cost. 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 be updated every five years, as well as internal audits conducted every two years. If there are significant changes to the SSMP then it must be recertified by the enrollee.

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.

A key requirement of the Sanitary Sewer Systems Order is that SSOs must be entered into the State Water Board's CIWQS Online SSO database. The Central Valley region began reporting in September 2007. Under the initial Order, there were Category 1 and Category 2 spills. Category 1 spills were wastewater spills equal to or greater than 1,000 gallons, all wastewater spills that enter a drainage channel or surface water, or wastewater discharge to a storm drain that was not fully captured and returned to the sanitary sewer system. Category 1 SSOs were to be reported to the online SSO database as soon as possible but no later than three business days after the SSO was detected. Category 2 spills were all other wastewater spills.

Under the 2013 MRP amendments, there are now three categories of SSOs: Category 1 – wastewater spills of any volume that reach surface water or an MS4 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 – all other wastewater spills. Currently, all Category 1 SSOs must have a draft report submitted by the enrollee via the CIWQS Online SSO Database within three business days of them becoming aware of the SSO and certified within 15 calendar days of SSO end date. In addition, Category 1 SSOs greater than 1,000 gallons must be verbally notified to Cal OES within two hours of the enrollee being aware of the spill. Finally, for 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.

The State Water Board adopted a new order for Sanitary Sewer Systems (Order No. 2022-0103-DWQ) in December 2022 to replace Order No. 2006-0003. This is not effective until June 2023, so it is not included in this 2023 Update.

Septic Systems

The State Water Board adopted the OWTS Policy (Resolution 2012-0032) in June 2012, and it became effective in May 2013. Counties are now required to develop a Local Agency Management Plan (LAMP) to show how the Policy requirements will be implemented. The OWTS Policy is 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 five (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. The LAMP for El Dorado County is effective as of May 13, 2018, and allows for the continued use of OWTS under local agency oversite on existing small domestic parcels. There have been no changes to the LAMP.

Water Quality Issues and Data Review

The City of Placerville's Hangtown Creek WRF conducted two effluent monitoring programs of interest. DOC was sampled quarterly in the effluent from October 2020 through April 2022. The results were very consistent, with an average DOC of 7.97 mg/L. In addition, PFAS compounds were monitored in the effluent The effluent was sampled quarterly from November 2020 through July 2021 for 31 PFAS compounds, including PFOA and PFOS. Eleven PFAS compounds were detectable, as summarized in **Table 4-29**, indicating that wastewater is a source of PFAS compounds in the American River watershed.

Table 4-29
Detectable PFAS in Hangtown Creek WRF Effluent (ng/L)

PFAS Compound	Minimum	Maximum	Average	Median
PFHA	12	30	18.5	16
PFOA	7.7	11	9.125	8.9
PFPA	5.5	11	9.1	9.95
PFBA	<2.2	5	2.225	1.95
PFBS	<1.8	3.7	1.78	1.71
PFOS	<4.9	2.7	1.7	2.05
PFHPA	<2.3	2.4	1.65	2.1
NMEFOSAA	<1.7	1.5	0.57	0.39
PFHXS	<5.2	1.1	0.67	0.79
PFNA	<18	1.1	0.68	0.81
PFNDCA	<2.8	1.1	0.5925	0.635

Several of the detected PFAS compounds have a human health threshold to compare with. PFOA and PFOS have existing Notification Levels from DDW (5.1 and 6.5 ng/L, respectively) and proposed MCLs from the USEPA (4 ng/L for both). This means that the detectable PFOA is above this level and the detectable PFOS is below this level. DDW has also set Notifications Levels for PFBS (0.5 ng/L) and PFHxS (3 ng/L). The PFBS is detected above its Notification Level and the PFHxS is detected below its Notification Level. In addition, USEPA has proposed a Hazard Index for four other PFAS compounds, including PFNA that has a comparative value of 10 ng/L. The PFNA is detected below this comparative value.

The City of Sacramento has monitored PFAS compounds in the raw water and has not detected any.

Source Water Protection Efforts

The American River Watershed Technical Committee (ARWTC) is comprised of the participating water utilities and functions as an ad-hoc group to work together in implementing some of the recommendations from the watershed sanitary surveys and share information. The ARWTC has been very active in continuing implementation of a voluntary river spill notification program in the American River watershed. This includes direct contact with, and obtaining voluntary notification from, wastewater agencies in the event of a potentially significant discharge (greater than 1,000 gallons) to the American River or its tributaries. The Lower American River participating water utilities have also continued the voluntary river spill notification program on the Lower American River, which is coordinated with the ARWTC effort. These programs have been very effective at providing advance notification. This was discussed previously in the Watershed Spills subsection.

SPECIAL TOPICS

Five special topics were identified for limited investigation and summary. This included projected population growth in the watershed, an upper watershed management program, the Regional Water Board's Delta Drinking Water Policy, climate change, and Folsom Lake operations. Finally, a brief review of three additional topics was conducted. This included irrigated agriculture in Placer and El Dorado counties, outdoor cannabis cultivation, and selected mine facilities. All of these topics are summarized only for informational purposes.

Population Growth

Growth trends were examined in order to identify the potential long-term impacts of population growth on the related potential contaminant sources being investigated. The watershed includes portions of five counties: Amador, Alpine, El Dorado, Placer, and Sacramento. However, only very small portions of Amador and Alpine counties are included and those areas are mountainous with sparse population so they are not included in this discussion. It should also be noted that the remaining three counties have significant population outside the American River watershed, but there is no way to partition the counts so the entire county population is included in this report as a general indicator. The estimated total population of the counties in the American River watershed was just over 2.1 million in 2018. The majority of growth continues to occur in the middle watershed, from El Dorado Hills and Roseville east to the communities of Colfax and Placerville, in proximity to the drinking water intakes. Much of the growth has occurred as extensions of existing urban areas.

Table 4-30 provides the recent change in population of the three primary counties in the watershed. It can be seen that there has been a 2.9 percent increase in population of the watershed counties over the study period. The growth in El Dorado and Sacramento counties has slowed significantly since the last study period, while Placer County growth has remained steady. It is possible that much of this growth occurred in areas outside of the American River watershed.

Table 4-30
Population Change in Watershed Counties[1]

County	2018	2023	Change
El Dorado	187,232	189,006	0.9%
Placer	386,706	410,305	6.1%
Sacramento	1,537,189	1,572,453	2.3%
TOTAL	**2,111,127**	**2,171,764**	**2.9%**

[1] Based on data from the California Department of Finance

Table 4-31 provides information on population projections by the Department of Finance through 2060. The population of the primary counties within the watershed is projected to increase approximately 27 percent, to over 2.7 million, over the next 40 years. The net change has been revised down from the projections in 2018, which showed a 44 percent increase through 2060. The ultimate population projections have been revised lower due to a slowing growth rate.

Table 4-31
Population Projections for the Watershed Through 2060[1]

County	2020	2030	2040	2050	2060	Net Change
El Dorado	192,012	200,004	210,196	215,511	222,219	16%
Placer	397,469	437,655	476,434	501,591	522,567	31%
Sacramento	1,562,242	1,687,220	1,808,307	1,901,507	1,979,204	27%
TOTAL	2,151,723	2,324,879	2,494,937	2,618,609	2,723,990	**27%**

[1] Based on data from the California Department of Finance

This increasing human population in the watershed will likely mean an increasing urbanization of the watershed as well as the potential for 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 what extent 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 their impact. 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.

Upper Watershed Management Program

The Cosumnes, American, Bear and Yuba (CABY) Integrated Regional Management group is an innovative, stakeholder-driven collaboration among local government, Tribes, watershed groups, and interested partners in the foothills region of California. A key feature of this group is development of an Integrated Regional Water Master Plan (IRWMP). The IRWMP was first adopted in December 2006. The first IRWMP Update was adopted in May 2014. The most recent IRWMP Update was completed in 2021 and approved by the Department of Water Resources on August 26, 2021.

The 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 rivers region. This effort includes participants from water suppliers (including PCWA, GDPUD, NID, and EID), power utilities, and watershed conservation groups; the purpose is to give:

- Provision of long-term water supplies,
- Protection and improvement of water quality, and
- Enhancement of environmental and habitat resources.

The IRWMP presents information on current water resource issues in the region, provides solutions to address those issues, and prioritizes projects across the four watersheds. It is a coordinated effort among water agencies, federal, state, and county agencies, citizens groups, power utilities, and other stakeholders. The goals and objectives presented in the Plan were identified and include framework programs in the following areas: water supply, water quality, environment and habitat, climate change, and human-landscape interaction. Implementation of the goals and objectives is the core of the Plan and is achieved through a series of specific actions or projects. The goals are as follows:

- Water Supply: Ensure adequate and reliable supply that can be adapted to climate change and can meet the needs of the region.
- Water Quality: Ensure sufficient water quality to support healthy ecosystems and dependent organisms.
- Environment and Habitat: Preserve and restore watershed health.
- Climate Change: Anticipate climate change needs and be prepared to respond adaptively to human and ecosystem needs.
- Human-Landscape Interaction: Maintain and enhance functioning landscapes that provide sustainable services for humans.

The Plan also identifies objectives, which describe how goals are to be attained. The Plan identifies 52 objectives, of which there are 18 that are highlighted here as significant to surface drinking water quality in the American River watershed.

- WS-1: Implement urban water conservation plans
- WS-2: Upgrade aging infrastructure
- WS-3: Complete major strategic interties between regional water agencies
- WS-4: Assess the need and economic and environmental feasibility of new storage facilities
- WS-7: Adopt local drought and regional drought and emergency management preparedness plans
- WS-8: Development of additional recycled water infrastructure
- WS-9: Convene CABY meetings discussing water transfers in and out of the region
- WQ-1: Remediate abandoned mining site and mine features
- WQ-2: Remove legacy mining contaminants from region
- WQ-3: Increase the number of water bodies that can achieve water quality objectives
- WQ-4: Enhance the natural sediment transport regime
- WQ-5: Map and prioritize debris control dams on national forest lands for remediation
- WQ-6: Complete unpaved roads assessment and prioritize watersheds for remediation
- WQ-7: Assess the level of preparedness and prevention measures in place for wastewater spills
- WQ-8: Improve watersheds critical to major in-region urban areas' water supply
- WQ-9: Maintain watershed resilience
- WQ-10: Evaluate feasibility of a watershed and water quality 'credit trading program'
- HL-13: Monitor regulatory processes with the potential to affect water resources in the region

In addition, CABY has identified actions associated with a variety of topics related to the IRWMP. Water quality is one of those topics with the following target outcomes identified:

- Prioritize abandoned mine land sites for remediation, develop necessary plans, and obtain permits and funding to ensure implementation.
- Remove legacy mining contaminants.
- Work with stakeholders to collaborate with the land owner/land manager to develop/implement/fund remediation of the site.
- Work with affected parties to restore a natural balance to identified river systems.
- Monitor and publicize the work being done and encourage the implementation of projects designed to restore natural sediment transport.
- Convene regional discussions on the topic [of wastewater spills] with regional agencies that provide wastewater services (including small systems).
- Work with stakeholders to identify the major threats to those important watersheds (including wildland fire, development, insects and disease, climate change, or other threats).
- Focus on watersheds that are the most critical for production of surface drinking water for the major urban areas in the CABY region.

- Consultation with tribes and disadvantaged communities to improve watersheds.
- Take advantage of the most economically efficient activities to facilitate compliance with water quality standards.

Proposition 50 and 84 funds were awarded for completion of the 2014 Update, as well as projects described in the IRWMP. A Climate Change assessment was completed as part of the 2021 Update and it has identified several objectives of potential interest to drinking water quality.

- Increase the capacity of the landscape to absorb and filter water.
- Preserve and/or restore, where appropriate, riparian vegetation to control water temperature for aquatic biota.
- Identify 303(d)-listed waters that may become more challenging to manage under future climate scenarios, and work with agencies to develop management strategies and projects/actions that address impacts.
- Identify places where the assimilative (dilution of contaminants) capacity of streams and rivers may be at risk and monitor those areas.
- Headwaters protection projects.
- Aquatic invasive species prevention programs.
- Climate change adaptive management strategies.

Drinking Water Policy for Surface Waters of the Delta and Its Upstream Tributaries

The Regional Water Board adopted the Basin Plan Amendment to Establish a Drinking Water Policy for Surface Waters of the Delta and Its Upstream Tributaries (Drinking Water Policy). The Drinking Water Policy addresses organic carbon by modifying the Basin Plan to clarify the existing water quality objective for chemical constituents with a footnote stating that the existing objective applies to drinking water chemical constituents, such as organic carbon. The Drinking Water Policy addresses pathogens by establishing a new narrative water quality objective for *Cryptosporidium* and *Giardia* to protect the public water system component of the MUN beneficial use. This narrative water quality objective for *Cryptosporidium* and *Giardia* is only applied within the Sacramento-San Joaquin Delta and its tributaries below the first major dams. Compliance with this trigger is assessed at existing and new public water system intakes.

The Drinking Water Policy requires an Implementation Program for the proposed narrative water quality objective for *Cryptosporidium* and *Giardia* that describes the actions that the Regional Water Board will take to maintain existing water quality if trigger values for *Cryptosporidium* are exceeded at water treatment plant intakes and the impacted water agency requests Regional Water Board action. The trigger values are 80 percent of the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) bin classifications.

If *Cryptosporidium* monitoring data from an existing public water system intake indicate that the maximum running annual average (MRAA) has reached 80 percent of the next highest bin, the affected public water system may request that the Regional Water Board initiate an investigation. If the affected public water system requests assistance, the Regional Water Board should coordinate with DDW, the affected public water system, and potential sources to assess the data and evaluate the need to conduct source evaluations and implement control options.

The Delta RMP performed a pathogen study to support any findings of trigger exceedances during the second round of LT2ESWTR monitoring, between 2015 and 2017. None of the sampling sites were located in the American River watershed.

Climate Change

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. The sun is the energy source that drives the climate system. Greenhouse gases (GHGs) include water vapor, carbon dioxide, methane, nitrous oxides, and human-made chemicals such as chlorofluorocarbons. As these GHGs are emitted into the atmosphere, they trap infrared radiation in the atmosphere and cause increases in air, land, and water temperatures, also known as global warming.

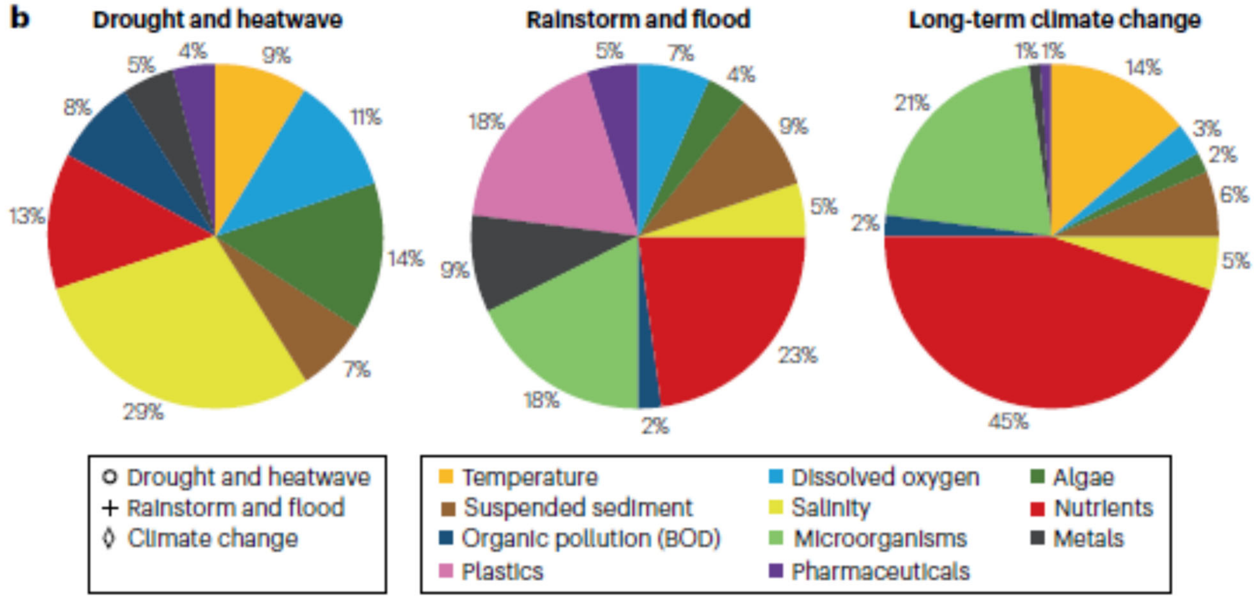
This climate change subsection summarizes a recently published assessment of the impacts of hydroclimatic extremes (droughts and heatwaves, rainstorms and floods) and multidecadal climate change on river water quality. The majority of the subsection will focus on information State and Local/Regional level efforts. Much of the information discussed in this subsection is targeted towards implementation and progress on managing climate change impacts, versus understanding the science of climate change.

Studies on Climate Change and River Water Quality

"Global River Water Quality Under Climate Change and Hydroclimatic Extremes" was recently 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. As shown in **Figure 4-30,** the majority of the case studies reported changes in salinity (29%), followed by algae, nutrients, dissolved oxygen and water temperature.

Figure 4-30. River Water Quality Responses (based on changes in concentration) Due to Hydroclimatic Extremes and Long-Term Climate Change



Overall, water quality deterioration under drought-heatwave events typically occurs in rivers receiving point source pollutant inputs (which are maintained during drought). Here, lower dilution capacities under low flow and continued source inputs of pollutants (such as salinity) result in higher 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. However, rivers and streams are considered to be less prone to algal blooms than lakes and reservoirs under heatwaves. Suspended sediment concentrations show mostly lower concentrations during droughts owing to the reduced erosion rates and lower transport capacity under low flow conditions.

Water quality deterioration was found for 51 percent of the case studies under 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.

Reported water quality impacts under long-term climate change include diverse responses, resulting in a general deterioration (56 percent of case studies), improvement (31 percent) or no substantial improvement or mixed response (13 percent). 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). The main driving mechanisms for multidecadal water quality changes in response to climate change include hydrological alterations (i.e., surface runoff and timing), long-term rises in water, sediment and soil temperatures, and land use. Future water temperature rises can deteriorate water quality due to reduced dissolved oxygen concentrations, and increases in algal blooms. Increasing temperature of soil also impacts water quality owing to increased microbial activities, leading to changes in biogeochemical processes related to the carbon and nutrient cycles (mineralization, nitrification, and denitrification). Additionally, 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.

To summarize, droughts, heatwaves, rainstorms and floods show in most cases a deterioration of river water quality, but improvements or mixed responses are also reported owing to counteracting mechanisms (such as pollutant mobilization versus dilution). Detailed information about responses and mechanisms discussed above is also provided in **Table 4-32.**

State of California Efforts

California's Fourth Climate Change Assessment

The Fourth Climate Change Assessment was completed in August 2018. For the first time, the assessment contains a series of regionally focused reports. The Sacramento Valley Regional Report was the regional report reviewed for this update. Additionally, the assessment completed 44 technical reports.

The fourth assessment 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:

- By 2050, the average water supply from snowpack is projected to decline to 2/3 from historical levels. If emissions reductions do not occur, water from snowpack could fall to less than 1/3 of historical levels by 2100.
- By 2100, the average annual maximum temperature is projected to increase by 5.6°F if greenhouse emissions are reduced at a moderate rate or is projected to increase by 8.8°F if greenhouse emissions continue at current rates.
- Modeling of reservoir operations show that Shasta and Oroville reservoirs will have roughly 1/3 less water stored annually by end of century under current management practices. Promising adaptation options are the use of probabilistic hydrological forecasts, better measurements of snowpack, and increasing groundwater shortage.
- By 2050, under certain precipitation conditions, a study estimates California's agricultural production could face climate-related water shortages of up to 16 percent in certain regions. Hotter conditions due to climate change could lead to loss of soil moisture. Models show that increasing soil organic matter increases the soil water holding capacity, demonstrating one adaptation option.

Table 4-32
Responses and Mechanisms in Different Water Quality Constituents Under Various Extreme Weather Events and Climate Change

	Droughts and heatwaves		Rainstorms and floods		Long-term climate change	
	Overall response	**Mechanisms**	**Overall response**	**Mechanisms**	**Overall response**	**Mechanisms**
Temperature	↑	Increased atmospheric warming; lower thermal capacity; lower dilution capacity for thermal pollution under low flow	?	Not described in literature	↑	Increased atmospheric warming; changes in river flow and variability
Dissolved oxygen	↓(↑)	Lower dissolved oxygen solubility under higher water temperature (↓); algal blooms (↑day, ↓night); increased stratification (↓); lower reaeration rates under low flow (↓)	↓(↑)	Higher reaeration rates under higher flow (↑); large supply of oxygen-depleted discharge and floodplain water (↓); increased intensity of heterotrophic microbial activities owing to organic and nutrient inputs after rainfall events (↓); hypoxic black water impacts (↓)	↓	Water temperature rises (↓); changing reaeration under changing river flow (↑↓); increased decay of organic matter (↓); risk of hypoxia under high flow/floods (↓)
Algae	↑	Increased water temperature; increased stratification; longer residence times; increase in light availability owing to high solar radiation or lower turbidity	↓↑	Increases in nutrient inputs (↑); increases in dilution (↓)	↑(↓)	Increased water temperature (↑); increased stratification (↑); shift of phytoplankton composition (↑↓); increase in light availability owing to high solar radiation or lower turbidity (↑)
Suspended sediment	↓	Less sediment erosion; lower mobilization, resuspension and sediment transport capacity	↑(↓)	Increased sediment erosion (↑); increased mobilization, resuspension and transport capacity (↑); increased dilution (↓)	↓↑	Changes in river flow variability (↑↓); changes in sediment pulses (↑↓)
Salinity	↑	Less dilution under low flow; increased evapo-concentration; increased seawater intrusion	↓	More dilution under high flow	↓↑	Changes in dilution patterns (↑↓); increased evapo-concentration (↑); increased seawater intrusion under lower flow and sea level rise (↑)
Nutrients	↓↑	Reduced nutrient inputs by runoff and leaching (↓); lower velocity, longer residence times and increased retention (↓); increased denitrification under higher water temperature (↓); less dilution under low flow (↑)	↑(↓)	Increased mobilization in soils and leaching (↑); increased runoff and mobilization (↑); increased resuspension (↑); increased sewer overflows (↑); less retention by soil and sediment (↑); more dilution (↓)	↑↓	Changes in runoff and leaching impacting mobilization and transport (↑↓); river flow induced changes in dilution (↑↓); increased sewer overflows under increasing rainstorms and floods (↑); water temperature increases (↓)
Organic pollution (BOD)	↓↑	Less dilution under low flow (↑); increased decay under longer residence time and higher water temperature (↓)	↑(↓)	Increased runoff from agricultural and urban wastewater (↑); increased dilution under higher flow (↓)	↓↑	Less dilution under low flow (↑); increased decay under longer residence time and higher water temperature (↓)
Microorganisms	?	Not described in literature	↑(↓)	Increased wash-off from upstream sources (↑); increased sewer overflows (↑); increased dilution (↓)	↓↑	Changes in runoff and leaching (↑↓); river flow induced changes in dilution (↓); increased sewer overflows (↑); water temperature increases (↑↓)
Metals	↓↑	Less dilution of metals in dissolved phase (↑); lower suspended sediment and reduced sediment-adsorbed metals (↓)	↓↑	Increased resuspension of sediment-adsorbed metals (↑); increased dilution of metals in dissolved phase (↓)	↓↑	River flow changes impacting mobilization and transport of sediment-adsorbed metals (↑↓); river flow changes impacting dilution of metals mainly in dissolved phase (↑↓)

Table 4-32 Cont'd
Responses and Mechanisms in Different Water Quality Constituents Under Various Extreme Weather Events and Climate Change

	Droughts and heatwaves		Rainstorms and floods		Long-term climate change	
	Overall response	Mechanisms	Overall response	Mechanisms	Overall response	Mechanisms
Plastics	?	Not described in literature	↓↑	Increased inundation of contaminated industrial and/or urban areas (↑); increased transport capacity and dynamics (↑); increased dilution under high flow (↓)	?	Not described in literature
Pharmaceuticals	↑(↓)	Lower flow, less dilution (↑); increased decay under higher water temperature for less-persistent pharmaceuticals (↓)	↓↑	Increased dilution under high flow (↓); increased resuspension of (sediment) adsorbed pharmaceuticals (↑)	↑(↓)	River flow changes impacting dilution (↑↓); increased decay under water temperature rises (↓)

Summary of overall responses, such as predominant increase (↑) or decrease (↓) or mixed response (↑↓), in concentrations for different water quality constituents under various event types. The main driving mechanisms for each response are listed. For mixed responses (↑↓), the individual trends are shown for each mechanism to show where they differ. In the overall trend for mixed responses cases, an arrow between brackets represents a response that is less important than the arrow that is not in brackets for that case. See Supplementary Notes 2–12 for reports on more detailed water quality responses, mechanisms and impacts for sectors and ecosystems and associated literature. BOD, biochemical oxygen demand.

- By 2100, if greenhouse gas emissions continue to rise, one study found that the frequency of extreme wildfires would increase, and the average area burned statewide would increase by 77 percent. An extensive scientific review supported by the fourth assessment found that reducing tree density and prescribed burns can improve long-term resilience to California's forests. This supports the State's Forest Carbon Plan to increase forest restoration and treatment, such as prescribed fire, to an average of 35,000 acres a year by 2020.

The regional report for the Sacramento Valley contained many of the same trends and concerns as for the state as a whole. Some specific details were found in this report:

- The Sacramento Valley will likely see average daily maximum temperature increase by 10°F by end-of-century. Midtown Sacramento will likely see the average number of extreme heat days (temperatures more than 103.9°F) grow from 4 days a year to 40 days a year by end-of-century.
- 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). (Sacramento Valley Region Report, California's Fourth Climate Change Assessment). Global climate change affects precipitation by increasing the atmosphere's capacity to "hold" water vapor, so winter storms generally carry more rain. It is stated in the Fourth Assessment that for each degree Celsius of warming, storms can hold six to seven percent more water. Whiplash 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.

California's Fifth Climate Change Assessment

California's Fifth Climate Change Assessment is underway and is expected to be completed by 2026. Previous assessments (2006, 2009, 2012, 2018) contributed to a growing understanding about the impacts of climate change in California and offer communities and decision makers the tools to take action. This assessment has a unique focus to address gaps in the existing literature and knowledge base on climate change impacts and adaptation.

Overall, expected outcomes are:

- New climate data and scenarios projecting the impacts of climate change in California (the next generation of projections that align with Coupled Model Intercomparison Project Phase 6 – CMIP6).
- Original research that addresses California specific research needs and questions related to climate change.
- A Tribal research program to integrate tribal expertise, traditional knowledge, and input from California Native American tribes throughout the Fifth Assessment process.
- A suite of regional, topical, and statewide synthesis reports that prioritize equity in the translation of this cutting-edge research to meet the needs and context of regions across the state.

The Fifth Assessment's team will lead competitive research funding programs to address California specific research gaps related to climate change impacts and adaptation. Currently there are 26 research topics that were identified with inputs from over 200 experts and community partners throughout the State. Some of the research topics of interest are:

- Impacts of drought and climate-change induced aridity on surface and groundwater supply, changes to surface-groundwater connections, and recharge potential, including the economic and equity impacts of these changes.
- Effects of increasing water temperatures, varying precipitation patterns, and associated events (such as harmful algal blooms) on fish and other aquatic ecosystems.
- Impacts of climate change on forest health and how cultural and prescribed burning can build resilience to these impacts.
- Effects headwater management practices have on downstream water supply and quality, hydrology, habitat quality and biodiversity.

California Natural Resources Agency

In April 2019, Governor Newsom signed Executive Order N-10-19 calling for the California Natural Resources Agency (CNRA), 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 Safeguarding California work previously completed by the CNRA was used in the preparation of the Water Resilience Portfolio.

A draft of the Water Resilience Portfolio was completed in January 2020 and was finalized in July 2020. The portfolio includes 142 separate actions to be taken by state agencies to support local efforts to maintain and diversify water supplies, protect, and enhance natural systems, build connections (whether human, physical, or digital), and prepare for future risks. The portfolio prioritizes construction of new places to store water, both above and below ground, through the Proposition 1 Water Storage Investment Program, and it supports timely promulgation of new regulations that will allow water districts to directly distribute recycled water. Other portfolio actions emphasize the need to reconnect aquatic habitat – such as through the removal of four obsolete dams on the Klamath River – and to encourage farmers to adopt practices that build soil health and harbor biodiversity.

In January 2022, the Administration released a progress report documenting its efforts to implement the 142 actions in the Water Resilience Portfolio over the previous 18 months. There are several actions of interest (Actions 3.4, 3.5, 5.2, 7.1, 8.1, 8.2, 8.3, 8.7, 15.1, 15.3, 18.4, 19.5, 26.3, 27.1 to 27.4), from a drinking water perspective, in the 2020 Water Resilience Portfolio. **Appendix D** contains a table of these actions and the status as shown in the January 2022 Progress Report. Please note that some actions were renumbered or changed from the May 2020 Update.

The Water Resilience Portfolio is now part of the 2021 Climate Adaptation Strategy which brings together numerous state plans and strategies. The draft of the 2021 Climate Adaptation Strategy was released in October 2021 and the final Strategy is available as an interactive website that serves as a hub for state climate resilience action. The website will be updated to reflect progress made and adjustments in approach throughout the year. **Table 4-33** provides a summary of the changes in California's approach to climate change since the May 2020 Update.

The Climate Adaptation Strategy elevates six key priorities that must drive all resilience actions in California:

- Strengthen Protections for Climate Vulnerable Communities,
- Bolster Public Health and Safety to Protect Against Increasing Climate Risks,
- Build a Climate Resilient Economy,
- Accelerate Nature-Based Climate Solutions and Strengthen Climate Resilience of Natural Systems,
- Make Decisions Based on the Best Available Climate Science, and
- Partner and Collaborate to Leverage Resources.

Table 4-33
Significant Changes in California's Approach to the 2021 Climate Adaptation Strategy

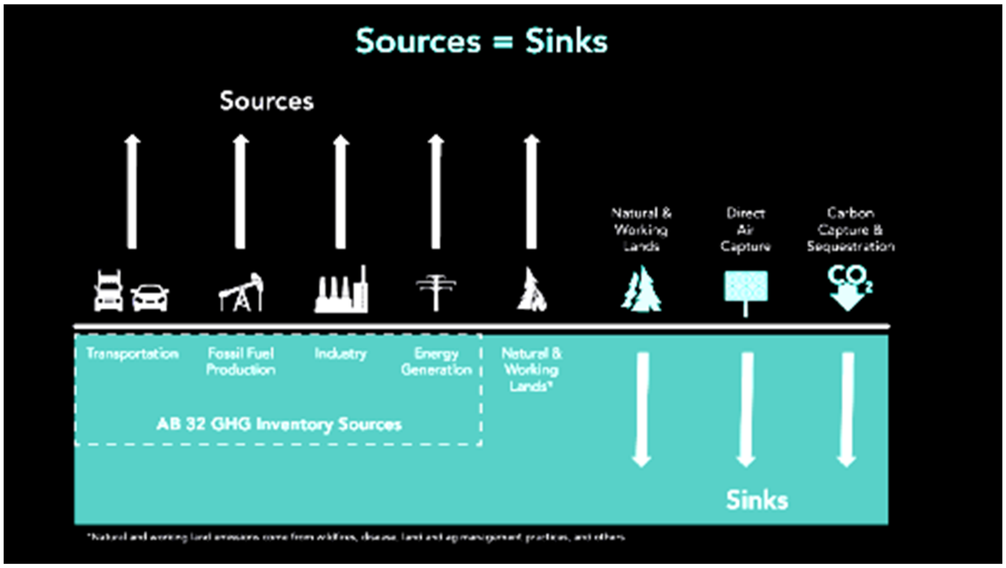
	Previous Strategies	2021 Update
Goal	Report on state agency actions	Drive collective action moving forward
Organization	Sector-specific	Outcome-based priorities
Format	Document	Dynamic website
Actions	Inventory of all state actions	Key actions that drive on our collective climate resilience agenda, with links to more detailed actions underway
Size	300-1000 actions	6 priorities, nearly 150 actions
Transparency	Includes existing and recommended actions	Reflects actions underway and with clear state commitments for implementation
Accountability	Implementation reporting, Unfunded actions included	Includes success metrics and timeframes; only reflects actions underway; improves implementation reporting

Source: California Climate Adaptation Strategy, April 2022

Several documents were released in 2021 and 2022. One of the first work products was California's Wildfire and Forest Resilience Action Plan, released in January 2021. The Extreme Heat Action Plan was released in January 2022. Additionally, the Draft Scoping Plan for Achieving Carbon Neutrality (Draft 2022 Scoping Plan or 2022 Scoping Plan) was released in May 2022 and is the most comprehensive and far-reaching Scoping Plan developed to date. It identifies a technologically feasible and cost-effective path to achieve carbon neutrality by 2045 while also assessing the progress California is making toward reducing its greenhouse gas (GHG) emissions by at least 40 percent below 1990 levels by 2030, as called for in SB 32 and laid out in the 2017 Scoping Plan.

To date, California and many other regions have focused on reducing GHG emissions from the industrial and energy sectors. By moving to a framework of carbon neutrality or "net-zero" carbon, the scope for accounting is expanded to include all sources and sinks. As such, carbon neutrality is achieved when the flux of GHGs from the sources equal the sinks. **Figure 4-31** depicts the sources included in the AB 32 GHG Inventory and the new sources and sinks added in the 2022 Scoping Plan under the framework of carbon neutrality. Natural and working lands, given their ability to sequester carbon, play an increasingly important role in this framework. However, modeling for this plan shows that carbon sequestration in our natural and working lands alone will be insufficient to achieve carbon neutrality no later than 2045. Therefore, this Scoping Plan also considers the role of carbon capture and sequestration and direct air capture of carbon, biological, and mechanical processes included in the International Panel on Climate Change (IPCC) Sixth Assessment Report as necessary tools for climate change mitigation.

Figure 4-31. Carbon Neutrality: Balancing the Net Flux of GHG Emissions



In April 2022, two additional documents were released "Pathways to 30X30 California" and "Natural and Working Land Climate Smart Strategy." Both documents support nature-based solutions for climate change. The goal of the 30X30 California initiative is to conserve 30 percent of California's lands and coastal waters by 2030. Approximately 24 percent of California's lands and 16 percent of its coastal waters are already conserved based on the definition of 30x30 Conservation Areas. The strategy lays out a vision to conserve an additional six million acres of lands and half million acres of coastal waters needed to reach 30 percent.

The goal of the Natural and Working Land is to guide and accelerate near- and long-term climate action across key California landscapes. The Natural and Working Lands Climate Smart Strategy responds directly to Governor Newsom's nature-based solutions Executive Order N-82-20, which identified our natural and working lands as a critical yet currently underutilized sector in the fight against climate change. These lands cover 90 percent of California's 105 million acres, and can sequester and store carbon emissions, limit future carbon emissions into the atmosphere, protect people and nature from the impacts of climate change, and build resilience to future climate risks.

To advance the 30×30 and Climate Smart Lands initiatives, the Governor's proposed budget includes a $768 million spending plan over two years, with nearly $600 in the 2022-23 budget. Significant investments include:

- $275 million (over two years) to fund projects that will deliver climate benefits and protect biodiversity, including voluntary conservation acquisitions and easements.
- $161 million (over two years) to support regional action through investments in Natural Community Conservation Planning programs and projects funded through state conservancies.

- $100 million for the Tribal Nature-Based Solutions Program announced in March at the California Truth & Healing Council meeting.
- $90 million for inland wetlands restoration, which delivers multiple benefits including sequestering greenhouse gas emissions, protecting habitat, and advancing economic opportunity. This complements funding directed to coastal wetlands in last year's climate package ($500 million).
- $50 million to enable more wildlife crossings like the Wallis Annenberg Wildlife Crossing breaking ground today.
- $30 million (over two years) to accelerate the uptake of climate-smart land management practices across California's diverse landscape, including farms, forests, and community green spaces.
- $7.5 million (over two years) to support a compost permitting pilot program that will help local government entities and facilities locate and permit small and medium sized compost facilities, diverting more organic waste away from landfills and into the creation of healthy soils.

California invested over $15 billion in climate action through the 2021–2022 California Comeback Plan and the Governor has proposed investing over $22 billion through the 2022–2023 California Blueprint.

Together, these budgets would be put towards the following climate change investments:

- $10 billion for zero-emission vehicles, with a particular focus on programs that improve the communities of low-income Californians, such as heavy-duty and port electrification.
- $2 billion for clean energy investments, such as long duration storage and industrial decarbonization.
- Over $9 billion for programs that reduce emissions from the transportation sector, such as active transportation projects and high-speed rail.
- Nearly $1 billion to mainstream climate change in our education system and to train current and future workers to lead the climate revolution.
- Over $1 billion to build sustainable, affordable housing.

California Department of Water Resources (DWR)

Since the climate system includes freshwaters, changes to air and land temperatures will have an impact on the timing, amount, type, and location of precipitation and runoff in the Sacramento River watershed. DWR research shows that from 1901 to 2000 the Sacramento River system runoff volume has remained stable on an annual basis, but there has been a nine percent reduction in runoff from April through July. This is likely the result of increased winter rainfall and less snowpack storage. DWR also estimates that for each 1.8°F increase in Earth's temperature, the Sierra snowpack will retreat 500 feet. This will mean an increase in wet season runoff and less available storage under current operations.

California Water Plan Update 2018

The California Water Plan is updated by DWR every five years, with the 2018 Update finalized in June 2019. The Update is concise and prioritizes State framework to manage California's water resources for sustainability. The plan sets goals, recommends actions, offers funding scenarios, and provides a State water investment strategy. Additional information is provided on the actions most relevant to climate change. The six goals and recommended actions are as follows:

Goal 1: Improve Integrated Watershed Management

- Action 1.1 Strengthen State Support for Integrated Regional Water Management and Vulnerable Communities.
- Action 1.2 Support the Role of Working Landscapes
- Action 1.3 Promote Flood-Managed Aquifer Recharge (Flood-MAR) and Sustainable Groundwater Management Practices

Goal 2: Strengthen Resiliency and Operational Flexibility of Existing and Future Infrastructure

- Action 2.1 Improve Infrastructure and Promote Long-Term Management

Goal 3: Restore Critical Ecosystem Functions

- Action 3.1 Address Legacy Impacts
- Action 3.2 Facilitate Multi-Benefit Water Management Projects
- Action 3.3 Quantify Natural Capital

Goal 4. Empower California's Under-Represented or Vulnerable Communities

- Action 4.1 Expand Tribal Involvement in Regional Planning Efforts
- Action 4.2 Engage Proactively with Disadvantaged Community Liaisons

Goal 5. Improve Inter-Agency Alignment and Address Persistent Regulatory Challenges

- Action 5.1 Incorporate Ecosystem Needs into Water Management Infrastructure Planning and Implementation
- Action 5.2 Streamline Ecosystem Restoration Project Permitting
- Action 5.3 Address Regulatory Challenges

Goal 6. Support Real-time Decision Making, Adaptive Management, and Long-Term Planning

- o Action 6.1 Facilitate Comprehensive Water Resources Data Collection and Management. As required by AB 1755 (Dodd, 2016), state agencies will publish and update State water and ecological datasets on an easily accessible data platform.
- o Action 6.2 Coordinate Climate Science and Monitoring Efforts. State agencies should consider further coordination of critical climate science and monitoring efforts. The effort would support and expand ongoing research collaborations designed to track atmospheric rivers, rain-to-snow percentage trends, high-

elevation snow water content, upland watershed monitoring, paleo hydrology, sea level rise, seasonal winter outlooks, and changes in streamflow and stream temperatures.

- Action 6.3 Improve Performance Tracking
- Action 6.4 Develop Regional Water Management Atlas. DWR will implement the Regional Water Management Atlas, a new interactive statewide tool that will provide users with access to critical water management data and water-resource management projects. This will help to track regional projects and provide a platform for building partnerships on multi-benefit projects.
- Action 6.5 Report on Outcomes of Projects Receiving State Financial Assistance
- Action 6.6 Expand Water Resource Education
- Action 6.7 Explore Ways to Develop Stable and Sufficient Funding

California Water Plan Update 2023

The California Water Plan is updated every five years and is the State's strategic plan for sustainably and equitably managing and developing water resources for current and future generations. Update 2023 will promote 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, and already in progress. The Public Review Draft Update was released in early 2023, with the final Plan expected at the end of 2023.

Climate Action Plan

DWR's Climate Action Plan was recently featured in the Journal of American Water Works Association December 2022 issue. DWR developed its own comprehensive Climate Action Plan to guide how DWR will continue to address climate change for programs, projects, and activities over which it has authority.

DWR's Climate Action Plan is divided into three phases: a greenhouse gas reduction plan, climate change analysis guidance, and a vulnerability assessment and adaptation plan. Phase I of DWR's Climate Action Plan covered mitigation of greenhouse gases, and the plan was completed in 2012. Phase Two began in 2012, and the purpose of Phase Two was to ensure that all DWR projects meet standards for consistency, quality, and adequacy in climate change analysis. As part of Phase Two, DWR empaneled 14 experts who provided recommendations to DWR on how to best use available climate change information in their report "Perspective and Guidance for Climate Change". Phase Three is DWR's Climate Change Vulnerability Assessment and Adaptation Plan (VA/AP). This phase of the Climate Action Plan evaluates, describes, and where possible, quantifies the vulnerabilities of DWR's assets and business activities to projected changes in temperature, wildfire, sea level rise, and hydrology (including precipitation, snowpack runoff, and flooding). Once the vulnerabilities were identified, appropriate adaptation strategies were developed to address them. Examples of adaptation strategies could be infrastructure improvements, enhanced maintenance and operation procedures, revised health and safety procedures, and improved habitat management.

Work on DWR's Vulnerability Assessment began in 2014. The Vulnerability Assessment portion of Phase III was completed in 2017. However, the Vulnerability Assessment was not released to the public until February 2019. The 2019 Vulnerability Assessment is the first comprehensive examination of DWR's vulnerabilities to climate change. The Vulnerability Assessment identifies the activities performed and specific assets owned and/operated by DWR that have vulnerabilities related to climate change, focusing on the mid-century (roughly 2030 to 2070) impacts from climate change. Facilities, operations, and activities that are identified as being moderately or highly vulnerable to climate change are suggested to be prioritized for future adaptation planning. The potential vulnerabilities from climate change which were studied in this report included: wildfire, extreme heat, sea-level rise, long-term persistent hydrologic changes, short-term extreme hydrologic changes, and habitat and ecosystem degradation.

The Phase III Adaptation Plan (AP) was released in July 2020. The Adaptation Plan pivoted from focusing on the hazards to identifying and implementing strategies for the staff in terms of extreme heat and emergency response impacts; loss of performance for the State Water Project; wildfire and watershed health for the Upper Feather River watershed, and additional stress on species and habitats on DWR lands. These plan elements are not relative to the American River watershed.

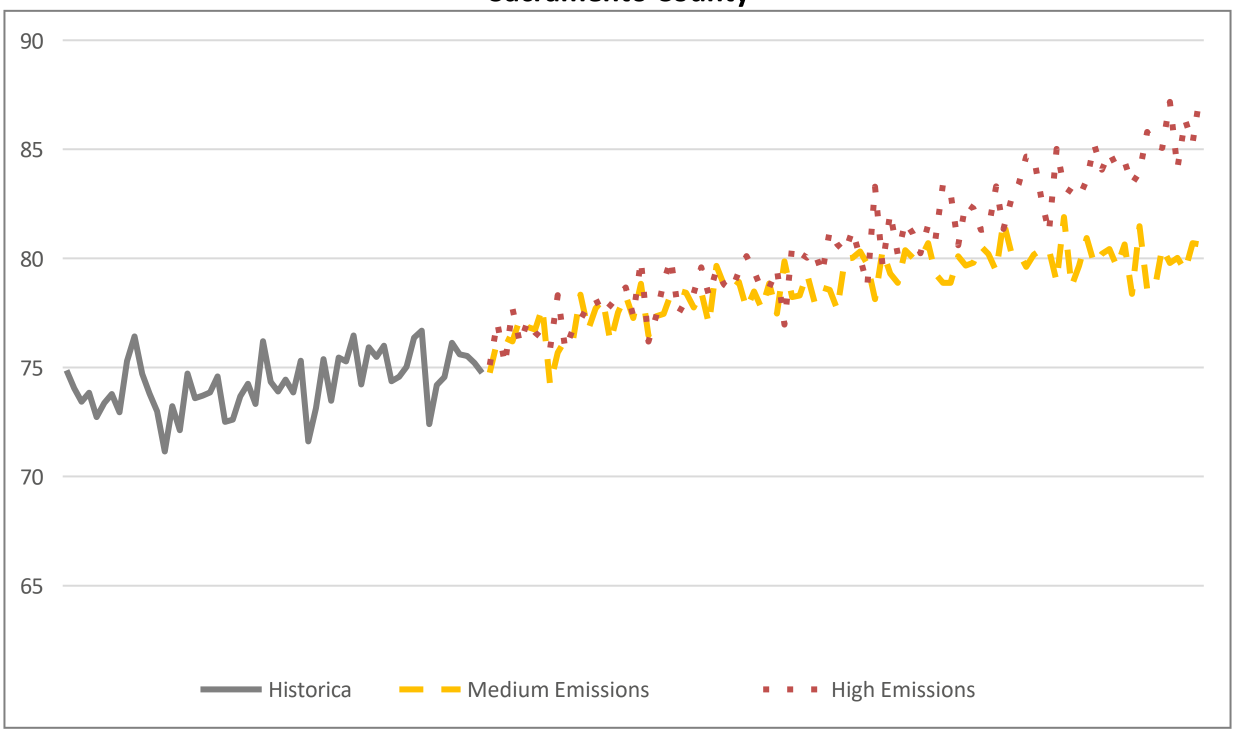
Cal-Adapt

Cal-Adapt is a website developed by the University of California at Berkeley's Geospatial Innovation Facility (GIF) with funding and advisory oversight by the California Energy Commission's Public Interest Energy Research (PIER) Program, and advisory support from Google.org. 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. 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 site generates a graphical representation of the data, which could be annual average maximum temperature, extreme precipitation events, extreme heat, sea level rise, snow pack, or average annual area burned by wildfire. For each of these parameters, data is shown for historical baseline (1961-1990), mid-century (2035-2064) and end of century (2070-2099) for two possible climate futures; one in which emissions peak around 2040 and then decline (RCP 4.5) and another in which emissions continue to rise throughout the 21st century (RCP 8.5). 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/resources/using-climate-projections/)

Sacramento County and the City of Folsom used Cal-Adapt to extract annual average maximum temperature, annual average minimum temperature, and annual average precipitation for their recent Climate Action Plan and Climate Adaptation and Resilience Reports, respectively. The City of Folsom also extracted average annual area burned from wildfires and number of extreme heat events in the City of Folsom. **Figure 4-32** shows annual average maximum temperature under medium and high emissions from Cal-Adapt for Sacramento County.

Figure 4-32. Historical and Projected Annual Average Maximum Temperature in Sacramento County



Local and Regional Climate Change Efforts

US Bureau of Reclamation – American River Basin Study

Reclamation has been conducting climate change related research to assist with water resources planning. Generally, Reclamation has been studying how the availability of water (in terms of snowpack, precipitation, and stream flow) will be affected by climate change.

The American River Basin Study (ARBS) was completed in August 2022. The ARBS was a joint effort between Reclamation and seven non-Federal cost-sharing partners (PCWA, El Dorado

County Water Agency, City of Sacramento, City of Roseville, City of Folsom, Sacramento Area Flood Control Agency, and the Regional Water Authority (RWA)).

The study was a holistic examination of water management practices in the American River basin to address recent changes in water supply conditions and to incorporate future climate change conditions. The purpose of the ARBS was to evaluate existing and potential future imbalances between water supplies and demands in the American River Basin and propose a range of strategies which may be employed to alleviate or mitigate identified imbalances. The report reiterated many key points on temperature, precipitation, and runoff.

- Surface air temperatures are projected to increase steadily, with summer temperatures increasing by approximately 7.2 °F by the end of the 21st century. Winter temperatures increasing by 4.9 °F.
- No clear long-term trend for precipitation over 21st century. Half of the projections indicate an increase, half indicate a decrease. Average fall and spring precipitation will decrease and winter and summer precipitation will increase (less snowpack).
- Runoff is projected to increase during winter months. Runoff will shift from May and June to earlier (December through March).

Specific impacts which will occur in the American River basin due to climate change are: 1) Water Supply Reliability – By 2070, supply demand imbalance is projected to be 63 to 78 thousand acre-feet in the Foothills, which means 50 percent of total demand cannot be met, 2) Fish and Wildlife Habitat – The shift in runoff timing will make it more difficult to manage flows and water temperature in the Lower American River, 3) Flood Risk Management – Increased early season runoff increases flood risk in the Lower American River, and 4) Hydropower and Recreation – The shift in runoff timing affects reservoir storage in summer and fall.

The study identified several adaptation measures to address climate change in the American River Basin as shown in **Table 4-34.**

<u>Capital Region Climate Readiness Collaborative (CRC)</u>

The Capital Region Climate Readiness Collaborative (CRC) is a membership network encompassing the six-county Sacramento area. CRC is a coalition program of the Local Government Commission and a member of the Alliance of Regional Collaboratives for Climate Adaptation. The City of Sacramento Community Development and Sacramento County are listed as members, as well as several other local surface water utilities including; City of Folsom, San Juan Water District, City of West Sacramento, City of Davis, and UC Davis.

Members have access to a bi-weekly newsletter containing the latest climate adaptation news, case studies, research, resources, funding opportunities, and events. There are also quarterly meetings featuring key adaptation issues for the region, as well as up-to-date information about local, state, and federal resiliency efforts and opportunities.

Table 4-34
Climate Change Adaptation Measures Identified in American River Basin Study

Project Name	Description	Status
Alder Creek Reservoir and Conservation Project	High elevation, off-stream storage to replace lost storage from reduced snowpack.	Reclamation and El Dorado County Water Agency are initiating a Federal Feasibility Study
Sacramento River Diversion Project	Use of existing diversion facilities on Sacramento River and exchange of water supply to reduce reliance of regional water supply on American River.	Reclamation, PCWA and RiverArc project partners are working to advance planning for Sacramento Groundwater Bank
Federally Recognized Groundwater Bank	Expand conjunctive use operations in North and South American River groundwater basins	Reclamation and the RWA are working to advance planning for groundwater banking
Folsom Dam Raise with Groundwater Banking	With more space to store water and with the use of forecast-informed reservoir operation, there is opportunity for early flood release to be captured as groundwater recharge.	USACE is completing construction of Folsom Dam Raise. PCWA, SMUD, and Sacramento Area Flood Control Agency are cooperating on facility improvements upstream of Folsom Dam for additional flood control surcharge space.

The 2021 Impact Report for CRC includes updates from members and a recap of yearly activities. Working Groups have been a priority of CRC since working groups elevate key initiatives by leveraging the time and resources of multiple organizations and community members. In 2021, working groups were formed on Building Electrification and Extreme Heat. By focusing on these topics, the CRC hopes to build out fact sheets and education tools for stakeholders and utilize a collective voice to advocate for greater regional investment.

Sacramento County

The Sacramento County board recently declared a Climate Emergency and set a goal to reach carbon neutrality by 2030. The County also released a Final Draft Climate Action Plan in February 2022. The Climate Action Plan details specific measures that will be implemented in Sacramento County by 2030 to reduce GHG emissions from community-wide activities and government operations. It also includes an adaptation plan that recommends 42 actions to reduce the community's vulnerability to the anticipated impacts of climate change. The Climate Action Plan goes into greater detail, however the main reduction in GHG emission are through 1) promoting and increasing carbon farming (working with farmers, ranchers to increase carbon sequestration), 2) increase energy efficiency and electrification of existing residential buildings, 3) eliminate fossil fuel consumption in new residential buildings, and 4) implement electric vehicle infrastructure Program (Install chargers throughout the community working with third-party installers and operators).

City of Sacramento

The City released the draft Climate Action and Adaptation Plan (CAAP) and the draft 2040 General Plan for public review in April 2023. In August 2023, the City released the draft Master Environmental Impact Report for public review. The CAAP sets new and ambitious targets for the City and identifies key strategies and actions that form the foundation of Sacramento's goal of achieving carbon neutrality by 2045. Carbon neutrality means balancing the emissions created within the City (e.g., through combustion of gasoline or usage of electricity) with the emissions sequestered (e.g., through carbon absorbed in trees or soils) within that boundary.

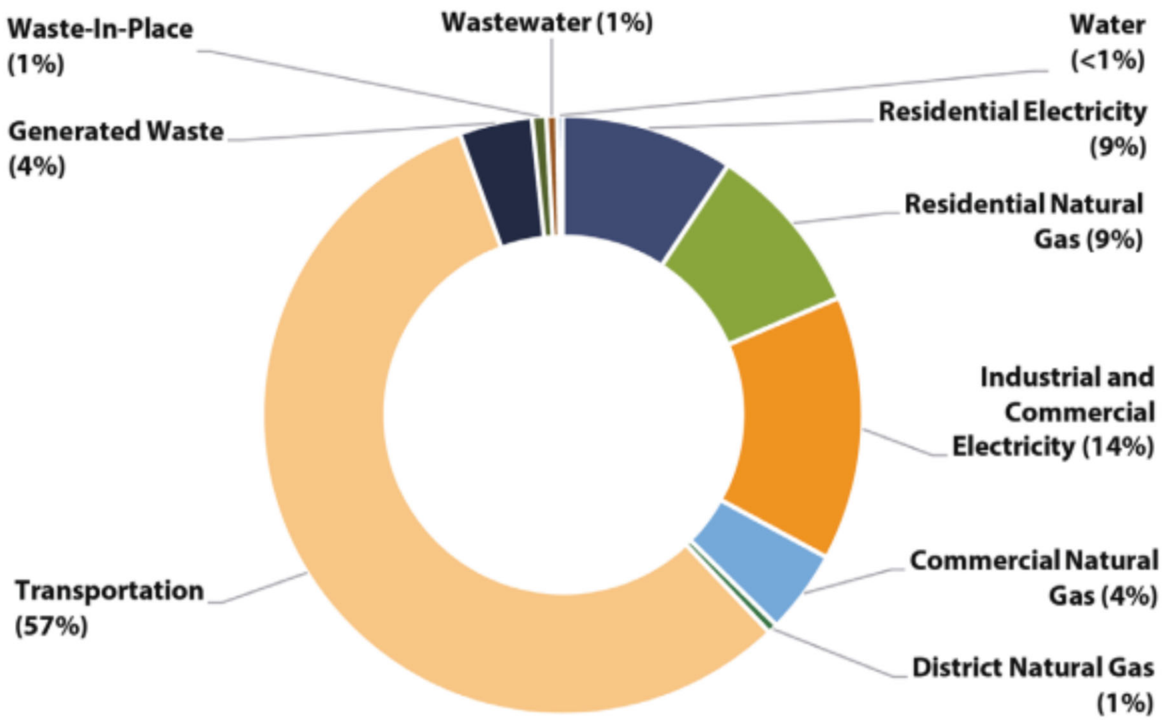
A GHG inventory was developed for Sacramento's CAAP using data from 2016. As shown in **Figure 4-33**, the largest GHG emissions sector is transportation, followed by buildings, waste, wastewater, and water. Based on these results, the greatest opportunities for GHG emissions reductions are in the transportation and buildings sectors. Based on this inventory, the CAAP has developed specific measures for the following sectors, which are described in detail in Chapter 6 of the CAAP.

- Built Environment (Electrification of Existing and New Buildings)
- Transportation
- Waste (Elimination of methane process emissions from landfilled waste)
- Water and Wastewater
- Carbon Sequestration

Using the Built Environment as an example, the City of Sacramento is developing a pathway to transition existing buildings to carbon-free electricity by 2045. Recommendations include requiring new construction to be all-electric, in addition to transitioning 25 percent of existing residential and small commercial buildings to all electric by 2030, and 100 percent of existing buildings by 2045. As Sacramento tracks its GHG emissions and implements the CAAP over the next 10 years, the climate action targets will provide an important point of comparison by which to measure progress and re-evaluate long-term strategies to achieve 2045 goals. The 2030 target and 2045 goal are:

- 2030 Climate Action Target**:** Reduce Sacramento's per capita GHG emissions to 3.63 MT CO2 e per person by 2030, equal to 63 percent below 1990 levels. In mass emissions, this equates to achieving emissions less than 2,160,128 MT CO2 e in 2030.
- 2045 Climate Action Goal**:** Reduce Sacramento's per capita GHG emissions to net zero MT CO2 e per person by 2045, equal to 100 percent below 1990 levels.

Figure 4-33. The City of Sacramento's 2016 GHG Emissions by Sector



In addition to specific actions to reduce GHG emissions, the plan also contains adaptation strategies (Chapter 7) to address the people, places, and infrastructure most at risk and to leverage other opportunities to effectively and equitably build climate resilience in Sacramento's communities. The following areas have been prioritized for adaptation strategies: 1) Strengthen City Government Capacity for Integrated, Holistic Climate Adaptive Strategies, 2) Extreme Heat and Urban Heat Island Effect, 3) Flooding, 4) Air Quality Impacts of Wildfires and Heat, 5) Climate Disaster Events and 6) Water Supply Availability and Water Conservation.

<u>City of Folsom</u>

The City of Folsom finalized and adopted the Climate Adaptation and Resilience Report in 2021. The report has a comprehensive assessment of the City of Folsom's vulnerabilities to climate change. The report concluded that the City was most vulnerable to increased temperatures and extreme heat, then increased extreme precipitation and flooding, then drought, and lastly increased wildfire risk. The City of Folsom also amended the General Plan Safety and Noise Element to include adaptation strategies to address climate-related impacts, including extreme heat, and initiated the City of Folsom Active Transportation Plan that combines and updates bicycle and pedestrian facilities in the City.

City of Roseville

The City of Roseville completed a GHG inventory on a citywide level and established feasible measures that will help reduce GHG emissions. These measures were incorporated into the 2020 General Plan and also the Multi Hazard Mitigation Plan which is currently being updated. The measures focus on implementing mitigation strategies to reduce air pollutant and GHG emissions from motor vehicles, and encouraging development to be located and designed to minimize GHG and air pollutant emissions.

East Bay Municipal Utility District (EBMUD)

EBMUD completed their Climate Action Plan in 2021. The plan outlines numerous climate adaptation strategies in the following areas: long-term water supply, water quality and environmental protection, long-term infrastructure investment, long-term financial stability, customer and community services, as well as workforce planning and resilience.

Conclusions

Climate change impacts are most likely to affect source water quality via changes in surface water runoff and timing, changes in reservoir operations, warmer water temperatures, warmer soil temperatures, increased frequency of extreme weather events, and fire risk in the American River watershed. Based on the previous updates and current information, 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 water.
- Increase of water-related pathogens, plastics, sediment, nutrients, and possibly other pollutants due to runoff from more frequent and intense precipitation events.
- Reduced ability of warm water to hold dissolved oxygen.
- Increase of acidity in waterbodies from higher carbon dioxide concentrations.
- More erosion and sedimentation caused by intense rainfall events, especially following wildfires.
- Increased velocity of stream flow.
- Potential increased sewer overflows due to intense precipitation and storm runoff.
- Increased formation of disinfection byproducts in treated drinking water due to warmer waters.

Overall, most of the climate change impact studies conducted to date are primarily focused on how climate change impacts water supplies, and not water quality. Due to less snowpack and more intensive precipitation, the timing and magnitude of typical spring runoff will be earlier. These extra flows occurring in the winter and early spring may not be able to be fully conserved in reservoirs to meet high demand in the summer. The extra water is released as flood water, resulting in a loss of seasonal storage for reservoirs. In turn, most climate adaptation strategies focus on addressing water supply shortage such as developing alternative water supplies, reoperation of reservoirs, increasing groundwater recharge projects, and building new reservoirs. Folsom Lake is currently operating using forecast-informed operations. Although water agencies may be involved in these types of projects, it is more likely that smaller-scale climate adaptation strategies would be more feasible to directly implement such as increasing conservation and recycling, addressing aging infrastructure, identifying critical operating equipment, identifying facilities which could be impacted by floods or wildfires, emergency planning, promoting stormwater capture, and preventing sewer overflows from inflow and infiltration.

California has committed to significant investments for climate change. Reports and plans have been developed for water resilience, wildfire and forest resilience, conserving land, achieving carbon neutrality through many means such as reduction of GHG emissions, and nature-based solutions such as carbon sequestration on natural and working lands. These reports are focused on specific actions and tracking the progress of the actions. Local agencies such as Sacramento County, the City of Folsom, the City of Roseville, EBMUD, and the City of Sacramento have completed climate change vulnerability assessments and identified adaptation measures to address climate change.

Folsom Lake Operations

In June 2019, Reclamation and the US Army Corps of Engineers (Corps) signed an updated Folsom Dam Water Control Manual for Folsom Dam and Lake that allows for more accurate release decisions based on weather forecasts, referred to as Forecast Informed Reservoir Operations (FIRO). The updated manual also incorporated the new Joint Federal Project (JFP) auxiliary spillway. Working within the requirements of the updated Water Control Manual, Reclamation uses ensemble forecasts and hydrologic modeling to meet specific management objectives. Due to drought conditions in 2019 and 2020, there was not an opportunity to model/test the 200 TAF of forecast dependable variable space until the fall of 2021.

Additionally, there has been no report produced by the U.S. Army Core of Engineers or Reclamation to evaluate potential water quality impacts since FIRO was implemented at Folsom Reservoir in 2021. Therefore, the following information on water quality impacts is based on a review of the Final Supplemental Environmental Assessment/Environmental Impact Report (SEA/EIR) for the Folsom Dam and Lake Water Control Manual Update which was completed in January 2019. It should be noted that there was little consideration of the impact on water quality for drinking water supplies.

Two alternatives were evaluated in the final SEA/EIR and Alternative 2 (Forecast Informed Alternative) was selected. This includes forecast informed operations with variable Folsom flood control space (400,000 acre-feet [af] to 600,000 af), with both the additional release capacity provided by the JFP auxiliary spillway and variable winter flood space of 400,000 to 600,000 af.

Temperature

Temperature management is required for the success of federally-listed endangered species on the Lower American River as well as the Nimbus and American River Fish Hatcheries operated by the California Department of Fish and Wildlife. The National Marine Fisheries Services (NMFS) 2009 Biological Opinion and amended 2011 Reasonable and Prudent Alternatives contain objectives for managing the Central Valley Steelhead on the Lower American River. Objectives include management of water temperatures during the summer through fall period. NMFS' management objective sets a daily average water temperature target of 65°F or lower at Watt Avenue Bridge from May 15th through October 31.

The Corps used the CalSim II model and Reclamation's monthly temperature model to evaluate simulated monthly water temperatures at representative nodes in the rivers in the Project Area. Simulated monthly temperatures at representative locations in the Lower American River indicate that water temperatures under Alternative 2 relative to No Action/No Project would generally be similar most of the time, but with measurable reductions in water temperature during late spring, summer and early fall months. Generally, the temperatures remain the same or slightly cooler. This is likely due to more water being retained in Folsom Reservoir, and having more of the colder, deeper water in the reservoir.

Specific information based on water year type and location(s) along the American River was presented in the final SEA/EIR.

- At the Nimbus Dam location, monthly water temperatures by water year type would be generally equivalent or similar during most months of all water year types, but would be measurably cooler during May of dry water years and measurably warmer during April of critical water years.
- At the Watt Avenue location, monthly water temperatures by water year type would be generally equivalent or similar during most months of all water year types, but would be warmer in March of above-normal water years, warmer during March and April of dry years, and cooler in July but warmer during April and May of critical water years.
- At the American River Mouth location, monthly water temperatures by water year type would be generally equivalent or similar during most months of all water year types, but would be warmer in March and June of above-normal water years, warmer during March and April of dry years, and cooler in July but warmer during April and May of critical water years.

Other Water Quality Impacts

As stated in the Final SEA/EIR, elemental mercury from historic mining operations was identified as a potential concern in sediment, which could affect water quality. The Final SEA/EIR refers to a 2006 analysis of sediment sample taken from Folsom Reservoir which showed none of the metal concentration levels exceeded any sediment standards. Therefore, the sediment would be suitable for unconfined aquatic disposal. In the Lower American River, the hydrology and hydraulics of the Lower American River under Alternative 2 are similar to the No Action Alternative hydrology and hydraulics. Therefore, no significant changes in suspension of metals and contaminants in the Lower American River are expected under Alternative 2.

Conclusions

Although the Final SEA/EIR for the Folsom Dam and Lake Water Control Manual did not identify any specific water quality impacts as a result of the Forecast Informed Alternative, there was very limited evaluation conducted. The American River water users may wish to request a water quality evaluation now that FIRO is being implemented at Folsom Reservoir.

BRIEF TOPICS

Three brief topics where identified by the participating water utilities for review. Provided below are discussions on irrigated agriculture, outdoor cannabis cultivation, and selected mines. These topics are summarized only for informational purposes.

Irrigated Agriculture

Irrigated agriculture in the upper watershed, specifically Placer and El Dorado counties, was briefly reviewed to ensure that there have not been significant changes in portions of the watershed that may have the potential to impact water quality.

According to the Placer County Agricultural Commissioner Annual Reports, the top agricultural crops in Placer County continue to include rice, cattle/calves, nursery stock, poultry, and walnuts. There is very limited, if any, nursery stock and walnut cultivating in the American River watershed, and no rice cultivation. Cattle/calves are limited to dispersed grazing, and that is discussed in the Forest Activities subsection. Poultry operations are located in Western Placer County, outside of the American River watershed. For that reason, there is no agriculture in Placer County that is of concern for the American River watershed.

The El Dorado County Agricultural Commissioner Annual Reports were also reviewed and the top agricultural crops include apples/pears, wine grapes, hay/pasture, livestock, and timber. The livestock and hay/pasture activities are discussed in the Forest Activities subsection. Timber is also discussed in the Forest Activities subsection. That leaves apples/pears and wine grapes as the most significant agricultural crop in the county. The pesticides used on these crops were reviewed to see if they had significant potential to impact source water quality.

Apple/pear and wine grape cultivators are largely located along Highway 50 in the portion of the American River watershed in El Dorado County. The majority of the Apple Hill agricultural district is located in the watershed. El Dorado County reports over 930 acres of apple/pears orchards and over 2,700 acres of wine grapes.

A review of the DPR pesticide use reporting was conducted to identify pesticides used on apples/pears and wine grapes in El Dorado County. There are very few pesticides consistently used in large quantities on either crop in the county. A review was conducted to identify pesticides that had 100 pounds of active ingredient applied annually as a trigger, for two or more years, for each crop.

Two pesticides were used above that amount on apples/pears: mancozeb and glyphosate. Mancozeb was the most heavily used pesticide, with annual use in El Dorado County in 2017 at 2,812 pounds and in 2021 at 911 pounds. Mancozeb does not have an MCL, but there is a USEPA Human Health Benchmark for Pesticide set at 0.492 µg/L (set for 10^{-6} cancer risk). Glyphosate use was significantly lower, ranging from 256 pounds in 2017 to 465 pounds in 2021. Glyphosate has a primary MCL of 700 µg/L.

For wine grapes, there were five pesticides that met the use trigger above, for the purpose of this review: boscalid, glyphosate, oryzalin, oxyfluorfen, and pendimethalin. **Table 4-35** presents a summary of the use information and human health threshold in drinking water.

Table 4-35
Pesticides Used in El Dorado County on Wine Grapes, 2017 and 2021

Constituent	Pounds Applied Annually, Range	Human Health Threshold, µg/L
Boscalid	165 - 180	1,300 [1]
Glyphosate	2,259 – 2,830	700 [2]
Oryzalin	123 – 183	3.8 [3]
Oxyfluorfen	162 – 372	0.404 [3]
Pendimethalin	442 - 811	2,000 [1]

[1] Human Health Benchmark for Pesticides Chronic Risk
[2] Primary MCL
[3] Human Health Benchmark for Pesticides 10^{-6} Cancer Risk

In the Central Valley, irrigated agriculture discharge is regulated through WDRs under the Irrigated Lands Regulatory Program from the Regional Water Board. The Sacramento Valley Water Quality Coalition (SVWQC) represented all non-rice irrigated crops in the Sacramento River Watershed. The SVWQC is divided into sub-watersheds, including the El Dorado County sub-watershed.

Historic monitoring results in the Irrigated Lands Regulatory Program have showed that production practices impact surface water primarily through winter storm runoff and irrigation return flows. Winter storm runoff can transport: pesticides applied to dormant orchards; sediment, which may contain dissolved nutrients or pesticides; and fecal waste and nutrients from pasture and confined animal facilities. Irrigation return flows can transport pesticides applied before irrigation; sediment (with pesticides/nutrients also) from tilled fields (row/field crops); and dissolved salts.

The current WDRs is Order No. R5-2014-0030-R1: Waste Discharge Requirements for Growers within the Sacramento River Watershed That are Members of a Third-Party Group (Sacramento River Watershed). Within this Group is the El Dorado County sub-watershed. There were two monitoring sites in the El Dorado County sub-watershed that are tributary to the American River: Coon Hollow Creek and North Canyon Creek. Both sites were monitored for general constituents and pesticides during the study period. There were no detects of any pesticides. TOC was also sampled at both sites, averaging 2.8 mg/L. *E. coli* was sampled at North Canyon Creek, averaging 5.1 MPN/100 mL. Both of these data results are within the range of normal conditions in the American River watershed.

In March 2016 the Regional Water Board approved a Reduced Monitoring/Management Practices Verification waiver for the El Dorado County sub-watershed due to the low risk to surface water quality. The Organochlorine Pesticide Management Plans for DDT and DDE were approved as complete in 2018 and 2020, respectively. This means that the Regional Water Board will not require any more standard monitoring for the El Dorado County sub-watershed due to low risk to the surface water quality.

The limited amount of irrigated agriculture in the American River watershed continues to be insignificant to source water quality.

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 legal/permitted outdoor cultivation since it has the highest potential to impact source water quality. Due to the infancy of regulatory programs and the potential expansion of this activity in the watershed, it is likely that this activity could be considered for review again in the 2028 Update report.

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 Water 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.

AB 21 was adopted in February 2016 to formalize the cultivation requirements and SB 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 American 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

Potential source water quality impacts caused by growers that engage in activities that can negatively impact receiving waters, 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 in situations where run off to surface waters may occur; discarding of trash and haphazard management of human waste; substandard storage of hazardous materials such as diesel and gasoline; and unauthorized diversion of water from streams.

Pesticides must be approved by USEPA and DPR for use on a specific crop like cannabis. None are currently approved since there is a federal ban on marijuana use. MMRSA charged the DPR with identifying pesticides for use on cannabis and the associated safe levels on harvested marijuana leaf, but DPR cannot do this since it conflicts with federal statutes. Pesticides registered for use on “unspecified green plants” can be used on cannabis. Home or illegal use of pesticides does not require a cultivator license from the California Department of Food and Agriculture, only commercial cultivators require a County Agricultural Commissioner to issue an operator identification (if allowed by local ordinances).

Pesticides most frequently found associated with illegal cannabis cultivation are Round Up (glyphosate) and carbofuran.

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 Tahoe and Eldorado National Forests. However, USFS and county law enforcement confirm that there are numerous illegal commercial grow operations within the National Forests. Essentially, cannabis cultivation can occur anywhere in the watershed where water and sunlight are available. The focus of this section is on outdoor cultivation in rural areas, similar to agricultural activities.

Medicinal and adult personal cannabis cultivation can occur in any county in the watershed. El Dorado County permits commercial cultivation, Placer County does not.

Regulation and Management

California

CalCannabis Cultivation Licensing is a division of the California Department of Food and Agriculture, which has been licensing commercial cannabis cultivation facilities in California. 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 will now issue licenses for cultivators for both adult and medicinal permits. It only issues permits in counties where it is legal to commercially cultivate cannabis (Nevada). 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 Water Board and the DFW in permitting cultivators.

The State Water 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 Water 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 Water Board Cannabis Cultivation NPDES General Order, adopted by the State Water Board (Order 2017-0023-DWQ) on October 17, 2017. There were no permittees under this Order in the American River watershed. When the Cannabis Cultivation Policy was updated, Order 2017-0023-DWQ was terminated and replaced with Order 2019-0001-DWQ. There are two permittees under this Order in the American River watershed, both in El Dorado County and a Tier 2 size (greater than 1 acre).

The Order covers all 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 exemptions for small personal and commercial outdoor cultivation (<2,000 square feet [sf]). Orders are risk-based, accounting for size of cultivation, slope of disturbed area, and proximity to a waterbody. The Cannabis Cultivation Policy includes many BMPs and prohibitions on cultivation that are intended to protect water quality.

In addition, the State Water 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 Water 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.

The Regional Water Board passed NPDES General Order No. R5-2015-0113 for Waste Discharges Associated with Cannabis Cultivation in 2015, prior to development of the CalCannabis program and State Water Board Order. There were no permittees in this program in the American River watershed. The Order was rescinded in June 2019 (R5-2019-0062) and permittees were transitioned to State Water Board Order 2017-0023-DWQ.

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 National Forests, the primary type of outdoor cannabis cultivator is a drug-trafficking organization. These grow operations occur in the American 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

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 allowing 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.

County staff prepared a zoning text amendment to outline additional detailed requirements for outdoor cultivation. The amendments limit outdoor cultivation to an area of no more than 50 square feet; establish 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.

El Dorado County

El Dorado County permits both personal and commercial cannabis cultivation. Personal cultivation applies to both medicinal and recreational and the Ordinance (5122) covers both indoor and outdoor cultivation. The ordinance related to personal cultivation includes:

1. Cultivation of up to six plants per parcel maximum.
2. Cultivation area must be secured by a 6 foot fence, screened from view, and setback from property lines at least 50 feet.
3. Residence must be at least 1,000 feet from any youth facility and no odor can be a nuisance to any neighbor.
4. Cultivator must either own the residence or have permission from the owner, if a tenant.
5. Environmental restrictions include: waste prohibition, runoff and drift prohibition, no sediment disturbance, no use of illegal pesticides, and secure right to use water for irrigation.

In November 2018, the voters of El Dorado County passed ballot measures creating a commercial cannabis program in the County. The program was developed through a stakeholder process to balance the desire for a commercial cannabis program with concerns raised in the community about impacts to communities from such a program. This includes a robust, three-phase permitting process, including the Sheriff's Office review of the criminal history of applicants. There are also substantial fees associated with the permits. The second phase of the application process includes an environmental review.

Selected Mines

Mining was evaluated in the original 1993 Survey, including an extensive inventory of historic and active mines. Mining was initiated in the watershed in 1848 on the South Fork American River and continues today. This includes a wide variety of mining types, such as lode, placer, open pit, and quarries. The largest inventory of mines in the watershed are historic gold mines, which have not changed since the 1993 Survey and do not warrant any additional investigation as they are not contributing to any source water quality issues of concern for drinking water treatment. Active mining for gold and other resources is permitted under both State and Federal programs. The focus of this 2023 Update was to look at two mines in the watershed that have NPDES permits for mine drainage discharge to receiving waters, and ultimately the American River.

The two mines included in this evaluation are Sliger Mine and Eagle's Nest Mine. A brief discussion of each is provided below. Both mines are regulated under NPDES permits from the

Regional Water Board and have been working to reduce discharges to surface water and manage activities at the mines better. These two mines do not appear to be of significant concern to surface water quality at this time.

Sliger Mine

Reclamation owns the inactive Sliger Mine in El Dorado County. This mine encompasses six acres located in unincorporated El Dorado County and is discharging mine drainage. The mine was founded in 1864 for gold mining. The original milling process consisted of two-stage crushing, flotation, and gravity concentration. The table tailing was sent to a conditioner and treated by flotation. The mine was closed for a period and was inactive until 1922. When it was reopened, the shaft was deepened to approximately 2,000 feet and a 15-stamp mill was added. From 1934 through 1953 the mine went through various owners and operations. By 1953, most of the surface equipment had been sold.

The mine site consists of underground workings, mine openings, concrete foundations, and waste rock on the east wall of the river canyon. A former mill located onsite was used to process ore removed from the Sliger Mine. Water that contains arsenic and other metals is discharged continuously from an adit (small passage for mine drainage), at approximately 0.1 cubic feet per second (cfs), west in a drainage channel to the Middle Fork of the American River.

In 2008 a passive biological treatment system was installed, utilizing sulfide-reducing bacteria to precipitate the metals, prior to discharge to the Middle Fork of the American River. The facility is operated under two NPDES permits during the study period (Order No. R5-2015-0121 and Order No. R5-2022-0007), with a permitted discharge flow of 0.194 mgd.

Under low flow conditions most of the water is expected to be consumed in the treatment system. Under average flow conditions, the water is expected to infiltrate into the soil underlying the discharge trench, preventing a direct discharge to the Middle Fork of the American River. During wet weather, stormwater runoff from adjacent areas can infiltrate the treatment system, so an influent weir directs flows in excess of 0.3 cfs away from the reactor to protect the treatment system from exceeding its capacity. The redirected flows, consisting of a portion of the adit drainage mixed with infiltrating stormwater, flow directly to the Middle Fork of the American River. High flows are anticipated to occur during significant rainfall events and during high rainfall years. Under these conditions, the flow in the Middle Fork of the American River would also be increased resulting in an increased dilution capacity and minimal if any impact.

Under its NPDES permit, the mine has seasonal effluent limits. The two seasons are dry (June 1 to November 30) and wet (December 1 to May 31). Limits are set for arsenic, pH, flow, iron, and electrical conductivity. The dry season limits are more conservative, likely due to reduced dilution capacity of receiving waters. Biannual monitoring is required on the mine effluent, as well as upstream and downstream receiving waters.

The effluent has consistently violated the arsenic effluent limit, and at times the iron effluent limit. Inspections by the Regional Water Board in 2013 and 2014 discovered that the treatment system has fallen into disrepair and arsenic, iron, and electrical conductivity levels are above effluent limits. Reclamation did not submit a Report of Waste Discharge (ROWD) prior to the NPDES permit expiring, and monitoring was not conducted in accordance with the terms of the permit. A Notice of Violation was issued by the Regional Water Board in June 2013.

This existing Order required upgrades and maintenance to the existing bioreactor/infiltration gallery and/or installation of new treatment units. The Order also required the discharger to file a ROWD no later than May 31, 2020. The Order contained standard provisions for NPDES permit compliance including taking reasonable steps to minimize or prevent any discharge of sludge or disposal in violation of the Order that has a reasonable likelihood of adversely affecting human health or the environment. The Order identified monitoring locations that the discharger shall establish to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in the Order.

Several violations of previous Order (R5-2015-0121) were observed during a Regional Water Board inspection in June 2020. Reclamation did not maintain the inlet or bioreactor as required in the previous Order. Adit discharge was also held at an unpermitted holding basin, with evidence of discharge to surface water in violation of the previous Order. Since the violation occurrences, Reclamation has performed corrective actions to rehabilitate the inlet to bioreactor.

The most recent revised NPDES permit (Order No. R5-2022-0007) for the Sliger Mine was adopted February 17, 2022, and became effective on April 1, 2022. The Order requires the discharger to file a ROWD no later than March 31, 2026, and the Order expires March 31, 2027. This new Order requires quarterly inspections of the existing and any new units of the treatment system/infiltration gallery to make observations, statements, take photographs, and maintain the treatment system/infiltration gallery, piping, and flow structures. The Order contains standard provisions for NPDES permit compliance including taking reasonable steps to minimize or prevent any discharge of sludge or disposal in violation of the Order that has a reasonable likelihood of adversely affecting human health or the environment. The Order identifies monitoring locations that the discharger shall establish to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in the Order.

Eagle's Nest Mine

The USFS owns the Eagle's Nest Mine site, an underground lode gold mine located in Placer County. The mine is located on two contiguous 20-acre parcels of land within the Tahoe National Forest, near the 6-mile mark of Mosquito Ridge Road in Foresthill. The mine is accessed by one portal on the Big Seam mining claim. The mining rights were sold and the mine is now operated by a new entity, called Eagle's Nest Mining. This was approved by the Regional

Water Board in April 2019 (R5-2019-0039). The new operator has taken over the NPDES permit (R5-2007-0181) and completed all required action elements from the CDO described below.

Mining at the site has been authorized under the mining laws governing locatable minerals on the Foresthill Ranger District, Tahoe National Forest, under the Code of Federal Regulations, Title 36, Part 228A. Mining claims on this site have been in operation since 1975, while the most recent conditional approval of the Plan of Operations is dated September 8, 2004. The mine consists of approximately 1.75-miles of underground mine workings. Waste-rock inside the mine is loaded and transported out of the underground workings with an underground load-haul-dump vehicle and side cast onto the waste dumps. Ore bearing material is hand sorted and transported off site. No milling or processing takes place on the surface of these claims.

Waste rock is created when drilling and blasting operations occur inside the mine. There are five waste dumps located at the mine site. Waste dumps 1 through 4 are located directly in front and to the east of the mine portal and cover approximately two acres. Flatter slopes allow for more storage of waste rock; the surface slope for waste dumps 1 through 4 range from 55-75 percent. Lack of capacity and slope stability issues restrict further placement of waste rock on these waste dumps. Waste dump 5 is the newest waste dump for the mine, located to the west of the portal on a surface slope ranging from 20 to 55 percent. This newer waste dump serves as a more stable and level storage area for further waste placement, and alleviates the need for increased capacity at waste dumps 1 through 4. A waste characterization analysis indicates that: the waste material is not acid generating and is classified as a Group C mining waste, and the discharge of waste rock from the mine does not pose a significant threat to water quality other than turbidity during rain events. The mine does not have a portal discharge to surface waters, though the property slopes south overlooking the Middle Fork of the American River.

Potential discharges to the American River system may result from stormwater runoff during rain events, although surface water monitoring programs are in place to comply with the General Industrial Stormwater Permit and the site-specific SWPPP, including BMPs. The mine is located approximately 0.4 miles north of the Middle Fork of the American River, and downstream of the Oxbow Reservoir which is approximately 1.4 miles west-northwest. Surface water draining from the site flows to a seasonal drainage (Mad Canyon) and tributary to the Middle Fork of the American River. During rain events, surface water runoff is diverted, generally south, to existing channels and four small drainage basins.

Compliance with all requirements of the NPDES permit is ultimately the responsibility of the USFS, as the administrator of the property at which discharge occurs; while the mine claimant and operator retains primary responsibility for compliance including operations and monitoring. All monitoring performed by the Discharger shall be conducted in accordance with a Sample Collection and Analysis Plan, and must be consistent with the Provisions for Monitoring in the Standard Provisions and Reporting Requirements (2003). This requires that the discharger report monitoring data and information in an annual monitoring summary report to be submitted by July 1st of each year.

An ACL order (Order R5-2012-0093) and CDO (Order R5-2012-0094) were issued on October 5, 2012 to the Discharger. The ACL detailed several violated provisions of the WDRs and the Industrial Storm Water General Permit (current Order 2014-0057-DWQ). The Regional Water Board found the Discharger to have violated Prohibition A.6 of the WDRs and California Water Code Section 13376 by discharging unauthorized waste into Mad Canyon, a tributary to the Middle Fork of the American River and water of the United States. Additional violations include failure to submit annual summary reports and/or annual facility inspection reports, and failure to pay annual requirement and permit fees for various fiscal years. A second ACL order (R5-2013-0049) was issued in 2013 to address the continued failure to submit an Annual Report in 2011/2012.

The CDO required an immediate cessation of discharge activities that violated the mine's WDRs. The CDO also detailed several measures to be implemented by the Discharger to ensure compliance with the provisions of the mine's WDRs and the Industrial Storm Water General Permit. These measures included submitting technical reports detailing erosion control measures employed at the mining site and reporting on the reclamation and closure of waste dumps 1 through 4.

On May 7, 2020, Regional Water Board staff received notification that the Discharger has achieved compliance by completing all the tasks in the CDO. Therefore, it is appropriate to rescind Order R5-2012-0094.

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The purpose of this section is to evaluate the existing water treatment plants using American River water for their compliance with existing drinking water regulations. **Appendix B** contains a summary of the data provided by each of the participating water utilities. **Appendix C** provides the Regulatory Framework used as the basis for evaluation and provides details on the selected existing drinking water regulations highlighted below**.**

There are nine existing intakes and 15 existing water treatment plants within the watershed that are included in this study. Each of these is discussed herein within the context of selected current and future regulatory compliance and potential treatment issues beginning with the most upstream diversion point and then moving downstream for each participating water utility.

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

Highlights of Selected Existing Drinking Water Regulations

NIPDWR and Phase I, II, and V Regulations. Sets Maximum Contaminant Levels (MCLs) for many inorganic chemicals, synthetic organic compounds (SOCs), and volatile organic compounds (VOCs).

Surface Water Treatment Rule (SWTR). Sets minimum 3/4-log reduction requirement for *Giardia* and viruses, respectively. Sets turbidity requirements, which have since been tightened by the Interim Enhanced Surface Water Treatment Rule.

Interim Enhanced SWTR (IESWTR), Long Term 1 ESWTR and Filter Backwash Rule. IESWTR applies to systems serving at least 10,000 population and LT1ESWTR 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 unit (NTU) in 95 percent of monthly measurements, and not to exceed 1 NTU. Requires recycling of all return flows to the headworks, upstream of chemical feed.

Stage 1 Disinfectants/Disinfection By-Product (D/DBP) Rule. 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 milligrams per liter (mg/L). Set MCLs for total trihalomethanes (TTHM) and haloacetic acids (HAA5) at 80 and 60 micrograms per liter (µg/L), respectively, in the distribution system as system-wide running annual average (RAA).

Long Term 2 Enhanced SWTR (LT2ESWTR). 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 running annual average *Cryptosporidium* value is > 0.075 oocysts per liter (/L), 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 system plans to make a significant change to disinfection.

Stage 2 D/DBP Rule. Requires compliance with distribution system MCLs for TTHM and HAA5 to be based on locational running annual average (LRAA). Under Stage 2, compliance is based on LRAA of 80 and 60 µg/L. Initial Distribution System Evaluations (IDSE) was completed to identify long term routine monitoring locations. Compliance schedules depend on system size and source type. For combined distributions systems, all systems are on schedule of earliest system. Operational evaluations are required if projected DBP levels exceed the MCLs.

PLACER COUNTY WATER AGENCY (PCWA)

System Description

Foothill 1 Water Treatment Plant

The American River raw water intake location for the Foothill 1 Water Treatment Plant (WTP) is located near Ophir Tunnel in Auburn, which diverts off the North Fork of the American River. Foothill 1 WTP is a ballasted clarification water treatment plant. The plant design flow is 40 million gallons per day (mgd), with average flows at about 30 mgd in summer and 10 mgd in winter. It should be noted that the use of American River water for the Foothill WTP is for standby to the Yuba and Bear River water supply delivered from the Pacific Gas and Electric (PG&E) canal system. Every year from approximately October 1st to November 24th, PG&E has a scheduled outage for canal inspection and maintenance. Over the reporting period, American River water was used as the main source for the Foothill WTP from approximately mid-October to mid-November. In 2021, the Foothill WTP was treating American River water for an extended time period from June 7 to November 18th due to the Bear River Canal collapse.

Either 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 within the coagulation mixing chambers of Actiflo®. The coagulated water then enters a four chamber Actiflo® microsand ballasted separation process consisting of coagulation, injection, maturation, and separation chambers, with a detention time of 15 minutes; it is then chlorinated, and enters into contact basins. The clarified water is then filtered through eight mono media deep bed filters, with a ninth filter as a standby. The filter loading rate is 10 gallons per minute per square foot (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 sodium hypochlorite, and stored in a 10 million gallon (mg) storage basin to meet disinfection contact time (CT) requirements. The average chlorine residual leaving the plant is 0.5 to 1.0 milligrams per liter (mg/L).

Foothill 2 Water Treatment Plant

The American River raw water intake location for the Foothill 2 WTP is the same as for Foothill 1 WTP described above. Foothill 2 WTP is a conventional water treatment plant. The plant design flow is 21 mgd, with average flows at 7 mgd in the winter and 15 mgd in the summer.

Either 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 taste and odor. Chemicals are mixed by a mechanical mixer which has two speed settings, and a mixing time of about 15 seconds. The coagulated water then enters a three stage tapered energy flocculator, with a detention time of 30 minutes, and then into sedimentation basins with a detention time of 120 minutes. The clarified water is chlorinated then filtered through four mono-media deep bed filters. The filter loading rate is 5 gpm/sf in standard mode and 6.9 gpm/sf in direct filtration mode. 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 sodium hypochlorite, and stored in a 10 mg storage basin to meet CT requirements. The average chlorine residual leaving the plant is 0.5 to 1.0 mg/L.

Highlight of Changes Since 2018 Update

A three-phase project was completed at the Foothill 2 WTP which consisted of: 1) converting the dual media filters to mono-media deep bed filters with 42 inches of anthracite, 2) changing the horizontal shaft flocculators to vertical turbine flocculators, and 3) adding plate settlers to the sedimentation basins.

Significant Potential Contaminating Activities

The Foothill WTP is located furthest upstream in the watershed on the North Fork of the American River. It diverts water at the American River Pump Station. From the upper watershed, recreational use is heavy and the potential for forest fires could increase the impact of erosion potential. During the study period the Mosquito Fire exemplified the potential for impact. Also of interest are timber harvesting activities, the potential spills associated with wastewater treatment and collection systems, railroads, highways, petroleum pipelines, and bridge crossings, and evolving impacts from climate change.

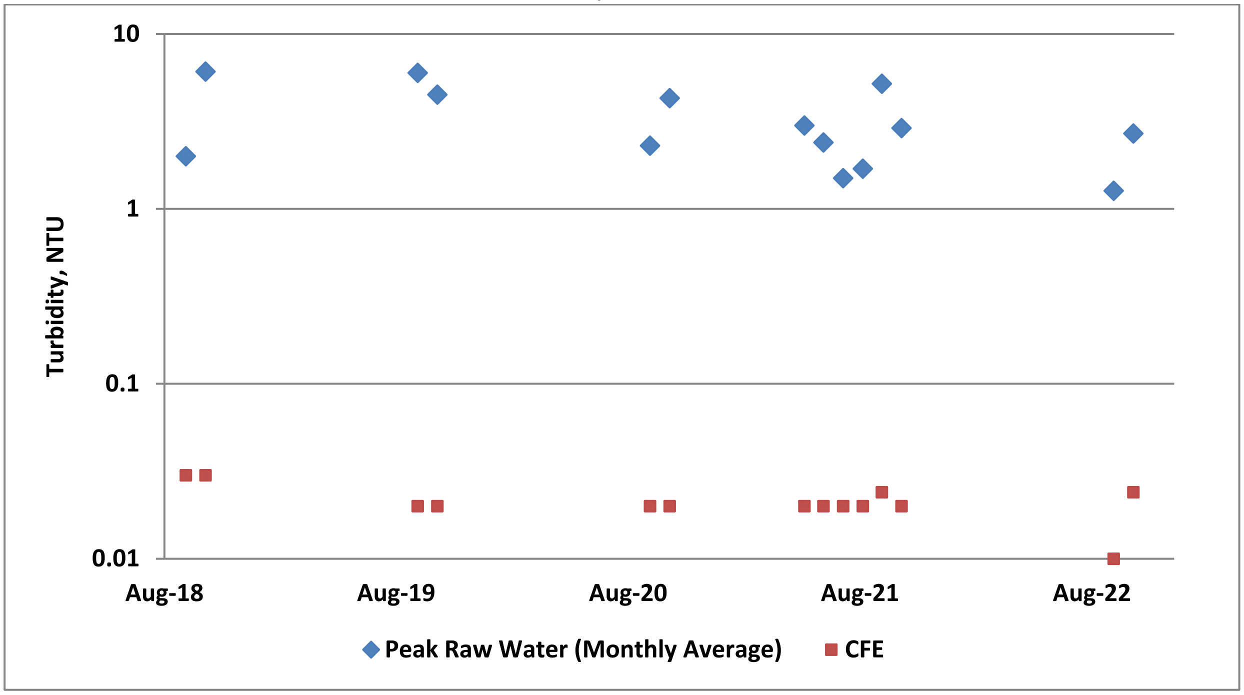
Treated Water Quality Summary

Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study. As the Foothill WTP uses American River water only a few weeks a year, the analysis focused on the applicable time periods.

Turbidity

The average of peak daily raw water turbidity at the Foothill 2 WTP for the period of study was 3.3 NTU, and on average the treatment process decreased this to 0.02 NTU, which equates to an average solids removal of 99.4 percent. **Figure 5-1** shows a time series plot of raw and treated turbidities. It should be noted that the raw water turbidities plotted are the monthly average of peak daily grab samples, and the treated water turbidities are the monthly average of the daily average samples, where the daily average is an average of all 4-hour (hr) samples taken in a 24 hour period. Foothill WTP meets all current treated water turbidity standards.

Figure 5-1. Foothill 2 WTP, Raw and Treated Water Turbidities During Periods of American River Use, 2018 – 2022



Microbiological Constituent Review

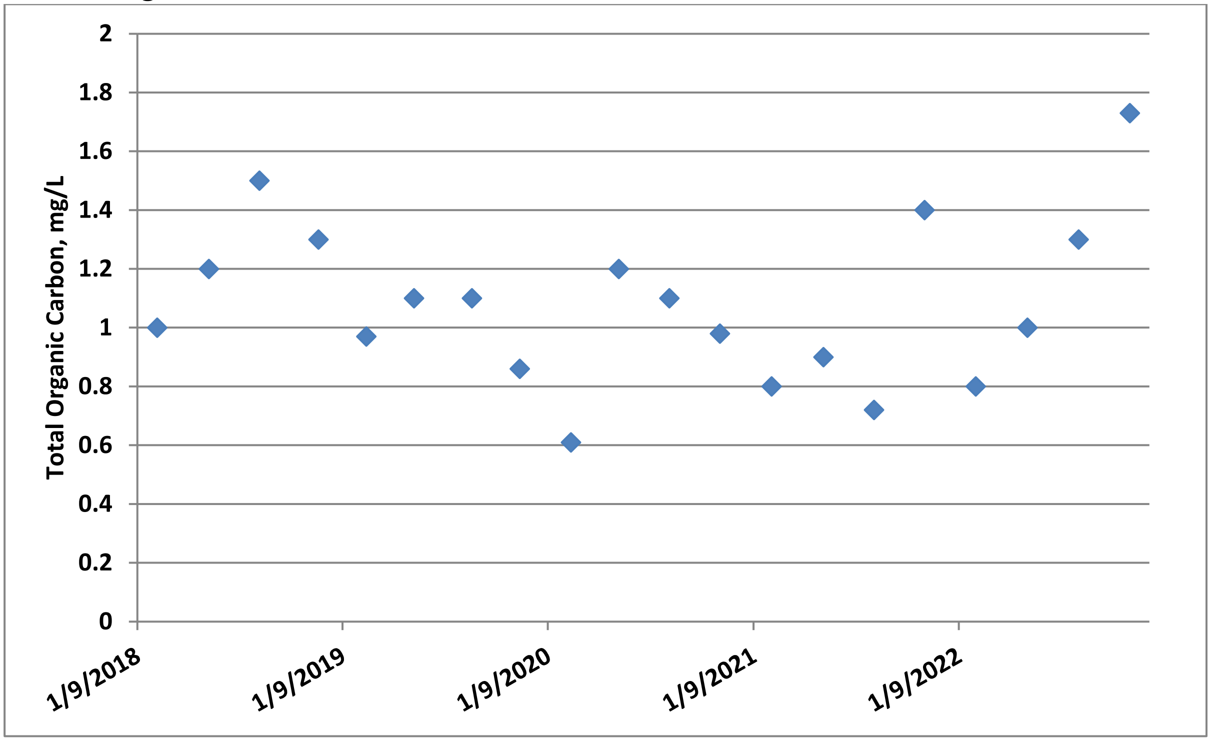
There were no positive coliform samples in the distribution system during the period of study.

Disinfection By-Products and Precursors

DBP Precursors

PCWA monitors raw American River for alkalinity and total organic carbon (TOC) levels on a quarterly basis. The average raw TOC level at the American River Pump Station was 1.1 mg/L. As shown in **Figure 5-2,** TOC levels in the raw water were below 2.0 mg/L all of the time during the study period. The highest recorded level was 1.7 mg/L in November 2022. The source water running annual average (RAA) for individual years 2018 to 2022 were less than 2.0 mg/L; therefore, an alternative compliance criterion was met and no TOC reduction was required. There are no seasonal trends in the raw TOC data.

Figure 5-2. Foothill WTP, TOC in Raw Water, American River, 2018 – 2022



<u>Stage 2 DBP Compliance</u>

Over the study period, PCWA sampled eight sites in the Foothill distribution system for TTHM and HAA5 on a quarterly basis. As the Foothill WTP treats American River water during a limited time period in any given year, there were only three quarters of TTHM and HAA5 data that were relevant to treated American River water. These three quarters were the fourth quarters of 2020, 2021, and 2022. Due to the limited data, RAAs and locational RAAs (LRAAs) cannot be calculated to evaluate Stage 2 D/DBP compliance. The range of individual DBP results is shown in **Table 5-1.** All individual samples were below the Maximum Contaminant Levels (MCLs) per the Stage 1 and Stage 2 D/DBP Rule.

Table 5-1
DBP Monitoring Data When Foothill WTP Treating American River Water

Quarter When Treating AR	Range of TTHM, µg/L	Range of HAA5,µg/L
4th quarter 2020	24 - 32	20 - 25
4th quarter 2021	38 - 64	34 - 56
4th quarter 2022	22 - 60	24.9 – 29.4

PCWA is active in making distribution system operational modifications to ensure that DBP levels will continue to remain low throughout the Foothill distribution system.

Volatile and Synthetic Organic Compounds

There were no detectable levels of volatile organic compounds (VOCs) or synthetic organic compounds (SOCs) in the treated water for the Foothill WTP during the study period.

Other Detectable Title 22 Constituents

There were no other detectable Title 22 constituents of interest.

Unregulated Contaminant Monitoring Rule (UCMR) 4

Biweekly monitoring for anatoxin-a, cylindrospermopsin, and total microcystin was conducted from June to September 2020 at the entry point to the distribution system. All sample results were non-detect.

The other 17 required constituents were also monitored quarterly at the entry point to the distribution system from July 2018 to April 2019. Out of the four quarters monitored (July 2018, October 2018, January 2019, and April 2019); only the October 2018 monitoring was when American River water was being treated at Foothill WTP. All sample results were non-detect, including manganese.

Three brominated haloacetic acid groups (HAA5, HAA9 [including HAA5 and four additional brominated HAAs], and HAA6Br [including six brominated HAAs]) were monitored in the distribution system from July 2018 to April 2019. Out of the four quarters monitored (July 2018, October 2018, January 2019, and April 2019), only the October 2018 monitoring was when American River water was being treated at Foothill WTP, with results shown in **Table 5-2.** The data indicates the low presence of brominated HAAs.

Table 5-2
Results from UCMR4 Monitoring for Foothill Sunset Distribution System
When Treating American River Water, October 2018 Data Only

Site Name	HAA5 µg/L	HAA6Br µg/L	HAA9 µg/L
Sunset	12	1.5	14
Ketchikan	15	1.7	17
Cincinnati	17	1.7	19
Ascension	15	1.8	17
Becky	14	1.6	15
Penryn	14	1.7	15
Claudio	14	1.6	15
Lake Forest	13	1.6	15

Giardia/Virus/*Cryptosporidium* Reduction Requirements

Based on the *E. coli* and protozoa data evaluated in **Section 3,** 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium* continue to be appropriate reduction requirements for the Foothill WTP.

The Foothill Plant 1 WTP and the Foothill Plant 2 WTP are classified as conventional filtration water treatment plants, and currently receive 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 and the IESWTR.

PCWA conducted the LT2ESWTR second round compliance monitoring by collecting monthly samples from the American River from October 2015 to September 2017. Out of the 24 samples, *Cryptosporidium* was detected once and *Giardia* was detected once. The maximum running annual average was 0.017 oocyst/L for *Cryptosporidium* and 0.017 cyst/L for *Giardia*, classifying the source as Bin 1.

Regulatory Compliance Evaluation

PCWA has been monitoring the raw and treated water for the Foothill WTP for all required Title 22 compliance constituents. **Table 5-3** lists the key existing drinking water regulations and a compliance evaluation for these standards at the Foothill WTP. The Foothill WTP is currently in compliance with existing regulations.

Table 5-3
Regulatory Compliance Evaluation
Placer County Water Agency – Foothill WTP

	Targeted Compounds	Key Issues and Compliance Status
Existing Regulations		
Phase I, II, and V	Inorganic compounds (IOCs), VOCs, SOCs	Monitored as required. No MCLs exceeded in the treated water.
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.
IESWTR and Filter Backwash Rule	Microbial and Turbidity	All new turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBP Rule	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in raw water. Therefore, enhanced coagulation not required.
LT2ESWTR	Microbial	Classified as Bin 1 based on second round monitoring.
Stage 2 D/DBP Rule	Disinfectants and Disinfection By-Products	Unable to evaluate TTHM/HAA5 LRAAs as there was only three quarters when DBP samples were collected during periods of American River usage. However, individual TTHM and HAA5 during this quarter were below the MCLs for TTHM and HAA5. No OELs were triggered.

EL DORADO IRRIGATION DISTRICT (EID)

Strawberry Water Treatment Plant

System Description

The raw water intake location for the Strawberry WTP is located off the upper South Fork of the American River. Strawberry is a small microfiltration plant with a design capacity of 100 gallons per minute (gpm), with flows normally varying from 70 to 90 gpm.

The plant consists of 20 microfiltration modules and is monitored with supervisory control and data acquisition (SCADA) controls and alarms in Placerville. There is no pretreatment of the influent water. The filtered water is disinfected with chlorine and the pH is adjusted with soda ash before entering the distribution system. The distribution system has one 0.25 mg covered storage reservoir.

Backwash of the microfiltration modules occurs every 45 minutes for three minutes, with filter-to-waste capability. Filter-to-waste and filter backwash water are sent to a wastewater tank, which then recycles the decant water back to the headworks.

Highlight of Changes Since 2018 Update

New raw water screens were installed which have resulted in improved source water quality to the Strawberry WTP, as well as fewer maintenance issues and required cleaning.

Significant Potential Contaminating Activities

The Strawberry WTP is located furthest upstream in the watershed on the South Fork of the American River. From the upper watershed, recreational use is heavy and the potential for forest fires could increase the impact of erosion potential. During the study period the Caldor Fire exemplified the potential for impact. Also of interest are the potential spills associated with Highway 50, timber harvesting activities, the potential impact of residences for both recreation and sanitation issues adjacent to the river, and evolving impacts from climate change.

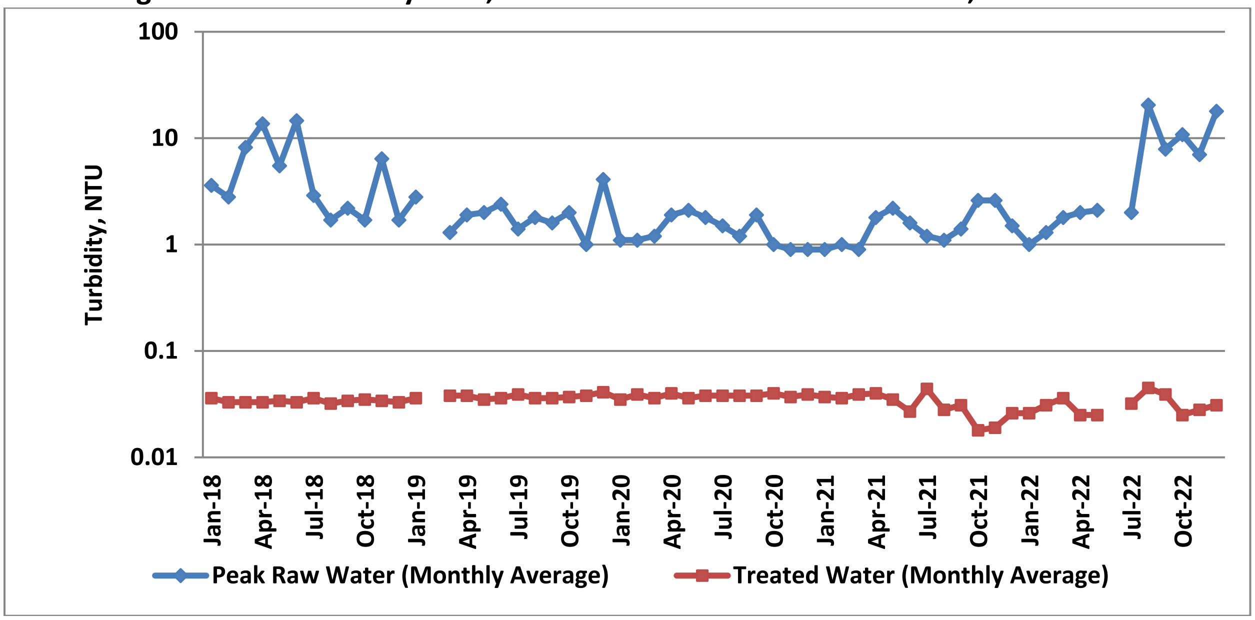
Treated Water Quality Summary

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 of peak daily raw water turbidity at Strawberry WTP for the period of study was 3.4 NTU, and on average the treatment process decreased this to 0.03 NTU, which equates to an average solids removal of 98.9 percent. **Figure 5-3** shows a time series plot of raw and treated water turbidities. It should be noted that the raw water turbidities plotted are a monthly average of peak daily grab samples. The treated water turbidities are a monthly average of a daily average, based on all 4-hr samples in a 24 hour period. Strawberry WTP meets all current treated water turbidity standards.

Figure 5-3. Strawberry WTP, Raw and Treated Water Turbidities, 2018 – 2022



Microbiological Constituent Review

There were no positive coliform samples in the distribution system during the period of study.

Disinfection By-Products and Precursors

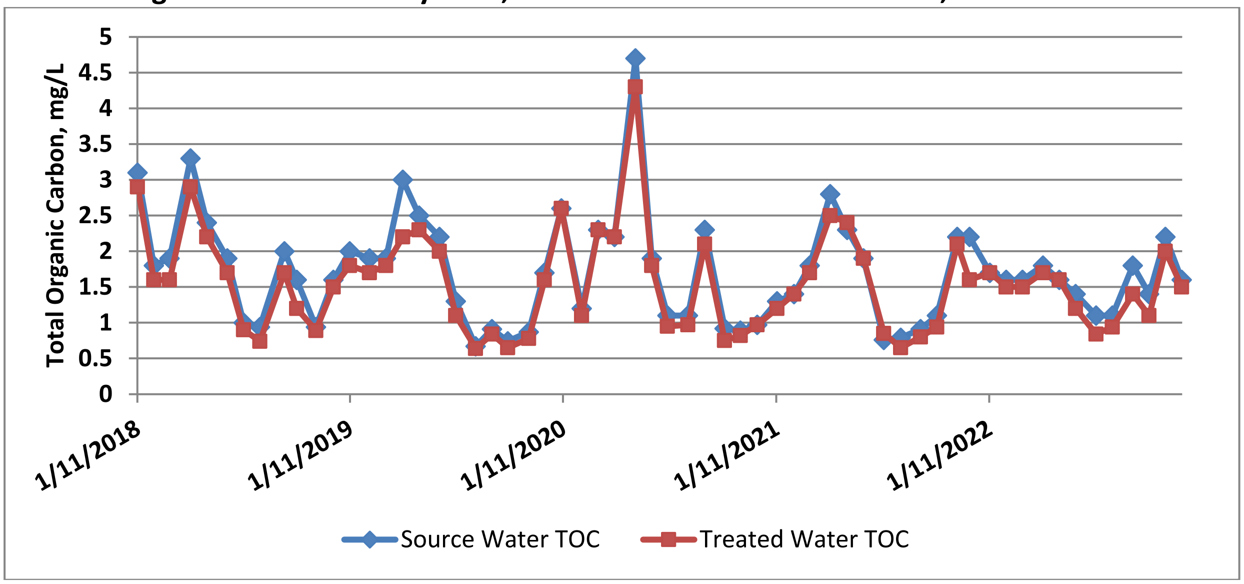
DBP Precursors

EID monitors TOC levels in the raw and treated water on a monthly basis. As the Strawberry WTP utilizes membranes, it is not required to achieve any TOC removal. The average raw and treated water TOC levels at Strawberry WTP were 1.71 mg/L and 1.55 mg/L, respectively, equating to 9.3 percent average removal.

Figure 5-4 shows a time series plot of raw and treated water TOC at Strawberry WTP. The highest recorded level in the raw water was 4.7 mg/L in May 2020. The annual peak occurred in either

April of May in all years shown in **Figure 5-4**, except in 2022 when the peak occurred in November.

Figure 5-4. Strawberry WTP, TOC in Raw and Treated Waters, 2018 – 2022



Stage 2 DBP Compliance

The site selected for Stage 2 D/DBP monitoring is 16354 Strawberry Lane. **Figure 5-5** shows individual TTHM results at the Stage 2 D/DBP rule monitoring site over the study period. Individual THMs ranged from 21 to 78 micrograms per liter (µg/L) and TTHM LRAAs ranged from 34 to 47 µg/L. No TTHM LRAAs exceeded the MCL of 80 µg/L. In years 2019, 2021, and 2022, the second quarters had the highest TTHM values.

Figure 5-5. Strawberry WTP, Individual Distribution System TTHM, 2018-2022

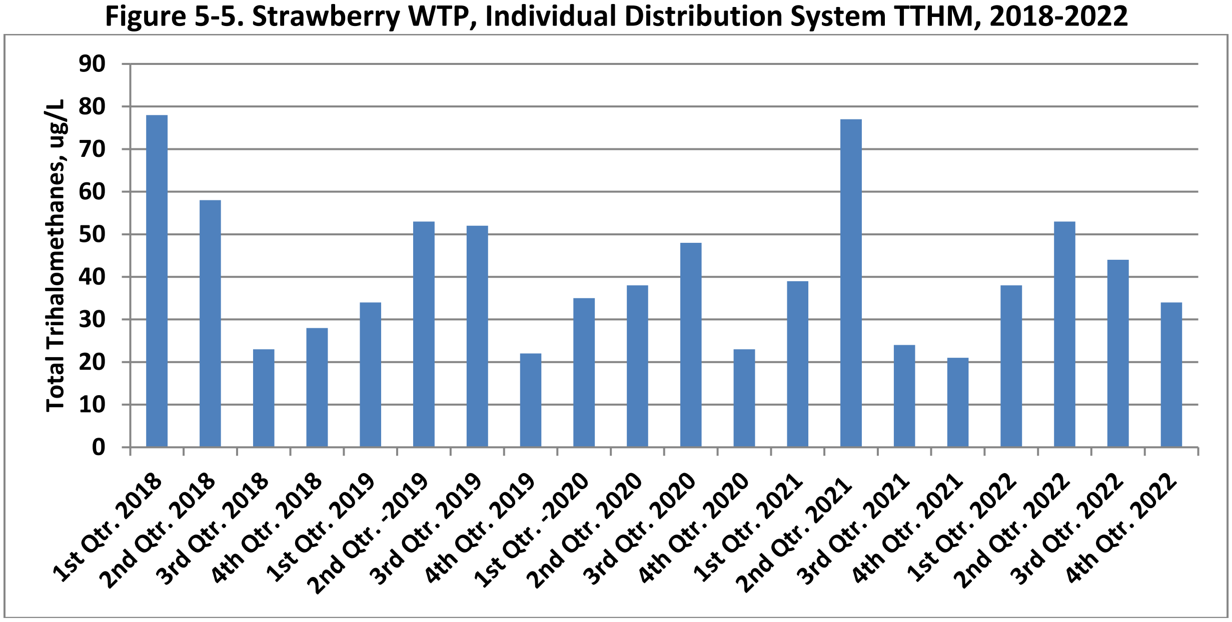
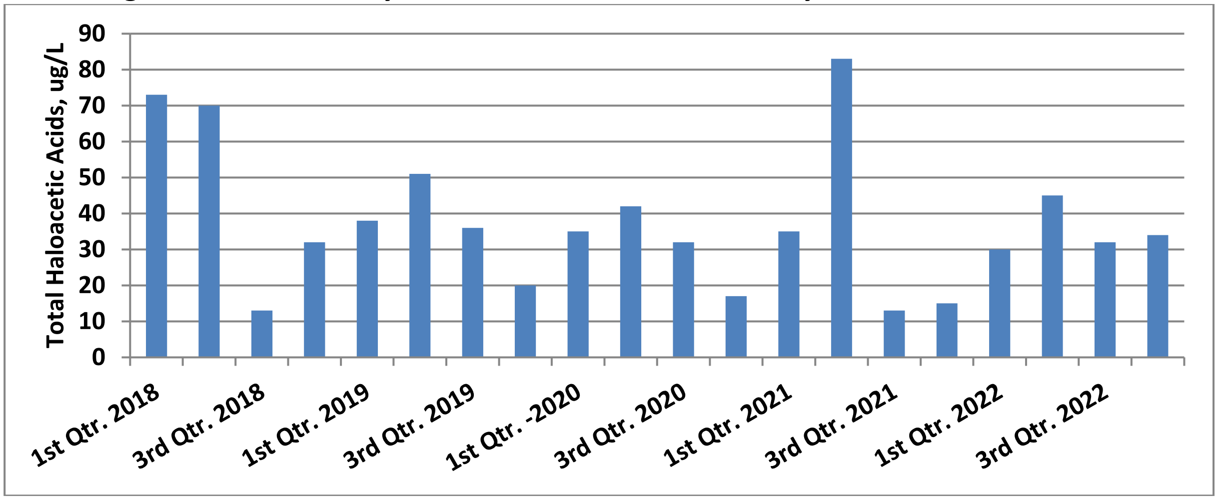


Figure 5-6 shows individual HAA5 results at the Stage 2 D/DBP rule monitoring site over the study period. Individual HAA5 ranged from 13 to 81 µg/L, and HAA5 LRAAs ranged from 26 to 47 µg/L. No HAA5 LRAAs exceeded the MCL of 60 µg/L.

Figure 5-6. Strawberry WTP, Individual Distribution System HAA5, 2018-2022



The first two quarters of 2018 had individual HAA5 samples at or above 70 µg/L and an associated Operational Evaluation Level (OEL) at 62 µg/L. Since the OEL exceeded 60 µg/L, an OEL Exceedance Report was submitted to the State Water Resources Control Board (State Water Board), Division of Drinking Water (DDW) on July 12, 2018. The OEL exceedance in the second quarter of 2018 was attributed to several unique issues identified through an investigative process. The second quarter 2018 TOC concentration was elevated (3.6 mg/L), water demand due to stormy weather was very low (5,500 gallons/day), storage tank level was 12 feet (approximately 70,000 gallons), water residence time was 12.7 days, and the chlorine feed system control malfunctioned, which resulted in overfeeding chlorine.

EID took the following actions as noted in the OEL exceedance report:

1) Control residence time of the produced water in the Strawberry system by decreasing storage volume from 70,000 gallons to approximately 40,000 gallons.
2) Increased mixing time at Strawberry storage tank from 8 hours to 22 hours.
3) Adjusted chlorine feed rate to meet desired chlorine residual set point of 0.6 parts per million (ppm) at water treatment facility. This was achieved that by changing feed rate control from PID (proportional, integral and derivative) back to simple proportional flow paced.
4) Increased flushing daily rate to 16,000 gallons per day.
5) Increased system chlorine monitoring.
6) Conducted additional DBP operational sampling to verify corrective actions were producing much lower HAA5 concentration within the drinking water supply.

Volatile and Synthetic Organic Compounds

There were no detectable levels of VOCs or SOCs in the raw water for the Strawberry WTP during the study period.

Other Detectable Title 22 Constituents

There were no other detectable Title 22 constituents of interest.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* data evaluated in **Section 3**, 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium* continue to be appropriate reduction requirements for the Strawberry WTP.

The Strawberry WTP is classified as an alternative treatment technology, and currently receives reduction credit for 3.0-log *Giardia,* 0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with chlorine provides 4.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR and the LT1ESWTR.

EID completed *E. coli* source water sampling to comply with the LT2ESWTR second round compliance monitoring in September 2018 and was classified as Bin 1 by DDW.

Regulatory Compliance Evaluation

EID has been monitoring the raw and treated water for the Strawberry WTP for all required Title 22 compliance constituents. **Table 5-4** lists the key existing drinking water regulations and a compliance evaluation for these standards at the Strawberry WTP. The Strawberry WTP is currently in compliance with existing regulations.

Table 5-4
Regulatory Compliance Evaluation
El Dorado Irrigation District – Strawberry WTP

	Targeted Compounds	**Key Issues and Compliance Status**
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	Monitored as required. No MCLs exceeded in the raw water.
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.
LT1ESWTR and Filter Backwash Rule	Microbial and Turbidity	All new turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBP Rule	Disinfectants and Disinfection By-Products	Not required to achieve TOC removal as an alternative technology.
LT2ESWTR	Microbial	Classified as Bin 1 based on second round monitoring.
Stage 2 D/DBP Rule	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 are below drinking water standards (< 80/60 µg/L, respectively). One OEL Report was prepared and submitted to DDW in 2018 and subsequent actions were implemented.

Reservoir One Water Treatment Plant

System Description

Reservoir One WTP receives water from the South Fork of the American River at Kyburz, which diverts water into the El Dorado Canal. Water then travels 21.9 miles to the Forebay Reservoir. From the Forebay Reservoir, water moves through the El Dorado Irrigation Ditch System 3.3 miles to the Reservoir One WTP. Reservoir One WTP is a conventional water treatment plant. The plant design flow is 26 mgd, with average flows of 6 to 13 mgd in winter (October through March) and 20 to 26 mgd in summer (April through September).

Aluminum chlorohydrate is used as the primary coagulant, and hydrated lime or soda ash is added for pH adjustment. Primary coagulants vary in use seasonally. Chemicals are mixed by a hydraulic jump. The coagulated water enters a flocculation basin, and then into a sedimentation basin. The clarified water is then filtered through eight dual media gravity filters. The filter loading rate is 6 gpm/sf.

The filters are backwashed based on an as-needed basis. Backwash water is recycled to the plant influent after settling in a wastewater tank. The plant has filter-to-waste capability after backwash or plant start-up. The filtered water is disinfected with chlorine, and stored in a 7 mg floating cover reservoir to meet CT requirements.

Highlight of Changes Since 2018 Update

Approximately three miles of the open ditch canal from the Forebay Reservoir (end of the canal/flume system of Project 184) to the headworks of Reservoir One WTP was changed from open canal to a pipeline. The Main Ditch Pipeline became operational for the Reservoir One WTP in April 2022. EID staff confirms that this has vastly improved source water quality.

Significant Potential Contaminating Activities

The diversion for the Reservoir One WTP is located downstream of Kyburz on the South Fork of the American River. The water then flows through the El Dorado Canal, Forebay Reservoir, and the Main Canal, which do receive some local drainage. From the upper watershed, recreational use is heavy and the potential for forest fires could increase the impact of erosion potential. During the study period the Caldor and Caples fires exemplified the potential for impact. Also of interest are the potential spills associated with Highway 50, timber harvesting activities, the potential impact of septic systems adjacent to the river or canals, and the evolving impact of climate change.

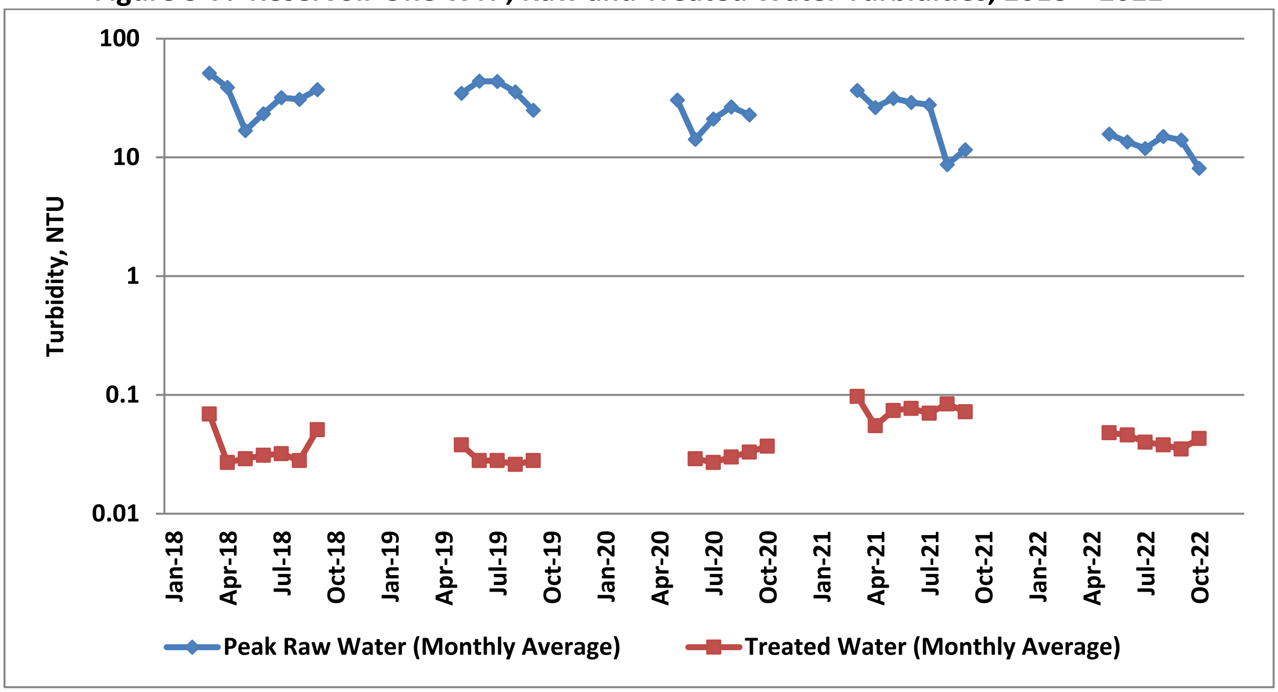
Treated Water Quality Summary

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 of peak daily raw water turbidity at Reservoir One WTP for the period of study was 25.9 NTU, and on average the treatment process decreased this to 0.05 NTU, which equates to an average solids removal of 99.8 percent. **Figure 5-7** shows a time series 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, based on all 4-hr samples in a 24 hour period. Reservoir One WTP meets all current treated water turbidity standards.

Figure 5-7. Reservoir One WTP, Raw and Treated Water Turbidities, 2018 – 2022



Microbiological Constituent Review

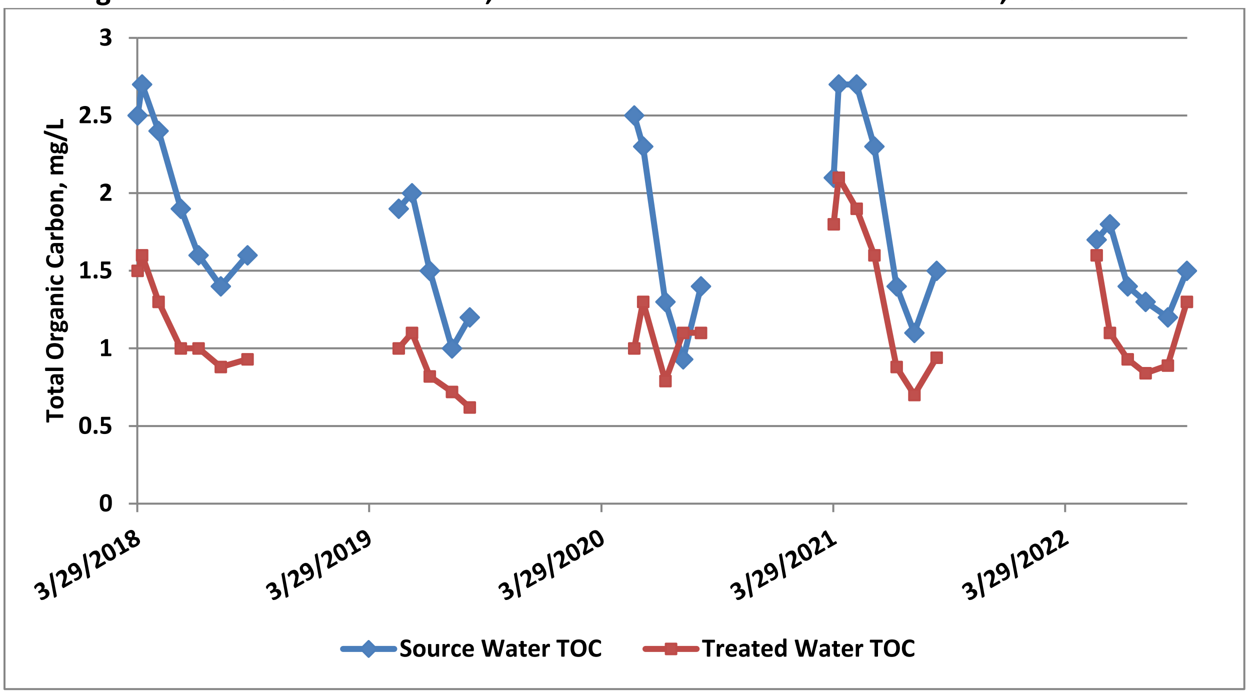
Distribution system monitoring for coliforms as part of the Total Coliform Rule and its revisions resulted in a few detections of total coliform in the Main distribution system during the study period, which includes treated water from Reservoir One WTP and El Dorado Hills (EDH) WTP. As reported in the 2018 to 2020 CCRs, one percent of monthly total coliform samples collected for the Main system were positive. However, since this is less than five percent of samples positive and there were no fecal coliform detected there was no violation of the coliform MCL.

Disinfection By-Products and Precursors

DBP Precursors

EID monitors TOC levels in its raw and treated water on a monthly basis in order to determine TOC removal compliance. The average raw and treated water TOC levels at Reservoir One WTP were 1.76 mg/L and 1.14 mg/L, respectively, equating to 35.0 percent average removal. **Figure 5-8** shows a time series plot of raw and treated water TOC at Reservoir One WTP. As the source and treated water running annual averages for years 2018 through 2022 were less than 2.0 mg/L, an alternative compliance criterion was met and no TOC removal was required.

Figure 5-8. Reservoir One WTP, TOC Levels in Raw and Treated Water, 2018 – 2022

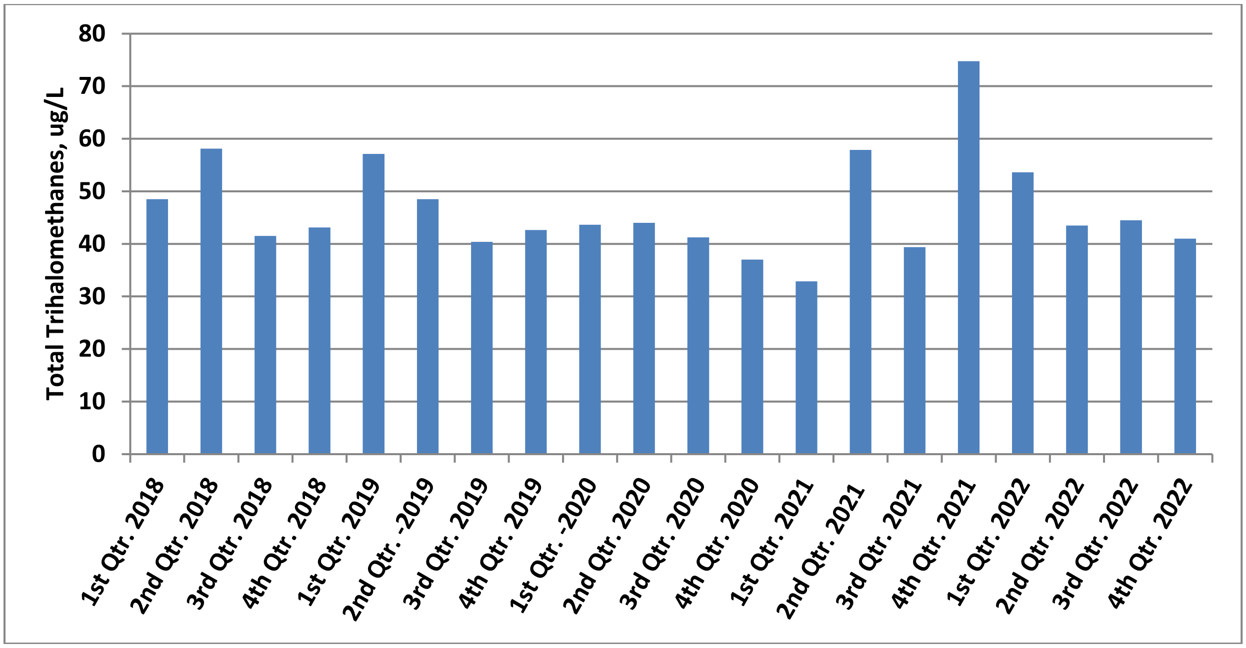


Stage 2 DBP Compliance

EID has collected both TTHM and HAA5 data for the Main distribution system, which is supplied by both the Reservoir One and EDH WTPs. EID converted to the eight Stage 2 D/DBP monitoring sites in February 2012. It should be noted that the distribution system water is also combined with treated water from the Cosumnes River. There was no way to isolate treated American River water only sites in the distribution system; therefore, all sites were evaluated.

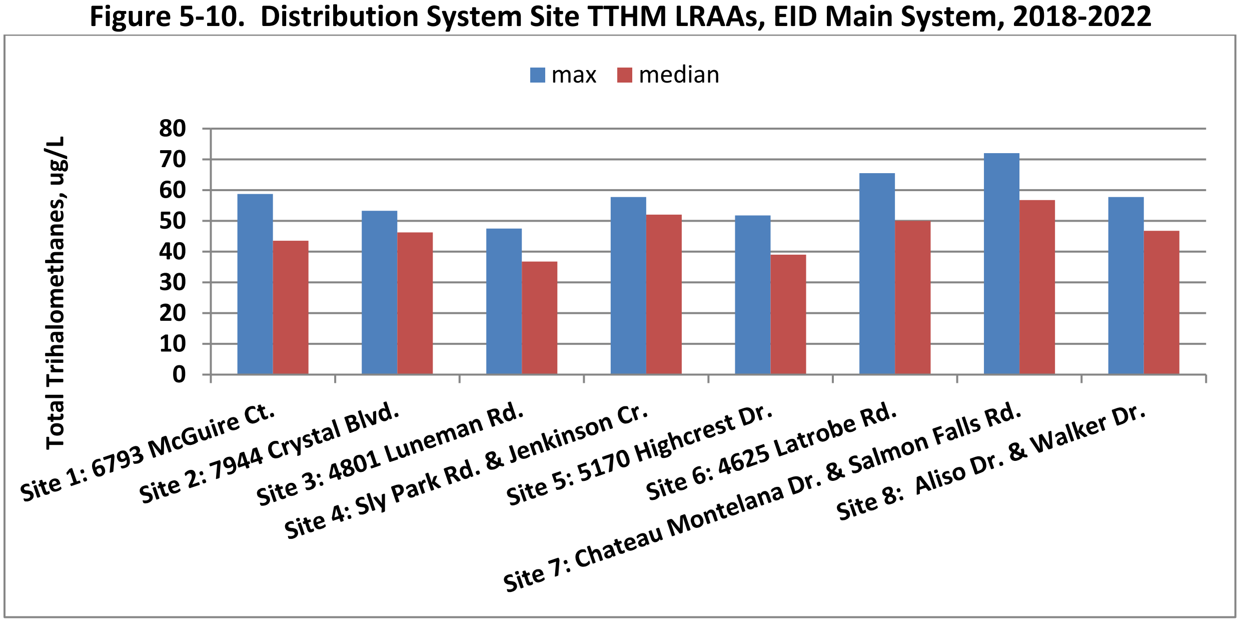
During the study period, the individual TTHM distribution system samples ranged from 19 to 86 µg/L. **Figure 5-9** shows the quarterly average of all distribution system sites for TTHM analysis. Quarterly average values range from 32.9 to 74.8 µg/L. The peak in THMs in the 4th quarter of 2021 occurred during a period of intense storm activity following several years of increased wildfire activity that could have combined to contribute to increased erosion of solids, including organic carbon.

Figure 5-9. Distribution System TTHM Quarterly Average of All Sites, EID Main System, 2018-2022



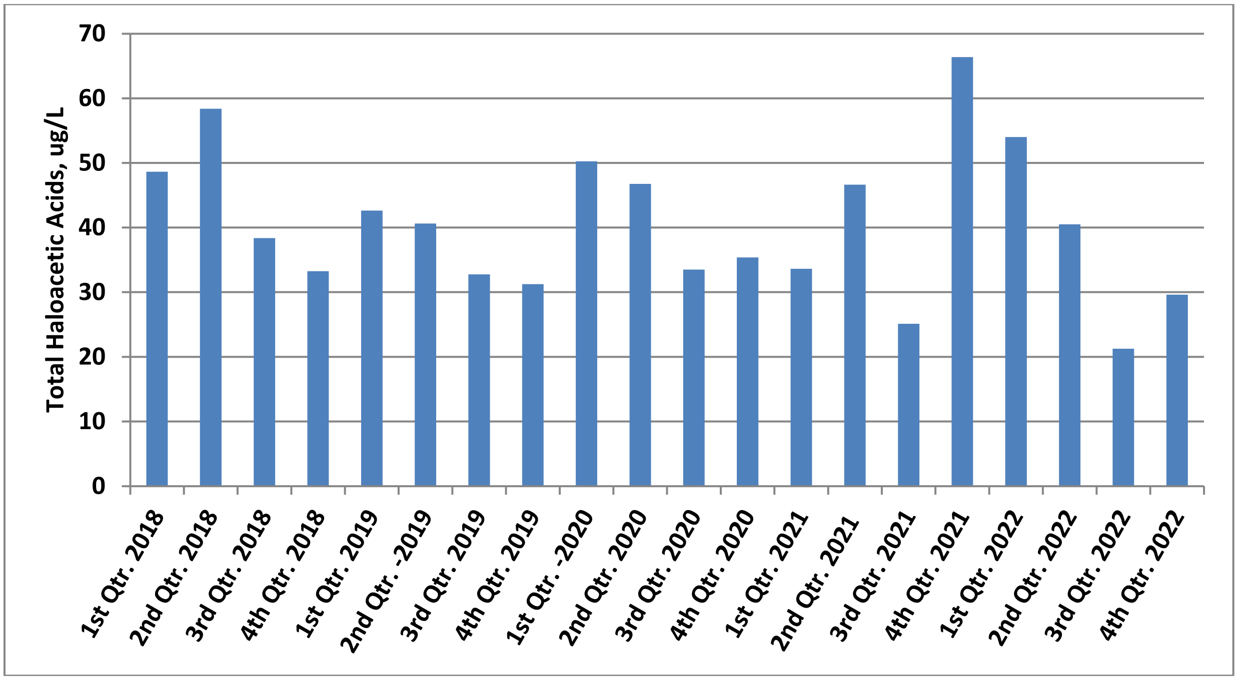
The TTHM LRAA for each distribution system site was calculated. **Figure 5-10** presents the TTHM LRAA maximum and median values. The LRAAs ranged from 29 to 72 µg/L, and the Chateau Montelena Rd. site had the highest LRAA. The THM LRAAs are below the current MCL of 80 µg/L.

Figure 5-10. Distribution System Site TTHM LRAAs, EID Main System, 2018-2022



During the study period, the individual HAA5 distribution system samples ranged from 14 to 98 µg/L. **Figure 5-11** shows the quarterly average of all distribution system sites for HAA5 analysis. Quarterly average values range from 21.2 to 66.4 µg/L. From this figure it can be seen that peak values typically occur in the first and second quarter, with the exception of 2021. Similar to TTHMs, peaks in the 4th quarter of 2021 could be attributable to watershed conditions affecting source water quality.

Figure 5-11. Distribution System HAA5 Quarterly Average of All Sites, EID Main System, 2018-2022

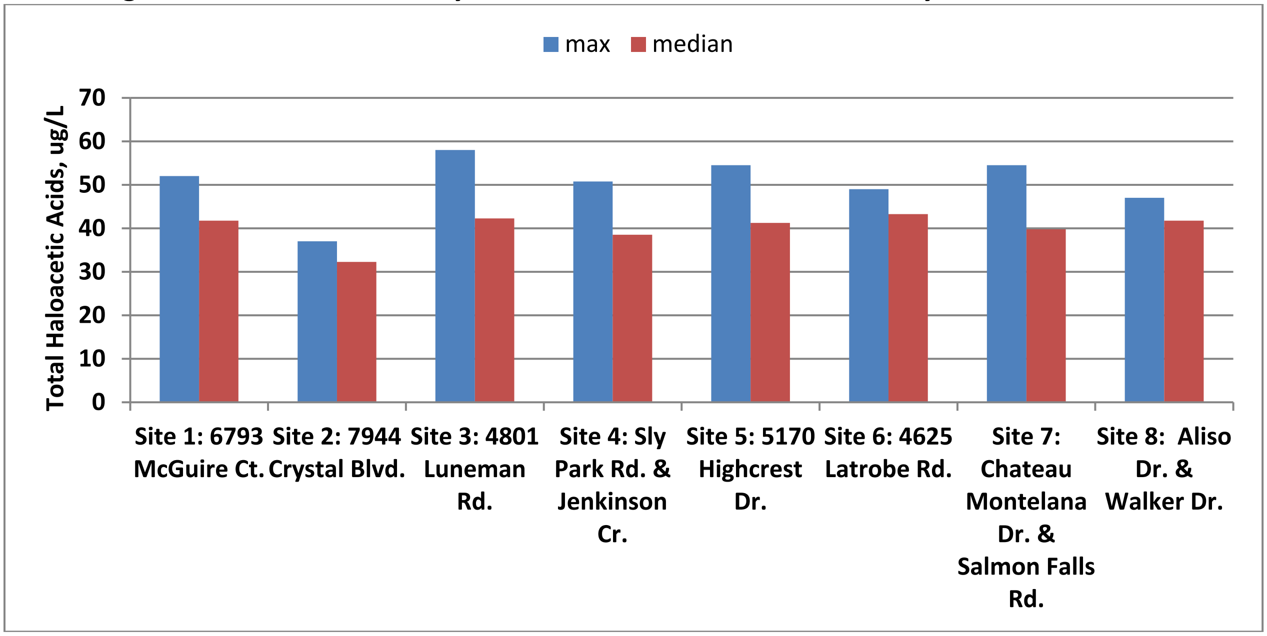


The HAA5 LRAA for each distribution system site was calculated. **Figure 5-12** presents the HAA5 LRAA maximum and median values. The LRAAs ranged from 25 to 58 µg/L., with the highest LRAA at the Luneman site. The HAA5 LRAAs are below the current MCL of 60 µg/L.

However, OELs exceeded the MCL of 60 µg/L on three occasions:

- Second Quarter of 2018 at Site7 (Chateau Montelena)
- Fourth Quarter of 2021 at Sites 3 and 5. (Please note that further discussion of these OELs at Sites 3 and 5 is not included in this 2023 Update as the exceedances were determined by EID staff to be associated with Reservoir A WTP and the direct impacts of the Caldor Fire)

Figure 5-12. Distribution System Site HAA5 LRAAs, EID Main System, 2018-2022



The second quarter of 2018 had an individual HAA5 sample at 81 µg/L and an associated OEL of 62 µg/L at Site 7. Since the OEL exceeded 60 µg/L, an OEL Exceedance Report was submitted to DDW on August 3, 2018.

Site 7 is supplied by the EDH WTP with water stored in the Monte Vista Tank to meet system demand. The tank is connected at the end of the distribution system, near the boundaries of the water system. EID is required to maintain at least a 15 foot level of water to meet fire flow requirements. The tank is filled or drained from the same pipe. The tank is not draining as quickly as in the past (attributed to water conservation efforts from EID's customers). Additionally, it may take up to eight hours to fill a tank because the pumps will feed the distribution system directly to meet demand before filling the tank. In short, water age is a significant factor in producing HAA5s in this tank. In addition to the tank location and design challenges, the source water TOC concentrations have slowly increased over the years. EID has found when TOC is above 2.0 mg/L it becomes more challenging to reduce the DBP formation in the system. Lastly, EID reviewed the chlorine feed rate and finished water chlorine residuals leaving the EDH WTP and determined the plant effluent chlorine residual was up by 20 to 50 percent from the target level of 1.0 mg/L as early as May 1, 2018 and lasting until as late as June 1, 2018.

EID attributes the HAA5 OEL exceedance at Site 7 to a result of water age due to seasonal low water demand, increasing TOC concentration in the source water, challenges with the water storage tank design feeding this location, and atypical higher chlorine residuals in the plant effluent.

EID has implemented a number of operational changes as a result of past OEL exceedances which occurred in years 2014-2016 and were discussed in the previous 2018 Update. After this OEL exceedance in 2018 EID conducted follow-up training with operation staff to insure the chlorine feed at the EDH WTP is at a set point to maintain finished water chlorine residual between 0.8 and 1.0 ppm leaving the water treatment facility.

Volatile and Synthetic Organic Compounds

There were no detectable levels of VOCs or SOCs in the raw water for the Reservoir One WTP during the study period.

Other Detectable Title 22 Constituents

There were no other detectable Title 22 constituents of interest.

UCMR 4

Biweekly monitoring for anatoxin-a, cylindrospermopsin, and total microcystin was conducted from April to July 2018 at the entry point to the distribution system. All sample results were non-detect.

The other 17 required constituents were also monitored quarterly at the entry point to the distribution system in May and August of 2019. Samples would have been collected in February and November, but Reservoir One WTP is a seasonal water treatment plant and does not operate in winter. All sample results were non-detect from the two quarters monitored, except for manganese which ranged from non-detect to 0.44 µg/L.

Three brominated haloacetic acid groups (HAA5, HAA9 and HAA6Br) were monitored at 8 sites in the distribution system in February, May, August, and November of 2019. Out of all the sites, and over the four quarters, the average difference between HAA9 and HAA5 was 1.3 µg/L and the maximum difference was 1.9 µg/L, indicating minimal presence of brominated HAAs.

***Giardia/Virus/Cryptosporidium* Reduction Requirements**

Based on the *E. coli* and protozoa data evaluated in **Section 3**, 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium* continue to be appropriate reduction requirements for the Reservoir One WTP.

The Reservoir One 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 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 and the IESWTR.

For the second round of LT2ESWTR monitoring, sixteen *Cryptosporidium* samples were taken during the months of April through September 2015, June through September 2016, and July through September 2017. There were no detects of *Cryptosporidium,* classifying the source as Bin 1. *Giardia* was detected four times, with an average of all samples at 0.0375 cysts/L.

Regulatory Compliance Evaluation

EID has been monitoring the raw and treated water for the Reservoir One WTP for all required Title 22 compliance constituents. **Table 5-5** lists the key existing drinking water regulations and a compliance evaluation for these standards at the Reservoir One WTP. The Reservoir One WTP is currently in compliance with existing regulations.

Table 5-5
Regulatory Compliance Evaluation
El Dorado Irrigation District – Reservoir One WTP

	Targeted Compounds	**Key Issues and Compliance Status**
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	Monitored as required. No MCLs exceeded in the raw water.
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.
IESWTR and Filter Backwash Rule	Microbial and Turbidity	All new turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBP Rule	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in raw and treated water. Therefore, enhanced coagulation not required.
LT2ESWTR	Microbial	Classified as Bin 1 for second round monitoring.
Stage 2 D/DBP Rule	Disinfectants and Disinfection By-Products	TTHM LRAAs for Stage 2 are below drinking water standard of 80 µg/L. HAA5 LRAA exceeded the MCL of 60 µg/L at Site 7. One OEL report was prepared and submitted to DDW for the American River supply during the study period and subsequent actions were implemented.

El Dorado Hills Water Treatment Plant

System Description

The raw water intake location for the EDH WTP is located at Folsom Lake, where the South Fork of the American River enters the lake. The EDH WTP utilizes Microfloc units, so it is an approved alternative filtration technology. The plant design flow is 19.5 mgd, with flows ranging from two to three mgd in the winter, and 3 to 19.5 mgd in the summer.

The influent water is pre-oxidized with chlorine, and aluminum chlorohydrate is the primary coagulant. Caustic Soda is also added for pH adjustment. Chemicals are mixed by pumped injection. The water is flocculated and clarified in buoyant media upflow clarifiers which are the Microfloc units. The clarified water is then filtered through six dual media gravity filters. The filter loading rate is six gpm/sf.

The filters are backwashed based on turbidity, head loss, time, and/or production. Filter backwash water is sent to a wastewater tank then treated for solids separation; the decant is recycled to the plant influent. The plant has filter-to-waste capability after backwash or plant start-up. The filtered water is then disinfected with chlorine, soda ash is added for pH adjustment, and is then stored in a 0.47 mg baffled clearwell to meet CT requirements.

Highlight of Changes Since 2018 Update

A new 16 mgd raw water intake for temperature control by the United States Bureau of Reclamation (Reclamation) was completed in 2022. The intake is equipped with three inlets at various elevations to increase operational flexibility and to preserve a cold water pool for aquatic habitat. A new SCADA and Programmable Logic Controller (PLC) system was also completed in 2022.

Significant Potential Contaminating Activities

The EDH WTP intake is located on Folsom Lake near the confluence with the South Fork of the American River. Recreational use is heavy along the South Fork of the American as well as within Folsom Lake. The potential for forest fires, as well as timber harvesting activities, could increase the impact of erosion potential from the upper watershed directly and into Folsom Lake. Also of interest are urban runoff from the Placerville and El Dorado Hills communities, potential spills associated with wastewater treatment and collection facilities and roads, and the evolving impact from climate change.

Of special interest is the potential impact that Folsom Lake operations may have on the source water quality, especially with the construction of a new temperature control intake and planned reoperation of Folsom Dam by Reclamation.

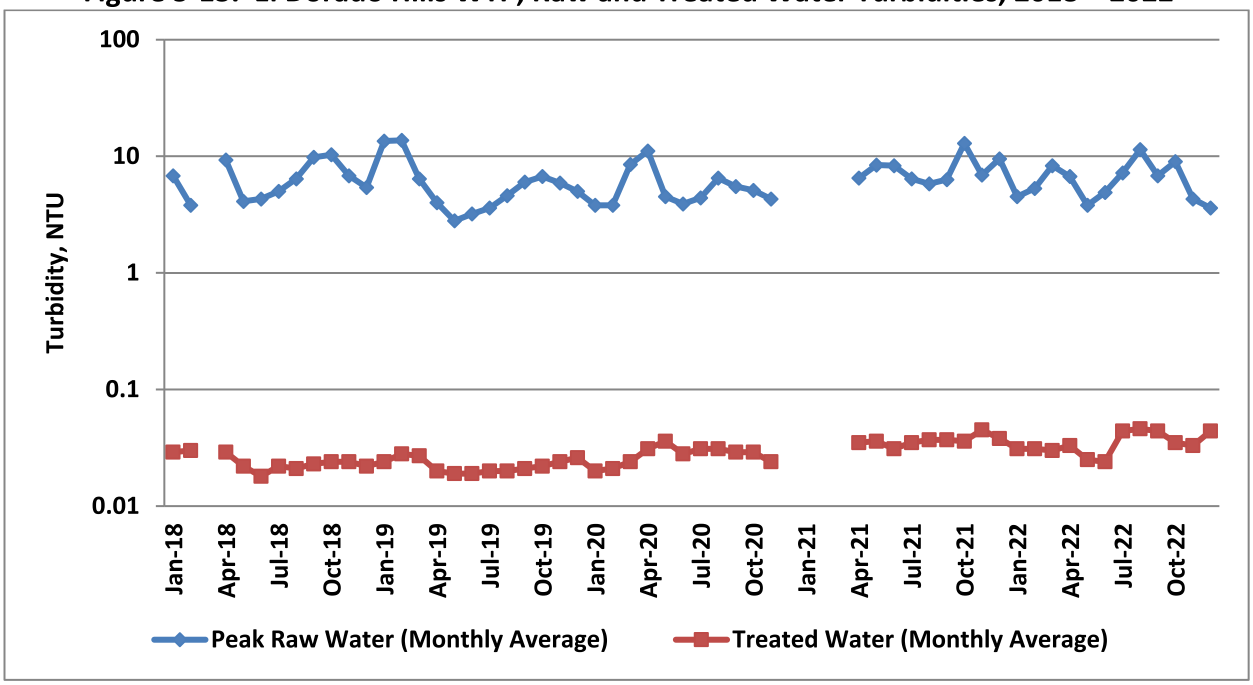
Treated Water Quality Summary

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 of peak daily raw water turbidity at EDH WTP for the period of study was 6.5 NTU, and on average the treatment process decreased this to 0.03 NTU, which equates to an average solids removal of 99.6 percent. **Figure 5-13** shows a time series plot of raw and treated water turbidities. It should be noted that the raw water turbidities plotted are a monthly average of peak daily grab samples. The treated water turbidities are a monthly average of a daily average, based on all 4-hr samples in a 24 hour period. EDH WTP meets all current treated water turbidity standards.

Figure 5-13. El Dorado Hills WTP, Raw and Treated Water Turbidities, 2018 – 2022



Microbiological Constituent Review

Please see Reservoir One WTP subsection above for information on coliform monitoring results in the Main distribution system.

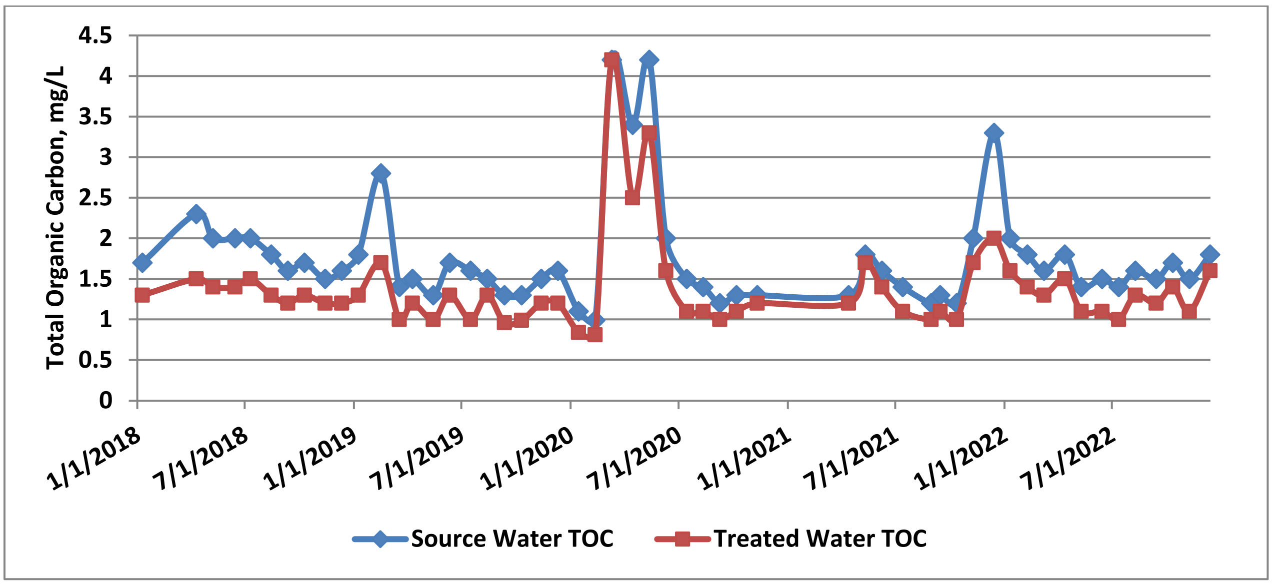
<u>Disinfection By-Products and Precursors</u>

DBP Precursors

EID monitors TOC levels in its raw and treated water on a monthly basis. The average raw and treated water TOC levels at EDH WTP were 1.75 mg/L and 1.37 mg/L, respectively, equating to 21.9 percent average removal. As the EDH WTP utilizes Microfloc units, which are an approved alternative filtration technology, TOC removal is not required under the Stage 1 D/DBP Rule.

Figure 5-14 shows a time series plot of raw and treated water TOC at EDH WTP. The highest recorded level was 4.2 mg/L in March and May 2020.

Figure 5-14. El Dorado Hills WTP – Total Organic Carbon in Raw and Treated Water, 2018-2022



Stage 2 DBP Compliance

Please see Reservoir One WTP subsection above for information on distribution system disinfection by-product levels.

<u>Volatile and Synthetic Organic Compounds</u>

There were no detectable levels of VOCs or SOCs in the raw water for the El Dorado Hills WTP during the study period.

<u>Other Detectable Title 22 Constituents</u>

There were no other detectable Title 22 constituents of interest.

UCMR 4

Biweekly monitoring for anatoxin-a, cylindrospermopsin, and total microcystin was conducted from April to July 2018 at the entry point to the distribution system. All sample results were non-detect.

The other 17 required constituents were also monitored quarterly at the entry point to the distribution system in February, May, August, and November of 2019. All sample results were non-detect, except for manganese which ranged from 1.5 to 6.9 µg/L.

Three brominated haloacetic acid groups (HAA5, HAA9 and HAA6Br) were monitored at 8 sites in the distribution system in February, May, August, and November of 2019. Please see Reservoir One WTP subsection above for information on UCMR4 distribution system HAA levels.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* and protozoa data evaluated in **Section 3**, 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium* continue to be appropriate reduction requirements for the EDH WTP.

The EDH WTP is classified as an alternative filtration technology, and currently receives reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal based on performance testing. 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 and the IESWTR.

EID conducted the LT2ESWTR second round compliance monitoring by collecting monthly samples for the EDH WTP from April 2015 to April 2017. *Cryptosporidium* was detected once, and the maximum running annual average was 0.033 oocyst/L, classifying the source as Bin 1. There were no detections for *Giardia*.

Regulatory Compliance Evaluation

EID has been monitoring the raw and treated water for the EDH WTP for all required Title 22 compliance constituents. **Table 5-6** lists the key existing drinking water regulations and a compliance evaluation for these standards at the EDH WTP. The EDH WTP is currently in compliance with existing regulations.

Table 5-6
Regulatory Compliance Evaluation
El Dorado Irrigation District – El Dorado Hills WTP

	Targeted Compounds	**Key Issues and Compliance Status**
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	Monitored as required. No MCLs exceeded in the raw water.
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.
IESWTR and Filter Backwash Rule	Microbial and Turbidity	All new turbidity standards met. 2-log reduction credit for *Cryptosporidium*.
Stage 1 D/DBP Rule	Disinfectants and Disinfection By-Products	Not required to achieve TOC removal as an alternative filtration technology.
LT2ESWTR	Microbial	Classified as Bin 1 for second round monitoring.
Stage 2 D/DBP Rule	Disinfectants and Disinfection By-Products	Please see Reservoir One WTP for Stage 2 D/DBP Results.

GEORGETOWN DIVIDE PUBLIC UTILITY DISTRICT

Walton Lake Water Treatment Plant

System Description

The primary source of surface water to Georgetown Divide Public Utility District (GDPUD) is the Stumpy Meadows Reservoir. Raw water from Stumpy Meadows is released down Pilot Creek, where it is diverted and conveyed through approximately 70 miles of supply ditch/conduits. The first diversion is to Walton Lake, which supplies water to the Walton Lake WTP. The Walton Lake WTP is a direct filtration plant. The plant design flow is 3 mgd, with flows ranging from 0.56 mgd in the winter to 0.99 mgd in the summer.

The influent water is pre-oxidized with sodium hypochlorite, and a polymer (ProPAC 9890) is added prior to a static inline mixer. The water is flocculated between the inline mixer and entering the three pressure filters. The filter loading rate is 2.9 gpm/sf. The filtered water is then disinfected with sodium hypochlorite, sodium carbonate is added for pH adjustment, and it is then stored in a 300,000 gallon baffled steel reservoir to meet CT requirements.

Highlight of Changes Since 2018 Update

There have been no major changes to the plant over the study period.

Significant Potential Contaminating Activities

The Walton Lake WTP intake is located on Walton Lake, which receives diverted water from Stumpy Meadows Reservoir in the Middle Fork of the American River watershed via Pilot Creek and a canal system. From the upper watershed, recreational use is heavy and the potential for forest fires could increase the impact of erosion potential. During the study period the Mosquito Fire exemplified the potential for impact. Also of interest are timber harvesting activities, grazing, potential spills, and evolving impacts from climate change.

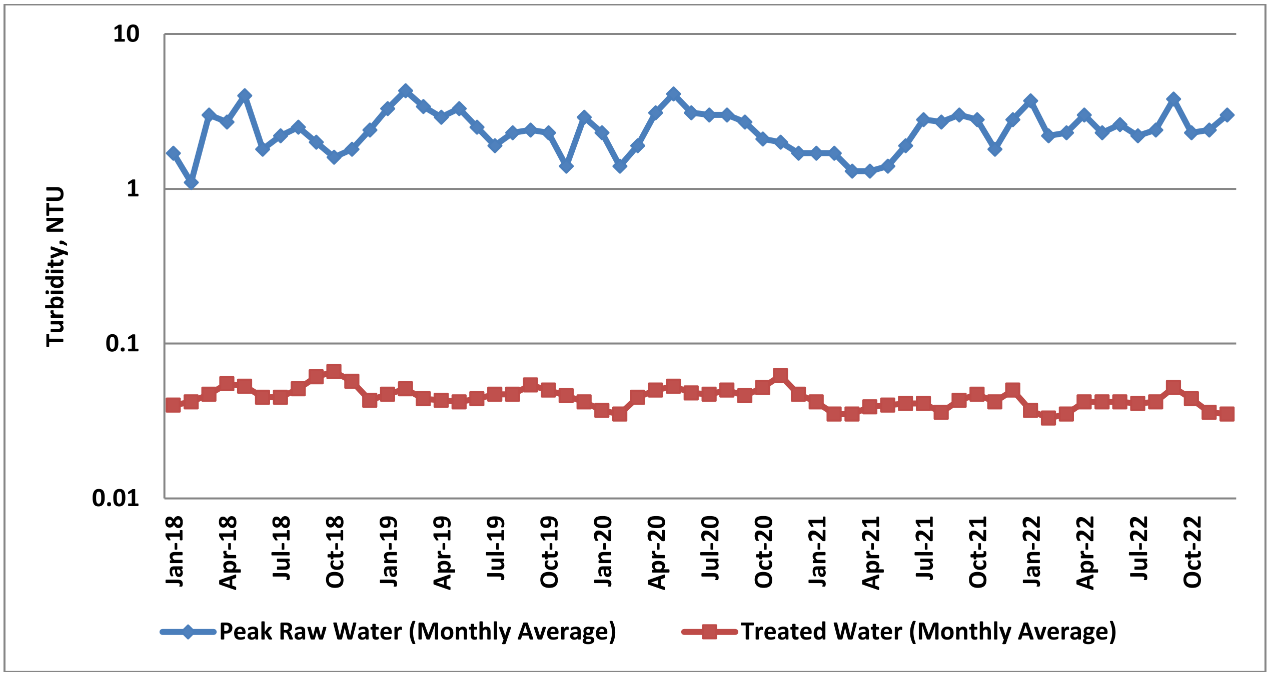
Treated Water Quality Summary

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 of peak daily raw water turbidity at Walton Lake WTP for the period of study was 2.5 NTU, and on average the treatment process decreased this to 0.045 NTU, which equates to an average solids removal of 98.1 percent. **Figure 5-15** shows a time series plot of raw and treated water turbidities. It should be noted that the raw water turbidities plotted are a monthly average of peak daily grab samples. The treated water turbidities are a monthly average of a daily average, based on all 4-hr samples in a 24 hour period. Walton Lake WTP meets all current treated water turbidity standards.

Figure 5-15. Walton Lake WTP – Raw and Treated Water Turbidity, 2018 – 2022



<u>Microbiological Constituent Review</u>

There were no positive coliform samples in the distribution system during the period of study.

<u>Disinfection By-Products and Precursors</u>

DBP Precursors

GDPUD does not monitor for TOC in its raw and treated water. As the Walton Lake WTP utilizes direct filtration, TOC removal is not required under the Stage 1 D/DBP Rule.

Stage 2 DBP Compliance

GDPUD began quarterly monitoring at one site associated with the Walton Lake WTP for the Stage 2 D/DBP Rule in October 2013. **Figure 5-16** shows individual TTHM results at the Stage 2 D/DBP rule monitoring site over the study period. Individual TTHMs ranged from 7.9 to 65 µg/L and TTHM LRAAs ranged from 13 to 40 µg/L. No TTHM LRAAs exceeded the MCL of 80 µg/L. Peak levels occurred in the 4th quarter of 2021 and 1st quarter of 2022, which coincided with a series of significant winter storms that likely contributed to increased erosion and transport of organic carbon.

Figure 5-16. Distribution System Individual TTHM, Walton Lake System, 2018-2022

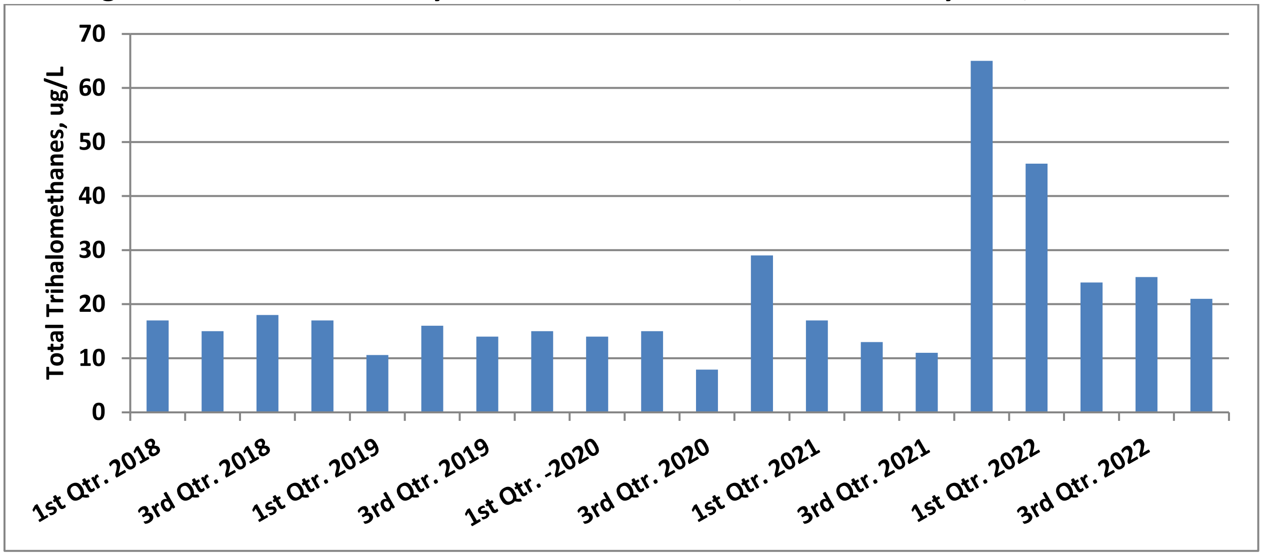
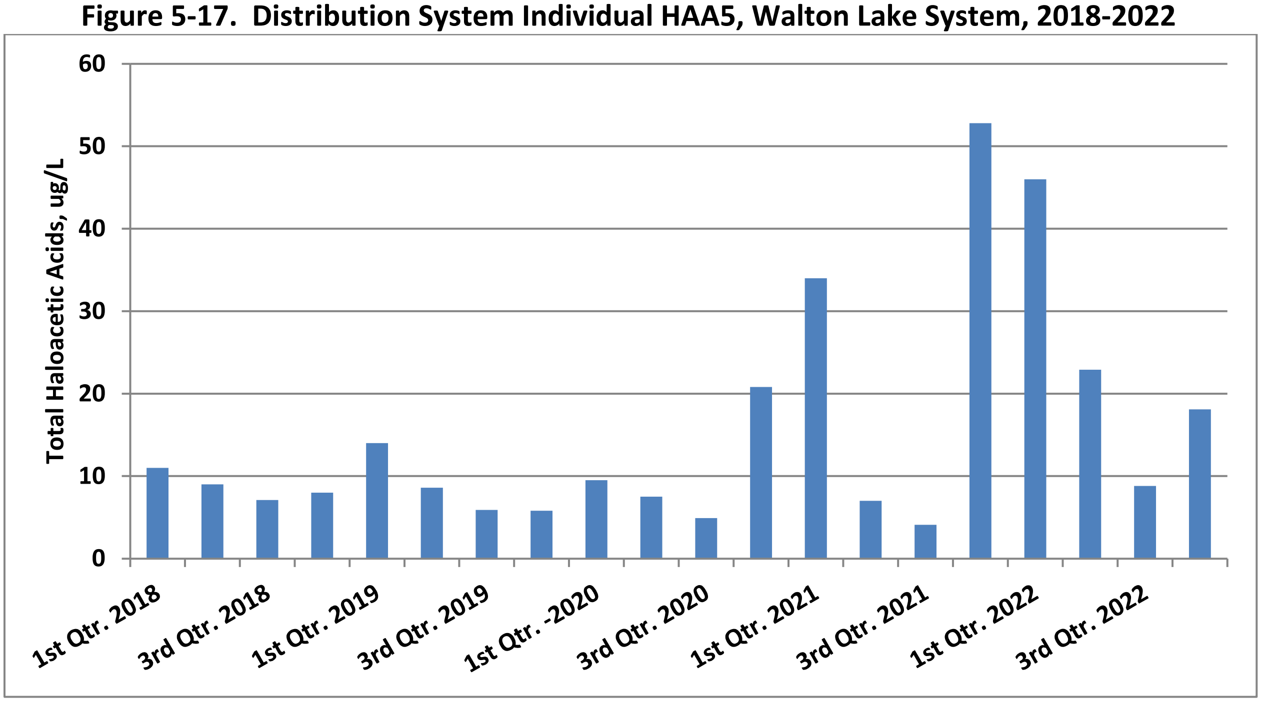


Figure 5-17 shows individual HAA5 results at the Stage 2 D/DBP rule monitoring site over the study period. Individual HAA5 ranged from 4.1 to 52.8 µg/L, and HAA5 LRAAs ranged from 6.9 to 32.6 µg/L. No HAA5 LRAAs exceeded the MCL of 60 µg/L. The same increases were seen in 4th quarter 2021 and 1st quarter 2022, likely due to watershed conditions impacting source water quality.

Figure 5-17. Distribution System Individual HAA5, Walton Lake System, 2018-2022



Volatile and Synthetic Organic Compounds

There were no detectable levels of VOCs or SOCs in the raw water for the Walton Lake WTP during the study period.

Other Detectable Title 22 Constituents

There were no other detectable Title 22 constituents of interest.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* data evaluated in **Section 3**, 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium* continue to be appropriate reduction requirements for the Walton Lake WTP.

The Walton Lake WTP is classified as a direct filtration WTP, and currently receives reduction credit for 2.0-log *Giardia,* 1.0-log viruses, and 2-log *Cryptosporidium* for physical removal based on performance testing. Disinfection with chlorine 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 and the IESWTR.

GDPUD completed *E. coli* source water sampling to comply with the LT2ESWTR second round compliance monitoring in June 2019, and had an annual mean of 27.4 MPN/100mL, which classifies the source as Bin 1.

Regulatory Compliance Evaluation

GDPUD has been monitoring the raw and treated water for the Walton Lake WTP for all required Title 22 compliance constituents. **Table 5-7** lists the key existing drinking water regulations and a compliance evaluation for these standards at the Walton Lake WTP. The Walton Lake WTP is currently in compliance with existing regulations.

Table 5-7
Regulatory Compliance Evaluation
Georgetown Divide Public Utility District – Walton Lake WTP

	Targeted Compounds	Key Issues and Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	Monitored as required. No MCLs exceeded in the raw water.
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.
LT1ESWTR and Filter Backwash Rule	Microbial and Turbidity	All new turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBP Rule	Disinfectants and Disinfection By-Products	Not required to achieve TOC removal as a direct filtration plant.
LT2ESWTR	Microbial	Classified as Bin 1 for second round monitoring.
Stage 2 D/DBP Rule	Disinfectants and Disinfection By-Products	TTHM and HAA5 LRAAs for Stage 2 are below drinking water standards of 80 µg/L and 60 µg/L, respectively. No OELs were triggered.

Auburn Lake Trails Water Treatment Plant/Sweetwater Water Treatment Plant

System Description

The primary source of surface water to GDPUD is the Stumpy Meadows Reservoir. Raw water from Stumpy Meadows is released down Pilot Creek, where it is diverted and conveyed through approximately 70 miles of supply ditch/conduits. After the first diversion to Walton Lake, a system of pipes and open ditches conveys water to a 10 acre-foot surface impoundment that serves the Auburn Lake Trails (ALT) WTP. The ALT WTP is an inline filtration WTP. The plant design flow is 3 mgd, with flows ranging from 0.42 mgd in the winter to 1.02 mgd in the summer.

The influent water is pre-oxidized with sodium hypochlorite, and a polymer (ProPAC 9890) is added. The water is then pumped to the pressure filters. (According to GDPUD, if the pumps were located prior to chemical addition, this would classify the WTP as direct filtration instead of in-line filtration).

The filter loading rate is 3 gpm/sf. The filtered water is then disinfected with sodium hypochlorite, sodium carbonate is added for pH adjustment, and it is then stored in two 300,000 gallon steel tanks to meet CT requirements. The first tank is baffled and the second tank is not.

In 2004, DDW issued an administrative order (No.01-09-04CO-002) because in-line filtration is not among those filtration technologies listed in the SWTR. GDPUD completed construction of a new replacement water treatment plant, which was originally known as the new ALT WTP, and then the Sweetwater WTP.

The Sweetwater WTP came on-line August 1, 2019. According to GDPUD, the switch from the old ALT WTP to Sweetwater WTP was a direct switch, with no overlap. Although the new water treatment plant was operating since August 1, 2019, the official name change from ALT WTP to Sweetwater WTP did not occur until December 2020. Since both water treatment plants take the source water from the same location, there is no need for separate discussions for this 2023 Update. For the purpose of this report, any water quality data from January 2018 to November 2020 will be associated with the ALT WTP, and any water quality data from December 2020 to December 2022 will be associated with the Sweetwater WTP.

In fact, the domestic water supply permit issued by DDW dated December 31, 2020 does not name “Sweetwater” in the permit, and in fact it says “The new Auburn Lakes Trail WTP will be completed in 2019 under compliance Order (No.01-09-04CO-002). The District applied for one permit for the entire system.”

The Sweetwater WTP provides a secondary filter aid polymer prior to the upflow clarification process that is followed by filtration (triton filters), and is considered an alternative treatment process. Sweetwater WTP qualifies for filtration removal credits of 2-log for *Giardia*, 2-log of

Cryptosporidium and 1-log for virus. Therefore, the water treatment plant must achieve through sufficient chlorine contact time, 1-log inactivation of *Giardia* and 3-log inactivation of virus.

The design flow is 2.0 mgd and the maximum flow is 3.0 mgd. The chemicals used are: 1) polymer as a coagulant aid at the inline static mixer located at the raw water pump station, 2) sodium hypochlorite for disinfection, and 3) soda ash for pH adjustment.

Significant Potential Contaminating Activities

The ALT WTP/Sweetwater intake is on a small impoundment, which receives diverted water from Stumpy Meadows Reservoir in the Middle Fork of the American River watershed via Pilot Creek and a canal system. From the upper watershed, recreational use is heavy and the potential for forest fires could increase the impact of erosion potential. During the study period the Mosquito Fire exemplified the potential for impact. Also of interest are timber harvesting activities, grazing, potential spills, and evolving impacts from climate change.

Treated 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 of peak daily raw water turbidity at ALT WTP from January 2018 to November 2020 was 4.6 NTU, and on average the treatment process decreased this to 0.05 NTU, which equates to an average solids removal of 98.8 percent. **Figure 5-18** shows a time series plot of raw and treated water turbidities. It should be noted that the raw water turbidities plotted are a monthly average of peak daily grab samples. The treated water turbidities are a monthly average of a daily average, based on all 4-hr samples in a 24 hour period. ALT WTP meets all current treated water turbidity standards.

The average of peak daily raw water turbidity at Sweetwater WTP from December 2020 to December 2022 was 2.3 NTU, and on average the treatment process decreased this to 0.05 NTU, which equates to an average solids removal of 97.7 percent. **Figure 5-19** shows a time series plot of raw and treated water turbidities. It should be noted that the raw water turbidities plotted are a monthly average of peak daily grab samples. The treated water turbidities are a monthly average of a daily average, based on all 4-hr samples in a 24 hour period. Sweetwater WTP meets all current treated water turbidity standards.

Figure 5-18. ALT WTP – Raw and Treated Water Turbidity, January 2018-November 2020

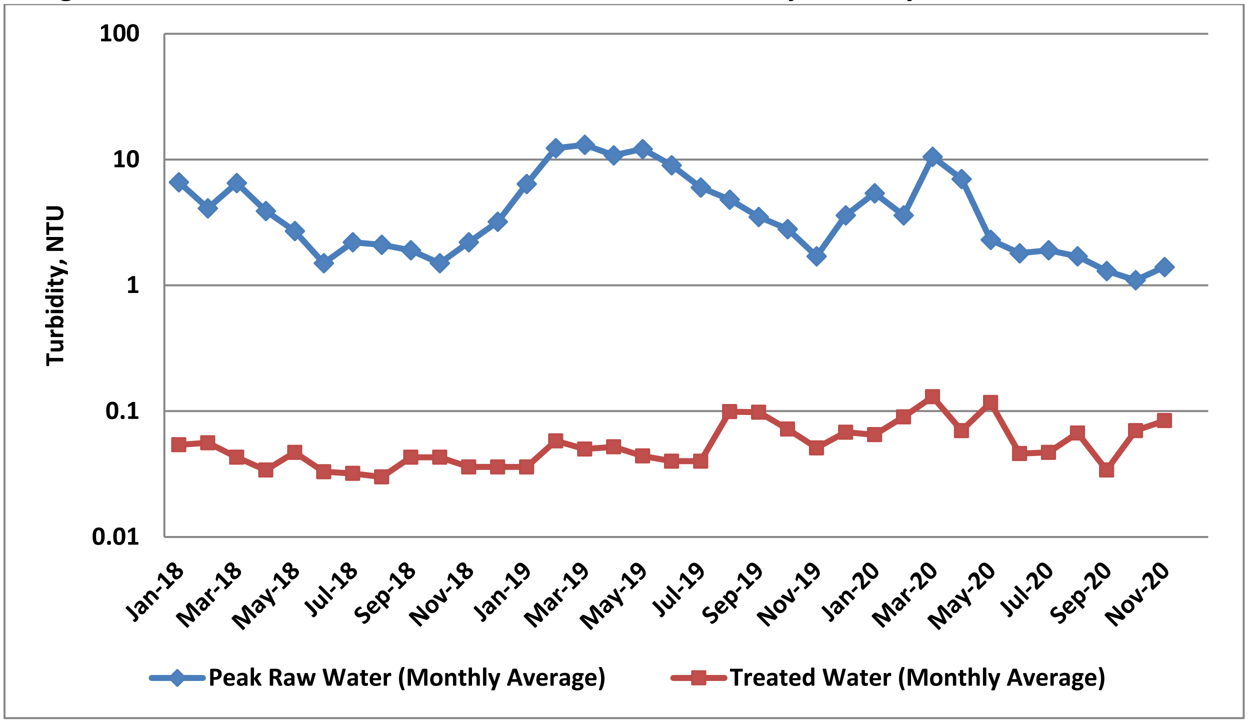
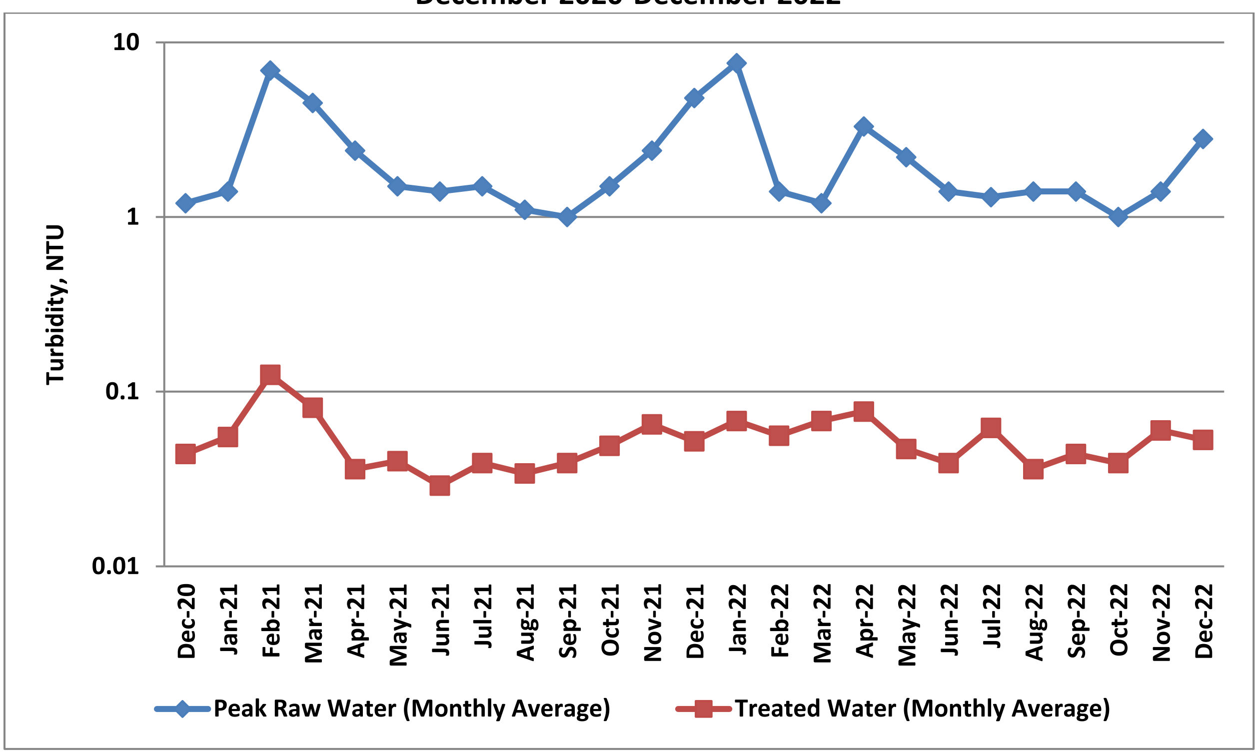


Figure 5-19. Sweetwater WTP – Raw and Treated Water Turbidity, December 2020-December 2022



Microbiological Constituent Review

There were no positive coliform samples in the distribution system during the period of study.

Disinfection By-Products and Precursors

DBP Precursors

GDPUD does not monitor for TOC in its raw and treated water. As the ALT WTP utilizes inline filtration it does not fit into any of the designated process categories under the Stage 1 D/DBP Rule. The Sweetwater WTP uses an alternative treatment process and also does not require compliance with TOC reduction requirements.

Stage 2 DBP Compliance

GDPUD began quarterly monitoring at the ALT WTP for the Stage 2 D/DBP Rule in October 2013. **Figure 5-20** shows individual TTHM results at the Stage 2 D/DBP rule monitoring site over the study period. Individual TTHMs ranged from 12 to 55 µg/L and TTHM LRAAs ranged from 17.8 to 36.8 µg/L. No TTHM LRAAs exceeded the MCL of 80 µg/L.

Figure 5-20. Distribution System Individual TTHM, ALT/Sweetwater WTP System, 2018-2022

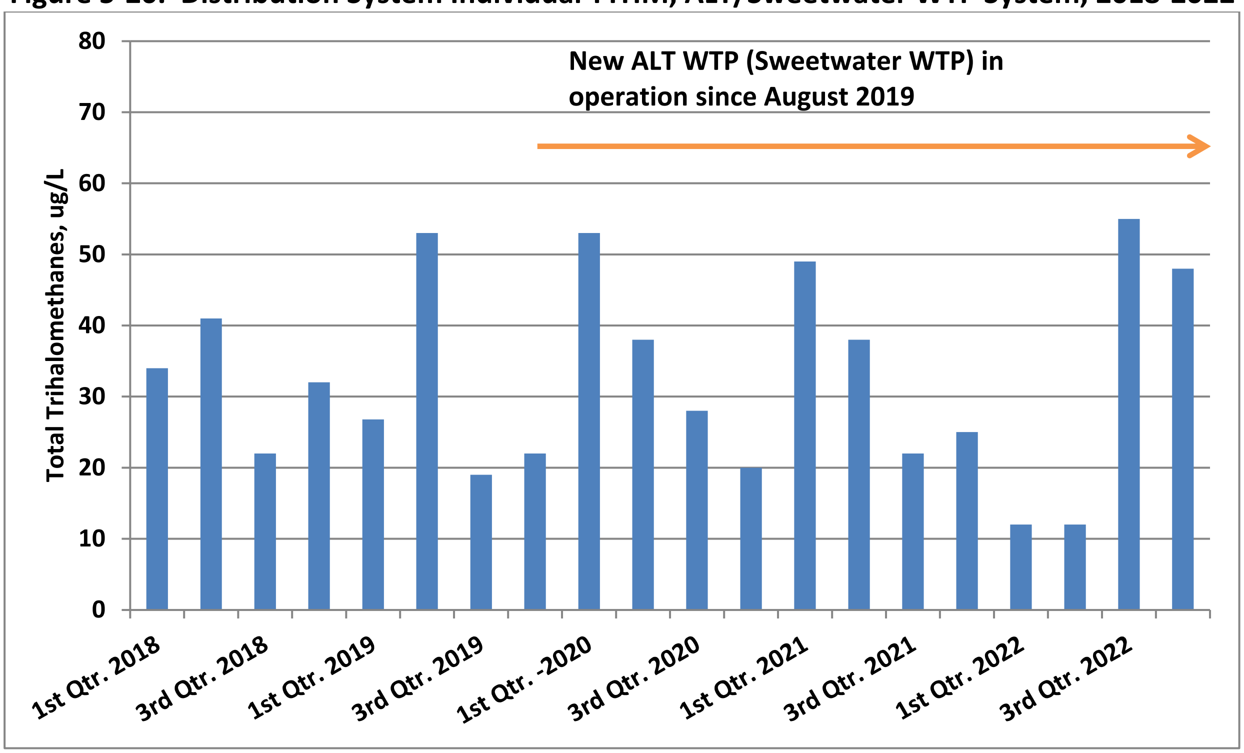
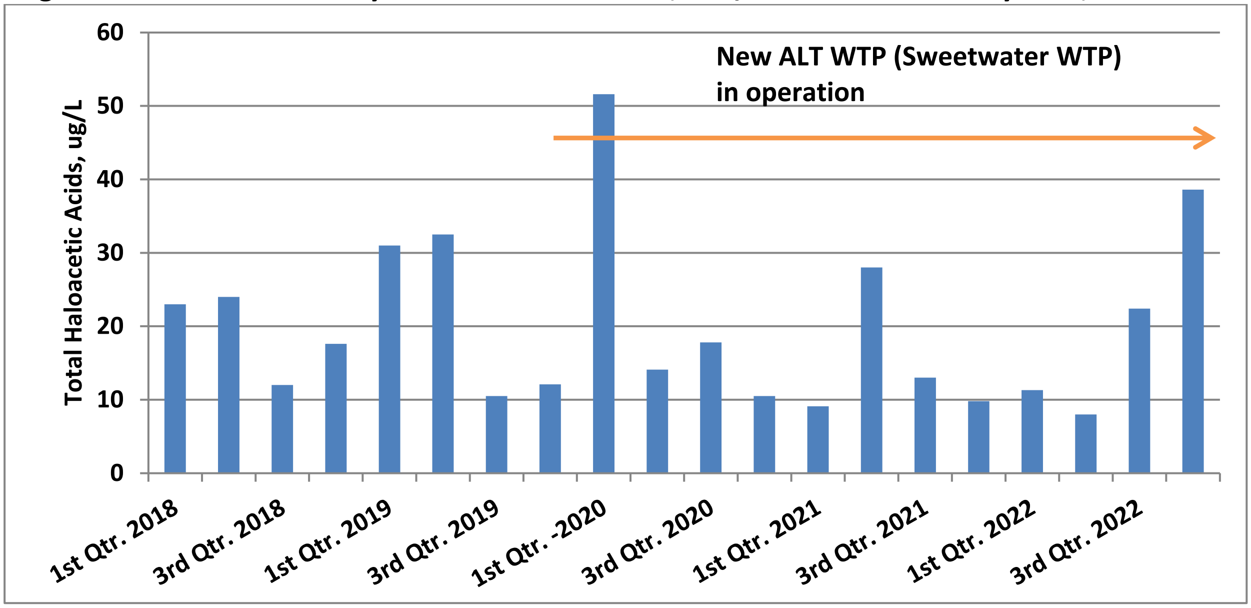


Figure 5-21 shows individual HAA5 results at the Stage 2 D/DBP rule monitoring site over the study period. Individual HAA5 ranged from 8 to 51.6 µg/L, and HAA5 LRAAs ranged from 10.5 to 26.7 µg/L. No HAA5 LRAAs exceeded the MCL of 60 µg/L.

Figure 5-21. Distribution System Individual HAA5, ALT/Sweetwater WTP System, 2018-2022



Volatile and Synthetic Organic Compounds

There were no detectable levels of VOCs or SOCs in the raw water during the study period.

Other Detectable Title 22 Constituents

There were no other detectable Title 22 constituents of interest.

***Giardia/Virus/Cryptosporidium* Reduction Requirements**

Based on the *E. coli* data evaluated in **Section 3**, 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium* continue to be appropriate reduction requirements for the Sweetwater WTP. As stated earlier, the Sweetwater WTP qualifies for filtration removal credits of 2-log for *Giardia*, 2-log of *Cryptosporidium* and 1-log for virus.

GDPUD completed *E. coli* source water sampling to comply with the LT2ESWTR second round compliance monitoring in June 2019, and had an annual mean of 52.4 MPN/100mL, which classifies the source as Bin 1.

Regulatory Compliance Evaluation

GDPUD has been monitoring the raw and treated water for the ALT WTP and the Sweetwater WTP for all required Title 22 compliance constituents. **Table 5-8** lists the key existing drinking water regulations and a compliance evaluation for these standards at the ALT/Sweetwater WTP. The ALT/Sweetwater WTP is currently in compliance with existing regulations.

Table 5-8
Regulatory Compliance Evaluation
Georgetown Divide Public Utility District – ALT WTP/Sweetwater WTP

	Targeted Compounds	Key Issues and Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	Monitored as required. No MCLs exceeded in the raw water.
SWTR	Microbial and Turbidity	Data continue to support 3/4—log reduction requirement for *Giardia*/viruses. All treated water turbidity standards are met.
LT1ESWTR and Filter Backwash Rule	Microbial and Turbidity	All new turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBP Rule	Disinfectants and Disinfection By-Products	Not required to achieve TOC removal as an alternative filtration plant.
LT2ESWTR	Microbial	Classified as Bin 1 for second round monitoring.
Stage 2 D/DBP Rule	Disinfectants and Disinfection By-Products	TTHM and HAA5 LRAAs for Stage 2 are below drinking water standards of 80 µg/L and 60 µg/L, respectively. No OELs triggered.

CITY OF FOLSOM

System Description

Folsom Water Treatment Plant

The raw water intake location for the Folsom WTP is the shared diversion facilities at Folsom Dam. Water is provided to the water utilities through the Temperature Control Device (TCD), which is a louvered column that allows for water to be diverted from various depths in the lake to preserve the coldwater pool. Folsom WTP is a conventional water treatment plant. The plant design flow is 50 mgd, with average winter flows at 14 mgd and average summer flows at 32 mgd.

The influent water is pre-oxidized with sodium hypochlorite, and aluminum chlorohydrate and anionic polymer are added as the primary coagulant and coagulant aid. Chemicals are mixed by a static mixer. The coagulated water is then sent to Actiflo® pretreatment where coagulation, sand injection, maturation, and settling occur. The water is then filtered through 10 dual media gravity filters. The filter loading rate is 6.0 gpm/sf. Non-ionic polymer is used as a filter aid as needed.

The filters can be backwashed based on turbidity, headloss, or time. Currently, the filters are backwashed based on time, which is typically daily during the summer and every three days in the winter. The plant has filter-to-waste capability after backwash or plant start-up. Backwash water and filter-to-waste flow to a return backwash water pond. Decant water from the pond is returned to the plant, ahead of chemical feed. The filtered water is disinfected with sodium hypochlorite and stored in a 1.2 mg covered storage reservoir to meet CT requirements. The City of Folsom distribution system has a total of 34.5 mg storage.

Highlight of Changes Since 2018 Update

During the study period, plate settlers were added to the sedimentation basin for better settling. Additionally, two mixer and blower systems were added to tanks in the distribution system to help reduce DBP formation.

Significant Potential Contaminating Activities

The Folsom WTP diversion is located at the Folsom Dam. Recreational use is heavy in the upper watershed, as well as within Folsom Lake. The potential for forest fires, as well as timber harvesting activities, could increase the impact of erosion potential from the upper watershed into Folsom Lake. There were significant wildfires during the study period, especially the Caldor and Mosquito fires. Also of interest are urban runoff from the Auburn, Placerville and El Dorado Hills communities, potential spills associated with wastewater treatment and collection facilities, roads, railroads, and petroleum pipelines, and the evolving impacts of climate change.

Of special interest is the potential impact that Folsom Lake operations may have on the source water quality, especially with the planned reoperation of Folsom Dam by Reclamation.

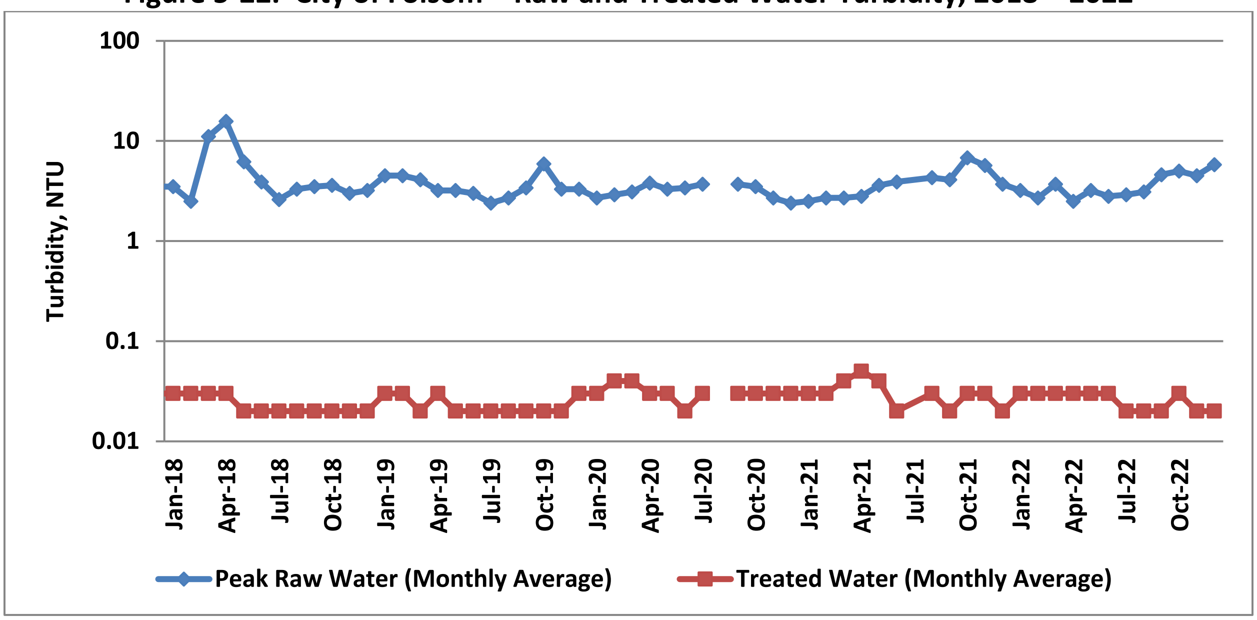
Treated Water Quality Summary

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 of peak daily raw water turbidity at Folsom WTP for the period of study was 3.9 NTU, and on average the treatment process decreased this to 0.03 NTU, which equates to an average solids removal of 99.3 percent. **Figure 5-22** shows a time series plot of raw and treated water turbidities. It should be noted that the raw water turbidities plotted are a monthly average of peak daily grab samples. The treated water turbidities are a monthly average of a daily average, based on all 4-hr samples in a 24 hour period. Folsom WTP meets all current treated water turbidity standards.

Figure 5-22. City of Folsom – Raw and Treated Water Turbidity, 2018 – 2022



Microbiological Constituent Review

There were no positive coliform samples in the distribution system during the period of study.

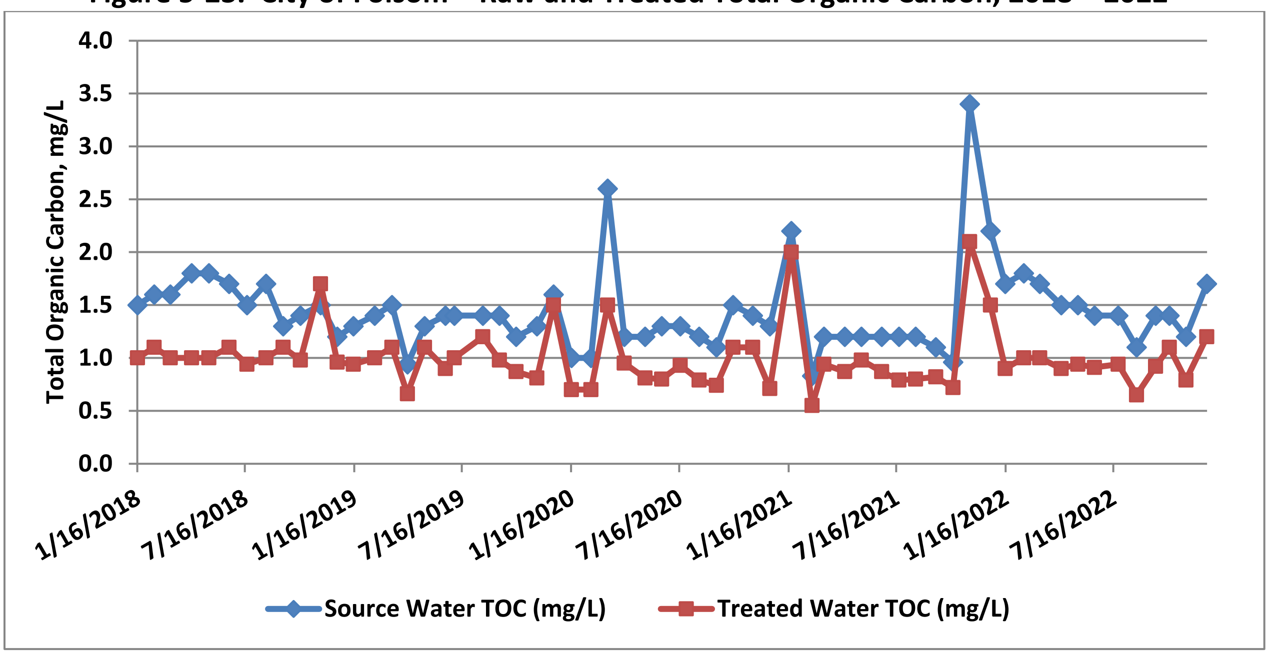
Disinfection By-Products and Precursors

DBP Precursors

The City of Folsom 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 Folsom WTP were 1.4 mg/L and 1.0 mg/L, respectively, equating to 30.7 percent average removal. **Figure 5-23** shows a time series plot of raw and treated water TOC at Folsom WTP. Ninety-four percent of the time, TOC levels in the raw water were below 2.0 mg/L; the highest recorded level was 3.4 mg/L in November 2021. This occurred during a period of intense storm activity, which also coincided with extremely low storage in Folsom Lake and a fall lake turnover event, likely contributing to significant impacts to source water quality.

As both the source and treated water TOC RAAs for 2018 through 2022 were less than 2.0 mg/L, an alternative compliance criterion was met and no TOC removal was required.

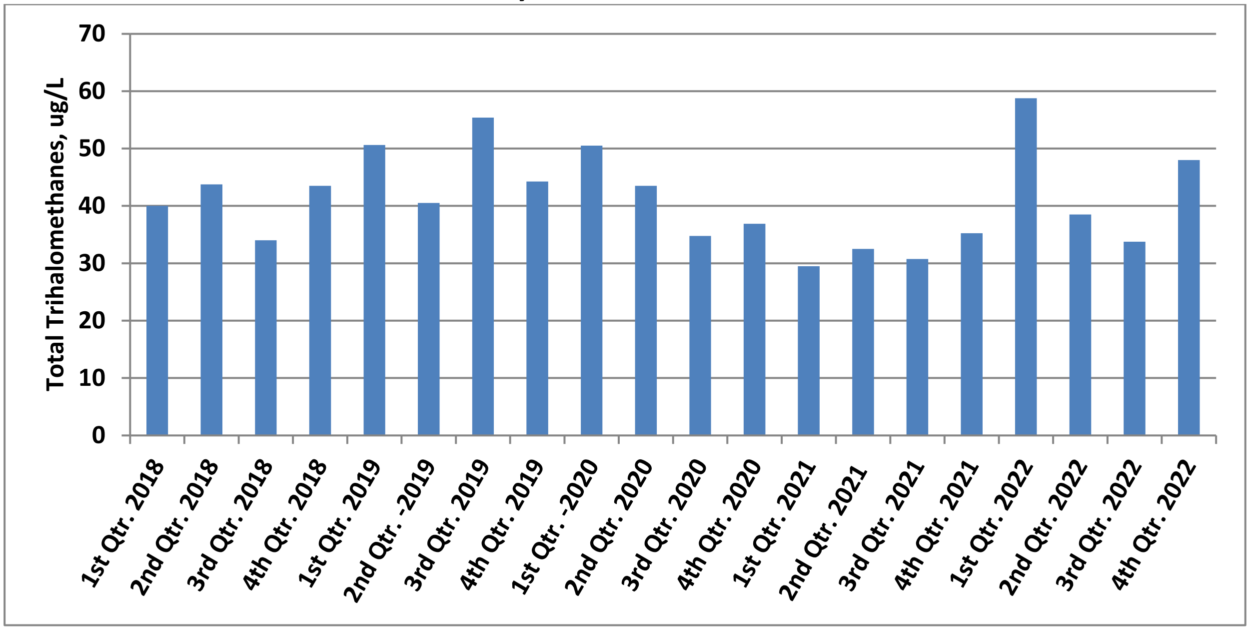
Figure 5-23. City of Folsom – Raw and Treated Total Organic Carbon, 2018 – 2022



Stage 2 DBP Compliance

The City of Folsom converted to eight Stage 2 D/DBP monitoring sites in July 2010. During the study period, the individual TTHM distribution system samples ranged from 17 to 81 µg/L. **Figure 5-24** shows the quarterly average of all distribution system sites for TTHM analysis. Quarterly average values range from 29.5 to 58.8 µg/L. The highest quarter was 1st quarter 2022, likely as a result of the fall 2021 and winter 2022 significant source water quality upset that occurred in Folsom Lake.

Figure 5-24. Distribution System TTHM Quarterly Average of All Sites, City of Folsom Main System, 2018-2022



The TTHM LRAA for each distribution system site was calculated. **Figure 5-25** presents the TTHM LRAA maximum and median values. The LRAAs ranged from 19 to 64 µg/L, and the Needlegrass site had the highest LRAA. These values are all well below the MCL of 80 µg/L.

During the study period, the individual HAA5 distribution system samples ranged from 13 to 86 µg/L. **Figure 5-26** shows the quarterly average of all distribution system sites for HAA5 analysis. Quarterly average values range from 18.9 to 62.8 µg/L. Similar to TTHMs, the highest concentrations occurred in the 1st quarter 2022, likely a result of the source water quality incident at Folsom Lake.

The HAA5 LRAA for each distribution system site was calculated. **Figure 5-27** presents the HAA5 LRAA maximum and median values. The LRAAs ranged from 16 to 54 µg/L. As shown in **Figure 5-27,** the Mistry Meadow site has the highest HAA5 LRAA. All LRAA values are all below the current MCL of 60 µg/L.

Figure 5-25. Distribution System Site TTHM LRAAs, City of Folsom Main System, 2018-2022

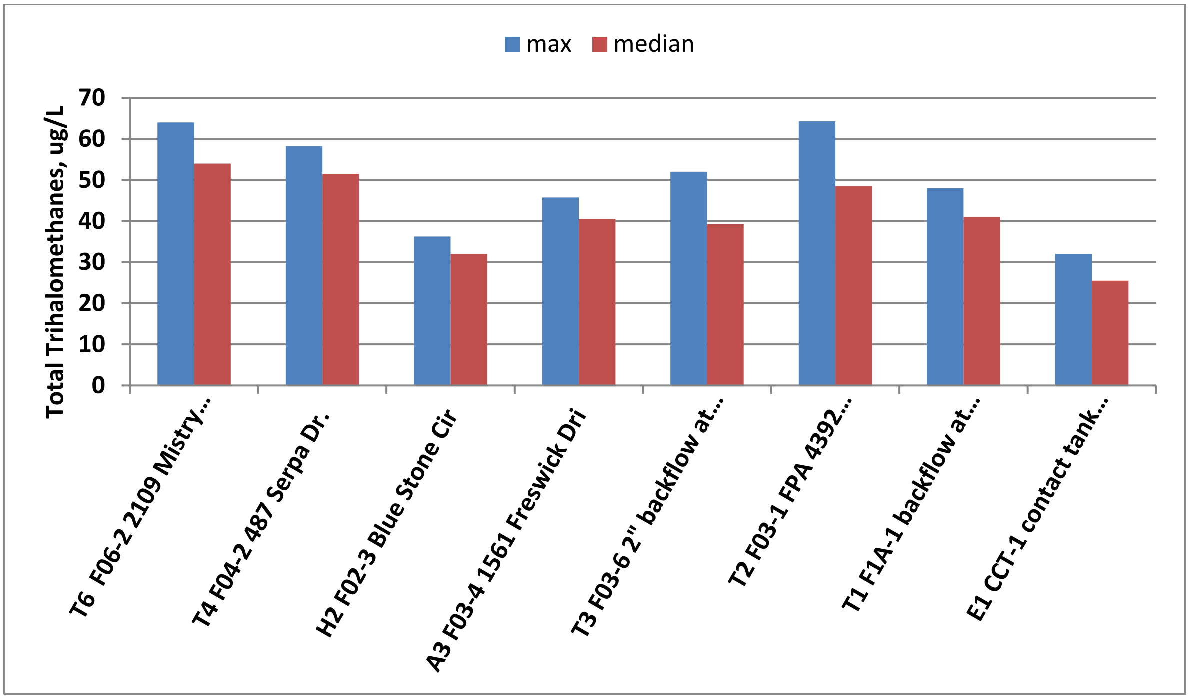


Figure 5-26. Distribution System HAA5 Quarterly Average of All Sites, City of Folsom Main System, 2018-2022

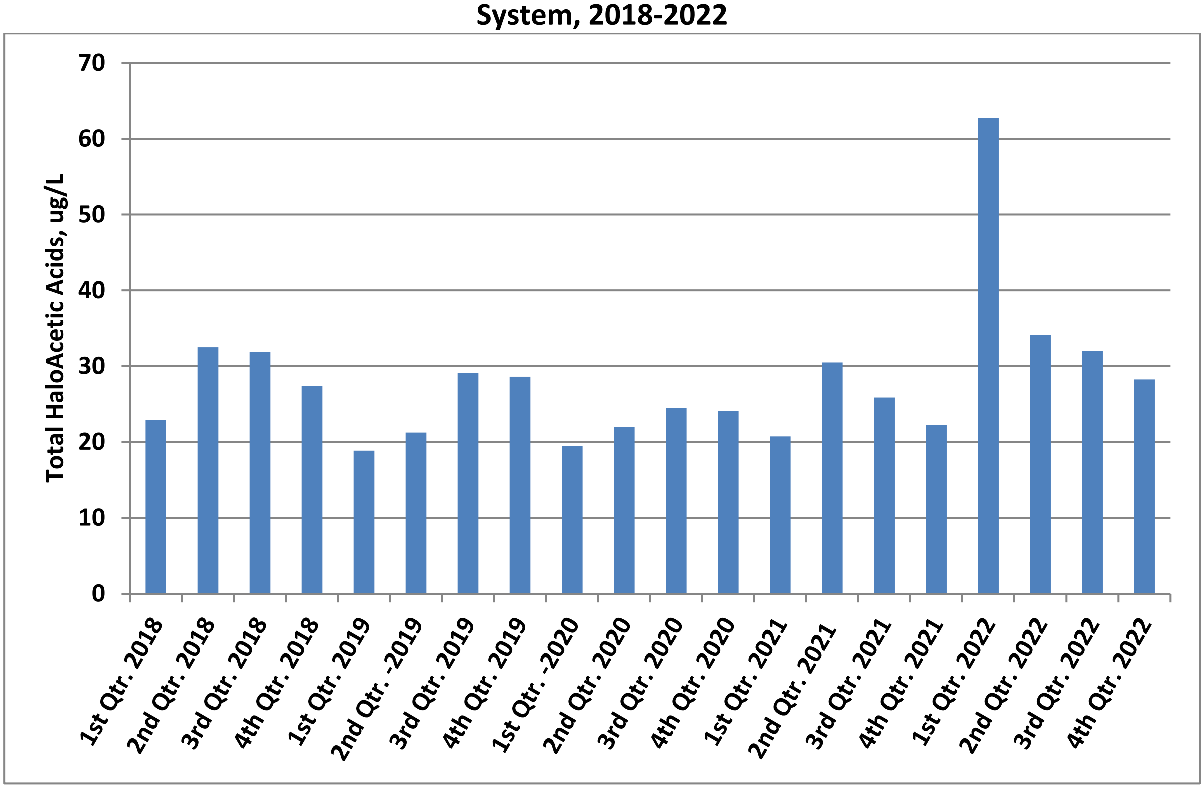
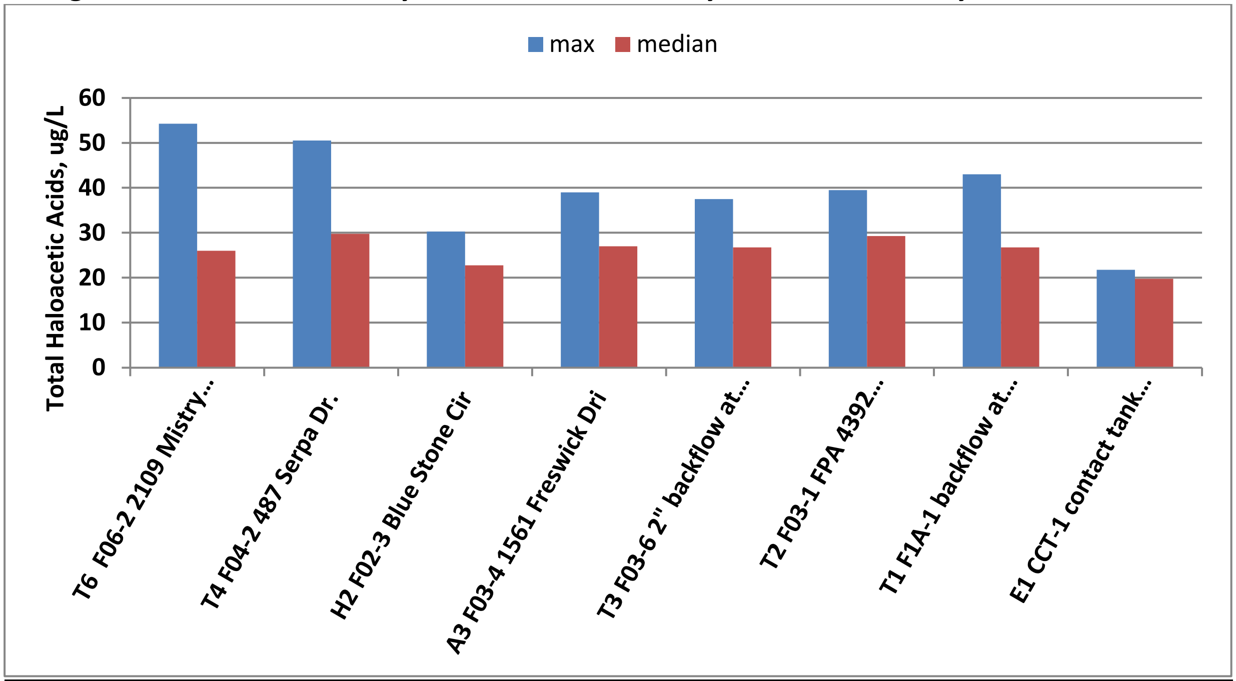


Figure 5-27. Distribution System HAA5 LRAAs, City of Folsom Main System, 2018-2022



Volatile and Synthetic Organic Compounds

There were no detectable levels of VOCs or SOCs in the raw water for the Folsom WTP during the study period.

Other Detectable Title 22 Constituents

There were no other detectable Title 22 constituents of interest.

UCMR 4

Biweekly monitoring for anatoxin-a, cylindrospermopsin, and total microcystin was conducted from March to June 2018 at the entry point to the distribution system. All sample results were non-detect.

The other 17 required constituents were also monitored quarterly at the entry point to the distribution system in February, May, August, and November of 2018. All sample results were non-detect, except for manganese which ranged from non-detect to 1.5 µg/L.

Three brominated haloacetic acid groups (HAA5, HAA9 and HAA6Br) were monitored at four sites in the distribution system in February, May, August, and November of 2018. Out of all the sites, and over the four quarters, the average difference between HAA9 and HAA5 was 1.4 µg/L and the maximum difference was 1.8 µg/L, indicating minimal presence of brominated HAAs.

*Giardia/*Virus/*Cryptosporidium* Reduction Requirements

Based on the *E. coli* and protozoa data evaluated in **Section 3**, 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium* continue to be appropriate reduction requirements for the Folsom WTP at this time.

The Folsom 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 and the IESWTR.

The City of Folsom conducted the LT2ESWTR second round compliance monitoring by collecting monthly samples for *Cryptosporidium* and *Giardia* from October 2015 to September 2017. There were no detections of *Cryptosporidium* or *Giardia*, classifying the source as Bin 1.

Regulatory Compliance Evaluation

The City of Folsom has been monitoring the raw and treated water for the Folsom WTP for all required Title 22 compliance constituents. **Table 5-9** lists the key existing drinking water regulations and a compliance evaluation for these standards at the Folsom WTP. The Folsom WTP is currently in compliance with existing regulations.

Table 5-9
Regulatory Compliance Evaluation
City of Folsom – Folsom WTP

	Targeted Compounds	Key Issues and Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	Monitored as required. No MCLs exceeded in the raw water.
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.
IESWTR and Filter Backwash Rule	Microbial and Turbidity	All new turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBP Rule	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in source and treated water. Therefore, enhanced coagulation not required. TTHM/HAA5 RAAs comply with drinking water standards (< 80/60 µg/L, respectively).
LT2ESWTR	Microbial	Classified as Bin 1 for second round monitoring.
Stage 2 D/DBP Rule	Disinfectants and Disinfection By-Products	Current TTHM/HAA5 LRAAs for Stage 2 data are below the MCLs (<80/60 µg/L, respectively). No OELs triggered.

FOLSOM STATE PRISON

System Description

Folsom Prison Water Treatment Plant

The raw water intake location for the Folsom State Prison WTP is the shared diversion facilities at Folsom Dam. Water is provided to the water utilities through the TCD, which is a louvered column that allows for water to be diverted from various depths in the lake to preserve the coldwater pool. Folsom State Prison WTP is a Micro-floc Two-Stage Filtration Package plant, utilizing direct filtration. The plant design flow is 4 mgd, with average winter flows at 1.5 mgd and average summer flows at 1.9 mgd.

The influent water is pre-chlorinated, and alum is added as the primary coagulant. Chemicals are mixed by an in-line mixer, then flocculated and clarified in an upflow clarifier. The water is then filtered through two tri-media gravity filters. The filter loading rate is 5.2 gpm/sf.

The filters are backwashed based on time or headloss. The plant has filter-to-waste capability after backwash. Backwash water and filter-to-waste flow to a reclamation basin. Decant water from the basin is returned to the plant, ahead of chemical feed. The filtered water is then disinfected with chlorine and lime is added for pH adjustment, before being stored in two 1 mg covered storage reservoirs.

Highlight of Changes Since 2018 Update

There have been no major changes to the plant over the study period.

Significant Potential Contaminating Activities

The Folsom State Prison WTP diversion is located at the Folsom Dam. Recreational use is heavy in the upper watershed as well as within Folsom Lake. The potential for forest fires, as well as timber harvesting activities, could increase the impact of erosion potential from the upper watershed into Folsom Lake. There were significant wildfires during the study period, especially the Caldor and Mosquito fires. Also of interest are urban runoff from the Auburn, Placerville and El Dorado Hills communities, potential spills associated with wastewater treatment and collection facilities, roads, railroads, and petroleum pipelines, and the evolving impacts of climate change.

Of special interest is the potential impact that Folsom Lake operations may have on the source water quality, especially with the planned reoperation of Folsom Dam by Reclamation.

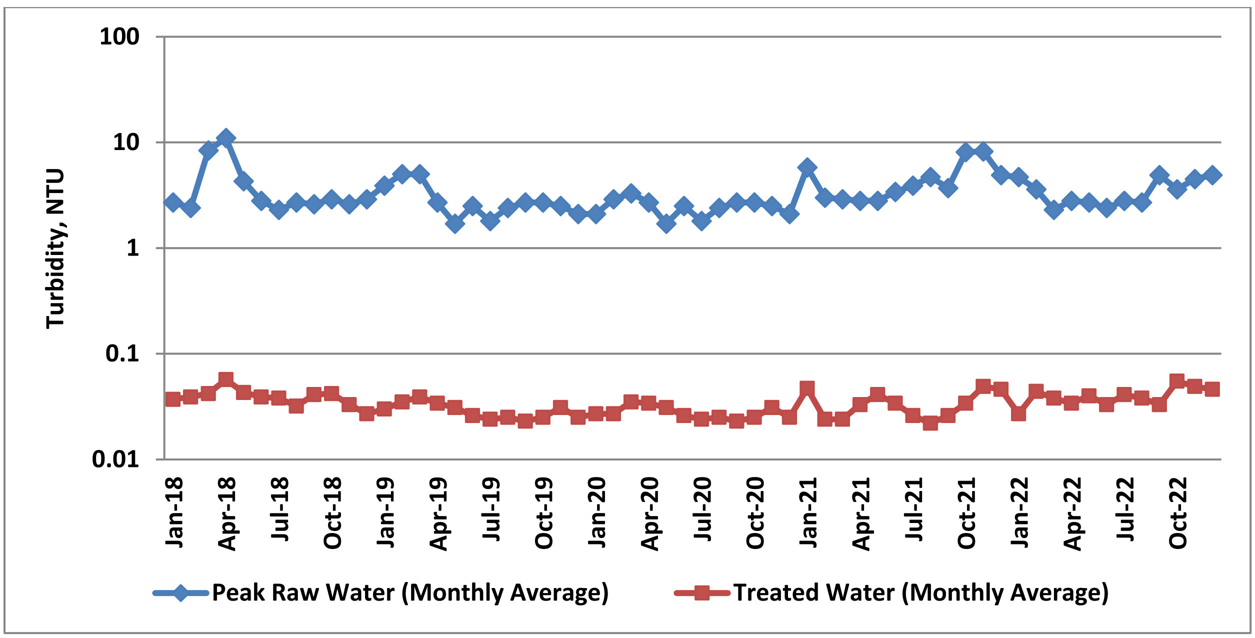
Treated Water Quality Summary

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 of peak daily raw water turbidity at Folsom State Prison WTP for the period of study was 3.5 NTU, and on average the treatment process decreased this to 0.03 NTU, which equates to an average solids removal of 99.0 percent. **Figure 5-28** shows a time series plot of raw and treated water turbidities. It should be noted that the raw water turbidities plotted are a monthly average of peak daily grab samples. The treated water turbidities are a monthly average of a daily average, based on all 4-hr samples in a 24 hour period. Folsom State Prison WTP meets all current treated water turbidity standards.

Figure 5-28. Folsom State Prison WTP- Raw, Settled, and Treated Water Turbidities, 2018 – 2022



Microbiological Constituent Review

There were no positive coliform samples in the distribution system during the period of study.

Disinfection By-Products and Precursors

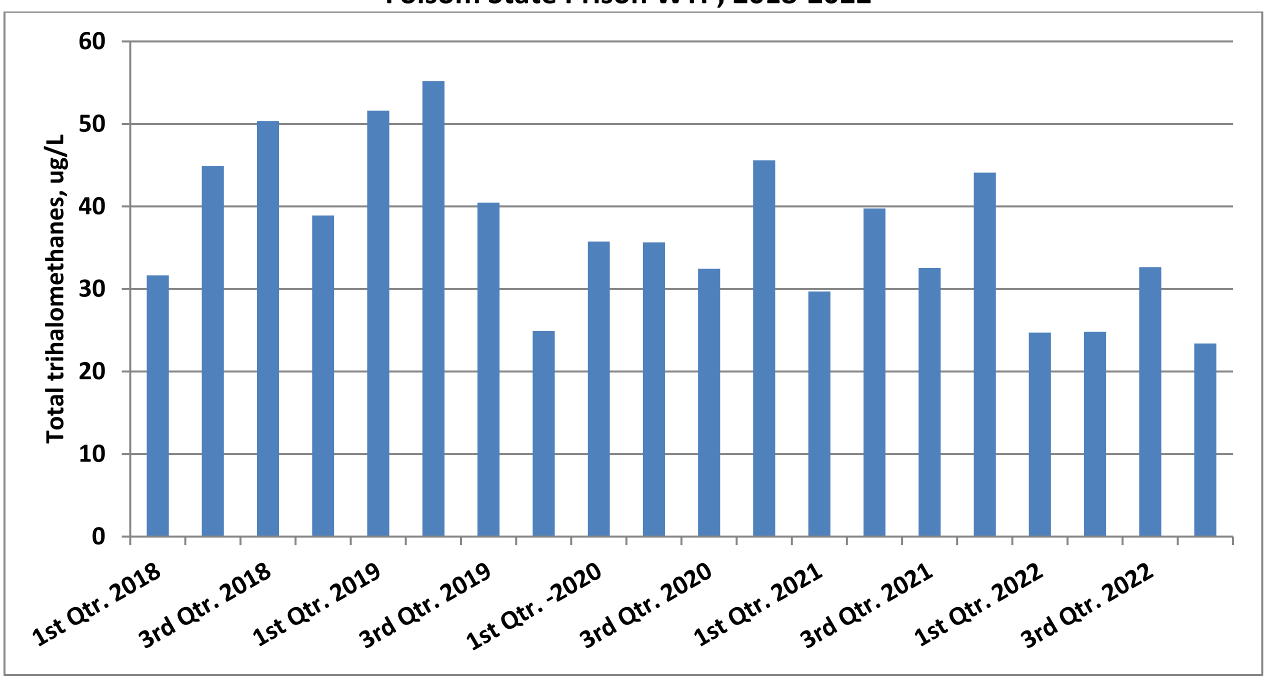
DBP Precursors

The Folsom State Prison WTP monitors alkalinity and TOC levels in its raw water and TOC levels in its treated water. As Folsom State Prison WTP is a direct filtration plant, it is not required to achieve any TOC removal. Based on a limited number of samples from 2019 and 2021, the average raw and treated water TOC levels at Folsom State Prison WTP were 1.47 mg/L and 1.05 mg/L, respectively, equating to 28.4 percent average removal.

Stage 2 DBP Compliance

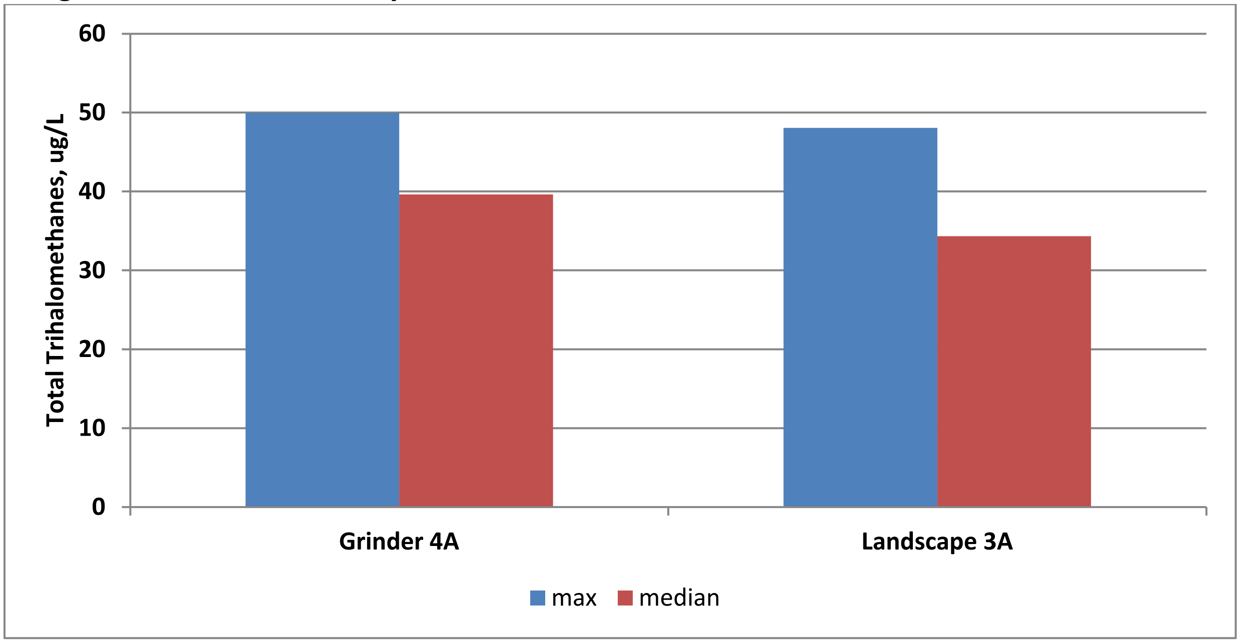
Stage 2 D/DBP Rule monitoring began in October 2013 and two sites are monitored quarterly in the distribution system. During the study period, the individual TTHM distribution system samples ranged from 19.4 to 57 µg/L, with a median value of 58.3 µg/L. **Figure 5-29** shows the quarterly average of both distribution system sites for TTHM analysis. Quarterly average values range from 23.4 to 55.2 µg/L. From this figure it can be seen that peak values can occur throughout the year.

Figure 5-29. Distribution System TTHM Quarterly Average of Both Sites, Folsom State Prison WTP, 2018-2022



The TTHM LRAA for each distribution system site was calculated. **Figure 5-30** presents the TTHM LRAA maximum and median values. The LRAAs ranged from 23 to 50 µg/L, and the Grinder site had the highest LRAA. These values are all well below the MCL of 80 µg/L.

Figure 5-30. Distribution System Site TTHM LRAAs, Folsom State Prison WTP, 2018-2022



During the study period, the individual HAA5 distribution system samples ranged from 2.2 to 53 µg/L. **Figure 5-31** shows the quarterly average of both distribution system sites for HAA5 analysis. Quarterly average values range from 10.7 to 39.9 µg/L. From this figure it can be seen that peak values can occur throughout the year.

The HAA5 LRAA for each distribution system site was calculated. **Figure 5-32** presents the HAA5 LRAA maximum and median values. The LRAAs ranged from 10 to 36.9 µg/L. As shown in **Figure 5-32,** the Landscape site had the highest HAA5 LRAA. All LRAA values are all well below the current MCL of 60 µg/L.

Figure 5-31. Distribution System HAA5 Quarterly Average of Both Sites, Folsom State Prison WTP, 2018-2022

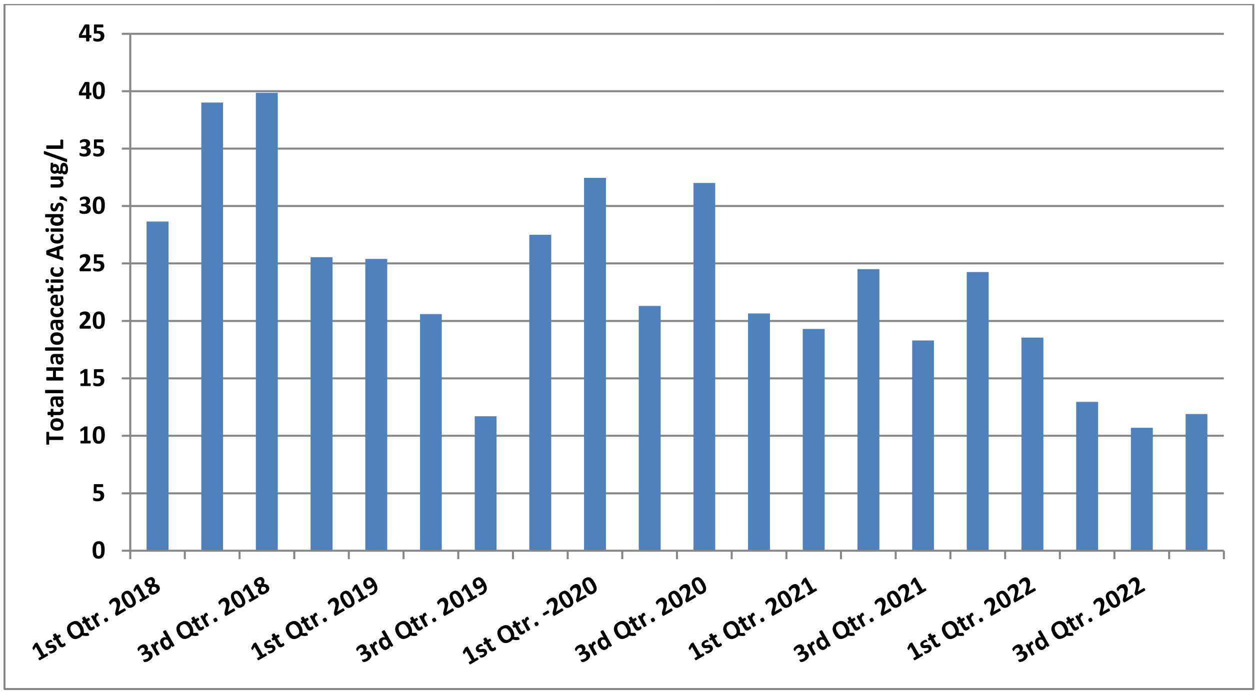
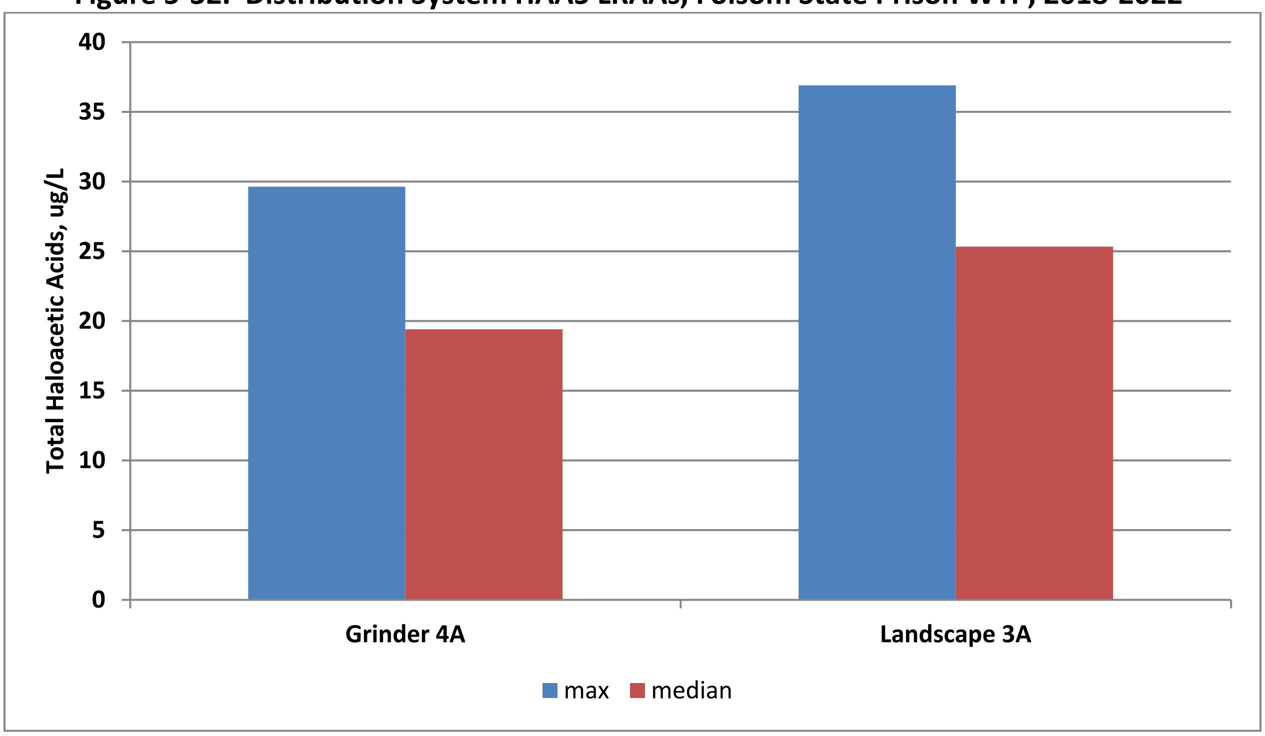


Figure 5-32. Distribution System HAA5 LRAAs, Folsom State Prison WTP, 2018-2022



Volatile and Synthetic Organic Compounds

There were no detectable levels of VOCs or SOCs in the raw water for the Folsom State Prison WTP during the study period.

Other Detectable Title 22 Constituents

There were no other detectable Title 22 constituents of interest.

***Giardia/*Virus/*Cryptosporidium* Reduction Requirements**

Based on the fecal coliform data, and the protozoa data from other Folsom Lake water utilities, evaluated in **Section 3**, 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium* continue to be appropriate reduction requirements for the Folsom State Prison WTP.

The Folsom State Prison 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 chlorine 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 and the LT1ESWTR.

The Folsom State Prison WTP was given a waiver for the second round of LT2ESWTR monitoring based on sufficient data from other Folsom Lake water treatment plants, and source is classified as Bin 1.

Regulatory Compliance Evaluation

Folsom State Prison has been monitoring the raw and treated water for the Folsom State Prison WTP for all required Title 22 compliance constituents. **Table 5-10** lists the key existing drinking water regulations and a compliance evaluation for these standards. The Folsom State Prison WTP is currently in compliance with existing regulations.

Table 5-10
Regulatory Compliance Evaluation
Folsom State Prison – FSP WTP

	Targeted Compounds	**Key Issues and Compliance Status**
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	Monitored as required. No MCLs exceeded in the raw water.
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.
LT1ESWTR and Filter Backwash Rule	Microbial and Turbidity	All new turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBP Rule	Disinfectants and Disinfection By-Products	Not required to achieve TOC removal as a direct filtration plant.
LT2ESWTR	Microbial	Classified as Bin 1 based on other Folsom Lake utility data.
Stage 2 D/DBP Rule	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs comply with drinking water standards (< 80/60 µg/L, respectively). No OELs triggered.

SAN JUAN WATER DISTRICT (SJWD)

System Description

Sidney N. Peterson Water Treatment Plant

The raw water intake location for the Peterson WTP is the shared diversion facilities at Folsom Dam. Water is provided to the water utilities through the TCD which is a louvered column that allows for water to be diverted from various depths in the lake to preserve the coldwater pool. The Peterson WTP is a conventional water treatment plant. The original plant design was 100 mgd. In 2013 it was permitted by DDW to operate up to 150 mgd from May 15th to September 30th and up to 120 mgd from October 1 to May 14th based on process and hydraulic improvements that were implemented over the years.

The influent water is pre-chlorinated, and an aluminum sulfate/2 percent cationic blend is used as the primary coagulant. Typically, coagulation is accomplished hydraulically but the Peterson WTP has mixers that can create a G-value of 300 second^{-1}. The water then enters a 3-stage flocculation basin with horizontal mechanical mixers, and then into sedimentation basins. Nonionic polymer is added both as a flocculant and filter aid. As a flocculant aid it is added prior to flocculation to enhance the process and develop a larger, more resilient floc particle. It is also added as a filter aid before the clarified water enters the 24 gravity dual media filter groups, each made of 10 - 8-foot by 8-foot filter cells, which are operated up to but not to exceed 8.5 gpm/ft^2. Filters are backwashed based on time, turbidity, or head loss. The plant does not have filter-to-waste capability.

Backwash water flows to a wastewater basin, and the decant water is sent to the process upstream of chemical feed. The filtered water is disinfected with chlorine, and pH adjusted with calcium hydroxide. The treatment plant has a 62 mg floating cover reservoir on site, with an additional 6.26 mg from other distribution reservoirs.

Highlight of Changes Since 2018 Update

There have been no major changes to the plant over the study period.

Significant Potential Contaminating Activities

The Peterson WTP diversion is located at the Folsom Dam. Recreational use is heavy in the upper watershed as well as within Folsom Lake. The potential for forest fires, as well as timber harvesting activities, could increase the impact of erosion potential from the upper watershed into Folsom Lake. There were significant wildfires during the study period, especially the Caldor and Mosquito fires. Also of interest are urban runoff from the Auburn, Placerville and El Dorado Hills communities, potential spills associated with wastewater treatment and collection facilities, roads, railroads, and petroleum pipelines, and the evolving impacts of climate change.

Of special interest is the potential impact that Folsom Lake operations may have on the source water quality, especially with the planned reoperation of Folsom Dam by Reclamation.

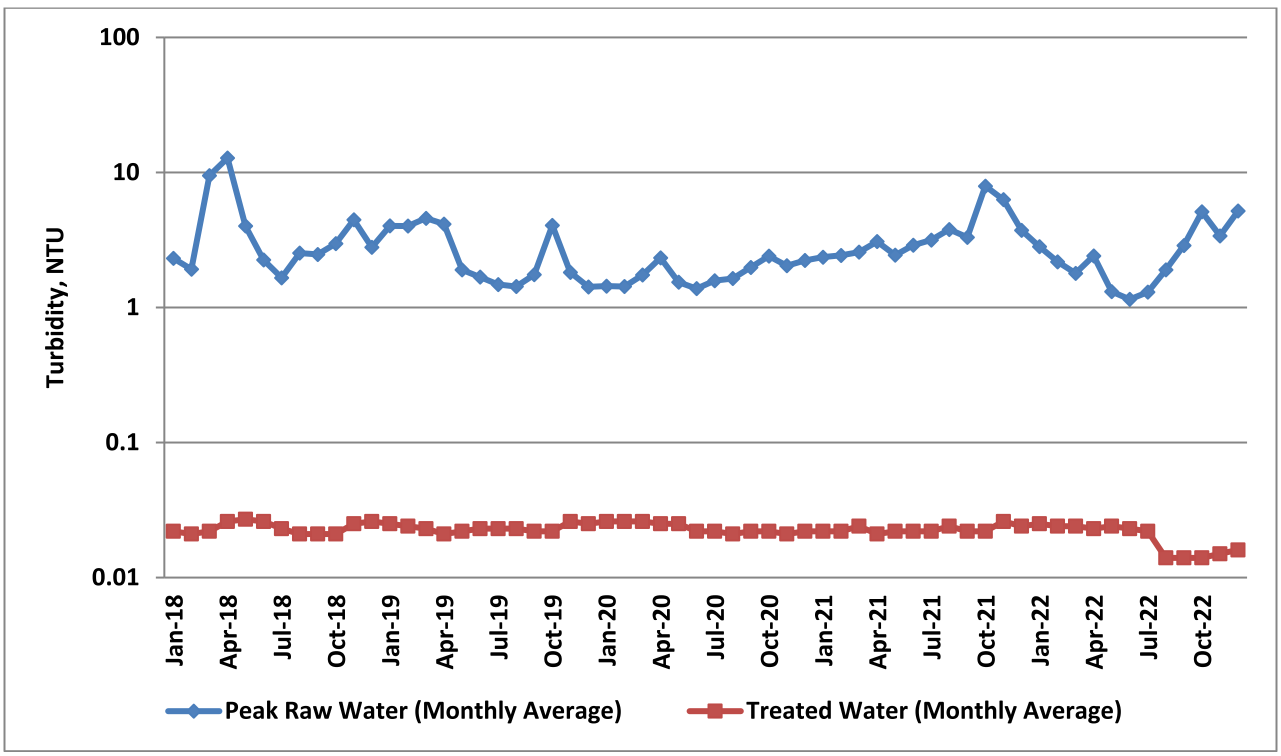
Treated Water Quality Summary

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 of peak daily raw water turbidity at the Peterson WTP for the period of study was 3.0 NTU, and on average the treatment process decreased this to 0.02 NTU, which equates to an average solids removal of 99.2 percent. **Figure 5-33** shows a time series plot of raw and treated turbidities. It should be noted that the raw water turbidities plotted are a monthly average of peak daily grab samples. The treated water turbidities are a monthly average of a daily average, based on all 4-hr samples in a 24 hour period. Peterson WTP meets all current treated water turbidity standards.

Figure 5-33. San Juan Water District – Raw and Treated Water Turbidities, 2018 – 2022



Microbiological Constituent Review

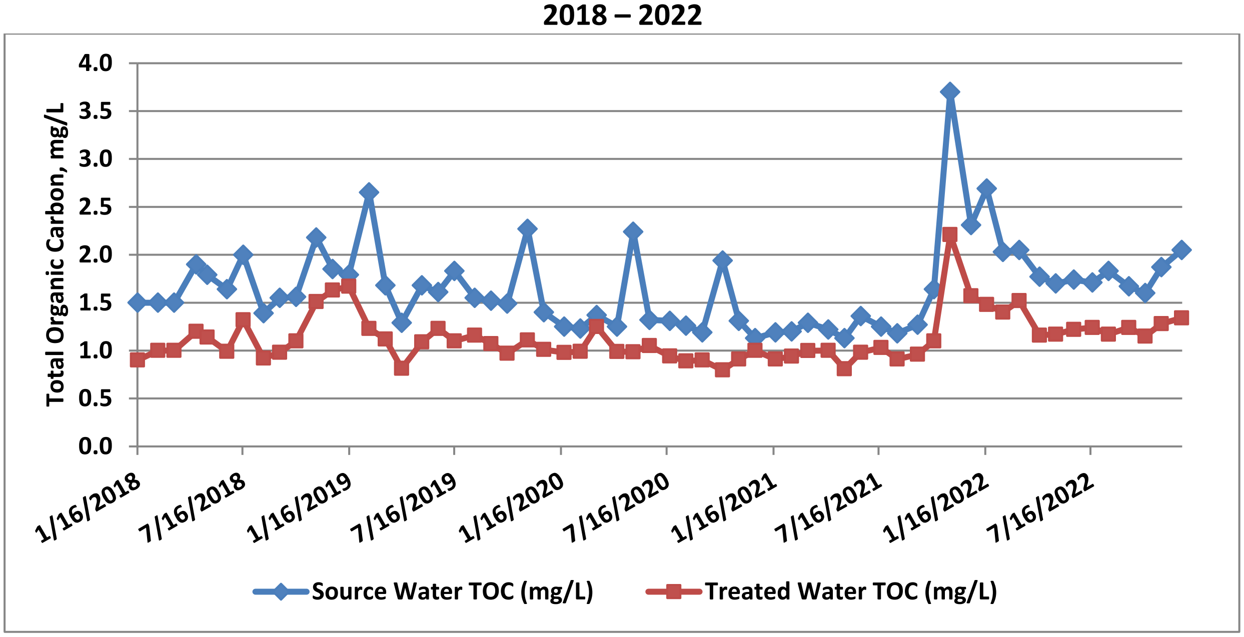
As reported in the 2018, 2020, and 2021 CCRs, the highest monthly percentage of positive total coliform samples was 2.32 percent. Similarly, the highest monthly percentage of positive total coliform samples was 4.35 percent in 2022. These percentages are not in violation of the Total Coliform Rule and its revisions since the percent positive was less than five percent and repeat samples were all negative. Additionally, there were no detections of fecal coliform.

Disinfection By-Products and Precursors

DBP Precursors

SJWD 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 Peterson WTP were 1.66 mg/L and 1.13 mg/L, respectively, equating to 31.8 percent average removal. **Figure 5-34** shows a time series plot of raw and treated water TOC. Eighty-two percent of the time, TOC levels in the raw water were below 2.0 mg/L; the highest recorded level was 3.7 mg/L in November 2021. This occurred during a period of intense storm activity, which also coincided with extremely low storage in Folsom Lake and a fall lake turnover event, likely contributing to significant impacts to source water quality. As the treated water running annual averages for years 2018 through 2022 were less than 2.0 mg/L, an alternative compliance criterion was met and no TOC removal was required under the Stage 1 D/DBP Rule.

Figure 5-34. San Juan Water District – Raw and Treated Total Organic Carbon, mg/L, 2018 – 2022



Stage 2 DBP Compliance

SJWD converted to four Stage 2 D/DBP monitoring sites in January 2011. During the study period, the individual TTHM distribution system samples ranged from 21.7 to 71.3 µg/L. **Figure 5-35** shows the quarterly average of all distribution system sites for TTHM analysis. Quarterly average values range from 26.5 to 61.1 µg/L. The highest quarters persisted through 2022, likely as a result of the fall 2021 and winter 2022 significant source water quality upset that occurred in Folsom Lake.

The TTHM LRAA for each distribution system site was calculated. **Figure 5-36** presents the TTHM LRAA maximum and median values. The LRAAs ranged from 27.2 to 60 µg/L, and the Lawrence site had the highest LRAA. These values are all well below the current MCL of 80 µg/L.

During the study period, the individual HAA5 distribution system samples ranged from 17.2 to 84.4 µg/L. **Figure 5-37** shows the quarterly average of all distribution system sites for HAA5 analysis. Quarterly average values range from 21.8 to 63.5 µg/L. The highest quarter was 1st quarter 2022, likely similar to the TTHM impacts caused by the source water quality incident in Folsom Lake.

The HAA5 LRAA for each distribution system site was calculated. **Figure 5-38** presents the HAA5 LRAA maximum and median values. The LRAAs ranged from 22 to 49.1 µg/L, and the Fort Rock site had the highest LRAA . All LRAA values are all below the current MCL of 60 µg/L.

Figure 5-35. Distribution System TTHM Quarterly Average of All Sites, Peterson WTP, 2018-2022

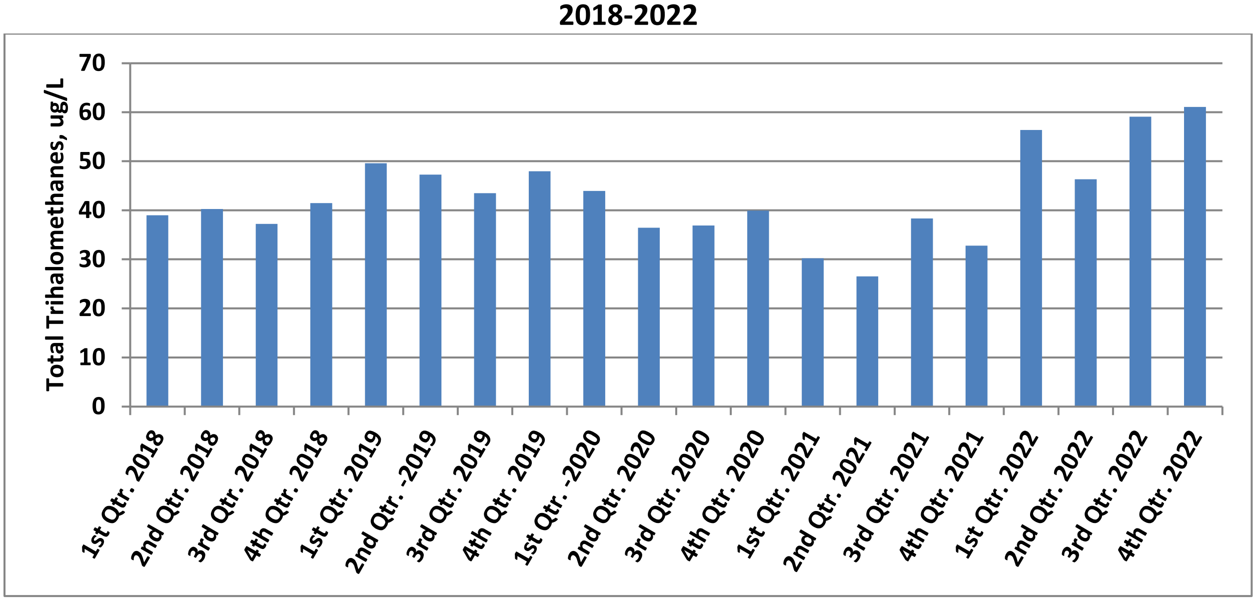


Figure 5-36. Distribution System Site TTHM LRAAs, Peterson WTP, 2018-2022

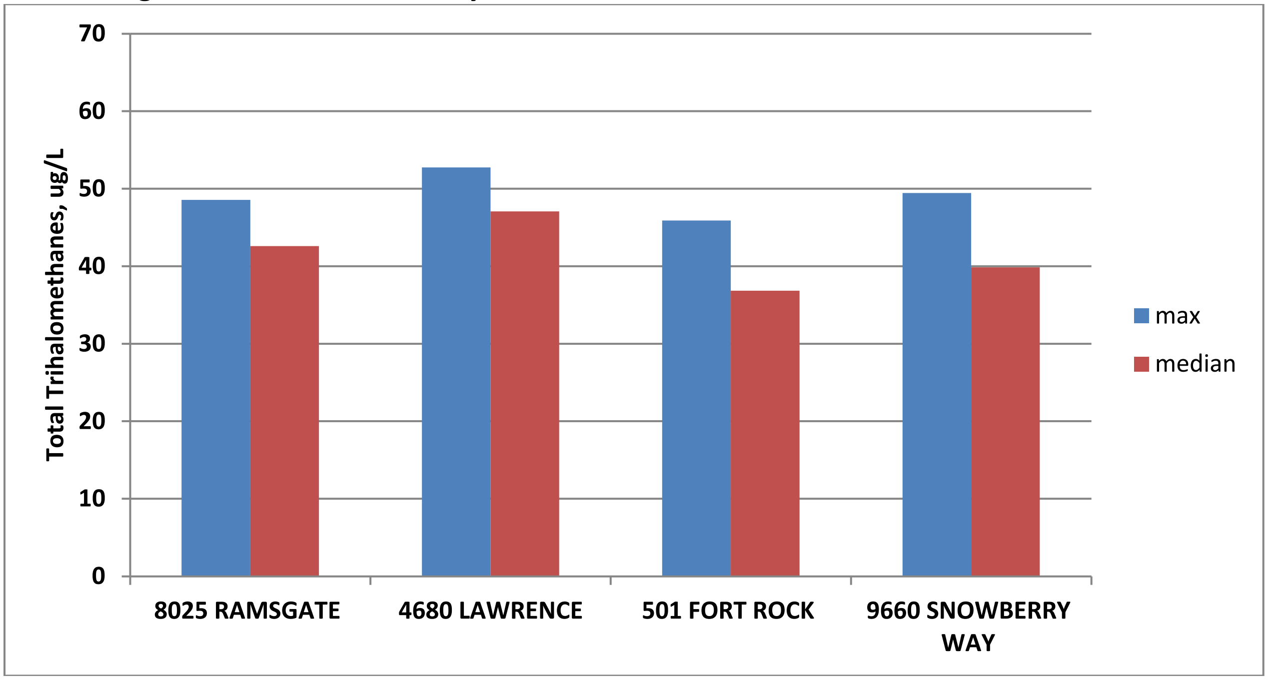


Figure 5-37. Distribution System HAA5 Quarterly Average of All Sites, Peterson WTP, 2018-2022

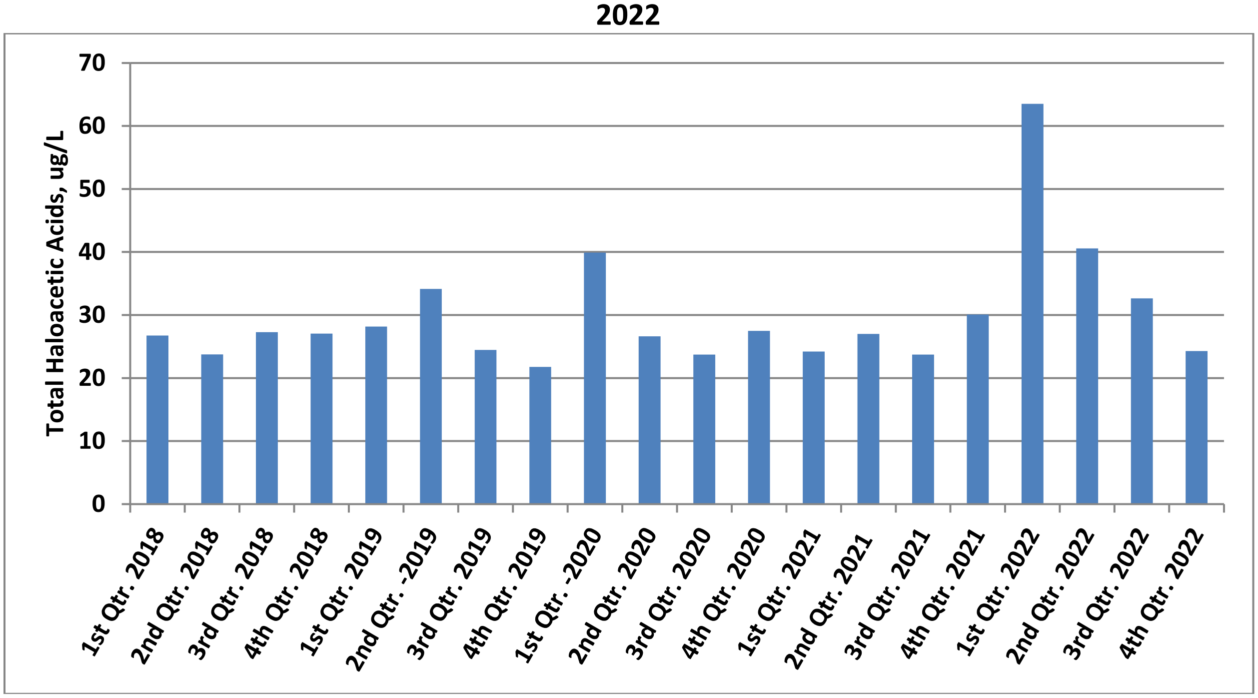
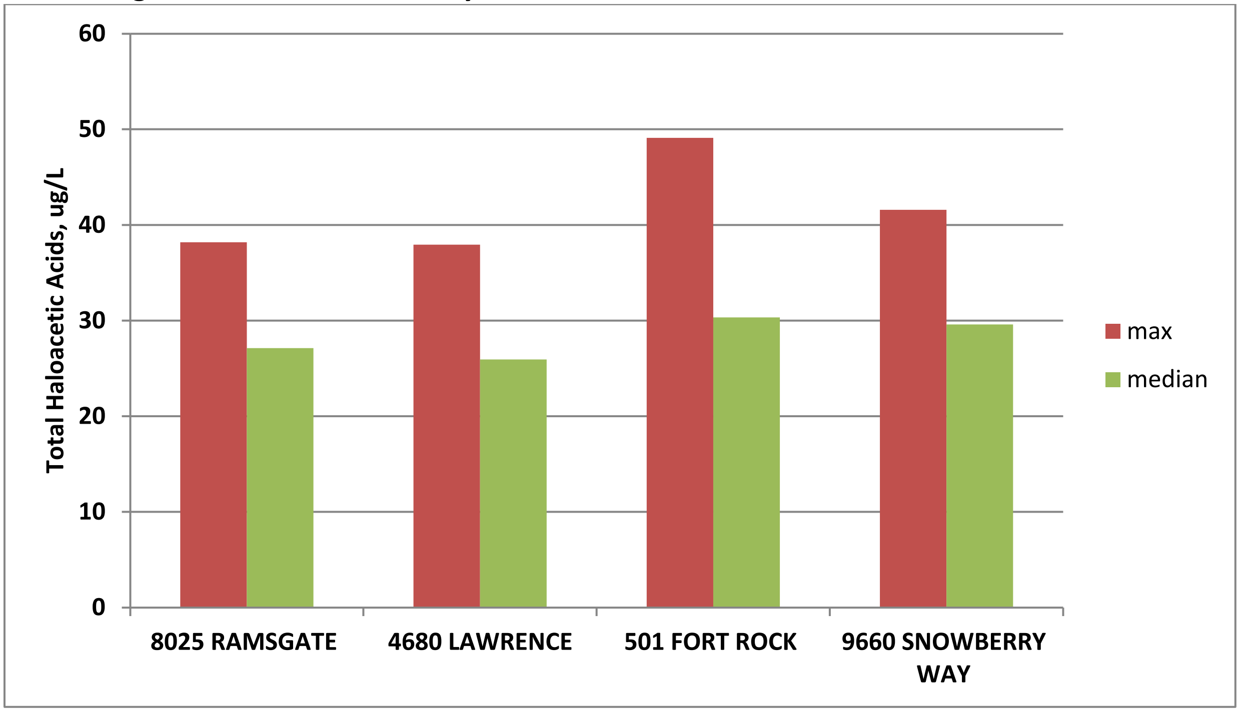


Figure 5-38. Distribution System Site HAA5 LRAAs, Peterson WTP, 2018-2022



Volatile and Synthetic Organic Compounds

There were no detectable levels of VOCs or SOCs in either the raw or treated water for the Peterson WTP during the study period.

Other Detectable Title 22 Constituents

The 2022 CCR noted one site in the distribution system exceeded the Action Level of 15 µg/L for lead. However, the 90^{th} percentile for all samples was non-detect.

UCMR 4

Biweekly monitoring for anatoxin-a, cylindrospermopsin, and total microcystin was conducted from March to June 2019 at the entry point to the distribution system. All sample results were non-detect.

The other 17 required constituents were also monitored quarterly at the entry point to the distribution system in March, June, September, and December of 2019. All sample results were non-detect, except for manganese which ranged from non-detect to 3.24 µg/L.

Three brominated haloacetic acid groups (HAA5, HAA9 and HAA6Br) were monitored at 4 sites in the distribution system in March, June, September, and December of 2019. Out of all the sites, and over the four quarters, the average difference between HAA9 and HAA5 was 0.53 µg/L and the maximum difference was 1.0 µg/L, indicating minimal presence of brominated HAAs.

***Giardia*/Virus/*Cryptosporidium* Reduction Requirements**

Based on the *E. coli* and protozoa data evaluated in **Section 3**, 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium* continue to be appropriate reduction requirements for Peterson WTP.

The Peterson 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 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 and the IESWTR.

SJWD conducted the LT2ESWTR second round compliance monitoring by collecting monthly samples for *Cryptosporidium* and *Giardia* from April 2015 to March 2017. There were no detections of *Cryptosporidium,* classifying the source as Bin 1. There was one detection of *Giardia*.

Regulatory Compliance Evaluation

SJWD has been monitoring the raw and treated water for the Peterson WTP for all required Title 22 compliance constituents. **Table 5-11** lists the key existing drinking water regulations and a compliance evaluation for these standards at the Peterson WTP. The Peterson WTP is currently in compliance with existing regulations.

Table 5-11
Regulatory Compliance Evaluation
San Juan Water District – Peterson WTP

	Targeted Compounds	Key Issues and Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	Monitored as required. No MCLs exceeded in the raw or treated water.
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.
IESWTR and Filter Backwash Rule	Microbial and Turbidity	All new turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBP Rule	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in treated water. Therefore, enhanced coagulation not required.
LT2ESWTR	Microbial	Classified as Bin 1 based on second round monitoring.
Stage 2 D/DBP Rule	Disinfectants and Disinfection By-Products	Current TTHM/HAA5 LRAAs for Stage 2 data are below the MCLs (<80/60 µg/L, respectively). No OELs triggered.

CITY OF ROSEVILLE

System Description

Roseville Water Treatment Plant

The raw water intake location for the Roseville WTP is the shared diversion facilities at Folsom Dam. Water is provided to the water utilities through the TCD which is a louvered column that allows for water to be diverted from various depths in the lake to preserve the coldwater pool. Roseville WTP is a conventional water treatment plant. The plant design flow is 100 mgd, with average winter flows of 16 mgd and average summer flows of 39 mgd.

The influent water is pre-chlorinated, and alum and nonionic polymer are the primary coagulant and coagulant aid, respectively. Chemicals are mixed hydraulically using the headloss at the inlet control valve to clarifiers and a flash mix pump leading to the floc/sed basins. The treatment plant has two trains. The original train achieves flocculation and sedimentation in three upflow clarifiers. The newer train has three parallel sub-trains, with long, rectangular 4-stage flocculation and sedimentation basins. A non-ionic polymer is used as filter aid upstream of the filters. The clarified water is then filtered through twelve dual media gravity filters.

The filters can be backwashed based on time or turbidity, but normally based on time. The plant has filter-to-waste capability after backwash or plant start-up. Backwash water and filter-to-waste flow to reclamation basins, where the decant is returned ahead of chemical injection. The filtered water is then disinfected with sodium hypochlorite, hydrofluorosilicic acid is added for fluoride, and pH is adjusted using either calcium oxide or sodium hydroxide. The Roseville WTP has 44 mg of covered storage, 12 mg of storage at the Roseville WTP and 32 mg of storage in the distribution system.

Highlight of Changes Since 2018 Update

There have been no major changes to the plant over the study period. For the future, the City of Roseville is considering changing the current pre-oxidant from sodium hypochlorite to sodium permanganate. The City of Roseville is also evaluating corrosion control options, including orthophosphate.

Significant Potential Contaminating Activities

The Roseville WTP diversion is located at the Folsom Dam. Recreational use is heavy in the upper watershed as well as within Folsom Lake. The potential for forest fires, as well as timber harvesting activities, could increase the impact of erosion potential from the upper watershed into Folsom Lake. There were significant wildfires during the study period, especially the Caldor and Mosquito fires. Also of interest are urban runoff from the Auburn, Placerville and El Dorado

Hills communities, potential spills associated with wastewater treatment and collection facilities, roads, railroads, and petroleum pipelines, and the evolving impacts of climate change.
Of special interest is the potential impact that Folsom Lake operations may have on the source water quality, especially with the planned reoperation of Folsom Dam by Reclamation.

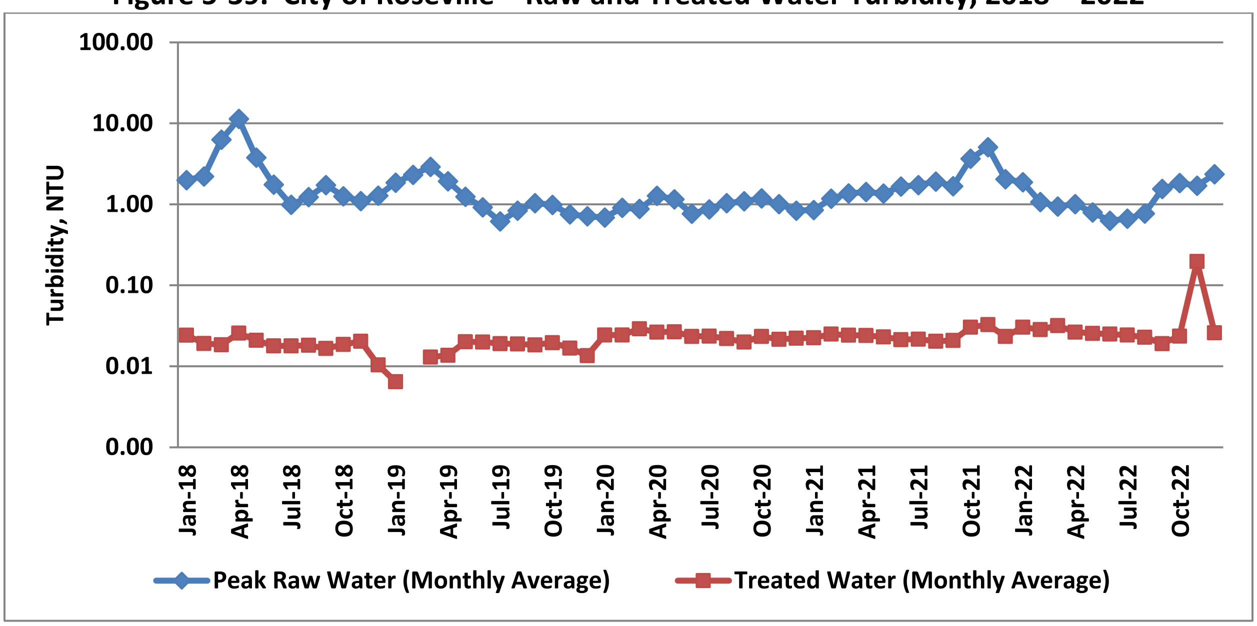
Treated Water Quality Summary

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 of peak daily raw water turbidity at Roseville WTP (West Train) for the period of study was 1.7 NTU, and on average the treatment process decreased this to 0.04 NTU, which equates to an average solids removal of 97.6 percent. **Figure 5-39** shows a time series plot of raw and treated turbidities. It should be noted that the raw water turbidities plotted are a monthly average of peak daily grab samples. The treated water turbidities are a monthly average of a daily average, based on all 4-hr samples in a 24 hour period. Roseville WTP meets all current treated water turbidity standards.

Figure 5-39. City of Roseville – Raw and Treated Water Turbidity, 2018 – 2022



Microbiological Constituent Review

There were no positive total coliform samples in the distribution system during the period of study.

Disinfection By-Products and Precursors

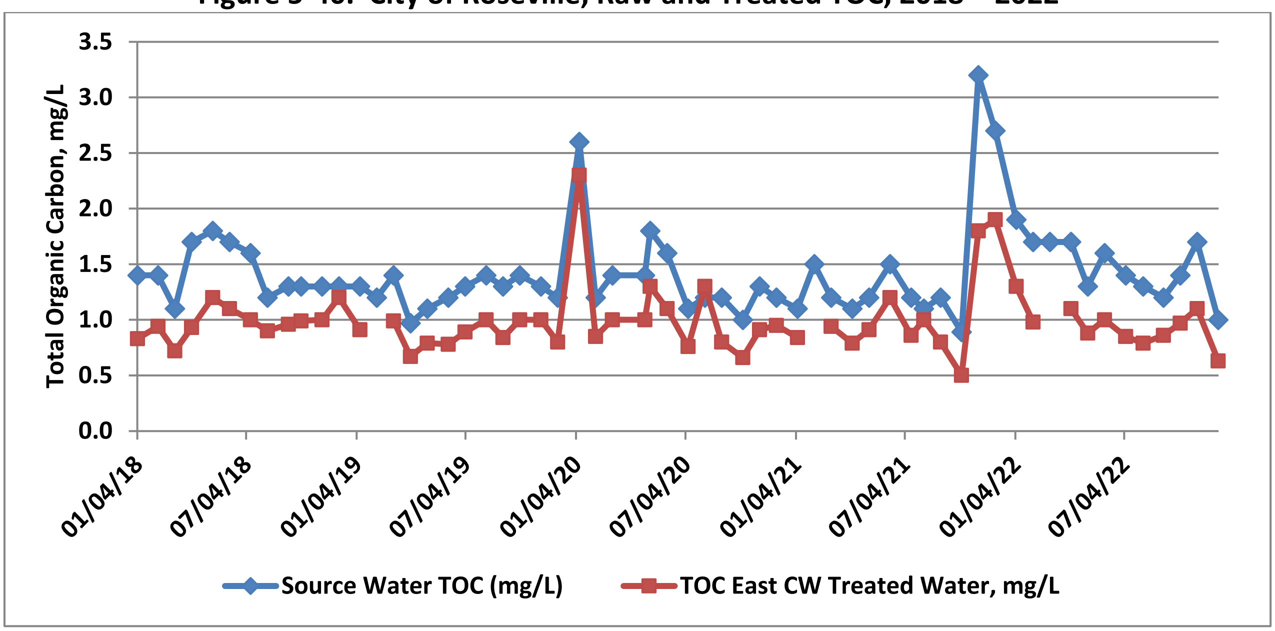
DBP Precursors

The City of Roseville monitors alkalinity and TOC levels in its raw and treated water on a monthly basis in order to determine TOC removal compliance. The average raw and treated water TOC levels at Roseville WTP were 1.4 mg/L and 1.0 mg/L, respectively, equating to 33.2 percent average removal. **Figure 5-40** shows a time series plot of raw and treated water TOC at Roseville WTP.

Ninety-five percent of the time, TOC levels in the raw water were below 2.0 mg/L; the highest recorded level was 3.2 mg/L in November 2021. This occurred during a period of intense storm activity, which also coincided with extremely low storage in Folsom Lake and a fall lake turnover event, likely contributing to significant impacts to source water quality.

As the source and treated water running annual averages for years 2018 through 2022 were less than 2.0 mg/L, an alternative compliance criterion was met and no TOC removal was required.

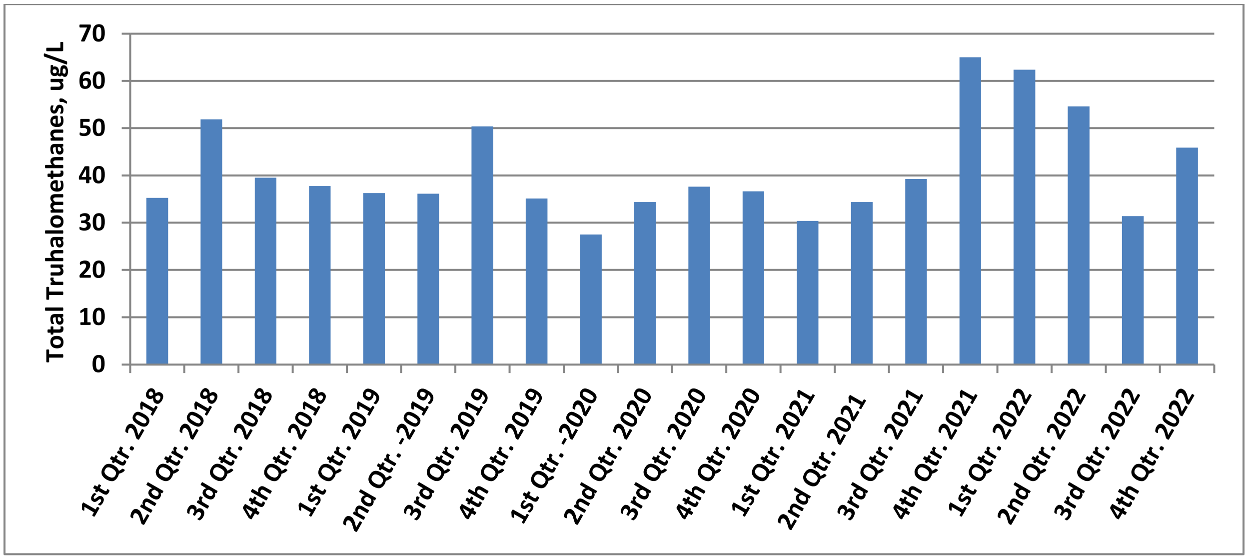
Figure 5-40. City of Roseville, Raw and Treated TOC, 2018 – 2022



Stage 2 DBP Compliance

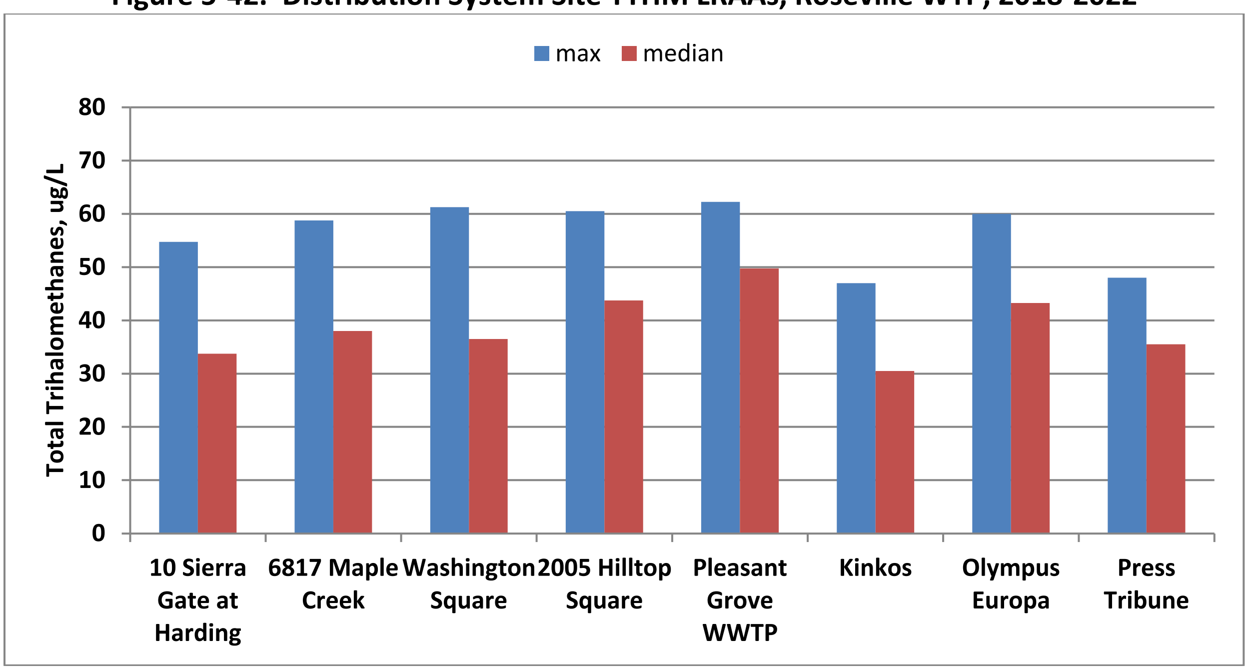
The City of Roseville converted to the eight Stage 2 D/DBP monitoring sites in January 2011. During the study period, the individual TTHM distribution system samples ranged from 17 to 86 µg/L. **Figure 5-41** shows the quarterly average of all distribution system sites for TTHM analysis. Quarterly average values range from 28 to 65 µg/L. The highest quarter was 4^{th} quarter 2021, likely as a result of the fall 2021 significant source water quality upset that occurred in Folsom Lake.

Figure 5-41. Distribution System TTHM Quarterly Average of All Sites, Roseville WTP, 2018-2022



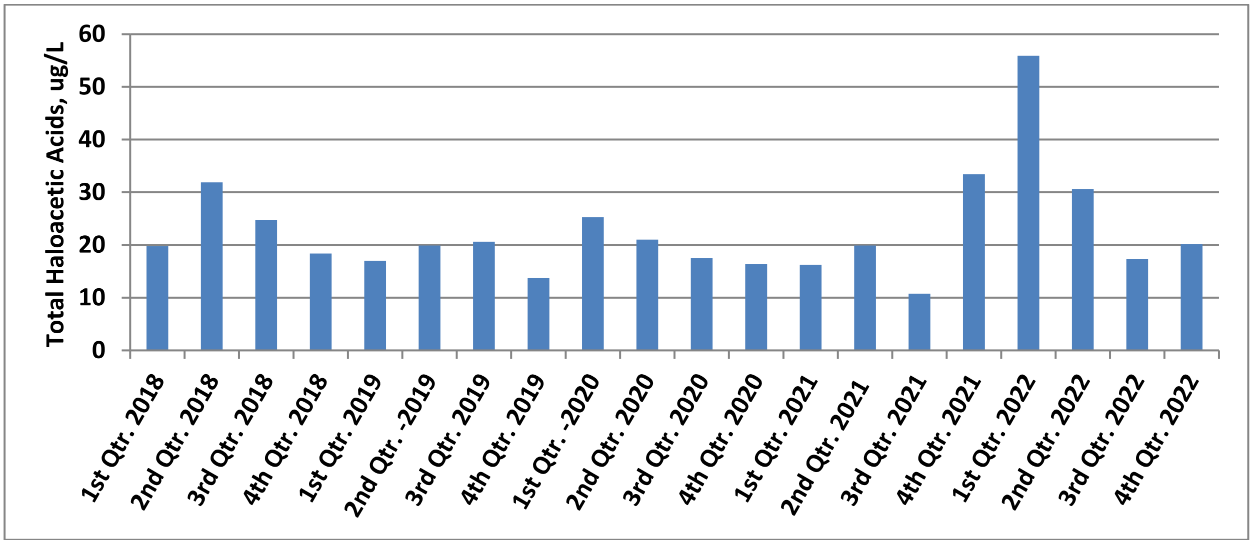
The TTHM LRAA for each distribution system site was calculated. **Figure 5-42** presents the TTHM LRAA maximum and median values. The LRAAs ranged from 25 to 62 µg/L, and the Pleasant Grove Wastewater Treatment Plant (WWTP) site had the highest LRAA. These values are all well below the current MCL of 80 µg/L.

Figure 5-42. Distribution System Site TTHM LRAAs, Roseville WTP, 2018-2022



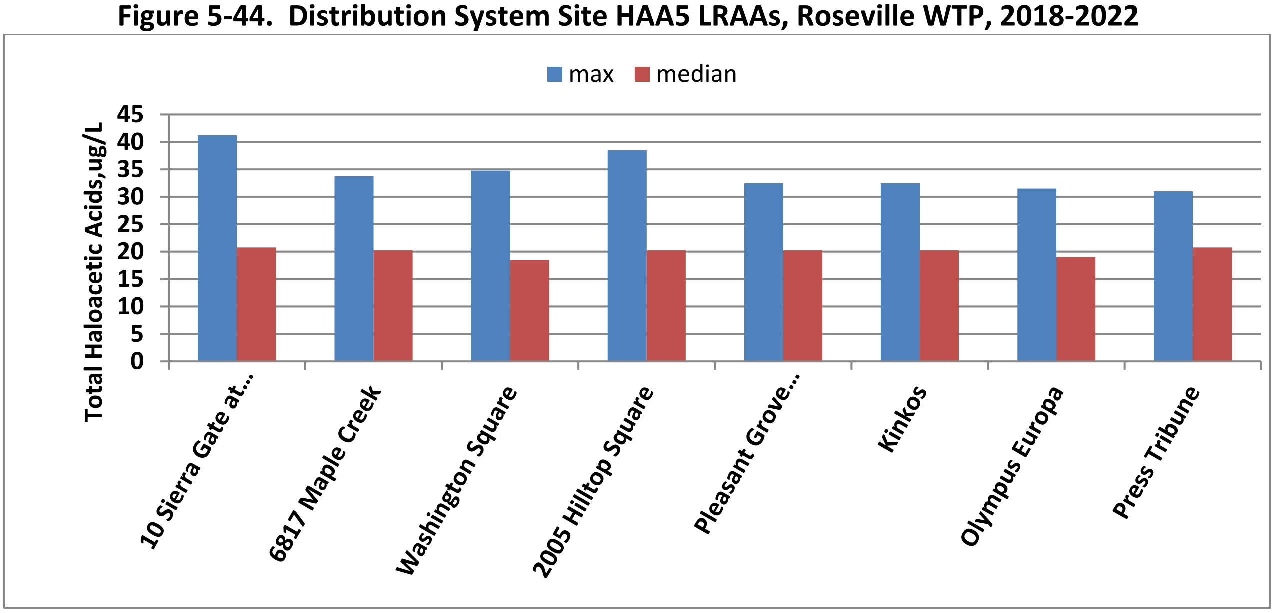
During the study period, the individual HAA5 distribution system samples ranged from non-detect to 65 µg/L. **Figure 5-43** shows the quarterly average of all distribution system sites for HAA5 analysis. Quarterly average values range from 11 to 56 µg/L. The highest quarter was 1st quarter 2022, likely as a result of the persistence of the fall 2021 and winter 2022 significant source water quality upset that occurred in Folsom Lake.

Figure 5-43. Distribution System HAA5 Quarterly Average of All Sites, Roseville WTP, 2018-2022



The HAA5 LRAA for each distribution system site was calculated. **Figure 5-44** presents the HAA5 LRAA maximum and median values. The LRAAs ranged from 13 to 41 µg/L, and the Sierra Gate site had the highest LRAA All LRAA values are all well below the current MCL of 60 µg/L.

Figure 5-44. Distribution System Site HAA5 LRAAs, Roseville WTP, 2018-2022



Volatile and Synthetic Organic Compounds

There were no detectable levels of VOCs or SOCs in the raw water for the Roseville WTP during the study period.

Other Detectable Title 22 Constituents

There were no other detectable Title 22 constituents of interest.

UCMR 4

Biweekly monitoring for anatoxin-a, cylindrospermopsin, and total microcystin was conducted from March to June 2019 at the entry point to the distribution system. All sample results were non-detect.

The other 17 required constituents were also monitored quarterly at the entry point to the distribution system in March, June, September, and December of 2019. All sample results were non-detect, except for manganese which ranged from non-detect to 4.1 µg/L.

Three brominated haloacetic acid groups (HAA5, HAA9 and HAA6Br) were monitored at eight sites in the distribution system in January, April, July and December of 2019. Out of all the sites, and over the four quarters, the average difference between HAA9 and HAA5 was 0.6 µg/L and the maximum difference was 2.0 µg/L, indicating minimal presence of brominated HAAs.

***Giardia/*Virus*/Cryptosporidium* Reduction Requirements**

Based on the total coliform and protozoa data evaluated in **Section 3**, 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium* continue to be appropriate reduction requirements for Roseville WTP.

The Roseville 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 and the IESWTR.

The City of Roseville conducted the LT2ESWTR second round compliance monitoring by collecting monthly samples for *Cryptosporidium* and *Giardia* from June 2015 to May 2017. There was one detection of *Cryptosporidium* and one detection of *Giardia*. The maximum running annual average was 0.0077 oocyst/L for *Cryptosporidium*, classifying the source as Bin 1.

Regulatory Compliance Evaluation

The City of Roseville has been monitoring the raw and treated water for the Roseville WTP for all required Title 22 compliance constituents. **Table 5-12** lists the key existing drinking water regulations and a compliance evaluation for these standards at the Roseville WTP. The Roseville WTP is currently in compliance with existing regulations.

Table 5-12
Regulatory Compliance Evaluation
City of Roseville – Roseville WTP

	Targeted Compounds	Key Issues and Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	Monitored as required. No MCLs exceeded in the raw water.
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.
IESWTR and Filter Backwash Rule	Microbial and Turbidity	All new turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBP Rule	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in raw and treated water. Therefore, enhanced coagulation not required.
LT2ESWTR	Microbial	Classified as Bin 1 based on second round of monitoring.
Stage 2 D/DBP Rule	Disinfectants and Disinfection By-Products	Current TTHM/HAA5 LRAAs for Stage 2 data are well below the MCLs (< 80/60 µg/L, respectively). No OELs triggered.

GOLDEN STATE WATER COMPANY (GSWC)

GSWC operates two independent water treatment plants, Coloma and Pyrites water treatment plants, which treat American River water. They are both located on the same property and supplied with the same water, but they have independent water treatment processes.

Coloma Water Treatment Plant

System Description

The raw water for the Coloma WTP is diverted off the Folsom South Canal, approximately one to two miles downstream of the Nimbus Dam. The Coloma WTP is classified by DDW as an alternative treatment technology water treatment plant, due to the limited size of the sedimentation basins. The plant design flow is 15.7 mgd (including Pyrites), with average flows of 8.9 mgd in the summer and offline in the winter. Once the water is diverted from the Folsom South Canal, it is treated with potassium permanganate to help prevent algal growth along the pipeline to the water treatment plant and for taste and odor problems.

There are two parallel flocculation and sedimentation basins. Basin 1 is the original facility. Polymers are added to the water and are mixed with a static mixer. There is a flocculation/sedimentation basin that has a vertical paddle flocculator with a rectangular sedimentation basin. Basin 2 includes hydraulic mixing, two stage flocculation with vertical paddles, and a rectangular sedimentation basin.

Cationic polymer is added as a filter aid upstream of the filters. The clarified water passes through ten dual media pressure filters. The filter loading rate ranges from two to three gpm/sf.

The filters are backwashed based on either turbidity or headloss. The plant has filter-to-waste capability after backwash. Backwash water and filter-to-waste water is sent to an upflow clarifier, where the effluent is sent to the headworks upstream of chemical feed. The filtered water is disinfected with chlorine and passes through three clearwells to meet CT requirements.

Highlight of Changes Since 2018 Update

A new intake rake was installed in 2022 to help clear trash and algae growth from the intake screen. This has decreased overall maintenance frequency, as well as less frequent backflushing.

Significant Potential Contaminating Activities

The Coloma WTP diversion is located at Lake Natoma, just upstream of Nimbus Dam. Recreational use is heavy in the upper watershed, Folsom Lake, and Lake Natoma. The potential for forest fires, as well as timber harvesting activities, could increase the impact of erosion potential from the upper watershed into Folsom Lake. Also of interest are urban runoff and local drainage, potential discharges from the Aerojet facility, bird waste management at Lake Natoma, potential spills associated with wastewater treatment and collection facilities, roads, railroads, and petroleum pipelines, and the evolving impacts of climate change.

Of special interest is the potential impact that Folsom Lake operations may have on the source water quality, especially with the planned reoperation of Folsom Dam by Reclamation.

Treated 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.

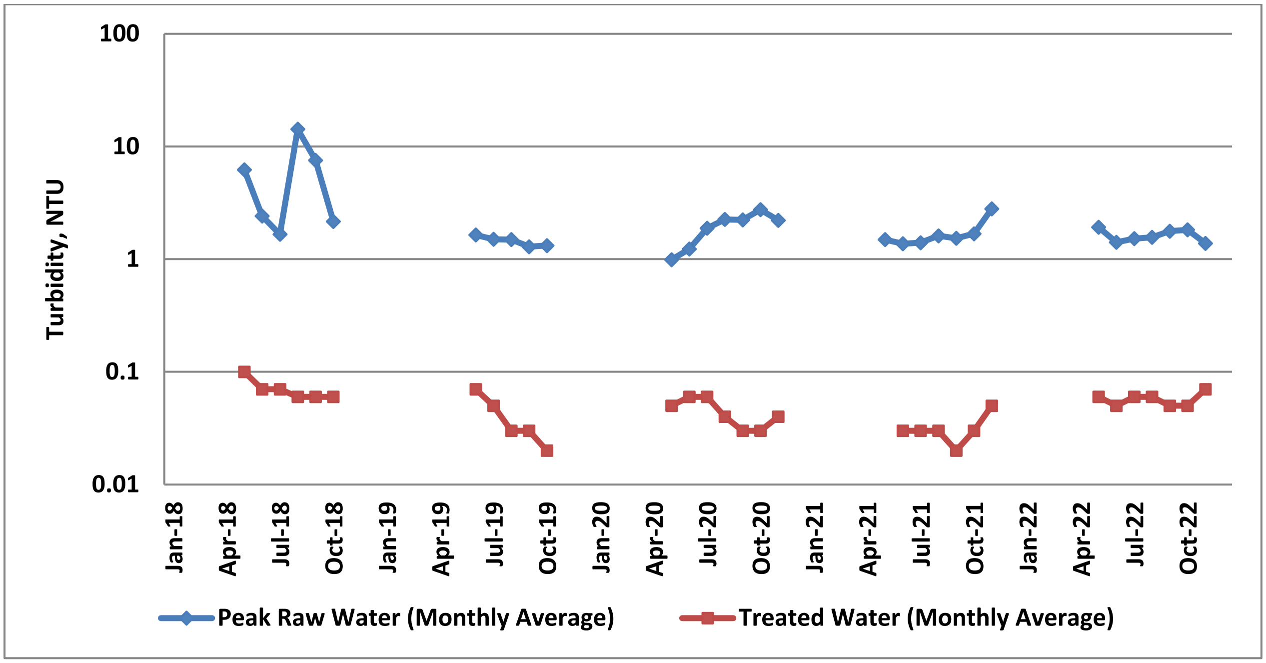
<u>Turbidity</u>

The average of peak daily raw water turbidity at Coloma WTP for the period of study was 2.4 NTU, and on average the treatment process decreased this to 0.05 NTU, which equates to an average solids removal of 97.9 percent. **Figure 5-45** shows a time series plot of raw and treated turbidities. It should be noted that the raw water turbidities plotted are a monthly average of peak daily grab samples. The treated water turbidities are a monthly average of a daily average, based on all 4-hr samples in a 24 hour period. Coloma WTP meets all current treated water turbidity standards.

<u>Microbiological Constituent Review</u>

The Cordova system had 2.0 percent total coliform positive samples in 2021. This is not in violation of the Total Coliform Rule and its revisions since it is less than five percent positive, repeat samples were all negative, and there were no detections of fecal coliform.

Figure 5-45. Coloma WTP – Raw and Treated Water Turbidities, 2018 – 2022



<u>Disinfection By-Products and Precursors</u>

DBP Precursors

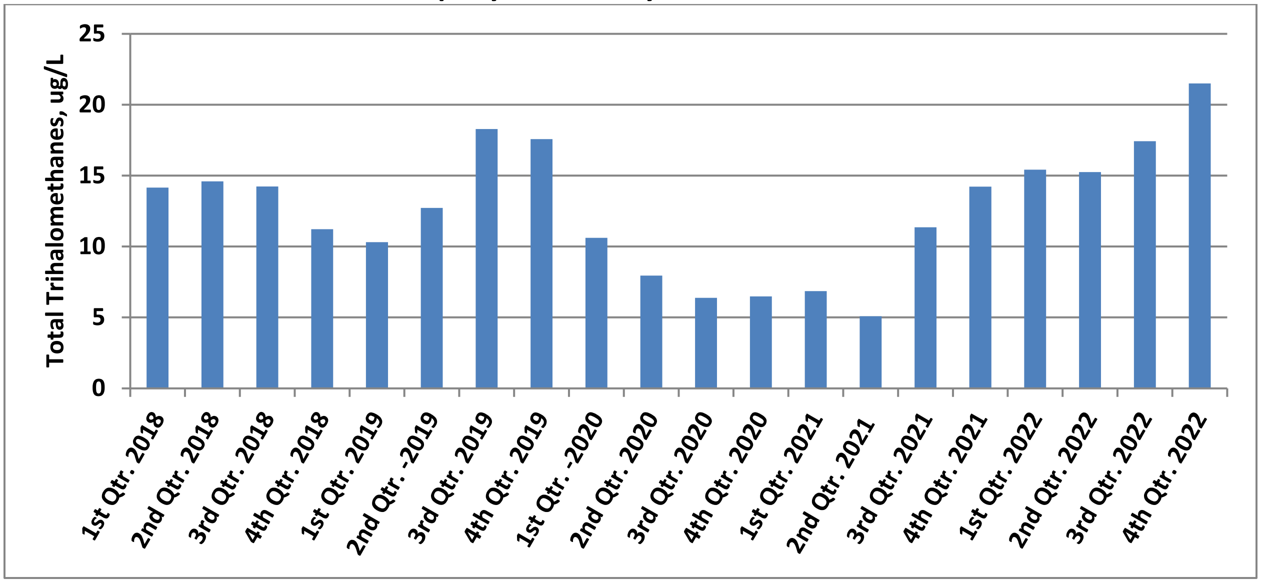
GSWC monitors alkalinity and TOC levels in its raw water and TOC levels in its treated water on a monthly or quarterly basis. As the Coloma WTP is an alternative technology plant, it is not required to achieve any TOC removal. Based on 31 raw water and 25 treated water samples, the average raw and treated water TOC levels at Coloma WTP were 1.7 mg/L and 1.04 mg/L, respectively, equating to 39.4 percent average removal.

Eighty-one percent of the time, TOC levels in the raw water were below 2.0 mg/L; the highest recorded level was 2.4 mg/L in November 2021. This occurred during a period of intense storm activity, which also coincided with extremely low storage in Folsom Lake and a fall lake turnover event, likely contributing to significant impacts to source water quality.

Stage 2 DBP Compliance

GSWC converted to four Stage 2 D/DBP monitoring sites in October 2013. During the study period, the individual TTHM distribution system samples ranged from 0.5 to 50 µg/L. **Figure 5-46** shows the quarterly average of all distribution system sites for TTHM analysis. Quarterly average values range from 5 to 22 µg/L.

Figure 5-46. Distribution System TTHM Quarterly Average of All Sites, Golden State Water Company Cordova System, 2018-2022

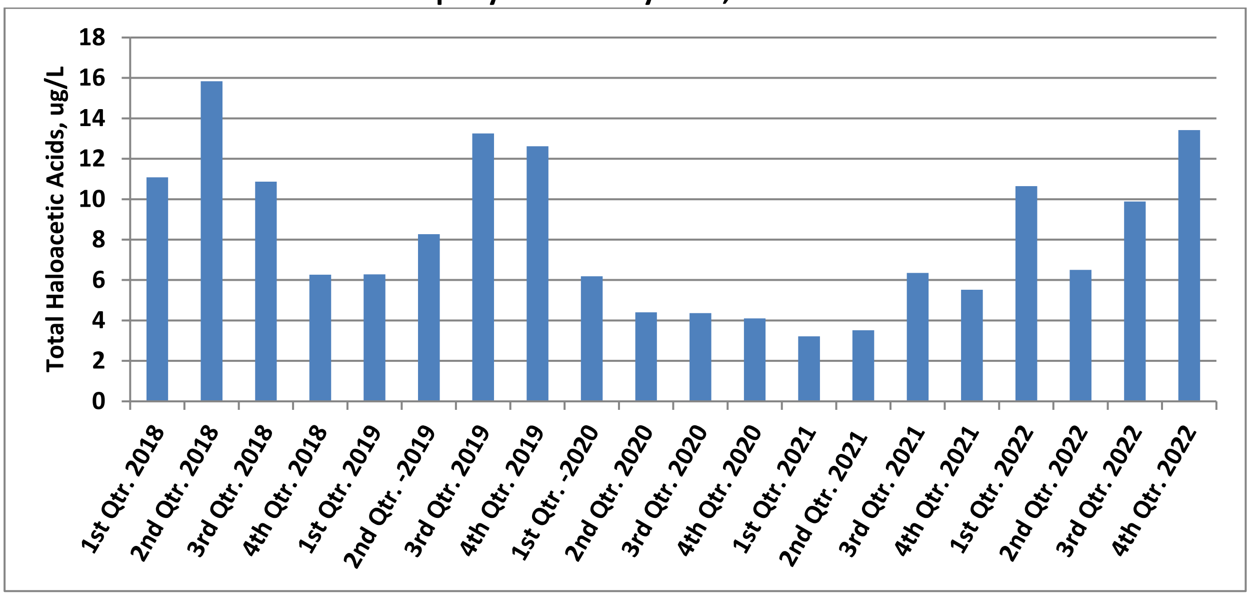


The TTHM LRAA for each distribution system site was calculated. **Figure 5-47** presents the TTHM LRAA maximum and median values. The LRAAs ranged from 1 to 41 µg/L, and the Gold Pointe site had the highest LRAAs. These values are all well below the current MCL of 80 µg/L.

Figure 5-47. Distribution System Site TTHM LRAAs, Golden State Water Company Cordova System, 2018-2022

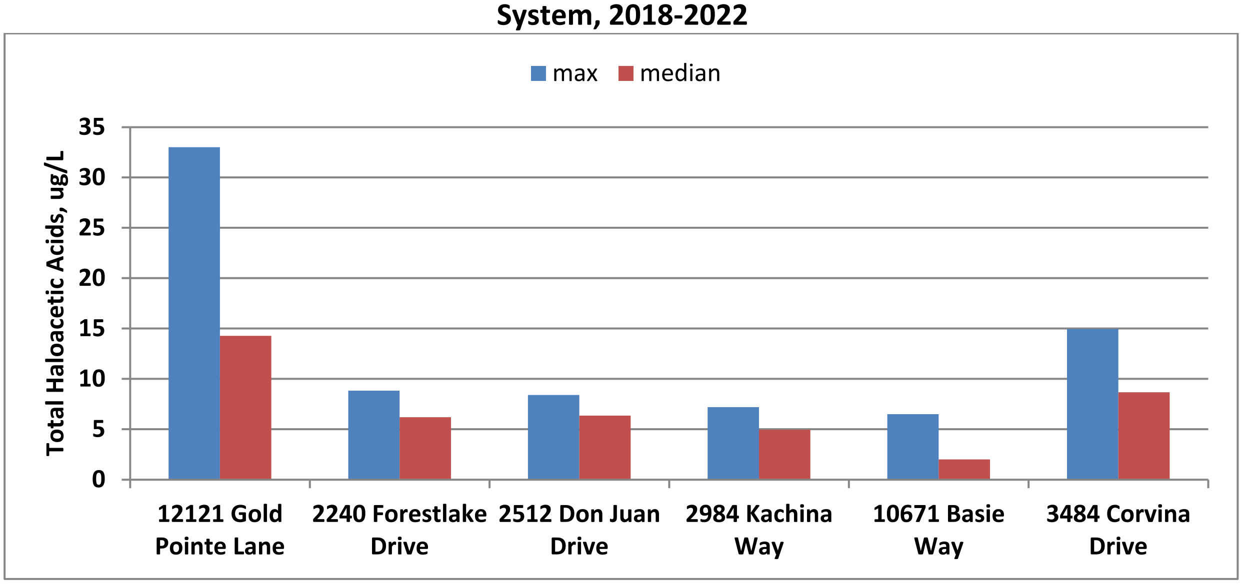
During the study period, the individual HAA5 distribution system samples ranged from 2 to 59 µg/L. **Figure 5-48** shows the quarterly average of all distribution system sites for HAA5 analysis. Quarterly average values ranged from 3 to 16 µg/L.

Figure 5-48. Distribution System HAA5 Quarterly Average of All Sites, Golden State Water Company Cordova System, 2018-2022



The HAA5 LRAA for each distribution system site was calculated. **Figure 5-49** presents the HAA5 LRAA maximum and median values. The LRAAs ranged from 2 to 33 µg/L. As shown in **Figure 5-49,** the Gold Pointe site had the highest HAA LRAA. All LRAA values are all well below the current MCL of 60 µg/L.

Figure 5-49. Distribution System Site HAA5 LRAAs, Golden State Water Company Cordova System, 2018-2022



Volatile and Synthetic Organic Compounds

There were no detectable levels of VOCs or SOCs in the raw water for the Coloma WTP attributable to the American River water supply during the study period.

Other Detectable Title 22 Constituents

The 2018 CCR noted one site in the distribution system exceeded the Action Level of 15 µg/L for lead. However, the 90th percentile for all samples was non-detect.

UCMR 4

Biweekly monitoring for anatoxin-a, cylindrospermopsin, and total microcystin was conducted from June to September 2018 at the entry point to the distribution system. All sample results were non-detect.

The other 17 required constituents were also monitored quarterly at the entry point to the distribution system in August 2018, November 2018 and May 2019. All sample results were non-detect, except for manganese which ranged from 1.4 to 6.5 µg/L.

Three brominated haloacetic acid groups (HAA5, HAA9 and HAA6Br) were monitored at four sites in the distribution system in August 2018, November 2018, March 2019, and May 2019. Out of all the sites, and over the four quarters, the average difference between HAA9 and HAA5 was 0.7 µg/L and the maximum difference was 2.0 µg/L, indicating minimal presence of brominated HAAs.

Giardia/Virus/Cryptosporidium Reduction Requirements

As discussed in **Section 3**, the DDW water supply permit for GSWC requires an additional log reduction for *Giardia* and viruses if either the monthly median for *E. coli* is greater than 200 MPN/100mL or the monthly median for total coliform is greater than 1,000 MPN/100mL. Monthly medians for both total coliform and *E. coli* were evaluated.

Although *E. coli* and protozoa data evaluated in **Section 3** support 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium*, 32 out of the 34 monthly medians for total coliform were above 1,000 MPN/100mL, which requires the plant to operate at 4/5-log reduction for *Giardia*/virus. GSWC elects to operate at 4/5-log reduction for *Giardia*/virus year-round.

The Coloma WTP is classified as an alternative technology plant, and currently receives reduction credit for 2.0-log *Giardia,* 1.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with chlorine provides the remaining reduction credit required for 4/5-log reduction for *Giardia*/virus which is 2.0-log credit for *Giardia* and 4.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR and the IESWTR.

GSWC conducted the LT2ESWTR second round compliance monitoring from October 2016 to September 2018 for Coloma/Pyrites WTPs. LT2ESWTR samples were only required to be collected when the plant was in operation. For the 12 monthly samples collected, there were no detections of *Cryptosporidium* and *Giardia*, classifying the source as Bin 1.

Regulatory Compliance Evaluation

GSWC has been monitoring the raw and treated water for the Coloma WTP for all required Title 22 compliance constituents. **Table 5-13** lists the key existing drinking water regulations and a compliance evaluation for these standards at the Coloma WTP. The Coloma WTP is currently in compliance with existing regulations.

Table 5-13
Regulatory Compliance Evaluation
Golden State Water Company – Coloma WTP

	Targeted Compounds	Key Issues and Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	Monitored as required. No MCLs exceeded in the raw water.
SWTR	Microbial and Turbidity	Based on *E. coli* data, 3/4—log reduction requirement for *Giardia*/viruses is supported. Based on total coliform data, 4/5-log reduction for *Giardia*/viruses is warranted nearly half of the study period. All operations, monitoring and reporting requirements are met, and all treated water turbidity standards are met.
IESWTR and Filter Backwash Rule	Microbial and Turbidity	All new turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBP Rule	Disinfectants and Disinfection By-Products	Not required to achieve TOC removal as a direct filtration plant.
LT2ESWTR	Microbial	Classified as Bin 1 based on second round monitoring.
Stage 2 D/DBP Rule	Disinfectants and Disinfection By-Products	Current TTHM/HAA5 LRAAs for Stage 2 data are well below the MCLs (< 80/60 µg/L, respectively). No OELs triggered.

Pyrites Water Treatment Plant

System Description

The raw water for the Pyrites WTP is the same intake as for the Coloma WTP. The Pyrites WTP is an alternative treatment technology water treatment plant, consisting of two US Filter Actifloc® package plants operating in parallel. Each package plant employs a four stage microsand ballasted clarification pretreatment process followed by rapid sand gravity filtration. The plant design flow is 3,500 gpm, with average flows ranging from 1,750 to 3,500 gpm.

Once the water is diverted from the Folsom South Canal, it is treated with potassium permanganate to help prevent algal growth along the pipeline to the water treatment plant and for taste and odor problems.

The Actifloc® system uses a four stage microsand ballasted clarification pretreatment process followed by rapid sand gravity filtration. During stage 1, raw water with cationic polymer as the primary coagulant is slowly mixed to destabilize suspended solids and colloidal matter. Stage 2 is the injection tank, where a polymer and microsand are added and slowly mixed to initiate floc formation. Stage 3 is the maturation tank where gentle mixing allows bridging between the microsand and destabilized suspended solids. During stage 4, the ballasted floc enters the settling tank where the floc settles and the clarified water flows upward through tube settlers.

The clarified water then flows to a tri-media rapid sand pressure filter. The maximum filtration rate is 5 gpm/sf. The filter is backwashed based on either turbidity (greater than 0.20 NTU), headloss (greater than 7 feet), or time (48 hours). The plant has filter-to-waste capability after backwash. Backwash water and filter-to-waste water is sent to an upflow clarifier, where the effluent is sent to the headworks upstream of chemical feed. The filtered water is disinfected with chlorine and passes through three clearwells to meet CT requirements.

Highlight of Changes Since 2018 Update

There have been no major changes to the plant over the study period.

Significant Potential Contaminating Activities

Please see discussion for Coloma WTP above.

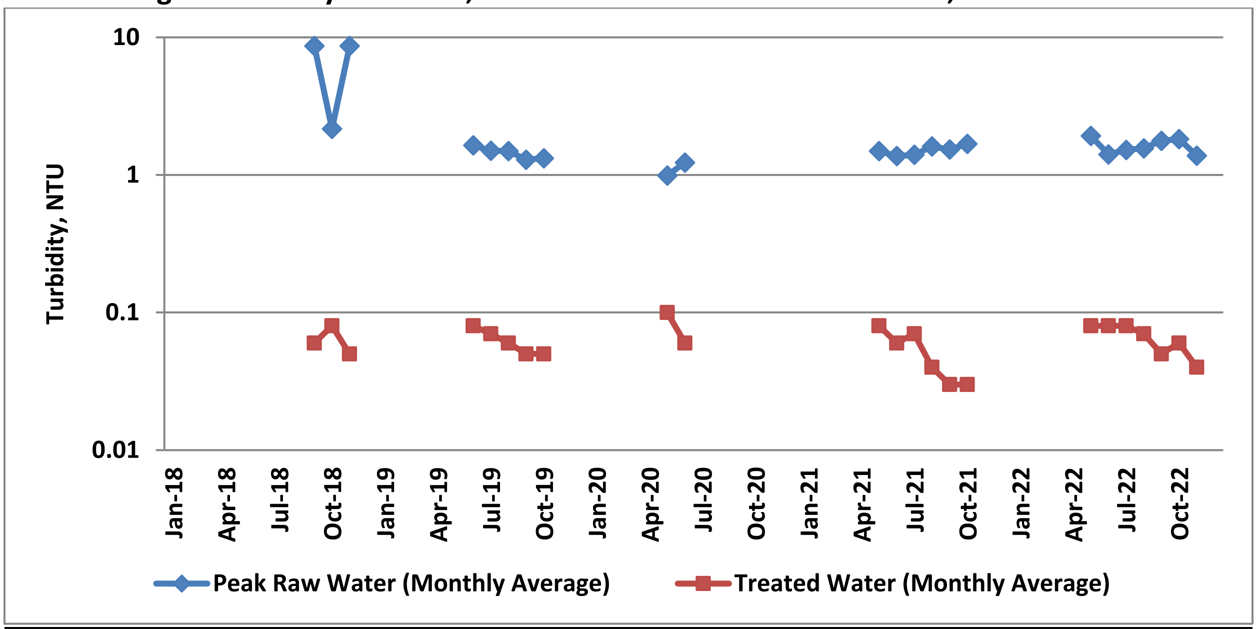
Treated Water Quality Summary

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 of peak daily raw water turbidity at Pyrites WTP for the period of study was 2.1 NTU, and on average the treatment process decreased this to 0.06 NTU, which equates to an average solids removal of 97.9 percent. **Figure 5-50** shows a time series plot of raw and treated turbidities. It should be noted that the raw water turbidities plotted are a monthly average of peak daily grab samples. The treated water turbidities are a monthly average of a daily average, based on all 4-hr samples in a 24 hour period. Pyrites WTP meets all current treated water turbidity standards.

Figure 5-50. Pyrites WTP, Raw and Treated Water Turbidities, 2018 – 2022



Microbiological Constituent Review

Please see discussion for Coloma WTP above.

Disinfection By-Products and Precursors

DBP Precursors

GSWC monitors for alkalinity and TOC levels in its raw water and TOC levels in its treated water. As Pyrites WTP is a direct filtration plant, it is not required to achieve any TOC removal. Based on thirty-one raw water and twenty-one treated water samples, the average raw and treated water TOC levels at Coloma WTP were 1.7 mg/L and 1.1 mg/L, respectively, equating to 36.9 percent average removal. The raw water sampling point is the same for both Coloma and Pyrites WTPs. As discussed for the Coloma WTP, TOC levels in the raw water are below 2.0 mg/L 81 percent of the time.

Stage 2 DBP Compliance

Please see TTHM and HAA5 discussion for Coloma WTP above.

Volatile and Synthetic Organic Compounds

Please see discussion for Coloma WTP above.

Other Detectable Title 22 Constituents

Please see discussion for Coloma WTP above.

Giardia/Virus/Cryptosporidium Reduction Requirements

As discussed in **Section 3**, the DDW water supply permit for GSWC requires an additional log reduction for *Giardia* and viruses if either the monthly median for *E. coli* is greater than 200 MPN/100mL or the monthly median for total coliform is greater than 1,000 MPN/100mL. Monthly medians for both total coliform and *E. coli* were evaluated.

Although *E. coli* and protozoa data evaluated in **Section 3** support 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium*, 32 out of the 34 monthly medians for total coliform were above 1,000 MPN/100mL, which requires the plant to operate at 4/5-log reduction for *Giardia*/virus. GSWC elects to operate at 4/5-log reduction for *Giardia*/virus year-round.

The Pyrites WTP is classified as an alternative treatment technology, and currently receives reduction credit for 2.0-log *Giardia,* 1.0-log viruses, and 2-log *Cryptosporidium* for physical removal. Disinfection with chlorine provides the remaining reduction credit required for 4/5-log reduction for *Giardia*/virus which is 2.0-log credit for *Giardia* and 4.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR and the IESWTR.

Please see LT2ESWTR discussion for Coloma WTP above.

Regulatory Compliance Evaluation

GSWC has been monitoring the raw and treated water for the Pyrites WTP for all required Title 22 compliance constituents. **Table 5-14** lists the key existing drinking water regulations and a compliance evaluation for these standards at the Pyrites WTP. The Pyrites WTP is currently in compliance with existing regulations.

Table 5-14
Regulatory Compliance Evaluation
Golden State Water Company – Pyrites WTP

	Targeted Compounds	Key Issues and Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	Monitored as required. No MCLs exceeded in the raw water.
SWTR	Microbial and Turbidity	Based on *E. coli* data, 3/4—log reduction requirement for *Giardia*/viruses is supported. Based on total coliform data, 4/5-log reduction for *Giardia*/viruses is warranted nearly half of the study period. All operations, monitoring and reporting requirements are met, and all treated water turbidity standards are met.
IESWTR and Filter Backwash Rule	Microbial and Turbidity	All new turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBP Rule	Disinfectants and Disinfection By-Products	Not required to achieve TOC removal as a direct filtration plant.
LT2ESWTR	Microbial	Classified as Bin 1 based on second round monitoring.
Stage 2 D/DBP Rule	Disinfectants and Disinfection By-Products	Current TTHM/HAA5 LRAAs for Stage 2 data are well below the MCLs (< 80/60 µg/L, respectively). No OELs triggered.

CARMICHAEL WATER DISTRICT (CWD)

System Description

Bajamont Water Treatment Plant

The Bajamont WTP diverts water from the Lower American River near River Mile 17.5 through three Ranney Collectors. The Bajamont WTP is composed of microfiltration membrane units with a design capacity of 22 mgd, with average winter flows of 8.4 mgd and average summer flows of 11.0 mgd.

The membrane units are backwashed regularly based on time or pressure gradient. The backwash water is filtered prior to recycling to the headworks. After filtration, the water is chlorinated with sodium hypochlorite and the pH is adjusted with caustic prior to distribution. CWD has 6 mg of covered storage.

Highlight of Changes Since 2018 Update

There have been no major changes to the plant over the study period.

Significant Potential Contaminating Activities

The Bajamont WTP diversion is located near Rossmoor Bar on the Lower American River. Recreational use is heavy in the upper watershed, at Lake Natoma, and along the Lower American River. The potential for forest fires, as well as timber harvesting activities, could increase the impact of erosion potential from the upper watershed into Folsom Lake. Also of interest are urban runoff and local drainage, industrial discharges from the Aerojet facility, potential spills associated with wastewater treatment and collection facilities, roads, railroads, and petroleum pipelines, and the evolving impacts from climate change.

Of special interest is the potential impact that Folsom Lake operations may have on the source water quality, especially with the planned reoperation of Folsom Dam by Reclamation.

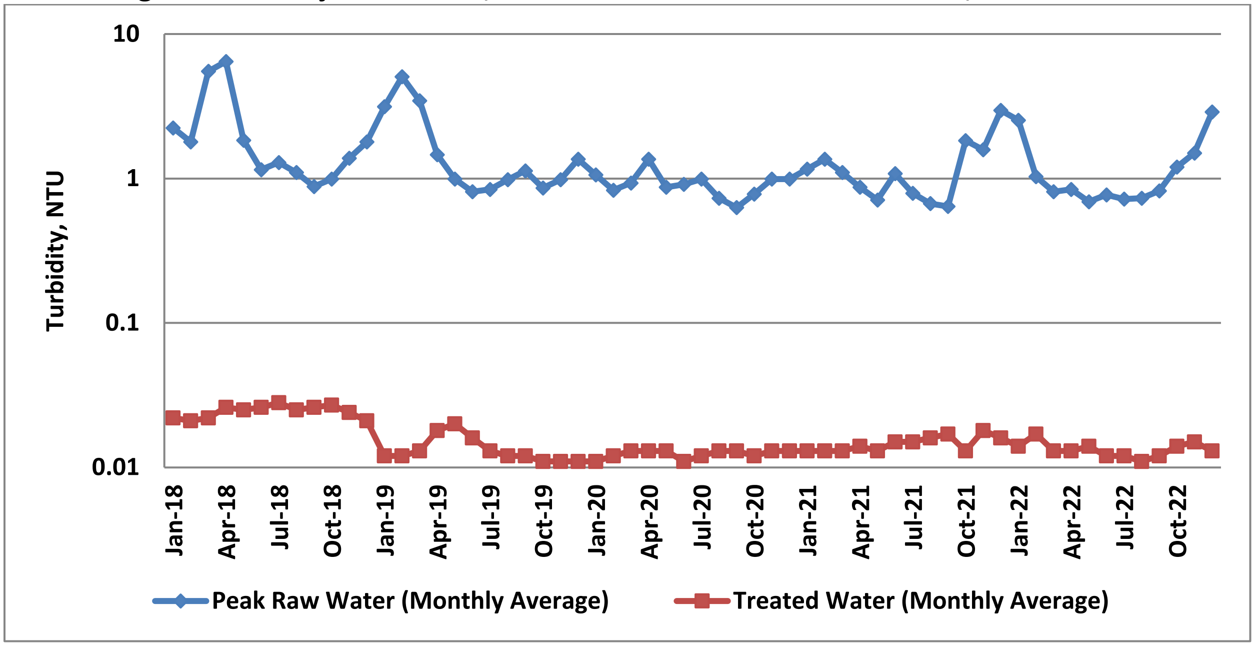
Treated Water Quality Summary

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 of peak daily raw water turbidity at Bajamont WTP for the period of study was 1.5 NTU, and on average the treatment process decreased this to 0.02 NTU, which equates to an average solids removal of 98.9 percent. **Figure 5-51** shows a time series plot of raw and treated turbidities. It should be noted that the raw water turbidities plotted are a monthly average of peak daily grab samples. The treated water turbidities are a monthly average of a daily average, based on all 4-hr samples in a 24 hour period. Bajamont WTP meets all current treated water turbidity standards.

Figure 5-51. Bajamont WTP, Raw and Treated Water Turbidities, 2018 – 2022



Microbiological Constituent Review

There were no positive total coliform samples in the distribution system during the period of study.

Disinfection By-Products and Precursors

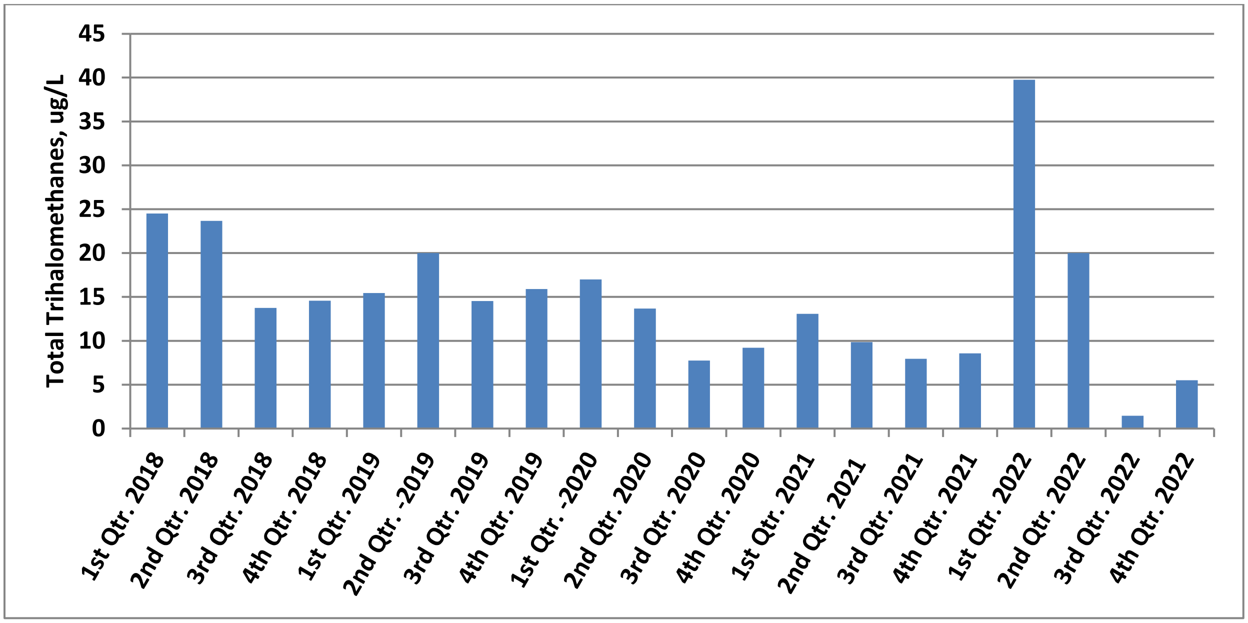
<u>DBP Precursors</u>

As the Bajamont WTP employs microfiltration, it is not required to achieve any TOC removal or monitor for TOC.

<u>Stage 2 DBP Compliance</u>

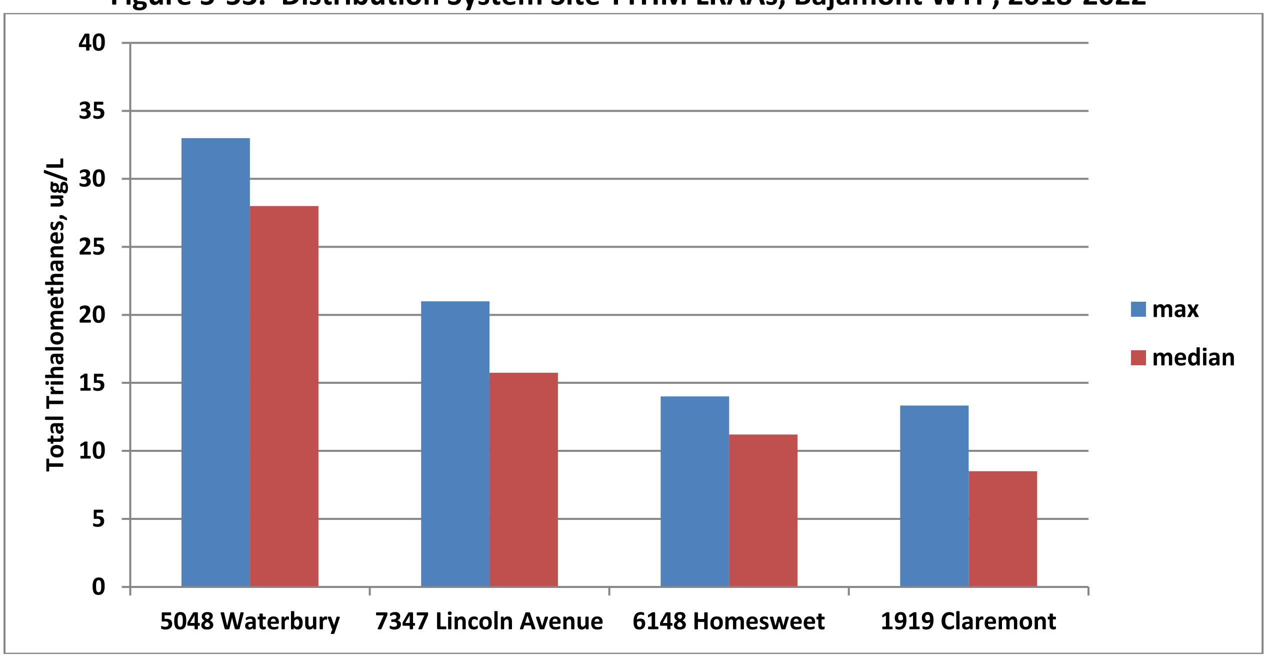
CWD converted to the Stage 2 D/DBP monitoring sites in January 2013. During the study period, the individual TTHM distribution system samples ranged from non-detect to 67 µg/L. **Figure 5-52** shows the quarterly average of all distribution system sites for TTHM analysis. Quarterly average values range from 1.5 to 39.8 µg/L. The highest quarter was 1st quarter 2022, which could be a consequence of the persistence of the fall 2021 and winter 2022 significant source water quality upset that occurred in Folsom Lake.

Figure 5-52. Distribution System TTHM Quarterly Average of All Sites, Bajamont WTP, 2018-2022



The TTHM LRAA for each distribution system site was calculated. **Figure 5-53** presents the TTHM LRAA maximum and median values. The LRAAs ranged from 5.5 to 33 µg/L, and the Waterbury site had the highest LRAA. These values are all well below the current MCL of 80 µg/L.

Figure 5-53. Distribution System Site TTHM LRAAs, Bajamont WTP, 2018-2022



During the study period, the individual HAA5 distribution system samples ranged from non-detect to 24 µg/L. **Figure 5-54** shows the quarterly average of all distribution system sites for

HAA5 analysis. Quarterly average values range from non-detect to 20.5 µg/L. Similar to TTHMs, the highest quarter was 1st quarter 2022 and could be caused by the persistence of the fall 2021 and winter 2022 significant source water quality upset that occurred in Folsom Lake.

The HAA5 LRAA for each distribution system site was calculated. **Figure 5-55** presents the HAA5 LRAA maximum and median values. The LRAAs ranged from 2.6 to 16 µg/L. As shown in **Figure 5-55,** the Waterbury site had the highest HAA5 LRAA. All LRAA values are all well below the current MCL of 60 µg/L.

Figure 5-54. Distribution System HAA5 Quarterly Average of All Sites, Bajamont WTP, 2018-2022

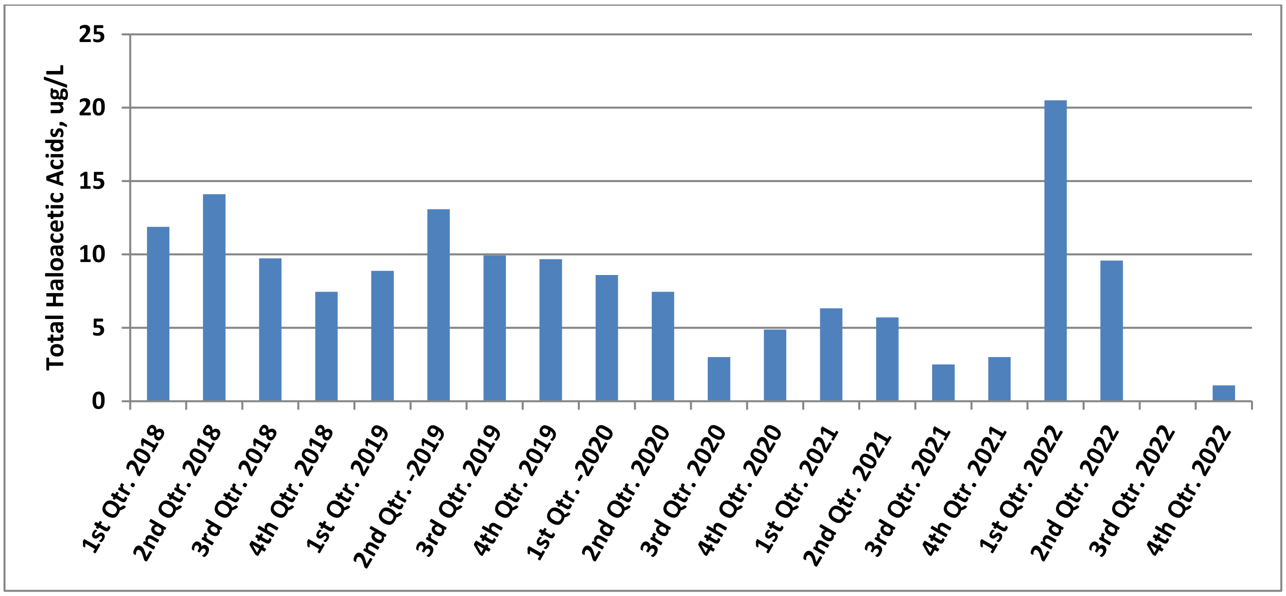
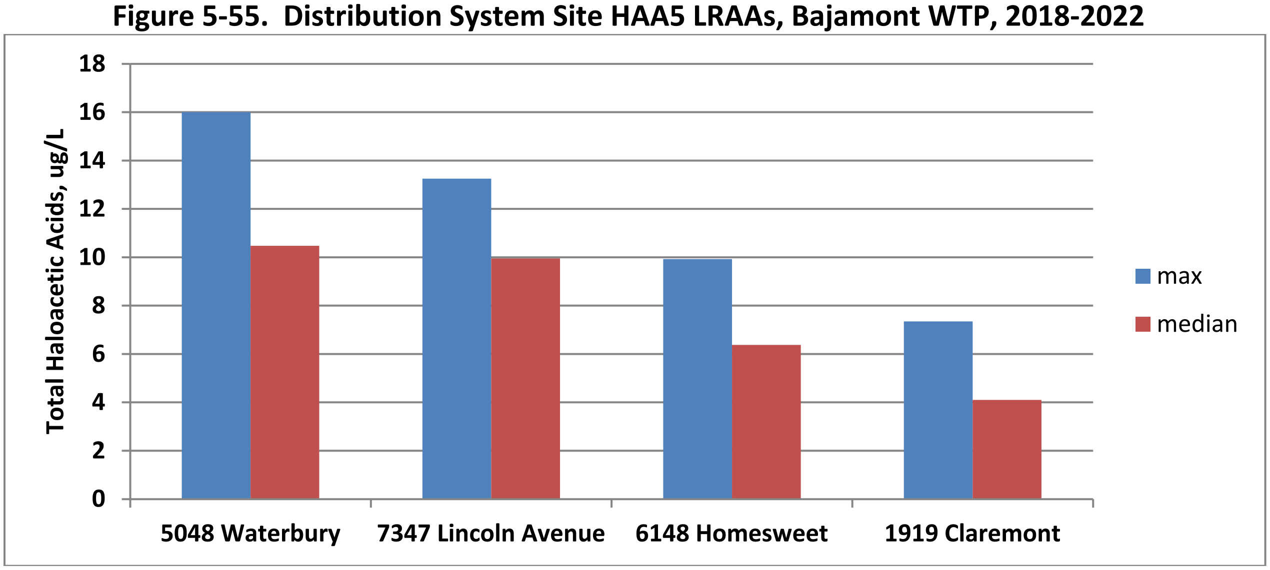


Figure 5-55. Distribution System Site HAA5 LRAAs, Bajamont WTP, 2018-2022



Volatile and Synthetic Organic Compounds

There were no detectable levels of VOCs or SOCs in the raw or treated water for Bajamont WTP during the study period.

Other Detectable Title 22 Constituents

The 2020 CCR noted one site in the distribution system exceeded the Action Level of 15 µg/L for lead. However, the 90th percentile for all samples was non-detect.

UCMR 4

Biweekly monitoring for anatoxin-a, cylindrospermopsin, and total microcystin was conducted from July to October 2018 at the entry point to the distribution system. All sample results were non-detect.

The other 17 required constituents were also monitored quarterly at the entry point to the distribution system in February 2020, May 2020, August 2020 and November 2020. All sample results were non-detect.

Three brominated haloacetic acid groups (HAA5, HAA9 and HAA6Br) were monitored at four sites in the distribution system in February 2020, May 2020, August 2020 and November 2020. Out of all the sites, and over the four quarters, the average difference between HAA9 and HAA5 was 0.82 µg/L and the maximum difference was 2.3 µg/L, indicating minimal presence of brominated HAAs.

Giardia/**Virus/*****Cryptosporidium* Reduction Requirements**

Based on the *E. coli* data evaluated in **Section 3**, 3/4-log reduction of *Giardia*/virus continue to be appropriate reduction requirements for the Bajamont WTP. Based on protozoa data evaluated in **Section 3**, 3-log reduction of *Cryptosporidium* is required at the Bajamont WTP.

The Bajamont WTP is classified as an alternative treatment technology, and currently receives reduction credit for 4-log *Giardia,* 0-log viruses, and 4-log *Cryptosporidium* for physical removal. Disinfection with sodium hypochlorite provides 4.0-log credit for viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR and the IESWTR.

CWD conducted the LT2ESWTR second round compliance monitoring by collecting monthly samples for *Cryptosporidium* and *Giardia* from October 2016 to September 2018. There were seven detections of *Cryptosporidium,* with a maximum running annual average of 0.075 oocysts/L. It was determined that the source be classified as Bin 2. As the membranes operating at the Bajamont WTP receive reduction credit for 4-log *Cryptosporidium,* no additional action is needed.

Regulatory Compliance Evaluation

CWD has been monitoring the raw and treated water for the Bajamont WTP for all required Title 22 compliance constituents. **Table 5-15** lists the key existing drinking water regulations and a compliance evaluation for these standards at the Bajamont WTP. The Bajamont WTP is currently in compliance with existing regulations.

Table 5-15
Regulatory Compliance Evaluation
Carmichael Water District – Bajamont WTP

	Targeted Compounds	Key Issues and Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	Monitored as required. No MCLs exceeded in the raw or treated water.
SWTR	Microbial and Turbidity	Coliform 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.
IESWTR and Filter Backwash Rule	Microbial and Turbidity	All new turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBP Rule	Disinfectants and Disinfection By-Products	Not required to achieve TOC removal as alternative technology.
LT2ESWTR	Microbial	Classified as Bin 2 based on second round monitoring.
Stage 2 D/DBP Rule	Disinfectants and Disinfection By-Products	Current TTHM/HAA5 LRAAs for Stage 2 data are below the Stage 2 D/DBP Rule MCLs (<80/60 µg/L, respectively). No OELs triggered.

CITY OF SACRAMENTO

System Description

E.A. Fairbairn Water Treatment Plant (Fairbairn WTP)

The raw water intake location for the Fairbairn WTP is located on the Lower American River near Howe Avenue. Fairbairn WTP is a conventional water treatment plant, and the current plant capacity is 80 mgd with a permitted capacity of 160 mgd, with average winter flows of 44 mgd and average summer flows of 66 mgd.

The influent water is pre-chlorinated, alum is used as the primary coagulant, and sodium hydroxide is used for pH adjustment when necessary. Chemicals are mixed by pumped injection. The original plant was expanded in 2005, which increased the plant permitted capacity from 80 mgd to 160 mgd. The original plant has two 3-stage flocculation basins with horizontal mechanical flocculators. Floc aid polymer is normally added during flocculation. There are two sedimentation basins with a surface loading rate of 0.99 gpm/sf. After settling, a polymer can then be added as a filter aid. The clarified water then passes through eight tri-media gravity filters. The filtration rate is 5.7 gpm/sf at 100 mgd with seven filters in operation.

The plant expansion essentially duplicated the existing plant, except there are two 4-stage flocculation basins, two sedimentation basins with a surface loading rate of 0.97 gpm/sf, and eight dual-media gravity filters, operated at a filtration rate of 5.1 gpm/sf at 100 mgd with seven filters in operation.

The filters are backwashed based on time, headloss, or turbidity. The plant has filter-to-waste capability after backwash. Filter backwash water and filter-to-waste water are sent to filter waste washwater basins for sedimentation and equalization. Clarified filter waste washwater is automatically returned prior to the flash mixer, upstream of chemical feed, based on level at a flow rate not to exceed 10 percent of the Fairbairn WTP raw water flow.

The filtered water is then disinfected with chlorine, hydrofluosilicic acid is added for fluoridation, and calcium oxide is added for pH adjustment. The City of Sacramento has 45 mg of covered storage.

Highlight of Changes Since 2018 Update

There have been no major changes to the plant over the study period. However, the City of Sacramento is planning future projects involving ozone, conversion from chlorine gas to liquid sodium hypochlorite, and conversion from slaked lime to lime slurry.

Significant Potential Contaminating Activities

The Fairbairn WTP diversion is located near Howe Avenue on the Lower American River. Recreational use is heavy in the upper watershed, at Lake Natoma, and along the Lower American River, which increases the potential risk of contaminants from body contact recreation and other recreational activities. The potential for forest fires, as well as timber harvesting activities in the upper watershed, could increase the impact of erosion potential on water quality in Folsom Lake and subsequently the Lower American River. Also of interest are urban runoff and local drainage, industrial discharges from the Aerojet facility, potential spills associated with wastewater treatment and collection facilities, roads, railroads, and petroleum pipelines, and the evolving impacts from climate change.

Of special interest is the potential impact that Folsom Lake operations may have on the source water quality, especially with the planned reoperation of Folsom Dam by Reclamation.

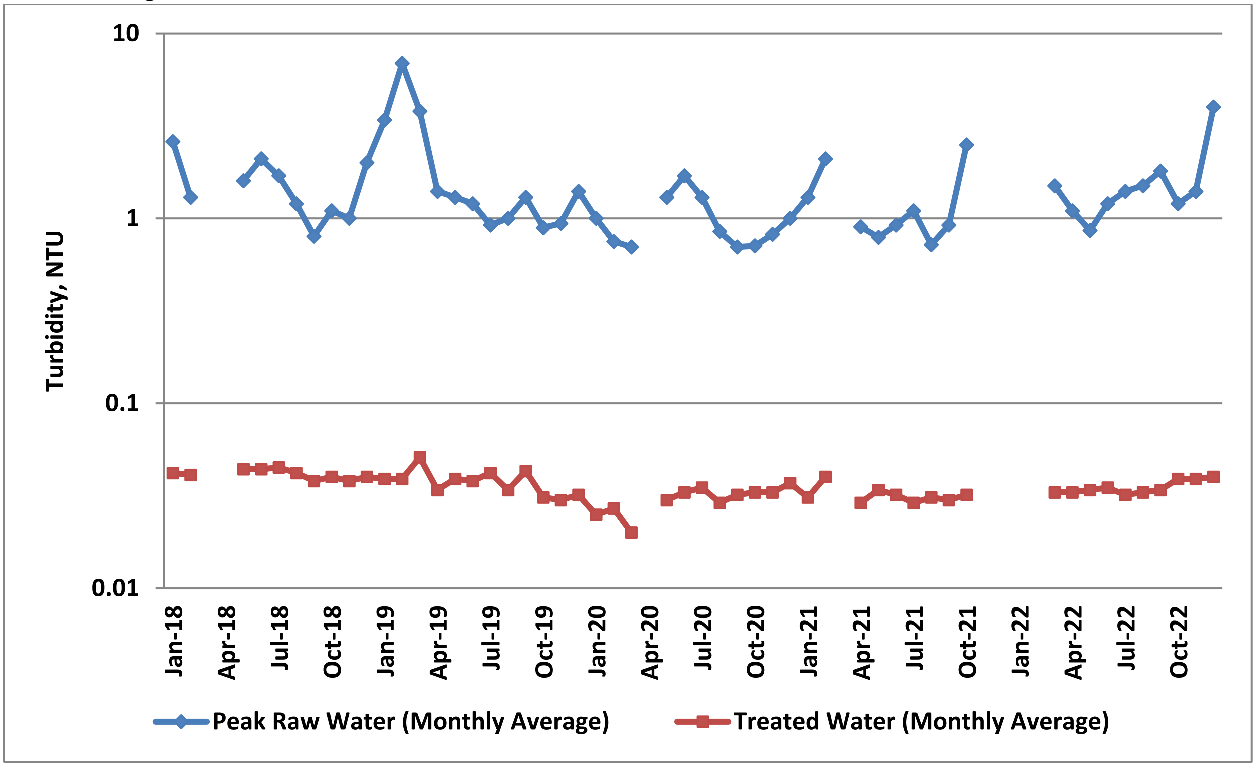
Treated Water Quality Summary

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 Fairbairn WTP is periodically taken out of service to conduct regular maintenance activities and therefore there are periods without water quality data.

Turbidity

The average of peak daily raw water turbidity at Fairbairn WTP for the period of study was 1.5 NTU, and on average the treatment process decreased this to 0.040 NTU, which equates to an average solids removal of 97.6 percent. **Figure 5-56** shows a time series plot of raw and treated turbidities. It should be noted that the raw water turbidities plotted are a monthly average of peak daily grab samples. The treated water turbidities are a monthly average of a daily average, based on all 4-hr samples in a 24 hour period. Fairbairn WTP meets all current treated water turbidity standards.

Figure 5-56. Fairbairn WTP, Raw and Treated Water Turbidities, 2018 – 2022



Microbiological Constituent Review

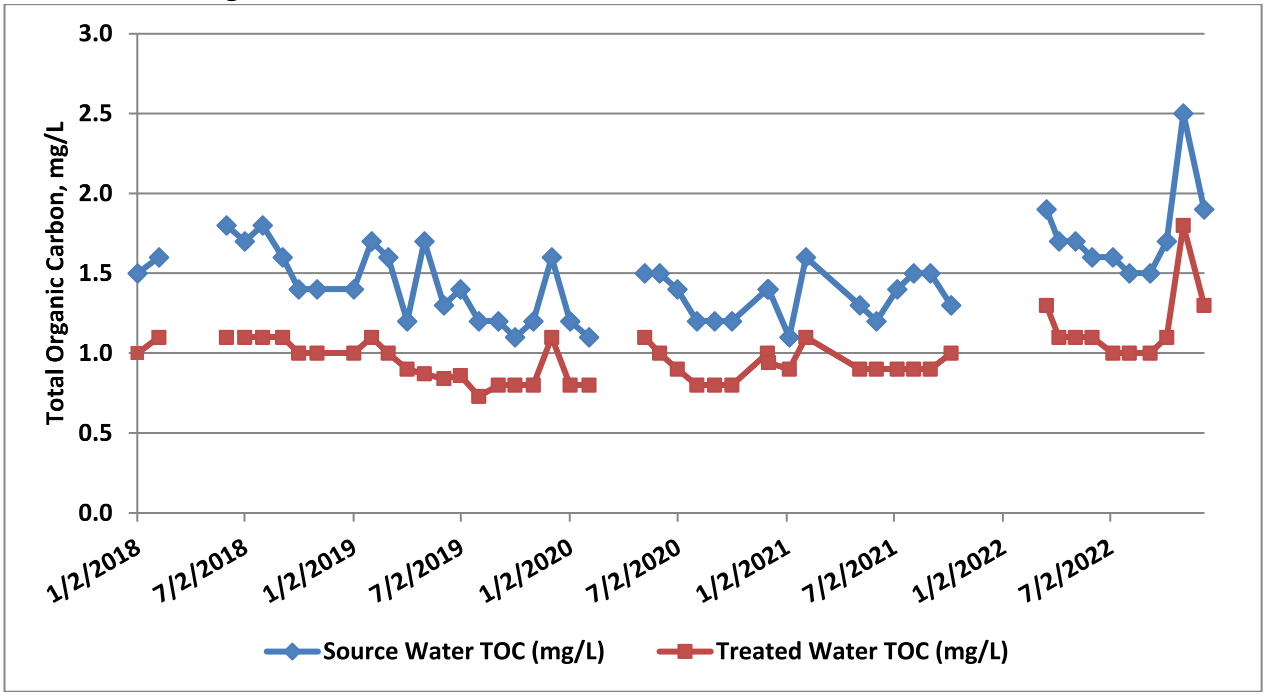
As reported in the 2018 CCR, the highest monthly percentage of positive total coliform samples was 0.4 percent. This is not in violation of the Total Coliform Rule and its revisions since it is less than five percent positive, repeat samples were all negative, and there were no detections of fecal coliform.

Disinfection By-Products and Precursors

<u>DBP Precursors</u>

The City of Sacramento monitors for TOC in its raw and treated water monthly in order to determine TOC removal compliance. The average raw and treated water TOC levels at Fairbairn WTP were 1.5 mg/L and 1.0 mg/L, respectively, equating to 33.0 percent average removal. **Figure 5-57** shows a time series plot of raw and treated water TOC at Fairbairn WTP.

Figure 5-57. Fairbairn WTP – Raw and Treated TOC, 2018 – 2022



Ninety-eight percent of the time, TOC levels in the raw water were below 2.0 mg/L; the highest recorded level was 2.5 mg/L in November 2022. This occurred during a period of intense storm activity, which also coincided with extremely low storage in Folsom Lake and a fall lake turnover event, likely contributing to significant impacts to source water quality.

As the source and treated water running annual averages for years 2018 through 2022 were less than 2.0 mg/L, an alternative compliance criterion was met and no TOC removal was required.

Stage 2 DBP Compliance

The City of Sacramento established 12 Stage 2 D/DBP monitoring sites in April 2011. It should be noted that only sites associated with treated American River water from the Fairbairn WTP were evaluated in this 2023 Update. For the Stage 2 D/DBP monitoring sites, the relevant sites were 3S6 and 3SB. It should be noted for this report that data is not reported for the second quarter of 2018, 2020, and 2021 as well as the first quarter of 2022 since the Fairbairn WTP was off-line when these samples were collected.

During the study period, the individual TTHM distribution system samples for the two sites ranged from 25 to 86 µg/L. **Figure 5-58** shows the quarterly average of both distribution system sites for TTHM analysis. Quarterly average values range from 29 to 81 µg/L.

The TTHM LRAA for each distribution system site was calculated. **Figure 5-59** presents the TTHM LRAA maximum and median values. The LRAAs ranged from 39 to 72 µg/L, and the 3S6 site had the highest LRAAs. These values are all below the current MCL of 80 µg/L.

Figure 5-58. Distribution System TTHM Quarterly Average of Both Sites, Fairbairn WTP, 2018-2022

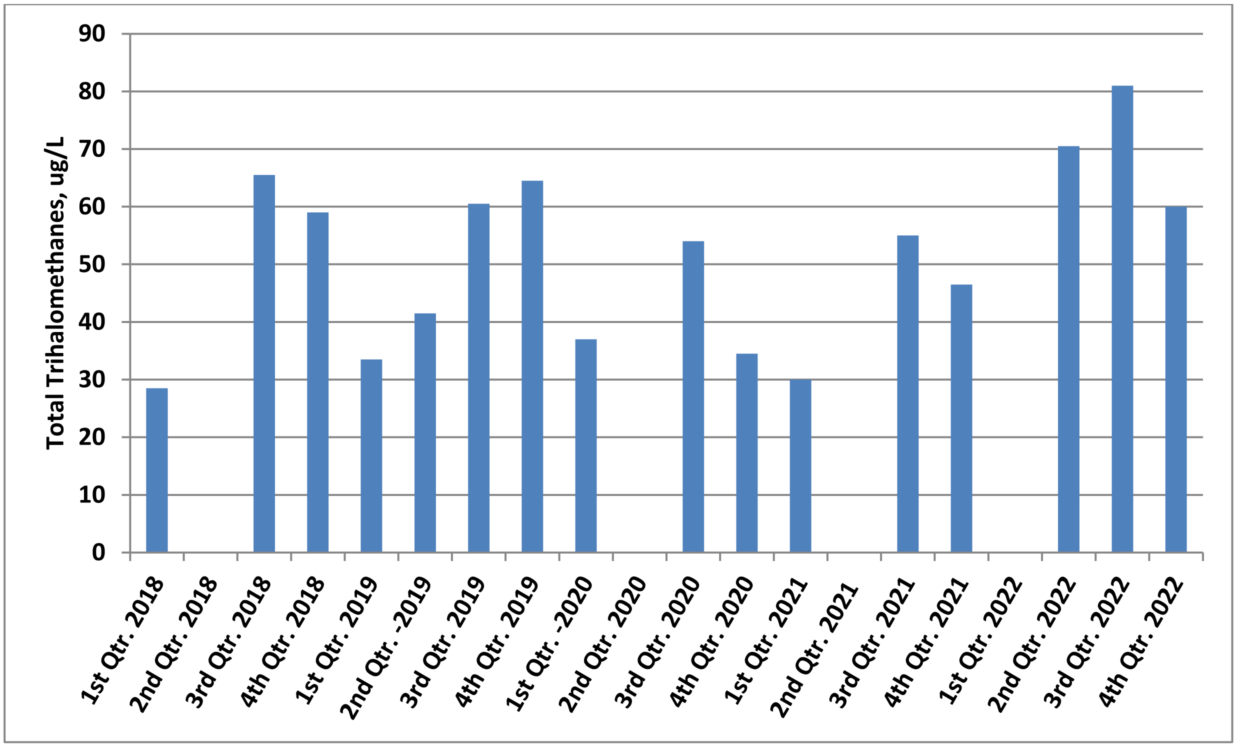
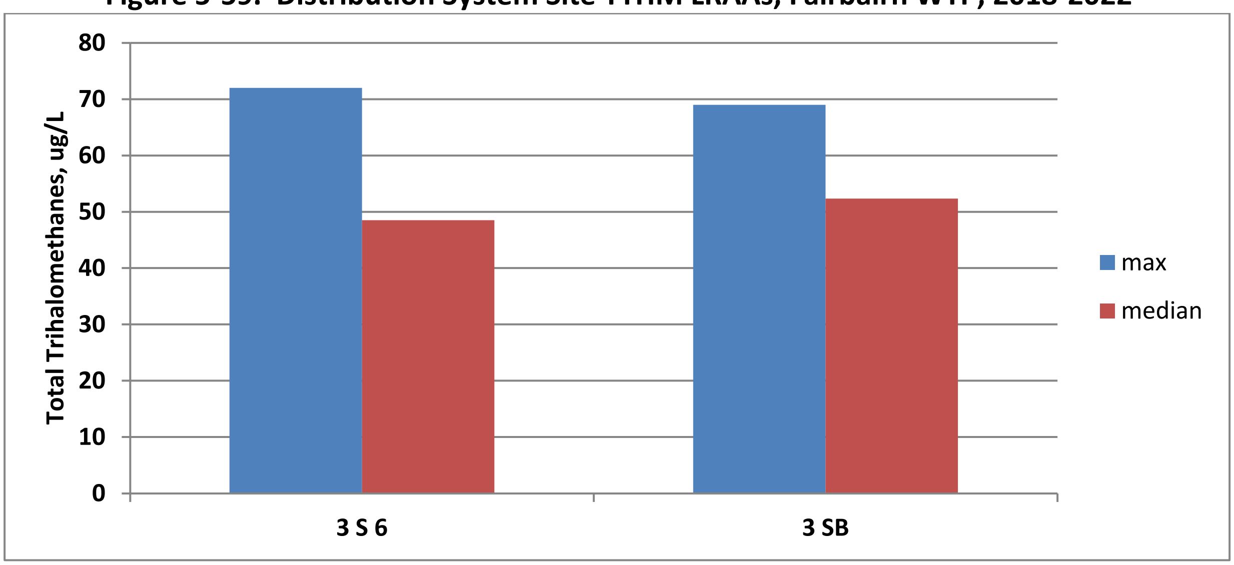


Figure 5-59. Distribution System Site TTHM LRAAs, Fairbairn WTP, 2018-2022



During the study period, the individual HAA5 distribution system samples for the two sites ranged from 15 to 53 µg/L. **Figure 5-60** shows the quarterly average of both distribution system sites for HAA5 analysis. Quarterly average values range from 19 to 50 µg/L.

The HAA5 LRAA for each distribution system site was calculated. **Figure 5-61** presents the HAA5 LRAA maximum and median values. The LRAAs ranged from 21 to 46 µg/L. As shown in **Figure 5-61,** the 3S6 site had the highest HAA LRAA. All LRAA values are all below the current MCL of 60 µg/L.

Figure 5-60. Distribution System HAA5 Quarterly Average of All Sites, Fairbairn WTP, 2018-2022

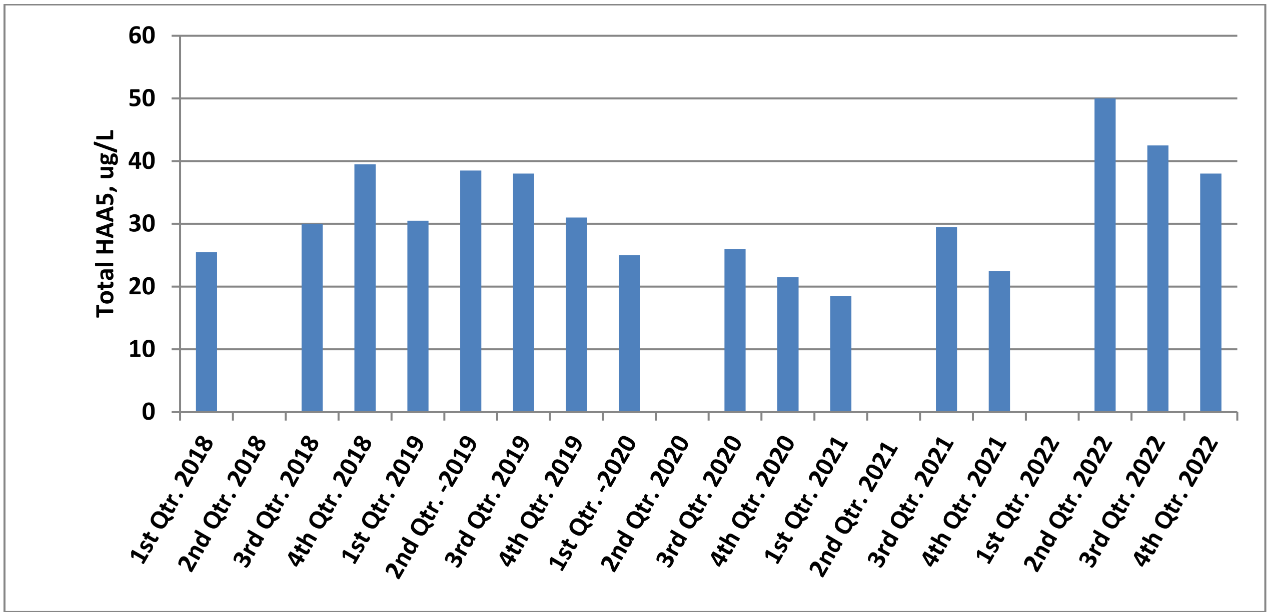
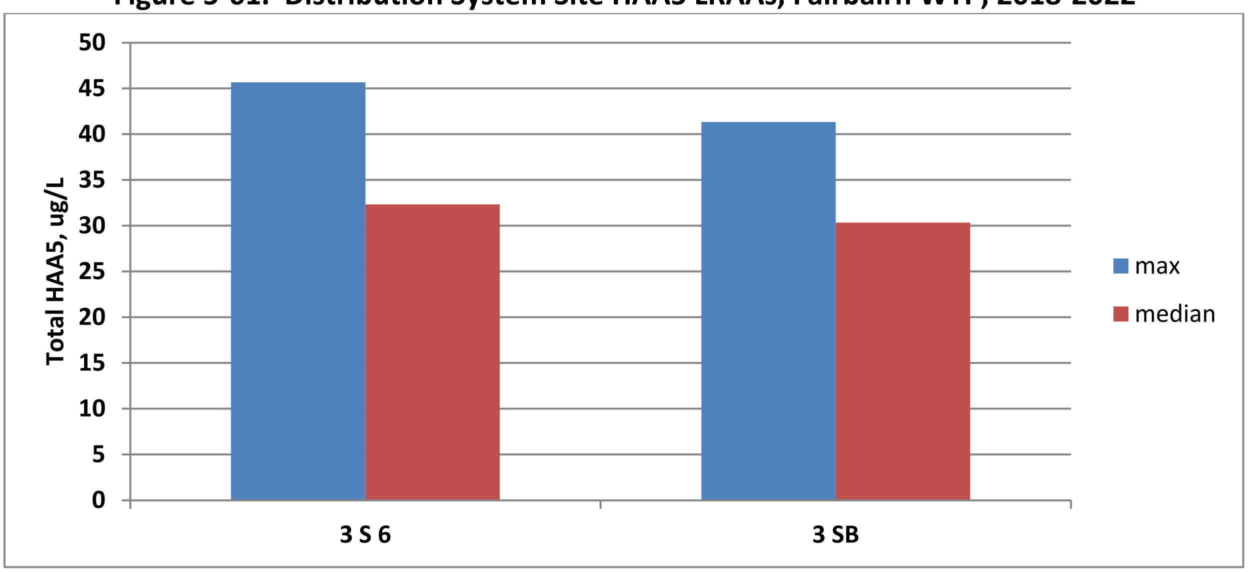


Figure 5-61. Distribution System Site HAA5 LRAAs, Fairbairn WTP, 2018-2022



Volatile and Synthetic Organic Compounds

There were no detectable levels of VOCs or SOCs in the raw or treated water for the Fairbairn WTP during the study period.

Other Detectable Title 22 Constituents

There were no other detectable Title 22 constituents of interest.

UCMR 4

Biweekly monitoring for anatoxin-a, cylindrospermopsin, and total microcystin was conducted from April to July 2019 at the entry point to the distribution system. All sample results were non-detect.

The other 17 required constituents were also monitored quarterly at the entry point to the distribution system in December 2019, March, June and September 2020. All sample results were non-detect, except for manganese which ranged from 0.46 to 1.3 µg/L.

Three brominated haloacetic acid groups (HAA5, HAA9 and HAA6Br) were monitored at sites in the distribution system in December 2019, March 2020, June 2020, and September 2020. For the 3S6 and 3SB sites, and over the four quarters, the average difference between HAA9 and HAA5 was 2.4 µg/L and the maximum difference was 4.0 µg/L, indicating minimal presence of brominated HAAs.

***Giardia*/Virus/*Cryptosporidium* Reduction Requirements**

Based on the *E. coli* and protozoa data evaluated in **Section 3**, 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium* continue to be appropriate reduction requirements for the Fairbairn WTP.

The Fairbairn 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 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 and the IESWTR.

The City of Sacramento conducted the LT2ESWTR second round compliance monitoring by collecting monthly samples for *Cryptosporidium* and *Giardia* from April 2015 to March 2017 for the Fairbairn WTP. There were no detections of *Cryptosporidium,* classifying the source as Bin 1. There were nine detections of *Giardia*, with an average of 0.058 cysts/L for all samples collected.

Regulatory Compliance Evaluation

The City of Sacramento has been monitoring the raw and treated water for the Fairbairn WTP for all required Title 22 compliance constituents. **Table 5-16** lists the key existing drinking water regulations and a compliance evaluation for these standards at the Fairbairn WTP. The Fairbairn WTP is currently in compliance with existing regulations.

Table 5-16
Regulatory Compliance Evaluation
City of Sacramento – Fairbairn WTP

	Targeted Compounds	Key Issues and Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	Monitored as required. No MCLs exceeded in the raw or treated water.
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.
IESWTR and Filter Backwash Rule	Microbial and Turbidity	All new turbidity standards met. 2-log reduction credit for *Cryptosporidium* applicable.
Stage 1 D/DBP Rule	Disinfectants and Disinfection By-Products	RAA TOC < 2.0 mg/L in raw and treated water. Therefore, enhanced coagulation not required.
LT2ESWTR	Microbial	Classified as Bin 1 based on second round monitoring.
Stage 2 D/DBP Rule	Disinfectants and Disinfection By-Products	Current TTHM/HAA5 LRAAs for Stage 2 data are below the MCLs (< 80/60 µg/L, respectively). No OELs triggered.

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This section consists of a discussion of the key findings for this 2023 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 IN THE PAST FIVE YEARS

During the past five years, new information has been generated that was used to evaluate source water quality, treatment capabilities, and potential contaminating activities in the watershed. This new information, which is highlighted below, was obtained and evaluated for this 2023 Update.

- Seven of the water treatment plants underwent modifications, including:
  - ➢ El Dorado Irrigation District (EID) installed new intake screens at the Strawberry Water Treatment Plant (WTP).
  - ➢ EID encased three miles of open canal between Forebay Reservoir and Reservoir One WTP.
  - ➢ EID installed a new temperature control device intake structure in Folsom Lake for the El Dorado Hills WTP.
  - ➢ Georgetown Divide Public Utility District (GDPUD) replaced the Auburn Lakes Trail (ALT) WTP with the new Sweetwater WTP, which includes upflow clarification, filtration and disinfection.
  - ➢ Placer County Water Agency's (PCWA) Foothill WTP completed an upgrade project that converted dual media filters to deep bed monomedia, changed horizontal flocculators to vertical turbine flocculators, and added plate settlers to the sedimentation basins.
  - ➢ City of Folsom WTP added plate settlers to the sedimentation basin and installed mixers and blowers in the distribution system tanks to reduce disinfection by-product (DBP) formation.
  - ➢ Golden State Water Company (GSWC) installed new intake rakes to improve trash and algae removal from the intake screens.
- Drought conditions persisted during much of the study period and resulted in reduced water storage levels and unusual hydrologic conditions throughout the watershed.
- The United States Bureau of Reclamation (Reclamation) has completed significant improvements and operational revisions at Folsom Lake. Operations can now be forecast-informed, allowing for different variations in storage and releases. This was first operational in the fall of 2021, and coincided with significant hydrologic conditions (i.e., low lake level and cyclone bomb storm) that resulted in significant impacts to source water quality.

- There has been a surge in homelessness in Sacramento County, including the American River Parkway. There has been a 250 percent increase in the number of homeless in the County and an increasing shift toward unsheltered homeless. This has resulted in increased presence of illegal camping. Local governments are working diligently to prohibit illegal camping in the American River Parkway to protect public safety.
- The Lower American River was investigated by the Central Valley Regional Water Quality Control Board (Regional Water Board) related to the Clean Water Act (CWA) 303(d) listing for indicator bacteria. Initial studies confirm that elevated levels in dry weather occur below the participating water utilities' intakes and appear to be heavily contributed by bird populations.
- Wildfire continued to have a severe impact on the American River watershed, with over 200,000 acres burned during the study period. State and Federal agencies are restructuring many aspects of forest management to accelerate resiliency.
- Discharge from the Aerojet Rocketdyne Holdings, Inc. (Aerojet) groundwater extraction and treatment system continued at 50 million gallons per day (mgd) to the American River or its tributaries. Per- and poly- fluoroalkyl substances (PFAS) have been extensively detected in the source wells, but the groundwater treatment facilities appear to be reducing the effluent sufficiently. Investigations are showing possible offsite transport via groundwater seeps to Alder Creek, which is tributary to the American River.
- Over 230 spills occurred in the American River watershed that reached surface water during the study period, however very few notifications were received via the formal notification process from the State Water Resources Control Board, Division of Drinking Water (DDW). The American River Watershed Technical Committee (ARWTC) Voluntary Spill Notification Program serves as a stopgap measure for this failure in the notification system, but it is still far from complete.
- Sanitary sewer collection system spills occur regularly, especially during the wet months when infiltration and inflow can occur. Over 4,000,000 gallons of raw sewage was discharged into the American River watershed during the study period. This was especially present in December 2022 along the South Fork of the American River.

KEY FINDINGS

The key findings for this report are organized as they pertain to American River water quality, treatment and regulatory compliance, and watershed contaminant sources. Highlights of these findings are presented below.

American River Water Quality

Overall, the American River provides excellent quality water. The raw water can be treated to meet all drinking water standards using conventional, direct, or membrane treatment processes. No persistently present constituents that require additional treatment processes have been currently identified in the raw water. Key findings for the constituents of interest are presented below.

Turbidity

The average of the monthly average raw water turbidity ranged from 1.5 nephelometric turbidity units (NTU) at the City of Sacramento's E.A. Fairbairn Water Treatment Plant (Fairbairn WTP) to 25.9 NTU at EID's Reservoir One WTP. Almost all of the water treatment plants had slightly lower median turbidity levels during this study period (2018 to 2022) as compared with the previous period (2013 to 2017), and it was more similar to the 2008 to 2012 pre-drought period. The monthly average raw water turbidities for all but one of the water treatment plants (Reservoir One WTP) stayed below 10 NTU, generally between 2 and 5 NTU, except during storm events.

Turbidity levels generally increase during the winter storm season and correlate with precipitation. Coloma WTP and Reservoir One WTP have unique seasonal patterns, likely attributable to their off-stream supply canals.

Microbiological Constituents

The median *Escherichia coli* (*E. coli)* values for the raw water data range from non-detectable at Carmichael Water District's (CWD) Bajamont WTP to 46 most probable number per 100 milliliters (MPN/100 mL) at GDPUD's ALT WTP/Sweetwater WTP. Median *E. coli* values generally appear to increase from upstream to downstream. Similar to previous Update results, average *E. coli* values are higher than the median, emphasizing the influence of peak bacteria counts associated with peak storm events.

GSWC's Coloma and Pyrites WTPs source water is similarly impacted by storm events, but may also be impacted by another source local to Lake Natoma or the Folsom South Canal, as *E. coli* increases consistently in late spring and early summer each year. EID's water treatment plants along the South Fork American River have increased levels of bacteria in September when recreational releases from Echo Lake occur to increase flows in the South Fork American River.

The source water *E. coli* monthly medians are generally below 200 MPN/100mL for all the water treatment plants. Six water treatment plants had one monthly median exceed that trigger level. Therefore, the current level of treatment of 3/4-log reduction for *Giardia* and viruses appears appropriate, based on *E. coli*, for all of the water treatment plants (except Coloma and Pyrites WTP based on total coliform trigger, see discussion below).

Total coliform was evaluated for GSWC's Coloma and Pyrites WTPs since it is listed as a trigger for additional log reduction for *Giardia*/viruses in their water supply permit from DDW. Ninety-five percent of monthly median total coliform values exceeded 1,000 MPN/100 mL and triggered the need to provide 4/5-log reduction for *Giardia* and viruses. GSWC provides 4/5-log reduction on a regular basis.

All water treatment plants completed their second round of monitoring as required under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). All were classified as Bin 1, except for CWD's Bajamont WTP. The Bajamont WTP achieves the extra log *Cryptosporidium* action through its membrane filtration process.

Disinfection By-Product Precursors (Total Organic Carbon)

The water treatment plant intake total organic carbon (TOC) average levels range from 1.1 to 1.8 milligrams per liter (mg/L). Similar to turbidity, the majority of water treatment plants saw a decrease in the average and median values of TOC in the source water compared to the last study period (2013 to 2017). Also similar to turbidity, the peak levels of TOC in the source water are associated with storm events.

Selected Unregulated Constituents of Interest

Some of the participating water utilities have monitored for hexavalent chromium, n-Nitrosodimethylamine (NDMA), 1,4-dioxane, PFAS, and cyanotoxins. These are of special interest due to recent regulatory development or presence in the watershed. All hexavalent chromium detects were well below the recently proposed Maximum Contaminant Level (MCL) of 10 micrograms per liter (µg/L). All NDMA results were non-detect, well below the current DDW Notification Level of 10 nanograms per liter (ng/L). All 1,4-Dioxane results were non-detect, below the current DDW Notification Level of 1 µg/L. Monitoring for 18 PFAS resulted in none detected, with reporting limits below the existing or proposed regulatory thresholds. Cyanotoxin monitoring resulted in only the detection of anatoxin-a on the Lower American River, at levels well below the current DDW Notification Level of 4 µg/L.

Treatment and Regulatory Compliance

All of the water treatment plants are currently in compliance with all existing drinking water regulations. The participating water utilities implement various types of treatment processes, depending on facility size and source water quality, and meet all current drinking water standards (except as noted below), including MCLs and treatment technology requirements. Below is a summary of the selected treatment and regulatory compliance topics.

Turbidity

All the water treatment plants met the combined filter effluent turbidity standard of less than 0.3 NTU in 95 percent of measurements and never exceeding 1 NTU. Therefore, all conventional and direct filtration plants should be awarded 2-log reduction credit for *Cryptosporidium* under the Interim Enhanced Surface Water Treatment Rule (IESWTR). The average percent solids removal through the water treatment plants ranged from 97.6 to 99.8 percent, well exceeding the required 80 percent.

Microbiological Constituents

The treated water coliform standards were met in each of the distribution systems. A few participating water utilities had occasions of total coliform positive results, but none resulted in fecal coliform detects or a sufficient number of detections in a month to cause a violation of the Total Coliform Rule or its revisions.

Disinfection By-Products

The treated water DBP standards were met in each of the distribution systems. All the participating water utilities have DBP levels below the primary MCLs of 80 and 60 µg/L for total trihalomethanes (TTHM) and haloacetic acids (HAA5), respectively, based on locational running annual averages (LRAAs). Under the Stage 2 D/DBP Rule the LRAA for TTHM ranged from 1 to 72 µg/L. The LRAAs for HAA5 ranged from 2 to 58 µg/L. All of the distribution systems saw the highest levels of DBPs in late 2021 and into 2022, during and following an intense storm period that caused a significant impact to the source water quality at Folsom Lake.

EID's Strawberry and Main water systems each had to complete an Operational Evaluation Level report related to HAA5 in 2018. EID continued to implement numerous actions for managing DBP formation to meet drinking water standards, bringing DBP levels down in both systems.

Unregulated Contaminant Monitoring Rule 4 data for brominated haloacetic acids indicates that there is very little presence of these constituents in the treated water from the American River.

Other Detectable Title 22 Constituents

Several participating water utilities reported individual distribution system detections of lead above the Action Level of 15 µg/L, but all the 90^{th} percentiles were below the Action Level.

Giardia/Virus/Cryptosporidium Reduction Requirements

Based on the *E. coli* 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. *E. coli* monthly median values are well below 200 MPN/100 mL at almost all times. Total coliform evaluation for Coloma and Pyrites WTP was conducted, in accordance with their DDW Water Supply permit, and it results in increased log reduction requirements, as discussed in **Sections 3** and **5**.

Under the LT2ESWTR, water treatment plants were classified in bins based on source water characterization. All the water treatment plants in the American River watershed participating in this study have received a second round Bin 1 classification from DDW, except for CWD. CWD's Bajamont WTP data results placed them in Bin 2 under the second round of monitoring. Compliance is achieved through their membrane filtration process.

The water treatment plants implement either conventional, direct, alternative, or membrane 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 Surface Water Treatment Rule (SWTR) and either the IESWTR or the Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR).

Watershed Contaminant Sources

There are numerous types of potential contaminating activities in the watershed. Seven 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.

Creek and River Corridor Activities

There were four river corridor activities of interest that were addressed in this section: bird management at Lake Natoma, pet waste management, equestrian waste management, and illegal camping/homelessness along the Lower American River.

Lake Natoma has a large population of resident and migratory geese. Feeding the geese is prohibited, but it is a popular past-time leading to fecal waste issues at Nimbus Flat. California Department of Parks and Recreation (State Parks) has not initiated any efforts to control the waterfowl population at Lake Natoma. Coliform data from the GSWC's Coloma WTP continue to indicate peak levels occur in the late spring and early summer, which do not correlate with any other known source of fecal matter.

Dog walking along the American River Parkway is a popular past-time. Some of the participating water utilities support the "Pups in the Park" program. This program provides 22 pet waste stations with Mutt Mitts® between Sunrise Avenue and Discovery Park, primarily above Paradise Beach, to encourage owners to clean up after their pets. According to the American River Parkway Foundation approximately 65,000 to 80,000 bags per year are used.

Equestrian use in the American River Parkway occurs from both two adjacent stables and day use at seven equestrian staging areas. The number of riders is not known, but is most prevalent in the middle reach of the Lower American River. Horse manure removal is not required.

Illegal camping primarily occurs in the lower three miles of the Lower American River. Between 2018 and 2022 there was a more than tripling of the unsheltered homeless population in Sacramento County, and subsequently in the American River Parkway. The City and County of Sacramento are working diligently to address multiple aspects of homelessness, including banning encampments in the American River Parkway and using law enforcement to remove illegal campsites from the American River Parkway.

In 2016, the Regional Water Board added the Lower American River (below Nimbus Dam) to the 303(d) list of impaired waterbodies, for indicator bacteria related to water contact recreation. A bacterial study was initiated, including microbial source tracking (MST) to identify sources of coliform during dry weather on the lower six miles of the river. The coliform levels have remained elevated downstream, however the MST results indicate that the majority of the coliform is sourced from birds. There is some coliform sourced from dogs, and very little from humans. The dog sources are most prevalent just downstream of Paradise Beach, where substantial dog walking activities occur and few pet waste stations exist. The Regional Water Board is expected to develop a Total Maximum Daily Load (TMDL) by 2027.

Forest Activities

This study identified timber harvesting and pesticide use, wildfires, off-highway vehicle (OHV) use, and upper watershed grazing as activities of significant interest. The United States Department of Agriculture Forest Service (USFS) and the State Water Resources Control Board (State Water Board) agree that the most important source of pollution in the forests is the timber harvesting road system, and for this reason they are working toward increased management of forest activities. The State of California and the USFS are working cooperatively to increase wildfire and forest resiliency statewide. This includes treating 1,000,000 acres per year, such as the French Meadows Restoration Project in the American River watershed. The California Vegetation Treatment Program will increase funding opportunities for local agencies to implement fuel reduction and forest treatments.

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 on state and private lands by the California Department of Forestry and Fire Protection (CAL FIRE). A review of the Placer and El Dorado County Agricultural Commissioners' annual crop reports shows that there were nearly 400,000,000 board feet of timber harvested during the study period, less than the last study period. In addition, CAL FIRE issued over 2,500 Timber Harvest Plans (THPs) on over 50,000 acres in the watershed. There has been a significant increase in fuel reduction and vegetation management by the USFS and private landowners due to the significant tree mortality associated with the drought and bark beetle infestation. A new trend is the use of Emergency and Exemption Notices for these types of timber activities, which resulted in over 625,000 acres being "treated" in the watershed during the study period. These notices are exempt from coverage through the Regional Water Board THP program. The Regional Water Board issued 149 THP permits as well, requiring protection of surface water bodies. Anyone conducting harvest activities, except those emergency or special exemptions, must apply for coverage under the Order. The Order also contains monitoring and reporting conditions. Other than the herbicide glyphosate, there is limited use of pesticides on forested lands.

Wildfires cause the loss of ground cover, the chemical transformation of soil, and the reduction in soil infiltration rates; these all increase the likelihood of erosion and hydrophobic soils contributing to increased solids (including organics, nutrients, and metals) in the receiving water, resulting in adverse effects to the source water quality of the water treatment plants. There were five major fires during the study period: the Caldor Fire, the Mosquito Fire, the Caples Fire, the Fork Fire, and the North Fire. Combined, these fires burned over 200,000 acres.

Both the Tahoe and Eldorado National Forests have completed OHV and Over-Snow Vehicle (OSV) trail designation programs. El Dorado County, Eldorado National Forest, and State Parks work together extensively to implement a trail management program for the Rubicon Trail. This has been very effective at improving maintenance of the trail and its facilities, as well as creating a significant public education and outreach program.

Grazing occurs in the upper watershed. The livestock population is relatively low and has remained stable during the study period. There are 22 grazing allotments on USFS land and one on United States Bureau of Land Management (USBLM) land in the watershed, only eight of these are active. There is substantial environmental review required for grazing allotments, making stocking rates very low and with limited potential for impact to source water quality. In addition, there are significant outreach and education to ranchers about the impacts of grazing. The most commonly used pesticides for pastureland are glyphosate and triclopyr.

Aerojet Rocketdyne Holdings, Inc. Industrial Facility

A review of the Aerojet Superfund Site confirms that discharges to the American River continued to be expanded over the study period. There are currently 11 Groundwater Extraction and Treatment (GET) facilities that treat and discharge nearly 50 mgd to the American River or its tributaries. The GET facilities are permitted by the Regional Water Board, and effluent limits are generally set below drinking water levels of concern. The principal constituents of interest include perchlorate, NDMA, 1,4-dioxane, VOCs, and PFAS.

Aerojet ceased industrial operations at the site in December 2019, leaving only the environmental remediation group. Subsequently, the Regional Water Board rescinded the industrial stormwater permit for runoff from the site in June 2020. However, the Regional Water Board has continued to require monitoring and investigation related to detectable perchlorate in Alder Creek, tributary to the American River, during the summer months. The levels of perchlorate are well above the primary MCL and the source is unknown. Aerojet is continuing monitoring in 2023 to further understand the potential sources and other associated contaminants.

The National Pollutant Discharge Elimination System (NPDES) permit requires Aerojet to notify CWD, the City of Sacramento, the Freeport Regional Water Authority, and GSWC (if impacted) when effluent limits at the GET facilities are exceeded in the discharge or receiving water or if there is a GET process upset.

Recreation

There is a substantial amount of recreation that occurs in the American River watershed. Recreation occurs in both the upper and lower watersheds, 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 the watershed. Non-body contact recreation includes camping, boating, fishing, hiking, biking, and winter activities such as snow play, skiing, and snowmobiling.

Whitewater rafting has historically been an intensive use in the upper watershed. User statistics from El Dorado County indicate that annual use of the South Fork American River below Chili Bar Reservoir decreased from peak historic levels and has shifted to more commercial operations.

Auburn State Recreation Area (SRA) provides numerous recreational opportunities in the Foothills. Use statistics from State Parks indicates that use in Auburn SRA declined significantly during the study period. The Marshall Gold Discovery State Historic Park use was stable, while Folsom Lake SRA visitorship saw a dramatic increase during the study period.

Most recreation managers in the watershed indicate that there is insufficient recreation facilities for the growing demand. There are numerous potentials for expansion of recreation facilities in the watershed including: Recreation Facility Analysis priorities by the USFS, General Plan/Resource Management Plan for Folsom Lake SRA, and Federal Energy Regulatory Commission (FERC) re-licensing projects. Of specific note is the possible expansion of motorized boating at Folsom Lake, with increased marina wet slips, launching space, and dredging to improve access.

The American River Parkway continues to be a heavily used recreation area in the watershed. The “Keep Our Waters Clean” and “Pups in the Park” campaigns have been instrumental in providing public education and outreach materials on sanitation facilities between Folsom Lake and the American River Parkway and the location of pet waste stations in the American River Parkway.

Watershed 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 and plan measures to protect the water supply.

A review of the California Office of Emergency Services (Cal OES) spill database revealed 230 incidents throughout the watershed during the study period. Half of these were related to wastewater and are discussed under Wastewater below. Of the non-wastewater spills, 23 were considered potentially significant. Most of these spills were related to vehicle or vessel accidents that release petroleum products. Several were related to substantial amounts of fire-fighting flows. Cal OES standard procedures for notification regarding spills that are potentially impacting drinking water supplies include calls to DDW Duty Officers, with subsequent notification to water utilities. Of the 23 spills of potential significance noted above, only two notifications were received from DDW by the participating water utilities. This is a significant failure of the standard procedure.

The participating water utilities continued a voluntary spill notification program through the American River Watershed Technical Committee (ARWTC) to ensure timely notification in the event that a spill threatens the source water quality. The Lower American River participating water utilities have also continued the voluntary river spill notification program on the Lower American River, which is coordinated with the ARWTC effort. These programs have been effective for receiving timely notification for major spill events.

Stormwater Runoff

There is little urban runoff in the upper watershed. In the lower watershed there is significant urban runoff. Stormwater runoff is managed through several regulatory programs.

For the larger Phase I municipal dischargers, there is a Region-Wide General Permit for Discharges from Municipal Separate Storm Sewer System (MS4), with all the Sacramento area municipalities enrolled individually. They work together as part of the Sacramento Stormwater Quality Partnership (SSQP) to comply with aspects of the General Permit, such as implementation of monitoring programs and preparation of reports. As part of this process, the SSQP participates in the Delta RMP in lieu of local ambient monitoring and have reduced urban tributary monitoring. The SSQP has significant regional activities, including: target pollutant reduction strategies, a water quality monitoring program, special studies, regional public outreach and education, regional development standards, industrial/commercial sites program, and program effectiveness evaluation. There are numerous BMPs implemented that address drinking water constituents of interest. A review of the urban tributary and urban runoff data shows that there were few constituents of interest that had detectable levels. High levels of *E. coli*, organic carbon, and total iron (which was detected at average levels exceeding the secondary MCL) continue to be of interest in urban runoff discharge.

Smaller municipalities and special systems are regulated under Phase II. There are currently eight NPDES Stormwater Permit Phase II permits within the American River watershed. The Phase II permittees have Stormwater Management Plans and implemented the standard six program elements during the study period. The standard six program elements include: Public Education and Outreach on Stormwater Impacts, Public Involvement/Participation, Illicit Discharge Detection and Elimination, Construction Site Stormwater Runoff Control, Post-Construction Stormwater Quality Management in New Development and Redevelopment, and Pollution Prevention/Good Housekeeping for Municipal Operations.

Also permitted in the watershed are industrial sites, construction sites, and the California Department of Transportation (Caltrans). Industrial and construction activities are covered under separate general orders which have specific requirements focused on BMPs. Caltrans is covered under a statewide general permit, addressing Caltrans' Phase I MS4 and construction requirements.

Wastewater

There are two permitted NPDES wastewater treatment plants in the American River watershed: the City of Colfax Wastewater Treatment Plant (WWTP) and the City of Placerville Water Reclamation Facility (WRF). These are shown on the Watershed Map, **Figure 2-1**. Each of these facilities has an associated collection system, also located within the watershed.

The City of Colfax WWTP discharges 0.275 mgd to Bunch Canyon, which is tributary to the North Fork American River. There were no violation notices issued or spill events during the study period. The City of Placerville WRF discharges 2.3 mgd to Hangtown Creek, which is tributary to the South Fork American River. There was one violation notice issued to the City for minor exceedances, but no recorded spill events.

The presence of septic systems along the South Fork American River upstream of the Strawberry WTP, along Main Canal upstream of Reservoir One WTP, and along the GDPUD canal system continues to be a potential concern. All of these locations are in El Dorado County, where there is little on-going maintenance and inspection of septic systems. The data were reviewed and indicate the potential for septic systems to contribute to source water bacterial levels.

There are 19 sanitary sewer collection systems in the American River watershed and 13 of these had at least one Category 1 sanitary sewer overflow that reached surface water. These collection systems discharged over 4 million gallons of untreated wastewater to surface water during the study period, primarily during significant rainfall events. Much of this total volume was discharged in late December 2022.

The participating water utilities have obtained voluntary direct notification agreements with all of the above wastewater agencies and are voluntarily notified in the event of a significant spill to the American River or its tributaries.

RECOMMENDATIONS

Table 6-1 presents the recommendations developed for this 2023 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 utilities is critical. Recommendations may be implemented by the participating water utilities at their discretion as they have resources available.

TABLE 6-1
2023 Update Recommendations

Water Quality Recommendations	**Applies To**
Continue to optimize treatment and distribution processes. Optimization may include: ➢ Monitoring source water quality. ➢ Conducting regular equipment inspection and maintenance. ➢ Optimizing facility controls such as; flow, coagulant type, loading rates, backwash procedures, and disinfection. ➢ Coordinating with distribution system operations and maintenance to preserve treated water quality and minimize degradation.	All Participating Utilities
Consider tracking the Regional Water Board's efforts on the Lower American River Bacteria Study.	CWD, City of Sacramento, Sacramento County Water Agency (SCWA), East Bay Municipal Utility District (EBMUD)
Watershed Contaminant Sources Recommendation	**Applies To**
Continue to maintain voluntary direct notification and inter-notification procedures established by the ARWTC and supplemented on the Lower American River. Periodically check the currency of the contacts and notification agreements and conduct periodic dry-runs to test and improve the procedures.	American River - All Participating Utilities Lower American River – CWD, City of Sacramento, SCWA, EBMUD (Future Consideration for GSWC)
Continue to support the Keep Our Waters Clean (KOWC) campaign.	City of Folsom, SJWD, City of Roseville, CWD, City of Sacramento, EID, Folsom State Prison, GSWC, PCWA, SCWA, and EBMUD
Continue to support the Pups in the Park program. Consider advocate for installation of more pet waste stations at and downstream of Paradise Beach.	GSWC, CWD, City of Sacramento, PCWA, SCWA (Future Consideration for EBMUD)

TABLE 6-1 Continued
2023 Update Recommendations

Watershed Contaminant Sources Recommendation	**Applies To**
Continue to track events at the Aerojet site, receive notification for discharges, and act as an active stakeholder with regard to USEPA, Department of Toxic Substances Control, and Regional Water Board permitting, as applicable.	CWD, City of Sacramento, SCWA, EBMUD, GSWC
Continue stakeholder participation in the Cosumnes, American, Bear, and Yuba Rivers Integrated Regional Water Master Plan (CABY IRWMP) and consider development of source water protection projects to implement. Consider coordinating efforts with the ARWTC.	PCWA, GDPUD, EID
Continue coordination with CAL FIRE and USFS when wildfires impact drinking water sources.	PCWA, GDPUD, EID
Consider further discussion of these topics within the American River Watershed Technical Committee: • Communicate with the United States Bureau of Reclamation (Reclamation)/ California Department of Parks and Recreation (State Parks) on impacts to drinking water supplies of operations and activities at Folsom Lake. • Consider options for better understanding wildfire impacts to local source water quality. • Track and consider potential impacts from climate change on American River.	Varies by Topic
Continue to conduct cyanotoxin monitoring in raw water during peak vulnerable periods (i.e., summer and fall).	City of Sacramento
Consider using San Francisco Estuary Institute Harmful Algal Bloom Satellite Analysis Tool to track bloom activity in waterbodies of interest (Folsom Lake, French Meadows, Hell Hole, Loon Lake, Union Valley).	All
Continue to include climate change as a special topic in the watershed sanitary survey updates.	All
Remove Agriculture, Regional Water Board Drinking Water Policy, Outdoor Cannabis Cultivation, and Mining as special topics for investigation in the 2028 Update. These are low intensity activities that are well regulated with limited detections of constituents of concern in source water.	All

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APPENDIX A

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APPENDIX B
SUMMARIES OF PARTICIPATING WATER UTILITY DATA

Sample Date	American River - PCWA Average E. coli
Jan-18	0
Feb-18	0
Mar-18	0
Apr-18	4.1
May-18	1
Jun-18	5.2
Jul-18	2
Aug-18	5.2
Sep-18	12.2
Oct-18	0
Nov-18	6.3
Dec-18	5.2
Jan-19	3
Feb-19	3.1
Mar-19	9.7
Apr-19	5.2
May-19	0
Jun-19	10.8
Jul-19	7.4
Aug-19	2
Sep-19	1
Oct-19	2
Nov-19	17.3
Dec-19	118.6
Jan-20	1
Feb-20	1
Mar-20	1
Apr-20	3
May-20	2
Jun-20	8.6
Jul-20	8.5
Aug-20	7.5
Sep-20	5.2
Oct-20	1
Nov-20	7.5
Dec-20	0
Jan-21	2
Feb-21	6.3
Mar-21	1
Apr-21	3.1
May-21	6.3

Jun-21	12.2
Jul-21	40.4
Aug-21	30.9
Sep-21	10.9
Oct-21	53.85
Nov-21	7.5
Dec-21	0
Jan-22	14.75
Feb-22	1.55
Mar-22	1.5
Apr-22	6.45
May-22	6.9
Jun-22	45.8
Jul-22	11.35
Aug-22	6.3
Sep-22	6.85
Oct-22	9.3
Nov-22	15.5
Dec-22	13.95

ave	9.704167
median	5.2

PCWA AR Pump Station

Sample Date1	Source Water Alkalinity (mg/L)	Source Water TOC (mg/L)	Treated Water TOC (mg/L)
2/13/2018	32	1.0	1.3
5/16/2018	22	1.2	1.0
8/14/2018	22	1.5	1.0
11/27/2018	30	1.3	0.9
2/20/2019	27	1.0	1.3
5/16/2019	16	1.1	0.9
8/27/2019	17	1.1	0.7
11/20/2019	20	0.9	0.8
2/19/2020	36	0.6	0.9
5/14/2020	22	1.2	0.7
8/12/2020	21	1.1	0.8
11/10/2020	25	1.0	0.9
2/10/2021	21	0.8	0.6
5/13/2021	26	0.9	0.8
8/11/2021	26	0.7	0.5
11/9/2021	33	1.4	1.0
2/8/2022	31	0.8	1.0
5/11/2022	24	1.0	0.9
8/10/2022	88	1.3	0.9
11/9/2022	41.1	1.7	1.2
	ave	1.1	
	median	1.1	

THM

	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	4th Qtr. 2019	1st Qtr. - 2020	4th Qtr. 2020	3rd Qtr. 2021	4th Qtr. 2021	4th Qtr. 2022
Cincinnati	51	56	46	26	42	32	0	59	29
Woodside Park (5903 Sunset for 2018)	43	50	33	37	43	27	47	61	60
Penryn	41	48	71	34	39	26	37	38	22
Ascension	47	59	61	29	40	30	55	64	26
Claudio	46	54	40	38	39	30	54	47	43
Lake Forest	42	48	50	23	38	24	30	48	28
Ketchikan	41	48	40	24	34	29	40	47	57
Becky Way	37	48	45	20	36	25	32	46	25
qtr average	43.5	51.4	48.3	28.9	38.9	27.9	36.9	51.3	36.3

HAA5

	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	4th Qtr. 2019	1st Qtr. - 2020	4th Qtr. 2020	3rd Qtr. 2021	4th Qtr. 2021	4th Qtr. 2022
Cincinnati	18	45	42	26	33	20	0	41	28.6
Woodside Park (5903 Sunset for 2018)	30	37	39	30	33	22	31	34	27.1
Penryn	29	41	36	27	28	25	25	43	25.7
Ascension	39	38	43	24	29	21	29	48	25.7
Claudio	34	39	38	28	29	21	18	42	24.9
Lake Forest	34	40	37	26	31	24	25	56	26.9
Ketchikan	32	37	36	26	27	22	29	55	29.4
Becky Way	30	40	32	24	29	25	26	53	26.8
qtr average	30.8	39.6	37.9	26.4	29.9	22.5	22.9	46.5	26.9

DATE	Total Coliform QT MPN/100 mL SWTP- Source Water	eColi QT MPN/100 mL SWTP- Source Water
01/08/18	150	3.1
01/17/18	73	3.1
01/31/18	50	<1
02/14/18	55	1.0
02/28/18	44	1.0
03/15/18	46	<1
03/29/18	41	11
04/12/18	106.8	2.0
04/25/18	<1	<1
05/10/18	42.0	5.1
05/23/18	50.4	<1
06/07/18	129.1	1.0
06/21/18	261.3	3.1
07/05/18	1413.8	3.1
07/18/18	410.6	7.5
08/01/18	365.4	3.0
08/15/18	275.5	1.0
08/29/18	727.0	3.1
09/12/18	770.1	9.7
09/26/18	307.6	<1
10/11/18	275.5	1.0
11/13/18	77.6	<1
12/13/18	111.9	2.0
01/10/19	43.5	2.0
02/13/19	69.7	7.4
03/13/19	41.7	3.1
04/11/19	65.0	3.1
05/09/19	48.7	<1
6/13/2019	65	1.0
07/11/19	118.7	2.0
08/14/19	248.1	<1
09/11/19	143.0	5.2
10/08/19	275.5	1.0
11/13/19	53.8	1.0
12/10/19	123.6	1.0
01/08/20	48.0	<1
02/12/20	29.9	2.1
03/11/20	82.2	2.0
04/08/20	40.4	12.2
05/14/20	71.2	2.0
06/11/20	186.0	1.0
07/08/20	579.4	7.5
08/12/20	1203.3	3.1
09/10/20	>2419.6	248.1
10/14/20	770.0	4.1
11/10/20	461.1	<1
12/09/20	108.1	<1
01/12/21	83.3	7.3
02/10/21	63.1	1.0
03/09/21	48.0	<1
04/13/21	83.9	2.0
05/12/21	77.1	1.0
06/09/21	410.6	<1

07/14/21	>2419.6	5.2
08/12/21	755.6	20.1
9/15/2021	866.4	2.0
10/13/21	920.8	8.6
11/17/21	218.7	3.1
12/08/21	135.4	6.3
01/12/22	85.7	5.2
02/09/22	88.2	<1
03/09/22	55.6	2.0
4/13/2022	61.3	1.0
5/11/2022	51.2	3.1
06/08/22	165.8	1.0
07/13/22	1413.6	23.8
08/10/22	>2419.6	6.3
09/21/22	>2419.6	66.3
10/12/22	461.1	<1
11/16/22	387.3	1
12/07/22	135.4	11

	SWTP-Source Water		**SWTP-Source Water**		**SWTP-Combined Filter Effluent**		**SWTP-Combined Filter Effluent**		**SWTP-Spent Backwash Return-Post Filtration**
	Alkalinity CaCO3		TOC		TOC		DOC		TOC
Units	mg/L		mg/L		mg/L		mg/L		mg/L
Date		Date		Date		Date		Date	
01/11/18	6.20	01/11/18	3.10	01/11/18	2.90	01/11/18		01/11/18	3.80
02/08/18	6.40	02/08/18	1.80	02/08/18	1.60	02/08/18	1.7	02/08/18	2.40
03/07/18	8.60	03/07/18	1.90	03/07/18	1.60	03/07/18		03/07/18	2.20
04/12/18	5.70	04/12/18	3.30	04/12/18	2.90	04/12/18		04/12/18	3.00
05/10/18	4.20	05/10/18	2.40	05/10/18	2.20	05/10/18	2.0	05/10/18	2.60
06/14/18	5.80	06/14/18	1.90	06/14/18	1.70	06/14/18		06/14/18	2.40
07/12/18	4.20	07/12/18	1.00	07/12/18	0.90	07/12/18		07/12/18	2.50
08/09/18	2.30	08/09/18	0.94	08/09/18	0.74	08/09/18	1.0	08/09/18	2.80
09/20/18	6.00	09/20/18	2.00	09/20/18	1.70	09/20/18		09/20/18	3.50
10/11/18	8.90	10/11/18	1.60	10/11/18	1.20	10/11/18		10/11/18	2.20
11/13/18	13.00	11/13/18	0.94	11/13/18	0.89	11/13/18	1.7	11/13/18	1.20
12/12/2018	Lab Error	12/13/18	1.60	12/13/18	1.50	12/13/18		12/13/18	2.30
01/10/19	6.20	01/10/19	2.00	01/10/19	1.80	01/10/19		01/10/19	1.90
02/13/19	6.50	02/13/19	1.90	02/13/19	1.70	02/13/19	1.8	02/13/19	1.80
03/13/19	7.80	03/13/19	1.90	03/13/19	1.80	03/13/19		03/13/19	2.00
04/11/19	7.60	04/11/19	3.00	04/11/19	2.20	04/11/19		04/11/19	2.00
05/09/19	5.40	05/09/19	2.50	05/09/19	2.30	05/09/19	2.6	05/09/19	1.80
06/13/19	3.90	06/13/19	2.20	06/13/19	2.00	06/13/19		06/13/19	2.00
07/11/19	4.40	07/11/19	1.30	07/11/19	1.10	07/11/19		07/11/19	1.50
08/14/19	3.00	08/14/19	0.67	08/14/19	0.64	08/14/19	0.86	08/14/19	1.10
09/11/19	3.00	09/11/19	0.91	09/11/19	0.84	09/11/19		09/11/19	1.60
10/08/19	5.70	10/08/19	0.74	10/08/19	0.65	10/08/19		10/09/19	2.70
11/13/19	12.00	11/13/19	0.87	11/13/19	0.78	11/13/19	1.2	11/13/19	1.10
12/10/19	8.00	12/10/19	1.70	12/10/19	1.60	12/10/19		12/10/19	2.80
01/08/20	7.90	01/08/20	2.60	01/08/20	2.60	01/08/20		01/08/20	3.00
02/12/20	7.90	02/12/20	1.20	02/12/20	1.10	02/12/20	1.3	02/12/20	1.20
03/11/20	7.50	03/11/20	2.30	03/11/20	2.30	03/11/20		03/11/20	2.40
04/08/20	7.50	04/08/20	2.20	04/08/20	2.20	04/08/20		04/08/20	1.90
05/14/20	6.00	05/14/20	4.70	05/14/20	4.30	05/14/20	2.5	05/14/20	4.40
06/11/20	6.30	06/11/20	1.90	06/11/20	1.80	06/11/20		06/11/20	3.00
07/08/20	6.80	07/08/20	1.10	07/08/20	0.95	07/08/20		07/08/20	1.90
08/12/20	3.40	08/12/20	1.10	08/12/20	0.97	08/12/20	0.36	08/12/20	2.30
09/10/20	6.70	09/10/20	2.30	09/10/20	2.10	09/10/20		09/10/20	3.50
10/14/20	5.60	10/14/20	0.92	10/14/20	0.75	10/14/20		10/14/20	1.20
11/10/20	5.80	11/10/20	0.89	11/10/20	0.82	11/10/20	0.63	11/10/20	1.10
12/09/20	7.50	12/09/20	0.97	12/09/20	0.97	12/09/20		12/09/20	0.96
01/12/21	6.90	01/12/21	1.30	01/12/21	1.20	01/12/21		01/12/21	1.50
02/10/21	6.90	02/10/21	1.40	02/10/21	1.40	02/10/21	1.4	02/10/21	1.70
03/09/21	7.60	03/09/21	1.80	03/09/21	1.70	03/09/21		03/09/21	1.70
04/13/21	5.60	04/13/21	2.80	04/13/21	2.50	04/13/21		04/13/21	2.90
05/12/21	4.90	05/12/21	2.30	05/12/21	2.40	05/12/21	2.3	05/12/21	3.50
06/09/21	7.20	06/09/21	1.90	06/09/21	1.90	06/09/21		06/09/21	2.60
07/14/21	3.40	07/14/21	0.76	07/14/21	0.85	07/14/21		7/14/2021	Unable to Collect Sample
08/12/21	6.20	08/12/21	0.79	08/12/21	0.65	08/12/21	0.64	08/12/21	1.40
09/15/21	13.00	09/15/21	0.91	09/15/21	0.80	09/15/21		09/15/21	1.30
10/13/21	16.00	10/13/21	1.10	10/13/21	0.94	10/13/21		10/13/21	1.50
11/17/21	12.00	11/17/21	2.20	11/17/21	2.10	11/17/21	2.0	11/17/21	2.50
12/08/21	12.00	12/08/21	2.20	12/08/21	1.60	12/08/21		12/08/21	2.40
01/12/22	12.00	01/12/22	1.70	01/12/22	1.70	01/12/22		01/12/22	1.70
02/09/22	10.00	02/09/22	1.60	02/09/22	1.50	02/09/22	1.9	02/09/22	1.70
03/09/22	11.00	03/09/22	1.60	03/09/22	1.50	03/09/22		03/09/22	1.70
04/13/22	8.20	04/13/22	1.80	04/13/22	1.70	04/13/22		04/13/22	1.90
05/11/22	7.90	05/11/22	1.60	05/11/22	1.60	05/11/22	1.6	05/11/22	1.80
06/08/22	7.60	06/08/22	1.40	06/08/22	1.20	06/08/22		06/08/22	1.90
07/13/22	7.80	07/13/22	1.10	07/13/22	0.84	07/13/22		07/13/22	1.80
08/10/22	8.70	08/10/22	1.10	08/10/22	0.94	08/10/22	1.3	08/10/22	1.70
09/14/22	8.70	09/14/22	1.80	09/14/22	1.40	09/14/22		09/14/22	1.90
10/12/22	15.00	10/12/22	1.40	10/12/22	1.10	10/12/22		10/12/22	1.70
11/09/22	10.00	11/09/22	2.20	11/09/22	2.00	11/09/22	2.0	11/09/22	3.00
12/07/22	11.00	12/07/22	1.60	12/07/22	1.50	12/07/22		12/07/22	2.60

System Name: El Dorado Irrigation District : Strawberry Water System
THM

Year:	2018				2019				2020				2021				2022			
Quarter:	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. -2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
Sample Date (month/day):	01/11	Various	07/12	10/11	01/10	04/11	07/11	10/08	01/08	04/08	07/08	10/14	01/12	04/13	07/14	10/13	01/12	04/13	07/13	10/12
Site 1: 16354 Strawberry Ln. (SWS-SS02)	78.00	58.00	23.00	28.00	34.00	53.00	52.00	22.00	35.00	38.00	48.00	23.00	39.00	77.00	24.00	21.00	38.00	53.00	44.00	34.00
LRAA				46.75	35.75	34.50	41.75	40.25	40.50	36.75	35.75	36.00	37.00	46.75	40.75	40.25	40.00	34.00	39.00	42.25

System Name: El Dorado Irrigation District : Strawberry Water System
HAA

Year:	2018				2019				2020				2021				2022			
Quarter:	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. -2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
Sample Date (month/day):	01/11	Various	07/12	10/11	01/10	04/11	07/11	10/08	01/08	04/08	07/08	10/14	01/12	Various	07/14	10/13	01/12	04/13	07/13	10/12
Site 1: 16354 Strawberry Ln. (SWS-SS02)	73.00	70.00	13.00	32.00	38.00	51.00	36.00	20.00	35.00	42.00	32.00	17.00	35.00	83.00	13.00	15.00	30.00	45.00	32.00	34.00
				47.00	38.25	33.50	39.25	36.25	35.50	33.25	32.25	31.50	31.50	41.75	37.00	36.50	35.25	25.75	30.50	35.25

DATE	MPWS R1WTP-RW Total Coliform QT MPN/100 mL R1WTP-SW	DATE	MPWS R1WTP-RW eColi Coliform QT MPN/100 mL R1WTP-SW	DATE	MPWS Ditch Total Coliform QT MPN/100 mL Main Ditch-A18 (Main Ditch to R1 WTP)	MPWS Ditch eColi Coliform QT MPN/100 mL Main Ditch-A18 (Main Ditch to R1 WTP)
03/29/18	120	03/29/18	16	03/29/18	43	1
04/11/18	76	04/11/18	16	04/11/18	117	6
05/01/18	155	05/01/18	40	05/01/18	81	2
06/05/18	326	06/05/18	59	06/05/18	308	10
07/03/18	921	07/03/18	50	07/03/18	210	28
08/07/18	>2,420	08/07/18	19	08/07/18	2,420	4
09/18/18	1,986	09/18/18	86	09/18/18	461	9
06/04/19	1,203	06/04/19	42	06/04/19	124	15
07/02/19	135	07/02/19	17	07/02/19	129	9
08/06/19	727	08/06/19	34	08/06/19	435	11
09/03/19	921	09/03/19	19	09/03/19	1,203	12
05/19/20	517	05/19/20	49	05/19/20	727	23
06/02/20	214	06/02/20	23	06/02/20	291	12
07/07/20	12	07/07/20	<1	07/07/20	345	5
08/04/20	921	08/04/20	15	08/04/20	921	10
09/01/20	488	09/01/20	30	09/01/20	517	4
03/31/21	112	03/31/21	23	03/31/21	34	4
04/06/21	162	04/06/21	9	04/06/21	68	1
05/04/21	155	05/04/21	30	05/04/21	123	6
06/01/21	411	06/01/21	49	06/01/21	206	5
07/06/21	>2,420	07/06/21	49	07/06/21	2,420	27
09/07/21	>2,420	09/07/21	93	09/07/21	2,420	11
06/07/22	281	06/07/22	6	06/07/22	*	
07/05/22	461	07/05/22	5	07/05/22	*	
08/02/22	579	08/02/22	14	08/02/22	*	
09/06/22	291	09/06/22	5	09/06/22	*	
10/05/22	225	10/05/22	9	10/05/22	*	

	R1WTP-SW		R1WTP-SW		R1WTP-CFE		R1WTP-CFE
Units	Alkalinity mg/L		TOC mg/L		TOC mg/L		DOC mg/L
Date		Date		Date		Date	
03/29/18	13.00	03/29/18	2.50	03/29/18	1.50	03/29/18	1.50
04/05/18	12.00	04/05/18	2.70	4/5/2018	1.60		
05/01/18	11.00	05/01/18	2.40	05/01/18	1.30	05/01/18	1.30
06/05/18	10.00	06/05/18	1.90	06/05/18	1.00		
07/03/18	13.00	07/03/18	1.60	07/03/18	1.00		
08/07/18	12.00	08/07/18	1.40	08/07/18	0.88	08/07/18	0.91
09/18/18	14.00	09/18/18	1.60	09/18/18	0.93		
05/14/19	10.00	05/14/19	1.90	05/14/19	1.00	05/14/19	1.20
06/04/19	11.00	06/04/19	2.00	06/04/19	1.10		
07/02/19	9.90	07/02/19	1.50	07/02/19	0.82		
08/06/19	10.00	08/06/19	1.00	08/06/19	0.72	08/06/19	0.84
09/03/19	11.00	09/03/19	1.20	09/03/19	0.62		
05/19/20	11.00	05/19/20	2.50	05/19/20	1.00	05/19/20	1.00
06/02/20	11.00	06/02/20	2.30	06/02/20	1.30		
07/07/20	16.00	07/07/20	1.30	07/07/20	0.79		
08/04/20	12.00	08/04/20	0.93	08/04/20	1.10	08/04/20	0.70
09/01/20	13.00	09/01/20	1.40	09/01/20	1.10		
03/29/21	16.00	03/29/21	2.10	03/29/21	1.80	03/29/21	1.20
04/06/21	13.00	04/06/21	2.70	04/06/21	2.10		
05/04/21	10.00	05/04/21	2.70	05/04/21	1.90	05/04/21	1.50
06/01/21	13.00	06/01/21	2.30	06/01/21	1.60		
07/06/21	16.00	07/06/21	1.40	07/06/21	0.88		
08/03/21	14.00	08/03/21	1.10	08/03/21	0.70	08/03/21	0.90
09/07/21	23.00	09/07/21	1.50	09/07/21	0.94		
05/17/22	14.00	05/17/22	1.70	05/17/22	1.60	05/17/22	1.30
06/07/22	15.00	06/07/22	1.80	06/07/22	1.10	06/07/22	1.40
07/05/22	16.00	07/05/22	1.40	07/05/22	0.93	07/05/22	1.10
08/02/22	18.00	08/02/22	1.30	08/02/22	0.84	08/02/22	1.10
09/06/22	16.00	09/06/22	1.20	09/06/22	0.89	09/06/22	1.10
10/06/22	15.00	10/06/22	1.50	10/06/22	1.30	10/06/22	1.30

DATE	Total Coliform QT MPN/100 mL EDHWTP-Source Water	eColi Coliform QT MPN/100 mL EDHWTP-Source Water
01/09/18	460	15.0
02/21/18	54	1.0
03/2018	Offline	
04/10/18	172	2.0
05/08/18	225	1.0
06/14/18	26	<1.0
07/10/18	326	<1.0
08/14/18	108	<1.0
09/11/18	72	<1.0
10/09/18	548	33.6
11/13/18	179	4.1
12/11/18	108	11.0
01/08/19	435	34.5
02/15/19	2,420	139.6
03/18/19	276	4.1
04/09/19	102	4.1
06/11/19	133	<1.0
07/16/19	62	<1.0
08/13/19	121	<1.0
09/10/19	273	<1.0
10/08/19	124	1.0
11/12/19	122	2.0
12/10/19	816	52.0
01/14/20	37	1.0
02/11/20	28	<1.0
03/10/20	113	2.0
04/14/20	326	14.6
05/12/20	157	<1.0
06/09/20	687	1.0
07/14/20	613	<1.0
08/11/20	99	<1.0
09/08/20	83	<1.0
10/06/20	261	2.0
11/10/20	276	2.0
12/2020	Offline	
01/2021	Offline	
02/2021	Offline	
03/2021	Offline	
04/13/21	46	1.0
05/11/21	201	4.1
06/08/21	110	<1.0
07/13/21	145	<1.0
08/10/21	248	4.1
09/14/21	579	6.3
10/12/21	172	1.0
11/09/21	866	16.1
12/14/21	>2,420	613.1
01/10/22	194	6.3
02/08/22	64	<1.0
03/8/2022	365.4	1.0
4/13/2022	45.7	1.0
5/11/2022	201.4	4.1
06/14/22	167	<1.0
07/12/22	166	<1.0
08/09/22	214	1.0
09/13/22	435	1.0
10/11/22	816	5.2
11/08/22	308	10.9
12/13/22	461	29.2

	EDHWTP-Source Water		EDHWTP-Source Water		EDHWTP-Combined Filter Effluent
Units	Alkalinity CaCO3 mg/L		TOC mg/L		TOC mg/L
Date		Date		Date	
01/09/18	20	01/09/18	1.7	01/09/18	1.3
* 2/18					
* 3/18					
04/10/18	26	04/10/18	2.3	04/10/18	1.5
05/08/18	22	05/08/18	2.0	05/08/18	1.4
06/14/18	22	06/14/18	2.0	06/14/18	1.4
07/10/18	23	07/10/18	2.0	07/10/18	1.5
08/14/18	22	08/14/18	1.8	08/14/18	1.3
09/11/18	20	09/11/18	1.6	09/11/18	1.2
10/09/18	15	10/09/18	1.7	10/09/18	1.3
11/13/18	22	11/13/18	1.5	11/13/18	1.2
12/11/18	23	12/11/18	1.6	12/11/18	1.2
01/08/19	25	01/08/19	1.8	01/08/19	1.3
02/15/19	25	02/15/19	2.8	02/15/19	1.7
03/18/19	26	03/18/19	1.4	03/18/19	1.0
04/09/19	24	04/09/19	1.5	04/09/19	1.2
05/14/19	22	05/14/19	1.3	05/14/19	1.0
06/11/19	18	06/11/19	1.7	06/11/19	1.3
07/16/19	17	07/16/19	1.6	07/16/19	1.0
08/13/19	14	08/13/19	1.5	08/13/19	1.3
09/11/19	14	09/11/19	1.3	09/11/19	0.96
10/10/19	12	10/10/19	1.3	10/10/19	0.99
11/12/19	14	11/12/19	1.5	11/12/19	1.2
12/10/19	22	12/10/19	1.6	12/10/19	1.2
01/14/20	22	01/14/20	1.1	01/14/20	0.84
02/11/20	25	02/11/20	0.99	02/11/20	0.81
03/10/20	24	03/10/20	4.2	03/10/20	4.2
04/14/20	33	04/14/20	3.4	04/14/20	2.5
05/12/20	31	05/12/20	4.2	05/12/20	3.3
06/09/20	29	06/09/20	2.0	06/09/20	1.6
07/14/20	28	07/14/20	1.5	07/14/20	1.1
08/11/20	26	08/11/20	1.4	08/11/20	1.1
09/08/20	23	09/08/20	1.2	09/08/20	1.0
10/06/20	16	10/06/20	1.3	10/06/20	1.1
11/10/20	17	11/10/20	1.3	11/10/20	1.2
* 12/20					
* 1/21					
* 2/21					
* 3/21					
04/13/21	27	04/13/21	1.3	04/13/21	1.2
05/11/21	24	05/11/21	1.8	05/11/21	1.7
06/08/21	29	06/08/21	1.6	06/08/21	1.4
07/13/21	30	07/13/21	1.4	07/13/21	1.1
08/30/21	17	08/30/21	1.2	08/30/21	1.0
09/14/21	20	09/14/21	1.3	09/14/21	1.1
10/12/21	24	10/12/21	1.2	10/12/21	1.0
11/09/21	29	11/09/21	2.0	11/09/21	1.7
12/14/21	33	12/14/21	3.3	12/14/21	2.0
01/10/22	31	01/10/22	2.0	01/10/22	1.6
02/08/22	29	02/08/22	1.8	02/08/22	1.4
03/08/22	28	03/08/22	1.6	03/08/22	1.3
04/12/22	25	04/12/22	1.8	04/12/22	1.5
05/10/22	22	05/10/22	1.4	05/10/22	1.1
06/14/22	22	06/14/22	1.5	06/14/22	1.1
07/12/22	21	07/12/22	1.4	07/12/22	1.0
08/09/22	22	08/09/22	1.6	08/09/22	1.3
09/13/22	23	09/13/22	1.5	09/13/22	1.2
10/11/22	18	10/11/22	1.7	10/11/22	1.4
11/08/22	23	11/08/22	1.5	11/08/22	1.1
12/13/22	30	12/13/22	1.8	12/13/22	1.6

THM

System Name: El Dorado Irrigation District : Main Water System

Year:	2018				2019				2020				2021				2022			
Quarter:	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. -2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
Sample Date (month/day):	02/12	05/07	08/13	Various	Various	Various	Various	Various	02/11	05/14	08/11	11/09	02/09	05/11	08/10	Various	02/08	05/10	08/09	11/08
Site 1: 6793 McGuire Ct.	86.00	67.00	35.00	47.00	57.00	49.00	33.00	35.00	40.00	34.00	28.00	33.00	28.00	64.00	24.00	73.00	45.00	32.00	36.00	36.00
Site 2: 7944 Crystal Blvd.	46.00	57.00	42.00	48.00	52.00	49.00	38.00	46.00	52.00	46.00	35.00	33.00	38.00	38.00	39.00	68.00	54.00	47.00	44.00	40.00
Site 3: 4801 Luneman Rd.	50.00	48.00	32.00	38.00	42.00	41.00	35.00	29.00	41.00	31.00	27.00	27.00	29.00	46.00	28.00	70.00	46.00	33.00	31.00	33.00
Site 4: Sly Park Rd. & Jenkinson Cr.	41.00	65.00	49.00	48.00	47.00	68.00	55.00	40.00	61.00	39.00	58.00	40.00	37.00	73.00	33.00	81.00	44.00	49.00	51.00	48.00
Site 5: 5170 Highcrest Dr.	36.00	58.00	38.00	39.00	43.00	42.00	32.00	33.00	36.00	33.00	34.00	27.00	30.00	32.00	43.00	76.00	47.00	41.00	37.00	40.00
Site 6: 4625 Latrobe Rd.	43.00	51.00	43.00	41.00	73.00	47.00	48.00	47.00	19.00	55.00	45.00	49.00	32.00	69.00	44.00	81.00	68.00	46.00	49.00	37.00
Site 7: Chateau Montelana Dr. & Salmon Falls Rd.	50.00	68.00	53.00	46.00	76.00	50.00	43.00	57.00	58.00	59.00	62.00	49.00	39.00	77.00	61.00	78.00	72.00	60.00	63.00	57.00
Site 8: Aliso Dr. & Walker Dr.	36.00	51.00	40.00	38.00	67.00	42.00	39.00	54.00	42.00	55.00	41.00	38.00	30.00	64.00	43.00	71.00	53.00	40.00	45.00	37.00
Quarterly Average	48.50	58.13	41.50	43.13	57.13	48.50	40.38	42.63	43.63	44.00	41.25	37.00	32.88	57.88	39.38	74.75	53.63	43.50	44.50	41.00

ind min 19.00
ind max 86.00

min qtr 32.88
max qtr 74.75

Year:	2018				2019				2020				2021				2022			
Quarter:	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. -2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
Sample Date (month/day):	02/12	05/07	08/13	Various	Various	Various	Various	Various	02/11	05/14	08/11	11/09	02/09	05/11	08/10	Various	02/08	Various	08/09	11/08
Site 1: 6793 McGuire Ct., Placerville (MWS-SS23)	52.00	48.00	41.00	39.00	48.00	36.00	36.00	30.00	53.00	48.00	34.00	36.00	35.00	75.00	24.00	57.00	52.00	35.00	22.00	30.00
Site 2: 7944 Crystal Blvd., El Dorado (MWS-SS02)	33.00	39.00	34.00	29.00	30.00	27.00	34.00	26.00	30.00	28.00	45.00	33.00	25.00	25.00	22.00	60.00	35.00	29.00	24.00	25.00
Site 3: 4801 Luneman Rd., Placerville (MWS-SS14)	54.00	58.00	39.00	40.00	49.00	46.00	34.00	33.00	54.00	43.00	32.00	38.00	38.00	61.00	27.00	95.00	49.00	40.00	26.00	42.00
Site 4: Sly Park Rd. & Jenkinson Cr., Pollock Pines (MWS-SS26)	46.00	46.00	16.00	30.00	36.00	41.00	21.00	30.00	48.00	52.00	26.00	38.00	38.00	67.00	17.00	69.00	50.00	47.00	14.00	26.00
Site 5: 5170 Highcrest Dr., Cameron Park (MWS-SS27)	57.00	66.00	46.00	40.00	42.00	36.00	38.00	35.00	48.00	44.00	39.00	35.00	37.00	41.00	25.00	98.00	51.00	40.00	29.00	32.00
Site 6: 4625 Latrobe Rd., El Dorado Hills (MWS-SS28)	45.00	62.00	42.00	31.00	38.00	42.00	39.00	34.00	61.00	62.00	35.00	32.00	39.00	45.00	30.00	51.00	69.00	44.00	20.00	24.00
Site 7: Chateau Montelana Dr. & Salmon Falls Rd., El Dorado Hills (MWS-SS04)	47.00	81.00	50.00	30.00	57.00	51.00	32.00	25.00	52.00	39.00	29.00	31.00	22.00	23.00	25.00	48.00	63.00	48.00	16.00	27.00
Site 8: Aliso Dr. & Walker Dr., El Dorado Hills (MWS-SS05)	55.00	67.00	39.00	27.00	41.00	46.00	28.00	37.00	56.00	58.00	28.00	40.00	35.00	36.00	31.00	53.00	63.00	41.00	19.00	31.00
Quarterly Average	48.63	58.38	38.38	33.25	42.63	40.63	32.75	31.25	50.25	46.75	33.50	35.38	33.63	46.63	25.13	66.38	54.00	40.50	21.25	29.63

ind min 14.00
ind max 98.00

min qtr 21.25
max qtr 66.38

Date	Walton WTP E. Coli
1/2/2018	130
2/5/2018	4.5
3/5/2018	13
4/2/2018	17
5/7/2018	11
6/4/2018	23
6/25/2018	14
7/2/2018	6.8
7/16/2018	49
7/30/2018	49
8/13/2018	6.8
9/10/2018	1.8
9/24/2018	6.8
10/8/2018	49
10/22/2018	11
11/2/2018	23
11/19/2018	33
12/3/2018	33
12/17/2018	49
12/31/2018	7.8
1/22/2019	94
2/6/2019	2
2/19/2019	14
3/4/2019	4.5
3/18/2019	7.8
4/1/2019	33
4/15/2019	1.8
4/29/2019	23
5/13/2019	33
5/29/2019	2
6/11/2019	33
6/24/2019	130
7/15/2019	33
8/6/2019	23
9/3/2019	79
10/7/2019	70
11/4/2019	33
12/2/2019	350
1/6/2020	6.8
2/4/2020	46
3/2/2020	23
4/6/2020	17
5/5/2020	23
6/2/2020	33
7/2/2020	7.8
8/4/2020	49
9/1/2020	13
10/7/2020	31
11/3/2020	22
12/7/2020	23
1/4/2021	33
2/16/2021	33
3/1/2021	7.8
4/5/2021	1.8
5/11/2021	79
6/1/2021	110
7/13/2021	22
8/3/2021	33
9/7/2021	110
10/13/2021	170
11/2/2021	540
12/1/2021	130
1/4/2022	63
2/1/2022	33
3/1/2022	1.8
4/5/2022	70
5/3/2022	70
6/1/2022	14
7/5/2022	4.5
8/2/2022	49
9/6/2022	79
10/4/2022	49
11/1/2022	110
12/6/2022	13

Date	*Auburn Lakes WTP E. coli*
1/2/2018	1.8
2/5/2018	49
3/5/2018	4.5
4/2/2018	1.8
5/7/2018	79
6/4/2018	17
6/25/2018	17
7/2/2018	130
7/16/2018	14
7/30/2018	110
8/13/2018	49
9/10/2018	1.8
9/24/2018	21
10/8/2018	26
10/22/2018	79
11/2/2018	240
11/19/2018	79
12/3/2018	79
12/17/2018	49
12/31/2018	46
1/22/2019	110
2/6/2019	1.8
2/19/2019	1.8
3/4/2019	1.8
3/18/2019	7.8
4/1/2019	1.8
4/15/2019	33
4/29/2019	49
5/13/2019	1.8
5/29/2019	49
6/11/2019	70
6/24/2019	130
7/15/2019	130
8/6/2019	130
9/3/2019	40
10/7/2019	13
11/4/2019	70
12/2/2019	49
1/6/2020	4
2/4/2020	46
3/2/2020	23
4/6/2020	46
5/5/2020	110
6/2/2020	110
7/2/2020	14
8/4/2020	21
9/1/2020	21
10/7/2020	350
11/3/2020	170
12/7/2020	33
1/4/2021	13
2/16/2021	33
3/1/2021	79
4/5/2021	3.6
5/11/2021	49
6/1/2021	22
7/13/2021	49
8/3/2021	49
9/7/2021	13
10/13/2021	79
11/2/2021	240
12/1/2021	170
1/4/2022	49
2/1/2022	1.8
3/1/2022	23
4/5/2022	49
5/3/2022	22
6/1/2022	7.8
7/5/2022	33
8/2/2022	49
9/6/2022	49
10/4/2022	33
11/1/2022	70
12/6/2022	23

State of California
Drinking Water Program

Department of Health Services

Stage 2 DBP-Quarterly TTHM Report for Disinfection Byproducts Compliance (in μg/L or ppb)

System Name: Georgetown Divide Public Utility District System No.: 910013 Year: 2022 Quarter: 3

Year:	2018				2019				2020				2021				2022			
Quarter:	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
nple Date (month/date):	1/16	4/12	7/16	10/30	1/22	4/8	7/8	10/14	2/10	5/12	8/11	11/3	2/8	5/11	8/17	11/9	2/15	5/17	8/2	11/15
Site 1	34.0	41.0	22.0	32.0	26.8	53.0	19.0	22.0	53.0	38.0	28.0	20.0	49.0	38.0	22.0	25.0	12.0	12.0	55.0	48.0
Site 2	17.0	15.0	18.0	17.0	10.6	16.0	14.0	15.0	14.0	15.0	7.9	29.0	17.0	13.0	11.0	65.0	46.0	24.0	25.0	21.0
SM#1																				
SM#2																				
SM#3																				
SM#4																				
Site 7																				
Site 8																				
Site 9																				
Site 10																				
Site 11																				
Site 12																				
Quarterly Average	25.5	28.0	20.0	24.5	18.7	34.5	16.5	18.5	33.5	26.5	18.0	24.5	33.0	25.5	16.5	45.0	29.0	18.0	40.0	34.5
Running Annual	30.4	26.3	25.5	24.5	22.8	24.4	23.6	22.1	25.8	23.8	24.1	25.6	25.5	25.2	24.9	30.0	29.0	27.1	33.0	30.4
Meets Standard?* (check box)	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐
Number of Samples Taken	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Identify the sample locations in the table below.

Site	Sample Location
1	Auburn Lake Trails Water System-End of Meadowcroft Lane in Pilot Hil
2	Walton Lake Water System-End of Sliger Mine Rd. in Greenwood
SM#1	Walton Lake Water System-Greenwood USPS
SM#2	Auburn Lake Trails Water System-End of Rattlesnake Bar Rd. in Pilot H
SM#3	Walton Lake Water System- End of Stewart Mine Rd. in Kelsey
SM#4	Auburn Lake Trails Water System-Pilot Hill USPS

Comments:

Martin Ceirante WTPO Lead/Chief Operator

12/7/2022

Signature Date

*If, during the first year of monitoring, any individual quarter's average will cause the running annual average of that system to exceed the standard, then the system is out of compliance at the end of that quarter.

State of California
Drinking Water Program

Department of Healtl

Stage 2 DBP-Quarterly HAA5 Report for Disinfection Byproducts Compliance (in μg/L or ppb)

System Name: Georgetown Divide Public Utility District   System No.: 910013   Year: 2022   Quarter: 3

Year:	2018				2019				2020				2021				2022			
Quarter:	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
ple Date (month/date):	1/16	4/12	7/16	10/30	1/22	4/8	7/8	10/14	2/10	5/12	8/11	11/3	2/8	5/11	8/17	11/9	2/15	5/17	8/2	11/15
Site 1	23.0	24.0	12.0	17.6	31	32.5	10.5	12.1	51.6	14.1	17.8	10.5	9.1	28	13	9.8	11.3	8	22.4	38.6
Site 2	11.0	9.0	7.1	8.0	14	8.6	5.9	5.8	9.5	7.5	4.9	20.8	34	7	4.1	52.8	46	22.9	8.8	18.1
SM#1																				
SM#2																				
SM#3																				
SM#4																				
Site 7																				
Site 8																				
Site 9																				
Site 10																				
Site 11																				
Site 12																				
Quarterly Average	16.0	15.1	9.0	9.6	17.0	16.5	9.6	12.8	22.5	20.6	8.2	9.0	21.6	17.5	8.6	31.3	28.7	15.5	15.6	28.4
Running Annual Average	13.9	12.8	12.6	12.4	12.6	13.0	13.2	14.0	15.3	16.4	16.0	15.1	14.8	14.1	14.1	19.7	21.5	21.0	22.8	22.0
Meets Standard? ☑ (check box) ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐	Yes ☑ No ☐
Number of Samples Taken	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

Identify the sample locations in the table below.

Site	Sample Location
1	Auburn Lake Trails Water System-End of Meadowcroft Lane in Pilot Hi
2	Walton Lake Water System-End of Sliger Mine Rd. in Greenwood
SM#1	Walton Lake Water System-Greenwood USPS
SM#2	Auburn Lake Trails Water System-End of Rattlesnake Bar Rd. in Pilot
SM#3	Walton Lake Water System- End of Stewart Mine Rd. in Kelsey
SM#4	Auburn Lake Trails Water System-Pilot Hill USPS

Comments:

Martin Ceirante **WTPO Lead/Chief Operator**

Signature   Date **12/7/2022**

*If, during the first year of monitoring, any individual quarter's average will cause the running annual average of that system to exceed the standard, then the system is out of compliance at the end of that quarter.

City of Folsom Treatment Plant (Raw) Samples

2018		
Date	E.Coli	Total Coliforms
3-Jan	52.00	120.00
9-Jan	50.00	84.00
16-Jan	13.00	220.00
23-Jan	24.00	76.00
30-Jan	31.00	68.00
6-Feb	41.00	110.00
13-Feb	44.00	100.00
20-Feb	16.00	33.00
27-Feb	35.00	64.00
5-Mar	17.00	50.00
12-Mar	69.00	110.00
19-Mar	30.00	88.00
27-Mar	46.00	920.00
3-Apr	9.80	126.60
10-Apr	10.90	71.20
17-Apr	4.10	108.10
24-Apr	2.00	53.00
1-May	1.00	31.30
8-May	3.10	44.80
15-May	2.00	36.90
22-May	2.00	53.00
29-May	1.00	38.40
6-Jun	1.00	18.90
12-Jun	<1	13.50
19-Jun	<1	6.30
26-Jun	<1	13.50
3-Jul	<1	29.30
10-Jul	<1	63.70
24-Jul	<1	165.00
31-Jul	1.00	517.20
7-Aug	<1	344.80
14-Aug	<1	365.40
21-Aug	1.00	179.30
28-Aug	10.90	218.70
4-Sep	2.00	111.90
11-Sep	3.10	204.60
18-Sep	4.10	130.90
25-Sep	<1	410.60
2-Oct	3.10	290.90
9-Oct	3.10	261.30
16-Oct	25.90	517.20
23-Oct	6.30	325.50
30-Oct	16.60	209.80
13-Nov	18.90	121.00
20-Nov	10.80	128.10
27-Nov	13.20	101.90
3-Dec	19.90	127.40
11-Dec	17.30	115.30
18-Dec	111.90	307.60
26-Dec	107.60	285.10

City of Folsom Treatment Plant (Raw) Samples

2019		
Date	E.Coli	Total Coliforms
2-Jan	12.20	36.90
7-Jan	11.00	53.80
14-Jan	36.80	133.30
22-Jan	11.90	160.70
5-Feb	24.10	123.60
12-Feb	20.10	88.20
4-Mar	4.10	44.10
12-Mar	7.50	76.70
19-Mar	6.30	24.30
25-Mar	10.90	27.50
9-Apr	2.00	24.90
15-Apr	2.00	25.90
23-Apr	1.00	37.90
30-Apr	<1	18.90
7-May	<1	17.50
14-May	<1	35.90
20-May	1.00	54.80
28-May	1.00	56.50
4-Jun	<1	24.60
11-Jun	1.00	28.80
18-Jun	<1	39.30
25-Jun	<1	38.90
2-Jul	<1	34.50
9-Jul	<1	21.80
16-Jul	1.00	42.60
23-Jul	<1	57.60
30-Jul	<1	73.30
6-Aug	<1	40.80
13-Aug	<1	235.90
20-Aug	<1	1203.30
3-Sep	<1	547.50
9-Sep	2.00	228.20
17-Sep	<	115.30
24-Sep	1.00	83.60
1-Oct	9.50	88.20
8-Oct	8.50	101.70
15-Oct	4.10	83.30
22-Oct	10.80	70.80
29-Oct	23.30	196.80
5-Nov	60.20	184.20
12-Nov	27.20	98.80
19-Nov	10.70	77.60
25-Nov	12.10	53.80
3-Dec	12.10	34.50
10-Dec	12.00	65.70
17-Dec	34.50	78.90
23-Dec	18.30	37.30
30-Dec	9.80	27.90

City of Folsom Treatment Plant (Raw) Samples

2020		
Date	E.Coli	Total Coliforms
7-Jan	5.20	21.10
13-Jan	4.10	25.30
21-Jan	6.20	13.10
28-Jan	14.80	28.20
4-Feb	21.30	59.10
11-Feb	4.10	16.90
18-Feb	30.50	74.90
25-Feb	18.10	34.00
3-Mar	10.00	43.20
11-Mar	18.70	42.60
17-Mar	20.30	187.20
23-Mar	8.50	48.00
31-Mar	2.00	93.30
7-Apr	1.00	67.00
14-Apr	1.00	78.50
21-Apr	2.00	105.00
28-Apr	4.10	35.50
5-May	<1	79.40
12-May	1.00	143.00
19-May	1.00	648.80
26-May	<1	1413.60
2-Jun	<1	1203.30
9-Jun	<1	1553.10
16-Jun	<1	579.40
23-Jun	<1	325.50
30-Jun	<1	435.20
7-Jul	<1	689.30
14-Jul	<1	1203.30
21-Jul	<1	1119.90
28-Jul	<1	1119.90
4-Aug	1.00	547.50
11-Aug	2.00	204.80
18-Aug	1.00	293.30
25-Aug	<1	99.00
1-Sep	1.00	101.70
8-Sep	1.00	139.60
15-Sep	3.10	146.70
22-Sep	1.00	111.20
29-Sep	1.00	235.90
6-Oct	2.00	238.20
13-Oct	6.30	1119.90
20-Oct	9.80	980.40
27-Oct	23.10	1553.10
3-Nov	145.00	866.40
10-Nov	10.90	461.10
16-Nov	9.80	365.40
24-Nov	13.50	275.50
1-Dec	38.40	133.30
8-Dec	16.10	88.40
15-Dec	12.00	90.60
21-Dec	13.50	88.40
28-Dec	10.90	69.70

City of Folsom Treatment Plant (Raw) Samples

2021		
Date	E.Coli	Total Coliforms
5-Jan	9.70	70.30
12-Jan	24.30	125.00
19-Jan	31.30	75.40
26-Jan	27.90	75.40
1-Feb	24.90	145.00
9-Feb	18.90	60.90
16-Feb	9.60	81.60
23-Feb	8.50	46.40
2-Mar	9.80	86.50
8-Mar	9.80	54.80
16-Mar	2.00	26.20
23-Mar	4.10	56.50
30-Mar	8.60	56.50
6-Apr	4.10	148.40
13-Apr	3.00	146.40
20-Apr	2.00	42.60
27-Apr	2.00	83.60
4-May	1.00	121.10
11-May	3.10	>2419.6
18-May	1.00	2419.60
25-May	1.00	727.00
1-Jun	<1	648.80
8-Jun	<1	178.90
15-Jun	<1	129.60
22-Jun	<1	79.80
29-Jun	<1	85.50
6-Jul	<1	686.70
13-Jul	<1	461.10
20-Jul	<1	290.90
27-Jul	<1	165.80
3-Aug	<1	112.60
10-Aug	<1	88.20
17-Aug	3.10	275.50
24-Aug	2.00	648.80
31-Aug	3.10	547.50
7-Sep	1.00	488.40
14-Sep	2.00	770.10
21-Sep	1.00	770.10
28-Sep	14.80	435.20
5-Oct	5.20	285.10
12-Oct	36.80	1119.90
19-Oct	16.90	387.30
26-Oct	517.20	>2419.6
2-Nov	29.90	198.90
9-Nov	44.80	517.20
16-Nov	20.10	290.90
23-Nov	83.90	816.40
30-Nov	41.70	325.50
7-Dec	16.00	172.20
14-Dec	27.90	228.20
20-Dec	19.90	547.50
28-Dec	24.30	275.50

City of Folsom Treatment Plant (Raw) Samples

2022		
Date	E.Coli	Total Coliforms
4-Jan	9.60	224.70
12-Jan	4.10	104.60
18-Jan	3.10	58.30
25-Jan	9.60	49.60
1-Feb	6.30	36.40
8-Feb	1.00	39.30
15-Feb	7.50	53.00
22-Feb	10.90	31.70
1-Mar	35.50	95.90
8-Mar	8.60	48.70
14-Mar	9.80	52.90
22-Mar	21.10	73.30
29-Mar	5.20	18.10
5-Apr	4.10	47.10
12-Apr	3.10	156.50
18-Apr	2.00	150.00
26-Apr	<1	1413.60
3-May	<1	866.00
10-May	1.00	980.40
17-May	<1	231.80
24-May	<1	517.20
31-May	<1	218.70
7-Jun	<1	186.00
14-Jun	<1	157.60
21-Jun	<1	28.40
28-Jun	<1	85.20
5-Jul	<1	88.60
12-Jul	<1	186.00
19-Jul	2.00	108.10
26-Jul	<1	35.40
2-Aug	<1	49.60
9-Aug	1.00	67.00
16-Aug	3.10	231.00
23-Aug	<1	920.80
30-Aug	2.00	410.60
6-Sep	2.00	238.20
13-Sep	9.70	461.10
20-Sep	7.50	387.30
27-Sep	4.10	410.60
4-Oct	11.00	648.80
11-Oct	2.00	1986.30
18-Oct	8.60	1299.70
25-Oct	6.30	410.60
31-Oct	9.80	686.70
7-Nov	4.10	228.20
14-Nov	28.10	435.20
22-Nov	13.40	290.90
29-Nov	13.40	88.20
6-Dec	4.10	34.50
13-Dec	28.50	290.90
20-Dec	5.00	90.80
28-Dec	12.10	68.40

City of Folsom - Main/3410014
DBP Precursor Removal Compliance Calculations For Water Utility
Enhanced Coagulation - Year 15

Year: 2018

Month	Day	Source Water Alk (mg/L)	Source Water TOC (mg/L)	Treated Water TOC (mg/L)	Basis for Required % Removal	(A) Actual % TOC Removal	(B) Required % TOC Removal	(C) Removal Ratio (A) / (B)	(D)a Quarterly Average Ratio	(E)b RAA Ratio (Last 4 Quarters)	In Compliance Yes/No?
January	16	24	1.5	1.0	Step 1	33.3%	-	1.00			
February	13	25	1.6	1.1	Step 1	31.3%	-	1.00			Yes
March	12	23	1.6	1.0	Step 1	37.5%	35.0%	1.07	1.02	1.05	
April	17	22	1.8	1.0	Step 1	44.4%	35.0%	1.27			
May	16	23	1.8	1.0	Step 1	44.4%	35.0%	1.27			Yes
June	19	23	1.7	1.1	Step 1	35.3%	35.0%	1.01	1.18	1.08	
July	19	23	1.5	0.9	Step 1	37.3%	35.0%	1.07			
August	20	22	1.7	1.0	Step 1	41.2%	35.0%	1.18			Yes
September	18	17	1.3	1.1	Step 1	15.4%	-	1.00	1.08	1.09	
October	17	21	1.4	1.0	Step 1	30.0%	-	1.00			
November	20	24	1.5	1.7	Step 1	0.0%	-	1.00			Yes
December	18	25	1.2	1.0	Step 1	20.0%	-	1.00	1.00	1.07	

[a] Quarterly ratio calculated as an average of the actual / required % removal ratio for the three months in that quarter.
[b] Running Annual Average (RAA) of quarterly TOC % removal ratios for the last four quarters; if the results in column (E) is greater than or equal to 1.00, then the system is in compliance with the TOC removal requirements.

Treated Water TOC Sample Location: **WTP Chlorine Contact Tank Effluent**

City of Folsom - Main/3410014
DBP Precursor Removal Compliance Calculations For Water Utility
Enhanced Coagulation - Year 16

Year: 2019

Month	Day	Source Water Alk (mg/L)	Source Water TOC (mg/L)	Treated Water TOC (mg/L)	Basis for Required % Removal	(A) Actual % TOC Removal	(B) Required % TOC Removal	(C) Removal Ratio (A) / (B)	(D)a Quarterly Average Ratio	(E)b RAA Ratio (Last 4 Quarters)	In Compliance Yes/No?
January	14	26	1.3	0.9	Step 1	27.7%	-	1.00			
February	19	28	1.4	1.0	Step 1	28.6%	-	1.00			Yes
March	20	27	1.5	1.1	Step 1	26.7%	-	1.00	1.00	1.07	
April	15	25	0.9	0.7	Step 1	29.8%	-	1.00			
May	14	16	1.3	1.1	Step 1	15.4%	-	1.00			Yes
June	18	16	1.4	0.9	Step 1	35.7%	35.0%	1.02	1.01	1.02	
July	3	15	1.4	1.0	Step 1	28.6%	-	1.00			
August	20	14	1.4	1.2	Step 1	14.3%	-	1.00			Yes
September	17	14	1.4	1.0	Step 1	30.0%	-	1.00	1.00	1.00	
October	15	17	1.2	0.9	Step 1	27.5%	-	1.00			
November	19	18	1.3	0.8	Step 1	37.7%	35.0%	1.08			Yes
December	17	22	1.6	1.5	Step 1	6.3%	-	1.00	1.03	1.01	

[a] Quarterly ratio calculated as an average of the actual / required % removal ratio for the three months in that quarter.
[b] Running Annual Average (RAA) of quarterly TOC % removal ratios for the last four quarters; if the results in column (E) is greater than or equal to 1.00, then the system is in compliance with the TOC removal requirements.

Treated Water TOC Sample Location: **WTP Chlorine Contact Tank Effluent**

City of Folsom - Main/3410014
DBP Precursor Removal Compliance Calculations For Water Utility
Enhanced Coagulation - Year 17

Year: 2020

Month	Day	Source Water Alk (mg/L)	Source Water TOC (mg/L)	Treated Water TOC (mg/L)	Basis for Required % Removal	(A) Actual % TOC Removal	(B) Required % TOC Removal	(C) Removal Ratio (A) / (B)	(D)a Quarterly Average Ratio	(E)b RAA Ratio (Last 4 Quarters)	In Compliance Yes/No?
January	16	21	1.0	0.7	Step 1	30.0%	-	1.00			
February	18	23	1.0	0.7	Step 1	30.0%	-	1.00			Yes
March	17	25	2.6	1.5	Step 1	42.3%	35.0%	1.21	1.07	1.07	
April	14	27	1.2	1.0	Step 1	20.8%	-	1.00			
May	19	28	1.2	0.8	Step 1	32.5%	-	1.00			Yes
June	16	27	1.3	0.8	Step 1	38.5%	35.0%	1.10	1.03	1.05	
July	17	27	1.3	0.9	Step 1	28.5%	-	1.00			
August	18	24	1.2	0.8	Step 1	34.2%	-	1.00			Yes
September	16	17	1.1	0.7	Step 1	32.7%	-	1.00	1.00	1.03	
October	14	17	1.5	1.1	Step 1	26.7%	-	1.00			
November	16	22	1.4	1.1	Step 1	21.4%	-	1.00			Yes
December	15	22	1.3	0.7	Step 1	45.4%	35.0%	1.30	1.10	1.05	

City of Folsom - Main/3410014
DBP Precursor Removal Compliance Calculations For Water Utility
Enhanced Coagulation - Year 18

Year: 2021

Month	Day	Source Water Alk (mg/L)	Source Water TOC (mg/L)	Treated Water TOC (mg/L)	Basis for Required % Removal	(A) Actual % TOC Removal	(B) Required % TOC Removal	(C) Removal Ratio (A) / (B)	(D)a Quarterly Average Ratio	(E)b RAA Ratio (Last 4 Ouarters)	In Compliance Yes/No?
January	20	23	2.2	2.0	Step 1	9.1%	-	1.00			
February	24	26	0.8	0.6	Step 1	33.7%	-	1.00			Yes
March	16	28	1.2	0.9	Step 1	21.7%	35.0%	1.00	1.00	1.03	
April	20	28	1.2	0.9	Step 1	27.5%	35.0%	1.00			
May	18	28	1.2	1.0	Step 1	18.3%	35.0%	1.00			Yes
June	21	28	1.2	0.9	Step 1	27.5%	35.0%	1.00	1.00	1.02	
July	20	26	1.2	0.8	Step 1	34.2%	35.0%	1.00			
August	17	21	1.2	0.8	Step 1	33.3%	35.0%	1.00			Yes
September	20	25	1.1	0.8	Step 1	25.5%	35.0%	1.00	1.00	1.02	
October	19	26	1.0	0.7	Step 1	25.0%	-	1.00			
November	16	26	3.4	2.1	Step 1	38.2%	35.0%	1.09			Yes
December	21	28	2.2	1.5	Step 1	31.8%	35.0%	1.00	1.03	1.01	

[a] Quarterly ratio calculated as an average of the actual / required % removal ratio for the three months in that quarter.

[b] Running Annual Average (RAA) of quarterly TOC % removal ratios for the last four quarters; if the results in column (E) is greater than or equal to 1.00, then the system is in compliance with the TOC removal requirements.

Treated Water TOC Sample Location: **WTP Chlorine Contact Tank Effluent**

DBP Precursor Removal Compliance Calculations For Water Utility
DBP Precursor Removal Compliance Calculations For Water Utility
Enhanced Coagulation - Year 18

Year: 2022

Month	Day	Source Water Alk (mg/L)	Source Water TOC (mg/L)	Treated Water TOC (mg/L)	Basis for Required % Removal	(A) Actual % TOC Removal	(B) Required % TOC Removal	(C) Removal Ratio (A) / (B)	(D)a Quarterly Average Ratio	(E)b RAA Ratio (Last 4 Ouarters)	In Compliance Yes/No?
January	15	30	1.7	0.9	Step 1	47.1%	-	1.00			
February	15	29	1.8	1.0	Step 1	44.4%	-	1.00			Yes
March	14	31	1.7	1.0	Step 1	41.2%	35.0%	1.18	1.06	1.03	
April	19	28	1.5	0.9	Step 1	40.0%	35.0%	1.14			
May	17	26	1.5	0.9	Step 1	37.3%	35.0%	1.07			Yes
June	14	24	1.4	0.9	Step 1	35.0%	35.0%	1.00	1.07	1.05	
July	24	24	1.4	0.9	Step 1	32.9%	35.0%	1.00			
August	24	24	1.1	0.7	Step 1	40.9%	35.0%	1.17			Yes
September	25	25	1.4	0.9	Step 1	34.3%	35.0%	1.00	1.06	1.06	
October	18	20	1.4	1.1	Step 1	21.4%	-	1.00			
November	15	25	1.2	0.8	Step 1	34.2%	35.0%	1.00			Yes
December	20	31	1.7	1.2	Step 1	29.4%	35.0%	1.00	1.00	1.05	

For questions, contact Guy Schott, guy.schott@cdph.ca.gov, 707-576-2732

Program version 1.1

Select population and sample frequency:

Population: 50,000 - 249,999 SW

Frequency: Routine

STAGE 2 DISINFECTION BYPRODUCT RULE
TOTAL TRIHALOMETHANES (TTHM)
LOCATIONAL RUNNING AVERAGE SUMMARY REPORT

Water System Name: City of Folsom - Main **System No.** 3410014

Quarterly: 8 dual sample sets	TTHM (ug/L)							
	Monitoring Periods				LRAA (TTHM) ug/L	Meets Standard? (Y/N)	OEL (TTHM) ug/L	Exceed OEL? (Y/N)
	Qrt 1	Qrt 2	Qrt 3	Qrt 4				
2019	***01/09/19***	***04/10/19***	***07/17/19***	***10/09/19***				
T6 F06-2 2109 Mistry Meadow Dr.	70.0	57.0	70.0	48.0	64.00	Y	55.75	N
T4 F04-2 487 Serpa Dr.	62.0	43.0	62.0	54.0	55.75	Y	53.25	N
H2 F02-3 Blue Stone Cir	36.0	26.0	37.0	40.0	31.00	Y	35.75	N
A3 F03-4 1561 Freswick Dri	44.0	34.0	49.0	37.0	40.50	Y	39.25	N
T3 F03-6 2" backflow at 10 Tacana Dr	54.0	50.0	44.0	44.0	52.00	Y	45.50	N
T2 F03-1 FPA 4392 Needlegrass Dr.	58.0	56.0	81.0	56.0	62.00	Y	62.25	N
T1 F1A-1 backflow at Folsom Auto Mall	45.0	38.0	61.0	42.0	44.50	Y	45.75	N
E1 CCT-1 contact tank effluent tap at WTP	36.0	20.0	39.0	33.0	30.25	Y	31.25	N
2020	***1/8/2020***	***4/8/2020***	***7/8/2020***	***10/14/20***				
T6 F06-2 2109 Mistry Meadow Dr.	66.0	51.0	43.0	56.0	54.00	Y	51.50	N
T4 F04-2 487 Serpa Dr.	63.0	54.0	37.0	35.0	47.25	Y	40.25	N
H2 F02-3 Blue Stone Cir	41.0	27.0	22.0	24.0	28.50	Y	24.25	N
A3 F03-4 1561 Freswick Dri	55.0	42.0	40.0	29.0	41.50	Y	35.00	N
T3 F03-6 2" backflow at 10 Tacana Dr	50.0	46.0	25.0	35.0	39.00	Y	35.25	N
T2 F03-1 FPA 4392 Needlegrass Dr.	64.0	54.0	52.0	49.0	54.75	Y	51.00	N
T1 F1A-1 backflow at Folsom Auto Mall	42.0	47.0	33.0	42.0	41.00	Y	41.00	N
E1 CCT-1 contact tank effluent tap at WTP	23.0	27.0	26.0	25.0	25.25	Y	25.75	N
2021	***1/13/2021***	***4/14/2021***	***7/14/2021***	***10/13/21***				
T6 F06-2 2109 Mistry Meadow Dr.	30.0	41.0	45.0	39.0	38.75	Y	41.00	N
T4 F04-2 487 Serpa Dr.	38.0	43.0	45.0	48.0	43.50	Y	46.00	N
H2 F02-3 Blue Stone Cir	25.0	26.0	29.0	27.0	26.75	Y	27.25	N
A3 F03-4 1561 Freswick Dri	32.0	37.0	30.0	31.0	32.50	Y	32.25	N
T3 F03-6 2" backflow at 10 Tacana Dr	28.0	28.0	21.0	28.0	26.25	Y	26.25	N
T2 F03-1 FPA 4392 Needlegrass Dr.	36.0	33.0	28.0	41.0	34.50	Y	35.75	N
T1 F1A-1 backflow at Folsom Auto Mall	29.0	32.0	31.0	48.0	35.00	Y	39.75	N
E1 CCT-1 contact tank effluent tap at WTP	18.0	20.0	17.0	20.0	18.75	Y	19.25	N
2022	***1/11/2022***	***4/13/2022***	***7/22/2022***	***10/12/2022***				
T6 F06-2 2109 Mistry Meadow Dr.	71.0	48.0	51.0	60.0	57.50	Y	54.75	N
T4 F04-2 487 Serpa Dr.	62.0	48.0	43.0	61.0	53.50	Y	53.25	N
H2 F02-3 Blue Stone Cir	46.0	29.0	29.0	33.0	34.25	Y	31.00	N
A3 F03-4 1561 Freswick Dri	61.0	41.0	33.0	39.0	43.50	Y	38.00	N
T3 F03-6 2" backflow at 10 Tacana Dr	61.0	40.0	28.0	46.0	43.75	Y	40.00	N
T2 F03-1 FPA 4392 Needlegrass Dr.	72.0	38.0	33.0	69.0	53.00	Y	52.25	N
T1 F1A-1 backflow at Folsom Auto Mall	60.0	40.0	32.0	51.0	45.75	Y	43.50	N
E1 CCT-1 contact tank effluent tap at WTP	37.0	24.0	21.0	25.0	26.75	Y	23.75	N

STAGE 2 DISINFECTION BYPRODUCT RULE
HALOACETIC ACIDS - FIVE (HAA5)
LOCATIONAL RUNNING AVERAGE SUMMARY REPORT

Water System Name: City of Folsom - Main **System No.** 3410014

Quarterly: 8 dual sample sets	HAA5 (ug/L)							
	Monitoring Periods				LRAA (HAA5) ug/L	Meets Standard? (Y/N)	OEL (HAA5) ug/L	Exceed OEL? (Y/N)
	Qrt 1	Qrt 2	Qrt 3	Qrt 4				
2019	***01/09/19***	***04/10/19***	***07/17/19***	***10/09/19***				
T6 F06-2 2109 Mistry Meadow Dr.	16.0	22.0	29.0	29.0	24.00	Y	27.25	N
T4 F04-2 487 Serpa Dr.	17.0	24.0	28.0	32.0	25.25	Y	29.00	N
H2 F02-3 Blue Stone Cir	18.0	20.0	28.0	25.0	22.75	Y	24.50	N
A3 F03-4 1561 Freswick Dri	22.0	22.0	34.0	29.0	26.75	Y	28.50	N
T3 F03-6 2" backflow at 10 Tacana Dr	24.0	26.0	28.0	26.0	26.00	Y	26.50	N
T2 F03-1 FPA 4392 Needlegrass Dr.	17.0	19.0	29.0	39.0	26.00	Y	31.50	N
T1 F1A-1 backflow at Folsom Auto Mall	20.0	21.0	32.0	28.0	25.25	Y	27.25	N
E1 CCT-1 contact tank effluent tap at WTP	17.0	16.0	25.0	21.0	19.75	Y	20.75	N
2020	***1/8/2020***	***4/8/2020***	***7/8/2020***	***10/14/2020***				
T6 F06-2 2109 Mistry Meadow Dr.	16.0	17.0	28.0	31.0	23.00	Y	26.75	N
T4 F04-2 487 Serpa Dr.	15.0	17.0	33.0	24.0	22.25	Y	24.50	N
H2 F02-3 Blue Stone Cir	20.0	21.0	19.0	18.0	19.50	Y	19.00	N
A3 F03-4 1561 Freswick Dri	23.0	23.0	26.0	21.0	23.25	Y	22.75	N
T3 F03-6 2" backflow at 10 Tacana Dr	27.0	32.0	17.0	24.0	25.00	Y	24.25	N
T2 F03-1 FPA 4392 Needlegrass Dr.	16.0	19.0	33.0	31.0	24.75	Y	28.50	N
T1 F1A-1 backflow at Folsom Auto Mall	22.0	25.0	24.0	28.0	24.75	Y	26.25	N
E1 CCT-1 contact tank effluent tap at WTP	17.0	22.0	16.0	16.0	17.75	Y	17.50	N
2021	***1/13/2021***	***4/14/2021***	***7/14/2021***	***10/13/2021***				
T6 F06-2 2109 Mistry Meadow Dr.	20.0	37.0	35.0	29.0	30.25	Y	32.50	N
T4 F04-2 487 Serpa Dr.	27.0	35.0	33.0	28.0	30.75	Y	31.00	N
H2 F02-3 Blue Stone Cir	17.0	19.0	19.0	16.0	17.75	Y	17.50	N
A3 F03-4 1561 Freswick Dri	20.0	31.0	22.0	18.0	22.75	Y	22.25	N
T3 F03-6 2" backflow at 10 Tacana Dr	23.0	30.0	21.0	19.0	23.25	Y	22.25	N
T2 F03-1 FPA 4392 Needlegrass Dr.	25.0	37.0	30.0	25.0	29.25	Y	29.25	N
T1 F1A-1 backflow at Folsom Auto Mall	21.0	33.0	32.0	29.0	28.75	Y	30.75	N
E1 CCT-1 contact tank effluent tap at WTP	13.0	22.0	15.0	14.0	16.00	Y	16.25	N
2022	***1/11/2022***	***4/13/2022***	***7/22/2022***	***10/12/2022***				
T6 F06-2 2109 Mistry Meadow Dr.	86.0	44.0	45.0	42.0	54.25	Y	43.25	N
T4 F04-2 487 Serpa Dr.	81.0	43.0	39.0	39.0	50.50	Y	40.00	N
H2 F02-3 Blue Stone Cir	48.0	26.0	24.0	23.0	30.25	Y	24.00	N
A3 F03-4 1561 Freswick Dri	62.0	38.0	29.0	27.0	39.00	Y	30.25	N
T3 F03-6 2" backflow at 10 Tacana Dr	62.0	35.0	30.0	23.0	37.50	Y	27.75	N
T2 F03-1 FPA 4392 Needlegrass Dr.	54.0	34.0	38.0	32.0	39.50	Y	34.00	N
T1 F1A-1 backflow at Folsom Auto Mall	78.0	33.0	31.0	24.0	41.50	Y	28.00	N
E1 CCT-1 contact tank effluent tap at WTP	31.0	20.0	20.0	16.0	21.75	Y	18.00	N

Folsom State Prison WTP

Date	Fecal Coliform
1/10/2018	13
2/7/2018	30
3/7/2018	50
4/4/2018	4.5
5/2/2018	2
6/6/2018	4.5
7/5/2018	<1.8
8/1/2018	<1.8
9/5/2018	<1.8
10/3/2018	2
11/7/2018	17
12/5/2018	23
1/2/2019	17
2/6/2019	11
3/6/2019	no data
4/3/2019	17
5/1/2019	7.8
6/5/2019	2
7/3/2019	<1.8
8/7/2019	<1.8
9/4/2019	<1.8
10/2/2019	33
11/6/2019	33
12/4/2019	2
12/31/2019	13
2/5/2020	<1.8
3/4/2020	49
4/1/2020	<2
5/6/2020	<2
6/3/2020	<2
7/1/2020	<2
8/5/2020	<2
9/2/2020	2
10/7/2020	<2
11/4/2020	<2
12/4/2020	23
1/20/2021	70
2/17/2021	220
3/3/2021	27
4/7/2021	2
5/5/2021	<2
6/2/2021	<2
7/7/2021	<1.8
8/4/2021	<1.8
9/29/2021	<1.8
10/13/2021	17
11/10/2021	33
12/8/2021	6.8
1/19/2022	11
2/2/2022	4.5
3/2/2022	33
4/6/2022	2
5/4/2022	2
6/8/2022	2
7/6/2022	2
8/3/2022	<1.8
9/7/2022	2
10/5/2022	4.5
11/2/2022	7.8
12/14/2022	ND

Stage 2 DBP-Quarterly TTHM Report for Disinfection Byproducts Compliance and Operational Evaluation (in μg/L or ppb)

System Name: Folsom State Prison System No.: CA3410032-002-002 Year: 2022 Quarter: 4

Year:	2018				2019				2020				2021				2022			
Quarter:	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
Sample Date (month/date):	1/10	6/29	9/5	12/5	3/6	6/5	9/4	12/4	3/4	6/3	9/2	12/2	3/3	6/2	9/1	12/8	3/2	6/8	9/7	12/14
Site 1 4A	32.2	47.8	54.3	39.8	53.7	52.1	44.7	25.8	40.4	38.7	36.6	50.4	32.8	41.8	30.2	45.9	27.1	ND	40.0	27.4
Site 2 3A	31.1	42.0	46.4	38.0	49.5	58.3	36.2	24.0	31.1	32.6	28.3	40.8	26.6	37.7	34.9	42.3	22.4	24.8	25.2	19.4
Site 3	31.7	44.9	50.4	38.9	51.6	55.2	40.5	24.9	35.8	35.7	32.5	45.6	29.7	39.8	32.6	44.1	24.7	24.8	32.6	23.4
Site 4																				
Site 5																				
Site 6																				
Site 7																				
Site 8																				
Site 9																				
Site 10																				
Site 11																				
Site 12																				
Number of Samples Taken	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	2	2	2	2

Stage 2 DBP-Quarterly HAA5 Report for Disinfection Byproducts Compliance and Operational Evaluation (in μg/L or ppb)

System Name: Folsom State Prison System No.: CA3410032-002-002 Year: 2022 Quarter: 4

Year:	2018				2019				2020				2021				2022			
Quarter:	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
Sample Date (month/date):	1/10	6/29	9/5	12/5	3/6	6/5	9/4	12/4	3/4	6/3	9/2	12/2	3/3	6/2	9/1	12/8	3/2	6/8	9/7	12/14
Site 1 Grinder 4A	29.2	25.0	41.8	22.5	23.3	15.6	6.2	27.8	31.6	17.8	ND	18.4	22.0	19.2	12.5	18.5	15.7	11.0	2.2	10.9
Site 2 Landscape 3A	28.1	53.0	37.9	28.6	27.5	25.6	17.2	27.2	33.3	24.8	32.0	22.9	16.6	29.8	24.1	30.0	21.4	14.9	19.2	12.9
Site 3	28.7	39.0	39.9	25.6	25.4	20.6	11.7	27.5	32.5	21.3	32.0	20.7	19.3	24.5	18.3	24.3	18.6	13.0	10.7	11.9
Site 4																				
Site 5																				
Site 6																				
Site 7																				
Site 8																				
Site 9																				
Site 10																				
Site 11																				
Site 12																				
Number of Samples Taken	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Roseville
WTP

	E Coli
1/23/2018	9.8
2/27/2018	26.2
3/27/2018	53.8
4/24/2018	1
5/22/2018	4.1
6/20/2018	0
7/24/2018	1
8/21/2018	5.2
9/25/2018	4.1
10/23/2018	13.2
11/19/2018	13.2
12/18/2018	146.7
1/22/2019	18.5
2/19/2019	29.9
3/27/2019	7.5
4/23/2019	5.2
5/7/2019	1
6/25/2019	1
7/23/2019	0
8/20/2019	0
9/10/2019	2
10/23/2019	25.6
11/6/2019	55.4
12/18/2019	11
1/28/2020	8.5
2/4/2020	11
3/24/2020	6.3
4/21/2020	1
5/26/2020	0
6/25/2020	0
7/20/2020	0
8/25/2020	1
9/22/2020	1
10/20/2020	2
11/10/2020	19.9
12/15/2020	15.5
1/28/2021	46.4
2/23/2021	5.2
3/23/2021	4.1
4/20/2021	2
5/25/2021	0
6/17/2021	0
7/13/2021	1
8/24/2021	3.1
9/28/2021	8.4
10/12/2021	2419.6
11/30/2021	30.7
12/7/2021	18.5
1/25/2022	4.1
2/22/2022	14.8
3/15/2022	14.8
4/26/2022	2
5/17/2022	1
6/8/2022	0
7/5/2022	0
8/16/2022	1
9/20/2022	6.3
10/25/2022	3.1
11/21/2022	8.6
12/20/2022	7.4

Roseville

	Source Water TOC (mg/L)	Alkalinity (raw)	TOC East CW Treated Water, mg/L	TOC West CW Filtered Water
	Raw Water Tap	Raw Water Tap	Sample Sink	Sample Sink
Sample Date	(mg/L)	(mg/L)	(mg/L)	(mg/L)
01/04/18	1.4	17	0.8	NA
02/07/18	1.4	22	0.9	NA
03/07/18	1.1	24	0.7	NA
04/04/18	1.7	21	0.9	NA
05/09/18	1.8	23	1.2	1.2
06/06/18	1.7	23	1.1	1.1
07/11/18	1.6	23	1.0	1.0
08/08/18	1.2	21	0.9	0.9
09/12/18	1.3	17	1.0	0.9
10/03/18	1.3	18	1.0	0.9
11/07/18	1.3	23	1.0	1.0
12/05/18	1.3	23	1.2	1.0
01/09/19	1.3	26	0.91	
02/06/19	1.2	26		0.82
03/06/19	1.4	26	0.99	
04/03/19	1.0	25	0.67	
05/01/19	1.1	22	0.79	0.77
06/05/19	1.2	20	0.78	0.89
07/03/19	1.3	15	0.89	0.76
08/07/19	1.4	16	1.00	0.96
09/04/19	1.3	14	0.84	0.87
10/02/19	1.4	16	1.00	1.10
11/06/19	1.3	17	1.00	0.93
12/04/19	1.2	17	0.80	
01/09/20	2.6	21	2.30	
02/05/20	1.2	22	0.85	

03/04/20	1.4	23	1.00	
04/27/20	1.4	28	1.00	
05/06/20	1.8	27	1.30	1.30
06/03/20	1.6	27	1.10	1.00
07/08/20	1.1	25	0.76	0.79
08/05/20	1.2	24	1.30	1.30
09/02/20	1.2	19	0.80	0.80
10/07/20	1.0	17	0.66	0.67
11/04/20	1.3	21	0.91	0.97
12/02/20	1.2	21	0.95	
01/06/21	1.1	23	0.84	
02/03/21	1.5	25		1.30
03/03/21	1.2	28	0.94	
04/07/21	1.1	29	0.79	0.78
05/05/21	1.2	27	0.91	0.83
06/09/21	1.5	28	1.20	1.30
07/14/21	1.2	27	0.86	0.92
08/04/21	1.1	27	1.00	0.79
09/01/21	1.2	23	0.80	0.83
10/06/21	0.9	24	0.50	0.60
11/03/21	3.2	30	1.80	
12/01/21	2.7	28	1.90	
01/05/22	1.9	30	1.30	
02/02/22	1.7	28	0.98	
03/02/22	1.7	30		1.30
04/06/22	1.7	27	1.10	
05/04/22	1.3	27	0.88	0.85
06/01/22	1.6	25	1.00	1.00
07/06/22	1.4	24	0.85	0.85
08/04/22	1.3	24	0.79	0.79
09/07/22	1.2	24	0.86	0.84
10/05/22	1.4	17	0.97	0.90
11/02/22	1.7	25	1.10	1.10
12/07/22	1.0	29	0.63	

Roseville WTP
THMs

	2018				2019				2020			
	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020
	1/17	4/12	7/17	10/10	1/17	4/24	7/9	12/11	1/27	4/14	7/16	11/6
10 Sierra Gate at Harding	27	47	33	30	31	29	46	29	23	28	29	31
6817 Maple Creek	31	51	37	43	34	35	50	33	30	34	38	36
Washington Square	31	51	34	37	33	30	46	30	26	31	34	35
2005 Hilltop Square	46	55	40	52	46	37	51	41	36	40	36	37
Pleasant Grove WWTP	55	65	67	36	56	55	68	40	36	40	57	41
Kinkos	29	40	29	26	30	27	41	24	19	28	27	28
Olympus Europa	35	54	44	45	31	40	57	51	22	42	45	47
Press Tribune	28	52	32	33	29	36	44	33	28	32	35	38

	2021				2022			
	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
	1/25	4/15	9/9	11/3	1/20	4/13	8/3	11/16
10 Sierra Gate at Harding	22	28	35	73	62	49	26	36
6817 Maple Creek	30	36	44	64	70	57	35	44
Washington Square	28	37	46	86	63	50	29	39
2005 Hilltop Square	37	32	43	78	66	55	31	60
Pleasant Grove WWTP	40	37	22	66	63	71	43	72
Kinkos	22	25	32	73	47	36	24	30
Olympus Europa	32	43	48	63	66	63	32	43
Press Tribune	32	37	44	17	62	56	31	43

Roseville WTP
HAAs

	2018				2019				2020				2021				2022			
	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
	1/17	4/12	7/17	10/10	1/17	4/24	7/9	12/11	1/27	4/14	7/16	11/6	1/25	4/15	9/9	11/3	1/20	4/13	8/3	11/16
10 Sierra Gate at Harding	23	37	28	19	18	18	22	15	24	25	16	16	16	19	15	53	57	37	18	20
6817 Maple Creek	22	37	26	19	17	22	22	13	24	21	19	16	16	20	16	38	55	26	15	20
Washington Square	19	30	22	18	16	18	19	13	23	18	17	17	16	20	14	39	52	31	17	19
2005 Hilltop Square	19	34	21	18	19	21	20	14	24	23	18	16	17	20	14	48	58	30	18	27
Pleasant Grove WWTP	18	26	26	18	16	19	21	14	27	21	18	17	15	19	0	27	53	32	18	20
Kinkos	18	26	26	18	16	19	21	14	27	21	18	17	15	19	0	27	53	32	18	20
Olympus Europa	17	31	25	18	18	20	20	13	25	18	17	14	18	19	13	20	65	24	17	16
Press Tribune	22	34	24	19	16	22	20	14	28	21	17	18	17	23	14	15	54	33	18	19

	Peterson WTP E. coli
01/02/18	49
01/16/18	33
02/06/19	79
02/20/18	79
03/06/18	17
03/20/18	46
04/03/18	0
04/17/18	22
05/03/18	4.5
05/16/18	2
06/05/18	0
06/19/18	0
07/03/18	0
07/17/18	0
08/07/18	0
08/21/18	0
09/04/18	0
09/18/18	2
10/02/18	1.8
10/16/18	22
11/09/18	22
11/20/18	46
12/04/18	7.8
12/18/18	240
01/02/19	23
01/15/19	49
02/05/19	13
02/19/19	23
03/05/19	4.5
03/19/19	2
04/02/19	23
04/16/19	2
05/07/19	0
05/21/19	0
06/04/19	0
06/18/19	0
07/02/19	0
07/16/19	2
08/06/19	0
08/20/19	0
09/03/19	0
09/17/19	0
10/01/19	4.5
10/15/19	2
11/05/19	23
11/19/19	14
12/03/19	33
12/17/19	11
01/07/20	1.8
01/21/20	2
02/04/20	49
02/18/20	33
03/03/20	9.3
03/17/20	33
04/07/20	2
04/21/20	2
05/05/20	2
05/19/20	0
06/02/20	0
06/16/20	0
07/07/20	0
07/21/20	0
08/04/20	2
08/18/20	0
09/01/20	2
09/15/20	6.8
10/06/20	0
10/20/20	13
11/03/20	170
11/17/20	17
12/01/20	49
12/15/20	13

01/05/21	13
01/19/21	49
02/02/21	33
02/16/21	13
03/02/21	22
03/16/21	2
04/06/21	2
04/20/21	2
05/04/21	4.5
05/18/21	0
06/02/21	0
06/15/21	0
07/06/21	0
07/20/21	0
08/03/21	0
08/17/21	0
09/07/21	4.5
09/21/21	0
10/05/21	4.5
10/19/21	7.8
11/02/21	13
11/16/21	11
12/07/21	13
12/22/22	33
01/04/22	6.8
01/18/22	6.8
02/01/22	13
02/15/22	17
03/01/22	79
03/15/22	7.8
04/05/22	2
04/19/22	2
05/03/22	4.5
05/17/22	0
06/07/22	0
06/21/22	0
07/05/22	0
07/19/22	0
08/02/22	0
08/16/22	6.8
09/06/22	4.5
09/20/22	2
10/04/22	2
10/18/22	7.8
11/01/22	46
11/15/22	27
12/06/22	4.5
12/20/22	7.8

SJWD

Sample Site	Source Water TOC (mg/L)	Treated Water TOC (mg/L)
1/16/2018	1.50	0.90
2/20/2018	1.50	1.00
3/20/2018	1.50	1.00
4/27/2018	1.90	1.20
5/16/2018	1.79	1.14
6/19/2018	1.64	0.99
7/17/2018	2.00	1.32
8/21/2018	1.39	0.92
9/18/2018	1.55	0.98
10/16/2018	1.56	1.10
11/20/2018	2.18	1.51
12/18/2018	1.85	1.63
1/15/2019	1.79	1.67
2/19/2019	2.65	1.23
3/19/2019	1.68	1.12
4/16/2019	1.29	0.81
5/21/2019	1.68	1.09
6/18/2019	1.61	1.23
7/16/2019	1.83	1.10
8/20/2019	1.55	1.16
9/17/2019	1.52	1.07
10/15/2019	1.49	0.97
11/19/2019	2.27	1.11
12/17/2019	1.40	1.01
1/21/2020	1.25	0.979
2/18/2020	1.23	0.990
3/17/2020	1.37	1.250
4/21/2020	1.25	0.989
5/19/2020	2.24	0.986
6/16/2020	1.32	1.050
7/21/2020	1.31	0.942
8/18/2020	1.26	0.890
9/15/2020	1.19	0.901
10/20/2020	1.94	0.797
11/17/2020	1.310	0.910
12/15/2020	1.130	1.000
1/19/2021	1.190	0.910
2/16/2021	1.200	0.940
3/16/2021	1.290	0.999
4/20/2021	1.220	1.000
5/18/2021	1.130	0.808
6/15/2021	1.360	0.981
7/20/2021	1.250	1.030
8/17/2021	1.180	0.910
9/21/2021	1.270	0.960
10/19/2021	1.640	1.100
11/16/2021	3.700	2.210
12/22/2021	2.310	1.570
1/18/2022	2.690	1.480
2/15/2022	2.030	1.400
3/15/2022	2.05	1.52
4/19/2022	1.77	1.16
5/17/2022	1.70	1.17
6/17/2022	1.74	1.22
7/19/2022	1.71	1.24
8/16/2022	1.83	1.17
9/20/2022	1.67	1.24
10/18/2022	1.60	1.15
11/15/2022	1.87	1.28
12/20/2022	2.05	1.34

averaged these columns for 1st qtr 2022

	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022				2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
	1/26/2018	4/5/2018	8/27/2018	11/15/2018	2/27/2019	5/28/2019	9/3/2019	10/30/2019	2/25/2020	5/15/2020	7/14/2020	10/6/2020	1/5/2021	4/6/2021	7/6/2021	10/12/2021	1/11/2022	2/8/2022	2/16/2022	2/23/2022	4/12/2022	7/12/2022	10/11/2022
THM's - 8025 RAMSGATE (2)	41.0	46.0	39.1	41.29	52.8	52.3	42.2	46.9	44.03	37.31	38.1	39.4	33.9	27.76	42.2	30.2	55	63.8	54.3	49.2	45.61	54.65	71.31
THM's - 4680 LAWRENCE (3)	48.0	54.0	39.1	51.1	60.2	55.9	42.4	48.9	46.19	42.49	36.2	45.3	35.2	27.87	42.5	32.8	64	69.3	62.3	55.6	50.08	65.17	61.71
THM's - 501 FORT ROCK (4)	31.0	29.0	38.7	32.39	41.6	41.7	36.5	41.0	39.34	31.58	35.4	34.2	24.2	21.7	29.3	33.4	42	49.8	52.7	57.8	42.88	56.83	53.44
THM's - 9660 SNOWBERRY WAY (1)	36.0	32.0	32.0	41.1	43.7	39.2	52.9	55.1	46.23	34.33	38.0	40.9	27.6	28.72	39.3	34.8	60	63.8	49.7	52.8	46.77	59.71	57.86

	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022		
	1/26/2018	4/5/2018	8/27/2018	11/15/2018	2/27/2019	5/28/2019	9/3/2019	10/30/2019	2/25/2020	5/15/2020	7/14/2020	10/6/2020	1/5/2021	4/6/2021	7/6/2021	10/12/2021	-	4/12/2022	7/12/2022	10/11/2022	qtr	
THM's - 8025 RAMSGATE (2)	41.0	46.0	39.1	41.29	52.8	52.3	42.2	46.9	44.03	37.31	38.1	39.4	33.9	27.76	42.2	30.2	56	45.61	54.65	71.31	min	26.51
THM's - 4680 LAWRENCE (3)	48.0	54.0	39.1	51.1	60.2	55.9	42.4	48.9	46.19	42.49	36.2	45.3	35.2	27.87	42.5	32.8	63	50.08	65.17	61.71	max	61.08
THM's - 501 FORT ROCK (4)	31.0	29.0	38.7	32.39	41.6	41.7	36.5	41.0	39.34	31.58	35.4	34.2	24.2	21.7	29.3	33.4	50	42.88	56.83	53.44		
THM's - 9660 SNOWBERRY WAY (1)	36.0	32.0	32.0	41.1	43.7	39.2	52.9	55.1	46.23	34.33	38.0	40.9	27.6	28.72	39.3	34.8	57	46.77	59.71	57.86		

	1/26/2018	4/5/2018	8/27/2018	11/15/2018	2/27/2019	5/28/2019	9/3/2019	10/30/2019	2/25/2020	5/15/2020	7/14/2020	10/6/2020
HAA5's - 8025 RAMSGATE (2)	26.0	21.0	24.5	30	27.1	30.8	25.7	22.1	35.4	25.3	23.7	26.8
HAA5's - 4680 LAWRENCE (3)	21.0	20.0	28.4	30.7	22.4	34.4	20.4	22.2	35.5	19.6	22.8	25.8
HAA5's - 501 FORT ROCK (4)	31.0	28.0	27.5	30.3	31.6	36.2	23.2	19.8	46.3	31.3	24.9	26.9
HAA5's - 9660 SNOWBERRY WAY (1)	29.0	26.0	28.7	17.2	31.6	35.2	28.6	23.0	42.4	30.3	23.5	30.4

	1/5/2021	4/6/2021	7/6/2021	10/12/2021	1/11/2022	2/8/2022	2/16/2022	2/23/2022	4/12/2022	7/12/2022	10/11/2022
HAA5's - 8025 RAMSGATE (2)	21.5	27.0	24.2	27.8	53	86.0	41.8	42.2	41.5	27.7	22.8
HAA5's - 4680 LAWRENCE (3)	19.7	23.8	24.3	36.0	64	68.2	38.1	36.3	32.3	31.8	22.9
HAA5's - 501 FORT ROCK (4)	28.8	27.8	21.7	29.3	101	109.6	60.2	67.2	47.0	35.7	27.4
HAA5's - 9660 SNOWBERRY WAY (1)	26.8	29.4	24.7	27.2	74.6	93.1	40.8	40.5	41.5	35.4	24.0

	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020
HAA5's - 8025 RAMSGATE (2)	26.0	21.0	24.5	30	27.1	30.8	25.7	22.1	35.4	25.3
HAA5's - 4680 LAWRENCE (3)	21.0	20.0	28.4	30.7	22.4	34.4	20.4	22.2	35.5	19.6
HAA5's - 501 FORT ROCK (4)	31.0	28.0	27.5	30.3	31.6	36.2	23.2	19.8	46.3	31.3
HAA5's - 9660 SNOWBERRY WAY (1)	29.0	26.0	28.7	17.2	31.6	35.2	28.6	23.0	42.4	30.3

	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
HAA5's - 8025 RAMSGATE (2)	23.7	26.8	21.5	27.0	24.2	27.8	55.8	41.5	27.7	22.8
HAA5's - 4680 LAWRENCE (3)	22.8	25.8	19.7	23.8	24.3	36.0	51.6	32.3	31.8	22.9
HAA5's - 501 FORT ROCK (4)	24.9	26.9	28.8	27.8	21.7	29.3	84.4	47.0	35.7	27.4
HAA5's - 9660 SNOWBERRY WAY (1)	23.5	30.4	26.8	29.4	24.7	27.2	62.3	41.5	35.4	24.0

	qtr
min	21.8
max	63.5

Sample Date	Site ID	sitelabel	Analyte	Result	Unit
5/1/2018 2:01:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	96	MPN/100mL
5/8/2018 12:36:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	75.9	MPN/100mL
5/15/2018 9:22:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	1553.1	MPN/100mL
5/22/2018 8:54:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	727	MPN/100mL
5/29/2018 10:07:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	185	MPN/100mL
6/5/2018 8:18:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	167	MPN/100mL
6/12/2018 9:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	54.6	MPN/100mL
6/19/2018 7:40:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	24.3	MPN/100mL
6/26/2018 9:54:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	36.9	MPN/100mL
7/2/2018 7:44:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	155.3	MPN/100mL
7/10/2018 12:25:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	55.4	MPN/100mL
7/17/2018 8:36:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	66.3	MPN/100mL
7/24/2018 9:23:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	78.9	MPN/100mL
7/31/2018 8:34:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	42.8	MPN/100mL
8/7/2018 8:01:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	7.3	MPN/100mL
8/14/2018 9:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	<1	MPN/100mL
8/21/2018 8:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	8.5	MPN/100mL
8/28/2018 10:54:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	2	MPN/100mL
9/4/2018 10:44:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	6.3	MPN/100mL
9/11/2018 8:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	5.2	MPN/100mL
9/18/2018 9:02:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	13.2	MPN/100mL
9/25/2018 8:43:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	13	MPN/100mL
9/25/2018 9:46:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	0	PresentAbsent
10/2/2018 11:16:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	4.1	MPN/100mL
10/9/2018 8:33:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	6.3	MPN/100mL
10/16/2018 8:03:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	18.9	MPN/100mL
10/23/2018 8:44:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	27.5	MPN/100mL
10/30/2018 1:36:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	4.1	MPN/100mL
11/6/2018 12:17:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	7.5	MPN/100mL
11/13/2018 2:24:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	14.8	MPN/100mL
4/2/2019 8:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	1	PresentAbsent
5/17/2019 11:36:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	218.7	MPN/100mL
5/21/2019 7:13:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	224.7	MPN/100mL
5/28/2019 7:45:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	82	MPN/100mL
6/4/2019 7:45:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	56.3	MPN/100mL
6/11/2019 8:28:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	60.5	MPN/100mL
6/18/2019 8:17:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	55.6	MPN/100mL
6/25/2019 9:40:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	123.6	MPN/100mL
7/23/2019 8:35:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	12.2	MPN/100mL
7/31/2019 9:10:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	2	MPN/100mL
8/7/2019 8:40:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	17.3	MPN/100mL
8/13/2019 7:48:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	2	MPN/100mL
8/21/2019 8:03:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	6.3	MPN/100mL
8/27/2019 8:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	8.6	MPN/100mL
9/3/2019 9:10:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	5.2	MPN/100mL
9/10/2019 8:10:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	12.2	MPN/100mL
9/17/2019 8:55:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	19.7	MPN/100mL
9/24/2019 9:29:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	16.1	MPN/100mL
10/1/2019 8:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	13.4	MPN/100mL
10/8/2019 8:54:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	12.1	MPN/100mL
10/15/2019 8:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	12	MPN/100mL
10/22/2019 8:22:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	13.5	MPN/100mL
5/12/2020 10:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	517.2	MPN/100mL
5/19/2020 1:15:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	183.5	MPN/100mL
5/26/2020 9:20:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	111.9	MPN/100mL
6/2/2020 10:24:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	146.7	MPN/100mL
6/9/2020 9:55:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	86	MPN/100mL
6/16/2020 1:30:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	16	MPN/100mL
6/23/2020 9:50:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	28.5	MPN/100mL
6/30/2020 10:35:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	49.6	MPN/100mL
7/7/2020 11:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	29.2	MPN/100mL
7/14/2020 12:40:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	43.7	MPN/100mL
7/21/2020 2:10:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	33.1	MPN/100mL
7/28/2020 8:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	42.8	MPN/100mL
8/4/2020 7:55:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	38.4	MPN/100mL
8/11/2020 8:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	2	MPN/100mL
8/18/2020 8:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	3.1	MPN/100mL
8/25/2020 10:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	4.1	MPN/100mL
9/1/2020 9:35:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	3.1	MPN/100mL
9/8/2020 9:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	3.1	MPN/100mL
9/22/2020 2:50:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	5.2	MPN/100mL
10/7/2020 2:20:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	8.5	MPN/100mL
10/20/2020 12:05:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	3.1	MPN/100mL
10/27/2020 9:55:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	2	MPN/100mL
11/3/2020 1:50:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	<1	MPN/100mL
11/10/2020 1:00:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	5.2	MPN/100mL
5/18/2021 1:30:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	275.5	MPN/100mL
5/25/2021 12:25:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	127.4	MPN/100mL
6/2/2021 11:50:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	93.3	MPN/100mL
6/9/2021 12:30:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	55.6	MPN/100mL
6/15/2021 9:10:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	53	MPN/100mL
6/22/2021 11:25:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	45.9	MPN/100mL
6/29/2021 9:40:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	56.3	MPN/100mL
7/6/2021 11:45:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	51.2	MPN/100mL
7/13/2021 11:44:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	80.1	MPN/100mL
7/20/2021 12:56:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	52.8	MPN/100mL
7/27/2021 9:58:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	32.7	MPN/100mL
8/3/2021 10:57:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	5.2	MPN/100mL
8/10/2021 1:24:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	2	MPN/100mL

8/17/2021 7:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	2	MPN/100mL
8/24/2021 9:58:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	5.2	MPN/100mL
9/3/2021 2:56:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	<1	MPN/100mL
9/7/2021 2:17:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	6.3	MPN/100mL
9/15/2021 9:38:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	<1	MPN/100mL
9/21/2021 2:58:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	1	MPN/100mL
9/28/2021 1:58:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	7.4	MPN/100mL
10/4/2021 8:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	24.1	MPN/100mL
10/12/2021 2:57:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	10.9	MPN/100mL
10/18/2021 2:32:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	5.2	MPN/100 mL
10/25/2021 7:58:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	272.3	MPN/100 mL
11/1/2021 12:53:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	9.8	MPN/100 mL
11/8/2021 7:51:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	3.1	MPN/100 mL
5/13/2022 9:40:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	190.4	MPN/100 mL
5/17/2022 9:25:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	579.4	MPN/100 mL
5/24/2022 8:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	172.3	MPN/100 mL
5/31/2022 2:00:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	104.3	MPN/100 mL
6/7/2022 8:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	110	MPN/100 mL
6/14/2022 10:10:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	70.3	MPN/100 mL
6/21/2022 11:12:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	132	MPN/100 mL
6/28/2022 7:45:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	365.4	MPN/100 mL
7/5/2022 10:55:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	52.9	MPN/100 mL
7/12/2022 8:55:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	52.1	MPN/100 mL
7/19/2022 10:50:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	7.4	MPN/100 mL
7/26/2022 8:20:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	5.2	MPN/100 mL
8/4/2022 10:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	8.4	MPN/100 mL
8/9/2022 8:25:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	4.1	MPN/100 mL
8/16/2022 8:40:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	10.9	MPN/100 mL
8/23/2022 8:50:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	4.1	MPN/100 mL
8/30/2022 9:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	4.1	MPN/100 mL
9/6/2022 8:20:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	4.1	MPN/100 mL
9/13/2022 8:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	53.6	MPN/100 mL
9/20/2022 8:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	4.1	MPN/100 mL
9/27/2022 2:20:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	8.6	MPN/100 mL
10/4/2022 8:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	4.1	MPN/100 mL
10/11/2022 8:20:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	8.5	MPN/100 mL
10/18/2022 8:50:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	3	MPN/100 mL
10/25/2022 11:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	13.4	MPN/100 mL
11/1/2022 11:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	<1	MPN/100 mL
11/9/2022 8:10:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	<1	MPN/100 mL
11/15/2022 11:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	1	MPN/100 mL
11/22/2022 9:05:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	1	MPN/100 mL
11/29/2022 8:20:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	E. coli	<1	MPN/100 mL

Sample Date	Site ID	sitelabel	Analyte	Result	Unit
5/1/2018 2:01:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	866.4	MPN/100mL
5/8/2018 12:36:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1203.3	MPN/100mL
5/15/2018 9:22:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
5/22/2018 8:54:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1553.1	MPN/100mL
5/29/2018 10:07:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1119.9	MPN/100mL
6/5/2018 8:18:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
6/12/2018 9:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
6/19/2018 7:40:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1203.3	MPN/100mL
6/26/2018 9:54:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100mL
7/2/2018 7:44:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
7/10/2018 12:25:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
7/17/2018 8:36:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
7/24/2018 9:23:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
7/31/2018 8:34:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
8/7/2018 8:01:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
8/14/2018 9:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1732.9	MPN/100mL
8/21/2018 8:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1732.9	MPN/100mL
8/28/2018 10:54:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
9/4/2018 10:44:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1413.6	MPN/100mL
9/11/2018 8:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1732.9	MPN/100mL
9/18/2018 9:02:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1413.6	MPN/100mL
9/25/2018 8:43:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
9/25/2018 9:46:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	0	PresentAbsent
10/2/2018 11:16:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100mL
10/9/2018 8:33:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
10/16/2018 8:03:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100mL
10/23/2018 8:44:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100mL
10/30/2018 1:36:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
11/6/2018 12:17:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1553.1	MPN/100mL
11/13/2018 2:24:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1299.7	MPN/100mL
4/2/2019 8:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1	PresentAbsent
5/17/2019 11:36:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
5/21/2019 7:13:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100mL
5/28/2019 7:45:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100mL
6/4/2019 7:45:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1732.9	MPN/100mL
6/11/2019 8:28:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
6/18/2019 8:17:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
6/25/2019 9:40:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
7/23/2019 8:35:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
7/31/2019 9:10:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
8/7/2019 8:40:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
8/13/2019 7:48:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
8/21/2019 8:03:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
8/27/2019 8:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
9/3/2019 9:10:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
9/10/2019 8:10:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
9/17/2019 8:55:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
9/24/2019 9:29:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
10/1/2019 8:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
10/8/2019 8:54:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1732.9	MPN/100mL
10/15/2019 8:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1732.9	MPN/100mL
10/22/2019 8:22:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1299.7	MPN/100mL
5/12/2020 10:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
5/19/2020 1:15:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100mL
5/26/2020 9:20:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1119.9	MPN/100mL
6/2/2020 10:24:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
6/9/2020 9:55:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100mL
6/16/2020 1:30:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	980.4	MPN/100mL
6/23/2020 9:50:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
6/30/2020 10:35:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100mL
7/7/2020 11:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
7/14/2020 12:40:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
7/21/2020 2:10:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
7/28/2020 8:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
8/4/2020 7:55:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100mL
8/11/2020 8:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
8/18/2020 8:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100mL
8/25/2020 10:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
9/1/2020 9:35:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100mL
9/8/2020 9:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
9/22/2020 2:50:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
10/7/2020 2:20:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
10/20/2020 12:05:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
10/27/2020 9:55:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100mL
11/3/2020 1:50:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	920.8	MPN/100mL
11/10/2020 1:00:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	866.4	MPN/100mL
5/18/2021 1:30:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
5/25/2021 12:25:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
6/2/2021 11:50:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
6/9/2021 12:30:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
6/15/2021 9:10:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
6/22/2021 11:25:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
6/29/2021 9:40:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
7/6/2021 11:45:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
7/13/2021 11:44:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
7/20/2021 12:56:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
7/27/2021 9:58:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
8/3/2021 10:57:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
8/10/2021 1:24:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100mL
8/17/2021 7:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
8/24/2021 9:58:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100mL
9/3/2021 2:56:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1553.1	MPN/100mL
9/7/2021 2:17:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
9/15/2021 9:38:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
9/21/2021 2:58:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
9/28/2021 1:58:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
10/4/2021 8:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100mL
10/12/2021 2:57:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100mL
10/18/2021 2:32:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100 mL
10/25/2021 7:58:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100 mL
11/1/2021 12:53:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100 mL
11/8/2021 7:51:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	727	MPN/100 mL
5/13/2022 9:40:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	686.7	MPN/100 mL
5/17/2022 9:25:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1732.9	MPN/100 mL
5/24/2022 8:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1203.3	MPN/100 mL
5/31/2022 2:00:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	980.4	MPN/100 mL
6/7/2022 8:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	770.1	MPN/100 mL
6/14/2022 10:10:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1119.9	MPN/100 mL
6/21/2022 11:12:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1732.9	MPN/100 mL
6/28/2022 7:45:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100 mL
7/5/2022 10:55:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100 mL
7/12/2022 8:55:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1732.9	MPN/100 mL
7/19/2022 10:50:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1413.6	MPN/100 mL
7/26/2022 8:20:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100 mL
8/4/2022 10:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100 mL
8/9/2022 8:25:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1553.1	MPN/100 mL
8/16/2022 8:40:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100 mL
8/23/2022 8:50:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100 mL
8/30/2022 9:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100 mL
9/6/2022 8:20:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100 mL
9/13/2022 8:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100 mL
9/20/2022 8:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1986.3	MPN/100 mL
9/27/2022 2:20:00 PM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	2419.6	MPN/100 mL
10/4/2022 8:15:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100 mL
10/11/2022 8:20:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	461.1	MPN/100 mL
10/18/2022 8:50:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100 mL
10/25/2022 11:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	>2419.6	MPN/100 mL
11/1/2022 11:30:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1299.7	MPN/100 mL
11/9/2022 8:10:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	1553.1	MPN/100 mL
11/15/2022 11:00:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	435.2	MPN/100 mL
11/22/2022 9:05:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	178.2	MPN/100 mL
11/29/2022 8:20:00 AM	CO-FS-SW	01 - Coloma & Pyrites SWTP (Raw)	Total Coliform	118.3	MPN/100 mL

01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	2	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	2	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.6	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.9	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.9	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.7	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.3	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.4	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.3	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.8	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.6	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.8	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.8	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.6	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.8	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	2	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.7	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.5	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.6	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.6	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.5	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.4	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.5	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	2.4	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	2	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	2.07	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.8	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.99	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.5	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.7	mg/L
01 - Coloma & Pyrites SWTP (Raw)	Total Organic Carbon (T	1.7	mg/L

9/26/2018 9:25:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	0.98
6/27/2019 2:49:00 PM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	0.84

7/23/2019 10:35:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	0.92
8/27/2019 9:25:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	0.8
9/17/2019 1:20:00 PM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	0.86
10/15/2019 8:35:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	0.83
5/28/2020 12:00:00 PM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	1.2
6/23/2020 8:48:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	1
7/14/2020 7:05:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	1.6
8/4/2020 8:41:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	0.99
9/23/2020 9:00:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	0.9
10/20/2020 11:10:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	1.1
11/3/2020 9:45:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	0.99
6/29/2021 11:34:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	1
7/6/2021 12:32:00 PM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	1
8/3/2021 8:40:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	1
9/7/2021 9:10:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	0.77
10/5/2021 7:45:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	0.84
11/2/2021 8:20:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	1.5
6/7/2022 10:10:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	1.3
7/12/2022 9:40:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	1.34
8/2/2022 9:35:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	1.25
9/6/2022 8:45:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	1
10/4/2022 11:15:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	1.1
11/1/2022 8:40:00 AM	CO-CO-F01	02 - Coloma SWTP (Filtered/PreCl2)	Total Organic Carbon (TO	0.98

Cordova System - GSWC

THM	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
	02/06/18	04/24/18	10/12/18	12/11/18	01/08/19	04/16/19	07/16/19	10/15/19	01/28/20	04/14/20	07/28/20	10/13/20	01/19/21	04/20/21	07/07/21	10/05/21	01/25/22	04/26/22	07/05/22	10/11/22
12121 Gold Pointe Lane	37	50	39	38	34	38	42	46	38	5.1	3.5	1.6	7	2.5	21	19	28	12	32	26
2240 Forestlake Drive	7.6	16	8.7	6.5	6.8	8.2	9.2	12	5.5	8.7	9.3	7.7	5.5	7.1	8	9.7	16	15	11	13
2512 Don Juan Drive	7.6	15	9.2	7	6.7	8.4	9.9	8.9	5.6	8.3	8	6.6	5.7	7.3	8.2	9.4	17	15	11	14
2984 Kachina Way	8.7	1	6	5.4	5	7.6	14	12	4.8	11	0.71	10	7.1	9.1	6.5	21	14	15	18	13
10671 Basie Way	12	0.72	0.5	0.77	0.72	3.1	6.6	0.5	0.78	0.6	0.75	1	0.78	0.5	1.4	2.2	0.5	0.5	0.5	27
3484 Corvina Drive	12	4.8	22	9.6	8.6	11	28	26	9	14	16	12	15	4	23	24	17	34	32	36

HAA5	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
	2/6/18	4/24/18	10/12/18	12/11/18	1/8/19	4/16/19	7/16/19	10/15/19	1/28/20	4/14/20	7/28/20	10/13/20	1/19/21	4/20/21	7/7/21	10/5/21	1/25/22	4/26/22	7/5/22	10/11/22
12121 Gold Pointe Lane	29	59	29	15	17	21	27	29	20	2.4	2	2	2	2	12	10	21	5.1	21	21
2240 Forestlake Drive	8	16	5.6	5.7	5.6	7.9	8.3	8.1	4.6	5.3	6.6	5.5	2.9	4.6	4	2.9	11	6.7	6.4	7.3
2512 Don Juan Drive	7.8	14	5.7	6.1	5.8	7.8	9.1	7	4.9	5.2	5.4	4.4	2.8	4.8	4.1	2	11	6.8	6.1	6.9
2984 Kachina Way	5.3	2	2.9	4.1	3.5	5.7	11	8.6	2.7	6.5	2	5.5	3.7	5.7	2	5.2	9.1	6.4	5.8	5.3
10671 Basie Way	11	2	2	2	2	2	3.1	2	2	2	2	2	2	2	2	2	2	2	2	20
3484 Corvina Drive	5.4	2	20	4.7	3.8	5.2	21	21	2.9	5	8.2	5.2	5.9	2	14	11	9.8	12	18	20

	CWD *E. coli*
Jan-18	1
Feb-18	0
Mar-18	0
Apr-18	0
May-18	0
Jun-18	2
Jul-18	0
Aug-18	0
Sep-18	0
Oct-18	0
Nov-18	0
Dec-18	0
Jan-19	2
Feb-19	0
Mar-19	0
Apr-19	1.8
May-19	0
Jun-19	0
Jul-19	0
Aug-19	0
Sep-19	
Oct-19	0
Nov-19	0
Dec-19	
Jan-20	0
Feb-20	0
Mar-20	0
Apr-20	0
May-20	0
Jun-20	0
Jul-20	0
Aug-20	0
Sep-20	0
Oct-20	0
Nov-20	0
Dec-20	
Jan-21	0
Feb-21	
Mar-21	0
Apr-21	0
May-21	0
Jun-21	0
Jul-21	
Aug-21	0
Sep-21	2
Oct-21	0
Nov-21	0
Dec-21	0
Jan-22	2
Feb-22	0
Mar-22	0
Apr-22	0
May-22	0
Jun-22	0
Jul-22	4
Aug-22	0
Sep-22	0
Oct-22	0
Nov-22	2
Dec-22	0

Carmichael WD

THM	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
	1/19/2018	4/6/2018	7/6/2018	10/24/2018	1/16/2019	4/9/2019	7/10/2019	10/03/2019	01/20/2020	04/06/2020	07/16/2020	10/19/2020	01/22/2021	04/13/2021	07/20/2021	10/08/2021	01/17/2022	04/15/2022	07/16/2022	10/20/2022
5048 Waterbury	38	39	27	28	25	32	28	31	27	22	23	19	22	11	12	12	67	33	4.5	10
7347 Lincoln Avenue	22	28	16	18	12	17	16	18	16	12	0	9.9	12	11	13	11	34	20	0.62	2.2
6148 Homesweet	11	22	12	11	9.8	12	13	13	11	8.7	1.6	7	7.3	6.4	5.5	8.2	24	14	0	4.2
1919 Claremont	27	5.7	0	1.3	15	19	1.1	1.6	14	12	6.4	0.94	11	11	1.3	3.1	34	13	0.72	5.6

HAA	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
	1/19/2018	4/6/2018	7/6/2018	10/24/2018	1/16/2019	4/9/2019	7/10/2019	10/03/2019	01/20/2020	04/06/2020	07/16/2020	10/19/2020	01/22/2021	04/13/2021	07/20/2021	10/08/2021	01/17/2022	04/15/2022	07/16/2022	10/20/2022
5048 Waterbury	14	20	18	12	10	16	18	15	10	10	12	9.6	10	5.8	4.3	4.6	21	12	0	4.3
7347 Lincoln Avenue	12	18	12	11	8.8	13	12	9.7	9.4	7.4	0	6.2	5.7	6.9	5.7	4.8	24	11	0	0
6148 Homesweet	7.5	16	8.9	6.8	6.7	9.3	9.7	14	6.6	5.3	0	3.7	3.8	4	0	2.6	15	7.9	0	0
1919 Claremont	14	2.4	0	0	10	14	0	0	8.4	7.1	0	0	5.8	6.1	0	0	22	7.4	0	0

2018-2022 EAFWTP Raw E. Coli and Total Coliform - MPN/100mL

CollectDate	E_ Coli	Total Coliform
04-Jan-18	307.6	1413.6
10-Jan-18	410.6	14136.0
17-Jan-18	26.5	613.1
23-Jan-18	32.7	365.4
30-Jan-18	16.9	344.8
06-Feb-18	29.5	365.4
13-Feb-18	14.6	461.1
21-Feb-18	22.8	235.9
22-May-18	57.6	1119.9
30-May-18	12.2	1299.7
06-Jun-18	18.9	866.4
13-Jun-18	21.3	721.5
20-Jun-18	10.9	1203.3
26-Jun-18	16.0	1732.9
03-Jul-18	35.4	1986.3
11-Jul-18	14.6	980.4
18-Jul-18	21.6	1986.3
25-Jul-18	30.0	1396.0
31-Jul-18	14.8	816.4
08-Aug-18	25.9	1413.6
15-Aug-18	23.0	980.0
22-Aug-18	9.8	866.4
27-Aug-18	3.1	547.5
28-Aug-18	13.4	770.1
29-Aug-18	16.1	579.4
30-Aug-18	7.4	410.6
31-Aug-18	7.4	648.8
01-Sep-18	6.3	816.4
02-Sep-18	7.3	686.7
03-Sep-18	23.1	1203.3
05-Sep-18	8.4	613.1
12-Sep-18	14.3	686.7
18-Sep-18	8.4	816.4
25-Sep-18	13.4	648.8
03-Oct-18	13.5	980.4
10-Oct-18	34.1	1203.3
17-Oct-18	14.6	816.4
24-Oct-18	5.2	648.8
31-Oct-18	8.6	727.0
08-Nov-18	24.9	307.6
19-Dec-18	101.4	1299.7
26-Dec-18	73.8	1299.7
03-Jan-19	27.2	378.4
10-Jan-19	96.0	2755.0
17-Jan-19	770.1	14136.0
23-Jan-19	34.1	980.4

29-Jan-19	23.1	435.2
07-Feb-19	69.1	1119.9
11-Feb-19	35.0	500.4
19-Feb-19	24.9	387.3
27-Feb-19	88.6	1553.1
06-Mar-19	20.0	393.0
13-Mar-19	25.9	248.9
20-Mar-19	63.0	1576.0
28-Mar-19	10.0	650.0
04-Apr-19	10.0	246.0
11-Apr-19	14.6	238.2
17-Apr-19	7.3	214.2
24-Apr-19	20.0	359.0
01-May-19	10.0	211.0
07-May-19	9.8	344.8
15-May-19	6.3	378.4
21-May-19	21.3	981.4
30-May-19	4.1	178.5
05-Jun-19	41.0	432.0
12-Jun-19	10.0	487.0
19-Jun-19	20.3	461.1
26-Jun-19	5.1	816.4
02-Jul-19	8.6	196.8
10-Jul-19	10.0	495.0
17-Jul-19	5.2	517.2
24-Jul-19	10.0	420.0
31-Jul-19	6.3	461.1
07-Aug-19	10.9	517.2
15-Aug-19	20.0	443.0
21-Aug-19	20.0	988.0
28-Aug-19	31.0	836.0
03-Sep-19	10.0	441.0
11-Sep-19	6.3	980.4
19-Sep-19	97.0	9804.0
25-Sep-19	20.0	763.0
02-Oct-19	9.7	436.0
09-Oct-19	8.5	770.1
17-Oct-19	6.3	573.0
24-Oct-19	13.2	517.2
30-Oct-19	7.5	426.0
06-Nov-19	17.1	471.0
13-Nov-19	14.6	261.3
20-Nov-19	22.6	547.5
27-Nov-19	187.0	2530.0
03-Dec-19	30.9	1842.0
11-Dec-19	63.0	857.0
18-Dec-19	22.8	408.0

23-Dec-19	41.4	1299.7
30-Dec-19	35.5	520.0
02-Jan-20	14.5	214.2
08-Jan-20	100.0	422.0
15-Jan-20	31.0	443.0
23-Jan-20	9.5	435.2
29-Jan-20	52.0	457.0
06-Feb-20	63.8	686.7
12-Feb-20	54.8	524.7
19-Feb-20	75.0	789.0
26-Feb-20	52.0	443.0
02-Mar-20	3.1	233.0
07-May-20	17.3	1413.6
13-May-20	36.4	1986.3
20-May-20	31.0	2046.0
27-May-20	20.0	1723.0
03-Jun-20	22.8	> 2419.6
10-Jun-20	31.0	839.0
17-Jun-20	31.0	809.0
24-Jun-20	14.8	1076.0

01-Jul-20	20.1	866.4
08-Jul-20	35.9	794.0
15-Jul-20	20.0	1291.0
22-Jul-20	18.5	1658.0
29-Jul-20	12.2	1413.6
05-Aug-20	15.8	7270.0
12-Aug-20	7.4	933.0
19-Aug-20	24.1	1223.0
26-Aug-20	26.2	717.0
02-Sep-20	15.8	816.4
09-Sep-20	14.6	1986.3
16-Sep-20	9.8	920.8
23-Sep-20	22.3	727.0
30-Sep-20	16.0	770.1
07-Oct-20	10.0	743.0
14-Oct-20	31.0	631.0
21-Oct-20	18.7	556.0
28-Oct-20	21.8	528.0
04-Nov-20	21.3	275.0
12-Nov-20	24.1	573.0
16-Nov-20	28.8	1467.0
24-Nov-20	20.9	420.0
02-Dec-20	91.0	1541.0
09-Dec-20	37.9	1860.0
16-Dec-20	31.3	3230.0
23-Dec-20	19.5	1354.0
30-Dec-20	24.1	1067.0
06-Jan-21	18.9	1187.0
13-Jan-21	45.0	1274.0
21-Jan-21	18.9	960.0
27-Jan-21	565.0	6630.0
03-Feb-21	32.7	1497.0
21-Apr-21	2.0	448.0
28-Apr-21	7.5	546.0
05-May-21	10.8	501.2
12-May-21	12.2	1500.0
19-May-21	21.1	1314.0
26-May-21	24.3	1274.0
02-Jun-21	13.1	959.0
09-Jun-21	9.8	1467.0
16-Jun-21	16.9	1014.0
23-Jun-21	20.3	857.0
30-Jun-21	12.1	836.0
07-Jul-21	9.5	988.0
14-Jul-21	14.5	2382.0
21-Jul-21	20.1	1299.7
28-Jul-21	7.5	2415.0
04-Aug-21	35.5	1860.0
11-Aug-21	13.2	1172.0
18-Aug-21	9.7	1119.9
25-Aug-21	10.6	980.4
01-Sep-21	9.8	1576.0
09-Sep-21	14.5	1012.0
15-Sep-21	19.9	1483.0
23-Sep-21	14.5	3310.0
29-Sep-21	16.0	5172.0
06-Oct-21	19.9	2613.0
13-Oct-21	8.5	836.0
20-Oct-21	7.5	813.0
25-Oct-21	6300.0	241960.0
27-Oct-21	132.0	5794.0
28-Oct-21	86.0	4106.0
29-Oct-21	34.5	4352.0
30-Oct-21	60.9	2613.0
31-Oct-21	41.0	2790.0
01-Nov-21	35.0	2382.0
02-Nov-21	41.4	2130.0
03-Nov-21	22.6	1785.0
09-Nov-21	934.0	24950.0
17-Nov-21	28.2	2750.0
15-Dec-21	241.0	2400.0
11-Mar-22	13.5	387.3
16-Mar-22	41.0	2098.0
23-Mar-22	10.9	980.4
29-Mar-22	75.0	4786.0
06-Apr-22	13.4	1413.6
13-Apr-22	11.0	1054.0
20-Apr-22	20.0	1076.0
27-Apr-22	10.0	1017.0
04-May-22	10.0	1723.0
11-May-22	85.0	3255.0
18-May-22	18.5	980.4
25-May-22	29.8	1119.9
01-Jun-22	13.5	1043.0
08-Jun-22	22.3	1553.0
15-Jun-22	17.3	2380.0
22-Jun-22	25.6	1970.0
29-Jun-22	41.0	1500.0
06-Jul-22	23.8	1137.0
13-Jul-22	34.1	1299.7
20-Jul-22	12.0	1616.0
27-Jul-22	13.5	1782.0
03-Aug-22	9.7	1046.2
10-Aug-22	52.0	2755.0
17-Aug-22	9.7	1439.0
24-Aug-22	12.2	980.4
31-Aug-22	16.1	1565.0
07-Sep-22	12.2	1413.6
14-Sep-22	7.4	980.4
21-Sep-22	300.0	3930.0
28-Sep-22	8.6	1553.1
05-Oct-22	22.8	2419.6
12-Oct-22	11.0	2419.6
19-Oct-22	12.0	2282.0
26-Oct-22	21.6	1553.1
02-Nov-22	272.0	3590.0
09-Nov-22	86.2	2098.0
16-Nov-22	8.6	387.3
23-Nov-22	12.0	359.0
30-Nov-22	9.8	240.0
07-Dec-22	21.3	920.8
14-Dec-22	27.5	1986.3
21-Dec-22	12.2	436.0
28-Dec-22	50.4	1732.9

Fairbairn WTP

Sample Date[1]	Source Water Alkalinity (mg/L)	Source Water TOC (mg/L)	Treated Water TOC (mg/L)
1/2/2018	22	1.5	1.0
2/7/2018	25	1.6	1.1
O/S			
O/S			
O/S			
6/1/2018	24	1.8	1.1
7/2/2018	23	1.7	1.1
8/1/2018	24	1.8	1.1
9/4/2018	24	1.6	1.1
10/1/2018	21	1.4	1.0
11/1/2018	20	1.4	1.0
O/S			

Sample Date[1]	Source Water Alkalinity (mg/L) **[REQUIRED]** **[1]**	Source Water TOC (mg/L) **[REQUIRED]** **[2]**	Treated Water TOC (mg/L) **[REQUIRED]** **[3]**
1/2/19	27	1.4	1.0
2/1/19	29	1.7	1.1
3/1/19	26	1.6	1.0
4/2/19	28	1.2	0.9
5/1/19	22	1.7	0.9
6/3/19	19	1.3	0.8
7/1/19	17	1.4	0.9
8/1/19	19	1.2	0.7
9/3/19	17	1.2	0.8
10/1/19	16	1.1	0.8
11/1/19	18	1.2	0.8
12/2/19	19	1.6	1.1

Sample Date[1]	Source Water Alkalinity (mg/L) **[REQUIRED]** **[1]**	Source Water TOC (mg/L) **[REQUIRED]** **[2]**	Treated Water TOC (mg/L) **[REQUIRED]** **[3]**
1/2/20	22	1.2	0.8
2/3/20	25	1.1	0.8
O/S	O/S	O/S	O/S
O/S	O/S	O/S	O/S
5/7/20	28	1.5	1.1
6/1/20	26	1.5	1.0
7/1/20	26	1.4	0.9
8/3/20	25	1.2	0.8
9/2/20	24	1.2	0.8
10/1/20	21	1.2	0.8
11/30/20	22	1.4	1.0
12/2/20	23	1.4	0.9

Sample Date[1]	Source Water Alkalinity (mg/L) **[REQUIRED]** **[1]**	Source Water TOC (mg/L) **[REQUIRED]** **[2]**	Treated Water TOC (mg/L) **[REQUIRED]** **[3]**
1/6/21	26	1.1	0.9
2/3/21	27	1.6	1.1
O/S	O/S	O/S	O/S
O/S	O/S	O/S	O/S
5/5/21	22	1.3	0.9
6/2/21	25	1.2	0.9
7/7/21	25	1.4	0.9
8/4/21	27	1.5	0.9
9/1/21	25	1.5	0.9
10/6/21	27	1.3	1.0
O/S	O/S	O/S	O/S
O/S	O/S	O/S	O/S

Sample Date[1]	Source Water Alkalinity (mg/L) **[REQUIRED]** **[1]**	Source Water TOC (mg/L) **[REQUIRED]** **[2]**	Treated Water TOC (mg/L) **[REQUIRED]** **[3]**
O/S	O/S	O/S	O/S
O/S	O/S	O/S	O/S

3/16/22	32	1.9	1.3
4/6/22	31	1.7	1.1
5/4/22	30	1.7	1.1
6/1/22	25	1.6	1.1
7/6/22	24	1.6	1.0
8/3/22	24	1.5	1.0
9/7/22	24	1.5	1.0
10/5/22	23	1.7	1.1
11/2/22	32	2.5	1.8
12/7/22	28	1.9	1.3

Fairbairn WTP

	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
		deleted as Fairbairn off on this date								deleted as Fairbairn off on this date				deleted as Fairbairn off on this date			deleted as Fairbairn off on this date			
THM																				
3 S 6	29		59	61	32	41	59	62	33		50	41	25		55	43		74	76	66
3 SB	28		72	57	35	42	62	67	41		58	28	35		55	50		67	86	54

Fairbairn WTP

HAA5

	1st Qtr. 2018	2nd Qtr. 2018	3rd Qtr. 2018	4th Qtr. 2018	1st Qtr. 2019	2nd Qtr. - 2019	3rd Qtr. 2019	4th Qtr. 2019	1st Qtr. - 2020	2nd Qtr. 2020	3rd Qtr. 2020	4th Qtr. 2020	1st Qtr. 2021	2nd Qtr. 2021	3rd Qtr. 2021	4th Qtr. 2021	1st Qtr. 2022	2nd Qtr. 2022	3rd Qtr. 2022	4th Qtr. 2022
3 S 6	26		33	43	32	39	39	33	25		25	28	17		28	22		47	45	45
3 SB	25		27	36	29	38	37	29	25		27	15	20		31	23		53	40	31

Analyte Acronym	Sample Quarter	Sample Date	Site	Lab Name	Lab Order #	Lab Sample #	Method	Analyte	Result
NEtFOSAA	2019-Q2	05/15/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	805559	201905160663	EPA 537	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2019-Q2	05/15/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	805559	201905160663	EPA 537	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2019-Q2	05/15/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	805559	201905160663	EPA 537	Perfluorobutanesulfonic acid	ND
PFDA	2019-Q2	05/15/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	805559	201905160663	EPA 537	Perfluorodecanoic acid	ND
PFDoA	2019-Q2	05/15/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	805559	201905160663	EPA 537	Perfluorododecanoic acid	ND
PFHpA	2019-Q2	05/15/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	805559	201905160663	EPA 537	Perfluoroheptanoic acid	ND
PFHxA	2019-Q2	05/15/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	805559	201905160663	EPA 537	Perfluorohexanoic acid	ND
PFHxS	2019-Q2	05/15/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	805559	201905160663	EPA 537	Perfluorohexanesulfonic acid	ND
PFNA	2019-Q2	05/15/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	805559	201905160663	EPA 537	Perfluorononanoic acid	ND
PFOA	2019-Q2	05/15/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	805559	201905160663	EPA 537	Perfluorooctanoic acid	ND
PFOS	2019-Q2	05/15/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	805559	201905160663	EPA 537	Perfluorooctanesulfonic acid	ND
PFTA	2019-Q2	05/15/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	805559	201905160663	EPA 537	Perfluorotetradecanoic acid	ND
PFTrDA	2019-Q2	05/15/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	805559	201905160663	EPA 537	Perfluorotridecanoic acid	ND
PFUnA	2019-Q2	05/15/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	805559	201905160663	EPA 537	Perfluoroundecanoic acid	ND
NEtFOSAA	2019-Q2	05/15/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	805559	201905160667	EPA 537	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2019-Q2	05/15/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	805559	201905160667	EPA 537	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2019-Q2	05/15/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	805559	201905160667	EPA 537	Perfluorobutanesulfonic acid	ND
PFDA	2019-Q2	05/15/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	805559	201905160667	EPA 537	Perfluorodecanoic acid	ND
PFDoA	2019-Q2	05/15/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	805559	201905160667	EPA 537	Perfluorododecanoic acid	ND
PFHpA	2019-Q2	05/15/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	805559	201905160667	EPA 537	Perfluoroheptanoic acid	ND
PFHxA	2019-Q2	05/15/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	805559	201905160667	EPA 537	Perfluorohexanoic acid	ND
PFHxS	2019-Q2	05/15/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	805559	201905160667	EPA 537	Perfluorohexanesulfonic acid	ND
PFNA	2019-Q2	05/15/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	805559	201905160667	EPA 537	Perfluorononanoic acid	ND
PFOA	2019-Q2	05/15/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	805559	201905160667	EPA 537	Perfluorooctanoic acid	ND
PFOS	2019-Q2	05/15/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	805559	201905160667	EPA 537	Perfluorooctanesulfonic acid	ND
PFTA	2019-Q2	05/15/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	805559	201905160667	EPA 537	Perfluorotetradecanoic acid	ND
PFTrDA	2019-Q2	05/15/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	805559	201905160667	EPA 537	Perfluorotridecanoic acid	ND
PFUnA	2019-Q2	05/15/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	805559	201905160667	EPA 537	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2019-Q3	08/13/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	821479	201908140651	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2019-Q3	08/13/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	821479	201908140653	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2019-Q4	11/05/19	EAFWTP Tap 01 (Raw)	Eurofins Eaton	837269	201911060687	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	Perfluorotetradecanoic acid	ND

PFTrDA	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2019-Q4	11/05/19	EAFWTP Tap 12 (Treated)	Eurofins Eaton	837269	201911060689	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2020-Q1	02/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	855200	202002140407	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2020-Q1	02/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	855200	202002140409	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2020-Q4	10/13/20	EAFWTP Tap 01 (Raw)	Eurofins Eaton	898292	202010140598	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2020-Q4	10/13/20	EAFWTP Tap 12 (Treated)	Eurofins Eaton	898292	202010140600	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2021-Q1	01/06/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	911777	202101070218	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	Perfluorohexanoic acid	ND

PFHxS	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2021-Q1	01/06/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	911777	202101070220	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2021-Q2	04/22/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	931328	202104230673	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2021-Q2	04/22/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	931330	202104230677	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2021-Q3	07/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	946861	202107160610	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2021-Q3	07/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	946876	202107160669	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2021-Q4	10/14/21	EAFWTP Tap 01 (Raw)	Eurofins Eaton	964418	202110150509	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND

PFBS	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	Perfluorononanoic acid	ND
PFOA	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2021-Q4	10/14/21	EAFWTP Tap 12 (Treated)	Eurofins Eaton	964418	202110150512	EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
11Cl-PF3OUdS	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
9Cl-PF3ONS	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
ADONA	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
HFPO-DA	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NEtFOSAA	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	Perfluorobutanesulfonic acid	ND
PFBS	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	Perfluorodecanoic acid	ND
PFDA	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	Perfluorododecanoic acid	ND
PFDoA	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	Perfluoroheptanoic acid	ND
PFHpA	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	Perfluorohexanoic acid	ND
PFHxA	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	Perfluorohexanesulfonic acid	ND
PFHxS	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	Perfluorononanoic acid	ND
PFNA	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	Perfluorononanoic acid	ND
PFOA	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	Perfluorooctanoic acid	ND
PFOA	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	Perfluorooctanesulfonic acid	ND
PFOS	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	Perfluorotetradecanoic acid	ND
PFTA	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	Perfluorotridecanoic acid	ND
PFTrDA	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2022-Q1	03/14/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	992962		EPA 537.1	Perfluoroundecanoic acid	ND
PFUnA	2022-Q1	03/14/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	992962		EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
11Cl-PF3OUdS	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
9Cl-PF3ONS	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
ADONA	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
HFPO-DA	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NEtFOSAA	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	Perfluorobutanesulfonic acid	ND
PFBS	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	Perfluorobutanesulfonic acid	ND
PFDA	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	Perfluorodecanoic acid	ND
PFDA	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	Perfluorodecanoic acid	ND
PFDoA	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	Perfluorododecanoic acid	ND
PFDoA	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	Perfluorododecanoic acid	ND
PFHpA	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	Perfluoroheptanoic acid	ND
PFHpA	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	Perfluoroheptanoic acid	ND
PFHxA	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	Perfluorohexanoic acid	ND
PFHxA	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	Perfluorohexanoic acid	ND
PFHxS	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	Perfluorohexanesulfonic acid	ND
PFHxS	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	Perfluorohexanesulfonic acid	ND
PFNA	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	Perfluorononanoic acid	ND
PFNA	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	Perfluorononanoic acid	ND
PFOA	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	Perfluorooctanoic acid	ND
PFOA	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	Perfluorooctanoic acid	ND
PFOS	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	Perfluorooctanesulfonic acid	ND
PFOS	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	Perfluorooctanesulfonic acid	ND
PFTA	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	Perfluorotetradecanoic acid	ND
PFTA	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	Perfluorotridecanoic acid	ND
PFTrDA	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	Perfluorotridecanoic acid	ND
PFUnA	2022-Q2	04/20/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton	1000704		EPA 537.1	Perfluoroundecanoic acid	ND
PFUnA	2022-Q2	04/20/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton	1000704		EPA 537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	Perfluorobutanesulfonic acid	ND
PFDA	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	Perfluorodecanoic acid	ND
PFDoA	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	Perfluorododecanoic acid	ND
PFHpA	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	Perfluoroheptanoic acid	ND
PFHxA	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	Perfluorohexanoic acid	ND
PFHxS	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	Perfluorohexanesulfonic acid	ND
PFNA	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	Perfluorononanoic acid	ND
PFOA	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	Perfluorooctanoic acid	ND
PFOS	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	Perfluorooctanesulfonic acid	ND
PFTA	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	Perfluorotridecanoic acid	ND
PFUnA	2022-Q3	07/13/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-10420-1	380-10420-1	537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND

9Cl-PF3ONS	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	Perfluorobutanesulfonic acid	ND
PFDA	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	Perfluorodecanoic acid	ND
PFDoA	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	Perfluorododecanoic acid	ND
PFHpA	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	Perfluoroheptanoic acid	ND
PFHxA	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	Perfluorohexanoic acid	ND
PFHxS	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	Perfluorohexanesulfonic acid	ND
PFNA	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	Perfluorononanoic acid	ND
PFOA	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	Perfluorooctanoic acid	ND
PFOS	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	Perfluorooctanesulfonic acid	ND
PFTA	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	Perfluorotridecanoic acid	ND
PFUnA	2022-Q3	07/13/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-10420-1	380-10420-3	537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	Perfluorobutanesulfonic acid	ND
PFDA	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	Perfluorodecanoic acid	ND
PFDoA	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	Perfluorododecanoic acid	ND
PFHpA	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	Perfluoroheptanoic acid	ND
PFHxA	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	Perfluorohexanoic acid	ND
PFHxS	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	Perfluorohexanesulfonic acid	ND
PFNA	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	Perfluorononanoic acid	ND
PFOA	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	Perfluorooctanoic acid	ND
PFOS	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	Perfluorooctanesulfonic acid	ND
PFTA	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	Perfluorotridecanoic acid	ND
PFUnA	2022-Q4	10/12/22	EAFWTP Tap 01 (Raw)	Eurofins Eaton Monrovia	380-24433-1	380-24433-1	537.1	Perfluoroundecanoic acid	ND
11Cl-PF3OUdS	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND
9Cl-PF3ONS	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	ND
ADONA	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	4,8-dioxa-3H-perfluorononanoic acid	ND
HFPO-DA	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	Hexafluoropropylene oxide dimer acid	ND
NEtFOSAA	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	N-ethyl perfluorooctanesulfonamidoacetic acid	ND
NMeFOSAA	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	N-methyl perfluorooctanesulfonamidoacetic acid	ND
PFBS	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	Perfluorobutanesulfonic acid	ND
PFDA	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	Perfluorodecanoic acid	ND
PFDoA	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	Perfluorododecanoic acid	ND
PFHpA	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	Perfluoroheptanoic acid	ND
PFHxA	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	Perfluorohexanoic acid	ND
PFHxS	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	Perfluorohexanesulfonic acid	ND
PFNA	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	Perfluorononanoic acid	ND
PFOA	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	Perfluorooctanoic acid	ND
PFOS	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	Perfluorooctanesulfonic acid	ND
PFTA	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	Perfluorotetradecanoic acid	ND
PFTrDA	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	Perfluorotridecanoic acid	ND
PFUnA	2022-Q4	10/12/22	EAFWTP Tap 12 (Treated)	Eurofins Eaton Monrovia	380-24433-1	380-24433-3	537.1	Perfluoroundecanoic acid	ND

City of Sacramento Cyanotoxin Monitoring

CollectDate	Site	Atoxin-A, ug/L	Cylindrospermopsin, ug/L	Microcystin-LA, ug/L	Microcystin-LF, ug/L	Microcystin-LR, ug/L	Microcystin-LY, ug/L	Microcystin-RR, ug/L	Microcystin-YR, ug/L	Nodularins, ng/L
5/24/2018	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/7/2018	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/14/2018	EAFWTP Tap 01 (Raw)	**0.02**	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/21/2018	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/5/2018	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/12/2018	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/19/2018	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/26/2018	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/2/2018	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/9/2018	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/16/2018	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/23/2018	EAFWTP Tap 01 (Raw)	**0.05**	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/30/2018	EAFWTP Tap 01 (Raw)	**0.1**	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/6/2018	EAFWTP Tap 01 (Raw)	**0.1**	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/13/2018	EAFWTP Tap 01 (Raw)	**0.1**	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/20/2018	EAFWTP Tap 01 (Raw)	**0.12**	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/27/2018	EAFWTP Tap 01 (Raw)	**0.084**	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
10/4/2018	EAFWTP Tap 01 (Raw)	**0.039**	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
10/11/2018	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
5/20/2021	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
5/27/2021	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/3/2021	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/10/2021	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/17/2021	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/24/2021	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/1/2021	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/8/2021	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/15/2021	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/22/2021	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/29/2021	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/5/2021	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/12/2021	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/19/2021	EAFWTP Tap 01 (Raw)	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/26/2021	EAFWTP Tap 01 (Raw)	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/2/2021	EAFWTP Tap 01 (Raw)	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/9/2021	EAFWTP Tap 01 (Raw)	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/16/2021	EAFWTP Tap 01 (Raw)	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/23/2021	EAFWTP Tap 01 (Raw)	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/30/2021	EAFWTP Tap 01 (Raw)	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/7/2021	EAFWTP Tap 01 (Raw)	ND	ND	ND	ND	ND	ND	ND	ND	ND
6/6/2019	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
6/13/2019	EAFWTP Tap 1 (Raw)	**0.021**	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
6/20/2019	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
6/27/2019	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
7/4/2019	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
7/11/2019	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
7/18/2019	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
7/25/2019	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
8/1/2019	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
8/8/2019	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
8/22/2019	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
8/29/2019	EAFWTP Tap 1 (Raw)	**0.028**	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
9/5/2019	EAFWTP Tap 1 (Raw)	**0.025**	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
9/12/2019	EAFWTP Tap 1 (Raw)	**0.025**	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
9/19/2019	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
9/26/2019	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
6/4/2020	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
6/11/2020	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
6/18/2020	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
6/25/2020	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
7/9/2020	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
7/16/2020	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
7/23/2020	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
7/30/2020	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
8/6/2020	EAFWTP Tap 1 (Raw)	**0.021**	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
8/13/2020	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
8/20/2020	EAFWTP Tap 1 (Raw)	**0.022**	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
8/27/2020	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
9/3/2020	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
9/10/2020	EAFWTP Tap 1 (Raw)	**0.038**	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
9/17/2020	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
9/24/2020	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
10/1/2020	EAFWTP Tap 1 (Raw)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
7/16/2020	EAFWTP Tap 12 (Treated)	< 0.0200	< 0.0500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100

CollectDate	Site	Anatoxin-A µg/L	Cylindrospermopsin µg/L	Microcystin-LA µg/L	Microcystin-LF µg/L	Microcystin-LR µg/L	Microcystin-LY µg/L	Microcystin-RR µg/L	Microcystin-YR µg/L	Nodularin µg/L
5/19/2022	EAFWTP Tap 01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/2/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/9/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/16/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/23/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/30/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/7/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/14/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/21/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/28/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/4/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/11/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/18/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/25/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/1/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/8/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/15/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/22/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/29/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
10/6/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
10/13/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
10/20/2022	EAFWTP Tap 1 (Raw)									
10/27/2022	EAFWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
11/17/2022	EAFWTP Tap 1 (Raw)									
12/15/2022	EAFWTP Tap 1 (Raw)									
9/8/2022	EAFWTP Tap 12 (Treated)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/22/2022	EAFWTP Tap 12 (Treated)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
10/27/2022	EAFWTP Tap 12 (Treated)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
11/17/2022	EAFWTP Tap 12 (Treated)									
12/15/2022	EAFWTP Tap 12 (Treated)									
5/26/2022	EAFWTP Tap01 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
5/19/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
5/26/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/2/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/9/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/16/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/23/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
6/30/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/7/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/14/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/21/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
7/28/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/4/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/11/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/18/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
8/25/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/1/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/8/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/15/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/22/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/29/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
10/6/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
10/13/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
10/20/2022	SRWTP Tap 1 (Raw)									
10/27/2022	SRWTP Tap 1 (Raw)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/8/2022	SRWTP Tap 13 (Treated)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
9/22/2022	SRWTP Tap 13 (Treated)	< 0.020	< 0.050	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
10/27/2022	SRWTP Tap 13 (Treated)	0.10	< 0.050	0.58	< 0.10	0.15	< 0.10	< 0.10	< 0.10	< 0.10

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APPENDIX C
REGULATORY FRAMEWORK

REGULATORY FRAMEWORK

This Framework provides a review of current and anticipated drinking water regulations related to surface water systems as promulgated by the United States Environmental Protection Agency (USEPA) and the California State Water Resources Control Board's Division of Drinking Water (DDW). Anticipated regulations were limited to those projected to be implemented within five years. Under the provisions of the Safe Drinking Water Act (SDWA), the DDW has the primary enforcement responsibility (referred to as "primacy"). The Health and Safety Code of the California Administrative Code establishes DDW's authority and stipulates drinking water quality and monitoring standards. To maintain primacy, a state's drinking water regulations can be no less stringent than the federal standards (a state's regulations can be more stringent).

The USEPA and DDW establish primary regulations for the control of contaminants that affect public health and secondary regulations for compounds that affect the taste or aesthetics of drinking water. For each contaminant that is regulated, the USEPA is required to establish a maximum contaminant level (MCL) or a treatment technique (TT) to limit the level of these compounds in drinking waters. USEPA is also required to recommend a Best Available Technology (BAT) for removal of each contaminant during treatment.

In March 2010 the USEPA announced that they would be implementing a new regulatory strategy for drinking water. There are four major components to the strategy:

- Regulate contaminants as groups,
- Foster development of new drinking water treatment technologies,
- Use authority of multiple statutes to protect drinking water, and
- Partner with states to share data.

CURRENT REGULATIONS

The most significant drinking water quality regulations applied to surface water supplies are shown in **Table 1**. **Attachment 1** contains a summary of each of the contaminants currently regulated in drinking water by either the USEPA or the DDW. The attachment identifies the regulation and the MCL or the TT associated with each of the contaminants listed. There are numerous constituents which only have a California drinking water standard or a more stringent California drinking water standard, so the regulation is indicated as DDW. The following is a general discussion of the requirements of the regulations listed in **Table 1**.

NIPDWR

Prior to the establishment of the USEPA, the US Public Health Service had established 22 drinking water standards. These standards were adopted by the USEPA as National Interim Primary Drinking Water Regulations (NIPDWR) by the SDWA. These contaminants have been updated or replaced by subsequent regulations.

Table 1
Summary of Current Major Federal and State Drinking Water Quality Regulations Related to Surface Water

Regulation	Year of Promulgation	Number of Contaminants	Targeted Contaminants
National Interim Primary Drinking Water Regulations (NIPDWR)	1975-1981	7	Trihalomethanes, Arsenic, Radiologicals
Phase I Regulations	1987	8	VOCs
Phase II Regulations	1991	36	VOCs, SOCs, and IOCs
Phase V Regulations	1992	23	VOCs, SOCs, and IOCs
Surface Water Treatment Rule (SWTR)	1989	5	Microbiological and Turbidity
Total Coliform Rule (TCR)	1989	2	Microbiological
Lead and Copper Rule (LCR)	1991/2003 [1]	2	Lead and Copper
Drinking Water Source Assessment and Protection Program	1996	-	Source Water Protection
Contaminant Candidate List 1/First Regulatory Determination	1998/2003	60	Microbial and Chemical
Stage 1 Disinfectants/Disinfection By-Products (D/DBP) Rule	1998/2006 [1]	14	D/DBPs and Precursors
Interim Enhanced Surface Water Treatment Rule (IESWTR)	1998/2007 [1]	2	Microbiological and Turbidity, Systems >10,000
Radionuclides Rule	2000/2006 [1]	4	Radionuclides
Arsenic Rule	2001/2008 [1]	1	Arsenic
Filter Backwash Recycling Rule	2001/2007 [1]	-	Microbiological and Turbidity
Stage 2 D/DBP Rule	2006/2012[1]	9	DBPs
Long Term 2 ESWTR	2006	1	*Cryptosporidium*
Unregulated Contaminant Monitoring Rule 2	2006	25	Chemical and Microbiological
CA Public Notification Requirements	2006	None	None
CA Secondary Drinking Water Standards	2006	25	Human Welfare/Aesthetics
CA Perchlorate Regulation	2007	1	Perchlorate
Contaminant Candidate List 2/ Second Regulatory Determination	2005/2008	51/11	Chemical
CA Waterworks Standard	2008	None	None
Endocrine Disrupters Screening Program	2009/2010	134	Endocrine Disrupters

Table 1 Cont'd
Summary of Current Major Federal and State Drinking Water Quality Regulations Related to Surface Water

Regulation	Year of Promulgation	Number of Contaminants	Targeted Contaminants
Contaminant Candidate List 3/ Third Regulatory Determination	2009/2016	116/5	Chemical and Microbiological
Six-Year Review	2017	-	-
Unregulated Contaminant Monitoring Rule 3	2012	30	Chemical and Biological
Revised Total Coliform Rule	2012	3	Microbiological
CA Hexavalent Chromium Regulation [2]	2014	1	Hexavalent Chromium
Contaminant Candidate List 4/Fourth Regulatory Determination	2016/2021	109/8	Chemical and Microbiological
Unregulated Contaminant Monitoring Rule 4	2016	30	Chemical and Microbiological
CA 1,2,3-Trichloropropane Regulation	2017	1	1,2,3-Trichloropropane
USEPA Long Term Revisions to the Lead and Copper Rule	2019/2021	2	Lead and Copper
Contaminant Candidate List 5/Fifth Regulatory Determination	2022/2027	81	Chemical and Microbiological
Unregulated Contaminant Monitoring Rule 5	2021	30	Chemical
CA Revised Total Coliform Rule	2021	3	Microbial
CA Microplastics Regulation	2020/2022	1	Microplastics

[1] California Adoption of Federal Rule
[2] California Repealed the Hexavalent Chromium Regulation in September 2017 and is currently under reconsideration

Phase I Regulations

The Phase I Regulations were finalized in July 1987 and compliance for large utilities was required by January 1989. The Phase I Regulations included MCLs for eight volatile organic compounds (VOCs) and required utilities to collect quarterly samples from each source water supply for one year. After one year, utilities could qualify for reduced monitoring based on the first year monitoring results (one sample every three years). The Phase I Regulations also included monitoring requirements for unregulated contaminants. All systems were required to monitor for a minimum of 34 unregulated volatile organic contaminants; two additional contaminants if the system is determined vulnerable; and 15 additional contaminants at the State's discretion.

Phase II Regulations

The Phase II Regulations were proposed in May 1989 and finalized in July 1991. Monitoring under the Phase II Regulations was required to begin in January 1993. The Phase II Regulations established MCLs for 36 contaminants (7 inorganic constituents (IOCs), 10 VOCs, and 19 synthetic organic compounds (SOCs), plus nitrate, nitrite, and total nitrate and nitrite) and TT requirements for two additional treatment additives (polymers). In order to simplify the increasing number of monitoring requirements, the Standardized Monitoring Framework (SMF) was developed. The SMF is based on a nine-year cycle divided into three, three-year monitoring periods. Under the new monitoring schedule, initial monitoring, baseline monitoring, reduced monitoring, and increased monitoring requirements were established.

Phase V Regulations

The Phase V Regulations were proposed in July 1990 and finalized in July 1992. The SMF was incorporated into the Phase V Regulations with the first compliance period for large utilities beginning January 1994. Phase V established regulations for 23 contaminants including 22 from the original list of 83 included in the 1986 SDWA Amendments (originally included a proposal for sulfate that was not included in the final Phase V regulations). The 23 Phase V contaminants include five IOCs, three VOCs, and 15 SOCs. The MCL for nickel, 0.1 milligrams per liter (mg/L), was remanded in February 1995 by the US Court of Appeals for the District of Columbia Circuit. The USEPA is required to reconsider the nickel MCL Goal (MCLG) and the MCL, but no action was ever taken.

Surface Water Treatment Rule

The Surface Water Treatment Rule (SWTR) was promulgated to control the levels of turbidity, *Giardia lamblia*, viruses, *Legionella*, and heterotrophic plate count bacteria in U.S. drinking waters. Many of the detailed requirements of this regulation were enhanced or superseded by the Interim and Long Term 2 Enhanced Surface Water Treatment Rules described later.

The California SWTR requires all utilities utilizing a surface water supply or a groundwater supply under the influence of a surface water supply, to provide adequate disinfection and, under most conditions, to provide filtration. Exemptions from filtration of surface water supplies are provided in rare occasions where the source water supply meets extremely rigid requirements for water quality and the utility possesses control of the watershed.

General Requirements

The SWTR includes the following general requirements to minimize human exposure to microbial contaminants in drinking water.

- Utilities are required to achieve at least 99.9 percent removal and/or inactivation of *Giardia lamblia* cysts (3-log removal) and a minimum 99.99 percent removal and/or inactivation of viruses (4-log removal). The required level of removal/inactivation must occur between the point where the raw water ceases to be influenced by surface water runoff to the point at which the first customer is served.
- The disinfectant residual entering the distribution system must not fall below 0.2 mg/L for more than 4 hours during any 24-hour period.
- A disinfectant residual must be detectable in 95 percent of distribution system samples. A heterotrophic plate count (HPC) concentration of less than 500 colonies per milliliter (/mL) can serve as a detectable residual if no residual is measured.
- Each utility must perform a watershed sanitary survey at least every five years.

Removal Credit

The level of physical removal credit given a utility for both *Giardia lamblia* and viruses is determined by the type of treatment process used. For a conventional water treatment plant, the SWTR provides a 2.5-log removal credit for *Giardia lamblia* and a 2.0-log removal credit for viruses. Alternative treatment technologies are awarded removal credit from DDW based on performance tests.

Disinfection Credit

Disinfection during conventional treatment (assuming all operational criteria and performance standards are met and the plant receives 2.5-log credit for physical removal of *Giardia* and 2.0-log credit for physical removal of viruses), must achieve 0.5-log inactivation of *Giardia lamblia* and 2.0-log inactivation of viruses. To determine the inactivation of *Giardia lamblia* and viruses achieved at a treatment plant, the SWTR established the concept of disinfection contact time (CT). CT is the product of the concentration of disinfectant remaining at the end of a treatment process ("C" in mg/L) and the contact time in which 10 percent of the water passes through the treatment process ("T" or "T_{10}" in minutes). The contact time in which 10 percent of the water travels through a unit process can be conservatively estimated from DDW guidelines or more accurately determined by conducting a tracer study. The USEPA Guidance Manual to the SWTR includes tables that identify the log removal of both *Giardia lamblia* and viruses achieved for a calculated CT value based on the type of disinfectant, the water temperature, and pH.

Total Coliform Rule

The Total Coliform Rule (TCR) was promulgated by the USEPA in June 1989 with compliance required eighteen months after promulgation (January 1991). DDW promulgated the Total Coliform Rule in January 1992 and the Rule went into effect on May 1, 1992. The Revised Total Coliform Rule is discussed later and supersedes some parts of this rule. Under the TCR, utilities must submit a monitoring plan to the DDW for approval. The plan must provide for representative sampling of the distribution system (including all pressure zones and reservoir areas), describe any sample rotations proposed and include a statement that the sample collector has been trained. The total number of samples and frequency of sampling required is dependent on the population served by the utility. For all but the smallest utilities, weekly sampling is required. If any sample is coliform-positive, two actions must be taken within 24 hours of notification to DDW of the positive result:

- A set of repeat samples must be collected. The location of the repeat samples must include the tap that tested positive, and one upstream and downstream location, both of which must be within five service connections of the positive sample location. If one or more of the repeat samples tests positive for the presence of coliforms, an additional set of repeat samples must be taken. This process continues until all of the samples are total coliform-negative or an MCL has been violated.
- The sample must be analyzed for the presence of fecal coliform or *E. coli*.

The previous coliform standard was a density based standard, which had been in place since 1914 under the Interstate Quarantine Act and subsequently modified through 1974. This was replaced by a presence/absence regulation. There are three potential scenarios in which an MCL is violated. These scenarios consist of the following:

- For utilities that analyze less than 40 samples per month, no more than 1 monthly sample may be coliform-positive (this includes repeat samples). If more than 1 monthly sample is coliform-positive then an MCL has been violated. For >40 samples per month collected, an MCL has been violated if more than 5.0% are positive.
- Utilities are in violation of an MCL if an original sample is fecal coliform/*E. coli*-positive <u>and</u> any repeat sample is total, fecal, or *E. coli*-positive.
- Utilities are in violation of an MCL if an original sample is total coliform-positive <u>and</u> any repeat sample is fecal coliform/*E. coli*-positive.

Furthermore, there are two conditions that result in a “Significant Rise in Bacterial Count” classification. This condition is not considered a violation of an MCL; however, it does require notification to DDW. The two conditions that result in this classification are listed below:

- An initial sample that is total coliform-positive is determined to be either fecal coliform or *E. coli*.-positive, as well.
- At least two repeat samples are total coliform-positive but neither sample is fecal coliform or *E. coli*-positive.

Best Available Technology

The TCR includes a list of four preventative measures a utility can institute to minimize the presence of coliforms in the distribution system. These four items include the following:

- Ensure proper well protection.
- Maintain of a minimum 0.2 mg/L disinfectant residual through the entire distribution system.
- Institute a distribution system maintenance program including:
  - appropriate pipe replacement and repair procedures,
  - flushing program,
  - proper operation and maintenance of distribution system reservoirs, and
  - maintenance of a positive water pressure throughout system.
- Provide adequate filtration and disinfection treatment processes.

Lead and Copper Rule

The Lead and Copper Rule (LCR) was promulgated by the USEPA on June 7, 1991. The objective of the LCR is to minimize the corrosion of lead and copper-containing plumbing materials in public water systems (PWS) by requiring utilities to optimize treatment for corrosion control. The LCR establishes "action levels" in lieu of MCLs for regulating the levels of both lead and copper in drinking water. The action level for lead was established at 0.015 mg/L while the action level for copper was set at 1.3 mg/L. The compliance for these action levels is based on results from first-flush distribution system samples at sites selected to meet the LCR requirements. An action level is exceeded when greater than 10 percent of samples collected from the sampling pool contain lead levels above 0.015 mg/L or copper levels above 1.3 mg/L. Unlike an MCL, a utility is not out of compliance with the LCR when an action level is exceeded. Exceedance of an action level requires a utility to take additional steps to reduce lead and copper corrosion in the distribution system. In addition, there is a California state secondary standard, of 1.0 mg/L, for copper that requires monitoring in the source and treated water separately.

In October 1999, USEPA made minor revisions to the LCR to clarify the original rule, streamline implementation, promote consistent national implementation, and reduce the reporting requirements. The revisions do not include any changes to the action levels for lead and copper. The revisions include requiring monitoring for public water systems with optimized corrosion control, which was inadvertently left out of the original LCR. The revisions also include changing the definition of the word "control" in the LCR to only require public water systems to replace lines that it owns or has authority to replace to protect the water quality. The revisions allow systems with low lead and copper tap levels to reduce the number and frequency of sample collection sooner. Finally, there are numerous modifications to the system reporting requirements to minimize the reporting burden.

In 2004 and 2007 the USEPA made several more minor revisions to the LCR, including a requirement to include lead health effects language in the annual Consumer Confidence Report. This was summarized in a Guidance Document in 2008, Lead and Copper Rule: Public Education & Other Public Information Requirements for Community Water Systems.

In February 2016, in response to the Flint, Michigan water quality crisis, the USEPA sent a letter to State Water Division Managers to clarify tap sample collection procedures under the LCR.

Drinking Water Source Assessment and Protection Program

The 1996 SDWA Amendments included a requirement for States to develop a program to assess sources of drinking water and encourage States to establish protection programs. California developed the Drinking Water Source Assessment and Protection (DWSAP) Program in response to this requirement. When bringing a new source into service, a source assessment must be conducted as part of the permitting process.

In November 1999, USEPA gave final approval of the DWSAP Program as California's source water assessment and protection program. The State Department of Health Services (DHS, previous name for DDW) was responsible for the completion of all assessments by May 2003. Water systems that planned to conduct their own assessments were required to submit their final assessments to DHS no later than December 31, 2002.

Once an original assessment is performed for a source water, DDW recommends that the assessment be reviewed every five years. If conditions have changed that might impact the overall ranking of potential contaminating activities (presence in watershed/source water or change to treatment), then a water utility could consider updating the assessment. A completed assessment is required to obtain and continue to obtain chemical monitoring waivers for source waters.

There are eight components identified by California which are required as part of its DWSAP Program. The following is summary of the components, from the perspective of preparation by a water system.

- Source Identification: Systems must locate the source using Global Positioning System.

- Delineation of the Watershed and the Near Intake Zones: Surface water systems must delineate the watershed contributing to the source and may, optionally, identify the near intake zones which are close to the point of diversion where contaminant activities may have a greater influence.
- Evaluation of the Physical Barrier Effectiveness: Surface water systems must complete the forms developed by the State to determine the effectiveness of the natural physical barriers for preventing contaminants from entering the source.
- Identification of Potential Contaminating Activities (PCAs): Surface water systems must develop an inventory of PCAs within the near intake zone or the entire watershed. The PCAs on the inventory must then be ranked for risk using the table from the DWSAP guidance.
- Perform a Vulnerability Assessment: Systems must perform a vulnerability assessment for each PCA identified. This assessment is based on the risk ranking, location, and the physical barrier effectiveness. After assessment, the PCAs are prioritized.
- Develop an Assessment Map: Systems must develop an assessment map, at a minimum using USGS quad maps 7.5 minute series. The map must show the location of the source, the watershed or recharge area, the near intake zones, and the location of the PCAs.
- Prepare a Drinking Water Source Assessment Report: Systems must prepare a report on the assessment to submit to the State for review. The report must include the assessment map, the methods used to locate the source, the recharge area delineation calculations, the physical barrier effectiveness forms, the potential contaminating activity forms, and the vulnerability assessment forms.
- Include a Summary of the Report in the Annual Consumer Confidence Report: Systems must provide a vulnerability summary of the assessment identifying PCAs to which the system is most vulnerable, as well as other information, to include in the annual Consumer Confidence Report. A summary of the assessment must be available upon request, and the report must also be available to the public for review.

The DWSAP guidance encourages voluntary source water protection program development and implementation following completion of the DWSAPs. There are some loan and grant funds available to assist with these programs. The Source Water Protection Program components have been highlighted by the State and include: public involvement, report review, initiation of protection measures, and information transfer to the public.

Contaminant Candidate List 1 (CCL1)

The 1996 Safe Drinking Water Act Amendments provided a list of chemical and microbial contaminants for possible future regulation. Every five years the USEPA is required to update the list, select at least five constituents for evaluation, and determine whether to regulate. The regulations will be determined based on risk assessment and cost-benefit considerations and on minimizing overall risk.

The USEPA selected 60 constituents, including 10 microbial and 50 chemical constituents, to evaluate as part of the first listing in 1998. The USEPA evaluated nine contaminants for possible regulatory determination; *Acanthamoeba*, Aldrin, dieldrin, hexachlorobutadiene, manganese, metribuzin, naphthalene, sodium, and sulfate. The USEPA determined in 2003 not to regulate any of those selected.

Stage 1 Disinfectants and Disinfection By-Products Rule

The purpose of the Stage 1 Disinfectants/Disinfection By-Product (D/DBP) Rule is "… to minimize risks from disinfection by-products and still maintain adequate control over microbial contamination." DDW adopted this regulation in 2012 without any significant variation from the Federal rule. The Stage 2 D/DBP Rule is discussed later and supersedes some parts of this rule.

Maximum Residual Disinfectant Level Goals

The USEPA set maximum residual disinfectant level goals (MRDLGs) for chlorine, chloramines, and chlorine dioxide. These are shown in **Table 2**.

Table 2
Maximum Residual Disinfectant Level Goals

Disinfectant	Goal
Chlorine	4 mg/L as Cl_2
Chloramines	4 mg/L as Cl_2
Chlorine Dioxide	0.8 mg/L as ClO_2

The MRDLGs are set at levels for which no known or anticipated adverse health effects occur. These goals are non-enforceable health goals based only on health effects and exposure information.

Maximum Residual Disinfectant Levels

The Stage 1 D/DBP Rule established maximum residual disinfectant levels (MRDLs) for chlorine, chloramines, and chlorine dioxide. These are shown in **Table 3**.

Table 3
Maximum Residual Disinfectant Levels

Disinfectant	Level
Chlorine	4.0 mg/L as Cl_2
Chloramines	4.0 mg/L as Cl_2
Chlorine Dioxide	0.8 mg/L as ClO_2

Chlorine

The residual disinfectant level must be monitored at the same points in the distribution system and at the same time as when sampling for total coliforms. Compliance with the MRDL will be based on the running annual average of the monthly average of all samples, computed quarterly. Operators may increase the residual chlorine level in the distribution system above the MRDL if necessary to protect public health from acute microbiological contamination problems including: distribution line breaks, storm runoff events, source water contamination, or cross-connections.

Chloramines

The residual disinfectant level must be monitored at the same points in the distribution system and at the same time as when sampling for total coliforms. Compliance with the MRDL will be based on the running annual average of the monthly average of all samples, computed quarterly. Operators may increase the residual chloramine level in the distribution system above the MRDL if necessary to protect public health from acute microbiological contamination problems including: distribution line breaks, storm runoff events, source water contamination, or cross-connections.

Chlorine Dioxide

Systems that use chlorine dioxide must measure the residual disinfectant level at the entrance to the distribution system on a daily basis. Non-compliance with the MRDL can result in acute or non-acute violations. If the daily sample at the entrance exceeds the MRDL, then the system is required to take three additional samples in the distribution system on the next day as described below. If any samples collected the second day in the distribution system exceed the MRDL, or if the distribution system samples were not collected, the system will be in acute violation of the MRDL. If only the sample collected at the entrance to the distribution system exceeds the MRDL on the second day, or if the entrance sample was not collected, the system will be in a non-acute violation of the MRDL.

Follow up monitoring in the distribution system will be governed by the type of residual disinfectant used. Systems using chlorine as a residual disinfectant and operating booster stations after the entrance to the distribution system must take three samples in the distribution system; one close to the first customer, one at an average residence time, and one at the maximum residence time. Systems using chlorine dioxide or chloramines as a residual disinfectant or chlorine without operating booster stations after the entrance to the distribution system must take three samples in the distribution system as close as possible to the first customer at intervals of not less than six hours.

Operators may not increase the residual chlorine dioxide level in the distribution system above the MRDL under any circumstances.

Maximum Contaminant Level Goals (MCLGs) for Trihalomethanes, Haloacetic Acids, Chlorite, and Bromate

The USEPA set MCLGs for four trihalomethanes, three haloacetic acids, chlorite, and bromate. These are shown in **Table 4**.

The MCLGs are set at levels for which no known or anticipated adverse health effects occur. These goals are non-enforceable health goals based only on health effects and exposure information.

Table 4
Maximum Contaminant Level Goals

Disinfection By-Product	MCLG
Bromodichloromethane	0 mg/L
Dibromochloromethane	0.06 mg/L
Bromoform	0 mg/L
Chloroform	0.07 mg/L
Monochloroacetic Acid	0.07 mg/L
Dichloroacetic Acid	0 mg/L
Trichloroacetic Acid	0.02 mg/L
Chlorite	0.8 mg/L
Bromate	0 mg/L

Maximum Contaminant Levels for TTHM, HAA5, Chlorite, and Bromate

The Stage 1 D/DBP Rule set MCLs for Total Trihalomethanes (TTHM), five haloacetic acids (HAA5), chlorite, and bromate. These are shown in **Table 5**.

Table 5
Maximum Contaminant Levels

Contaminant	Level
TTHM[1]	0.080 mg/L
HAA5[2]	0.060 mg/L
Chlorite	1.0 mg/L
Bromate	0.010 mg/L

[1]TTHM includes chloroform, bromodichloromethane, dibromochloromethane, and bromoform.
[2] HAA5 includes mono, di and tri-chloroacetic acids and mono and di-bromoacetic acids.

Total Trihalomethanes and Haloacetic Acids

TTHMs and HAA5 are formed when disinfectants react with naturally occurring organic matter in water. All systems must monitor the distribution system for TTHMs and HAA5. Compliance for surface water, groundwater under the direct influence of surface water (GWUDIS), and groundwater systems with population greater than 10,000 is based on the running annual average of quarterly averages of all samples taken in the distribution system, computed quarterly.

Chlorite

Chlorite is produced when chlorine dioxide reacts with naturally-occurring organic material. Systems using chlorine dioxide for disinfection are required to conduct sampling for chlorite. Systems are required to monitor chlorite on a daily basis at the point of entry to the distribution system. If chlorite is detected at levels greater than 1.0 mg/L at the entrance to the distribution system, then additional distribution system monitoring is required the following day. Systems must monitor three locations in the distribution system (at the same time): close to the first customer, representative of average residence time, and representative of maximum residence time, on a monthly basis.

Bromate

Bromate is produced when ozone reacts with naturally occurring bromide. Systems using ozone for disinfection are required to conduct sampling for bromate. Systems must collect one sample per month at the entrance to the distribution system while the ozonation system is operating under normal conditions. Compliance with the MCL is based on a running annual average, computed quarterly, of monthly samples.

Treatment Technique for Disinfection By-Product Precursors

The USEPA requires systems that have surface water or GWUDIS as a supply that use conventional filtration treatment are required to remove specific amounts of organic material by implementing a treatment technique, either by enhanced coagulation or enhanced softening, unless a system meets alternative criteria. The percent of removal required depends on source water total organic carbon (TOC) and alkalinity. **Table 6** provides a summary of the removal requirements.

Compliance with this treatment technique must be calculated on a quarterly basis, once 12 months of data are available. Each month the system must calculate percent actual TOC removal, determine the percent required TOC removal (from above), and calculate the removal ratio (must be greater than 1.0).

Table 6
TOC Removal Requirements (Percent)

	Alkalinity, mg/L as $CaCO_3$		
TOC, mg/L	0 – 60	> 60 – 120	> 120
> 2.0 - 4.0	35.0	25.0	15.0
> 4.0 - 8.0	45.0	35.0	25.0
> 8.0	50.0	40.0	30.0

In lieu of calculating the removal ratio, systems have the opportunity to be granted a 1.0 for the monthly removal ratio if they meet one of the four following conditions, regardless of the calculated removal ratio:

- Remove greater than or equal to 10 mg/L of magnesium hardness (as $CaCO_3$),
- Raw water TOC is less than 2.0 mg/L,
- Raw water or treated water specific UV absorbance (SUVA) is less than or equal to 2.0 L/mg-m, or
- Treated water alkalinity is less than 60 mg/L (only for systems practicing enhanced softening).

The USEPA has also provided alternative compliance criteria from the treatment technique requirements. Utilities will not be required to achieve the specified TOC removals provided one of the following conditions is met:

- Source water TOC is less than 2.0 mg/L,
- Treated water TOC is less than 2.0 mg/L,
- Source water TOC is less than 4.0 mg/L, source water alkalinity is greater than 60 mg/L, and distribution system TTHM is less than 0.04 mg/L and HAA5 is less than 0.03 mg/L,
- Distribution system TTHM is less than 0.04 mg/L and HAA5 is less than 0.03 mg/L and only chlorine is used for primary disinfection and distribution system residual,
- Source water SUVA, prior to any treatment, is less than or equal to 2.0 L/mg-m, or
- Treated water SUVA is less than or equal to 2.0 L/mg-m.

Interim Enhanced Surface Water Treatment Rule

The Interim ESWTR applies to public water systems (PWSs) that use surface water or GWUDIS and serve > 10,000 population. The purpose of this regulation is "… to improve control of microbial pathogens, including specifically *Cryptosporidium*, in drinking water; and address risk trade-offs with disinfection by-products." When the DDW adopted this regulation in 2007, it included several more detailed regulatory requirements than the Federal version.

Cryptosporidium

The rule set an MCLG for the protozoan genus *Cryptosporidium* of zero (0). Since there was not a reliable means for monitoring this constituent in the drinking water at the time of promulgation, a treatment technique requirement was established in lieu of setting an MCL. The treatment technique requires a 2.0-log (99 percent) *Cryptosporidium* removal or control for PWSs that are currently required to filter under the existing SWTR. This removal must be achieved between the raw water intake and the first customer.

The rule provides that systems with conventional or direct filtration water treatment plants will be granted the 2.0-log removal credit, provided turbidity requirements are met for the existing SWTR (1.0/5.0 nephelometric turbidity units [NTU], 95th percentile and never to exceed) and the combined filter effluent requirements for this rule (0.3/1.0 NTU, 95th percentile and never to exceed).

The rule also provides that systems with slow sand or diatomaceous earth filtration water treatment plants will be granted the 2.0-log removal credit, provided turbidity requirements are met for the existing SWTR (1.0/5.0 NTU). For systems applying to use an "alternative filtration technology", the system must show that the treatment, in combination with disinfection, consistently achieves 99.9 percent removal/inactivation of *Giardia*, 99.99 percent removal/inactivation of viruses, and 99 percent removal of *Cryptosporidium*.

Turbidity

For surface water and GWUDIS systems that are required to filter their source water under the existing SWTR, that employ conventional or direct filtration for treatment, the combined filter effluent turbidity requirements have been tightened. For alternative filtration technologies, the State set turbidity performance requirements at a level that, in combination with disinfection, will consistently achieve 99.9 percent removal/inactivation of *Giardia*, 99.99 percent removal/inactivation of viruses, and 99 percent removal of *Cryptosporidium*.

The combined filter effluent (CFE) turbidity must be less than 0.3 NTU in at least 95 percent of monthly measurements. The CFE may never exceed 1 NTU (based on four hour measurements) and may not exceed 1 NTU for more than 1 continuous hour based on more frequent measurements (at least recorded every 15 minutes for conventional and direct filtration plants). The CFE turbidity shall not exceed 1.0 NTU for more than eight hours (based on 15-minute measurements). Monthly reports must show total number of measurements taken and have two options for value reporting:

- Report the number of 15-minute measurements and show the 50th, 90th, 95th, 98th, and 99th percentiles and report all measurements greater than 1.0 NTU.
- Report 4 hour measurements and also provide the number of 15-minute measurements that month, the number and percent of those 15-minute

measurements less than or equal to 0.3 NTU, and show all 15-minute measurements greater than 0.3 NTU.

The rule requires continuous, on-line measurement of turbidity for each individual filter effluent (IFE) for conventional and direct filtration plants. These data must be recorded every 15 minutes also. Systems with two or fewer filters may conduct continuous monitoring of the CFE turbidity in lieu of individual monitoring. IFE turbidity levels shall be monitored and the following conditions will require DDW reporting and self-assessment activities:

- Report IFE turbidity if greater than 1.0 NTU in two consecutive measurements, 15 minutes apart anytime during filter run
- Report IFE turbidity if greater than 0.3 NTU in two consecutive measurements, 15 minutes apart during the first 60 minutes of filter operation
- Conduct Filter Self-Assessment if IFE turbidity greater than 1.0 NTU in two consecutive measurements, 15 minutes apart anytime during filter run, for three consecutive months
- Conduct Comprehensive Performance Evaluation if IFE turbidity greater than 2.0 NTU in two consecutive measurements, 15 minutes apart anytime during filter run, for two consecutive months

DDW has added several other requirements to the rule including:

- All filters shall be visually inspected once per year as part of the operations plan based on DDW guidance.
- On-line turbidimeters shall be manually verified once per month for combined filter effluent and once per month for individual filter effluent.
- Turbidity shall be recorded and reported for sedimentation effluent at least once per day.
- Flow rate and turbidity shall be recorded and reported for recycled backwash water at least once per day.
- System must report turbidity data to the State within 10 days after the end of each month.

Disinfection Profiling and Benchmarking

The purpose of the disinfection profiling and benchmarking is to develop a process to assure that there is no significant reduction in microbial protection as a result of significant disinfection process modifications to meet the new MCLs for TTHMs and HAA5 from the Stage 1 D/DBP Rule, or subsequent MCLs.

Initial profiling was required for surface water systems if their annual average TTHM levels were greater than or equal to 80 percent of the new MCL (0.064 mg/L) or annual average HAA5 levels were greater than or equal to 80 percent of the new MCL (0.048 mg/L).

The initial disinfection profile was developed using a minimum of one year of weekly *Giardia lamblia* log inactivation. The month with the lowest average log inactivation was identified as the critical period or benchmark. When only one year of data was used, the benchmark inactivation was the same as the critical period. When multiple years of data were used, the benchmark inactivation was the average of the critical period from each year.

After the initial profiling and benchmarking was complete, a utility submitted it to the State as part of the sanitary survey (see description below). If a utility decides to make changes to the disinfection practices, then the utility must consult with the State to ensure that microbial protection is not compromised. Changes that would require a benchmark analysis include; changes in the point of disinfection, the type of disinfectant, the disinfection process, or any other modification identified by the State.

Finished Water Reservoirs

Under this rule, surface water and GWUDIS systems must cover all new treated water reservoirs, holding tanks, and other storage facilities.

Sanitary Surveys

Primacy states, such as California, must now conduct sanitary surveys for all surface water and GWUDIS systems, regardless of size. This is not the same as the watershed sanitary survey requirements, which is a water system requirement. The sanitary surveys must be conducted every three years for community water systems (CWS) and every five years for non-community water systems (NCWS). DDW may grant a waiver to water utilities and perform the sanitary survey every five years if the system has outstanding performance based on previous sanitary surveys. DDW must determine how outstanding performance will be evaluated to allow for the reduced frequency of the sanitary survey.

The sanitary surveys must meet the eight components of the 1995 USEPA/State Guidance. These components include: source assessment (DDW typically uses watershed sanitary surveys for compliance with this component); treatment; distribution system; finished water storage; pumps, pumping facilities and controls; monitoring and reporting (including data verification); system management and operation; and operator compliance with state requirements. Disinfection profiling must also be evaluated if required.

Radionuclides

The USEPA published the Final Radionuclides Rule on December 8, 2000. The Rule applies to all CWSs. It included several new standards including:

- Set the Gross Alpha, Gross Beta and Photon, Combined Radium (226/228), and Uranium MCLGs at zero.
- Set the Gross Alpha MCL at 15 picoCuries per liter (pCi/L).
- Set the Gross Beta and Photon MCL at 4 millirems per year (mrem/yr).
- Set the Combined Radium MCL at 5 pCi/L.
- Set the Uranium MCL at 30 micrograms per liter (µg/L).

The Rule requires all initial monitoring to be collected at the entry point to the distribution system (EPDS). It also clarified that Gross Beta and Photon are only required to be monitored by vulnerable systems. The frequency of repeat monitoring is determined by the initial one year of quarterly monitoring results.

- Sample results less than the detection limit for reporting (DLR), then 1 sample every 9 years.
- Sample results less than half the MCL, then 1 sample every 6 years.
- Sample results less than the MCL, then 1 sample every 3 years.

Arsenic Rule

The Final Arsenic Rule was promulgated by the USEPA on January 22, 2001, to be effective January 23, 2006. The Rule sets an MCLG of 0 mg/L and an MCL of 0.010 mg/L (10 µg/L) for arsenic. DDW adopted a regulation with the same standard in 2008. The California Office of Environmental Health Hazard Assessment (OEHHA) has developed a Public Health Goal (PHG) for arsenic of 4 nanograms per liter (ng/L), equal to 0.004 µg/L.

Surface water systems are required to collect an annual sample. If sample results are greater than the MCL, then quarterly sampling is triggered. Waivers are available with three rounds of monitoring with results less than the MCL. With a waiver, sampling can be reduced to once every nine years.

USEPA and DDW are considering revisions to the MCLs pending an updated human health assessment, as discussed below in the Anticipated Future Regulations section.

Filter Backwash Recycling Rule

The Final Filter Backwash Recycling Rule applies to all PWSs that use surface water and employ conventional or direct filtration and recycle water within the treatment plant. The DDW incorporated this rule into its adoption of the IESWTR.

This requires all recycle streams to pass through all treatment processes; therefore, all streams need to be returned prior to chemical addition and coagulation. Also, each system must notify DDW in writing that they practice recycling. This notification must include a plant schematic that shows the type and location of recycle streams, typical recycle flow data, highest plant flow in the previous year, design flow of the plant, and DDW approved operating capacity.

Each system must collect and maintain the following information: copy of recycle notice to DDW, list of all recycle flows and frequency, average and maximum backwash flow rate and duration, typical filter run length and how determined, type of recycle treatment, and data on recycle treatment facilities.

DDW has added several other requirements to the rule including:

- Raw water shall be sampled for total coliform and either fecal coliform or *E. Coli* at least once per month.
- Chlorine residual shall be confirmed in 95 percent of distribution samples every month.

Stage 2 Disinfectants and Disinfection By-Products Rule

The Stage 2 D/DBP Rule was published in January 2006 and adopted by DDW in 2012. It applies to public water systems (PWSs) that are community water systems (CWSs) or non-transient non-community water systems (NTNCWs) that add a primary or residual disinfectant other than ultraviolet light or deliver water that has been treated with a primary or residual disinfectant other than ultraviolet light.

The key provision in this rule is the change in calculating the maximum contaminant level (MCL). Under the State 1 D/DBP Rule compliance with the MCL was calculated using a running annual average (RAA) to average compliance samples from all distribution system sampling locations. Under Stage 2 D/DBPR, the MCL is calculated using locational running annual averages (LRAAs). PWSs must maintain the LRAA for each compliance sampling location at or below 0.080 mg/L total trihalomethanes (TTHM) and 0.060 mg/L haloacetic acids (HAA5). All systems, including consecutive systems, must comply with the MCLs for TTHM and HAA5 LRAA using compliance sampling locations identified from their Initial Distribution System Evaluation (IDSE) Final Report.

In May 2012 DDW adopted the Stage 2 D/DBP Rule as a marked up version of the existing regulatory code to incorporate the federal requirements into State code.

Initial Distribution System Evaluation

An IDSE was to be performed to identify locations with representative high TTHM and HAA5 concentrations throughout a system's retail distribution system. The IDSE results were used in conjunction with the Stage 1 D/DBPR compliance monitoring to identify and select Stage 2 D/DBPR routine compliance monitoring locations. There were four IDSE options:

- Standard monitoring program
- System specific study [based on TTHM and HAA5 monitoring] and modeling requirements
- Obtaining a 40/30 waiver
- Obtaining a very small system waiver

For systems electing the Standard Monitoring Program, both the timing and number of IDSE monitoring were based on the retail population served by the individual public water system(s) and the source water type (either surface water or groundwater).

The timing of when the IDSE must be completed was based on either an individual system's retail population or, in the case of a combined distribution system, the retail population served by the largest system in that combined system. Combined distribution systems include water systems that receive fully treated water from another water system. The system providing the water was the wholesaler and the system receiving the water was the consecutive system. Since this rule included specific monitoring requirements for both wholesale and consecutive systems, USEPA developed guidance materials to assist combined systems and encouraged coordinating the timing of sample collection for those consecutive systems to enable data assessment. Those systems determined to be large, >100,000 population, were required to submit their IDSE plans under Schedule 1, by October 1, 2006. Schedule 2 systems, those between 50,000 and 100,000 population, had plans due April 1, 2007. Schedule 3 systems, those between 10,000 and 50,000 population, had plans due October 1, 2007. Schedule 3 systems, those less than 10,000 population, had plans due April 1, 2008.

The numbers of IDSE samples in the standard monitoring option were based on each individual system's retail population and the source water type, with the number ranging from 2 to 40. The frequency of sample collection also depended on the retail population and source water type, either one annual, four quarterlies, or six every 60 days.

Compliance Monitoring

Compliance with the Stage 2 D/DBPR is based on calculating a LRAA, where compliance means maintaining the annual average at each routine sampling location in the distribution system at or below 0.080 mg/L and 0.060 mg/L for TTHM and HAA5, respectively. This is in lieu of the RAA MCL calculation under the Stage 1 D/DBPR that averaged observed values across distribution system compliance sampling locations. Monitoring for the LRAA will occur at routine sampling locations identified in the IDSE Final Report at specific frequencies based on system population. In addition, water systems must submit a new Monitoring Plan for routine sampling which identifies the location, timing, and frequency of sample collection as well as the methodology for determining compliance with the MCLs. The number of routine sites for compliance monitoring is based on retail population and source water type, ranging from 2 to 20. The frequency also depends on retail population and source water type, with small systems only required to monitor annually and large systems monitoring quarterly.

If a water system is required to conduct quarterly monitoring, it must make compliance calculations at the end of the fourth calendar quarter that follows the compliance date (based on system size and designation in their IDSE Report and updated Monitoring Plan) and at the end of each subsequent quarter (or earlier if the LRAA calculated based on fewer than four quarters of data would cause the MCL to be exceeded regardless of the monitoring results of subsequent quarters). If the system is required to conduct monitoring at a frequency that is less than quarterly, it must make compliance calculations beginning with the first compliance sample taken after the compliance date.

Operational Evaluation Levels

The Stage 2 D/DBPR includes the concept of "operational evaluation levels." Operational evaluation levels trigger a system to evaluate system operational practices and identify opportunities to reduce DBP concentrations in the distribution system in order to reduce the potential the system will exceed the MCL. The Stage 2 D/DBPR operational evaluation levels are identified using the system's Stage 2 D/DBPR compliance monitoring results.

The operational evaluation includes an examination of system treatment and distribution operational practices, including changes in sources or source water quality, storage tank operations, and excess storage capacity, which may contribute to high TTHM and HAA5 formation. Systems must also identify what steps could be considered to minimize future operational evaluation level exceedances.

Operational Evaluation Levels
(calculated at each monitoring location)

IF $(Q1 + Q2 + 2Q3)/4 > MCL$,
then the system must conduct an operational evaluation

where
Q3 = current quarter measurement
Q2 = previous quarter measurement
Q1 =quarter before previous quarter measurement
MCL=Stage 2 MCL for TTHM (0.080 mg/l) **or**
Stage 2 MCL for HAA5 (0.060 mg/L)

Minimum Reporting Levels for DBPs

The rule establishes regulatory minimum reporting limits (MRLs) for compliance reporting of DBPs by public water systems. These regulatory MRLs also define the minimum concentrations that must be reported as part of the Consumer Confidence Reports. Beginning April 1, 2007 water systems must report all quantitative data results that have concentrations above the MRL. This includes both compliance data, such as routine or increased DBP monitoring, as well as additional data collected by water systems, such as IDSE monitoring, operational evaluation assessment data, and treatment technique compliance data (for precursors).

Maintain TOC < 4 mg/L for Reduced TTHM and HAA5 Monitoring

In order to qualify for reduced routine compliance monitoring for TTHM and HAA5, subpart H systems (i.e., systems that use surface water supplies or ground water under direct influence of surface water) not monitoring to demonstrate compliance with TOC removal requirements of Stage 1 D/DBPR (i.e., plants that are not conventional filtration designs) must take monthly TOC samples every 30 days at a location prior to any treatment, beginning April 1, 2008 or earlier, if specified by the state. The source water TOC running annual average must be <4.0 mg/L (based on the most recent four quarters of monitoring) on a continuing basis at each treatment plant to reduce or remain on reduced monitoring for TTHM and HAA5. After demonstration of TOC level, the system may reduce monitoring to every 90 days.

Systems on a reduced monitoring schedule may remain on that reduced schedule as long as the average of all samples taken in the year (for systems which must monitor quarterly) or the result of the sample (for systems which must monitor no more than frequently than annually) is no more than 0.060 mg/L and 0.045 mg/L for TTHMs and HAA5, respectively.

Long Term 2 Enhanced Surface Water Treatment Rule

The Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) was published by the USEPA in early January 2006 in the Federal Register. This regulation applies to all public water systems that use surface water or ground water under the direct influence of surface water (GWUDI).

The LT2ESWTR includes variable deadlines that are dependent on population served. Some systems serving more than 100,000 people were required to submit detailed monitoring plan submissions under LT2ESWTR by July 1, 2006. The USEPA provided an overview of key monitoring, reporting, and compliance milestones under both rules.

The requirements for filtered and unfiltered systems are different. This section summarizes only the requirements for filtered systems.

Source Water Monitoring

Filtered systems were not required to conduct source water monitoring if the system provided a total of at least 5.5-log of treatment for *Cryptosporidium.* Otherwise, PWSs using surface water or GWUDI were required to monitor their source water (i.e., the influent water entering the treatment plant) monthly for 24 months to determine a maximum running annual average *Cryptosporidium* level. As described in the next section, monitoring results determined the extent of *Cryptosporidium* action requirements under the LT2ESWTR. Large systems also monitored for *E. coli* and turbidity at the same time in source water.

Systems adhered to their sampling plan and reported results no later than 10 days after the end of the first month following the month when the sample was collected. All systems serving at least 10,000 people reported the results from the initial source water monitoring to USEPA electronically using the Central Data Exchange (CDX) website. Submission of historical (grandfathered) data was allowed if it met the quality assurance and quality control requirements specified in the rule.

Systems serving less than 10,000 persons could use *E. coli* as a surrogate indicator for *Cryptosporidium.* However, if the *E. coli* levels were sufficiently high, these systems then undertook *Cryptosporidium* monitoring. The trigger level for *Cryptosporidium* monitoring was originally set at *E. coli* levels above 10 most probable number per 100 milliliters (MPN/100 mL) for a lake or reservoir source and 50 MPN/100 mL for a flowing stream. In 2010, based on data submitted by large systems, the USEPA revised the trigger threshold to 100 MPN/100 mL for all surface water supplies[1].

The rule also includes a provision for all systems to conduct a second round of source water monitoring (either *Cryptosporidium* or *E. coli)* for all systems. This second round of sampling was required at least six years following bin classification for the source water, beginning in 2016 for most large water systems.

Analytical Method

Systems must analyze for *Cryptosporidium* using either USEPA Method 1623 or Method 1622. Systems must analyze at least a 10 L sample, a packed pellet volume of at least 2 mL, or enough volume to clog two filters. The rule contains specific quality assurance and quality control requirements. Only USEPA approved laboratories can perform the *Cryptosporidium* sample analysis. Analytical methods are also specified for turbidity and *E. coli* measurements required by the rule.

Sampling

Filtered systems serving at least 10,000 people sampled their source water for *Cryptosporidium*, *E. coli*, and turbidity at least monthly for 24 months. Filtered systems serving fewer than 10,000 people sampled their source water for *E. coli* at least once every two weeks for 12 months. Filtered systems serving fewer than 10,000 people with

[1] USEPA Memorandum, "OGWDW Review of Small System Monitoring Requirements Under the Long Term 2 Enhanced Surface Water Treatment Rule", February 4, 2010.

the initial *E. coli* annual mean *E. coli* concentration greater than 100 *E. coli MPN*/100 mL then sampled their source water for *Cryptosporidium* at least twice per month for 12 months. These small systems could also elect to skip the *E. coli* monitoring and instead conduct *Cryptosporidium* monitoring at least monthly for 24 months.

Systems collected samples within a five-day period around the scheduled date. If an extreme condition or situation existed that could pose danger to the sample collector, or that could not be avoided and caused the system to be unable to sample, the system sampled as close to the scheduled date as was feasible unless the state approved an alternative sampling date. The system submitted an explanation for the delayed sampling date to the state concurrent with the shipment of the sample to the laboratory. If a system was unable to report a valid analytical result for a scheduled sampling date due to equipment failure, loss of or damage to the sample, failure to comply with the analytical method requirements, including the quality control requirements, or the failure of an approved laboratory to analyze the sample, then the system collected a replacement sample.

Replacement samples could not be collected later than 21 days after receiving information that an analytical result could not be reported for the scheduled date, unless the system demonstrated that collecting a replacement sample within this time frame was not feasible or the state approved an alternative re-sampling date. The system submitted an explanation for the delayed sampling date to the state concurrent with the shipment of the sample to the laboratory. Systems that failed to meet these criteria for any source water sample revised their sampling schedules to add dates for collecting all missed samples. Systems submitted the revised schedule to the state for approval prior to when the system began collecting the missed samples.

Monitoring Location

Systems collected samples for each plant that treats a surface water or GWUDI source. Where multiple plants draw water from the same influent, such as the same pipe or intake, the state could approve one set of monitoring results to be used for all plants. Systems collected source water samples prior to chemical treatment, such as coagulants, oxidants and disinfectants. The state could approve a system to collect a source water sample after chemical treatment. To grant this approval, the state determined that collecting a sample prior to chemical treatment was not feasible for the system and that the chemical treatment was unlikely to have a significant adverse effect on the analysis of the sample. Systems that recycled filter backwash water collected source water samples prior to the point of filter backwash water addition. Specific requirements were included for bank filtration and other special cases.

A system that began using a new source of surface water or GWUDI after the system was required to begin monitoring must monitor the new source on a schedule the state approves.

Monitoring and Treatment Compliance Dates

Starting dates for monitoring were staggered by system size, with smaller systems beginning monitoring after larger systems. Milestones for monitoring, reporting, and compliance occur first for very large systems (≥100,000 persons), then systems serving 50,000 - 99,999 persons, followed by systems serving 10,000 - 49,999 persons, and finally systems serving fewer than 10,000. Populations were based on retail population served.

Bin Classification Table for Filtered Systems

Filtered water systems were classified in one of four categories or bins based on their monitoring results. The rule specifies several calculation procedures depending on how many samples were collected or if the sample frequency was not consistent.

Additional action for *Cryptosporidium* (beyond 3.0-log reduction awarded for conventional filtration or 2.5-log reduction for direct filtration) is based on source water concentrations of the protozoa and the type of treatment implemented at the plant. If the maximum running annual average (MRAA) is less than 0.075 oocysts/L, the source is assigned Bin 1 classification and no additional action is required. If the MRAA is greater than or equal to 0.075 oocysts/L, then various levels of action are required based on the Bin classification and the treatment type. **Table 7** provides a summary of those action requirements.

Calculating Bin Placement

- Total of at least 48 samples. The bin concentration is equal to the arithmetic mean of all sample concentrations.
- Total of at least 24 samples, but not more than 47 samples. The bin concentration is equal to the highest arithmetic mean of all sample concentrations in any 12 consecutive months during which *Cryptosporidium* samples were collected (maximum running annual average).
- For systems that serve fewer than 10,000 people and monitor for *Cryptosporidium* for only one year (i.e., collect 24 samples in 12 months), the bin concentration is equal to the arithmetic mean of all sample concentrations.
- For systems with plants operating only part of the year that monitor fewer than 12 months per year under § 141.701(e), the bin concentration is equal to the highest arithmetic mean of all sample concentrations during any year of *Cryptosporidium* monitoring.

Table 7
Treatment Requirements by Bin Classification

Bin Classification	*Cryptosporidium* Concentration [1] (oocysts/L)	Filtration Treatment			
		Conventional filtration (including softening)	Direct Filtration	Slow Sand or Diatomaceous Earth Filtration	Alternative Filtration Technology
Bin 1	<0.075	No additional treatment	No additional treatment	No additional treatment	No additional treatment
Bin 2	0.075 – 1.0	1-log	1.5-log	1-log	As determined by State
Bin 3	1.0 – 3.0	2-log[1]	2.5-log[1]	2-log[1]	As determined by State[2]
Bin 4	>3.0	2.5-log[1]	3-log[1]	2.5-log[1]	As determined by State[2]

[1]Represents the maximum running annual average over compliance period
[2]Systems must achieve at least 1-log through ozone, chlorine dioxide, UV, membranes, bag/cartridge filters, or bank filtration.

Conventional filtration systems classified in Bins 2, 3 and 4 must provide 1.0 to 2.5-log additional action for *Cryptosporidium*. Systems will select from a wide range of treatment and management strategies in the "microbial toolbox" to meet their additional action requirements. Systems classified in Bin 3 and Bin 4 must achieve at least 1 log of additional treatment using either one or a combination of the following: bag filters, bank filtration, cartridge filters, chlorine dioxide, membranes, ozone, or ultraviolet (UV) light.

Microbial Toolbox

PWSs can achieve additional *Cryptosporidium* treatment credit through implementing pretreatment processes, such as pre-sedimentation or bank filtration, by developing a watershed control program, and by applying additional treatment steps like ozone, chlorine dioxide, UV, and membranes. In addition, PWSs can receive a higher level of credit for existing treatment processes through achieving superior filter effluent turbidity or through a demonstration of performance. Taken as a whole, this list of control options is termed the "microbial toolbox." PWSs may use one or more tools to accumulate the needed treatment credits to meet the treatment requirement associated with their bin classification.

UV Dose Table

Systems receive *Cryptosporidium*, *Giardia lamblia*, and virus treatment credits for ultraviolet (UV) light reactors by achieving the UV dose values described in the rule. Systems must validate and monitor UV reactors to demonstrate that they are achieving a particular UV dose value for treatment credit. UV reactor validation must occur at full-scale using a test microbe with quantified dose-response characteristics using low-pressure mercury lamps. Validation must include operating conditions of flow rate, UV intensity as measured by a UV sensor, and UV lamp status, as well as other considerations including lamp fouling and inlet/outlet hydraulics. To receive treatment credit for UV light, systems must treat at least 95 percent of the water delivered to the public during each month by UV reactors operating within validated conditions for the required UV dose.

CT Tables

CT is the product of the disinfectant contact time (T, in minutes) and disinfectant concentration (C, in milligrams per liter). Systems with treatment credit for chlorine dioxide or ozone must calculate CT at least once each day, with both C and T measured during peak hourly flow. Systems with several disinfection segments in sequence may calculate and sum the CT for each segment, where a disinfection segment is defined as a treatment unit process with a measurable disinfectant residual level and a liquid volume. Systems receive the *Cryptosporidium* treatment credit by meeting the corresponding CT value for the applicable water temperature specified in CT tables specified in the rule.

Open Finished Water Reservoirs

Up to now, regulations required PWSs to cover all new storage facilities for finished water but did not address existing uncovered finished water storage facilities. Under the LT2ESWTR, PWSs using uncovered finished water storage facilities must either cover the storage facility, treat the storage facility discharge to achieve inactivation and/or removal of 4-log virus, or develop and implement a risk mitigation plan.

Microbial Profiling and Benchmarking

After the first round of source water monitoring if a water system plans to make a significant change to its disinfection practice, they must develop a disinfection profile and calculate disinfection benchmarks for *Giardia lamblia* and viruses. The same process should be used as outlined in Guidance under the IESWTR. Significant changes to disinfection practice are defined as follows:

- Changes to the point of disinfection;
- Changes to the disinfectant(s) used in the treatment plant;
- Changes to the disinfection process; or
- Any other modification identified by the state as a significant change to disinfection practice.

Unregulated Contaminant Monitoring Rule 2

The Unregulated Contaminant Monitoring Rule 2 (UCMR2) required “treated” water monitoring of specified unregulated constituents. The Rule was promulgated on January 4, 2007. The purpose was to assist the USEPA to collect information about contaminants present in drinking water supplies that were unregulated. The UCMR2 was comprised of three lists, or groups, of monitoring. List 1 required CWSs and NTNCWs serving greater than 10,000 to conduct “treated” water monitoring of specified unregulated constituents. A select group of 800 systems serving less than 10,000 were also required to conduct the monitoring. List 2 required only large systems, serving greater than 100,000, to conduct “treated” water monitoring of specified unregulated constituents.

- List 1 - 10 constituents, two methods, sampling was conducted between January 2008 and December 2010, surface water quarterly for one year, groundwater semi-annual for one year, sampled at entry point to distribution system only.
  - 2,2',4,4'- tetrabromodiphenyl ether (BDE-47), 2,2',4,4',5-pentabromodiphenyl ether (BDE-99), 2,2',4,4',5,5'-hexabromobiphenyl (HBB), 2,2',4,4',5,5'-hexabromodiphenyl ether (BDE-153), 2,2',4,4',6-pentabromodiphenyl ether (BDE-100), Dimethoate, Terbufos sulfone, 1,3-dinitrobenzene, 2,4,6-trinitrotoluene (TNT), Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX).
- List 2 - 15 constituents, three methods, sampling was conducted between January 2008 and December 2010, surface water quarterly for one year, groundwater semi-annual for one year, sampled at entry point to distribution system for all constituents and also at distribution system maximum residence time for the six nitrosamines (all under one method).
  - N-nitrosodiethylamine (NDEA), N-nitrosodimethylamine (NDMA), N-nitroso-di-n-butylamine (NDBA), N-nitroso-di-n-propylamine (NDPA), N-nitrosomethylethylamine (NMEA), N-nitrosopyrrolidine (NPYR), Acetochlor ethane sulfonic acid (ESA), Acetochlor oxanilic acid (OA), Alachlor ESA, Alachlor OA, Metolachlor ESA, Metolachlor OA, Acetochlor, Alachlor, Metolachlor.

Analytical work was to be completed using a USEPA approved UCMR2 laboratory and data was to be submitted to the USEPA via the on-line CDX system. The USEPA assigned specific dates for sampling conducted by each water agency. The List 1 and List 2 constituents were monitored concurrently. Systems finalized their sampling inventory with the USEPA and had the opportunity to revise the sampling schedule through CDX. Some large systems that have multiple ground water entry points to the distribution system (EPTDSs) were allowed to monitor at representative entry point(s) rather than at each EPTDS with submittal of approval documentation or approval of proposed alternate sampling plan.

California Public Notification Requirements

These requirements were finalized and effective in September 2006. They apply to all PWSs. DDW revised the existing requirements by modifying the format substantially, and not necessarily the content. DDW revised public notification into three Tiers.

1. Tier 1 violations are the most serious (fecal/*E.coli* positive distribution system samples, nitrate/nitrite MCL exceedances without resampling, turbidity violations without DDW notification, or other emergency short-term exposure health advisories). These violations will require mass public notification within 24 hours.
2. Tier 2 violations are the less serious (other MCL violations, bacterial monitoring/testing errors). These violations require mass public notification within 30 days and must run for at least seven days. If the violation continues, the notification shall be repeated every 3 months.
3. Tier 3 violations are the least serious (other monitoring violations, testing procedure violations). These violations require mass public notification within one year and must run for at least seven days. If the violation continues, the notification shall be repeated annually. A detailed list of items to be included in public notifications is provided in the final rule.

There are new requirements, similar to the Consumer Confidence Report, such as foreign language translations, revised health effects text, submittal of certification to DDW within 10 days of public notification, and notification retention for up to three years. In April 2018, DDW published guidance for Tier 1 violations, Unsafe Water Notification Guidance.

California Secondary Drinking Water Standards

These Standards were finalized and effective in September 2006. They apply to all PWSs. DDW revised several secondary drinking water standards and clarified monitoring and compliance requirements. Corrosivity was removed from the list of secondary MCLs and pH was added.

Systems may obtain a waiver for treatment (up to nine years) to meet the secondary MCLs, and the process to obtain that waiver was clarified and detailed. Only sources with levels less than three times the MCLs may apply and must include:

- System complaint log
- Engineering report on treatment feasibility
- Results of customer survey
- Report of public meeting

The rule also clarifies that a source exceeding a secondary MCL may be used for standby or to meet peak demands if the use of the source is metered, it is only used less than five consecutive days or maximum 15 days per year, a PWS provides public notice prior to use if feasible, the use of the source is disclosed in the Consumer Confidence Report (CCR), and the system is flushed to minimize the impact of the source.

California Perchlorate Regulation

DDW developed a primary MCL for perchlorate in drinking water in July 2007. DDW set the MCL for perchlorate at 6 µg/L, based on the PHG for perchlorate at that time of 6 µg/L, set by OEHHA in March 2004. The regulation requires all sources to be monitored for perchlorate two times in one year, once during the vulnerable period (May through September) and once five to seven months earlier or later. Historic data collected after January 1, 2001 was allowed to be grandfathered if it met all the sampling and quality assurance and quality control requirements of the regulation.

OEHHA revised the PHG down to 1 µg/L in February 2015 (discussed further below in the Other Drinking Water Thresholds section). Given the number of detections in water supplies and the reduction in the PHG to take into account infant exposures, DDW has determined to examine the perchlorate detections at this lower DLR and the drinking water sources involved, and to develop a cost benefit analysis of a possible MCL revision. This is discussed later in the Anticipated Future Regulations section.

On June 17, 2021, the Office of Administrative Law approved the perchlorate detection limit for purposes of reporting (DLR) regulations adopted by the State Board on October 6, 2020. The regulations will take effect on July 1, 2021. The DLR will change from 0.004 mg/l to 0.002 mg/l on 1 July 2021, and further decrease to 0.001 mg/l on 1 January 2024.

Contaminant Candidate List 2 (CCL2)

For the second round of the Contaminant Candidate review process, the USEPA opted to use the remaining constituents from the CCL1 as the second list for evaluation. Beginning in 2006, from this list of 51 constituents, 42 chemical and 9 microbial, the USEPA was to select at least five to determine whether to regulate. Eleven constituents were selected for determination, several of which were already regulated in California. USEPA published a Final Regulatory Determination in July 2008 and determined not to regulate any of the eleven constituents due to their lack of presence at levels of public health concern in public water systems. USEPA did determine that updated Health Advisories were warranted for seven of the constituents; including both dacthal acid degradates, as shown on **Table 8**.

If a contaminant is determined to need regulation, the standard shall be promulgated within 18 months of the determination. The regulations are determined based on risk assessment and cost-benefit considerations and on minimizing overall risk. Regulations must be based on best available, peer-reviewed science and data from best available methods. If regulated, the standard will take effect three years later. For each new regulation, the USEPA is required to identify affordable technologies that will achieve compliance for small systems.

As part of the Regulatory Determination, USEPA also requested more information on perchlorate and MTBE in order to make those regulatory determinations. In February 2011 the USEPA determined that perchlorate did warrant regulation in drinking water, however this regulatory determination was revised in July 2020, and confirmed again in March 2022, when the USEPA determined not to set a federal regulation for perchlorate. A revised risk assessment for MTBE was expected in 2011 however it has not yet been completed. A regulatory determination will be made after that is complete.

Table 8
Contaminant Candidate List 2

Constituent	USEPA Regulate?	DDW Regulate?	Updated Health Advisory?
Boron	No	NL	Yes
Dacthal mono and di-acid degradates	No	No	Yes
1,1-dichloro-2,2-bis(p-chlorophenyl) ethylene (DDE)	No	No	No
1,3-dichloropropene	No	MCL	Yes
2,4-dinitrotoluene	No	No	Yes
2,6-dinitrotoluene	No	No	Yes
s-ethyl propylthiocarbamate (EPTC)	No	No	No
Fonofos	No	No	No
Terbacil	No	No	No
1,1,2,2-tetrachloroethane	No	MCL	Yes

California Waterworks Standard

This was finalized by DDW in February 2008 and effective on March 9, 2008. It applies to all PWSs. The previous requirements were modified substantially in format, and somewhat in content. The definitions were expanded and detailed. Permit requirements for new sources and systems, as well as amendments, were organized and detailed. This also included a list of actions that require a permit amendment. There is now a requirement for a source capacity planning study for any anticipated water system expansion. The study shall present information on expected growth, water demands, and water supplies for a ten-year projection in a report to DDW. An Urban Water Management Plan can also meet these requirements.

Significant detail has been added for new well siting, construction and permit application. All technical sections of the Standards, related to design, installation, and operation, were updated, and many were expanded or had detail added.

The additives section was expanded to include indirect additives. Indirect additives, including chemical, material, lubricant, or product in the production, treatment or distribution of drinking water that will result in its contact with the drinking water including process media (carbon, sand), protective materials (coatings, linings, liners), joining and sealing materials (solvent cements, welding materials, gaskets, lubricating oils), pipes and related products (pipes, tanks, fittings), and mechanical devices used in treatment/transmission/distribution systems (valves, chlorinators, separation membranes), must be tested and certified as meeting the specifications of American National Standard Institute/NSF International (ANSI/NSF) 61.

If a water system is determined by DDW to have a deficiency in operations, the water system may be required to develop and submit a Water System Operations and Maintenance Plan. Detailed requirements for the plan are provided.

Endocrine Disrupters Screening Program

This monitoring program was originally administered through the USEPA Office of Science and Technology/Office of Research and Development in April 2009, but has gone through several periods of dormancy, revision, and relocation. This program only applies to pesticide manufacturers, importers, and potentially users. The USEPA developed criteria for screening endocrine disrupters to identify priority chemicals. USEPA originally planned to implement the workplan by using assays in a two-tiered screening and testing process (Endocrine Disrupters Screening Program):

- Through Tier 1 screening, USEPA would identify chemicals with the potential to interact with the endocrine system. The purpose of Tier 1 screening was to identify chemicals that have the potential to interact with the three hormonal pathways in the body's endocrine system – estrogen, androgen, and thyroid pathways. Eleven assays, five in vitro (cell) and six in vivo (live animal) were used to determine whether these chemicals interact with these three hormone pathways.
- Through Tier 2 testing, USEPA would determine the endocrine-related effects caused by each chemical and obtain information about effects at various doses.

The initial list of 67 chemicals considered for Tier 1 screening was primarily pesticides – both active ingredients and inerts – was pared down to 52 chemicals due to discontinuations of chemical use. In December 2007, USEPA issued draft procedures for the initial screening. For active ingredients, test orders were sent to technical registrants and for inert ingredients, test orders were sent to manufacturers, importers, and potentially users of chemicals on the list. Some of these constituents were already regulated in drinking water and some were on the CCL3 (see discussion below). Based on screening, 18 chemicals were determined to potentially need more monitoring from List 1. Only five were of consideration for human health impact; cypermethrin, DCPA, dimethoate, linuron, and metribuzin. A second list of chemicals for Tier 1 screening was finalized in June 2013. The list of 107 chemicals includes pesticides, perfluorocarbon compounds (PFCs), and pharmaceuticals. This list also contains other chemicals, such as those used for industrial manufacturing processes, plasticizers, or in the production of pharmaceutical and personal care products (PPCPs).

In June 2015, USEPA proposed to modify the screening process to include the use of a high throughput assay (robot) and a computational model to identify a chemical's ability to interact with the endocrine system. This replaced three of the 11 assays in the Tier 1 battery (related to estrogen receptors). The USEPA hoped to replace the other eight assays in the future with other models. This alternative method accelerated the pace of screening, reduced costs, and reduced animal testing. Additional testing for chemicals under Tier 2 was needed in order to confirm and fully understand impacts a chemical has on the endocrine system.

Through Tier 2, USEPA planned to determine the endocrine-related effects caused by each chemical and obtain information about effects at various doses. USEPA was projecting a refined list of constituents of interest from the Tier 1 lists.

Program funding stalled significantly, but it appears that the USEPA is rebuilding the EDSP in the Office of Pesticide Programs (OPP) and they intend to utilize the pesticide registration review process as the framework for managing its responsibilities regarding the endocrine screening of pesticides, and intends to eventually incorporate these requirements routinely into the pesticide registration review process. OPP established the Endocrine Disruptor Science Policy Council (EDSPOC) in 2022 to lead these efforts. In December 2022 this group published a white paper entitled, "Availability of New Approach Methodologies (NAMs) in the Endocrine Disruptor Screening Program (EDSP)". This provides new direction for screening methods as part of Tier 1 to assess more chemicals more quickly.

Contaminant Candidate List 3 (CCL3)

This is the third list developed by USEPA, as described previously under CCL2, to determine whether additional constituents need to be regulated in drinking water. The process used to draft this list was different than that implemented to develop the first and second CCLs. This process involved development of a "universe" of potential chemicals and then screening that list down based on health effects and occurrence in drinking water supplies.

The final list for the CCL3 was published in September 2009 and focused on chemicals that are toxic and have potential to be present in drinking water supplies. This included 116 constituents, 104 chemicals and 12 microbiological contaminants. USEPA is required to select at least five constituents from the list to make regulatory determinations. In June 2011, the USEPA identified a short list of 32 constituents for the CCL3 that were assessed for determinations and in October 2014 announced preliminary regulatory determination for five constituents, including four determinations not to regulate and one to regulate (strontium).

In January 2016, USEPA published its final Third Regulatory Determination and determined not to regulate dimethoate, 1,3-dinitrobenzene, terbufos, and terbufos sulfone. USEPA delayed the final regulatory determination on strontium to consider additional data and decide whether there is a meaningful opportunity for health risk reduction by regulating strontium in drinking water. The Fourth Regulatory Determination, discussed below, provides additional insight on the continued delay for strontium regulation.

Six-Year Review

In January 2017, the USEPA published its Third Six-Year Review of the National Primary Drinking Water Regulations. This is an assessment of the existing 88 regulations to determine if any of the current standards are in need of a detailed analysis for possible regulatory revision. The USEPA determined that 80 of the 88 existing standards are acceptable as they stand. This includes fluoride, which was previously identified for potential revision, so the USEPA will not be pursuing any changes to the fluoride MCL at this time. Eight constituents are candidates for possible regulatory revision. This includes five under the SWTRs (viruses, heterotrophic bacteria, *Legionella*, *Giardia*, and *Cryptosporidium*) and three under the D/DBPRs (chlorite, TTHM, and HAA5).

The USEPA has convened workgroups on these regulatory reviews in 2020 and 2021 to discuss possible topics related to rule revision. This has initiated a process for detailed analyses in four categories to determine if the current standards should be revised. The analyses include:

- Health effects assessment
- Analytical and treatability feasibility assessment
- Occurrence assessment
- Cost and benefit assessment

The USEPA projects that they will determine by July 31, 2024 whether there will be possible rule revisions and the general scope of those revisions.

The Fourth Six-Year Review was initiated by USEPA in October 2018 with information requests sent to local primacy agencies and results are expected to be available in 2023.

Unregulated Contaminant Monitoring Rule 3

The goal of the Unregulated Contaminant Monitoring Program is to generate national occurrence data for CCL contaminants (and other selected contaminants) that can be used to make future regulatory determinations under the Safe Drinking Water Act. The third Unregulated Contaminant Monitoring Rule (UCMR3) was outlined in April 2010 and formally proposed in March 2011. The final rule was published in April 2012.

Sampling for the UCMR 3 occurred from 2013 through 2015. The monitoring included 30 contaminants (28 chemicals and 2 viruses) under three lists. Nineteen of the target contaminants are from the CCL3 that was finalized in September 2009. The eleven chemicals included in UCMR3 that were not part of CCL3 are chromium, chromium 6, testosterone, 4-androstene-3,17-dione, chlorodifluoromethane, bromodichloromethane, noroviruses, and four perfluorinated chemicals; perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexane sulfonic acid (PFHxS), and perfluoronanoic acid (PFNA).

- Assessment Monitoring (List 1 Contaminants) applies to all PWSs serving more than 10,000 people and 800 representative PWSs serving 10,000 or fewer people. These constituents were required to be monitored in the Entry Point to the Distribution System (EPDS), and the six metals and chlorate were also to be monitored at the maximum detention time in the distribution system.

    - Method 522 (GC/MS) for 1,4-dioxane;
    - Method 524.3 (GC/MS) for seven VOCs: 1,1-dichloroethane, 1,2,3-trichloropropane, 1,3-butadiene, bromochloromethane, chlorodifluoromethane, chloromethane, and methyl bromide;
    - Method 200.8 (ICP/MS) for five metals: cobalt, molybdenum, strontium, chromium, and vanadium;
    - Method 218.7 (IC/UV) for chromium 6;
    - Method 300.1 (IC) for chlorate; and
    - Method 537 Rev1.1 for perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), PFNA, PFHxS, PFHpA, and PFBS.

- Screening Survey (List 2 Contaminants) applies to all PWSs serving more than 100,000 people, 320 representative PWSs serving 10,001 to100,000 people, and 480 representative PWSs serving 10,000 or fewer people. These constituents were to be monitored at the EPDS.

    - Method 539 (LC/MS/MS) for seven hormones: 17-alpha-ethynylestradiol, 17-beta-estradiol, equilin, estriol, estrone, testosterone, and 4-androstene-3,17-dione.

- Pre-Screen Testing (List 3 Contaminants) applies to USEPA-selected 800 representative PWSs serving 1,000 or fewer people that do not disinfect. These PWSs with wells that are located in areas of karst or fractured bedrock were required to participate in monitoring for two List 3 viruses during a 12-month period from January 2013 through December 2015. These constituents were to be monitored at the EPDS.

    - Method 1615 for viruses; enteroviruses and noroviruses; and
    - Bacterial Indicators; total coliforms, *E. coli*, bacteriophage, *Enterococci*, and aerobic spores.

Changes from the UCMR2 included adding PWSs that rely on 100 percent purchased water (consecutive systems), clarifying the terms of representative groundwater sampling, and updated reporting elements.

Revised Total Coliform Rule

The USEPA published revisions to the TCR (RTCR) in February 2013. There were also some minor revisions published in February 2014. These revisions apply to all PWSs. There were numerous changes to the original TCR, but the key topics included:

- Removal of MCLG and MCL of zero for total coliform,
- Establish MCLG and MCL of zero of *E. coli,*
- Total coliform will serve as an indicator or potential contamination into the distribution system, with detects requiring assessments to determine if any sanitary defects exist and correct them (find and fix strategy),
- *E. coli* MCL violation will result in a requirement to conduct an assessment and correct any sanitary defects found,
- Minor revisions of routine and repeat monitoring requirements to match newer Groundwater Rule requirements (related to water quality and system performance),
- Opportunity for increased flexibility in repeat monitoring for total coliform positive to better increase options for verifying and identifying extent of fecal contamination, and
- Revised language to clarify that systems collecting more than one sample per month shall collect total coliform samples at regular intervals throughout the month.

Provided below are some additional details of the regulation related to the MCLs, monitoring, reporting, and public notification.

Coliform Treatment Technique

Under the RTCR there will no longer be a monthly MCL violation for multiple total coliform detections. This became effective on April 1, 2016. Instead, USEPA replaced the MCLG and MCL for total coliforms with a treatment technique for coliforms that requires assessment and corrective action. A PWS that exceeds a specified frequency of total coliform occurrence must conduct an assessment to determine if any sanitary defects exist (a sanitary defect is defined by the RTCR as a “defect that could provide a pathway of entry for microbial contamination into the distribution system or that is indicative of a failure or imminent failure of a barrier that is already in place”); if any are found, the system must correct them. In addition, under the treatment technique requirements, a PWS that incurs an *E. coli* MCL violation must conduct an assessment and correct any sanitary defects found.

A PWS that exceeds a specified frequency of coliform occurrence must conduct a Level 1 or Level 2 assessment to determine if any sanitary defect exists and, if found, to correct the sanitary defect. A Level 2 assessment requires a more in-depth and comprehensive review of the PWS compared to a Level 1. PWSs are required to correct all sanitary defects found through either a Level 1 or Level 2 assessment. Systems should ideally be able to correct any sanitary defects found in the assessment within 30 days and report that correction on the assessment form.

Level 1 treatment technique triggers:

- For systems taking 40 or more samples per month, the PWS exceeds 5.0 percent total coliform-positive samples for the month; or
- For systems taking fewer than 40 samples per month, the PWS has two or more total coliform-positive samples in the same month; or
- The PWS fails to take every required repeat sample after any single routine total coliform-positive sample.

Level 2 treatment technique triggers:

- The PWS has an *E. coli* MCL violation (see below for a description of what constitutes an *E. coli* MCL violation); or
- The PWS has a second Level 1 treatment technique trigger within a rolling 12-month period, unless the initial Level 1 treatment technique trigger was based on exceeding the allowable number of total coliform-positive samples, the State has determined a likely reason for the total coliform-positive samples that caused the initial Level 1 treatment technique trigger, and the State establishes that the system has fully corrected the problem; or
- For PWSs with approved reduced annual monitoring, the system has a Level 1 treatment technique trigger in two consecutive years.

At a minimum, both Level 1 and 2 assessments must include review and identification of the following elements:

- Atypical events that may affect distributed water quality or indicate that distributed water quality was impaired;
- Changes in distribution system maintenance and operation that may affect distributed water quality, including water storage;
- Source and treatment considerations that bear on distributed water quality, where appropriate;
- Existing water quality monitoring data; and
- Inadequacies in sample sites, sampling protocol, and sample processing.

Level 1 Assessment:

A Level 1 assessment must be conducted when a PWS exceeds one or more of the Level 1 treatment technique triggers specified previously. Under the rule, this self-assessment consists of a basic examination of the source water, treatment, distribution system and relevant operational practices. The PWS should look at conditions that could have occurred prior to and caused the total coliform-positive sample. Example conditions include treatment process interruptions, loss of pressure, maintenance and operation activities, recent operational changes, etc. In addition, the PWS should check the conditions of the following elements: sample sites, distribution system, storage tanks, source water, etc. These assessments can be completed by the water system.

Level 2 Assessment:

A Level 2 assessment must be conducted when a PWS exceeds one or more of the Level 2 treatment technique triggers specified previously. It is a more comprehensive examination of the system and its monitoring and operational practices than the Level 1 assessment. The level of effort and resources committed to undertaking a Level 2 assessment is commensurate with the more comprehensive investigation and review of available information, and engages additional parties and expertise relative to the Level 1 assessment. Level 2 assessments must be conducted by a party approved by the State: the State itself, a third party, or the PWS where the system has staff or management with the required certification or qualifications specified by the State. If the PWS or a third party conducts the Level 2 assessment, the PWS or third party must follow the State requirements for conducting the Level 2 assessment. The PWS must also comply with any expedited actions or additional actions required by the State in the case of an *E. coli* MCL violation.

USEPA published a draft Guidance Manual for completion of the Level 1 and 2 Assessments, which was replaced by an Interim Final in September 2014. The Assessments must include a list of sanitary defects/significant deficiencies or a statement of none found, a description of the corrective actions taken, and a list of additional corrective actions proposed.

Coliform Treatment Technique Violation

A system incurs a coliform treatment technique violation when any of the following occurs:

- A system fails to conduct a required assessment within 30 days of notification of the system exceeding the trigger.
- A system fails to correct any sanitary defect found through either a Level 1 or 2 assessment within 30 days or in accordance with State-derived schedule.
- A seasonal system fails to complete a State-approved start-up procedure prior to serving water to the public.

These violations would result in a Tier 2 Public Notification.

***E. coli* MCL**

Systems are required to meet an MCL for *E. coli*, as demonstrated by required monitoring. USEPA also established an MCLG of zero. These are both effective on April 1, 2016. The MCL for *E. coli* is based on the monitoring results for total coliforms and *E. coli*.

E. coli MCL Violation

A system incurs an *E. coli* MCL violation if any of the following occurs:

- A routine sample is total coliform-positive and one of its associated repeat samples is *E. coli*-positive.
- A routine sample is *E. coli*-positive and one of its associated repeat samples is total coliform-positive.
- A system fails to take all required repeat samples following a routine sample that is positive for *E. coli*.
- A system fails to test for *E. coli* when any repeat sample tests positive for total coliforms.

These violations result in a Tier 1 Public Notification. Although not explicitly stated, as a logical consequence of the second condition, a system also violates the MCL when an *E. coli*-positive routine sample is followed by an *E. coli*-positive repeat sample because *E. coli* bacteria are a subset of total coliforms.

Monitoring and Reporting Requirements

The RTCR specifies the frequency and timing of the microbial testing by water systems based on population served, system type, and source water type. The RTCR links monitoring frequency to compliance monitoring results and system performance. It provides criteria that well-operated small systems must meet to qualify for and stay on reduced monitoring. It requires increased monitoring for high-risk small systems with unacceptable compliance history. It also requires some new monitoring requirements for seasonal systems.

Monitoring Violation

A system incurs a monitoring violation when any of the following occurs:

- A system fails to take every required routine or additional routine sample in a compliance period.
- A system fails to test for *E. coli* following a routine sample that is total coliform-positive.

Reporting Violation

A system incurs a reporting violation when any of the following occurs:

- A system fails to timely submit a monitoring report or a correctly completed assessment form after it properly monitors or conducts an assessment by the required deadlines. The PWS is responsible for reporting this information to the State regardless of any arrangement with a laboratory.
- A system fails to timely notify the State following an *E. coli*-positive sample.
- A seasonal system fails to submit certification of completion of State-approved start-up procedure.

Public Notification Requirements

The rule continues to require public notification (PN) when there is a potential health threat as indicated by monitoring results, and when the system fails to identify and fix problems as required. The RTCR eliminates PN requirements based only on the presence of total coliforms. Instead, the RTCR requires PN when an *E. coli* MCL violation occurs, indicating a potential health threat, or when a PWS fails to conduct the required assessment and corrective action.

USEPA is requiring a Tier 1 PN for an *E. coli* MCL violation, Tier 2 PN for a treatment technique violation for failure to conduct assessments or corrective actions, and a Tier 3 PN for a monitoring violation or a reporting violation.

DDW did not adopt the California version until February 2021 (see discussion below), but compliance with this federal regulation began on April 1, 2016.

California Hexavalent Chromium Regulation

DDW published a Final Hexavalent Chromium Regulation in May 2014 with an MCL of 10 µg/L; effective July 1, 2014. This was based on the OEHHA PHG of 0.02 µg/L, which was finalized in July 2011. It was repealed on September 11, 2017 and the MCL is no longer in effect. DDW was directed by the Courts to reconsider the "Economic Feasibility" of hexavalent chromium treatment and set a new standard. This is discussed further below in Anticipated Future Regulations section.

Chromium (VI), or hexavalent chromium, has primarily been found in groundwater supplies in California. Chromium (VI) causes acute gastritis when ingested in high doses and is an established human lung carcinogen when inhaled.

USEPA is also investigating the need for a hexavalent chromium MCL and is working on a human health assessment, as discussed below in the Anticipated Future Regulations section.

In a parallel effort, the USEPA recommended that water systems conduct enhanced monitoring for hexavalent chromium. For surface waters this included quarterly sampling of the raw water, the entry point to the distribution system, and a maximum residence time location in the distribution system.

Contaminant Candidate List 4 (CCL4)

The USEPA published a final list of the fourth CCL in November 2016. See **Attachment 2** for a list of constituents on the Final CCL4. This list includes 109 constituents; 97 chemicals and 12 microbiological contaminants. The CCL4 is largely comprised of the same constituents on the CCL3, except the following; manganese and nonylphenol were added and perchlorate, strontium, dimethoate, 1,3-dinitrobenzene, terbufos, and terbufos sulfone were removed. Additionally, three constituents were removed from the draft list since they are cancelled pesticides; disulfoton, fenamiphos, and molinate.

The USEPA initiated the fourth Regulatory Determination process in May 2018 and published a Draft Fourth Regulatory Determination for the CCL4 in March 2020, with the final in January 2021. It includes determinations for eight constituents and updates on two additional constituents. The USEPA has determined not to regulate 1,1-dichloroethane, acetochlor, methyl bromide, metolachlor, nitrobenzene, and RDX. In addition, USEPA provided an update on; strontium and 1,4-dioxane. A strontium regulatory determination continues to be delayed to allow for consideration of additional studies. No determination will be made for 1,4-dioxane (no meaningful opportunity for public health risk reduction). USEPA determined that PFOS and PFOA warrant regulation, and potentially other per- and poly-fluoroalkyl substances (PFAS) too.

Unregulated Monitoring Contaminant Rule 4

The goal of the Unregulated Contaminant Monitoring Program is to generate national occurrence data for CCL contaminants (and other selected contaminants) that can be used to make future regulatory determinations under the Safe Drinking Water Act. This is the Fourth Round of the UCMR, promulgated in December 2016. The list includes 30 constituents, monitored between 2018 and 2020. Monitoring is conducted only for List 1 Contaminants, by both large PWSs (serving more than 10,000 people) and randomly selected small PWSs (serving 10,000 or fewer people).

- Cyanotoxin Monitoring: Ten constituents are monitored in the Entry Point to the Distribution System (EPDS) monthly over a four month consecutive period.

    - Method EPA 544 for microcystin-LA, microcystin-LF, microcystin-LR, microcystin-LY, microcystin-RR, microcystin-YR, nodularin;
    - Method EPA 545 for anatoxin-a, cylindrospermopsin; and
    - Method EPA 546 for total microcystins.

- Additional Chemicals: 22 constituents (including two surrogates) are monitored at the specified sites quarterly over a 12 month consecutive period.

- Method EPA 200.8 for manganese and germanium (at EPDS).
- Method EPA 525.3 for alpha-hexachlorocyclohexane, chlorpyrifos, dimethipin, ethoprop, oxyfluorfen, profenofos, tebuconazole, total permethrin, tribufos (at EPDS).
- Method EPA 552.3 for HAA5, HAA6Br, HAA9 (at Stage 2 D/DBP Sites).
- Method EPA 541 for 1-butanol, 2-methoxyethanol, 2-propen-1-ol (at EPDS).
- Method EPA 530 for butylated hydroxyanisole, o-toluidine, quinoline (at EPDS).
- Method EPA 300.0 for bromide (in source water coordinated with EPA 552.3).
- Standard Method 5310 for TOC (in source water coordinated with EPA 552.3).

California 1,2,3-Trichloropropane Regulation

1,2,3-Trichloroproane (1,2,3- TCP) is a manmade, chlorinated hydrocarbon that is very stable in the environment. It is found at industrial or hazardous waste sites and has been used as a cleaning and degreasing solvent and also is associated with pesticide products. 1,2,3-TCP causes cancer in laboratory animals and probably carcinogenic to humans.

In 1999, DDW published a Notification Level of 0.005 μg/L for 1,2,3-TCP due to detections in groundwater in Southern California. It was included in the California Unregulated Monitoring Requirements in 2001 and was detected throughout the state. DDW requested OEHHA to publish a Public Health Goal in 2004 and it was finalized in 2009 at 0.0007 μg/L.

DDW determined that an MCL was warranted for 1,2,3-TCP in 2016. A regulatory package was prepared and a primary MCL was adopted for 1,2,3-TCP at 0.000005 mg/L (0.005 μg/L) in December 2017. Initial quarterly monitoring requirements for surface water supplies were effective January 2018.

USEPA Long Term Revisions to the Lead and Copper Rule

The final Long-Term Revisions to the Lead and Copper Rule were published on January 15, 2021. On January 20, 2021 the Biden Administration issued a Regulatory Freeze to allow Federal agencies an opportunity to review recent regulations. On March 12, 2021 EPA published two *Federal Register* notices that were intended to allow EPA time to continue its review of the LCRR and "conduct important consultations with affected parties." The first *Federal Register* notice delayed the effective date of the rule from March 16, 2021 to June 17, 2021. Following a 30-day public comment period, the second *Federal Register* notice was published final on June 16, 2021 and extended the effective date from June 17, 2021 until December 16, 2021 and delayed the rule compliance deadline from January 16, 2024 to October 16, 2024.

The goal for the Long-Term Revisions to the Lead and Copper Rule is to improve public health protection by making substantive changes based on topics that were identified in the 2004 National Review, and to streamline the rule requirements. This will apply to all community water systems and non-transient non-community water systems. The proposed LCR Revisions maintain the current Maximum Contaminant Level Goal (MCLG) of zero and the Action Level of 15 µg/L. The rule requires a more comprehensive response at the action level and introduces a trigger level of 10 µg/L (also based on the 90th percentile) that requires more proactive planning in communities with lead service lines. The approach focuses on these key areas:

- All water systems prepare and update a lead service line (LSL) inventory and are required to “find-and-fix” the causes of elevated levels, exceeding the Action Level.
- All water systems prepare an LSL Replacement Plan. Require water systems to replace the water system-owned portion of an LSL when a customer chooses to replace their customer-owned portion of the line. Also require water systems to conduct outreach and initiate lead service line replacement programs when lead levels are above the proposed trigger level of 10 µg/L. Require systems that are above 10 µg/L but at or below 15 µg/L to work with their state to set an annual goal for replacement. Systems that are above 15 µg/L will be required to replace a minimum of three percent of the number of LSLs annually. Prevents systems from avoiding lead service line replacements (LSLR) by “testing out” through sampling. Systems must have an LSL Replacement Plan within three years of final rule. Small systems that exceed the trigger and action levels will have flexibility with respect to treatment and lead service line replacement actions.
- Revise requirements for corrosion control treatment (CCT) based on tap sampling results. Establishes a new trigger level of 10 µg/L. At this trigger level, systems that currently treat for corrosion would be required to re-optimize their existing treatment. Systems that do not currently treat for corrosion would be required to conduct a corrosion control study so that the system is prepared to respond quickly when necessary.
- Improve tap sampling procedures by requiring wide-mouth bottles for collection and prohibiting flushing and cleaning or removing faucet aerators before sampling. Changing the criteria for selecting homes where samples are taken to require sampling in homes with lead service lines. And, systems with higher levels of lead will sample more frequently.
- Water systems must execute Tier 1 Public Notification requirements for exceedance of lead Action Level and implement expanded risk communication requirements.
- Require systems to notify customers of an action level exceedance within 24 hours at their residence and require that systems make the LSL inventory publicly available and conduct regular outreach to homeowners with LSLs.
- Community water systems (CWS) must sample drinking water outlets schools and child care facilities served by the system (20 percent annually). The system would

be required to provide the results and information about the actions the school or child care facility can take to reduce lead in drinking water.

In December 2021, USEPA published its intent to propose and revise the Long-Term Revisions by October 2024 with the Lead and Copper Rule Improvements (LCRI). The LCRI is expected to delay compliance for some LCR components, but not the lead service line inventories. It may address; revised tap sampling, revised action levels, small system flexibility, daycare/school sampling, public education, and corrosion control treatment.

Additionally, USEPA issued Guidelines for Developing and Maintaining Lead Service Line Inventories in August 2022 to assist water utilities with this process. DDW issued an inventory template for lead service lines in September 2022.

Contaminant Candidate List 5 (CCL5)

In October 2018, the USEPA issued a request for CCL5 nominations and the draft list was published on July 19, 2021 with the final published on November 14, 2022.

The Final CCL 5 includes 81 contaminants or groups (Exhibits 2a, 2b, and 2c). The list is comprised of 69 chemicals or chemical groups and 12 microbes. The 69 chemicals or chemical groups include 66 chemicals recommended for listing following an improved process to evaluate, one group of cyanotoxins, one group of 23 disinfection byproducts (DBPs), and one group of PFAS chemicals. The 12 microbes include eight bacteria, three viruses, and one protozoa recommended for listing based on the scores for waterborne disease outbreaks, occurrence, health effects, and recommendations from various experts. See list on **Attachment 3**.

In February 2023, USEPA issued a request for CCL6 nominations.

Unregulated Monitoring Contaminant Rule 5

The goal of the Unregulated Contaminant Monitoring Program is to generate national occurrence data for CCL contaminants (and other selected contaminants) that can be used to make future regulatory determinations under the Safe Drinking Water Act. This is the Fifth Round of the UCMR.

The UCMR5 was proposed in March 2021, finalized in December 2021, and includes 30 constituents, monitored between 2023 and 2025. Samples will be collected quarterly by surface water systems for one year. The list includes 29 PFAS and one metal, lithium. Monitoring is conducted for all contaminants, by both large and medium PWSs (serving more than 3,300 people) and randomly selected small PWSs (serving 3,300 or fewer people).

California Revised Total Coliform Rule

In response to the Federal Revised Total Coliform Rule, California revised its version of the Total Coliform Rule in Title 22 in February 2021, effective July 1, 2021. Although these draft regulations were not adopted in time to correspond with the Federal rule requirements, beginning April 1, 2016 all public water systems were required to comply with California's existing Total Coliform Rule and the new requirements in the Federal Revised TCR.

The Rule includes the new coliform treatment technique requirement replacing the total coliform MCL and a new *E.coli* MCL. The revisions establish a "find-and-fix" approach for investigating and correcting causes of microbial contamination within water distribution systems. California's rule also requires public water systems using continuously-disinfected groundwater sources to collect a coliform sample of the water prior to disinfection once each calendar quarter.

State Board/DDW prepared language that includes all the requirements of the Federal rule, which were effective April 1, 2016, as well as additional state-only requirements. The key state-only requirements include:

- Requirements for bacteriological monitoring of a groundwater (not Ground Water Under the Direct Influence of Surface Water (GWUDI)) source that is treated with a primary or residual disinfectant on a continuous basis and for revising bacteriological sample siting plans to include the source sample sites;
- Requirements for public water systems on reduced bacteriological monitoring to return to routine bacteriological monitoring;
- Requirements for coliform density determinations of total coliforms and *E. coli*, if directed by the State Board;
- For public water systems collecting one sample per month, eliminating the need to submit a monthly summary of a bacteriological monitoring result, and clarifying the minimum monthly summary elements for public water systems collecting more than one sample per month;
- Requirements for a report and corrective action when monitoring results indicate a possible significant rise in bacterial count; and
- Requirements for seasonal system start-up procedure components, actions to be taken prior to serving water to the public, and a provision allowing an alternative to certain start-up procedure components.

California Microplastics Regulation

Senate Bill 1422 was approved on September 28, 2018 and required the State Board/DDW to adopt a definition of microplastics in drinking water on or before July 1, 2020, and on or before July 1, 2021, to adopt a standard methodology to be used in the testing of drinking water for microplastics and requirements for accrediting qualified laboratories and four years of testing and reporting of microplastics in drinking water, including public disclosure of those results. This could include setting a NL to assist consumers in interpreting analytical results. The State Board/DDW could do this through development of a Policy Handbook, rather than a specific regulation.

In February 2020 the State Board/DDW published a draft definition of "microplastics" – see below, which was adopted in June 2020.

Proposed Definition of 'Microplastics in Drinking Water'* -

> 'Microplastics in Drinking Water' are defined as solid[1] polymeric materials[2] to which chemical additives or other substances may have been added, which are particles which have at least two dimensions that are greater than 1 and less than 5,000 micrometers (µm). Polymers that are derived in nature that have not been chemically modified (other than by hydrolysis) are excluded."
>
> *Evidence concerning the toxicity and exposure of humans to microplastics is nascent and rapidly evolving, and the proposed definition of 'Microplastics in Drinking Water' is subject to change in response to new information. The definition may also change in response to advances in analytical techniques and/or the standardization of analytical methods.

DDW determined to manage microplastics through a Policy Handbook instead of a regulatory rule. A Policy Handbook Establishing a Standard Method of Testing and Reporting of Microplastics in Drinking Water was adopted by the State Board in September 2022. This provided an outline of analytical methods for microplastics monitoring in both raw and treated water and a two phase monitoring plan. Both phases will be two years in duration and include quarterly monitoring, for a total of eight samples per utility. Both phases will be driven by monitoring orders issued by DDW to selected utilities. In Phase I, selected utilities will monitor raw water for particles >50 microns from Fall 2023 through Fall 2025. In Phase II, selected utilities with detectable raw water microplastics will monitor treated water for particles >5 microns from Fall 2025 through Fall 2028. Three water utilities in the American River watershed have been notified that they have been selected to participate (San Juan Water District, Carmichael Water District, and the City of Sacramento).

OTHER DRINKING WATER THRESHOLDS

In addition to regulatory standards, there are several other drinking water thresholds that should be discussed. This includes USEPA Health Advisories, USEPA Human Health Benchmarks for Pesticides, California Notification Levels and Archived Advisory Levels, and OEHHA Public Health Goals.

USEPA Health Advisories

The USEPA Office of Water Office of Science and Technology has developed Health Advisories for other constituents in drinking water that are not currently regulated. These are non-enforceable levels which can provide guidance to water systems on the potential risk to public health. USEPA has conveniently compiled Federal drinking water standards, including Health Advisories, into a reference handbook (USEPA 2012). The reference handbook includes acute and chronic risk for cancer and non-cancer health effects. (https://www.epa.gov/sdwa/drinking-water-health-advisories-has)

USEPA added Health Advisories for two cyanotoxins in 2015, two perfluoroalkyl substances (PFAS) in 2016, and updated those and added two more PFAS in 2022, as described below.

Cyanotoxins

USEPA published 10-day Health Advisories (HA) for microcystin and cylindrospermopsin in June 2015. The HAs for children less than six years old are microcystin at 0.3 μg/L and cylindrospermopsin at 0.7 μg/L. The HAs for older children and adults are microcystin at 1.6 μg/L and cylindrospermopsin at 3.0 μg/L.

USEPA also released "Health Effects Support Documents" for microcystin, cylindrospermopsin and a third cyanotoxin, anatoxin-a. At this time, USEPA has determined that there is not sufficient data to develop a Health Advisory for anatoxin-a. In addition, USEPA released a document "Recommendations for Public Water Systems to Manage Cyanotoxins in Drinking Water." All three of these cyanotoxins are listed on the CCL3 and CCL4, for consideration of potential future regulation. They were also included in the UCMR4.

Perfluoroalkyl Substances

USEPA published lifetime Health Advisories for PFOA and PFOS in November 2016. The HA is 70 ng/L, either individually or combined. These were both updated in June 2022. The PFOA Interim Lifetime HA was set at 0.004 ng/L and the PFOS Interim Lifetime HA was set at 0.02 ng/L. This health advisory level offers a margin of protection for all Americans throughout their life from adverse health effects resulting from exposure to PFOA and PFOS in drinking water.

In June 2022 USEPA also published new Interim Lifetime HAs for PFBS (2,000 ng/L) and hexafluoropropylene oxide dimer acid (GenX) (10 ng/L).

PFOA and PFOS were both listed on the CCL3, CCL4, and CCL5, for consideration of potential future regulation, and included in the UCMR3 and UCMR5. The Fourth Regulatory Determination has determined to regulate both constituents, as discussed previously. USEPA proposed a regulation in March 2023 to address six PFAS compounds (see discussion in Anticipated Future Regulations below).

USEPA Human Health Benchmarks for Pesticides

For those pesticides without drinking water standards or Health Advisories, USEPA Office of Pesticide Programs has developed Human Health Benchmarks for use by the states and water systems in water quality management. The USEPA developed human health benchmarks for 394 pesticides to enable others to better determine whether the detection of a pesticide in drinking water or source waters for drinking water may indicate a potential health risk and to help them prioritize monitoring efforts. These values, which are periodically updated, are available on the Internet (https://www.epa.gov/sdwa/human-health-benchmarks). The benchmarks originally include acute and chronic non-cancer endpoints, and USEPA updated the benchmarks in 2017 to include cancer risk benchmarks and in 2021 to add more pesticides and update toxicity values.

California Notification Levels and Archived Advisory Levels

DDW and OEHHA establish health-based Notification Levels (NLs) for contaminants that have no MCLs but, are thought to pose a health risk to drinking water supplies. OEHHA develops recommended NLs when requested by the State Water Resources Control Board (State Board)/DDW, and then the State Board/DDW will establish a final NL. NLs and Archived Advisory Levels (AALs) have been established in response to detection in drinking water supplies or in anticipation of possible contamination. Chemicals for which NLs or AALs are established may eventually be regulated by MCLs. When NLs are exceeded, the drinking water system is required to notify the local governing body of the local agency in which the users of the drinking water reside. DDW also recommends that the utility also inform its customers and consumers about the presence of the contaminant and about the health concerns associated with its exposure. Response Levels (RLs) are levels of the contaminant at which State Board/DDW recommends the drinking water system take the affected water source out of service under the Health and Safety Code §116455. These levels range from 10 to 100 times the notification level depending on the chemical. If the drinking water system does not take the source out of service, more extensive public notification is required.

To date, 40 of the 97 chemicals for which NLs or AALs have been established, are now regulated by MCLs. Of the remaining 57 chemicals, 33 currently have NLs, as shown in **Table 9** and 24 are chemicals with AALs, as shown in **Table 10**.

DDW announced its intent to set draft MCLs for NDMA, PFOA, and PFOS, which have both PHGs and NLs. These are expected in late 2023 or 2024.

Table 9
DDW Drinking Water Notification Levels

Chemical	Notification Level (milligrams per liter)	Response Level (milligrams per liter)
Boron	1	10
n-Butylbenzene	0.26	2.6
sec-Butylbenzene	0.26	2.6
tert-Butylbenzene	0.26	2.6
Carbon disulfide	0.16	1.6
Chlorate	0.8	8
2-Chlorotoluene	0.14	1.4
4-Chlorotoluene	0.14	1.4
Diazinon	0.0012	0.012
Dichlorodifluoromethane (Freon 12)	1	10
1,4-Dioxane	0.001	0.035
Ethylene glycol	14	140
Formaldehyde	0.1	1
HMX	0.35	3.5
Isopropylbenzene	0.77	7.7
Manganese	0.5	5
Methyl isobutyl ketone (MIBK)	0.12	1.2
Naphthalene	0.017	0.17
N-Nitrosodiethyamine (NDEA)	0.00001	0.0001
N-Nitrosodimethylamine (NDMA)*	0.00001	0.0003
N-Nitrosodi-n-propylamine (NDPA)	0.00001	0.0005
Perfluorooctanoic acid (PFOA)*	0.0000051	0.00001
Perfluorooctane sulfonic acid (PFOS)*	0.0000065	0.00004
Perfluorobutane sulfonic acid (PFBS)	0.0005	0.005
Perfluorohexane sulfonic acid (PFHxS)	0.000003	0.00002
Propachlor	0.09	0.9
n-Propylbenzene	0.26	2.6
RDX	0.0003	0.03
Tertiary butyl alcohol (TBA)	0.012	1.2
1,2,4-Trimethylbenzene	0.33	3.3
1,3,5-Trimethylbenzene	0.33	3.3
2,4,6-Trinitrotoluene (TNT)	0.001	0.1
Vanadium	0.05	0.5

*MCL Currently in Development

Table 10
DDW Drinking Water Archived Advisory Levels

Chemical	Archived Advisory Level (milligrams per liter)	Response Level (milligrams per liter)
Aldicarb	0.007	0.07
Aldrin	0.000002	0.0002
Baygon	0.03	0.3
a-Benzene Hexachloride	0.000015	0.0015
b-Benzene Hexachloride	0.000025	0.0025
Captan	0.015	1.5
Carbaryl	0.7	7
Chloropicrin	0.05	0.5
Chlorpropham (CIPC)	1.2	12
1,3-Dichlorobenzene	0.6	6
Dieldrin	0.000002	0.0002
Dimethoate	0.001	0.01
2,4-Dimethylphenol	0.1	1
Diphenamide	0.2	2
Ethion	0.004	0.04
Malathion	0.009	0.9
N-Methyl dithiocarbamate (Metam sodium)	0.00019	0.019
Methylisothiocyanate	0.19	1.9
Methyl Parathion	0.002	0.02
Parathion	0.04	0.4
Pentachloronitrobenzene	0.02	0.2
Phenol	0.6	6
2,3,5,6-Tetrachloroterephthalate	3.5	35
Trithion	0.007	0.07

Pending Notification Levels

Manganese

DDW and OEHHA are in the process of developing a health-based NL for manganese. OEHHA recommended a health protective concentration of 0.020 mg/L, with a NL of 0.020 mg/L and a RL of 0.200 mg/L in February 2023. DDW is preparing a package for the State Board to adopt the NL and RL and that is expected in late 2023 or early 2024.

Perfluoroalkyl Substances

In July 2018, DDW adopted new NLs for PFOA and PFOS in response to the new USEPA Health Advisories set at 14 nanograms per liter (ng/L) for PFOA and 13 ng/L for PFOS, based on risk assessments from New Jersey. OEHHA conducted a review of human health risk and recommended in August 2019 that the NLs be revised down to the lowest level at which they can be reliably detected in drinking water using currently available and appropriate technologies. This is based on cancer and noncancer effects on the liver and immune system. After independent review of the available information on the risks, DDW established final NLs at 6.5 ng/L for PFOS and 5.1 ng/L for PFOA. The Response Level (RL) was set at 70 ng/L for each constituent, but was revised downward in February 2020 (PFOA 10 ng/L and PFOS 40 ng/L) following the revision to the NLs.

In February 2020, the State Board/DDW asked OEHHA to develop recommended NLs for seven per- and polyfluoroalkyl substances (PFAS) that have been detected in California drinking water supplies. OEHHA began work on these NL recommendations immediately. In March 2021, OEHHA published a final NL for PFBS at 0.0005 mg/L with an RL of 0.005 mg/L. In March 2022, OEHHA published a final NL for PFHxS at 0.000003 mg/L with a RL of 0.00002 mg/L. OEHHA is currently developing NLs for; perfluorohexanoic acid (PFHxA), perfluoroheptanoic acid (PFHpA), PFNA, perfluorodecanoic acid (PFDA), and 4,8-dioxa-3H-perfluorononanoic acid (ADONA).

In October 2022, the State Board/DDW issued Order DW 2022-0001-DDW that requires selected water utilities to monitor their raw water quarterly for PFAS beginning in March 2023. None of the participating water utilities on the American River were included in the Order.

Cyanotoxins

OEHHA prepared interim recommended NLs for four cyanotoxins in May 2021. This included anatoxin-a (0.004 mg/L based on one month), saxitoxin (0.0006 mg/L based on one day), microcystins (0.00003 mg/L based on three months), and cylindrospermopsin (0.0003 mg/L based on three months).

In June 2022, OEHHA provided updated notice to revise the saxitoxin NL and offer Acute NLs for the other three cyanotoxins based on one day as follows: anatoxin-a (0.008 mg/L based on one day), saxitoxin (0.0005 mg/L based on one day), microcystins (0.003 mg/L based on one day), and cylindrospermopsin (0.003 mg/L based on one day).

DDW will review these recommendations and prepare final recommended NLs and RLs for the State Board to adopt.

California Public Health Goals

OEHHA is responsible for development of risk assessments for drinking water contaminants and publication of PHGs. These values represent the level below which there is no expected or known risk to human health for non-carcinogens. For cancer-causing chemicals, the PHG is set at the one-in-a-million risk level. These are reviewed periodically and updated as appropriate. Currently, there are 98 final PHGs as shown in **Attachment 4**. OEHHA must develop a PHG before DDW can set a California MCL for a contaminant for the first time, or in agreement with adoption of a federal standard. The MCL must be as close as possible to the PHG, considering cost and feasibility of treatment. PHG are revised periodically. Whenever a PHG is updated, DDW must re-evaluate the current MCL. Here is activity between 2018 and 2023.

- In May 2018, OEHHA reviewed the PHGs for nitrate and nitrite and proposed no changes. In July 2018 OEHAA published updated PHGs for cis- and trans-1,2-dichloroethylene. Both PHGs were decreased. DDW is not proposing any changes to the current MCLs.

- In July 2020, OEHHA published an Updated PHG for DBCP increasing the PHG slightly from 0.0017 µg/L to 0.003 µg/L. DDW is not proposing a change to the current MCL.

- In February 2020, OEHHA published final PHGs for Total Trihalomethanes, including the four individual species. In December 2022 OEHHA published final PHGs for Haloacetic Acids, including the five individual species. These are very low levels and now the State Board/DDW is considering if the current TTHM and HAA5 MCLs are sufficient or if new MCLs are needed, or if individual MCLs are warranted.

- In March 2020, OEHHA announced it would begin development of a PHG for 1,4-dioxane at the request of the State Board/DDW and it was expected in late 2021 or early 2022. This already has a NL of 1 µg/L. OEHHA also announced that at the request of the State Board/DDW they would begin an update to the n-nitrosodimethylamine (NDMA) PHG. The current PHG is 0.003 µg/L.

- In October 2019, OEHHA announced the initiation of PHG assessments for PFOA and PFOS. These were first published in July 2021 with proposed PHGs of 0.007 parts per trillion (ppt) for PFOA and 1 ppt for PFOS, based on the one in a million cancer risk estimate. Non-cancer risks concentrations would be 3 ppt for PFOA and 2 ppt for PFOS. OEHHA published a second draft document with a proposed PHG of 0.007 ppt for PFOA and 1 ppt for PFOS in July 2023. This should be final in late 2023 and DDW expects that MCLs will be ready by 2024 for both PFOA and PFOS.

ANTICIPATED FUTURE REGULATIONS

The USEPA and DDW are developing new drinking water regulations. The major anticipated future regulations that are projected to impact surface water supplies within the next five years are shown in **Table 11,** and those regulations are discussed below.

DDW establishes its regulatory priorities for each year and in 2023 identified several priorities of interest. DDW's top priority is the development of new or updated MCLs for several key constituents (hexavalent chromium, arsenic, PFOA/PFOS, n-nitrosodimethylamine (NDMA), disinfection by-products, styrene, cadmium, and mercury). Additional priorities of interest include finalization of the Cross Connection Control Policy, LCR Revisions, and the reduction of DLRs for primary and secondary regulated metals to get closer to their PHGs.

It should be noted that there are other constituents of interest on the drinking water horizon, such as cyanotoxins and pharmaceutical compounds. There is no specific regulatory path for them at this time so they are not directly addressed in this section, but may be discussed previously in the Contaminant Candidate List subsections.

Table 11
Summary of Anticipated Major Federal and State Drinking Water Quality Regulations for Surface Water Supplies

Regulation	Year Projected[1]	Number of Contaminants	Targeted Contaminants
USEPA Perchlorate Regulation	Unknown	1	Perchlorate
USEPA cVOCs Regulation	2023/2024	Up to 16	Carcinogenic VOCs
USEPA PFAS Regulation	2023	6	PFAS
USEPA Hexavalent Chromium Regulation	Unknown	1	Hexavalent Chromium
USEPA Arsenic Regulation Review	Unknown	1	Arsenic
CA Lead and Copper Rule Revisions	2023/2024	2	Lead and Copper
CA Cross Connection Control Program	2023/2024	None	None
CA Revised Perchlorate DLR/MCL	2021/2025	1	Perchlorate
CA Reconsidered Hexavalent Chromium MCL	2023	1	Hexavalent Chromium
CA Metals DLR Reduction	2023/2024	11	Metals

[1] Draft/Final Rule Dates

USEPA Perchlorate Regulation

The USEPA determined not to develop a regulation for perchlorate in June 2020. A proposed rule was published in June 2019 and a final Rule was legally obligated by June 19, 2020.

An external peer review was completed in April 2018. A proposed rule for public review and comment was published in June 2019. The proposed rule established an MCL/MCLG for perchlorate at 56 µg/L, and asked input on three alternate regulatory strategies; MCL/MCLG 18 µg/L, MCL/MCLG 90 µg/L, and withdrawal of regulatory determination. USEPA signed a withdrawal of the regulatory determination for perchlorate on June 18, 2020 and as such, no federal regulation will be set. The USEPA determined that State regulations of perchlorate provided sufficient protection and that a federal standard was unnecessary to reduce risk further. However, this remains in legal limbo due to lawsuits pending.

USEPA Carcinogenic VOC Regulation

As part of the new Drinking Water Strategy USEPA announced that it will move forward with development of regulatory standards for a group of carcinogenic VOCs. A draft rule was projected for early 2015, with a final in 2016, but it has been delayed possibly until 2023 or later. These are largely industrial contaminants and include 16 VOCs, eight of which are already regulated so this Rule may result in lower values for MCLs. The regulated list includes; TCE, PCE, benzene, carbon tetrachloride, 1,2-dichloroethane, 1,2-dichloropropane, dichloro-methane, and vinyl chloride. The unregulated list includes; aniline, benzyl chloride, 1,3-butadiene, 1,1-dichloroethane, nitrobenzene, methyl oxirane, 1,2,3-trichloropropane, and urethane.

USEPA PFAS Regulation

As discussed previously, the USEPA announced in the Fourth Regulatory Determination in January 2021 that they intend to develop MCLs for PFOA and PFOS, and potentially other PFAS. On March 14, 2023, EPA announced the proposed National Primary Drinking Water Regulation (NPDWR) for six PFAS including PFOA, PFOS, PFNA, HFPO-DA (commonly known as GenX), PFHxS, and PFBS. USEPA anticipates finalizing the regulation by the end of 2023.

EPA is proposing MCLs for PFOA and PFOS as individual contaminants, and PFHxS, PFNA, PFBS, and GenX as a PFAS mixture. PFOA and PFOS will both have MCLGs of zero and MCLs of 4.0 ng/L. The other four PFAS will be combined together and compared to a Hazard Index (HI) of 1.0 (unitless). The HI is a tool used to evaluate potential health risks from exposure to chemical mixtures, based on the assumption of dose additivity.

To determine the HI, water systems would monitor the entry point to the distribution system and compare the amount of each of the four PFAS in drinking water to its associated Health Based Water Concentration (HBWC), which is the level below which no health effects are expected for that PFAS. The proposed HBWCs are: PFHxS 9.0 ng/L, PFNA 10 ng/L, PFBS 2,000 ng/L, and GenX 10 ng/L. The HI is the sum of the fractions of measured to HBWC for each PFAS compound. Compliance with the HI will be based on a running annual average.

In February 2019, the USEPA published a PFAS Action Plan that identified a strategy for moving forward with management of PFAS in drinking water. In February 2020 the USEPA published an Update to the PFAS Action Plan that included the following commitments; development of MCLs for PFOA/PFOS, inclusion of PFAS on the UCMR5, analytical method development, developing Clean Water Act water quality criteria for PFAS, and including PFAS at Federal Cleanup Sites.

USEPA Hexavalent Chromium Regulation

USEPA began a review of the health effects of hexavalent chromium following the 2008 release of toxicity studies by the Department of Health and Human Service's National Toxicology Program. In September, 2010, USEPA released a draft of the scientific human health assessment for public comment and external peer review. The Integrated Risk Information System (IRIS) has an outdated Oral Reference Dose for hexavalent chromium so USEPA is working to update the human health risk assessment.

IRIS published health information for hexavalent chromium in April and August 2014, and hosted public science meetings in June and October 2014. A *Systematic Review Protocol for the Hexavalent Chromium IRIS Assessment* (Preliminary Assessment Materials) was released in March 2019, as well as held a public science meeting in April 2019. The risk assessment is undergoing agency and interagency review and there is no official schedule identified for the final hexavalent chromium human health assessment out for peer review or public comment. USEPA will review the final assessment once it is available and consider all other relevant information to determine if a new drinking water regulation for hexavalent chromium, or a revision to the current total chromium standard, is warranted. Any revisions would need to be adopted by State Board/DDW and may impact development of a new standard in California.

USEPA recommended that water systems voluntarily implement enhanced monitoring for hexavalent chromium (as discussed previously).

USEPA Arsenic Regulation Review

USEPA IRIS initiated an update to the human health risk assessment for arsenic in 2003. Similar to hexavalent chromium, IRIS published health information for arsenic in April 2014 and hosted a public science meeting in June 2014. An *Updated Problem*

Formulation and Systematic Review Protocol for the Inorganic Arsenic IRIS Assessment was released in May 2019, followed by a public meeting in July 2019. The risk assessment is undergoing agency and interagency review and there is no specific schedule identified for the final arsenic human health assessment to be out for peer review or public comment.

This review has preliminarily indicated that the human health risks from arsenic may be broader and more significant than previously analyzed. Bladder and lung cancer risks are higher than previously thought, cardiovascular impacts are greater than previously quantified, and impacts on diabetes and intellect are now being identified. It is possible that arsenic is as significant as lead is for impacts to intellect development.

Once USEPA finalizes an updated risk assessment, a review of the primary MCL may be required. In addition, OEHHA could trigger a review of the current PHG for arsenic. Either case could result in a revision to the current primary MCL for arsenic.

California Lead and Copper Rule Revisions

DDW is planning to update the Lead and Copper regulations to incorporate recent Federal clarifications to the rule and State laws, as follows. This is the second highest regulatory priority for 2021. DDW will adopt the federal regulation, and may apply additional or lower limits.

In late February 2016, USEPA encouraged States to enhance the oversight of implementation and enforcement of drinking water regulations, including the Lead and Copper Rule. This included specific recommendations on the need to address lead action level exceedances, to fully implement and enforce the Lead and Copper Rule, to enhance public transparency and public access to data and compliance information, and to leverage additional funding sources to address aging infrastructure needs. At the same time, USEPA also clarified tap sampling procedures for the Lead and Copper Rule, with specific recommendations for removal and cleaning of aerators, pre-stagnation flushing, and sample bottle configuration. The memo includes a revised version of Suggested Directions for Homeowner Tap Sample Collection Procedures.

Senate Bill 1398 became effective January 1, 2017, as amended by Senate Bill 427, and requires CWSs to compile an inventory of known lead user service lines in use in its distribution system and identify areas that may have lead user service lines in use in its distribution system by July 1, 2018. Additional actions are required by July 1, 2020, including a timeline for replacing known LSLs.

In early 2017, DDW and Local Primacy Agencies issued amendments to the domestic water supply permits of approximately 1,200 CWSs so that public and private schools could request assistance from their CWS to conduct water sampling for lead and receive technical assistance if an elevated lead sample is found. In addition, Assembly Bill 746 was published on October 12, 2017, effective January 1, 2018, and required CWSs to test lead levels, by July 1, 2019, in drinking water at all California public, K-12 school sites that were constructed before January 1, 2010. This program is considered complete by DDW and no longer collects data.

California Cross Connection Control Program

This will apply to all PWSs. The State Board/DDW published a draft version of the Proposed Cross Connection Control Rule in 2010. The existing requirements were modified substantially in format, and somewhat in content. In October 2017, Assembly Bill 1671 was adopted which set compliance with this program through a Policy Handbook rather than a regulatory standard. This will prevent the cross connection control program from being a local-mandated criminal program.

This draft Cross Connection and Backflow Prevention Policy Handbook was released in February 2021. The Policy Handbook includes sections on dual plumbed recycled water systems with design and operations criteria. In addition, it includes; definitions, hazard assessment, backflow protection selection criteria and standards, backflow protection installation/ testing/ repairs, additional cross connection control requirements for CWSs, and recordkeeping and public notification. This also includes hazard criteria and appropriate backflow protection, and more details on all sections.

A second draft of the Policy Handbook was published in November 2022 and it is expected to be finalized and sent to the State Board for adoption in late 2023.

California Revised Perchlorate DLR/MCL

California had a Perchlorate MCL of 6 µg/L, a PHG of 1 µg/L (revised down from 6 µg/L in 2015), and a DLR of 4 µg/L. In July 2017, based on the revision to the PHG, State Board/DDW recommended that the DLR for perchlorate be lowered first to determine the frequency of low level detects of perchlorate before moving forward with a revised MCL. The MCL revision process will be delayed until after the DLR revision process is complete and additional information regarding low-level detects of perchlorate in drinking water sources is available in 2022 and later.

On June 17, 2021, the Office of Administrative Law approved the perchlorate DLR regulations adopted by the State Water Board on October 6, 2020. The regulations took effect on July 1, 2021. The DLR will change from 0.004 mg/l to 0.002 mg/l on July 1, 2021, and further decrease to 0.001 mg/l on January 1, 2024.

California Reconsidered Hexavalent Chromium Regulation

Hexavalent chromium causes acute gastritis when ingested in high doses and is an established human lung carcinogen when inhaled. Hexavalent chromium is included in the 50 µg/L MCL for total chromium. Senate Bill 541 was passed on October 9, 2001 that required development of a new hexavalent chromium standard for drinking water in California by January 1, 2004. OEHHA published the final PHG for hexavalent chromium in July 2011 at 0.02 µg/L. The State Board/DDW adopted a primary MCL of 10 µg/L in May 2014 that was effective beginning July 1, 2014.

On May 5, 2017 the Superior Court of California ordered State Board/DDW to withdraw the MCL for hexavalent chromium and develop a new MCL. The court's conclusion states the following: "....this case is remanded to the Department with orders to withdraw the current MCL and establish a new MCL. When establishing a new MCL, the Department must comply with the Legislature's directive to consider the economic feasibility of compliance, paying particular attention to small water systems and their users, and to set the MCL as close as economically feasible to the public health goal of 0.02 µg/L." The MCL was formally repealed on September 11, 2017.

In March 2022, DDW/State Board published an Administrative Draft Hexavalent Chromium MCL, set at 10 µg/L with a DLR of 0.05 µg/L. This provided a tiered compliance schedule based on system size, with large systems (>10,000 connections) having two years to comply, medium systems (1,000 – 10,000 connections) having three years to comply, and small systems (<1,000 connections) having four years to comply. In June 2023, the State Board published a Notice of Proposed Rulemaking for a hexavalent chromium MCL set at 10 µg/L, but with a slightly higher DLR of 0.1 µg/L. This will be presented to the State Board for approval in August 2023. This rule also includes a requirement for monitoring to begin immediately and if results exceed the MCL then a utility must submit a Hexavalent Chromium MCL Compliance Plan.

As discussed previously, USEPA IRIS is also preparing a human health assessment for hexavalent chromium which would be used to determine if a federal drinking water standard was necessary.

California Metals DLR Reduction

In November 2022, DDW/State Board proposed to lower the DLRs for several metals with primary and secondary MCLs to better assess lower levels closer to the PHGs. This includes antimony, arsenic, beryllium, cadmium, lead, mercury, nickel, and thallium, as well as iron, manganese, and zinc.

The DLRs will be lowered in two phases. The first phase will establish DLRs for the secondary MCL metals (iron at 100 µg/L, manganese at 20 µg/L, and zinc at 50 µg/L) and lower DLRs for lead (from 5 to 1 µg/L) and nickel. The second phase will lower DLRs for the other metals, including of interest; arsenic (from 2 to 0.5 µg/L), lead (from 1 to 0.5 µg/L), and manganese (from 20 to 10 µg/L).

ATTACHMENT 1
Summary of Regulated Contaminants

Summary of Contaminants
Currently Regulated by USEPA and DDW

Classification	Contaminant	Regulation	MCL (mg/L)
Inorganics (Section 64432)			
	Aluminum	DDW	1
	Antimony	Phase V	0.006
	Arsenic	Arsenic Rule	0.010
	Barium	DDW	1
	Beryllium	Phase V	0.004
	Cadmium	Phase II	0.005
	Chromium	DDW	0.05
	Copper	LCR	1.3 [1,2]
	Cyanide	Phase V	0.15
	Fluoride	DDW	2
	Lead	LCR	0.015 [1,2]
	Mercury	Phase II	0.002
	Nickel	DDW	0.1 [3]
	Perchlorate	Perchlorate	0.006
	Selenium	Phase II	0.05
	Thalium	Phase V	0.002
Nitrate, Nitrite (Section 64432.1)			
	Nitrate	Phase II	10 as N (45 as NO3)
	Nitrite	Phase II	1 as N
	Nitrate + Nitrite	Phase II	10 (sum as N)
Asbestos (Section 64432.2)			
	Asbestos	Phase II	7 MFL (>10um)
Secondary Standards (Section 64449, Table 64449-A)			
	Aluminum	DDW	0.2
	Color	DDW	15 Units
	Copper	DDW	1
	Foaming Agents	DDW	0.5
	Iron	DDW	0.3
	Manganese	DDW	0.05
	Methyl-tert-butyl-ether (MTBE)	DDW	0.005
	Odor-Threshold	DDW	3 Units
	Silver	DDW	0.1
	Thiobencarb	DDW	0.001
	Turbidity	DDW	5 NTU
	Zinc	DDW	5
Secondary Standards (Section 64449, Table 64449-B)			
	Total Dissolved Solids	DDW	500/1,000/1,500 [4]
	Specific Conductance	DDW	900/1,600/2,200 [4]
	Chloride	DDW	250/500/600 [4]
	Sulfate	DDW	250/500/600 [4]
General Mineral (Section 64449 (c) (2))			
	Bicarbonate	DDW	MO
	Carbonate	DDW	MO
	Hydroxide	DDW	MO
	Alkalinity	DDW	MO
	pH	DDW	MO
	Calcium	DDW	MO
	Magnesium	DDW	MO
	Sodium	DDW	MO
	Hardness	DDW	MO
(Volatile) Organic Chemicals (Section 64444, Table 64444-A (a))			
	Benzene	DDW	0.001
	Carbon Tetrachloride	DDW	0.0005
	o-Dichlorobenzene	Phase II	0.6
	p-Dichlorobenzene	DDW	0.005
	1,1-Dichloroethane	DDW	0.005
	1,2-Dichloroethane	DDW	0.0005
	1,1-Dichloroethylene	DDW	0.006
	cis-1,2-Dichloroethylene	DDW	0.006

Summary of Contaminants
Currently Regulated by USEPA and DDW

Classification	Contaminant	Regulation	MCL (mg/L)
	trans-1,2-Dichloroethylene	DDW	0.01
	Dichloromethane (Methylene chloride)	Phase V	0.005
	1,2-Dichloropropane	Phase II	0.005
	1,3-Dichloropropene	DDW	0.0005
	Ethylbenzene	DDW	0.3
	Methyl-tert-butyl ether (MTBE)	DDW	0.013
	Monochlorobenzene	DDW	0.07
	Styrene	Phase II	0.1
	1,1,2,2-Tetrachloroethane	DDW	0.001
	Tetrachloroethylene	Phase II	0.005
	Toluene	DDW	0.15
	1,2,4-Trichlorobenzene	DDW	0.005
	1,1,1-Trichloroethane	Phase I	0.2
	1,1,2-Trichloroethane	Phase V	0.005
	Trichloroethylene	Phase I	0.005
	Trichlorofluoromethane	DDW	0.15
	1,1,2-Trichloro-1,2,2-Triflouroethane	DDW	1.2
	Vinyl Chloride	DDW	0.0005
	Xylenes (total)	DDW	1.75
(Non-Volatile Synthetic) Organic Chemicals (Section 64444, Table 64444-A (b))			
	Acrylamide	Phase II	TT (PAP)
	Alachlor	Phase II	0.002
	Atrazine	DDW	0.001
	Bentazon	DDW	0.018
	Benzo(a)pyrene	Phase V	0.0002
	Carbofuran	DDW	0.018
	Chlordane	DDW	0.0001
	2,4,-D	Phase II	0.07
	Dalapon	Phase V	0.2
	Dibromochloropropane	Phase II	0.0002
	Di (2-ethylhexyl) Adipate	Phase V	0.4
	Di (2-ethylhexyl) Phthalate	DDW	0.004
	Dinoseb	Phase V	0.007
	Diquat	Phase V	0.02
	Endothall	Phase V	0.1
	Endrin	Phase V	0.002
	Epichlorohydrin	Phase II	TT (PAP)
	Ethylene Dibromide	Phase II	0.00005
	Glyphosate	Phase V	0.7
	Heptachlor	DDW	0.00001
	Heptachlor Epoxide	DDW	0.00001
	Hexachlorobenzene	Phase V	0.001
	Hexachlorocyclopentadiene	Phase V	0.05
	Lindane	Phase II	0.0002
	Methoxychlor	DDW	0.03
	Molinate	DDW	0.02
	Oxamyl	DDW	0.05
	Pentachlorophenol	Phase II	0.001
	Picloram	Phase V	0.5
	PCBs	Phase II	0.0005
	Simazine	Phase V	0.004
	Thiobencarb	DDW	0.07
	Toxaphene	Phase II	0.003
	1,2,3-Trichloropropane	DDW	0.000005
	2,3,7,8-TCDD (Dioxin)	Phase V	3.00E-08
	2,4,5-TP (Silvex)	Phase II	0.05
Natural Radioactivity (Section 64441)			
	Gross Alpha Particle Activity	NPDWR	15 pCi/L
	Combined Radium 226 & 228	NPDWR	5 pCi/L
	Uranium	DDW	20 pCi/L
Man-Made Radioactivity (Section 64443)			
	Tritium	DDW	20,000 pCi/L
	Strontium-90	DDW	8 pCi/L
	Gross Beta Particle Activity	NPDWR	50 pCi/L

Summary of Contaminants Currently Regulated by USEPA and DDW

Classification	Contaminant	Regulation	MCL (mg/L)
Disinfection By-Products			
	Total Trihalomethanes (Chloroform, Bromoform, Chlorodibromomethane, Bromodichloromethane)	Stage 1 D/DBP Rule	0.08
	Haloacetic Acids 5 (Mono, di, and tri-chloroacetic acid, mono and di-bromoacetic acid)	Stage 1 D/DBP Rule	0.06
	Chlorite	Stage 1 D/DBP Rule	1
	Bromate	Stage 1 D/DBP Rule	0.01
Disinfection By-Product Precursors			
	Total Organic Carbon	Stage 1 D/DBP Rule	TT (% Removal)
Disinfectants			
	Chlorine (as Cl2)	Stage 1 D/DBP Rule	4 [5]
	Chloramines (as Cl2)	Stage 1 D/DBP Rule	4 [5]
	Chlorine Dioxide (as ClO2)	Stage 1 D/DBP Rule	0.8 [5]
Microbial			
	Giardia Lamblia	SWTR	TT (3-log Reduction)
	Legionella	SWTR	TT
	Viruses	SWTR	TT (4-Log Reduction)
	Disinfectant Residual	SWTR	TT (detectable)
	Fecal Coliform	TCR	TT (positive sample)
	E. Coli	TCR/RTCR	TT (positive sample)
	Total Coliform	TCR	TT (<5% mo. samples pos., if >40 samples per month)
	Turbidity	IESWTR	TT (<0.3 in 95% CFE samples, <1 in 100% CFE)
	Cryptosporidium	IESWTR/ LT1ESWTR/ LT2ESWTR	TT (2-log Reduction or higher if trigger above Bin 2)

[1] - Action Level
[2] - Based on 90th Percentile of Tap Water Samples
[3] - DDW MCL, USEPA remanded in 1995
[4] - Recommended/Upper/Short Term MCLs
[5] - Maximum Residual Disinfectant Level (MRDL)

Acronyms:
USEPA - United States Environmental Protection Agency
DDW - California Division of Drinking Water
MCL - Maximum Contaminant Level
NPDWR - National Primary Drinking Water Regulation
LCR - Lead and Copper Rule
MO - Monitored Only
TT - Treatment Technology
PAP - Polymer Addition Practices
D/DBP - Disinfectants and Disinfection By-Products
SWTR - Surface Water Treatment Rule
TCR - Total Coliform Rule
IESWTR - Interim Enhanced Surface Water Treatment Rule
CFE - Combined Filter Effluent
RTCR - Revised Total Coliform Rule

ATTACHMENT 2
Contaminant Candidate List 4

CONTAMINANT CANDIDATE LIST 4

MICROBIAL CONTAMINANTS

Adenovirus
Calicivirus
Campylobacter jejuni
Enterovirus
Escherichia coli (0157)
Helicobacter pylori
Hepatitis A virus
Legionella pneumophila
Mycobacterium avium
Naegleria fowleri
Salmonella enterica
Shigella sonnei

CHEMICAL CONTAMINANTS

Common name--registry name	CASRN
1,1,1,2-Tetrachloroethane	630-20-6
1,1-Dichloroethane[1]	75-34-3
1,2,3-Trichloropropane[2]	96-18-4
1,3-Butadiene	106-99-0
1,4-Dioxane[2]	123-91-1
1-Butanol	71-36-3
17-alpha estradiol	57910
2-Methoxyethanol	109-86-4
2-Propen-1-ol	107-18-6
3-Hydroxycarbofuran	16655-82-6
4,4'-Methylenedianiline	101-77-9
Acephate	30560-19-1
Acetaldehyde	75-07-0
Acetamide	60-35-5
Acetochlor	34256-82-1
Acetochlor ethanesulfonic acid (ESA)	187022-11-3
Acetochlor oxanilic acid (OA)	184992-44-4
Acrolein	107-02-8
Alachlor ethanesulfonic acid (ESA)	142363-53-9
Alachlor oxanilic acid (OA)	171262-17-2
alpha-Hexachlorocyclohexane	319-84-6
Aniline	62-53-3
Bensulide	741-58-2
Benzyl chloride	100-44-7
Butylated hydroxyanisole	25013-16-5
Captan[3]	133-06-2
Chlorate	14866683
Chloromethane (Methyl chloride)	74-87-3
Clethodim	110429-62-4
Cobalt	7440-48-4
Cumene hydroperoxide	80-15-9
Cyanotoxins (3)	
Dicrotophos	141-66-2
Dimethipin	55290-64-7

Common name--registry name	CASRN
Diuron	330-54-1
Equilenin	517099
Equilin	474862
Erythromycin	114078
Estradiol (17-beta estradiol)	50282
Estrinol	50271
Estrone	53167
Ethinyl estradiol (17-alpha ethinyl estradiol)	57636
Ethoprop	13194-48-4
Ethylene glycol[2]	107-21-1
Ethylene oxide	75-21-8
Ethylene thiourea	96-45-7
Formaldehyde[2]	50-00-0
Germanium	7440-56-4
Halon 1011	74975
HCFC-22	75-45-6
Hexane	110-54-3
Hydrazine	302-01-2
Manganese	7439-96-5
Mestranol	72333
Methamidophos	10265-92-6
Methanol	67-56-1
Methyl bromide (Bromomethane)	74-83-9
Methyl tert-butyl ether[1]	1634-04-4
Metolachlor	51218-45-2
Metolachlor ethanesulfonic acid (ESA)	171118-09-5
Metolachlor oxanilic acid (OA)	152019-73-3
Molybdenum	7439-98-7
Nitrobenzene	98-95-3
Nitroglycerin	55-63-0
N-Methyl-2-pyrrolidone	872-50-4
N-nitrosodiethylamine (NDEA) [2]	55-18-5
N-nitrosodimethylamine (NDMA) [2]	62-75-9
N-nitroso-di-n-propylamine (NDPA)	621-64-7
N-Nitrosodiphenylamine	86-30-6
N-nitrosopyrrolidine (NPYR)	930-55-2
Nonylphenol	varies by species
Norethindron (19-Noresthisterone)	68224
n-Propylbenzene[2]	103-65-1
o-Toluidine	95-53-4
Oxirane, methyl-	75-56-9
Oxydemeton-methyl	301-12-2
Oxyfluorfen	42874-03-3
Perfluorooctane sulfonic acid (PFOS)	1763231
Permethrin	52645-53-1
PFOA (perfluorooctanoic acid)	335-67-1
Profenofos	41198-08-7
Quinoline	91-22-5
RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine)	121-82-4

Common name--registry name	CASRN
sec-Butylbenzene[2]	135-98-8
Tebuconazole	107534-96-3
Tebufenozide	112410-23-8
Tellurium	13494-80-9
Thiodicarb	59669-26-0
Thiophanate-methyl	23564-05-8
Toluene diisocyanate	26471-62-5
Tribufos	78-48-8
Triethylamine	121-44-8
Triphenyltin hydroxide (TPTH)	76-87-9
Urethane	51-79-6
Vanadium[2]	7440-62-2
Vinclozolin	50471-44-8
Ziram	137-30-4

[1]Primary Regulated Chemical in California
[2]Current Notification Level in California
[3]Archived Advisory Level in California

ATTACHMENT 3
Contaminant Candidate List 5

EXHIBIT 2a—CHEMICAL CONTAMINANTS ON THE CCL 5

1,2,3-Trichloropropane	
1,4-Dioxane	
17-alpha ethynyl estradiol	
2,4-Dinitrophenol DTXSID0020523	
2-Aminotoluene	
2-Hydroxyatrazine	
6-Chloro-1,3,5-triazine-2,4-diamine	
Acephate	
Acrolein	
alpha-Hexachlorocyclohexane (alpha-HCH)	
Anthraquinone	
Bensulide	
Bisphenol A	
Boron	
Bromoxynil	
Carbaryl	
Carbendazim (MBC)	
Chlordecone (Kepone)	
Chlorpyrifos	
Cobalt	
Cyanotoxins	Toxins naturally produced and released by some species of cyanobacteria (previously known as ‘‘blue-green algae’’). The group of cyanotoxins includes, but is not limited to: Anatoxin-a, cylindrospermopsin, microcystins, and saxitoxin
Deethylatrazine	
Desisopropyl atrazine	
Desvenlafaxine	
Diazinon	
Dicrotophos	
Dieldrin	
Dimethoate	
Disinfection byproducts (DBPs)	Includes 23 unregulated DBPs, see Exhibit 2b
Diuron	
Ethalfluralin	
Ethoprop	
Fipronil	
Fluconazole	
Flufenacet	
Fluometuron	
Iprodione	
Lithium	
Malathion	
Manganese	
Methomyl	
Methyl tert-butyl ether (MTBE)	
Methylmercury	
Molybdenum	
Nonylphenol	
Norflurazon	
Oxyfluorfen	
Per- and polyfluoroalkyl substances (PFAS)	For the purpose of CCL 5, the structural definition of per- and polyfluoroalkyl substances (PFAS) includes chemicals that contain at least one of these three structures (except for PFOA and PFOS which are already in the regulatory process): R-(CF2)-CF(R′)R″, where both the CF2 and CF moieties are saturated carbons, and none of the R groups can be hydrogen, R-CF2OCF2-R′, where both the CF2 moieties are saturated carbons, and none of the R groups can be hydrogen, CF3C(CF3)RR′, where all the carbons are saturated, and none of the R groups can be hydrogen
Permethrin	
Phorate	
Phosmet	
Phostebupirim	
Profenofos	
Propachlor	
Propanil	
Propargite	
Propazine	
Propoxur	
Quinoline	
Tebuconazole	
Terbufos	
Thiamethoxam	
Tri-allate	
Tribufos	
Tributyl phosphate	
Trimethylbenzene (1,2,4-)	
Tris(2-chloroethyl) phosphate (TCEP)	
Tungsten	
Vanadium	

EXHIBIT 2b—UNREGULATED DBPS IN THE DBP GROUP ON THE CCL 5

Haloacetic Acids:
Bromochloroacetic acid (BCAA)
Bromodichloroacetic acid (BDCAA)
Dibromochloroacetic acid (DBCAA)
Tribromoacetic acid (TBAA)
Haloacetonitriles:
Dichloroacetonitrile (DCAN)
Dibromoacetonitrile (DBAN)
Halonitromethanes:
Bromodichloronitromethane (BDCNM)
Chloropicrin (trichloronitromethane, TCNM)
Dibromochloronitromethane (DBCNM)
Iodinated Trihalomethanes:
Bromochloroiodomethane (BCIM)
Bromodiiodomethane (BDIM)
Chlorodiiodomethane (CDIM)
Dibromoiodomethane (DBIM)
Dichloroiodomethane (DCIM)
Iodoform (triiodomethane, TIM)
Nitrosamines:
Nitrosodibutylamine (NDBA)
N-Nitrosodiethylamine (NDEA)
N-Nitrosodimethylamine (NDMA)
N-Nitrosodi-n-propylamine (NDPA)
N-Nitrosodiphenylamine (NDPhA)
Nitrosopyrrolidine (NPYR)
Others:
Chlorate
Formaldehyde

EXHIBIT 2c—MICROBIAL CONTAMINANTS ON THE CCL 5

Adenovirus
Caliciviruses
Campylobacter jejuni
Escherichia coli (O157)
Enteroviruses
Helicobacter pylori
Legionella pneumophila
Mycobacterium abscessus
Mycobacterium avium
Naegleria fowleri
Pseudomonas aeruginosa
Shigella sonnei

ATTACHMENT 4
OEHHA Public Health Goals

OEHHA PHGs

Chemical	California PHG (ppb)
1,1-Dichloroethane	3
1,1-Dichloroethylene	10
1,1,1-Trichloroethane	1000
1,2-Dibromo-3-chloropropane	0.003
1,2-Dichloroethane	0.4
1,2-Dichloroethylene, cis	13
1,2-Dichloroethylene, trans	50
1,2-Dichloropropane	0.5
1,1,2-Trichloroethane	0.3
1,1,2,2-Tetrachloroethane	0.1
1,2,3-Trichloropropane	0.0007
1,2,4-Trichlorobenzene	5
1,2-Dichlorobenzene	600
1,3-Dichloropropene (Telone II®)	0.2
1,4-Dichlorobenzene	6
2,4-Dichlorophenoxyacetic acid	20
Alachlor	4
Aluminum	600
Antimony	1
Arsenic	0.004
Asbestos	7×10^{-6} fibers/L
Atrazine	0.15
Barium	2,000
Bentazon	200
Benzene	0.15
Benzo[a]pyrene	0.007
Beryllium	1
Bromate	0.1
Cadmium	0.04
Carbofuran	0.7
Carbon Tetrachloride	0.1
Chlordane	0.03
Chlorite	50
Chlorobenzene	70
Chromium, Hexavalent	0.02
Copper	300
Cyanide	150
Dalapon	790
Dichloromethane (Methylene chloride)	4
Diethylhexyl adipate	200
Diethylhexylphthalate (DEHP)	12
Dinoseb	14
Diquat	6
Endothall	94
Endrin	0.3
Ethylbenzene	300
Ethylene dibromide (1,2-dibromoethane)	0.01
Fluoride	1,000
Glyphosate	900
Haloacetic Acids: dibromoacetic acid	0.03
Haloacetic Acids: dichloroacetic acid	0.2

OEHHA PHGs

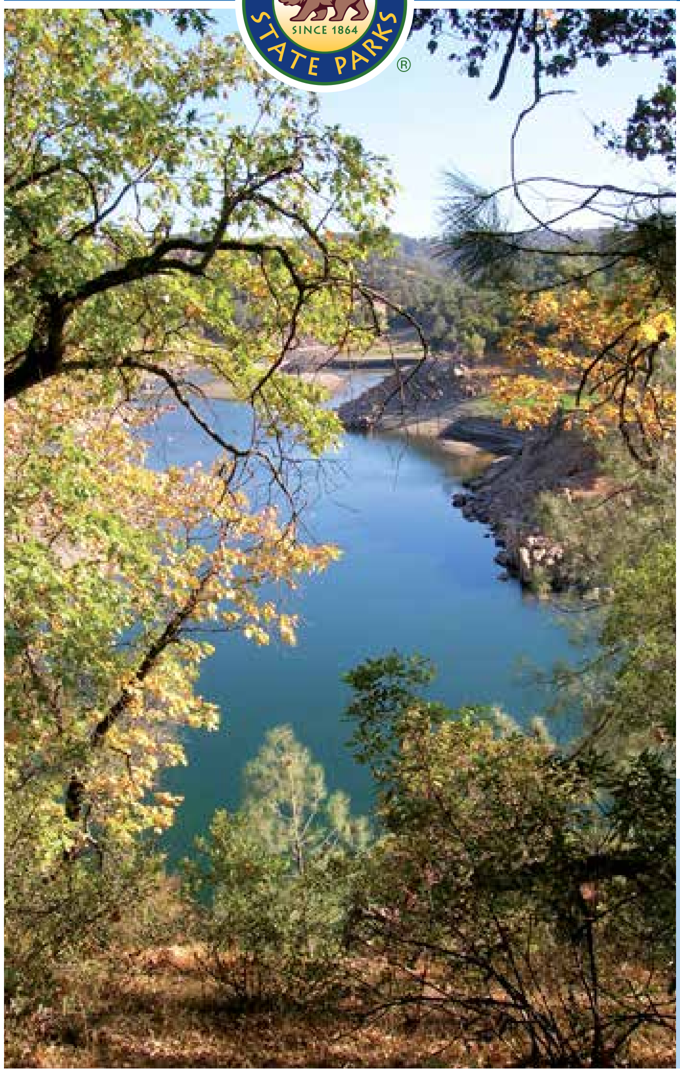
Chemical	California PHG (ppb)
Haloacetic Acids: monobromoacetic acid	25
Haloacetic Acids: monochloroacetic acid	53
Haloacetic Acids: trichloroacetic acid	0.1
Heptachlor	0.008
Heptachlor epoxide	0.006
Hexachlorobenzene	0.03
Hexachlorocyclopentadiene	2
Lead	0.2
Lindane	0.032
Mercury, inorganic	1.2
Methoxychlor	0.09
Methyl tertiary butyl ether (MTBE)	13
Molinate	1
N-Nitrosodimethylamine	0.003
Nickel	12
Nitrate	45,000 as NO_3
Nitrate and Nitrite	10,000 as N
Nitrite	1,000 as N
Oxamyl	26
Pentachlorophenol	0.3
Perchlorate	1
Picloram	166
Polychlorinated Biphenyls (PCBs)	0.09
Radium-226	0.05 pCi/L
Radium-228	0.019 pCi/L
Selenium	30
Silvex	3
Simazine	4
Strontium-90	0.35 pCi/L
Styrene	0.5
2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)	0.00005 parts per trillion (ppt)
Tetrachloroethylene	0.06
Thallium	0.1
Thiobencarb	42
Toluene	150
Toxaphene	0.03
Trichloroethylene	1.7
Trichlorofluoromethane (Freon 11)	1,300
Trichlorotrifluoroethane (Freon 113)	4,000
Trihalomethanes: Bromodichloromethane	0.06
Trihalomethanes: Bromoform	0.5
Trihalomethanes: Chloroform	0.4
Trihalomethanes: Dibromochloromethane	0.1
Tritium	400 pCi/L
Uranium	0.43 pCi/L
Vinyl Chloride	0.05
Xylene	1,800

APPENDIX D

WATERSHED CONTAMINANT SOURCES INFORMATION

Folsom Lake

State Recreation Area



Our Mission

The mission of California State Parks is to provide for the health, inspiration and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation.

California State Parks supports equal access. Prior to arrival, visitors with disabilities who need assistance should contact the park at **(916) 988-0205**. If you need this publication in an alternate format, contact **interp@parks.ca.gov**.

CALIFORNIA STATE PARKS
P.O. Box 942896
Sacramento, CA 94296-0001
For information call: (800) 777-0369
(916) 653-6995, outside the U.S.
711, TTY relay service

www.parks.ca.gov

Folsom Lake State Recreation Area
7755 Folsom-Auburn Road
Folsom, CA 95630
(916) 988-0205

Folsom Lake's miles of shoreline and waterside trails attract millions of boaters, equestrians, cyclists, and hikers each year.

Folsom Lake State Recreation Area offers scenic panoramas of open grasslands, rolling hills, the Sierra Nevada, Sacramento Valley, and the Bay Area's Mount Diablo. Folsom Lake State Recreation Area covers 19,500 acres. Its two reservoirs, Folsom and Natoma, attract about two million visitors annually.

Scenic views

The climate is typical of Sacramento area. Hot summers require a sunhat and sun block. In winter, fog brings a chill. Spring and fall offer rainy or warm days with cooler evenings and nights.

PARK HISTORY

Native People

For thousands of years, the land near Folsom Lake belonged to the Southern Maidu or Nisenan ("from among us"). The Nisenan lived in temporary summer shelters made from peeled tree bark. In winter they dwelled in permanent villages on the American River. These villages had community buildings, including *kum* ceremonial and guest structures.

The Nisenan traded with other native groups, exchanging local acorns for black oak acorns, manzanita berries, and sugar pine nuts. Coastal people traded with the Nisenan for oyster shells, shell beads, and basket materials. The Nisenan are still known worldwide for their woven baskets made from willow, redbud, tule, milkweed, sedge grass, and native grapevines.

After the 1848 gold discovery, most of the Nisenan lands were given away as Spanish land grants. The native people were overwhelmed by the loss of their food sources and by diseases like smallpox. The Nisenan people were nearly decimated, but today their descendants live in nearby communities or on reservations.

FOLSOM DAM

Folsom Lake was created in 1955 by the construction of Folsom Dam, a concrete dam flanked by earth wing dams and dikes, with a total length of about nine miles. The shoreline extends about 15 miles up the forks of the American River. Lake level normally varies from 460 feet in early spring to less than 400 feet by summer. Downstream, behind Nimbus Dam, smaller Lake Natoma has about 500 surface acres of water. Built by the Bureau of Reclamation as part of California's Central Valley Project, Nimbus and Folsom Dams control the waters of the American River and provide flood protection, household water supply, power, and irrigation.

THE FOLSOM POWERHOUSE

Nearby Folsom Powerhouse was built to harness the water power of the American River at the original Folsom Dam, completed by Folsom Prison laborers in 1893. The Powerhouse landmark, listed on the National Register of Historic Places, is a state historic park.

PLANTS AND WILDLIFE

Blue oaks, interior live oaks, foothill pines, and annual grasses dot the open woodlands. In the spring, blooming wildflowers include Indian paintbrush, larkspur, lupine, brodiaea, fiddleneck, dutchman's pipe, and monkey flower.

Black-tailed deer, raccoons, skunks, opossums, gray foxes, and coyotes are often seen in the park. Mountain lions and bobcats may occasionally be spotted. Beavers and river otters live in the Mormon Island Wetlands, a perfect area for bird watching.

Nesting egrets, herons, and cormorants may be observed from the Willow Creek access. Year-round residents include Canada geese, blackbirds, scrub jays, quail, wrens, bushtits, and towhees. Wrentits and California thrashers sing in the chamise-chaparral. Look for kingfishers and grebes near the water. Red-tailed hawks, kestrels, ospreys, and eagles might be seen soaring over the lake.

Folsom Lake and Dam

RECREATION

Fishing—Folsom Lake waters hold trout, catfish, largemouth and smallmouth bass, perch, and kokanee salmon. A valid California fishing license is required. Lake Natoma's accessible pier and fishing platform is at Nimbus Flat.

Photo courtesy of Sacramento State Aquatic Center

Windsurfing on Folsom Lake

Boating—Launching facilities are located at several places around the lake (see map for details). The marina at Brown's Ravine also features boat slips, a towing service, a gas dock, and snack bar.

CAUTION: Boaters should be alert for floating debris. Watch carefully for underwater hazards, especially when the lake level is very low. Observe speed limits.

Horseback riding trails at Folsom Lake

Camping

Peninsula Campground—A hundred family campsites—some accessible—accommodate trailers up to 18 feet and motor homes up to 24 feet. A sanitation station is provided. No site hookups are available. Accessible flush toilets, hot showers, and piped drinking water are available. Two launch ramps and a day-use area are near this secluded campground at the end of the Peninsula between the north and south forks of the American River. Reach the area by boat or drive ten miles south from the town of Pilot Hill on Highway 49.

Beals Point Campground
Just north of Folsom Dam, Beals Point has 49 family campsites and 20 RV hookup sites for trailers and motor homes up to 31 feet. A sanitation station, piped drinking water, and wheelchair-accessible restrooms with hot showers are available nearby.

Negro Bar Group Campsites—On the north shore of Lake Natoma, three group campsites are available. Two can hold up to 50 people each and one can accommodate up to 25 people.

Reservations—Reserve campsites at all campgrounds by calling (800) 444-7275 or visiting **www.parks.ca.gov**.

Boat Camping—You may camp overnight aboard your self-contained sailboat or powerboat only in designated mooring areas. Obtain a map of the mooring areas when registering for boat camping at the Granite Bay entrance station or the marina at Brown's Ravine. If no one is available when you arrive, contact park headquarters. Your boat must have self-contained sanitary and gray-water systems with sleeping accommodations for all aboard. You may camp ashore at the Peninsula Campground only in a designated campsite. Beach the bow of your boat and anchor off the stern. A secure tie-up is essential, as the wind may rise during the night. Boat camping is limited to two consecutive nights.

Picnicking—Family picnic sites are located at Willow Creek, Nimbus Flat, and Negro Bar on Lake Natoma, and at Beals Point, Brown's Ravine, Granite Bay, the Peninsula area, and Folsom Point on Folsom Lake. Beals Point, Nimbus Flat, and Peninsula have accessible picnic tables, restrooms, and parking. All sites have barbecues; bring charcoal. The group picnic area at Granite Bay holds up to 200 people. Reserve by calling (916) 988-0205.

Lake Natoma accessible picnic area

Nimbus Dam

Horseback Riding—Horse trailers can unload and park at several equestrian staging areas. Granite Bay has hitching rails, a water trough, and chemical toilets. Other staging areas are located at Negro Bar, Rattlesnake Bar, Brown's Ravine, Old Salmon Falls, Falcon Crest, and Sterling Pointe.

Trails—The park has 95 miles of trails for hikers, bicyclists, runners, and horseback riders. The trail system includes the Pioneer Express Trail, which is part of the 50-mile Western States/ Pioneer Express National Recreation Trail. Oaks Nature Trail is accessible.

A paved, mostly accessible bicycle trail loops around Lake Natoma, linking to Beals Point and the American River Bike Trail.

Photo courtesy of Sacramento State Aquatic Center

Canoeing at Lake Natoma

Darrington Trail is a popular mountain bike trail on the south fork of Folsom Lake, near Salmon Falls.

Beach/Shore Access—Call ahead to reserve a beach wheelchair for two hours at the Beals Point or Granite Bay day-use areas.

ACCESSIBLE FEATURES

Accessibility in California State Parks is continually improving. For specific details, visit **www.access.parks.ca.gov.**

EXHIBITS/PROGRAMS

The American River Water Education Center interprets water conservation and the American River Watershed. For information, call (916) 989-7100; for tours, call (916) 989-7132 or see **www.usbr.gov/mp/arwec.**

AQUATIC CENTER

The Sacramento State Aquatic Center offers boat rentals and boating safety classes. The facility is cooperatively operated by California State Parks, its Division of Boating and Waterways, and the Associated Students of California State University, Sacramento. For schedules, call (916) 278-2842 or visit **www.sacstateaquaticcenter.com**.

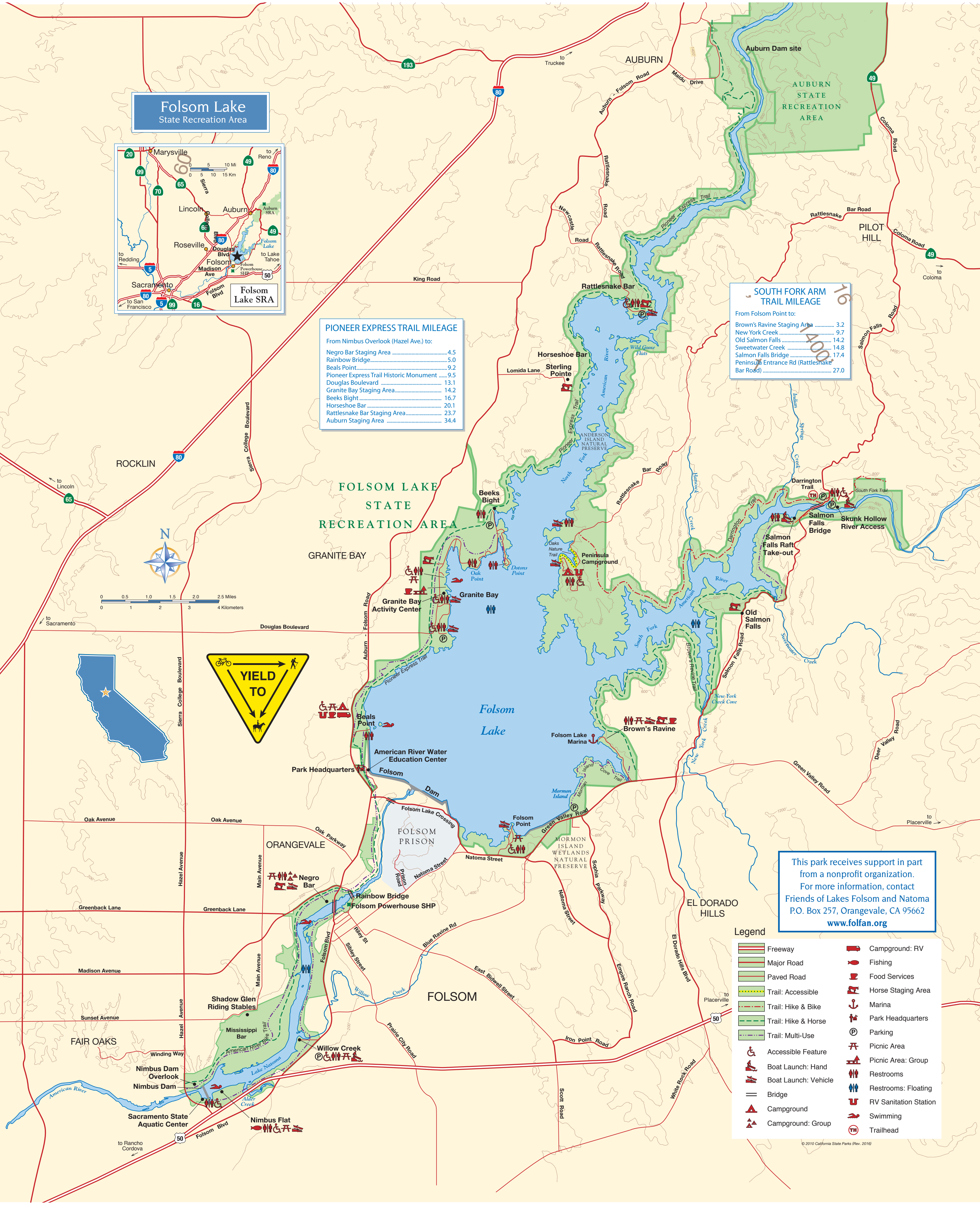
NEARBY STATE PARKS

- Folsom Powerhouse State Historic Park
  9980 Greenback Lane
  Folsom 95630
  (916) 985-4843
- Auburn SRA
  501 El Dorado St.
  Auburn 95602
  (530) 885-4527

PLEASE REMEMBER

- Grass, brush, and trees become tinder-dry. Wildfires are a serious threat. Fires are allowed only in the camp stoves or fire rings provided.
- Poison oak is present throughout the park. Even when dormant, poison oak can cause a serious rash.
- Rattlesnakes, mountain lions, or bobcats may be present in the park. Do not walk alone in isolated areas. Report sightings to park staff.
- Floating debris, an uneven lake bottom, and rock outcroppings are hazards for boaters and swimmers. Swim only in designated areas. No diving is permitted.
- All cultural and natural features are protected by law and may not be disturbed or removed.

Poison Oak


Folsom Lake
State Recreation Area
Marysville
Lincoln
Auburn
Auburn SRA
Roseville
Douglas Blvd
Folsom Lake
to Lake Tahoe
Madison Ave
Folsom
Folsom Powerhouse SHP
Sacramento
Folsom Blvd
to San Francisco
to Redding
to Reno
Sierra College
Folsom Lake SRA
0 5 10 Mi
0 5 10 15 Km
PIONEER EXPRESS TRAIL MILEAGE
From Nimbus Overlook (Hazel Ave.) to:
Negro Bar Staging Area 4.5
Rainbow Bridge 5.0
Beals Point 9.2
Pioneer Express Trail Historic Monument 9.5
Douglas Boulevard 13.1
Granite Bay Staging Area 14.2
Beeks Bight 16.7
Horseshoe Bar 20.1
Rattlesnake Bar Staging Area 23.7
Auburn Staging Area 34.4
SOUTH FORK ARM TRAIL MILEAGE
From Folsom Point to:
Brown's Ravine Staging Area 3.2
New York Creek 9.7
Old Salmon Falls 14.2
Sweetwater Creek 14.8
Salmon Falls Bridge 17.4
Peninsula Entrance Rd (Rattlesnake Bar Road) 27.0
AUBURN
Auburn Dam site
AUBURN STATE RECREATION AREA
Auburn - Folsom Road
Maidu Drive
to Truckee
Rattlesnake Road
Newcastle Road
Rattlesnake Bar
Pioneer Express Trail
PILOT HILL
Bar Road
Coloma Road
to Coloma
Salmon Falls Road
King Road
ROCKLIN
to Lincoln
Sierra College Boulevard
FOLSOM LAKE STATE RECREATION AREA
Horseshoe Bar
Lomida Lane
Sterling Pointe
Wild Goose Flats
ANDERSON ISLAND NATURAL PRESERVE
North Fork American River
Beeks Bight
Oak Point
Dotons Point
Oaks Nature Trail
Peninsula Campground
Darrington Trail
Salmon Falls Bridge
Skunk Hollow River Access
South Fork Trail
Salmon Falls Raft Take-out
Old Salmon Falls
South Fork American River
Brown's Ravine Trail
Sweetwater Creek
Hancock Creek
Indian Springs Creek
GRANITE BAY
Granite Bay
Granite Bay Activity Center
Douglas Boulevard
Auburn - Folsom Road
to Sacramento
0 0.5 1.0 1.5 2.0 2.5 Miles
0 1 2 3 4 Kilometers
N
YIELD TO
Beals Point
Folsom Lake
Folsom Lake Marina
Brown's Ravine
New York Creek Cove
New York Creek
American River Water Education Center
Park Headquarters
Folsom Dam
Folsom Lake Crossing
FOLSOM PRISON
Prison Road
Mormon Island
Mormon Island Cove Trail
Folsom Point
Green Valley Road
MORMON ISLAND WETLANDS NATURAL PRESERVE
Natoma Street
Sophia Parkway
Deer Valley Road
Green Valley Road
to Placerville
Oak Avenue
Oak Parkway
ORANGEVALE
Negro Bar
Rainbow Bridge
Folsom Powerhouse SHP
Greenback Lane
Main Avenue
Hazel Avenue
Riley St
Sibley Street
Blue Ravine Rd
East Bidwell Street
Madison Avenue
Folsom Blvd
Willow Creek
FOLSOM
Shadow Glen Riding Stables
Sunset Avenue
Mississippi Bar
American River Bike Trail
Lake Natoma
FAIR OAKS
Winding Way
Willow Creek
Nimbus Dam Overlook
Nimbus Dam
American River
Sacramento State Aquatic Center
Nimbus Flat
Alder Creek
to Rancho Cordova
Prairie City Road
Iron Point Road
Scott Road
White Rock Road
Empire Ranch Road
El Dorado Hills Blvd
to Placerville
EL DORADO HILLS
This park receives support in part from a nonprofit organization. For more information, contact Friends of Lakes Folsom and Natoma P.O. Box 257, Orangevale, CA 95662 www.folfan.org
Legend
Freeway
Major Road
Paved Road
Trail: Accessible
Trail: Hike & Bike
Trail: Hike & Horse
Trail: Multi-Use
Accessible Feature
Boat Launch: Hand
Boat Launch: Vehicle
Bridge
Campground
Campground: Group
Campground: RV
Fishing
Food Services
Horse Staging Area
Marina
Park Headquarters
Parking
Picnic Area
Picnic Area: Group
Restrooms
Restrooms: Floating
RV Sanitation Station
Swimming
Trailhead
© 2010 California State Parks (Rev. 2016)

AMERICAN RIVER PARKWAY
JEDEDIAH SMITH MEMORIAL TRAIL

KEEP OUR WATERS CLEAN
USE RESTROOMS AND PUMPOUTS

2022

Keep Our Waters Clean

Annual Report

It is with great pleasure and gratitude that we are able to provide you with another annual report for the Keep Our Waters Clean Campaign (KOWC). The campaign works with Sacramento water agencies as well as other city, county, and state agencies that value our water quality and vow to maintain clean water at its best for its consumers. Our partnership actively educates boaters, recreationalists, and community members about the value of our drinking water sources and of keeping our waters clean.

KOWC focuses on working with our partners and sponsors to distribute information and educate the community about the importance of keeping our local water ways free of pollution. We also encourage our audience to take an active role in our community and share our message to protect and preserve our waterways for future generations.

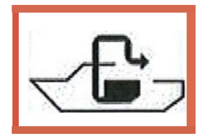
We would like to thank the community, our partners, and our sponsors for allowing us to share our message through materials, waterway surveys, attendance at community events, and educational presentations.

Thank you,

Jessica McCabe
KOWC Program Manager

Introduction & Background

Keep Our Waters Clean (KOWC) was originally called the Pumpout Public Education Campaign, created in 2000. The campaign focused on the Sacramento River, distributing literature and flags designating public pump out stations. Waterway survey events were conducted in order to gather information about the habits of local boaters and recreationalists to assess their level of knowledge regarding ways to protect source water quality.



With the help of various water agencies, such as the California Department of State Parks, the County of Sacramento Department of Regional Parks, the campaign was expanded to Folsom Lake as well as the Lower American River in 2001. The campaign also broadened its message to include the use of public restrooms while recreating along the waterways.

Each year, KOWC comes up with new ideas in order to expand the message to people of all ages in the Sacramento area about source water protection. We partner with boat stores and marinas to distribute our promotional materials to customers and members in order to ensure our target audience receives our message. In 2022, our partners distributed an estimated 5,000 brochures. In addition, materials were shared at community events and survey days.

The 2022 Keep Our Water's Clean Campaign was sponsored by: City of Folsom, City of Sacramento Department of Utilities, East Bay Municipal Utilities District, Golden State Water Company, City of Roseville, Placer County Water Agency, San Juan Water District and Sacramento County Department of Water Resources.

Outreach Tools

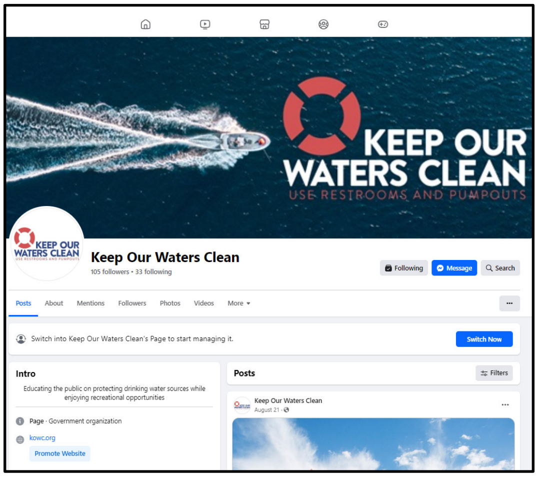
Because public outreach remains as the biggest focus of our program, we rely heavily on our public outreach tools that people can access or use to remember our community goal to protect and preserve our waterways.

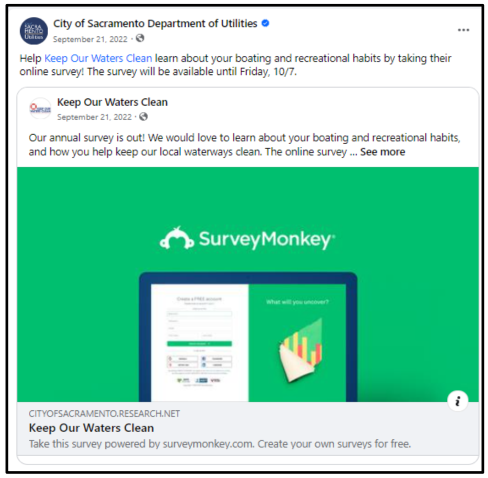
Website and Social Media

The KOWC website, www.kowc.org, features information for Sacramento-area boaters and recreationalists. The website was completely revamped this year to make it easier to navigate and user-friendly, and the logo was also updated to provide a modernized look that better represents the program and resonates with the community. All of our written materials are made available online, which allows boaters and recreationalists to access information as they need it. It also allows those who cannot attend our events or distribution centers to find information quickly and easily.

KOWC continued to promote clean boating habits by encouraging boaters to use restrooms and pumpout stations, protecting our drinking water, and keeping our local lakes and rivers clean.

These messages were shared on the City of Sacramento City Express blog, KOWC Facebook page and the City of Sacramento, Department of Utilities Facebook, Twitter and Instagram pages.



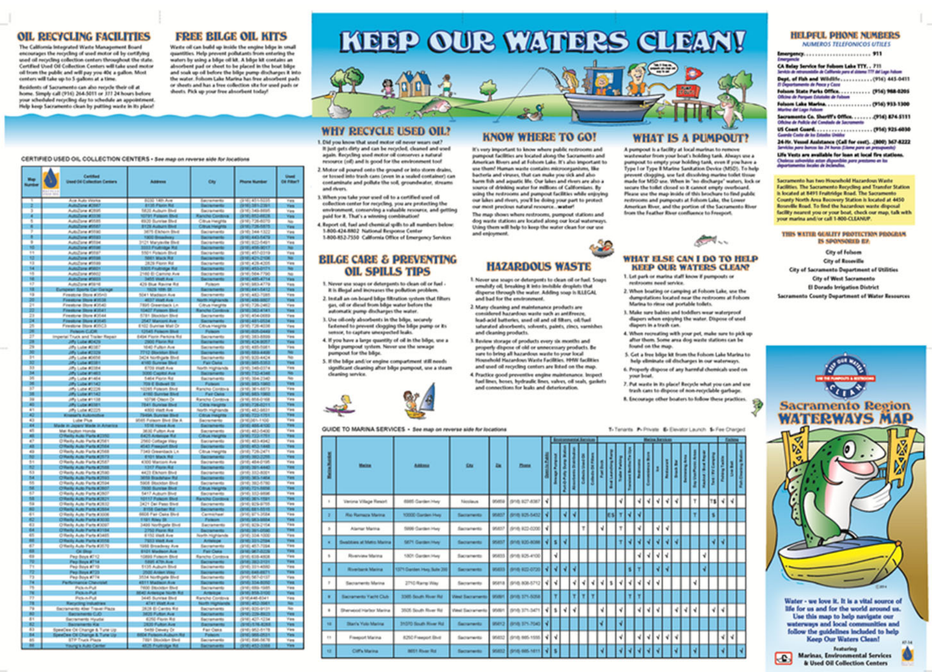


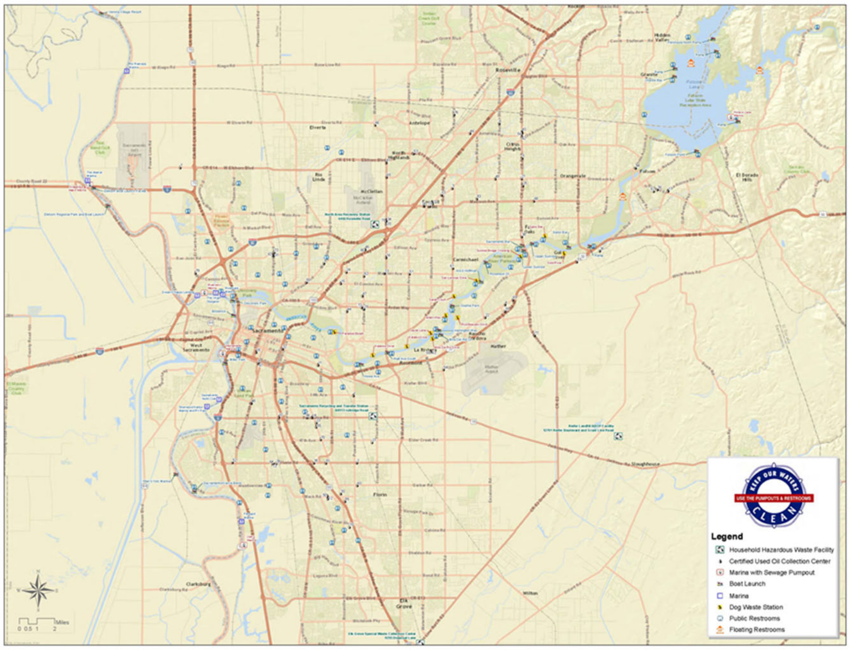
Materials

Every year, KOWC partners with local boat stores and marinas to distribute materials to boaters and recreationalists. This year, KOWC distributed materials through boat stores, marinas, and at community events held throughout the Sacramento region.

Our Sacramento Region Waterways Map continues to be a staple of our program's materials. The GIS-based map provides information regarding boat launch locations, pump out stations, public restrooms, marinas, and information to help boaters navigate local waterways with greater ease. Included also in the GIS map are dog waste stations, to help facilitate pet waste disposal, and marked places for people to drop off their used oil filters.

Region Waterways Map





The KOWC Activity Book continued to be popular with children at our survey days, community events and other educational events. The Activity Book incorporates the importance of keeping our waters clean through activities such as crossword puzzles, mazes and games.

In addition to our Waterways Map and Activity Book, KOWC uses other promotional items to share its message. This year KOWC also distributed:

- Floating Key Chains
- Rally Towels
- Sunglasses
- Drawstring backpacks
- Recycled Newspaper Pencils

Community Outreach

KOWC utilizes grassroots community outreach efforts to talk to those who are most impacted by our message: boaters and recreationalists and children. By attending and contributing to community events of local, cultural, and environmental celebrations, we reach as diverse a group as possible within the Sacramento area regarding water source protection.

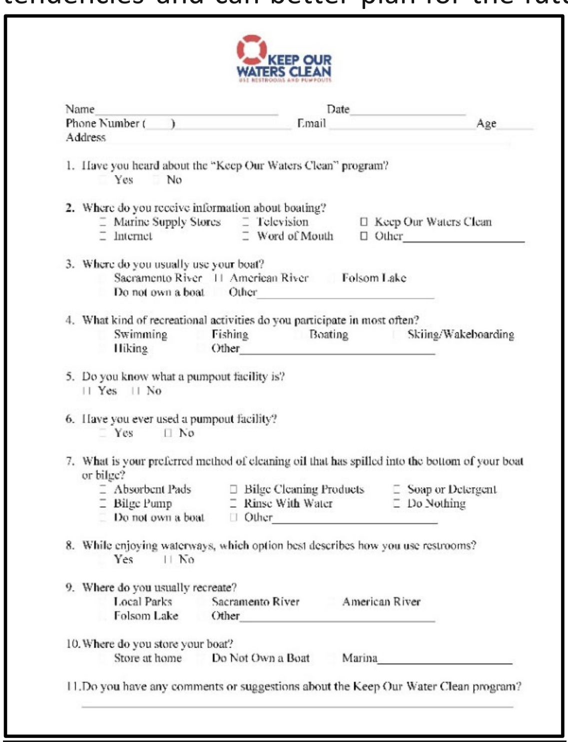
In 2022, KOWC participated in the following spring, summer and fall events:

- City of Sacramento Earth Day (multiple locations) – April 23rd
- ECOS Earth Day at Southside Park – April 24th
- City of Sacramento Water Conservation Showcase at City Dept of Utilities – July 23rd
- Spotlight on Stockton at Donner Field – October 8th
- City of Sacramento Highwater Jamboree at Garcia Bend Park – October 15th

Surveys

This summer, KOWC surveyed boaters and recreationalists online through Survey Monkey. We surveyed approximately forty people of all different ages to find out their habits on the water and their knowledge about preventing water pollution. We offered the recreationalists and boaters useful KOWC promotional items and provided GIS based waterways maps to survey participants.

The survey questions covered topics from boat cleaning and storage to recreational habits. By conducting the surveys, KOWC obtains a better understanding of community needs and tendencies and can better plan for the future of the program.



KEEP OUR WATERS CLEAN
USE RESTROOMS AND PUMPOUTS

Name__________ Date__________
Phone Number (   )__________ Email__________ Age_____
Address

1. Have you heard about the "Keep Our Waters Clean" program?
   ☐ Yes ☐ No
2. Where do you receive information about boating?
   ☐ Marine Supply Stores ☐ Television ☐ Keep Our Waters Clean
   ☐ Internet ☐ Word of Mouth ☐ Other__________
3. Where do you usually use your boat?
   ☐ Sacramento River ☐ American River ☐ Folsom Lake
   ☐ Do not own a boat ☐ Other__________
4. What kind of recreational activities do you participate in most often?
   ☐ Swimming ☐ Fishing ☐ Boating ☐ Skiing/Wakeboarding
   ☐ Hiking ☐ Other__________
5. Do you know what a pumpout facility is?
   ☐ Yes ☐ No
6. Have you ever used a pumpout facility?
   ☐ Yes ☐ No
7. What is your preferred method of cleaning oil that has spilled into the bottom of your boat or bilge?
   ☐ Absorbent Pads ☐ Bilge Cleaning Products ☐ Soap or Detergent
   ☐ Bilge Pump ☐ Rinse With Water ☐ Do Nothing
   ☐ Do not own a boat ☐ Other__________
8. While enjoying waterways, which option best describes how you use restrooms?
   ☐ Yes ☐ No
9. Where do you usually recreate?
   ☐ Local Parks ☐ Sacramento River ☐ American River
   ☐ Folsom Lake ☐ Other__________
10. Where do you store your boat?
    ☐ Store at home ☐ Do Not Own a Boat ☐ Marina__________
11. Do you have any comments or suggestions about the Keep Our Water Clean program?
    ____

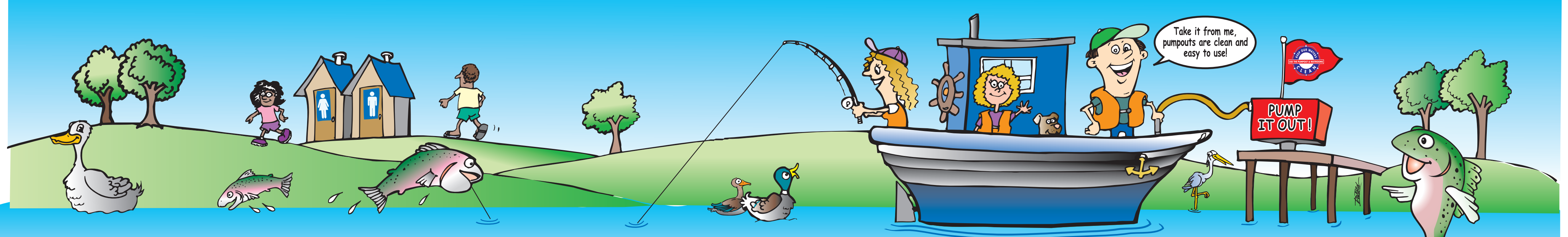
Summary

Each year KOWC is able to learn and grow from the boaters, recreationalists and young students, and 2022 was no exception. Thanks to their aid and cooperation, KOWC continues to strive to find new ways and ideas to help reduce pollution, protect our drinking water, and keep our local lakes and rivers beautiful. According to the feedback we receive from our community and peers, KOWC has contributed to a positive effect on our waterways, but we still have a lot of work to do together as a community.

In 2023, KOWC hopes to:

- Expand outreach through partnerships and utilize additional media.
- Engage more people to take the KOWC annual survey.
- Explore additional opportunities to share our message with non-English language communities.
- Increase our social media outreach through Facebook, Twitter and Instagram.

KEEP OUR WATERS CLEAN!



OIL RECYCLING FACILITIES

The California Integrated Waste Management Board encourages the recycling of used motor oil by certifying used oil recycling collection centers throughout the state. Certified Used Oil Collection Centers will take used motor oil from the public and will pay you 40¢ a gallon. Most centers will take up to 5 gallons at a time.

Residents of Sacramento can also recycle their oil at home. Simply call (916) 264-5011 or *311* 24 hours before your scheduled recycling day to schedule an appointment. Help keep Sacramento clean by putting waste in its place!

FREE BILGE OIL KITS

Waste oil can build up inside the engine bilge in small quantities. Help prevent pollutants from entering the waters by using a bilge oil kit. A bilge kit contains an absorbent pad or sheet to be placed in the boat bilge and soak up oil before the bilge pump discharges it into the water. Folsom Lake Marina has free absorbent pads or sheets and has a free collection site for used pads or sheets. Pick up your free absorbent today!

CERTIFIED USED OIL COLLECTION CENTERS • *See map on reverse side for locations*

Map Number	Certified Used Oil Collection Centers (RECYCLE USED OIL)	Address	City	Phone Number	Used Oil Filter?
1	Ace Auto Works	8030 14th Ave	Sacramento	(916) 451-5035	Yes
2	AutoZone #2867	8135 Florin Rd	Sacramento	(916) 381-2391	Yes
3	AutoZone #2895	5820 Auburn Blvd	Sacramento	(916) 349-8695	Yes
4	AutoZone #3336	10791 Folsom Blvd	Rancho Cordova	(916) 852-6628	Yes
5	AutoZone #5585	6920 Sunrise Blvd	Citrus Heights	(916) 726-6070	No
6	AutoZone #5587	8129 Auburn Blvd	Citrus Heights	(916) 726-5875	Yes
7	AutoZone #5590	3675 Elkhorn Blvd	Sacramento	(916) 344-1322	Yes
8	AutoZone #5593	1900 Broadway	Sacramento	(916) 443-5479	Yes
9	AutoZone #5594	3121 Marysville Blvd	Sacramento	(916) 922-5491	Yes
10	AutoZone #5596	3333 Fruitridge Rd	Sacramento	(916) 456-9017	No
11	AutoZone #5597	5501 Folsom Blvd	Sacramento	(916) 457-0319	Yes
12	AutoZone #5598	5661 Mack Rd	Sacramento	(916) 421-2106	No
13	AutoZone #5599	2829 Florin Rd	Sacramento	(916) 428-4205	Yes
14	AutoZone #5601	5305 Fruitridge Rd	Sacramento	(916) 453-0171	No
15	AutoZone #5602	2160 El Camino Ave	Sacramento	(916) 564-7790	No
16	AutoZone #5603	3455 Watt Ave	Sacramento	(916) 485-4714	Yes
17	AutoZone #5916	429 Blue Ravine Rd	Folsom	(916) 983-4779	Yes
18	European Sports Car Garage	1929 16th St	Sacramento	(916) 441-5412	Yes
19	Firestone Store #35H3	5041 Madison Ave	Sacramento	(916) 482-7085	Yes
20	Firestone Store #3538	4637 Watt Ave	North Highlands	(916) 486-9807	Yes
21	Firestone Store #3540	7895 Greenback Ln	Citrus Heights	(916) 726-2462	Yes
22	Firestone Store #3541	10407 Folsom Blvd	Rancho Cordova	(916) 362-4141	Yes
23	Firestone Store #3544	5781 Stockton Blvd	Sacramento	(916) 454-0689	Yes
24	Firestone Store #3545	2547 Marconi Ave	Sacramento	(916) 481-0534	Yes
25	Firestone Store #35C3	6102 Sunrise Mall Dr	Citrus Heights	(916) 726-4036	Yes
26	Folsom CJDR	12545 Folsom Blvd	Folsom	(916) 605-0449	Yes
27	Imperial Truck and Trailer Repair	6494 Florin Perkins Rd	Sacramento	(916) 383-8899	Yes
28	Jiffy Lube #0429	2900 Florin Rd	Sacramento	(916) 424-9057	Yes
29	Jiffy Lube #0387	1640 Fulton Ave	Sacramento	(916) 485-5981	Yes
30	Jiffy Lube #2329	7712 Stockton Blvd	Sacramento	(916) 689-4499	No
31	Jiffy Lube #0656	3424 Northgate Blvd	Sacramento	(916) 920-4424	No
32	Jiffy Lube #0381	4160 Sunrise Blvd	Fair Oaks	(916) 965-5353	Yes
33	Jiffy Lube #0384	6709 Watt Ave	North Highlands	(916) 348-0374	Yes
34	Jiffy Lube #1463	3000 Capitol Ave	Sacramento	(916) 732-4346	No
35	Jiffy Lube #1464	5464 Florin Rd	Sacramento	(916) 394-2340	No
36	Jiffy Lube #1142	709 E Bidwell St	Folsom	(916) 983-1960	Yes
37	Jiffy Lube #2226	10265 Folsom Blvd	Rancho Cordova	(916) 361-8873	Yes
38	Jiffy Lube #1142	4160 Sunrise Blvd	Fair Oaks	(916) 983-1960	Yes
39	Jiffy Lube #1138	10796 Olson Dr	Rancho Cordova	(916) 858-0168	Yes
40	Jiffy Lube #0381	7841 Sunrise Blvd	Citris Heights	(916) 726-0211	Yes
41	Jiffy Lube #2225	4800 Watt Ave	North Highlands	(916) 482-9831	Yes
42	Kniesel's Automotive	7949A Sunrise Blvd	Citrus Heights	(916) 722-1751	Yes
43	Lube Plus	9565 Folsom Blvd Ste A	Sacramento	(916)361-1100	Yes
44	Made in Japan/ Made in America	1516 Howe Ave	Sacramento	(916) 486-4100	Yes
45	Mel Rapton Honda	3630 Fulton Ave	Sacramento	(916) 482-5400	Yes
46	O'Reilly Auto Parts #2350	6425 Antelope Rd	Citrus Heights	(916) 722-1751	Yes
47	O'Reilly Auto Parts #2561	2560 Cottage Way	Sacramento	(916) 483-4942	Yes
48	O'Reilly Auto Parts #2564	4543 Freeport Blvd	Sacramento	(916) 452-1448	Yes
49	O'Reilly Auto Parts #2568	7349 Greenback Ln	Citrus Heights	(916) 726-2471	Yes
50	O'Reilly Auto Parts #2573	6101 Mack Rd	Sacramento	(916) 392-2255	Yes
51	O'Reilly Auto Parts #2587	4300 Marconi Ave	Sacramento	(916) 484-0195	Yes
52	O'Reilly Auto Parts #2588	1317 Florin Rd	Sacramento	(916) 391-4440	Yes
53	O'Reilly Auto Parts #2590	4423 Elkhorn Blvd	Sacramento	(916) 332-8001	Yes
54	O'Reilly Auto Parts #2593	3659 Bradshaw Rd	Sacramento	(916) 363-1464	Yes
55	O'Reilly Auto Parts #2594	5908 Stockton Blvd	Sacramento	(916) 392-5780	Yes
56	O'Reilly Auto Parts #2607	7800 Sunrise Blvd	Citrus Heights	(916) 721-5656	Yes
57	O'Reilly Auto Parts #2807	5417 Auburn Blvd	Sacramento	(916) 332-9896	Yes
58	O'Reilly Auto Parts #2821	10117 Folsom Blvd	Rancho Cordova	(916) 361-1591	Yes
59	O'Reilly Auto Parts #2832	2421 Del Paso Blvd	Sacramento	(916) 929-9755	Yes
60	O'Reilly Auto Parts #2884	8158 Gerber Rd	Sacramento	(916) 681-5515	Yes
61	O'Reilly Auto Parts #3006	6608 Fair Oaks Blvd	Carmichael	(916) 971-3584	Yes
62	O'Reilly Auto Parts #3030	1191 Riley St	Folsom	(916) 983-9884	Yes
63	O'Reilly Auto Parts #3097	3499 Northgate Blvd	Sacramento	(916) 929-2154	Yes
64	O'Reilly Auto Parts #3184	2750 Florin Rd	Sacramento	(916) 391-0590	Yes
65	O'Reilly Auto Parts #3465	6150 Watt Ave	North Highlands	(916) 334-1000	Yes
66	O'Reilly Auto Parts #3558	7933 Watt Ave	Antelope	(916) 331-2594	Yes
67	O'Reilly Auto Parts #3570	1988 Broadway Ave	Sacramento	(916) 457-7094	Yes
68	Oil Stop	8101 Madison Ave	Fair Oaks	(916) 967-0229	Yes
69	Pep Boys #712	10899 Folsom Blvd	Rancho Cordova	(916) 638-4808	Yes
70	Pep Boys #714	5895 47th Ave	Sacramento	(916) 392-3131	Yes
71	Pep Boys #719	5135 Auburn Blvd	Sacramento	(916) 331-4880	Yes
72	Pep Boys #723	2500 Arden Way	Sacramento	(916) 646-6671	Yes
73	Pep Boys #774	3534 Northgate Blvd	Sacramento	(916) 567-0137	Yes
74	Performance Chevrolet	4811 Madison Ave	Sacramento	(916) 334-8050	Yes
75	Pick-n-Pull	7600 Stockton Blvd	Sacramento	(916) 689-1985	Yes
76	Pick-n-Pull	8640 Antelope North Rd	Antelope	(916) 858-3100	Yes
77	Pick-n-Pull	3445 Sunrise Blvd	Rancho Cordova	(916)446-6341	Yes
78	Recycling Industries	4741 Watt Ave	North Highlands	(916) 452-3961	No
79	Sacramento 49er Travel Plaza	2828 El Centro Rd	Sacramento	(916) 920-9131	No
80	Sacramento CJD	3620 Fulton Ave	Sacramento	(916) 229-8923	Yes
81	Sacramento Hyudai	6250 Florin Rd	Sacramento	(916) 427-1234	Yes
82	Sacramento Kia	2820 Fulton Ave	Sacramento	(916) 576-8288	Yes
83	SpeeDee Oil Change & Tune Up	5489 Dewey Dr	Fair Oaks	(916) 952-5178	Yes
84	SpeeDee Oil Change & Tune Up	6604 Folsom-Auburn Rd	Folsom	(916) 988-0531	Yes
85	STP Truck Plaza	7891 Stockton Blvd	Sacramento	(916) 896-5676	Yes
86	Young's Auto Center	4825 Fruitridge Rd	Sacramento	(916) 452-3388	Yes

WHY RECYCLE USED OIL?

1. Did you know that used motor oil never wears out? It just gets dirty and can be recycled, cleaned and used again. Recycling used motor oil conserves a natural resource (oil) and is good for the environment too!
2. Motor oil poured onto the ground or into storm drains, or tossed into trash cans (even in a sealed container) can contaminate and pollute the soil, groundwater, streams and rivers.
3. When you take your used oil to a certified used oil collection center for recycling, you are protecting the environment, conserving a valuable resource, and getting paid for it. That's a winning combination!
4. Report oil, fuel and chemical spills to all numbers below:
   1-800-424-8802 National Response Center
   1-800-852-7550 California Office of Emergency Services

KNOW WHERE TO GO!

It's very important to know where public restrooms and pumpout facilities are located along the Sacramento and American Rivers and at Folsom Lake. It's also important to use them! Human waste contains microorganisms, like bacteria and viruses, that can make you sick and also harm fish and aquatic life. Our lakes and rivers are also a source of drinking water for millions of Californians. By using the restrooms and pumpout facilities while enjoying our lakes and rivers, you'll be doing your part to protect our most precious natural resource...**water!**

The map shows where restrooms, pumpout stations and dog waste stations are located along our local waterways. Using them will help to keep the water clean for our use and enjoyment.

WHAT IS A PUMPOUT?

A pumpout is a facility at local marinas to remove wastewater from your boat's holding tank. Always use a pumpout to empty your holding tank, even if you have a Type I or Type II Marine Sanitation Device (MSD). To help prevent clogging, use fast dissolving marine toilet tissue made for MSD use. When in "no discharge" waters, lock or secure the toilet closed so it cannot empty overboard. Please use the map inside of this brochure to find public restrooms and pumpouts at Folsom Lake, the Lower American River, and the portion of the Sacramento River from the Feather River confluence to Freeport.

BILGE CARE & PREVENTING OIL SPILLS TIPS

1. Never use soaps or detergents to clean oil or fuel - it is illegal and increases the pollution problem.
2. Install an on-board bilge filtration system that filters gas, oil or diesel from bilge water before the automatic pump discharges the water.
3. Use oil-only absorbents in the bilge, securely fastened to prevent clogging the bilge pump or its sensor, to capture unexpected leaks.
4. If you have a large quantity of oil in the bilge, use a bilge pumpout system. Never use the sewage pumpout for the bilge.
5. If the bilge and/or engine compartment still needs significant cleaning after bilge pumpout, use a steam cleaning service.

HAZARDOUS WASTE

1. Never use soaps or detergents to clean oil or fuel. Soaps emulsify oil, breaking it into invisible droplets that disperse through the water. Adding soap is ILLEGAL and bad for the environment.
2. Many cleaning and maintenance products are considered hazardous waste such as antifreeze, lead-acid batteries, used oil and oil filters, oil/fuel saturated absorbents, solvents, paints, zincs, varnishes and cleaning products.
3. Review storage of products every six months and properly dispose of old or unnecessary products. Be sure to bring all hazardous waste to your local Household Hazardous Waste Facilities. HHW facilities and used oil recycling centers are listed on the map.
4. Practice good preventive engine maintenance. Inspect fuel lines, hoses, hydraulic lines, valves, oil seals, gaskets and connections for leaks and deterioration.

WHAT ELSE CAN I DO TO HELP KEEP OUR WATERS CLEAN?

1. Let park or marina staff know if pumpouts or restrooms need service.
2. When boating or camping at Folsom Lake, use the dumpstations located near the restrooms at Folsom Marina to rinse out portable toilets.
3. Make sure babies and toddlers wear waterproof diapers when enjoying the water. Dispose of used diapers in a trash can.
4. When recreating with your pet, make sure to pick up after them. Some area dog waste stations can be found on the map.
5. Get a free bilge kit from the Folsom Lake Marina to help eliminate oil discharges in our waterways.
6. Properly dispose of any harmful chemicals used on your boat.
7. Put waste in its place! Recycle what you can and use trash cans to dispose of non-recyclable garbage.
8. Encourage other boaters to follow these practices.

GUIDE TO MARINA SERVICES • *See map on reverse side for locations*

T- Tenants **P-** Private **E-** Elevator Launch **$-** Fee Charged

Marina Number	Marina	Address	City	Zip	Phone	Open to Public	Environmental Services: Sewage Pumpout	Port-O-Potty Dump Station	Absorbents Distribution	Collects Used Oil	Collects Oil Filters	Marina Services: Fuel Dock	Boat Launching Ramp	Trailer Parking	Transient Berths/Tie Ups	Restrooms	Convenience Store	Ice	Restaurant	Snack Bar	Swimming Area	Day Use/Picnic Areas	Haulout / Boat Repair	Tent / RV Camping	Fishing: Fishing Tackle	Live Bait	Fish Cleaning Station
1	Verona Village Resort	6985 Garden Hwy	Nicolaus	95659	(916) 927-8387	√								√		√	√	√	√	√		T		T$	√	√	
2	Rio Ramaza Marina	10000 Garden Hwy	Sacramento	95837	(916) 925-5432	√		√	√				E$	T	√	√						T		$			
3	Alamar Marina	5999 Garden Hwy	Sacramento	95837	(916) 922-0200	√				T		√		T		√		√	√								
4	Swabbies at Metro Marina	5871 Garden Hwy	Sacramento	95837	(916) 920-8088	√	$	√						T	√	√	√	√	√	√				√	√		
5	Riverview Marina	1801 Garden Hwy	Sacramento	95833	(916) 925-4100		√									√	√	√	√				√				
6	Riverbank Marina	1371 Garden Hwy, Suite 200	Sacramento	95833	(916) 922-0720	√	√	√	√						$	T		√	√				√				
7	Sacramento Marina	2710 Ramp Way	Sacramento	95818	(916) 808-5712	√	√		√	√	√	√	$	√	√	√	√	√				√					
8	Sacramento Yacht Club	3365 South River Rd	West Sacramento	95691	(916) 371-5058		T		T	T	T				T	T											
9	Sherwood Harbor Marina	3505 South River Rd	West Sacramento	95691	(916) 371-3471	√	$	√	√			√		√		√	√	√		√	√	√		√	√		
10	Stan's Yolo Marina	31070 South River Rd	Sacramento	95612	(916) 371-7040	√						√		√													
11	Freeport Marina	8250 Freeport Blvd	Sacramento	95832	(916) 665-1555	√	√							√		√	√	√	√	√					√	√	
12	Cliff's Marina	8651 River Rd	Sacramento	95832	(916) 665-1611	√	$					√		√	√	√	√	√		√		√			√		√

HELPFUL PHONE NUMBERS

NUMEROS TELEFONICOS UTILES

Emergency. 911
Emergencia

CA Relay Service for Folsom Lake TTY. . 711
Servicio de retransmisión de California para el sistema TTY del Lago Folsom

Dept. of Fish and Wildlife . . . . (916) 445-0411
El Departamento de Pesca y Caza

Folsom State Parks Office. . . . . (916) 988-0205
Oficina de Parques Estatales de Folsom

Folsom Lake Marina. . . . . (916) 933-1300
Marina del Lago Folsom

Sacramento Co. Sheriff's Office. . . . .(916) 874-5111
Oficina de Policía del Condado de Sacramento

US Coast Guard. . . . . (916) 925-6030
Guarda Costa de los Estados Unidos

24-Hr. Vessel Assistance (Call for cost). .(800) 367-8222
Servicios para barcos las 24 horas (Llame para un presupuesto)

Life Vests are available for loan at local fire stations.
Chalecos salvavidas estan disponibles para prestamo en los departamentos locales de incendios.

Sacramento has two Household Hazardous Waste Facilities. The Sacramento Recycling and Transfer Station is located at 8491 Fruitridge Road. The Sacramento County North Area Recovery Station is located at 4450 Roseville Road. To find the hazardous waste disposal facility nearest you or your boat, check our map, talk with your marina and/or call 1-800-CLEANUP.

THIS WATER QUALITY PROTECTION PROGRAM IS SPONSORED BY:

City of Folsom
City of Roseville
City of Sacramento Department of Utilities
City of West Sacramento
El Dorado Irrigation District
Sacramento County Department of Water Resources

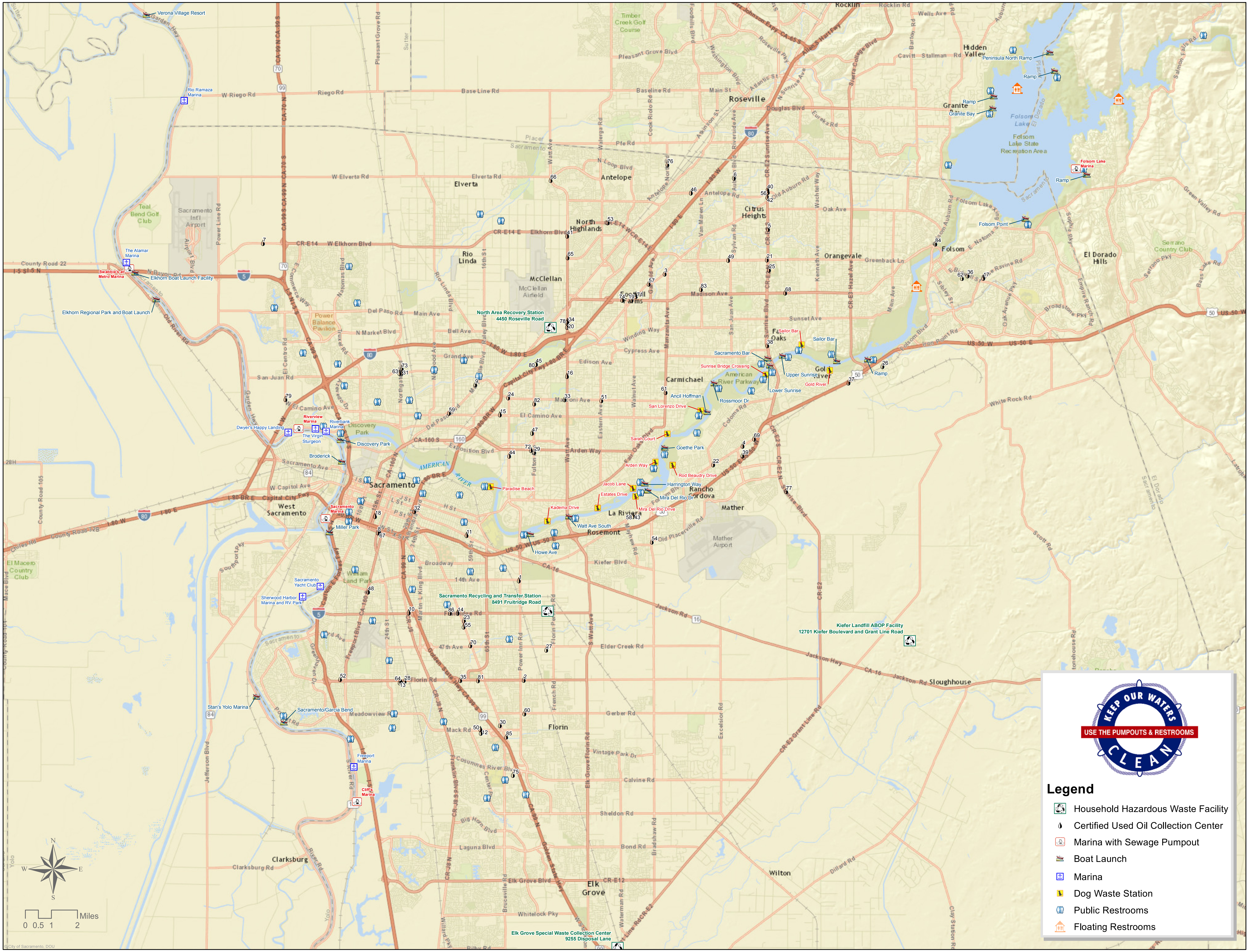
KEEP OUR WATERS CLEAN
USE THE PUMPOUTS & RESTROOMS

Sacramento Region WATERWAYS MAP

Water - we love it. It is a vital source of life for us and for the world around us. Use this map to help navigate our waterways and local communities and follow the guidelines included to help Keep Our Waters Clean!

#7-14

Featuring
Marinas, Environmental Services & Used Oil Collection Centers


KEEP OUR WATERS CLEAN
USE THE PUMPOUTS & RESTROOMS
Legend
Household Hazardous Waste Facility
Certified Used Oil Collection Center
Marina with Sewage Pumpout
Boat Launch
Marina
Dog Waste Station
Public Restrooms
Floating Restrooms
North Area Recovery Station
4450 Roseville Road
Sacramento Recycling and Transfer Station
8491 Fruitridge Road
Kiefer Landfill ABOP Facility
12701 Kiefer Boulevard and Grant Line Road
Elk Grove Special Waste Collection Center
9255 Disposal Lane
Verona Village Resort
Rio Ramaza Marina
The Alamar Marina
Swabbies at Metro Marina
Elkhorn Boat Launch Facility
Elkhorn Regional Park and Boat Launch
Dwyer's Happy Landing
Riverview Marina
Riverbank Marina
The Virgin Sturgeon
Discovery Park
Broderick
Sacramento Marina
Miller Park
Sacramento Yacht Club
Sherwood Harbor Marina and RV Park
Stan's Yolo Marina
Sacramento/Garcia Bend
Freeport Marina
Cliff's Marina
Paradise Beach
Howe Ave
Watt Ave South
Kadema Drive
Estates Drive
Jacob Lane
Mira Del Rio Drive
Mira Del Rio Dr
Harrington Way
Arden Way
Rod Beaudry Drive
Goethe Park
Sarah Court
San Lorenzo Drive
Ancil Hoffman
Rossmoor Dr
Sunrise Bridge Crossing
Sacramento Bar
Lower Sunrise
Upper Sunrise
Sailor Bar
Gold River
Ramp
Folsom Point
Folsom Lake Marina
Granite Bay
Peninsula North Ramp
Folsom Lake
Folsom Lake State Recreation Area
Sacramento
West Sacramento
Roseville
Rocklin
Citrus Heights
Orangevale
Folsom
El Dorado Hills
Antelope
North Highlands
Rio Linda
Elverta
McClellan
Carmichael
Fair Oaks
Rancho Cordova
La Riviera
Rosemont
Mather
Mather Airport
Florin
Elk Grove
Clarksburg
Wilton
Sloughhouse
Hidden Valley
Granite
Sacramento Int'l Airport
American River Parkway
AMERICAN RIVER
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©City of Sacramento, DOU

Incident Date	Location	City	County	Agency Notifying	Type of Spill	Substance	Amount Spilled	Units	Waterway Entered	Tributary to
1/4/2018	Just down river from the Nimbus Fish Hatchery	Rancho Cordova	Sacramento	CDFW	PETROLEUM	Rainbow Sheen	1 mile	Sheen	American River	American River
1/7/2018	Highway 50 & Hazel Ave	Rancho Cordova	Sacramento	AMPAC Fine Chemicals	CHEMICAL	Toluene	200	Gal(s)	Pond	American River
1/8/2018	Robbs Forebay	Unincorporated Area	El Dorado	SMUD	PETROLEUM	Hydraulic Fluid	1	Pt.(s)	Robbs Forebay	American River
1/9/2018	151 Blue Ravine Rd	Folsom	Sacramento	Vision Service Plan	CHEMICAL	Ophthalmic Lens Generation Fluid - LH305, Non toxic	400	Gal(s)	Willow Creek	American River
1/9/2018	4033 Las Pasas Wy	Sacramento	Sacramento	Sac Area Sewer Dist	SEWAGE	Sewage - Raw Type	5, 982	Gal(s)	Unnamed Creek to Strong Ranch Slough	American River
1/10/2018	9524 Lake Natoma Dr, Lincoln Palisades Pump Station	Orangevale	Sacramento	Sac Area Sewer Dist	SEWAGE	Sewage - Raw Type	1,400	Gal(s)	Unnamed Creek	American River
1/13/2018	3121 Eastern Avenue, Eastern Villa Apartments	Unincorporated Area	Sacramento	Sac Area Sewer Dist	SEWAGE	Sewage, Raw	2,190	Gal(s)	storm drain, unknown creek, Chicken Ranch Slough	American River
1/24/2018	N 7th at Richards Blvd	Sacramento	Sacramento	Sac FD	PETROLEUM	Fuel - Diesel, mixed w hydraulic oil	1	Gal(s)	StormStorrm drain	American River
1/31/2018	1970 Windemere Ln.	Sacramento	Sacramento	Sac Area Sewer Dist	SEWAGE	Sewage	884	Gal(s)	Storm Drain/ Unknown	American River
2/6/2018	El Dorado Road and Highway 50	Placerville	El Dorado	El Dorado Irrigation Dist	SEWAGE	Sewage	1,500	Gal(s)	Storm drain	American River
2/27/2018	Westbound 80, Rawlins lake road	Colfax	Placer	CHP	PETROLEUM	Diesel	Unknown	Gal(s)	Storm Drain	American River
2/27/2018	10730 International Drive	Rancho Cordova	Sacramento	Sac Area Sewer Dist	SEWAGE	Sewage	2,250	Gal(s)	Storm drain	American River
3/11/2018	3200 Truxel Rd	Natoma	Sacramento	Sac County EMD Hazmat	SEWAGE	Sewage	5,400	Gal(s)	Storm Drain	American River
3/17/2018	E bound I80 east of Nyack.	Emigrant Gap	Placer	CHP	PETROLEUM	Diesel	Unknown	Gal(s)	Strom drain	American River
3/22/2018	Along Salmon Falls Road at Hidden Bridges	El Dorado Hills	El Dorado	El Dorado Irrigation Dist	OTHER	Water, potable	75,297	Gal(s)	Folsom Lake	American River
4/1/2018	4236 Lingrove Wy	Carmichael	Sacramento	Sac Area Sewer Dist	SEWAGE	Sewage - Raw Type	700	Gal(s)	Unknown Creek	American River
4/9/2018	4875 Manzanita Ave, Creekside Oaks Apartments	Carmichael	Sacramento	Sac Area Sewer Dist	SEWAGE	Sewage - Raw Type	2,376	Gal(s)	Verde Cruz Creek	American River
4/18/2018	6400 Green Valley Road	Placerville	El Dorado	El Dorado Irrigation Dist	OTHER	Water, chlorinated	165,000	Gal(s)	Mound Springs Creek	American River
4/19/2018	4646 Summer Stream Lane	Placerville	El Dorado	CDFW	PETROLEUM	Possibly Petroleum	Unknown	Unknown	Webber Creek	American River
4/28/2018	6470 Laughlin Rd.	Kelsey	El Dorado	Private Citizen	PETROLEUM	Transmission Fluid	Unknown	Unknown	Possible natural spring	American River
4/30/2018	WB 80, Drum Forebay Rd.	Alta	Placer	Grass Valley	UNSPECIFIED	Unknown	Unknown	Unknown	unknown	American River
5/2/2018	38.8969, -120.3781 30 miles North of Highway 50 on Ice House Rd	Pollock Pines	El Dorado	SMUD	PETROLEUM	Fuel or Oil	5	Gal(s)	Union Valley Reservior	American River
5/3/2018	2636 Fulton Avenue	Sacramento	Sacramento	Sac Area Sewer Dist	SEWAGE	Sewage	1,500	Gal(s)	Chicken Ranch Slough	American River
5/8/2018	3333 Quality Dr	Rancho Cordova	Sacramento	Waste Management Sacramento	PETROLEUM	Unknown Oil	5-6	Gal(s)		American River
6/3/2018	US 50 Eastbound Just Prior to Watt Ave	Unincorporated Area	Sacramento	CHP Sacramento Comm Center	PETROLEUM	Gasoline	Unknown	Gal(s)		American River
6/4/2018	State Route 193 and Miners Spring Rd.	Placerville	El Dorado	CHP Sacramento	PETROLEUM	Jet A fuel	800	Gal(s)		American River
6/15/2018	Shirt Tail Bridge, Yankee Jim Road	Unincorporated Area	Placer	Placer County SO	PETROLEUM	Vehicle Fluids	20	Gal(s)	American River	American River

6/24/2018	330 Amy's Ln	El Dorado Hills	El Dorado	El Dorado Irrigation Dist	SEWAGE	Sewage - Raw Type	1,940	Gal(s)	Unnamed drainage	American River
7/2/2018	Hinkle Creek	Folsom	Sacramento	Private citizen	CHEMICAL	Algicide	Unknown	N/A	Hinkle Creek	American River
7/3/2018	Broadstone Parkway & Palladio Parkway	Folsom	Sacramento	Sacramento Fire - Dispatch	CHEMICAL	Paint	Unknown	N/A	Storm drain	American River
7/30/2018	4100 Throwita Way	Placerville	El Dorado	El Dorado Disposal	CHEMICAL	Calcium Hypochlorite	13.5	Lbs.	None	American River
8/4/2018	American River and Folsom Lake	Folsom	Sacramento	Private Citizen	UNSPECIFIED	Human Cremains	N/A	N/A	American River and Folsom Lake	American River
8/12/2018	4000 Eastwood Village Lane	Carmichael	Sacramento	Sac Area Sewer Dist	SEWAGE	Sewage	3120	Gal(s)	Storm Drain, Creek, Tributary to American River	American River
8/27/2018	6317 Main Avenue	Orangevale	Sacramento	Land and Habitat Restoration	PETROLEUM	Petroleum, unknown type	Unknown	N/A	Storm drain	American River
9/6/2018	9706 Fair Oaks Blvd	Fair Oaks	Sacramento	Sac Area Sewer Dist	SEWAGE	Sewage - Raw Type	1,106	Gal(s)	American River	American River
9/27/2018	Cotton Trail Road & Oak Hill Road (upstream of this location)	Placerville	El Dorado	Private citizen	UNSPECIFIED	Unknown material	Unknown	N/A	Squaw Hollow Creek	American River
9/29/2018	Cormorant Wy x Sacramento Inn Way	Sacramento	Sacramento	Sacramento City Fire	CHEMICAL	Muratic Acid	5	Gal(s)		American River
10/1/2018	300 Prison Road	Represa	Sacramento	Folsom State Prison	SEWAGE	Sewage	2,000	Gal(s)	Storm drain	American River
10/5/2018	9457 Orangevale	Orangevale	Sacramento	Private Citizen	CHEMICAL	Possible Pool Chemicals.	Unknown	Unknown	Private Pond / Natoma Lake	American River
10/11/2018	100 Prison Rd	Represa	Sacramento	CSP Sacramento	SEWAGE	Sewage	50-60	Gal(s)		American River
10/12/2018	Rear of 3360 El Camino Ave, Previous Sams Club	Sacramento	Sacramento	Sacramento Metro FD	PETROLEUM	Fuel - Gasoline Type	30	Gal(s)	Storm Drain	American River
10/16/2018	Robs Peak Forebay, 3 Miles Soutwest of Loon Lake on IceHouse Rd	Unincorporated Area	El Dorado	SMUD	PETROLEUM	Hydraulic Oil	1	Gal(s)	Robs Peak Forebay	American River
11/9/2018	2601 CA HWY 49	Cool	El Dorado	NRC	CHEMICAL	ETHYLENE GLYCOL	15	Gal(s)	Storm Drain	American River
12/11/2018	Lake Arthur Road X Fisher Road	Applegate	Placer	CA Fish & Wildlife	CHEMICAL	Automotive Coolant	5	Gal(s)	Storm Drain	American River
12/16/2018	5914 Stanley Ave	Carmichael	Sacramento	Sac County EMD Hazmat	SEWAGE	Raw Sewage	5,000	Gal(s)	Storm Drain	American River
12/26/2018	8510 Moss Wood Circle	Folsom	Sacramento	City of Folsom	SEWAGE	Sewage	450	Gal(s)	Hinkle Creek	American River
12/26/2018	7672 Lakeshore Drive	Granite Bay	Placer	Placer County Utilities Division	SEWAGE	Sewage	3,500	Gal(s)	Folsom Lake	American River
12/27/2018	3700 Business Dr.	Sacramento	Sacramento	Sac County EMD Hazmat	PETROLEUM	Gasoline	10	Gal(s)	Storm Drain	American River
1/2/2019	Sacramento River near Tiscornia Park	Sacramento	Sacramento	Sacramento Regional Fire Department	PETROLEUM	Fuel, aircraft	Unknown	N/A	American River	American River
1/4/2019	1111 Sierra at Tahoe Road	Twin Bridges	El Dorado	NRC	SEWAGE	Sewage	Unknown	N/A		American River
1/7/2019	1261 Fulton Avenue	Sacramento	Sacramento	Sacramento Area Sewer District	SEWAGE	Sewage	4,274	Gal(s)	Strong Ranch Slough	American River
1/8/2019	961 BOULDER MINE RD	Pilot Hill	El Dorado	NRC	PETROLEUM	Motor Oil	Unknown	Unknown	SOUTH FORK OF THE AMERICAN RIVER	American River
1/13/2019	1876 Exposition Boulevard	Sacramento	Sacramento	Sacramento Municipal Utility District (SMUD)	PETROLEUM	Oil, mineral	100	Gal(s)	Storm drain	American River
1/14/2019	Eastbound 80 just after Dutch Flat exit	Dutch Flat	Placer	CHP	PETROLEUM	Aviation Fuel	Unknown	Gal(s)		American River
1/17/2019	160 Sherwood Court	Colfax	Placer	Grass Valley Command Center	PETROLEUM	Gasoline	20	Gal(s)	Storm Drain	American River
1/17/2019	19500 Fun Valley Road	Colfax	Placer	PG&E	OTHER	FR-3 Vegetable Oil None PCB	8	Gal(s)		American River

2/1/2019	Eastbound U.S. 50 Highway, eastbound at Mather Field Road	Unincorporated county area Sacramento	Sacramento	Environmental Management Department's Incident Response	PETROLEUM	Fuel, diesel	50	Gal(s)	Storm drain	American River
2/2/2019	2111 Shelfield Dr	Carmichael	Sacramento	Sacramento Area Sewer District	SEWAGE	Sewage	8,870	Gal(s)	Storm Drain/American River	American River
2/5/2019	4140 Motherload drive	Shingle Springs	El Dorado	El Dorado Irrigation District	SEWAGE	Sewage	Unknown / 5 gallons per minute	N/A	Storm drain	American River
2/7/2019	American River Trail & Blue Tang Court	Cool	El Dorado	Georgetown Nevada Utility	SEWAGE	Sewage	31,000	Gal(s)	Knickerbocker Creek	American River
2/12/2019	9738 Lincoln Village Drive	Sacramento	Sacramento	Sacramento Area Sewer District	SEWAGE	Sewage	900	Gal(s)	Storm Drain	American River
2/14/2019	1102 Wayland Avenue	Sacramento	Sacramento	Sacramento Area Sewer District	SEWAGE	Sewage	1,000	Gal(s)	Storm drain	American River
2/15/2019	3089 Hazzard St	Placerville	El Dorado	CalFire Camino ECC	PETROLEUM	Diesel	100	Gal(s)	Hangtown Creek	American River
2/16/2019	Hazel & Highway 50	Rancho Cordova	Sacramento	AMPAC Fine Chemicals	CHEMICAL	Methlene Chloride	9	Lbs.	Pond on the Aerojet Site	American River
2/17/2019	Prairie City Rd Exit off Highway 50	Folsom	Sacramento	ERTS	PETROLEUM	Diesel Fuel	75	Gal(s)		American River
2/19/2019	2272 Zinfandel Drive	Rancho Cordova	Sacramento	Sacramento Area Sewer District	SEWAGE	Sewage	2,900	Gal(s)	Storm drain	American River
2/28/2019	8927 Renoir Court	Fair Oaks	Sacramento	Sacramento Area Sewer District	SEWAGE	Sewage	2,700	Gal(s)	Tributary of American River	American River
2/28/2019	4003 Westporter Dr	Unincorporated county area Sacramento	Sacramento	Sacramento Area Sewer District	SEWAGE	Sewage	1,161	Gal(s)	Storm Drain/Sutter Slough	American River
3/4/2019	17875 Lake Arthur Rd.	Applegate	Placer	Placer County EH	PETROLEUM	Unknown PCB Mineral Oil	10	Gal(s)	Storm Drain	American
3/4/2019	17885 Lake Arthur Rd	Applegate	Placer	Pacific Gas & Electric	PETROLEUM	Mineral Oil, non-PCB (less then 2 parts per million)	2	Gal(s)	Unknown	American
3/5/2019	2221 Fair Oaks Blvd	Sacramento	Sacramento	Sacramento Metro Fire	PETROLEUM	Gasoline	20	Gal(s)	Storm Drain	American
3/6/2019	East Bound US 50 West of Stockton Blvd	Sacramento	Sacramento	Sac Fire HAZMAT 30	PETROLEUM	Diesel	150	Gal(s)	Roadside Drain that leads to treatment plant	American
3/20/2019	2025 Trimble way	Sacramento	Sacramento	Sacramento Area Sewer District	SEWAGE	Sewage	3,100	Gal(s)	storm drain	American
3/30/2019	2807 Elvyra Way	Sacramento	Sacramento	Sacramento County Sewer District	SEWAGE	Raw Sewage	4,072	Gal(s)	Chicken Ranch Slough	American
4/3/2019	2180 Woodlawn Drive	Rancho Cordova	Sacramento	Sacramento Area Sewer Dist.	SEWAGE	Sewage	6000	Gal(s)	Storm Drain / American River	American
4/6/2019	11280 Trade Center Drive, Suite 100	Rancho Cordova	Sacramento	Sacramento Area Sewer District	SEWAGE	Sewage	17347	Gal(s)	Tributary to the American River	American
4/7/2019	229 Mont Rose Drive	Folsom	Sacramento	SMUD	PETROLEUM	Transformer Oil Unknown PCB	30	Gal(s)	storm drain	American
4/17/2019	Westbound Hwy 50 at the bottom of the Mather Field offramp	Rancho Cordova	Sacramento	CHP Sacramento	PETROLEUM	Diesel	100	Gal(s)	Storm drain	American
5/30/2019	2700 Alexandria Dr.	El Dorado Hills	El Dorado	El Dorado Irrigation District	SEWAGE	Sewage	250	Gal(s)	Storm Drain	American River
6/24/2019	659 Green Valley Road	El Dorado	El Dorado	NORCOM	PETROLEUM	Gasoline	5	Gal(s)	Folsom Lake	American River

7/29/2019	Canyon Way, 39.080765 -120.958283	Colfax	Placer	City of Colfax	SEWAGE	Sewage	1,000	Gal(s)	Bunch Creek	American River
8/5/2019	WB 1-80 at Canyon way, MM 133	Colfax	Placer	Cal Fire	PETROLEUM	Diesel fuel	several hundred	Gal(s)	Storm drain	American River
8/5/2019	7794 FOLSOM DAM ROAD	Folsom	Sacramento	NRC	PETROLEUM	HYDRAULIC OIL	10	Gal(s)	AMERICAN RIVER	American River
8/7/2019	5831 Fair Oaks Blvd, Twin Gardens Apartments	Carmichael	Sacramento	Sacramento Metro FD	PETROLEUM	Fuel - Gasoline Type, mixed w water	2-3	Gal(s)	Strorm Drain	American River
8/19/2019	Westbound I-80 west of the Gold Run Exit	Gold Run	Placer	CHP	PETROLEUM	Engine Oil	3-4	Gal(s)	Storm Drain	American River
9/3/2019	9801 Beachwood Dr	Orangevale	Sacramento	Sacramento Area Sewer District	SEWAGE	*Historical Release* Sewage	1100	Gal(s)	Storm Drain	American
9/3/2019	9801 Beachwood Dr	Orangevale	Sacramento	Sacramento Area Sewer District	SEWAGE	Sewage	1100	Gal(s)	Storm Drain	American
9/3/2019	698 Placerville Dr	Placerville	El Dorado	Cal Fire Camino	UNSPECIFIED	Trash	Unknown	Unknown	Hangtown Creek	American
9/16/2019	Westbound Highway 80 east of Laing Rd	Unincorporated county area Placer West of Donner Lake	Placer	CHP	PETROLEUM	Diesel	100	Gal(s)		American
9/24/2019	300 Prison Rd	Represa	Sacramento	Folsom State Prison	SEWAGE	Sewage	400	Gal(s)	American River	American
10/22/2019	Fairoaks Blvd at Monroe St	Sacramento	Sacramento	CHP	PETROLEUM	Hydraulic Fluid	unknown	Unknown	Stromdrain	American River
10/23/2019	Yankee Jim Road	Weimar	Placer	STATE OF CALIFORNIA (STATE PARK PEACE)	PETROLEUM	ETHYLENE GLYCOL, GASOLINE, OIL, TRANSMISSION FLUID	Unknown	N/A	NORTH FORK OF THE AMERICAN RIVER	American River
10/30/2019	225 W Weimar cross road	Colfax	Placer	UPRR	PETROLEUM	Battery Acid	1	Gal(s)		American River
11/18/2019	Intersection of Riley St and East Bidwell	Folsom	Sacramento	City of Folsom FD	SEWAGE	Sewage	50- 100	Gal(s)	Storm drain	American River
11/21/2019	Blackberry Circle Parkway Home Owners Association	Folsom	Sacramento	NRC	CHEMICAL	Pro Grass Herbicide	Unknown	Unknown	Stormdrain, Ditches	American River
11/23/2019	Old Salmon Falls Rd, Near Skunk Hollow	Unincorporated county area El Dorado	El Dorado	State Parks, Norcom	PETROLEUM	Fuel , Oil - Vehicle Fluids	Unk	Gal(s)	North Fork American River	American River
12/2/2019	303 Riley Street	Folsom	Sacramento	City of Folsom	SEWAGE	Sewage	2	Gal(s)	American River	American River
12/6/2019	307 Bridge Street	Folsom	Sacramento	City of Folsom	SEWAGE	Sewage	25	Gal(s)	American River	American River
12/22/2019	3520 El Dorado Rd	Placerville	El Dorado	PG&E	PETROLEUM	Transformer Oil	5	Gal(s)		American River
1/8/2020	9600 Greenback Lane	Orangevale	Sacramento County	Sacramento County EMD	PETROLEUM	Oil & Water	55	Gal(s)		American River
1/9/2020	622 Lake Wilhaggin Dr	Sacramento	Sacramento County	Sacramento Area Sewage District	SEWAGE	Sewage	4,773	Gal(s)	American River	American River
1/28/2020	EB East of Nyack Ave	Colfax	Placer County	CHP- Chico	OTHER	Almond Milk	25	Gal(s)	Storm Drain	American River
3/1/2020	4342 Galewood Way	Carmichael	Sacramento County	SMUD	PETROLEUM	Transformer Oil	1-2	Gal(s)		American River
3/18/2020	1775 Creekside Dr	Folsom	Sacramento County	City of Folsom	SEWAGE	Sewage	200-300	Gal(s)	Humbug Creek	American River
4/5/2020	3624 Buena Vista Drive	Sacramento	Sacramento County	Sacramento Area Sewer District	SEWAGE	Sewage	5700	Gal(s)	Strong Ranch Slough.	American River
4/5/2020	4033 Las Pasas Way	Sacramento	Sacramento County	Sacramento Area Sewer District	SEWAGE	Sewage	1500	Gal(s)	Strong Ranch Slough.	American River

4/6/2020	1940 65th Street	Sacramento	Sacramento County	Chevron	PETROLEUM	Gasoline, Regular - Unleaded	7-10	Gal(s)		American River
4/10/2020	2524 Andrade Way	Sacramento	Sacramento County	Sacramento Area Sewer District	SEWAGE	Sewage	2140	Gal(s)	Strong Ranch Slough	American River
4/19/2020	Mount Raslton Road & Hwy 50	Twin Bridges	El Dorado County	El Dorado County Hazmat	PETROLEUM	Unknown Fuel	25	Gal(s)	Unknown Stream	American River
4/25/2020	1520 Morse Ave	Sacramento	Sacramento County	Sacramento Area Sewer Dist.	SEWAGE	Sewage	14,000	Gal(s)	Strong Ranch Slough / Storm Drain	American River
5/15/2020	3353 Bradshaw Rd	Sacramento	Sacramento County	Sacramento County Environmental Management Department	SEWAGE	SEWAGE	2711	Gal(s)	Storm Drain	American River
5/16/2020	WB I-80 Just East of Drum Forebay	Unincorporated county area Placer West of Donner Lake	Placer County	CHP Chico Comm Center	PETROLEUM	Diesel Fuel	1	Gal(s)		American River
5/17/2020	WB I-80, West of Yuba Gap, On the Downgrade	Foresthill	Placer County	CHP	PETROLEUM	Diesel Fuel	Unknown	Unknown		American River
6/18/2020	8842 Winding Way	Fair Oaks	Sacramento County	Sacramento Area Sewer District	SEWAGE	Sewage	9,204	Gal(s)	Storm Drain	American River
6/20/2020	9181 Madison Ave	Orangevale	Sacramento County	Sacramento Area Sewer District	SEWAGE	Sewage	11,000	Gal(s)	American River	American River
6/25/2020	EB I80, Release goes from Colfax till Blue Banyon exit. // 39.282385 -120.706475	Colfax	Placer County	CHP - Chico	UNSPECIFIED	Unknown Fluid	Unknown	Unknown		American River
6/26/2020	Ebberts Ranch Rd	Foresthill	Placer County	Citizen	PETROLEUM	Vehicle Fluids	40	Gal(s)	Unk Creek	American River
6/27/2020	3400 Alta Arden	Sacramento	Sacramento County	Sacramento Area Sewer District	SEWAGE	Sewage	15,000	Gal(s)	Storm drain	American River
7/4/2020	Prairie City Road	Folsom	Sacramento County	NRC	OTHER	Mercury	Unknown	Unknown	Local Stream	American River
7/7/2020	999 LOTUS RD	Lotus	El Dorado County	NRC	PETROLEUM	HYDRAULIC OIL	Unknown	Unknown	Possibly American River	American River
7/16/2020	3971 Horseshoe Circle	Loomis	Placer County	Placer County Utilities	SEWAGE	Raw Sewage	6000	Gal(s)	Folsom Lake	American River
7/22/2020	Negro Bar, American River	Folsom	Sacramento County	Private citizen	PETROLEUM	Oil, motor	5	Gal(s)	American River (Negro Bar)	American River
8/11/2020	HWY 50 hazel Ave	Rancho Cordova	Sacramento County	Ampac Fine Chemicals	CHEMICAL	Methylene Chloride	0.25	Lbs.		American River
8/13/2020	MP 135.45, Roseville Sub	Colfax	Placer County	UPRR	PETROLEUM, RAILROAD	Oil - Lube Type	40	Gal(s)		American River/ Sacramento River
8/26/2020	2078 BLAIR ROAD; PRIVATE RESIDENCE	Pollock Pines	El Dorado County	NRC	PETROLEUM	OIL, MISC: MOTOR	Unknown	Unknown	Storm Drain	American River
8/27/2020	Oak Ave Parkway and East Bidwell	Folsom	Sacramento County	City of Folsom	SEWAGE	Sewage	Unknown	Gal(s)		American River
9/6/2020	2358 Sunrise Blvd	Rancho Cordova	Sacramento County	Chevron	PETROLEUM	Gasoline	32	Oz.		American River
10/6/2020	East Bound 80 at Gold Run	Gold Run	Placer County	CHP	PETROLEUM	Diesel	500	Gal(s)		American River
10/7/2020	300 Prison Rd	Represa	Sacramento County	Folsom State Prison	OTHER	Shower water	100	Gal(s)	Storm Drain	American River
10/12/2020	300 Prison Rd	Folsom Prison	Sacramento County	Folsom State Prison	SEWAGE	Sewage	Unknown	N/A	American River	American River
12/25/2020	16TH ST & RICHARDS BLVD, UNDER THE PIPES BRIDGE	Sacramento	Sacramento County	NRC	PETROLEUM	Gasoline	Unk	Unknown	American River	American River

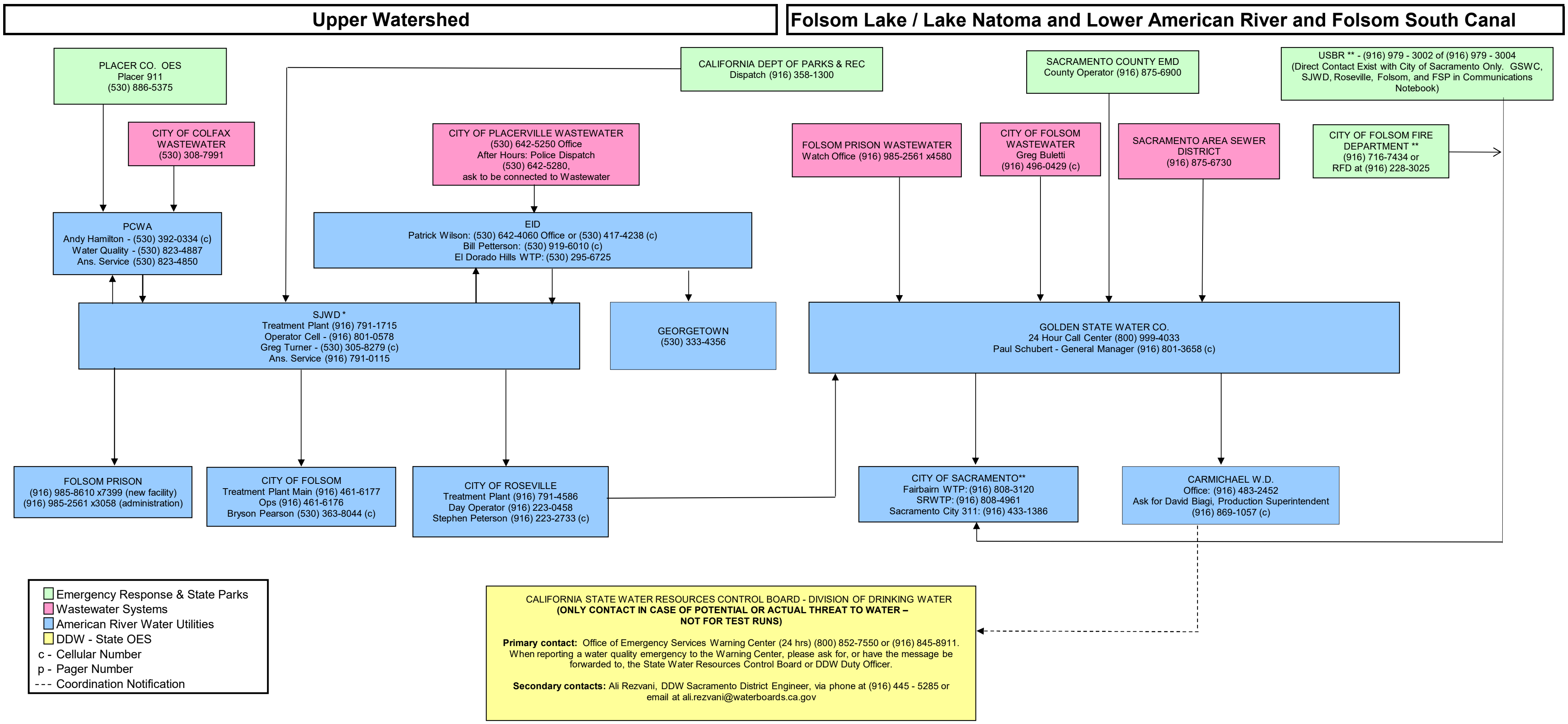
1/8/2021	3340 Forni Rd	Placerville	l Dorado Count	El Dorado County HazMat	PETROLEUM	Oil	10	Gal(s)	Webber Creek	American
1/21/2021	Hwy 50 at Fresh Pond	El Dorado	l Dorado Count	Sacramento CHP	PETROLEUM	Diesel	100	Gal(s)	Unknown	American
1/23/2021	Discovery Park - Boat Launch	Sacramento	cramento Cour	National Response Center (NRC)	PETROLEUM	Oil, unknown type	Unknown	N/A	Sacramento River	American
1/23/2021	2806 Elvira Way	Sacramento	cramento Cour	Sacramento Area Sewer District	SEWAGE	Sewage	3,612	Gal(s)	Storm Drain	American
1/28/2021	385341.98 -1210002.30	Cool	l Dorado Count	George Town Divide Public Utilities Dist.	SEWAGE	Sewage	3600	Gal(s)	Drainage Ditch	American
1/30/2021	1060 Sylvan Glen Place	Auburn	Placer County	Placer County Utility	SEWAGE	Sewage	100	Gal(s)	Drainage Ditch	American
2/18/2021	10425 Nordon Ave	Mather Air Force Base	cramento Cour	Sacramento International Airport	CHEMICAL	Fire suppressant foam	Unknown	Gal(s)	Unknown	American
2/19/2021	3955 Missouri Flat Rd	Placerville	l Dorado Count	Safeway	PETROLEUM	Unknown Oil	Unknown	Gal(s)	Unknown	American
2/28/2021	4809 Millshire Lane	Fair Oaks	cramento Cour	Sacramento Area Sewer Dist.	SEWAGE	Sewage	13,000	Gal(s)	Unk Tributary	American
3/14/2021	CORNER OF CANYON WAY AND EAST WEIMAR CROSS RD (Vacant Lot)	Colfax	Placer County	NRC	PETROLEUM	Kerosene	Unknown	Unknown	Water Shed	American
3/15/2021	3890 Hwy 49 Finch Rd.	Diamond Springs	l Dorado Count	CalFire - Camino Dispatch	PETROLEUM	Vehicle fluid	5	Qt.(s)	Webber Creek	American
3/16/2021	Drum Forebay Exit West Bound I80	Unincorporated county area Placer West of Donner Lake	Placer County	Placer County Environmental Health	PETROLEUM	Unknown Oil	10	Gal(s)	Towle Diversion Canal	American
4/4/2021	Eastbound Interstate 80, east of Nyack Road	Unincorporated county area Placer West of Donner Lake	Placer County	California Highway Patrol (CHP) - Chico	PETROLEUM	Fuel, diesel	15	Gal(s)	Creek	American
4/22/2021	2405 Cava Ct	Sacramento	cramento Cour	Sacramento Area Sewer Dist	SEWAGE	Sewage - Raw Type	1,748	Gal(s)	Chicken Ranch Slough	American
5/6/2021	7794 Folsom Dam Rd (Folsom Dam)	Folsom	cramento Cour	US Bureau of Reclamation	PETROLEUM	Hydraulic Oil	5	Gal(s)	American River	American
5/21/2021	305 Hartnell Pl.	Sacramento	cramento Cour	Sacramento County Sewage District	SEWAGE	Raw Sewage	3,600	Gal(s)	American River	American
5/22/2021	901 Arden Way	Sacramento	cramento Cour	Sacramento County Incident Response	OTHER	Fire Water Mixed with battery acid and motor oil	1500	Gal(s)	Storm Drain	American
6/18/2021	Strawberry Creek, Near Lovers Leap and 42 Mile Stone	El Dorado	l Dorado Count	Citizen	OTHER	Deer Carcass	1	Lbs.	Strawberry Creek	American
6/19/2021	13.6 Miles Past Mile Marker 19 / LAT: 39.01797, LONG - 120.76685 / Near 53555 Mosquito Ridge Rd	Foresthill	Placer County	Tahoe National Forrest Emergency Command Center	PETROLEUM	Gasoline	15	Gal(s)	Creek	American
6/21/2021	3900 Villa Court	Fair Oaks	cramento Cour	Sacramento Sewer District	SEWAGE	Sewage, Raw	7,500	Gal(s)	American River	American
7/10/2021	Across the street from 1013 58th St	Sacramento	cramento Cour	City of Sacramento, Department of Utilities	CHEMICAL	Soap	Unknown	Unknown	American River	American
7/16/2021	HWY 160 River Rd	Sacramento	cramento Cour	NRC	PETROLEUM	Unknown Oil	Unknown	Gal(s)	Sacramento River	American
7/25/2021	American River near Discovery Park between mileposts 0 and 1	Sacramento	cramento Cour	Sacramento City PD	PETROLEUM	Sinking Pleasure Craft	Unknown	Gal(s)	American River	American
8/17/2021	Westbound 80 at Gold Run Rest Area	Gold Run	Placer County	CHP Valley	PETROLEUM	Diesel	400	Gal(s)	Storm Drain	American
10/9/2021	10680 Coloma Rd	Rancho Cordova	cramento Cour	Sacramento Areas Sewer District	SEWAGE	Sewage	5400	Gal(s)	Unknown Tributary to Cordova Creek	American

10/24/2021	3812 Las Pasas Way	Sacramento	cramento Cour	Sac Area Sewer Dist.	SEWAGE	Sewage	1000	Gal(s)	Storm Drain / Arcade Creek	American
10/24/2021	4315 Niobe Circle	Rancho Cordova	cramento Cour	Sacramento Sewer District	SEWAGE	Sewage	13,544	Gal(s)	Storm drain	American
10/25/2021	3690 Kings Way	Sacramento	cramento Cour	Sacramento Area Sewer District	SEWAGE	Waste Water	4,000	Gal(s)	Storm	American
10/26/2021	Pleasant Valley Rd and Slate Creek Rd	El Dorado	l Dorado Count	El Dorado Irrigation District	SEWAGE	Wastewater	9,000	Gal(s)	Unknown	American
11/13/2021	LUMSDEN PARK RD	Placerville	l Dorado Count	NRC	PETROLEUM	Unknown Oil	Unknown	Sheen	UNNAMED POND	American
12/3/2021	9351 Jackson St., 5-Star Truck Repair Shop	Sacramento	cramento Cour	Former Employee of 5 Star Trucking	PETROLEUM	Oil	10	Gal(s)	Storm drain	American
12/8/2021	Eastbound 80 East of Drum	Gold Run	Placer County	CHP- Chico	PETROLEUM	Diesel	45-50	Gal(s)	Storm drain	American
12/11/2021	2638 Notre Dame Drive	Sacramento	cramento Cour	Sacramento Area Sewer District	SEWAGE	Waste Water	1,800	Gal(s)	American River	American
12/24/2021	3121 Cottage Park Ave	Sacramento	cramento Cour	Sac Area Sewer Dist.	SEWAGE	Sewage	3000	Gal(s)	Storm Drain / Strong Ranch Slough	American
12/25/2021	2200 Fair Oaks Blvd.	Sacramento	cramento Cour	Cura Emergency Services	PETROLEUM	Gasoline	5	Gal(s)	Storm Drain	American
12/25/2021	2400 Fair Oaks Blvd	Sacramento	cramento Cour	Sac Fire Dept.	PETROLEUM	Gasoline	5	Gal(s)	Storm Drain - Private Property	American
1/4/2022	8842 Winding Way	Fair Oaks	cramento Cour	Kirby's Pump and Mechanical	SEWAGE	Raw Sewage	10,000-15,000	Gal(s)	Unnamed Creek	American River
1/5/2022	7301 14th Ave., UC Davis Health Warehouse	Sacramento	cramento Cour	UC Davis Health	PETROLEUM	Oily Water	30-55	Gal(s)	Storm Drain	American River
1/11/2022	2059 Royal Oaks Drive	Sacramento	cramento Cour	City of Sacramento Sewer Division	SEWAGE	Sewage	12,000	Gal(s)	Storm Drain	American River
1/20/2022	Watt Ave and Hyde Way	Sacramento	cramento Cour	SMUD	PETROLEUM	FR3 Mineral Oil (non PCB)	10	Gal(s)	Storm Drain	American River
1/24/2022	230 Coloma St.	Placerville	l Dorado Count	City of Placerville Public Works	SEWAGE	Sewage	2,600	Gal(s)	Hangtown Creek	American River
1/25/2022	8842 Winding Way	Fair Oaks	cramento Cour	Sacramento Area Sewer District	SEWAGE	Raw Sewage	1,800	Gal(s)	Unnamed Creek	American River
2/13/2022	1628 Bell St.	Sacramento	cramento Cour	Sacramento Area Sewer District	SEWAGE	Sewage	11,682	Gal(s)	Chicken Ranch Slough	American River
2/21/2022	809 Bidwell Street, Folsom Oaks Apartments	Folsom	cramento Cour	Private Citizen	OTHER	Cigarettes	Unknown	N/A	Storm Drain	American River
2/21/2022	2113 Pantages Circle	Rancho Cordova	cramento Cour	Sacramento Area Sewer District	SEWAGE	Waste Water	3,780	Gal(s)	Storm Drain	American River
2/22/2022	Intersection of San Francisco Drive and Promontory Point	El Dorado Hills	l Dorado Count	El Dorado Irrigation District	SEWAGE	Waste Water	1,000	Gal(s)	Storm Drain	American River
2/22/2022	1061 Lindley Ct	Folsom	cramento Cour	Sac Regional County Sanitation District	SEWAGE	Sewage	3,397	Gal(s)	Storm Drain / Alder Creek	American River
2/22/2022	2618 Forest St	Sacramento	cramento Cour	NRC	SEWAGE	Sewage	Unk	Unknown	Storm Drain	American River
3/1/2022	2404 Benita Drive	Rancho Cordova	cramento Cour	Private Citizen	PETROLEUM	Oil	0.5	Qt.(s)	Storm Drain	American River
3/15/2022	10185 Country Way	Rancho Cordova	cramento Cour	Private Citizen	CHEMICAL	Paint	Unknown	Gal(s)	Storm Drain	American River
3/28/2022	Off Ramp 133 off highway 80. South West on Canyon Way toward Yankee Jims	Colfax	Placer County	Private Citizen	OTHER	Foam	Unknown	Gal(s)	Unknown	American River
3/29/2022	640 Goodview Court	Placerville	l Dorado Count	Private Citizen	PETROLEUM	Oil	2	Gal(s)	Unknown	American River
3/30/2022	2207 Francisco Drive, Safeway Store #2683	El Dorado Hills	l Dorado Count	Safeway Nor Cal	PETROLEUM	Fuel (Unknown if 91 or 87 Octane)	Unknown	Gal(s)	Storm Drain	American River
4/18/2022	2235 Royale Road	Sacramento	cramento Cour	Sacramento Area Sewer District	SEWAGE	Waste Water	1,682	Gal(s)	American River	American River
4/18/2022	2378 Hernando Rd.	Sacramento	cramento Cour	Sacramento Area Sewer District	SEWAGE	Sanitary Sewer	1,839	Gal(s)	Chicken Ranch Slough	American River

4/21/2022	WB IS 80 Just E Whittmore Caltrans Yard	Alta	Placer County	CHP - Goldrun	PETROLEUM	Oil	5-12	Gal(s)	Unnamed Creek	American River
5/5/2022	2510 Wittkop way	Sacramento	cramento Cour	Sacramento Area Sewer District	SEWAGE	Sewage	2,800	Gal(s)	Chicken Ranch Slough	American River
5/9/2022	1068 Lindley Court	Folsom	cramento Cour	Sac Regional County Sanitation District	SEWAGE	Sewage	17,000	Gal(s)	Storm Drain	American River
5/11/2022	10721 Coloma Rd	Rancho Cordova	cramento Cour	Sacramento Area Sewer District	SEWAGE	Sewage	1,980	Gal(s)	American River	American River
5/21/2022	7755 Folsom Auburn Rd (Granites Bay Park Unit / Stage 4 boat ramp north end)	Folsom	cramento Cour	CA State Parks	PETROLEUM	Gasoline and oil mixture	6 feet X 6 feet	Sheen	Folsom Lake	American River
5/24/2022	2301 Fallwater Circle	Carmichael	cramento Cour	County of Sacramento Department of Waste Management	PETROLEUM	Hydraulic Fluid	60	Gal(s)	Storm Drain	American River
6/1/2022	12633 Fair Oaks Blvd	Sacramento	cramento Cour	NRC	PETROLEUM	Gas (Unleaded)	Unknown	Gal(s)	Storm Drain	American River
6/25/2022	Eastbound St Hwy 50 just East of Kyburz Dr.	Kyburz	l Dorado Count	CHP - Sacramento	PETROLEUM	Diesel	10-15	Gal(s)	Unknown	American River
7/1/2022	Westbound Highway 50 east of Kyburz Drive	Kyburz	l Dorado Count	CHP	PETROLEUM	Diesel	Unknown but Substantial	Gal(s)	American River	American River
7/3/2022	Browns Marina	Folsom	cramento Cour	State Parks	PETROLEUM	Gas	25	Gal(s)	Folsom Lake	American River
7/13/2022	10339 Folsom Blvd	Rancho Cordova	cramento Cour	City of Rancho Cordova Public Works	SEWAGE	Sewage	2100	Gal(s)	Storm Drain	American River
7/13/2022	901 Fulton Ave	Sacramento	cramento Cour	Sacramento Area Sewer District	SEWAGE	Raw Sewage	1,000	Gal(s)	Strong Ranch Slough	American River
7/20/2022	Springvale Road (38.752630 - 120.937358)	Placerville	l Dorado Count	PG&E (Environmental Field Specialist)	UNSPECIFIED	Drilling Fluid (Bentonite [Non-Hazardous])	10	Gal(s)	Wetland	American River
7/28/2022	Highway 160 Bridge at Northgate Ave, Near Exit 46-A	Sacramento	cramento Cour	NRC	PETROLEUM	Fuel, Oil - Vessel fluids	Unk	Gal(s)	Sacramento River	American River
7/29/2022	1201 Fulton Ave	Sacramento	cramento Cour	Sacramento Area Sewer District	SEWAGE	Raw Sewage	1000	Gal(s)	Chicken Ranch Slough	American River
8/9/2022	10385 Folsom Blvd	Rancho Cordova	cramento Cour	City of Rancho Cordova Public Work	SEWAGE	Sewage	2100	Gal(s)	Storm Drain	American River
8/16/2022	4124 Joy Lane	Carmichael	cramento Cour	Sacramento Area Sewer District	SEWAGE	Raw Sewage	1,354	Gal(s)	Unnamed Creek	American River
8/28/2022	America River - downstream of and near the H Street Bridge (Construction Project)	Sacramento	cramento Cour	N/A	OTHER	Run-off, construction	Unknown	N/A	American River	American River
9/7/2022	125 Cascade Falls Drive	Folsom	cramento Cour	SMUD Environmental	PETROLEUM	Mineral Oil Non PCB	5	Gal(s)	Storm Drain	American River
9/21/2022	600 North 5th Street	Sacramento	cramento Cour	City of Sacramento	PETROLEUM	Diesel	Unknown	Gal(s)	Sump Station 111	American River
9/22/2022	On Wyda Way in between Bell Street and Howe Avenue	Sacramento	cramento Cour	Carmichael Water District, Sac Fire Dispatch	PETROLEUM	Diesel	200	Gal(s)	Chicken Ranch Slough	American River
9/23/2022	6701 Greenvalley Road	Placerville	l Dorado Count	MGE Underground	PETROLEUM	Diesel	20	Gal(s)	Unknown	American River
9/29/2022	8207 Trevi Way	El Dorado Hills	l Dorado Count	Premium Environmental Services	PETROLEUM	Diesel Fuel	20	Gal(s)	Unknown	American River
10/3/2022	10319 Folsom Blvd	Rancho Cordova	cramento Cour	Sacramento Area Sewer District	SEWAGE	Raw sewage	1000	Gal(s)	Storm Drain	American River

10/4/2022	Sugarhill Way and Grand Prairie Road	Folsom	cramento Cour	Sacramento County Environmental Management Department	PETROLEUM	Diesel	20	Gal(s)	Storm Drain	American River
10/5/2022	3101 Center St	Placerville	l Dorado Count	Fish and Wildlife	PETROLEUM	Oil Sheen	100 yds x 5 yds	Sheen	Hangtown Creek	American River
10/15/2022	Latitude: 38° 36' 09" N Longitude: 121° 30' 24" W	Sacramento	cramento Cour	NRC	PETROLEUM	UNKNOWN OIL	Unknown	Gal(s)	American River	American River
11/18/2022	2207 Francisco Drive	El Dorado Hills	l Dorado Count	Safeway	PETROLEUM	Fuel, Gasoline	0.5	Gal(s)	Storm Drain	American River
11/21/2022	3501 Broadmoor Way	Carmichael	cramento Cour	Sacramento Area Sewer District	SEWAGE	Sewage	1,400	Gal(s)	Storm Drain	American River
11/30/2022	10026 Horn Road	Rancho Cordova	cramento Cour	NRC	PETROLEUM	HYDRAULIC OIL	Unknown	Gal(s)	Unknown	American River
12/8/2022	Southside of the Rainbow Bridge - Lake Natoma	Folsom	cramento Cour	City of Folsom	PETROLEUM	Sewage	50	Gal(s)	American River	American River
12/9/2022	2207 Francisco Drive	El Dorado	l Dorado Count	Safeway	PETROLEUM	Fuel	5 to 10	Gal(s)	Storm Drain	American River
12/21/2022	3783 Forni Rd	Placerville	l Dorado Count	El Dorado Irrigation Dist	SEWAGE	Sewage - Raw Type	4,860	Gal(s)	Private Pond	American River
12/27/2022	2265 Sunrise Blvd	Rancho Cordova	cramento Cour	Sacramento County Environmental Management	CHEMICAL	Elastomeric Roof Coating	2-3	Gal(s)	Storm Drain	American River
12/30/2022	38.894994 -121.000639	Cool	l Dorado Count	Georgetown Divide Public Utility District	SEWAGE	Sewage	Unknown	Unknown	Knickerbocker Creek	American River
12/30/2022	End of State Lane	Diamond Springs	l Dorado Count	El Dorado Irrigation District	SEWAGE	Sewage	Unknown	Gal(s)	Storm Drain	American River
12/31/2022	End of South Steet	El Dorado	l Dorado Count	El Dorado Irrigation District	OTHER	Creek Water	Unknown	Gal(s)	Slade Creek	American River
12/31/2022	2300 Cool Water Creek Road	Placerville	l Dorado Count	City of Placerville	OTHER	Waste Water	Unknown	Gal(s)	Hangtown Creek	American River
12/31/2022	397 Foresthill Ave	Auburn	Placer County	City of Auburn	SEWAGE	Sewage	1,000	Gal(s)	Storm Drain	American River
12/31/2022	Pam O'Shanter across from Steven Harris Park	El Dorado	l Dorado Count	El Dorado Irrigation District	SEWAGE	Sewage	250	Gal(s)	New York Creek	American River
12/31/2022	Pleasant Valley Rd, 250ft East of Slate Creek	El Dorado	l Dorado Count	El Dorado Irrigation District	SEWAGE	Sewage	Unknown	Unknown	Slate Creek	American River
12/31/2022	Green Valley at Browns Ravine	El Dorado Hills	l Dorado Count	El Dorado Irrigation District	SEWAGE	Sewage	250	Gal(s)	Folsom Lake	American River
12/31/2022	New York Creek Road and Timberline Ridge Road	El Dorado Hills	l Dorado Count	El Dorado Irrigation District	SEWAGE	Sewage	Unknown	Gal(s)	New York Creek	American River
12/31/2022	121 Keller Circle	Folsom	cramento Cour	City of Folsom	SEWAGE	Sewage	Unknown	Unknown	Willow Creek	American River

AMERICAN RIVER WATER UTILITIES
VOLUNTARY EMERGENCY NOTIFICATION CHART



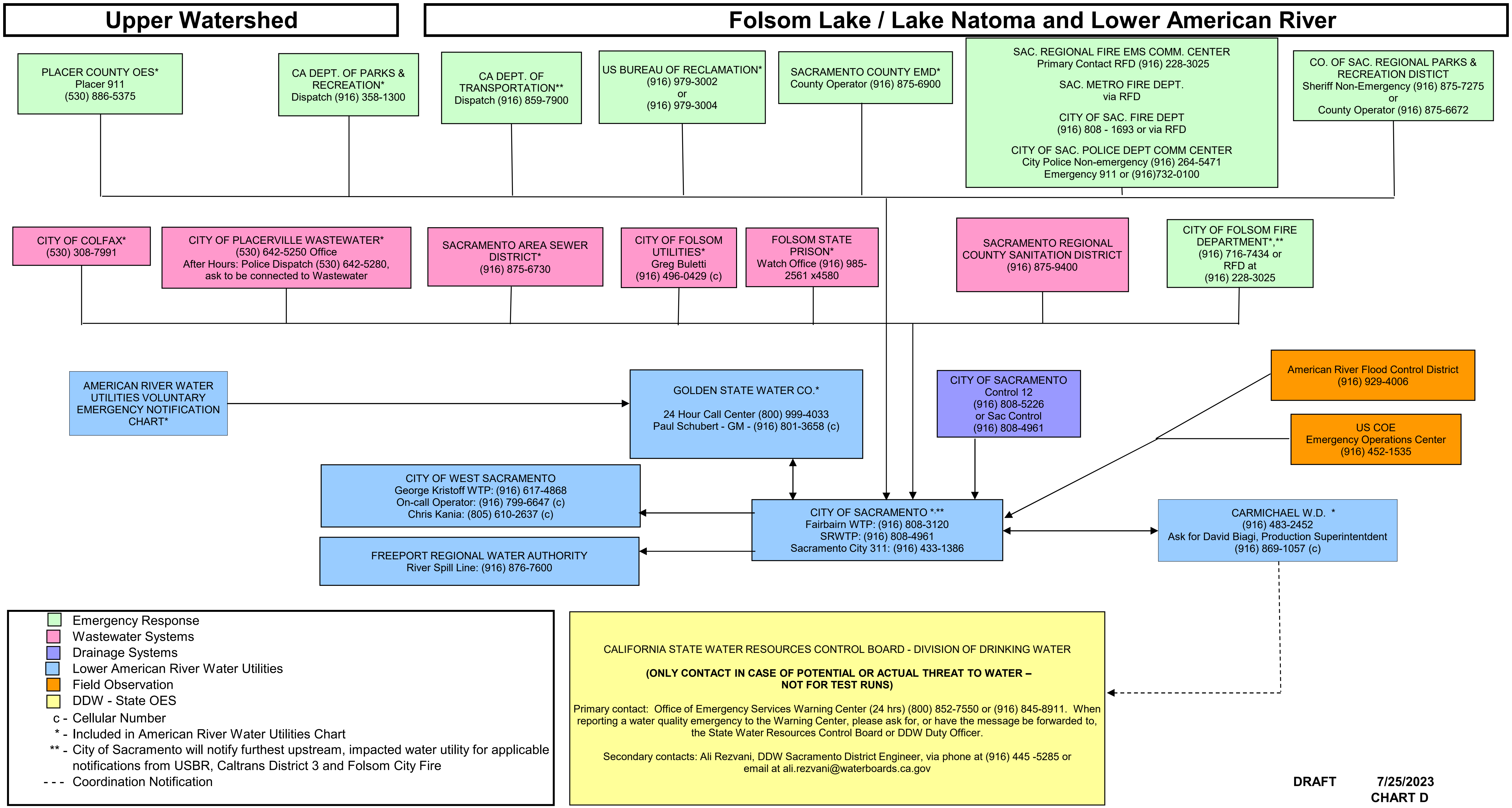
DRAFT 7/25/2023

Chart C

* SJWD will call PCWA for CDPR Calls in Auburn SRA and EID for CDPR Calls in Marshall Discovery SHP and Folsom SRA

** City of Sacramento will call SJWD for all notifications from the USBR, Folsom City Fire, and any applicable calls from Caltrans District 3 for the upper watershed

LOWER AMERICAN RIVER WATER UTILITIES
VOLUNTARY EMERGENCY NOTIFICATION CHART



DRAFT **7/25/2023**
CHART D
This chart incorporates the ARWU joint program for the upper AR watershed

PERMIT_TYPE	WDID	STATUS	SITE_NAME	SITE_ADDRESS	SITE_CITY	SITE_COUNTY
Caltrans Construction	5S31C398989	Active	1H2404 Auburn Roundabout	S of the Int of Rte 49 and Lincoln Wy and Borland A	Auburn	Placer
Caltrans Construction	5S31C389768	Terminated	4H6604 Colfax Widening	South Auburn Street Off Ramp	Colfax	Placer
Caltrans Construction	5S09C378984	Terminated	0F3104 Bridge Replacement Coloma	7310 HWY 49	Coloma	El Dorado
Caltrans Construction	5S31C383315	Terminated	3F4804 Gold Run Rest Area	West bound and East bound Rest Areas	Gold Run	Placer
Caltrans Construction	5S09C391337	Active	4E62U4 Hwy 50 Undercrossing	Hwy 50	Placerville	El Dorado
Caltrans Construction	5S09C390080	Terminated	0H3414 Sawmill Bridge	Ridgeway Drive and Sly Park Road Undercrossings	Pollock Pines	El Dorado
Caltrans Construction	5S34C387134	Terminated	1F1904 Add Aux Lane in Sacramento	Route 50 from Howe Avenue Overcrossing to sixty	Sacramento	Sacramento
Caltrans Construction	5S34C390497	Terminated	3F5404 Lagoon Creek	SR 160 Southbound Bridge	Sacramento	Sacramento
Caltrans Construction	5S34C391800	Active	0H08U4 Sac 50 Design Build	Rte 50 from E of I5 to E of Watt Ave	Sacramento	Sacramento
Caltrans Construction	5S34C393818	Terminated	1F1504 Sac 50 Aux Lane	From Bradshaw Rd to Mather Field Rd	Sacramento	Sacramento
Caltrans Construction	5S34C395370	Terminated	2H1104 Hwy 51 Gore Areas	Rte 51 from B St Underpass to Arden Way Undercr	Sacramento	Sacramento
Caltrans Construction	5S34C396269	Active	3F0714 American River CMGC	Sac S of Elvas Underpass to N of Exposition Blvd	Sacramento	Sacramento

Type	WDID	STATUS	Site/Facility Name	Site/Facility Address	SITE_CITY	SITE_COUNT	ACRES
Construction	5S31C376964	Active	American River Headwaters Restoration Project	North of French meadows reservoir	Foresthill	Placer	10000
Construction	5S34C379083	Terminated	Mangini Ranch Phase I	Scott Road	Folsom	Sacramento	225
Construction	5S34C397840	Active	Mills Ranch Rossmoor Neighborhood Street Rehabilitation Project	Chase Dr Coloma Rd	Rancho Cordova	Sacramento	180
Construction	5S09C398374	Active	Promontory Village 7 Units 2 to 5	Sophia Parkway	El Dorado Hills	El Dorado	163.8
Construction	5S09C382973	Active	El Dorado Forebay Dam Upgrade	Forebay Road	Pollock Pines	El Dorado	158
Construction	5S34C379813	Active	Folsom Plan Area - Russell Ranch Phase 1 Grading	Placerville Road	Folsom	Sacramento	150
Construction	5S34C391052	Active	Phase 1 Mass Grading Toll Brothers at Folsom Ranch	E Bidwell St	Folsom	Sacramento	148
Construction	5S34C396236	Active	Parcel 61 and Parcel 77	Alder Creek Pkwy	Folsom	Sacramento	130
Construction	5S34C396592	Active	Toll Brothers at Folsom Ranch Phase 2 and 3	East Bidwell St	Folsom	Sacramento	130
Construction	5S09C370588	Terminated	Villa Lago	Elmores Way	El Dorado Hills	El Dorado	123.5
Construction	5S09C398995	Active	Luneman Lane	Luneman Lane	Placerville	El Dorado	122
Construction	5S09C380459	Active	Saratoga Esates	Saratoga Way	El Dorado Hills	El Dorado	122
Construction	5S34C398669	Active	Rancho Cordova Logistics Center	12100 Atlanta Circle	Rancho Cordova	Sacramento	120.6
Construction	5S09C382824	Terminated	Sunset Campground Rehabilitation Project	Fashoda Way	Kyburz	El Dorado	120
Construction	5S34C383186	Active	White Rock Springs Ranch Phase 1	NE corner of Intersection of White Rock and Placerville Road	Folsom	Sacramento	118
Construction	5S34C393193	Active	Joint Powers Authority Southeast Connector Segment D3 White Rock Road	White Rock Rd Folsom	Folsom	Sacramento	110
Construction	5S34C393046	Active	Russell Ranch Phase 3	SE of Placerville Rd and Hwy 50	Folsom	Sacramento	108.4
Construction	5S34C387512	Terminated	Russell Ranch Phase 3	Placerville Road	Folsom	Sacramento	95
Construction	5S09C398500	Terminated	Calf Pasture Meadow	Eldorado National Forest Pacific Ranger District	Kyburz	El Dorado	93.8
Construction	5S09C393883	Active	Summerbrook	Green Valley Rd cross Pleasant Grove School	Rescue	El Dorado	89.5
Construction	5S34C394760	Active	Mangini Phase 3	E Bidwell St	Folsom	Sacramento	87
Construction	5S09C386540	Active	Via Veritas Phase 1	Malcom Dixon	El Dorado Hills	El Dorado	82
Construction	5S09W005498	Expired	3600 Green Valley Grading Areas 1A and 1B	3600 Green Valley Road	Rescue	El Dorado	80
Construction	5S34C379082	Terminated	Folsom Ranch Offsite Sewer, Lift Station, Force Main Improvements	Praire City Road	Folsom	Sacramento	77
Construction	5S34C393767	Active	Parcel 85A Folsom Ranch Medical Center	Placerville Rd	Folsom	Sacramento	75
Construction	5S34C389847	Terminated	Nimbus Fish Hatchery Ladder & Flume Fishway	2001 Nimbus Rd	Rancho Cordova	Sacramento	74
Construction	5S31C396174	Active	City of Colfax WWTP Solar System	23550 Grand View Way	Colfax	Placer	72.5
Construction	5S34C397624	Active	Lower American River Sites 2 2 & 2 3	Lower American River	Sacramento	Sacramento	68
Construction	5S34C387168	Active	Mangini Ranch Phase 2 Cargini	Placerville Road	Folsom	Sacramento	68
Construction	5S34C378942	Terminated	Folsom Plan Area - Russell Ranch Phase 1 Backbone Infrastructure	Placerville Road	Folsom	Sacramento	67
Construction	5S34C398994	Active	Township 9	Cannery Avenue	Sacramento	Sacramento	65
Construction	5S34C394863	Terminated	Ancil Hoffman Park Site	Ancil Hoffman Park River Mile 16	Carmichael	Sacramento	63
Construction	5S09W004567	Expired	All About Equine Animal Rescue	Hwy 49 and Rattlesnake Bar Road	Pilot Hill	El Dorado	61.74
Construction	5S09C384405	Terminated	Upper American River Project Roadway Improvement	Union Valley Reservoir and Ice House Reservoir	Pollock Pines	El Dorado	59.28
Construction	5S09C386621	Terminated	Upper American River Project Roadway Improvement Phase 2	Union Valley Reservoir and Ice House Reservoir	Pollock Pines	El Dorado	59.28
Construction	5S34C387423	Terminated	White Rock Springs Ranch Phase 2	NE corner of Intersection of White Rock and Placerville Road	Folsom	Sacramento	57
Construction	5S34C379084	Terminated	Scott Road & Street A Backbone Infrastructure	Scott Road	Folsom	Sacramento	52
Construction	5S34C391293	Terminated	Phase 1 Backbone Infrastructure Toll Brothers at Folsom Ranch	East Bidwell at White Rock Road	Sacramento	Sacramento	51
Construction	5S34C388041	Terminated	Upper Sailor Bar and Sailor Bar Borrow Sites	Below Nimbus Dam on the American River at Hazel Ave	Fair Oaks	Sacramento	49.2
Construction	5S34C379795	Terminated	Harvest Phase 1	East Natoma Street S of Empire Ranch Golf Club	Folsom	Sacramento	48
Construction	5S34C385849	Terminated	Harvest Phase 2	East Natoma Street S of Empire Ranch Golf Course	Folsom	Sacramento	48
Construction	5S34C388168	Active	Brookstone and Waterstone at Mangini Ranch	North of Mangini Pkwy at Wildflower Way	Folsom	Sacramento	45
Construction	5S09C393345	Active	2021 Wildfire Risk Mitigation Program Central Valley Region 5S	Various locations throughout the Region	Camino	El Dorado	44.23
Construction	5S34C394057	Active	Mangini Phase 1C	Placerville Rd	Folsom	Sacramento	42.7
Construction	5S09C393551	Terminated	West Point and Yellowjacket	Yellowjacket Campground and West Point Campground	Kyburz	El Dorado	42.6
Construction	5S09C389652	Terminated	Serrano Village M4	Western Sierra Way & Raphael Drive	El Dorado Hills	El Dorado	40.6
Construction	5S09C395253	Active	Serrano Village M4	Western Sierra Way & Raphael Drive	El Dorado Hills	El Dorado	40.6
Construction	5S34C388873	Terminated	Mangini Ranch Villages 6 & 7	North of White Rock Rd south of Sparrow Dr and Mangini Pkwy	Folsom	Sacramento	40
Construction	5S09C394952	Active	La Canada	Salmon Falls Road	El Dorado Hills	El Dorado	40
Construction	5S34C383504	Terminated	Mangini Ranch Villages 1 & 2	N of Mangini Ranch Parkway E of East Bidwell Street	Folsom	Sacramento	39
Construction	5S34C385999	Terminated	Mira Loma High School Science Building	4000 Edison Avenue	Sacramento	Sacramento	38.8
Construction	5S34W005348	Expired	Mira Loma High School Tennis Courts	4000 Edison Avenue	Sacramento	Sacramento	38
Construction	5S09C389456	Terminated	Serrano Village K1 K2 Unit 4	Raphael Drive	El Dorado Hills	El Dorado	37.5
Construction	5S34C396852	Active	Broadstone Villas	1565 Cavitt Drive	Folsom	Sacramento	37.1
Construction	5S09C398375	Active	Promontory Village 6 Phase 3	Beatty Drive and Karavi Drive	El Dorado Hills	El Dorado	37.1
Construction	5S09C396870	Terminated	Promontory Village 6 Phase 3	Beatty Drive/Karavi Drive	El Dorado Hills	El Dorado	37.1
Construction	5S34C397671	Active	Broadstone Estates	Placerville Road	Folsom	Sacramento	37
Construction	5S34C383449	Terminated	Copperwood Village 9 and Oakleaf Village 8	Northeast of Scott Road and White Rock Road	Folsom	Sacramento	36.91
Construction	5S34C397127	Active	Lower American River Site 2 1	American River Commons H street Bridge	Sacramento	Sacramento	36
Construction	5S34C380802	Terminated	The Pique at Iron Point	Iron Point Road	Folsom	Sacramento	36
Construction	5S34C394405	Active	Mangini Phase 1E	Placerville Rd	Folsom	Sacramento	36

Construction	5S31C382489	Terminated	Sierra Oaks Estates	Iowa Hill Road	Colfax	Placer	34.7
Construction	5S34C370132	Terminated	Parkshore	South of Parkshore Dr between Folsom Blvd and Plaza Dr	Folsom	Sacramento	34
Construction	5S09C384225	Terminated	Silva Valley Parkway Class 1 and Class 2 Bike Lanes Harvard to Green Valley	7141 Silva Valley Parkway	El Dorado Hills	El Dorado	33.7
Construction	5S09C375375	Terminated	Serrano M2	Western Sierra Drive	El Dorado Hills	El Dorado	33.5
Construction	5S34C371526	Terminated	HBA Retail Center	2030 Arden Way	Sacramento	Sacramento	33.3
Construction	5S34C384148	Terminated	Mills Middle School Softball Fields Modernization	10439 Coloma Road	Rancho Cordova	Sacramento	32.08
Construction	5S34C396885	Active	Russell Ranch Phase 3 Homebuilding	South East of Placerville Rd and Highway 50	Folsom	Sacramento	31.11
Construction	5S09C382324	Terminated	County of El Dorado Public Safety Facility	200 Industrial Dr	Diamond Springs	El Dorado	30.73
Construction	5S34C393401	Active	Aster and Lunaria at White Rock Springs	S of Mangini Pkwy and NE of Placerville Rd and White Rock Rd	Folsom	Sacramento	30.33
Construction	5S34C381818	Terminated	Enclave at Folsom Ranch	SE of Scott Road and Alder Creek Parkway	Folsom	Sacramento	29.3
Construction	5S09C381274	Terminated	Camino Elementary School Improvements	3060 Snows Road	Camino	El Dorado	26
Construction	5S09C398039	Active	Promontory Village 7 Unit 1	Alexandra Drive and Beatty Drive	El Dorado Hills	El Dorado	26
Construction	5S34C388846	Active	Arden Gateway	1600 Cormorant Way	Sacramento	Sacramento	25.33
Construction	5S34C396642	Active	2020 Street Rehabilitation Phase 2	Cordova Vineyards and Cordova Lane	Rancho Cordova	Sacramento	25.02
Construction	5S34C393750	Terminated	North 12th Street	200 N 12th Street	Sacramento	Sacramento	25
Construction	5S09C386328	Terminated	Cooper Residence	3209 Newton Road	Placerville	El Dorado	24.3
Construction	5S34C392907	Active	Department of Justice	4949 Broadway	Sacramento	Sacramento	24
Construction	5S09C386488	Active	Silver Springs Unit 1	APN 115 370 04	Rescue	El Dorado	23.68
Construction	5S09C395090	Active	Ridgeview Village Unit 9	Julie Ann Way	El Dorado Hills	El Dorado	23.5
Construction	5S34C387777	Active	White Rock Springs Ranch Village 1	Northeast of White Rock Road and Placerville Road	Folsom	Sacramento	22.7
Construction	5S09C393547	Active	Union Valley Bike Trail	Wench Creek Cmpground to Yellowjacket Campground	Kyburz	El Dorado	22.6
Construction	5S34C392670	Active	Stone Bluff at White Rock Springs Ranch Phase 2 Village 2 and 3	Northeast of White Rock Road and Placerville Road	Folsom	Sacramento	22.3
Construction	5S34C399009	Active	American River Common Features	Two Rivers Trail between 28th St and Carlsbad Way	Sacramento	Sacramento	22.1
Construction	5S34C396365	Terminated	ARCF 2016 Lower American River Contract 1	Glenn Hall Park to H Street Bridge	Sacramento	Sacramento	22
Construction	5S09C393036	Active	Cornett Mill Restoration	Jacquier Road	Placerville	El Dorado	22
Construction	5S34C393989	Active	John Barrett Middle School	4243 Barrett Road	Carmichael	Sacramento	21.9
Construction	5S09C393327	Active	Cottonwood Park	Constellation Avenue	Placerville	El Dorado	21.8
Construction	5S34C388161	Terminated	Iron Ridge at Russell Ranch	Placerville Rd at Alder Creek Pkwy	Folsom	Sacramento	21.5
Construction	5S34C382540	Terminated	Sutter Middle School Phase 2	715 Riley Street	Folsom	Sacramento	21
Construction	5S34W004399	Expired	Kaiser Permanente Rancho Cordova Medical Offices	10725 International Dr	Rancho Cordova	Sacramento	21
Construction	5S09C393372	Active	Serene Ranch	5160 Gold Hill Raod	Placerville	El Dorado	20.8
Construction	5S09C384384	Terminated	Delfino Winery	3205 North Canyon Road	Camino	El Dorado	20.12
Construction	5S34C395316	Active	2020 Street Rehabilitation	Cordova Vineyards and Cordova Lane Neighborhoods	Rancho Cordova	Sacramento	20.06
Construction	5S09C385255	Active	Crossings Phase 2 Rough Grading	Missouri Flat Road at Headingt	Placerville	El Dorado	20
Construction	5S34C380038	Terminated	Sutter Park Neighborhood	5105 F Street	Sacramento	Sacramento	20
Construction	5S09C377273	Terminated	Serrano Village M2 Unit 3	Western Sierra Way	El Dorado Hills	El Dorado	19.6
Construction	5S34C387778	Terminated	The Enclave	SE of Scott Road and Alder Creek Parkway	Folsom	Sacramento	19.42
Construction	5S34C386609	Terminated	Sutter Park	NE of F St and 51st St	Sacramento	Sacramento	19.37
Construction	5S34C379231	Terminated	Farmhouse at Willow Creek	North of Parkshore Drive	Folsom	Sacramento	19.33
Construction	5S34C386536	Terminated	Green Valley Road Widening	Green Valley Road	Folsom	Sacramento	18
Construction	5S34C393216	Active	Soleil at Folsom Ranch	Alder Creek Parkway & Placerville Road	Folsom	Sacramento	17.5
Construction	5S34C388152	Active	DGS Printing Plant	344 N 7th Street	Sacramento	Sacramento	17.3
Construction	5S09C381948	Terminated	Cypress at Serrano	Hogarth Way	El Dorado Hills	El Dorado	16.75
Construction	5S34C395427	Active	Lonestar at Mangini Ranch	SE of Savannah Pkwy at Westwood Dr	Folsom	Sacramento	15.72
Construction	5S34C389724	Active	Arden Middle School	1640 Watt Avenue	Sacramento	Sacramento	15.23
Construction	5S34C388162	Terminated	Russel Ranch	Alder Creek Parkway	Folsom	Sacramento	15.18
Construction	5S34C389432	Terminated	Arden Middle School	1640 Watt Avenue	Sacramento	Sacramento	15.16
Construction	5S34C398201	Terminated	Lower Sailor Bar Fish Habitat Restoration	8266 Olive Avenue	Fair Oaks	Sacramento	15.04
Construction	5S34C399279	Active	ARCF 2016 Lower American River Contract C PH 2	Lower American River Trail at H Street Bridge	Sacramento	Sacramento	15
Construction	5S09C397001	Terminated	Ice House Recreation Area Improvement Project	Ice House Recreation Area	Kyburz	El Dorado	14.4
Construction	5S09C391357	Terminated	Pacific Tunnel Portal Rehabilitation	Park Creek Road	Pollock Pines	El Dorado	14.21
Construction	5S34C389232	Terminated	Burlington Howe Bout Arden	1596 Ethan Way	Sacramento	Sacramento	13.9
Construction	5S34C387246	Terminated	Zinfandel Complex Project	Zinfandel Drive and Highway 50	Rancho Cordova	Sacramento	13.5
Construction	5S34C384571	Terminated	Del Paso Manor Elementary School	2700 Maryal Dr	Sacramento	Sacramento	13.4
Construction	5S34C387261	Terminated	The Retreat at Sacramento	2601 Redding Avenue	Sacramento	Sacramento	13.25
Construction	5S09W003637	Expired	Herbert Green Elementary School	3781 Forni Road	Placerville	El Dorado	12.9
Construction	5S34C392336	Active	Rockcress at Mangini Ranch	SE of E Bidwell St and Old Ranch Rd	Folsom	Sacramento	12.88
Construction	5S34C386856	Terminated	Sacramento State P3 Student Housing	3001 state university drive	Sacramento	Sacramento	12.79
Construction	5S31C394158	Active	Folsom Dam Raise Dikes 1thru 6	Park Rd Folsom	Folsom	Placer	12.64
Construction	5S34C389369	Terminated	Folsom Blvd Streetscape Enhancement Ph V	Bradshaw Rd to Horn Rd	Rancho Cordova	Sacramento	12.58
Construction	5S34C397759	Active	Alder Creek Apartments	Alder Creek Parkway West of E Bidwell	Folsom	Sacramento	12.5
Construction	5S09C384430	Terminated	Flume 44 Replacement Project	Rock Crusher Road	Pollock Pines	El Dorado	12.42

Construction	5S09C391275	Terminated	El Dorado County Community Health Center	4212 Missouri Flat Road	Placerville	El Dorado	12.4
Construction	5S09C391015	Terminated	Flume 38 40 Canal Conversion	Camp X Road off of Plum Creek Road	Pollock Pines	El Dorado	12.37
Construction	5S09C398949	Active	Flume 47A Replacement	USFS Road 10N40G	Pollock Pines	El Dorado	12.36
Construction	5S34C397588	Active	Folsom Corporate Center Apartments	2137 and 2275 Iron Point Road	Folsom	Sacramento	12.1
Construction	5S34C395428	Active	Eastwood at Mangini Ranch	SW of Savannah Pkwy and Westwood Dr	Folsom	Sacramento	12.07
Construction	5S34C377463	Terminated	Econome Family Park	1900 Parkway Drive	Folsom	Sacramento	12
Construction	5S09C399161	Active	Trento at The Promontory	Sophia Pkwy and Alexandra Dr	El Dorado Hills	El Dorado	12
Construction	5S09C383640	Active	The Ridge	Winesap Circle	Placerville	El Dorado	12
Construction	5S34W005065	Expired	Hubert H Bancroft ES Paving Repairs	2929 Belmar Street	Sacramento	Sacramento	11.89
Construction	5S03C398689	Active	Kirkwood Upper Timber Creek Parking Lot and Loop Road	Loop Road	-	Amador	11.58
Construction	5S34C376136	Terminated	Talavera Ridge Apartments	Broadstone Parkway and Cavitt Drive	Folsom	Sacramento	11.5
Construction	5S34C382578	Terminated	Ramona Avenue Extension	Ramona Avenue	Sacramento	Sacramento	11.25
Construction	5S09C390844	Terminated	Promontory Village 7 Unit 5	Beatty Drive	El Dorado Hills	El Dorado	11.2
Construction	5S09C394636	Terminated	Flume 30 Replacement	Camp 2 Road off Plum Creek Road	Pollock Pines	El Dorado	11.1
Construction	5S09C394636	Terminated	Flume 30 Replacement	Camp 2 Road off Plum Creek Road	Pollock Pines	El Dorado	11.1
Construction	5S34C391359	Terminated	White Rock Springs Ranch Villages 8 & 9	Mangini Parkway and Sycamore Creek Way	Folsom	Sacramento	11
Construction	5S31C397863	Active	Canyon Creek	Maidu Drive and Riverview Drive	Auburn	Placer	10.9
Construction	5S34C395762	Active	Stone Haven at White Rock	Southeast of Grand Prairie Road and Sycamore Creek Way	Folsom	Sacramento	10.9
Construction	5S34C398516	Active	Earl LeGette Elementary School	4623 Kenneth Avenue	Sacramento	Sacramento	10.78
Construction	5S34C397067	Active	Canterly at Mangini Ranch	Northwest of Mangini Parkway and Placerville Road	Folsom	Sacramento	10.71
Construction	5S34C382981	Terminated	SCUSD New Central Kitchen Increment 1	7058 San Joaquin Street	Sacramento	Sacramento	10.58
Construction	5S34C385847	Terminated	SCUSD New Central Kitchen Increment 2	7058 San Joaquin Street	Sacramento	Sacramento	10.58
Construction	5S34C388733	Terminated	Sacramento Business Center	3360 El Camino Avenue	Sacramento	Sacramento	10.3
Construction	5S34C390939	Active	Parkway Apartments	Blue Ravine and Oak Avenue	Folsom	Sacramento	10.17
Construction	5S34C377963	Terminated	Folsom Campus Apartments	NE Willard Drive and Iron Point	Folsom	Sacramento	10.1
Construction	5S09W003636	Expired	Indian Creek Elementary School	6701 Green Valley Road	Placerville	El Dorado	10
Construction	5S02C390476	Terminated	Caples Lake Project Phase 2	Caples Lake	Kirkwood	Alpine	10
Construction	5S34C396639	Terminated	ARCF 2016 Lower American River Contract C PH 1	Lower American River at Campus Commons Golf Course	Sacramento	Sacramento	10
Construction	5S09C398038	Active	Mosquito Road Bridge	Mosquito Road at South Fork American River	Placerville	El Dorado	10
Construction	5S09W005530	Expired	Havner Residence	Parcel A 1600 Kanaka Valley Road	Rescue	El Dorado	10
Construction	5S34C382098	Terminated	SMUD HQ Renovation Project	6201 S Street	Sacramento	Sacramento	10
Construction	5S34C399415	Active	Katherine Johnson Middle School New Construction	2641 KENT DR	Sacramento	Sacramento	9.65
Construction	5S34C380535	Terminated	Prospect Ridge	535 Levy Road	Folsom	Sacramento	9.64
Construction	5S34C383031	Terminated	Prospect Ridge	535 Levy Road	Folsom	Sacramento	9.64
Construction	5S34C399367	Active	Folsom Lake College Science Building Project	10 College Pkwy	Folsom	Sacramento	9.61
Construction	5S09C393910	Active	EDH Storage	230 Green Valley Road	El Dorado Hills	El Dorado	9.55
Construction	5S34C387667	Terminated	Mangini Ranch Elementary School	Mangini Parkway	Folsom	Sacramento	9.4
Construction	5S34C379156	Terminated	Oak Chan Elementary School Modernization	101 Pewter	Folsom	Sacramento	9
Construction	5S34C386466	Terminated	Folsom Hills Elementary School	106 Manseau Drive	Folsom	Sacramento	9
Construction	5S34C376597	Terminated	Carl Sundahl Elementary Modernization Increment 1 & 2	9932 Inwood	Folsom	Sacramento	9
Construction	5S09C395397	Terminated	Indian Creek Ranch	Echo Lane	Placerville	El Dorado	9
Construction	5S09C398311	Active	Indian Creek Ranch	Echo Lane	Shingle Springs	El Dorado	9
Construction	5S34C383395	Terminated	Greer Elementary School	2301 Hurley Way	Sacramento	Sacramento	8.99
Construction	5S31C391201	Terminated	Mammoth Bar OHV Area Track Relocation Project	Old Forestville Road	Auburn	Placer	8.8
Construction	5S34C397168	Active	Folsom Ranch Lot 16 Apartments	White Rock Road and East Bidwell Road	Folsom	Sacramento	8.5
Construction	5S09C395493	Active	Serrano Village M5	Appian Way & Sangiovese Drive	El Dorado Hills	El Dorado	8.42
Construction	5S09C385056	Active	Southpointe Meadows	Castec Way	El Dorado Hills	El Dorado	8.04
Construction	5S09C391317	Terminated	Silver Springs Parkway Offsite South Segment	2881 Sandhurst Hill Rd	Rescue	El Dorado	8
Construction	5S09C379165	Terminated	Flume 10 Collapse	Near Alder Creek Road	Kyburz	El Dorado	8
Construction	5S34C395062	Active	Country Club Center	Southwest Corner of Watt Ave and El Camino	Sacramento	Sacramento	8
Construction	5S09C395387	Terminated	Flume 4 5 and 6 Emergency Repair	West of Sand Flat Campground at El Dorado Ditch	Kyburz	El Dorado	8
Construction	5S34C389699	Terminated	Cemo Circle Apartment	2220 Cemo Circle	Rancho Cordova	Sacramento	7.97
Construction	5S34C387599	Terminated	Our Lady of Assumption	5057 Cottage Way	Carmichael	Sacramento	7.8
Construction	5S34C379585	Terminated	Folsom Fire Station 39	Ritchie Street and Empire Ranch Road	Folsom	Sacramento	7.6
Construction	5S34C391785	Active	Parking Structure IV	4860 Y Street	Sacramento	Sacramento	7.53
Construction	5S34C388175	Terminated	Folosm Dam Raise Dike 8	1 Folsom Point Road	Folsom	Sacramento	7.5
Construction	5S34C379812	Terminated	Folsom Plan Area - Grand Prairie Road	Placerville Road and White Rock Road	Folsom	Sacramento	7.5
Construction	5S34C381899	Terminated	Eastern Oak Park	3127 Eastern Avenue	Sacramento	Sacramento	7.29
Construction	5S34C392227	Active	Creekstone at Mangini Ranch	SE of E Bidwell St and Scott Rd	Folsom	Sacramento	7.26
Construction	5S34C384939	Terminated	Folsom Lake Boat & RV Storage	7740 Folsom Auburn Road	Folsom	Sacramento	7.17
Construction	5S34C389919	Terminated	Gold Hill Substation Security Upgrade	East Bidwell Street	Folsom	Sacramento	7.11
Construction	5S09C382373	Terminated	Western Placerville Interchange Phase 2	300 Forni Road	Placerville	El Dorado	7

Construction	5S34C391092	Terminated	Mangini Ranch Phase 1 Creekstone	Mangini Parkway	Folsom	Sacramento	7
Construction	5S31C398186	Active	Ponderosa Way Bridge Replacement	Ponderosa Way	Applegate	Placer	7
Construction	5S34C398785	Active	Hiram Johnson Stadium	6879 14th Avenue	Sacramento	Sacramento	7
Construction	5S34C391880	Active	Avenida Folsom	115 Healthy Way	Folsom	Sacramento	6.9
Construction	5S34C396617	Active	Avenida Folsom	115 Healthy Way	Folsom	Sacramento	6.9
Construction	5S09C380344	Terminated	The Pavilions at El Dorado Hills	Francisco Drive	El Dorado Hills	El Dorado	6.85
Construction	5S34C385422	Terminated	Folsom Dam	7794 Folsom Dam Road	Folsom	Sacramento	6.75
Construction	5S34C397282	Active	UCDH Pharmacy	3545 Business Drive	Sacramento	Sacramento	6.7
Construction	5S09C387118	Terminated	Diamond Springs Parkway Phase 1A	State Route 49 Pleasant Valley Road to Bradley Drive	Diamond Springs	El Dorado	6.7
Construction	5S34C383053	Terminated	Rio Americano High School	4540 American River Drive	Sacramento	Sacramento	6.62
Construction	5S34C381075	Terminated	Encina High School	1400 Bell Street	Sacramento	Sacramento	6.6
Construction	5S34C381076	Terminated	Mira Loma High School	4000 Edison Avenue	Sacramento	Sacramento	6.6
Construction	5S34C396029	Active	Carmichael Promenade	Fair Oaks Blvd and Marshall Ave	Carmichael	Sacramento	6.5
Construction	5S34C372947	Terminated	Hidden Ridge	Ridgegate and Codman Lane	Fair Oaks	Sacramento	6.5
Construction	5S34C397544	Active	Scott Road Realignment Project	Scott Rd	Folsom	Sacramento	6.5
Construction	5S34C390185	Terminated	Fair Oaks Blvd Improvement Project Phase 3	Fair Oaks Blvd	Sacramento	Sacramento	6.35
Construction	5S34C384581	Terminated	Revel Folsom	Iron Point Rd & Oak Avenue Pkwy	Folsom	Sacramento	6.02
Construction	5S34C377240	Terminated	Parkway Village H	Silberhorn Dr between Montmagny Ct and Morningside Dr	Folsom	Sacramento	6
Construction	5S34C382460	Terminated	The Preserve at the Parkway	Silberhorn Drive	Folsom	Sacramento	6
Construction	5S34C383812	Terminated	Hiram Johnson High School Stadium Renovation	6879 14th Avenue	Sacramento	Sacramento	6
Construction	5S34C396939	Active	Shops at Folsom Ranch	East Bidwell Street	Folsom	Sacramento	5.89
Construction	5S09C383795	Terminated	Hechtman Residence	200 Klee Court	El Dorado Hills	El Dorado	5.6
Construction	5S09C392177	Active	2256 Hill View Drive	2256 Hill View Drive	El Dorado Hills	El Dorado	5.6
Construction	5S34C376374	Terminated	Bridgeway Square Apartments	3175 Data Drive	Rancho Cordova	Sacramento	5.5
Construction	5S34C391640	Terminated	Legacy at Magini Ranch	E Bidwell Street and Savanah Parkway	Folsom	Sacramento	5.44
Construction	5S34C396482	Active	Lariat at Mangini Ranch	West of Mangini Parkway and Placerville Road	Folsom	Sacramento	5.39
Construction	5S34C382982	Terminated	SCUSD Transportation Facility	7058 San Joaquin Street	Sacramento	Sacramento	5.28
Construction	5S34C380071	Terminated	California State University, Sacramento Parking Structure V	6000 J. Street	Sacramento	Sacramento	5.24
Construction	5S09C386224	Active	Malcom Dixon Road Area of Benefit	Malcom Dixon road	El Dorado Hills	El Dorado	5.15
Construction	5S09C386805	Terminated	Francis Residence	0 Spyglass Ln	El Dorado Hills	El Dorado	5
Construction	5S34C398550	Active	Lower American River Salmonid Habitat Project	1901 Hazel Ave	Sacramento	Sacramento	5
Construction	5S31C388130	Terminated	Birdsall Road	Birdsall Road	Auburn	Placer	5
Construction	5S09C389657	Terminated	Upper Broadway Bike Lane and Storm Drain Replacement Project	Broadway Street	Placerville	El Dorado	5
Construction	5S09W003647	Expired	Azalea Cove Campground	Ice House Road at Wench Creek Campground	Pollock Pines	El Dorado	5
Construction	5S34C399090	Active	Phase 3 Arden Service Area Pipe and Meter Replacement	La Sierra Drive	Sacramento	Sacramento	5
Construction	5S34C389640	Terminated	Folsom Lake State Recreation Area Negro Bar Day Use Improvements Project	Park Road	Folsom	Sacramento	5
Construction	5S34C387759	Active	Bradshaw Village Parc Phase 1	Old Placerville Road	Rancho Cordova	Sacramento	5
Construction	5S09C387003	Terminated	El Dorado Trail Extension	4525 Blanchard Road	Diamond Springs	El Dorado	4.9
Construction	5S34C396306	Active	Mangini Place	14776 Mangini Parkway	Folsom	Sacramento	4.8
Construction	5S34C381458	Terminated	10670 International Drive	10670 International Drive	Rancho Cordova	Sacramento	4.8
Construction	5S34C396332	Terminated	Folsom Blvd	Mayhew Rd to Bradshaw Rd	Sacramento	Sacramento	4.78
Construction	5S34C389336	Active	Crescendo Self Storage	8240 Folsom Blvd	Sacramento	Sacramento	4.74
Construction	5S09C378210	Terminated	La Canada Phase 1A	Salmon Falls Road	El Dorado Hills	El Dorado	4.7
Construction	5S34C379261	Terminated	Sutter Middle School	715 Riley Street	Folsom	Sacramento	4.65
Construction	5S34C380196	Terminated	Niello BMW	1990 & 2020 Fulton Ave	Sacramento	Sacramento	4.6
Construction	5S09C391665	Active	Ridgeview West Unit 5 TM 95 1309 R2	7056 Via Barlogio	El Dorado Hills	El Dorado	4.53
Construction	5S34C389476	Active	WEXLER STUDENT HOUSING	6620 and 6800 Folsom Blvd	Sacramento	Sacramento	4.46
Construction	5S34W003601	Expired	Babcock Elementary School	2400 Cormorant Way	Sacramento	Sacramento	4.3
Construction	5S34C384396	Terminated	10730 International Drive	10730 International Drive	Rancho Cordova	Sacramento	4.3
Construction	5S34W005447	Expired	Natoma Station Elementary School Modernization	500 Turn Pike Drive	Folsom	Sacramento	4.19
Construction	5S31C398778	Active	Duncan Creek Diversion Dam Improvements	Duncan Creek	Foresthill	Placer	4.1
Construction	5S34C382235	Terminated	Bidwell Pointe	125 E Bidwell St	Folsom	Sacramento	4.05
Construction	5S09C382416	Terminated	The Pavilions at El Dorado Hills	2100 Francisco Drive	El Dorado Hills	El Dorado	4
Construction	5S09C383696	Terminated	New residence	415 Salmon Falls Rd	El Dorado Hills	El Dorado	4
Construction	5S09W004128	Expired	Northshore RV Campground Improvements	Ice House Rd Northwest Shoreline of Loon Lake	Kyburz	El Dorado	4
Construction	5S09C388286	Terminated	Flume 47C Replacement	Old Carson Road at El Dorado Ditch	Fresh Pond	El Dorado	4
Construction	5S09C392541	Terminated	Western Placerville Interchanges Project Phase 202	Ray Lawyer Dr	Placerville	El Dorado	4
Construction	5S34C394493	Active	Village Park Renovation Project	7991 California Avenue	Fair Oaks	Sacramento	3.99
Construction	5S09C389661	Terminated	Folsom Lake Intake Improvements	End of Planeta Way	El Dorado Hills	El Dorado	3.97
Construction	5S09C384418	Terminated	New York Creek Trail East Phase 2	6760 Silva Valley Parkway	El Dorado Hills	El Dorado	3.95
Construction	5S34C380411	Terminated	St Ignatius New School Construction	3235 Arden Way	Sacramento	Sacramento	3.9
Construction	5S34C396550	Terminated	Columbia Woodlake Road	500 Leisure Lane	Sacramento	Sacramento	3.9

Construction	5S34C393689	Active	La Vista Water Tank Replacement Project	3016	Carmichael	Sacramento	3.88
Construction	5S34C392129	Terminated	Aerojet Ampac Water Line Separation Nimbus Rd	Nimbus Road	Rancho Cordova	Sacramento	3.85
Construction	5S34C390995	Active	UC Davis Kindred Healthcare	4875 Broadway	Sacramento	Sacramento	3.84
Construction	5S34C392455	Terminated	Gold Hill Substation Physical Security Upgrade	2479 E Bidwell Street	Folsom	Sacramento	3.77
Construction	5S31C394317	Terminated	PCWA Interbay Sediment Removal Project	Mosquito Ridge Road	Foresthill	Placer	3.61
Construction	5S34C381225	Terminated	Homewood Suites by Hilton	10700 White Rock Road	Rancho Cordova	Sacramento	3.6
Construction	5S34C391183	Active	Arden Way Apartments	880 Arden Way	Sacramento	Sacramento	3.6
Construction	5S09W003754	Expired	El Dorado Trail Extension Los Trampas to Halcon	3200 Verde Robles Drive	Camino	El Dorado	3.5
Construction	5S34C397118	Active	Residence Inn Sacramento	500 Leisure Lane	Sacramento	Sacramento	3.5
Construction	5S34C397808	Active	The Boulevard	Southeast corner Fair Oaks Blvd and Howe Ave	Sacramento	Sacramento	3.5
Construction	5S34C383896	Terminated	Folsom Blvd Streetscape Enhancement Phase 4	Folsom Blvd from Horn Rd to Rod Beaudry Dr	Rancho Cordova	Sacramento	3.45
Construction	5S09C387776	Terminated	Greenstone Rd at Slate Creek Bridge Replacement	4498 Greenstone Road	Placerville	El Dorado	3.4
Construction	5S34C387046	Terminated	Sacramento Self Storage	500 Leisure Lane	Sacramento	Sacramento	3.38
Construction	5S34C381159	Terminated	Oakmont Senior Living, LLC	5301 F Street	Sacramento	Sacramento	3.35
Construction	5S09C379215	Terminated	Auburn Lake Trails Water Treatment Plant	3650 Sweetwater Trail	Cool	El Dorado	3.28
Construction	5S31C387658	Terminated	Dutch Flat I80 Jet A Fuel Release Remediation	I80 3 tenths miles east of Dutch Flat exit	Dutch Flat	Placer	3.2
Construction	5S34C394222	Active	Sage at Folsom Senior Living Apartments	NE Corner E Bidwell St and Scholar Way	Folsom	Sacramento	3.2
Construction	5S31C390732	Active	Colfax Maidu Village Phase 1	South Auburn Street	Colfax	Placer	3.14
Construction	5S34C392314	Active	403 E Bidwell	403 E Bidwell	Folsom	Sacramento	3.1
Construction	5S09C398183	Active	Flume 45 Abutment Improvements	Camp P Road Pacific House	Pollock Pines	El Dorado	3.09
Construction	5S34C389495	Terminated	Phase 2A Arden Service Area Pipe and Meter Installation Project	3501 Fair Oaks Blvd	Sacramento	Sacramento	3.07
Construction	5S34C378620	Active	Eastcliff Estates	8035 Archer Avenue	Fair Oaks	Sacramento	3
Construction	5S31C388163	Terminated	Colfax Roundabout	I80 at South Auburn	Colfax	Placer	3
Construction	5S34C384611	Terminated	Stormwater Basins Restoration Project	Russi Road	Folsom	Sacramento	3
Construction	5S09W003767	Expired	Gerle Creek Recreation Area Improvement	Wentworth Springs Road and Ice House Road	Pollock Pines	El Dorado	3
Construction	5S34C399025	Active	Folsom Fire Station 34	Westwood Drive and Old Ranch Road	Folsom	Sacramento	3
Construction	5S34C393636	Active	Medical Office Building	2195 Iron Point Road	Folsom	Sacramento	2.8
Construction	5S34C382987	Terminated	Broadstone Oaks	2005 Iron Point Road	Folsom	Sacramento	2.76
Construction	5S34C393833	Terminated	Goodman	181 Lathrop Way	Sacramento	Sacramento	2.73
Construction	5S34C379616	Terminated	Quick Quack Car Wash Folsom	1750 Cavitt Drive	Folsom	Sacramento	2.7
Construction	5S34C382319	Terminated	Mather Rails to Trails	Mather Blvd	Sacramento	Sacramento	2.66
Construction	5S34C383739	Terminated	Phase 1A Arden Service Area Distribution System Pipe Realignment and Mete	3501 Fair Oaks Blvd	Sacramento	Sacramento	2.63
Construction	5S34C391539	Terminated	UC Davis River Park Orthotics Center	1535 River Park Drive	Sacramento	Sacramento	2.6
Construction	5S09C398169	Active	Old Depot Bike Park	40 Old Depot Road	Placerville	El Dorado	2.6
Construction	5S09C381674	Terminated	Hay Ranch Road	5661 Gold Hill Road	Placerville	El Dorado	2.45
Construction	5S34C389576	Active	Weatherstone	8015 Fair Oaks blvd	Carmichael	Sacramento	2.44
Construction	5S34C379815	Terminated	Folsom Plan Area - Zone 5 Water Tank and Zone 6 Booster Station	Placerville Road and White Rock Road	Folsom	Sacramento	2.42
Construction	5S09C384831	Terminated	Georgetown Divide Water Conservation Supply and Protection	Various Locations	Georgetown	El Dorado	2.4
Construction	5S34C376288	Terminated	Manassero Homes	3111 and 3121 65th Street	Sacramento	Sacramento	2.31
Construction	5S34C389467	Active	Townplace Suites by Marriott	11212 Point East Drive	Rancho Cordova	Sacramento	2.3
Construction	5S34C397846	Active	Sunrise Crossing Apartments	11295 Folsom Boulevard	Rancho Cordova	Sacramento	2.3
Construction	5S34C381024	Terminated	2016 Parkland Estates Waterline Replacement Project Phase 2	Eastern, Robertson, Marconi, Greenwood Ave	Sacramento	Sacramento	2.3
Construction	5S34C380930	Terminated	Cracker Barrel #754	1000 Howe Avenue	Sacramento	Sacramento	2.13
Construction	5S34C385804	Terminated	Jonas Main Replacement Project	1301 Jonas Ave	Sacramento	Sacramento	2.1
Construction	5S31C384291	Active	Colfax Hotel	801 South Auburn Street	Colfax	Placer	2.1
Construction	5S31C379601	Terminated	Boeger Warehouse	87 apple ct.	Applegate	Placer	2.1
Construction	5S34W005040	Expired	Fong Park Ph 3	3004 Redding Ave	Sacramento	Sacramento	2.07
Construction	5S34W004549	Expired	Fong Park Soccer Field	3004 Redding Avenue	Sacramento	Sacramento	2.07
Construction	5S34C397835	Active	HQ Site Transition Project Phase II	6201 S street	Sacramento	Sacramento	2.06
Construction	5S31C376628	Terminated	Hell Hole Dam Simorg Borrow Site	11 Pines Road and Hell Hole	Foresthill	Placer	2
Construction	5S34W003830	Expired	Folsom Lake RV	11369 Folsom Blvd	Rancho Cordova	Sacramento	2
Construction	5S34C387645	Terminated	Folsom Career Tech Education Buildings	1655 Iron Point Road	Folsom	Sacramento	2
Construction	5S34C385561	Terminated	Folsom Point Pad F	175 Old Placerville Road	Folsom	Sacramento	2
Construction	5S09C383487	Terminated	Nimanns Auto Touch	200 Briw Ridge Ct	Placerville	El Dorado	2
Construction	5S09W004641	Expired	Bartolo Residence	4041 North Canyon Road	Camino	El Dorado	2
Construction	5S34C389720	Terminated	Thor Main Replacement Project	4425 Ulysses Dr	Sacramento	Sacramento	2
Construction	5S31C376629	Terminated	Hell Hole Dam Core Raise Project	Hell Hole Dam Road	Foresthill	Placer	2
Construction	5S09C391463	Terminated	Mosquito Road Stabilization	Mosquito Road	Placerville	El Dorado	2
Construction	5S09C391462	Terminated	Spring Street Pavement Rehabilitation	Spring Street	Placerville	El Dorado	2
Construction	5S34C379736	Terminated	CSUS Science II Building	6000 J Street	Sacramento	Sacramento	1.98
Construction	5S34C390734	Terminated	McKinley Village Self Storage	3700 McKinley Village Way	Sacramento	Sacramento	1.96
Construction	5S34C397272	Active	Blanche Sprentz ES Addition	249 Flower Drive	Folsom	Sacramento	1.9

Construction	5S34C388468	Terminated	Portofino	2234Monte Cassino Lane	Sacramento	Sacramento	1.85
Construction	5S34C391693	Terminated	DW Babcock School Access Improvements	1900 El Camino Ave	Sacramento	Sacramento	1.82
Construction	5S09C379880	Terminated	Groth Court	508 Groth Court	El Dorado Hills	El Dorado	1.8
Construction	5S34C369967	Terminated	Sheba Office Park	6609 Folsom Auburn Road	Folsom	Sacramento	1.8
Construction	5S31C387348	Terminated	Shadow Wood Place	Kneeland Street	Colfax	Placer	1.79
Construction	5S34C388353	Terminated	Quick Quack Rancho Cordova	2346 Sunrise Boulevard	Rancho Cordova	Sacramento	1.78
Construction	5S34C396129	Active	Lexington Dixieanne Selma Homeless Site	2323 Selma Street	Sacramento	Sacramento	1.7
Construction	5S34C381683	Terminated	Torabian Residence	6019 6115 6121 Kenneth Avenue	Carmichael	Sacramento	1.7
Construction	5S34C387551	Active	Home2 Suites 65th Street	1865 65th Street	Sacramento	Sacramento	1.7
Construction	5S09C390436	Active	Dollar General Cool	SR 49 and Northside Drive	Cool	El Dorado	1.68
Construction	5S34C380169	Active	University River Village	7901 La Riviera Drive	Sacramento	Sacramento	1.64
Construction	5S34C395816	Terminated	Our Lady of Assumption	5057 Cottage Way	Carmichael	Sacramento	1.6
Construction	5S09C386779	Terminated	Bassi Road at Granite Creek Bridge Replacement	Bassi Road at Granite Creek	Lotus	El Dorado	1.6
Construction	5S31C386510	Terminated	Bowman Road Over Union Pacific Railroad Bridge Rehabilitation Project	Bowman Road	Auburn	Placer	1.6
Construction	5S34C380166	Terminated	Evergreen Phase 2	2310 Evergreen Street	Sacramento	Sacramento	1.58
Construction	5S34C398154	Active	Folsom Pointe Pad E	165 Placerville Road	Folsom	Sacramento	1.5
Construction	5S09C392092	Terminated	Main Ditch Piping Project	2640 Blair Rd	Pollock Pines	El Dorado	1.5
Construction	5S34W005079	Expired	Evergreen Royal Oaks Feeder 1203 Extension	American River Bike Trail near Lathrop Way	Sacramento	Sacramento	1.5
Construction	5S34W005372	Expired	Evergreen Royal Oaks Feeder 1203 Extension	American River Bike Trail near Lathrop way	Sacramento	Sacramento	1.5
Construction	5S34C380675	Terminated	The Cottages at Sunset	Sunset Ave & Ward Lane	Sacramento	Sacramento	1.45
Construction	5S34W004718	Expired	Folsom Blvd Swlk Infill	9425 Folsom Blvd	Sacramento	Sacramento	1.42
Construction	5S03W005185	Expired	Vehicle Shop Replacement Parking	Southeast corner Loop Road and Kirkwood Meadows Drive	Kirkwood	Amador	1.4
Construction	5S34C396653	Active	Raising Canes 542 Sacramento	3348 El Camino Avenue	Sacramento	Sacramento	1.36
Construction	5S34C397939	Active	Sun Center Drive	11201 Sun Center Drive	Rancho Cordova	Sacramento	1.31
Construction	5S34C375594	Terminated	Vista Del Lago Stadium & Field Houses	1970 Broadstone Parkway	Folsom	Sacramento	1.3
Construction	5S34C379966	Terminated	Arden Creek Town Center	3521 Arden Way	Sacramento	Sacramento	1.3
Construction	5S34C378943	Terminated	FPA US Highway 50 Crossion Pipeline Project	Placerville Road	Folsom	Sacramento	1.29
Construction	5S09C389105	Terminated	GDPUD 2018 Main Canal Reliability Project	Georgetown Divid Ditch south of Spanish Dry Diggins Rd	Georgetown	El Dorado	1.28
Construction	5S09C398226	Active	Courtside Apartments Phase 2 Grading	Racquet Way	Diamond Springs	El Dorado	1.27
Construction	5S34C396532	Active	Bercut Self Storage	400 Bercut Drive	Sacramento	Sacramento	1.25
Construction	5S34C383129	Terminated	1831 Exposition Blvd and 1600 Challenge Way	1831 Exposition Blvd and 1600 Challenge Way	Sacramento	Sacramento	1.2
Construction	5S34C398194	Active	Hurley Way Townhomes	2995 Hurley Way	Sacramento	Sacramento	1.14
Construction	5S34C395594	Terminated	Soil Born Farms Parking Lot Improvements	2140 Chase Drive	Rancho Cordova	Sacramento	1.12
Construction	5S09C390069	Terminated	3154 Sweetwater Trail	3154 Sweetwater Trail	Cool	El Dorado	1.1
Construction	5S34C387288	Terminated	Mission Manor Townhomes	3532 Mission Ave	Carmichael	Sacramento	1.1
Construction	5S34C379734	Terminated	CSUS Student Union	6000 J Street	Sacramento	Sacramento	1.1
Construction	5S34C390253	Terminated	7Eleven 38703	9396 Greenback Lane	Orangevale	Sacramento	1.1
Construction	5S09W004995	Expired	Serrano Pedestrian Trail K1 K2 Unit 4	Raphael Drive	El Dorado Hills	El Dorado	1.1
Construction	5S34C390840	Terminated	SMUD HQ Site Transition Project	6201 S Street	Sacramento	Sacramento	1.1
Construction	5S34C380162	Active	DelPaso Grocery Outlet	2308 Del Paso Blvd	Sacramento	Sacramento	1.09
Construction	5S34W004717	Expired	Cottage Way Swlk Infill	Cottage Way	Sacramento	Sacramento	1.08
Construction	5S34W005349	Expired	Starr King T K and K Modular Classrooms	4848 Cottage Way	Carmichael	Sacramento	1.07
Construction	5S34C390478	Terminated	8 Oaks at Carmichael	8945 Fair Oaks Blvd	Carmichael	Sacramento	1.04
Construction	5S34C387649	Terminated	Hagan Community Park	2197 Chase Drive	Rancho Cordova	Sacramento	1
Construction	5S09C381952	Terminated	Town Center Force Main Replacement Project - Phase 2_Schd A	6100 Mother Lode Dr.	Placerville	El Dorado	1
Construction	5S34C394795	Terminated	Phase 2B Arden Service Area Pipe and Meter Replacement	America River Drive	Sacramento	Sacramento	1
Construction	5S02C387934	Terminated	Caples Lake Campground	Caples Lake	Kirkwood	Alpine	1
Construction	5S09C393994	Active	Crossings Offsite Missouri Flat and Headington Road Widening	Missouri Flat Rd at Headington Rd	Placerville	El Dorado	0.89
Construction	5S34C386895	Terminated	Hamid Hosseini Residence 378 Tobrurry Way	378 Tobrurry Way	Folsom	Sacramento	0.66
Construction	5S34C386873	Terminated	Ali Hosseini Residence 370 Tobrurry Way	370 Tobrurry Way	Folsom	Sacramento	0.57
Construction	5S09W005128	Expired	Silva Valley & Harvard Intersection Improvements	7141 Silva Valley Parkway	El Dorado Hills	El Dorado	0.5
Construction	5S34C379816	Terminated	Folsom Plan Area - Zone 4-5 Booster Pump Station	Placerville Road	Folsom	Sacramento	0.29
Construction	5S09CN604823	NOI Required	Mishra Alok	2650 Via Fiori	El Dorado Hills	El Dorado	0
Construction	5S34CN607532	NOI Required	Orange Ave Residences	7838 7840 7842 Orange Avenue	Fair Oaks	Sacramento	0

Type	WDID	STATUS	Site/Facility Name	Site/Facility Address	Site/Facility City	Site/Facility County	ACRES
Industrial	5S09I021987	Terminated	Big Cut Mine	2261 Donovan Ranch Rd	Placerville	El Dorado	13134
Industrial	5S34I002250	Terminated	Gencorp Aerojet Propulsion	20022 Aerojet Road	Rancho Cordova	Sacramento	8500
Industrial	5S34NEC009096	Active	Adams Sausage Factory	2539 Mercantile Drive	Rancho Cordova	Sacramento	2000
Industrial	5S34I001227	Active	CA Dept Corrections Folsom	300 Prison Rd	Represa	Sacramento	1200
Industrial	5S09I030076	Active	Teichert Cool Cave Quarry	2601 Highway 49	Cool	El Dorado	570
Industrial	5S09I017198	Terminated	Teichert Aggregates Cool Cave	2601 Hwy 49	Cool	El Dorado	557
Industrial	5S09I001215	Active	County of El Dorado Planning & Building	3501 Airport Rd	Placerville	El Dorado	253
Industrial	5S34I019343	Terminated	Aerojet Fine Chemicals LLC	Hwy 50 & Aerojet Rd	Rancho Cordova	Sacramento	200
Industrial	5S09I001185	Active	County of El Dorado Planning & Building	Dry Diggins Road	Georgetown	El Dorado	154
Industrial	5S09I022964	Terminated	Big Cut Mine	2261 Donovan Ranch Rd	Placerville	El Dorado	131.34
Industrial	5S34NNA002388	NONA Submitted	Teichert Perkins Plant	8760 Kiefer Boulevard	Sacramento	Sacramento	117
Industrial	5S09NNA000930	NONA Submitted	Cool Cave Quarry	2601 Highway 49	Cool	El Dorado	100
Industrial	5S09NEC000338	Active	Lava Cap Winery	2221 Fruitridge Rd	Placerville	El Dorado	80
Industrial	5S34NEC011106	Active	Kikkoman Foods Inc	1000 Glenn Drive	Folsom	Sacramento	52
Industrial	5S31I009749	Terminated	Colfax Shale	Canyon Way	Colfax	Placer	40
Industrial	5S09I023728	Active	Chili Bar Slate	11380 State Highway 193	Placerville	El Dorado	40
Industrial	5S09NNA002004	NONA Submitted	Sierra Rock LLC	1845 Quarry Rd	Placerville	El Dorado	38.3
Industrial	5S34I024070	Active	SFPP LP Bradshaw Terminal	2901 Bradshaw Road	Sacramento	Sacramento	35
Industrial	5S34I016056	Active	Sac Cnty Corp Yard	4000 Bradshaw Rd	Sacramento	Sacramento	33
Industrial	5S34I020226	Active	Cal Exposition Racing Stables	1600 Exposition Blvd	Sacramento	Sacramento	28
Industrial	5S09I030130	Active	Sierra Pacific Industries Camino	7015 Logyard Rd	Camino	El Dorado	26
Industrial	5S09I029912	Active	Edward Mackay	1390 E Broadway Rd Suite 294	Placerville	El Dorado	21
Industrial	5S31I029579	Active	Eagles Nest Mine	Section 32 Township 14 North Range 11 East	Foresthill	Placer	20
Industrial	5S09I002278	Terminated	Henningsen & Sons Inc	600 Placerville Dr	Placerville	El Dorado	18
Industrial	5S34I016266	Active	Folsom City Corp Yard	Western End Of Leidesdorff St	Folsom	Sacramento	18
Industrial	5S34I019869	Active	CMH Manufacturing West Inc dba Clayton Sacramento	9998 Old Placerville Rd	Sacramento	Sacramento	17.7
Industrial	5S34I029741	Active	California Cascade Building Materials Inc	7512 14th Ave	Sacramento	Sacramento	17
Industrial	5S34I025795	Terminated	California Cascade Building Materials Inc	7512 14th Avenue	Sacramento	Sacramento	17
Industrial	5S09NNA001997	NONA Submitted	Snows Quarry	4001 Snows Road	Placerville	El Dorado	15.99
Industrial	5S34I021994	Active	UPS Cordova CASMT	3930 Kristi Ct	Sacramento	Sacramento	13.640634
Industrial	5S09I005081	Terminated	Mother Lode Interceptor Pumpin	South Street	El Dorado	El Dorado	13
Industrial	5S34I003368	Active	SSI Sacramento	12000 Folsom Blvd	Rancho Cordova	Sacramento	13
Industrial	5S09I000281	Terminated	Pac Southeast Forest Prod	180 Industrial Drive	Diamond Springs	El Dorado	12
Industrial	5S09NEC002375	Terminated	Fried Chicken People	6543 Coop Lane	Folsom	El Dorado	12
Industrial	5S34I023074	Terminated	Office of State Publishing	344 N 7th St	Sacramento	Sacramento	11.721625
Industrial	5S09NEC007695	Active	Slate Ridge Vineyard	3701 Greenstone Road	Placerville	El Dorado	11.7
Industrial	5S09I010288	Terminated	Gilly S Auto Wrecking	2561 Blacks Ln	Placerville	El Dorado	11
Industrial	5S34I001473	Terminated	Golden West Homes	9998 Old Placerville Rd	Sacramento	Sacramento	11
Industrial	5S34I002975	Terminated	Envirotech Pumpsystems	721 N B St	Sacramento	Sacramento	11
Industrial	5S31I018932	Terminated	R&L Brosamer Inc	31514 High Sierra Dr	Gold Run	Placer	10
Industrial	5S09I020632	Active	El Dorado Disposal Material Recovery Facility	4100 Throwita Way	Placerville	El Dorado	10
Industrial	5S34NEC000024	Active	Sake Gekkeikan	1136 Sibley St	Folsom	Sacramento	9
Industrial	5S34I005108	Active	SMM Sacramento	130 N 12th St	Sacramento	Sacramento	8.5
Industrial	5S31I021140	Active	HBE Colfax	44 Central St	Colfax	Placer	8
Industrial	5S34I026773	Active	Setzer Forest Products Inc	7400 San Joaquin Street	Sacramento	Sacramento	8
Industrial	5S34I003452	Terminated	Mather Auto	4095 Happy Ln	Sacramento	Sacramento	8
Industrial	5S34I027711	Active	US Auto Parts Inc	4095 Happy Lane	Rancho Cordova	Sacramento	7.07
Industrial	5S09I020631	Active	El Dorado Disposal Maintenance Shop	3940 Hwy 49	Placerville	El Dorado	7
Industrial	5S34I019397	Terminated	Mather Auto Dismantlers	4095 Happy Ln	Sacramento	Sacramento	7
Industrial	5S34I004438	Active	Martin Sprocket Gear	1199 Vine St	Sacramento	Sacramento	6.9699265
Industrial	5S09I023787	Active	Blain Stumpf Trucking	5661 5637 Davidson Rd	Placerville	El Dorado	6.69
Industrial	5S34I026005	Active	VSPOne Optical Technology Centers Sacramento	151 Blue Ravine Road	Folsom	Sacramento	6.6
Industrial	5S09I026954	Terminated	Placerville DMS	1851 Lotus Road	Placerville	El Dorado	6.5
Industrial	5S34I026311	Active	FedEx SMFRT	431 Richards Blvd	Sacramento	Sacramento	6.5
Industrial	5S34I028263	Active	Pick n Pull	4075 Happy Lane	Sacramento	Sacramento	6.5

Industrial	5S34NEC000609	Active	USPS Sacramento VMF	2000 Royal Oaks Dr	Sacramento	Sacramento	6.2557392
Industrial	5S34NNA002288	NONA Submitted	Rancho Cordova - Mercantile Dr (Site 0274)	2410 Mercantile Dr.	Rancho Cordova	Sacramento	5.62
Industrial	5S09I008022	Active	Hangtown Creek WRF	2300 Coolwater Creek Rd	Placerville	El Dorado	5.5
Industrial	5S09I029390	Active	Larsen Drive Chipping Facility	2850 Larsen Drive	Camino	El Dorado	5.3
Industrial	5S34I003066	Terminated	F B Hart Co Inc	1441 Richards Blvd	Sacramento	Sacramento	5
Industrial	5S31I023103	Active	Weimar Auto Wreckers	21300 Canyon Way	Weimar	Placer	5
Industrial	5S34NNA001918	NONA Submitted	Folsom - Auburn Rd (Site 1953)	1031 W Willow Trail Way	Folsom	Sacramento	4.7
Industrial	5S34NEC005176	Active	SCUSD Transportation Department	7050 San Joaquin Street	Sacramento	Sacramento	4.5
Industrial	5S09I028614	Active	Mountain Enterprises Incorporated	1851 Lotus Road	Placerville	El Dorado	4.2
Industrial	5S34NEC011961	Active	Sentry Hazel & 50	12233 Folsom Blvd	Rancho Cordova	Sacramento	4
Industrial	5S34I026399	Active	Agilent Technologies	91 Blue Ravine Rd	Folsom	Sacramento	3.902663
Industrial	5S34I004106	Active	Sac City Usd Trans	3101 Redding Ave	Sacramento	Sacramento	3.7
Industrial	5S34I002163	Terminated	Trans Maint	3850 Happy Ln	Sacramento	Sacramento	3.5261708
Industrial	5S34NNA001431	NONA Submitted	load-n-lock storage	11297 Trade Center Dr	Rancho Cordova	Sacramento	3.51
Industrial	5S34I013314	Active	Subway Truck Parts Inc	903 Del Paso Blvd	Sacramento	Sacramento	3.26
Industrial	5S34NEC011378	Active	Metalcloak	2484 Mercantile Drive	Rancho Cordova	Sacramento	3.17
Industrial	5S34I029209	Terminated	Metalcloak	2484 Mercantile Drive	Rancho Cordova	Sacramento	3.17
Industrial	5S34NEC010472	Terminated	Altergy Systems	140 Blue Ravine Road	Folsom	Sacramento	3.15
Industrial	5S09I015039	Active	El Dorado Cnty Transit Auth	6565 Commerce Way	Diamond Springs	El Dorado	3
Industrial	5S09I016774	Active	Amerals Truck Auto Wrecking Scrap Metals	4468 Forni Rd	El Dorado	El Dorado	3
Industrial	5S34I005912	Active	Matheson Postal Servies Inc	455 Bannon St	Sacramento	Sacramento	3
Industrial	5S34I003350	Terminated	Honey Hill Farms	3150 Bradshaw Rd	Sacramento	Sacramento	3
Industrial	5S34I002688	Terminated	Wmi Services	360 N 10th St	Sacramento	Sacramento	3
Industrial	5S34NEC000751	Active	Fed Ex MHRA	11140 Sun Center Dr	Rancho Cordova	Sacramento	2.7
Industrial	5S34NEC011155	Active	Guard Dog Self Storage LLC	10333 White Rock Rd	Rancho Cordova	Sacramento	2.68
Industrial	5S31I026858	Active	A & A Ready Mixed Concrete Inc dba A & A Concrete Supply	212 Railroad Street	Colfax	Placer	2.6
Industrial	5S34NNA001818	NONA Submitted	CA Sacramento Self Storage LLC	610 Leisure Lane	Sacramento	Sacramento	2.3778926
Industrial	5S34NEC011962	Active	Sentry Storage Sunrise	11319 Folsom Blvd	Rancho Cordova	Sacramento	2.36
Industrial	5S31I020395	Terminated	Red Ink Maid & Big Seam Claims	6 Mi Down USFS Hwy 96	Foresthill	Placer	2.3
Industrial	5S34I003922	Terminated	Hirst Tow Ser	1710 Auburn Blvd	Sacramento	Sacramento	2.1808999
Industrial	5S34NNA001791	NONA Submitted	CH SS Fund Sacramento Folsom Auburn LP	7770 Folsom Auburn Rd	Folsom	Sacramento	2.1093205
Industrial	5S09I010475	Terminated	Spreckels Limestone & Agg	2601 Hwy 49	Cool	El Dorado	2
Industrial	5S09I002883	Active	Black Oak Mine School District	6540 Wentworth Springs Rd	Georgetown	El Dorado	2
Industrial	5S34I001818	Terminated	Safety Kleen Ser Ctr	2576 Mercantile Dr Ste A	Rancho Cordova	Sacramento	2
Industrial	5S09I003754	Terminated	Teters Auto Wrecking Inc	4487 Missouri Flat Rd	Placerville	El Dorado	1.9467401
Industrial	5S34NEC011960	Active	Sentry Storage Folsom Dam	201 Folsom Dam Rd	Folsom	Sacramento	1.8
Industrial	5S34NEC003963	Active	Philips Volcano	2870 Kilgore Road	Rancho Cordova	Sacramento	1.7361341
Industrial	5S34I004980	Active	ALL DODGE TRUCK	11350 S Bridge St	Rancho Cordova	Sacramento	1.6
Industrial	5S34NEC010887	Active	Clock Tower Storage	7500 Folsom Auburn Road	Folsom	Sacramento	1.5760101
Industrial	5S09I003348	Terminated	Mother Lode Van & Storage	485 Pierroz Rd	Placerville	El Dorado	1.572888
Industrial	5S09I005396	Terminated	Mother Lode Van & Storage	485 Pierroz Rd	Placerville	El Dorado	1.572888
Industrial	5S34NNA001751	NONA Submitted	Mini U Storage	300 S Lexington Dr	Folsom	Sacramento	1.5113177
Industrial	5S34NNA001408	NONA Submitted	Joel Carstens	3823 Wingate Dr	Carmichael	Sacramento	1.5
Industrial	5S31I028766	Terminated	Gold Run Hwy 80 Batch Plant	Gold Run Sand Salt Storage	Gold Run	Placer	1.5
Industrial	5S09I017872	Active	Mother Lode Unified School District	3783 Forni Rd	Placerville	El Dorado	1.5
Industrial	5S09I018174	Active	Placerville Union School District	2877 Schnell School Rd	Placerville	El Dorado	1.4233242
Industrial	5S34NNA001731	NONA Submitted	Folsom - Parkshore Dr. (1894)	1031 W Willow Trail Way	Folsom	Sacramento	1.41
Industrial	5S34NNA002191	NONA Submitted	Extra Space Storage	11055 Folsom Blvd	Folsom	Sacramento	1.3456382
Industrial	5S34NNA002168	NONA Submitted	Storage Star Rancho Cordova	11055 Folsom Blvd.	Folsom	Sacramento	1.3456382
Industrial	5S31NEC010945	Active	REACH 034 CALSTAR 3 Auburn CA	13750 Lincoln Way	Auburn	Placer	1.27
Industrial	5S09I017873	Active	Pollock Pines School District	2701 Amber Trl	Pollock Pines	El Dorado	1.2626263
Industrial	5S34NNA002124	NONA Submitted	CubeSmart 222	10651 White Rock Rd	Rancho Cordova	Sacramento	1.2437557
Industrial	5S34NNA001052	NONA Submitted	Roll Off Containers Rental	7140 Tokay Ave	Sacramento	Sacramento	1.2
Industrial	5S34NEC005518	Active	AMR Sacramento	1101 Fee Dr	Sacramento	Sacramento	1.1478421
Industrial	5S34I019459	Terminated	AMR Sacramento	1101 Fee Dr	Sacramento	Sacramento	1.1478421
Industrial	5S34NEC009183	Active	AutoTruck Kargo Equipment LLC	11261 Trade center drive	Rancho Cordova	Sacramento	1.1019284
Industrial	5S31I017899	Terminated	Foresthill Union School District	24750 Main St	Foresthill	Placer	1

Industrial	5S34I026595	Active	Rudys Metals	750 Richards	Sacramento	Sacramento	1
Industrial	5S34I029992	Active	Louis AC Salvage	7475 14th Avenue	Sacramento	Sacramento	1
Industrial	5S34NEC005257	Active	UPS Supply Chain Solutions CASCE	4512 Harlin Dr	Sacramento	Sacramento	1
Industrial	5S34I010160	Terminated	Super Cal Express	300 Richards Blvd Ste 100	Sacramento	Sacramento	1
Industrial	5S34I003219	Terminated	Mason Paint	2121 Blumenfeld Dr	Sacramento	Sacramento	1
Industrial	5S34I001475	Terminated	Arden Auto Dismantling	2411 Harvard St	Sacramento	Sacramento	1
Industrial	5S31I009012	Active	Foresthill Transfer Station	6699 Patent Road	Foresthill	Placer	0.95
Industrial	5S09I004314	Terminated	D Veerkamp General Engineerin	2585 Cold Springs Rd	Placerville	El Dorado	0.9182736
Industrial	5S34I003263	Terminated	Loral Microwave Narda West	11040 White Rock Rd # Bldg200	Rancho Cordova	Sacramento	0.9182736
Industrial	5S34I023756	Active	Yellow Cab Co of Sacramento	900 Richards Blvd	Sacramento	Sacramento	0.9
Industrial	5S34I023304	Active	TKO Recycling Inc	11493 Folsom Blvd	Rancho Cordova	Sacramento	0.8752296
Industrial	5S09NEC002765	Terminated	Criag Gillihan Automotive	2561 Blacks Lane	Placerville	El Dorado	0.85
Industrial	5S34NEC007502	Active	ELLIS AND ELLIS SIGN SYSTEMS	1111 Joellis Way	Sacramento	Sacramento	0.8316116
Industrial	5S34NEC010789	Active	General Dynamics OTS	105 Lake Forest Way	Folsom	Sacramento	0.7346189
Industrial	5S09I001158	Terminated	El Dorado Transit	3655 Chuckwagon Way # C	Placerville	El Dorado	0.7334711
Industrial	5S34NEC011365	Active	Group Manufacturing Services Incorporated	2483 Mercantile Drive	Rancho Cordova	Sacramento	0.7129247
Industrial	5S34NEC011221	Active	Sierra Office Systems and Products Inc	9950 Horn Road	Sacramento	Sacramento	0.661157
Industrial	5S34NEC009998	Active	ROWLETT MANUFACTURING & DESIGN INC	3150 Fite circle	Sacramento	Sacramento	0.6198347
Industrial	5S09I021560	Terminated	Placerville Bin	4003 Stage Court	Placerville	El Dorado	0.6
Industrial	5S34I025110	Terminated	Intex Forms Inc	9293 Beatty Drive	Sacramento	Sacramento	0.573921
Industrial	5S34I029648	Active	RIVER CITY MILLWORK INC	3045 Fite Cir	Sacramento	Sacramento	0.5509642
Industrial	5S34NEC008528	Active	PRECISION FLIGHT CONTROLS INC	2747 MERCANTILE DRIVE STE 100	Rancho Cordova	Sacramento	0.5404729
Industrial	5S34NEC008525	Terminated	Foremost Interiors Inc	2318 Gold River Rd	Rancho Cordova	Sacramento	0.5
Industrial	5S34I009649	Terminated	Foremost Interiors Inc	2318 Gold River Rd	Rancho Cordova	Sacramento	0.5
Industrial	5S34NEC008524	Terminated	Foremost Interiors Inc	2318 Gold River Rd	Rancho Cordova	Sacramento	0.5
Industrial	5S34NNA002029	NONA Submitted	Long Drive Trucking LLC	128 Grey Canyon Drive	Folsom	Sacramento	0.5
Industrial	5S09I000233	Active	Rescue Unified School District	3880 Green Valley Rd	Rescue	El Dorado	0.4820937
Industrial	5S09NEC004178	Active	Camino School District	3060 Snows Rd	Camino	El Dorado	0.45
Industrial	5S09I006522	Terminated	Camino School District	3060 Snows Rd	Camino	El Dorado	0.45
Industrial	5S34NEC007358	Active	Time Printing Solutions Provider	161 Commerce Circle Suite A	Sacramento	Sacramento	0.4132231
Industrial	5S34NNA001401	NONA Submitted	Tony's Sons Moving and Storage	2419 Mercantile Dr. Ste D	Rancho Cordova	Sacramento	0.4017447
Industrial	5S09I028516	Active	Crystal Basin Cellars	3550 Carson Road	Camino	El Dorado	0.4
Industrial	5S09NEC010921	Active	El Dorado Hills Soap	305 Ridgeview Court	El Dorado Hills	El Dorado	0.34
Industrial	5S34I016762	Terminated	Ozark Trucking Inc	1111 Fee Dr	Sacramento	Sacramento	0.3213958
Industrial	5S34NEC011099	Active	Phyzhon Health Inc	180A Blue Ravine Road	Folsom	Sacramento	0.3155877
Industrial	5S09I004843	Terminated	Morrison, Robert G	1145 Broadway	Placerville	El Dorado	0.3
Industrial	5S34NEC010067	Terminated	Recycling Zone Sacramento	777 Arden Way	Sacramento	Sacramento	0.3
Industrial	5S34NEC000091	Terminated	Sacramento 2 Sercive Center	777 Arden Way	Sacramento	Sacramento	0.3
Industrial	5S09I014311	Active	Boeger Winery	1709 Carson	Placerville	El Dorado	0.2754821
Industrial	5S34NEC003472	Active	Meticulous Manufacturing Inc	161 Commerce Circle Suite B	Sacramento	Sacramento	0.2754821
Industrial	5S34NEC000361	Terminated	Starr Johnson Wines	5417 Tree Side Drive	Carmichael	Sacramento	0.2536731
Industrial	5S34I027907	Active	US Granite	11300 Trade Center Drive Suite E	Rancho Cordova	Sacramento	0.2525253
Industrial	5S34NNA001887	NONA Submitted	Coffee Quintessence	6605 Folsom Auburn Road	Folsom	Sacramento	0.25
Industrial	5S34NEC010917	Active	Kelron Inc	1533 Thurman Way	Folsom	Sacramento	0.25
Industrial	5S34I024821	Terminated	Rudys Metals	325 N 7th Street	Sacramento	Sacramento	0.25
Industrial	5S34NEC001453	Terminated	UC Davis Medical Center	2315 Stockton Blvd	Sacramento	Sacramento	0.2295684
Industrial	5S34I029631	Active	Louis AC Salvage	7475 14th Avenue	Sacramento	Sacramento	0.2295684
Industrial	5S34IN607209	Terminated	Louis AC Salvage	7475 14th Avenue	Sacramento	Sacramento	0.2295684
Industrial	5S34NEC010974	Active	cbc rustic designs	2322 Gold River road	Rancho Cordova	Sacramento	0.2043159
Industrial	5S34NEC011662	Active	Clean Energy Systems Inc	3035 Prosprect Park Drive	Rancho Cordova	Sacramento	0.2005969
Industrial	5S34NNA001988	NONA Submitted	Boyd Trucking	630 Lefevre Drive	Folsom	Sacramento	0.1910698
Industrial	5S34I027221	Terminated	VSPOne Optical Technology Centers Sacramento	151 Blue Ravine Road	Folsom	Sacramento	0.1836623
Industrial	5S34NNA002100	NONA Submitted	i5LED LLC	3127 Fite Circle, Suite D/E	Sacramento	Sacramento	0.1661846
Industrial	5S34NEC010592	Active	Everbrite Inc	11492 Sunrise Gold Circle	Rancho Cordova	Sacramento	0.1619376
Industrial	5S34NEC007353	Terminated	California Tile & Granite Corp	9891 Horn Road	Sacramento	Sacramento	0.1606979
Industrial	5S34I028036	Terminated	California Tile & Granite Corp	9891 Horn Road	Sacramento	Sacramento	0.1606979
Industrial	5S34I010459	Terminated	Cs Trucking Inc	2445 Harvard St	Sacramento	Sacramento	0.1606979

Industrial	5S34NEC010845	Active	Kinetix Manufacturing Services Inc	11470 Sunrise Gold Circle Suite 6	Rancho Cordova	Sacramento	0.15955
Industrial	5S34NNA002199	NONA Submitted	GA Trucking Company	1168 Elderberry Circle	Folsom	Sacramento	0.1559917
Industrial	5S34NEC011183	Active	JAF Tire Recycling	9521 Greenback ln Folsom	Folsom	Sacramento	0.137741
Industrial	5S34NEC009133	Active	Clearwater Light	11305 Sunrise Gold Circle unit D	Rancho Cordova	Sacramento	0.137741
Industrial	5S34NEC011013	Active	NT ENGINEERING INC	11367 SUNRISE GOLD CIRCLE #A	Rancho Cordova	Sacramento	0.137741
Industrial	5S34I023768	Terminated	MV Transportation Div 04	10170 Croydon Wy A	Sacramento	Sacramento	0.137741
Industrial	5S34I011185	Terminated	Baystar Sac	9965 Horn Rd	Sacramento	Sacramento	0.137741
Industrial	5S09I010363	Terminated	Gillys Auto Wreckers	2561 Blacks Ln	Placerville	El Dorado	0.1147842
Industrial	5S34NEC009054	Active	INTOOL	2546 MERCANTILE DR	Rancho Cordova	Sacramento	0.1147842
Industrial	5S34NEC008750	Active	Burning Barrel Brewing Company LLC	11210 Sun Center Dr suite B	Rancho Cordova	Sacramento	0.1115702
Industrial	5S34NEC011342	Active	2664 Mercantile Drive	2664 Mercantile Drive	Rancho Cordova	Sacramento	0.0918274
Industrial	5S34NEC010933	Active	Elite Optical	9901 Horn Rd Ste G	Sacramento	Sacramento	0.0918274
Industrial	5S34NEC009879	Active	JG Graphics	11470 Sunrise Gold Circle	Rancho Cordova	Sacramento	0.0783976
Industrial	5S34NEC008463	Active	Capital Label Company	11336 Sunco Drive Suite D	Rancho Cordova	Sacramento	0.072314
Industrial	5S34NEC010391	Active	Load Right Inc	11311 Trade Center Drive	Rancho Cordova	Sacramento	0.0688705
Industrial	5S34NEC009850	Active	Tayco Screenprint Inc	11500 Sunrise Gold Circle Suite C	Rancho Cordova	Sacramento	0.0619835
Industrial	5S34NNA001572	NONA Submitted	Marcum's Marine Services LLC	2365 La Loma Dr	Rancho Cordova	Sacramento	0.0286961
Industrial	5S34NEC010776	Terminated	Innopulse Inc	11440 Sunrise Gold Cir Ste 8	Rancho Cordova	Sacramento	0.0227273
Industrial	5S09NNA000938	NONA Submitted	Groceryworks #2683	2207 Francisco Dr	El Dorado Hills	El Dorado	0.0206612
Industrial	5S09NEC011968	Active	Cool Saddleworks	2968 State Highway 49 Ste K	Cool	El Dorado	0.0172176
Industrial	5S34NNA000512	NONA Submitted	Heart of Gold Medical Transport Inc	1329 Howe Ave Ste 205	Sacramento	Sacramento	0.0149908
Industrial	5S34NNA002329	NONA Submitted	Main Office	705 Gold Lake Dr	Folsom	Sacramento	0.0114784
Industrial	5S34NNA002234	NONA Submitted	Home Office	5600 Marconi Ave Apt 226	Carmichael	Sacramento	0
Industrial	5S34NNA001850	NONA Submitted	Home	3536 Heron Court	Folsom	Sacramento	0
Industrial	5S34NNA001433	NONA Submitted	N/A	2720 La Verta Court	Rancho Cordova	Sacramento	0
Industrial	5S09IN601448	Undetermined	Hangtown Towing		Coloma	El Dorado	
Industrial	5S09IN602156	Undetermined	Lewis Ranch THP Construction	z	Greenwood	El Dorado	
Industrial	5S34I000003	Terminated	Intel	1900 Prairie City Rd	Folsom	Sacramento	
Industrial	5S34IN604526	Undetermined	Kikkoman Foods, Inc	1000 Glenn Dr	Folsom	Sacramento	
Industrial	5S09IN605321	Undetermined	Sierra Rock LLC	1845 Quarry Rd	Placerville	El Dorado	
Industrial	5S34IN602193	Undetermined	Home Depot Sunrise Blvd	2756 Sunrise	Rancho Cordova	Sacramento	
Industrial	5S34IN607714	NOI Required	Orlando Battuaro	1834 Aubrun Blvd	Sacramento	Sacramento	
Industrial	5S34IN604685	Undetermined	California Tile and Granite Corp	9891 Horn Road Suite D	Sacramento	Sacramento	
Industrial	5S09IN601454	Undetermined	Hahn Ranch	4831 Rock Barn	Shingle Springs	El Dorado	

Appendix D – Climate Change
CNRA – Water Resilience Portfolio
Status of Selected Actions in Water Resilience Portfolio as of January 2022

Action	**Action Status**
3.4 Explore ways to further streamline groundwater recharge and banking efforts that do not exacerbate water quality issues.	The 2021-22 state budget includes $300 million to DWR over three budget years, starting in 2021-2022, to support local SGMA implementation, including infrastructure projects to improve water supply security, water quality, and/or the reliability of drinking water wells. A DWR-Water Board technical team is using data from the Tuolumne River watershed to work through whether DWR's watershed studies that include climate change effects can be used to facilitate the water availability analyses required by the Water Board for water right decisions. The aim of the work is to ease the burden on local agencies of applying for rights to flood flows for groundwater recharge.
3.5 Make funding available for groundwater recharge and storage projects with multiple benefits.	The 2021-2022 state budget includes $300 million over three years for grants to support local planning and implementation of Groundwater Sustainability Plans across critically over-drafted basins. This funding will help local agencies address known data gaps, plan, and implement projects, and address deficiencies in sustainability plans. The Legislature and Administration also agreed to invest another $60 million each year for the following two fiscal years for local grants to support SGMA implementation.
5.2 Pilot stormwater capture and use projects through the Drinking Water State Revolving Fund to identify impediments to address and to provide a framework for additional future projects.	The Board awarded its final round of Proposition 1 Stormwater funding in February 2021. During the solicitation, no projects were submitted that fit this description and proposed use of state revolving funds.
7.1 Accelerate state permitting of projects that protect and enhance fish and wildlife and water supply reliability – such as Sites, Pacheco Reservoir Expansion, and the Chino Basin Conjunctive Use Environmental Water Storage/Exchange	By December 15, 2021, all seven projects in the Water Storage Investment Program (WSIP) had met the statutory deadline of January 1, 2022 to ensure progress and remain eligible for WSIP funding. The Water Commission and Water Board have

Program – that were selected under the Water Storage Investment Program (Proposition 1).	executed an interagency agreement to support sufficient water right staff to handle WSIP permit applications, once received. The Department of Fish and Wildlife has entered into a reimbursable agreement with Sites Joint Powers Authority and the Contra Costa Water District to provide dedicated staff to work on permits for the Sites Reservoir and Los Vaqueros expansion projects. The Water Commission is supporting DWR staff costs to analyze the effects of the seven proposed storage projects on State Water Project operations, including Sacramento River flows, south-of-Delta exports, and water availability at various times of the year. DWR will be the lead agency under the California Environmental Protection Act (CEQA) for an initial study to determine the level of further CEQA work for state agency actions not covered by local agency CEQA documents. The study is underway and expected to be completed by November 2021. DWR is coordinating with the Water Board on the timing and submittal of the State Water Project water rights changes required to implement the WSIP projects associated with SWP operations. The earliest any of the seven projects is expected to begin operation is 2024.
8.1 Implement AB 834, the 2019 legislation that requires the Water Board to establish and maintain a comprehensive harmful algal bloom program that includes incident response, monitoring, and website postings. (pg. 19)	The State and two Regional Water Boards in June 2021 completed filling five positions dedicated to carrying out AB 834. An annual report was posted on the Water Boards' website in July 2021. The Water Board has procured substantial new services, equipment, and capacity for data for the program this season. Progress on a new data platform capable of integrating community-collected data is ongoing.
8.3 (formally 8.2) Support State water source control programs for emerging contaminants of concern that are hardest to treat.	Progress has been made to date on PFAS investigations at airports, landfills, chrome plating facilities, wastewater treatment plants, bulk fuel terminals, and refineries. Approximately 950 source investigations

	are being conducted statewide along with the sampling of over 1,000 drinking water wells in the vicinity of these source areas. Data collected from wastewater treatment plant influent is expected to identify other potential industrial sources of PFAS for additional investigation. Once identified, the Regional Water Boards will work with those identified industrial facilities to identify safer alternatives and/or treatment options to mitigate the discharge of PFAS into wastewater. The 2021-22 state budget includes $30 million to support local agency treatment of PFAS contamination, with another $50 million in the 2022-23 budget and an additional $20 million in the 2023-24 budget.
8.4 (new) Explore ways to expand the scope and capacity of existing multi-agency post-fire assessment teams to evaluate anticipated impacts to aquatic life and drinking water sources.	The Water Board Emergency Management Program is leading a group related to the Governor's Wildfire and Forest Resilience Action Plan: the establishment of emergency forest restoration teams, the development of a restoration strategy for state lands, and the development of a restoration strategy for federal lands. The Water Boards' role is to identify and prioritize water quality concerns to ensure they are captured in these efforts.
8.8 (formally 8.7) Enhance dairy and livestock manure management programs to protect water quality, including activities that improve nutrient use efficiency and enable development of manure-based products, including bioenergy.	The 2021-2022 state budget includes $80 million over two years to CDFA to reduce livestock methane emissions. These funds will be used to incentivize dairy and livestock operators to develop dairy digesters to capture methane gas or change their existing liquid phase manure management process to a dry phase manure management process. The Dairy Digester Research and Development Program at CDFA has funded 118 projects that have an annual greenhouse gas reduction of 2.1 million metric tons of carbon dioxide equivalent and provide dairies with double-lined lagoons to prevent nitrate leaching. The Alternative Manure Management Program (AMMP)

	funds non-digester technologies on dairy operations and provide methane reduction benefits as well as other nutrient-related benefits. AMMP has funded 116 projects.
15.1 Encourage enhancement of both forest and water management through watershed coordinator programs, resource conservation districts, and other groups coordinating regionally.	In 2020, the Department of Conservation awarded a total of $1.5 million through five Sustainable Groundwater Watershed Coordinator grants that will build broad coalitions of government, stakeholders, and communities to develop plans and projects to improve watershed health and meet California's groundwater sustainability goals. The Department also funded five additional watershed coordinators to support the development of watershed plans and technical decision support tools for the upper watersheds of the Sacramento River. The 2021-22 state budget includes $110 million over two years to fund the Regional Forest and Fire Capacity Program to provide continued funding for forest health watershed coordinator activities.
15.2 Work toward accomplishing the goals of the California Forest Carbon Plan, which recommends actions to achieve healthy and resilient forests that help the state meet greenhouse gas reduction goals.	California has increased the funding and wildfire resilience activities requested in the Forest Carbon Plan from $75 million in 2020 to $1.5 billion in the 2021-22 state budget. These resources will enable the state to reach its target of 500,000 acres of forest and wildlands thinned or restored annually by 2023 – two years earlier than the target set in the Forest Carbon Plan. In 2020 and 2021, the Wildlife Conservation Board awarded more than $5 million in grants to three separate projects to develop a forest restoration plan in the North Yuba River watershed and to conduct research and monitoring to better understand the impact of thinning and other forest management actions on evapotranspiration and streamflow.
16.2 (new) Enhance agricultural lands for biodiversity, resilience, and habitat benefits through incentives for on-farm conservation practices and innovative partnerships.	The 2021-22 state budget appropriates $1.1 billion over two years in sustainable agriculture investments to support programs that include healthy soils, transition to safer sustainable pest

	management, alternatives to agricultural burning, and technical assistance for underserved farmers. In particular, the budget includes $39 million over two years for CDFA to provide technical assistance and support development of grower conservation management plans and $30 million over two years for pollinator habitat. Separately, CDFW has completed two solicitations for its California Winter Rice Habitat Incentive Program, enrolling more than 40,000 acres of agricultural lands in the program. The program incentivizes the winter flooding of harvested rice fields and provides habitat for thousands of wintering waterfowl and migrating shorebirds.
16.3 (new) Support research and technical assistance, such as through the UC Cooperative Extension Climate Smart Agriculture Advisors program and resource conservation districts, to support farmers and ranchers with education about healthy soils, manure management, water and nutrient efficiency practices, on-farm recharge, drought adaptation, and land management changes.	Approximately five percent of the funds allocated to CDFA's Climate Smart Agriculture (CSA) programs are made available for technical assistance. To date, 69 organizations have been funded, with awards totaling $4.8 million. An additional $1.2 million has been provided to the University of California Cooperative Extension to fund community education specialists to provide CSA technical assistance throughout the state to farmers and ranchers.
18.5 (formally 18.4) Provide incentive and technical advice to Delta landowners for creating managed wetlands or cultivating rice to reverse land subsidence and reduce carbon emissions. Eliminate subsidence-inducing practices on state-owned lands and pursue alternative sources of revenue to support long-term land management.	The Delta Conservancy continues to provide technical support to private and public Delta landowners for conversion to managed wetlands and rice cultivation. In 2020-21, approximately 2,000 acres have been converted to managed wetlands and several thousand more acres are in planning stage. There is a significant increase in interest in rice cultivation in the Delta from both rice growing associations and Delta farmers. In 2020-21, approximately 1,500 acres were converted to rice and over 6,000 acres are expected to be converted in the coming growing seasons. Additionally, there are several planning efforts looking at whole-island mosaic approaches where rice, managed wetlands, habitat, and high-value crops

	can be incorporated to address subsidence and carbon emissions and ensure long-term resilience and economic viability of the islands. To date, 1,850 acres of wetland and 600 acres of rice have been developed on DWR-owned land on Sherman and Twitchell islands. Another 1,000 acres of wetlands on Sherman Island are expected to be completed and operational during the summer of 2022.
20.1 (new) Build on the Integrated Water Management Program and other regional efforts to align climate scenarios and expand watershed-scale coordination and investments that contribute to water resilience. Emphasize integrated, multi-sector, and outcome-based planning, action, and monitoring. (pg. 48)	The California Water Plan Update for 2023 development by DWR and other agencies will focus on how to build watershed-scale coordination, with an emphasis on assessing climate vulnerabilities, adaptation strategies, equity, and measurement of progress. Extensive inter-agency and stakeholder coordination on Water Plan Update 2023 begins in early 2022.
25.5 (new) Facilitate interagency dam flood, debris flow, and wildfire emergency table-top exercises with emergency responders and local communities, focusing on testing emergency notification protocols, sirens and warning systems, and evacuation route planning. (pg.60)	During October and November 2020, as part of annual pre-season flood coordination meetings, DWR staff conducted 10 tabletop exercises focused on flood preparedness and response in various regions across the state. Scenarios were tailored to each region and guided local, county, state, and federal partners in discussing roles, responsibilities, capabilities, and procedures during a flood emergency. DWR is planning future pre-season interagency flood response coordination to include dam emergency action plans and post-fire debris flows. DWR plans to facilitate a tabletop exercise later in 2021 for the local, state, and federal agencies responsible for flood emergency response in the Yuba River and Feather River regions.
27.1 Support regional decision making with watershed-scale climate vulnerability and adaptation assessments that include strategies to address risks to water supply, ecosystems, and water quality.	The 2021-2022 state budget includes $29 million for DWR to conduct watershed-scale studies for the San Joaquin River watershed and its tributaries, develop integrated analytical models, identify

	vulnerabilities in the flood and water supply systems due to climate change and SGMA implementation, and identify adaptation strategies. In addition, DWR will evaluate the conveyance facilities in the San Joaquin River watershed to improve water system flexibility, reliability, and resilience. The analyses will be conducted with local partners using newly developed analytical models covering headwater to groundwater for each tributary watershed. Separately, in February 2021, the Water Board released an assessment of the role that climate change could play in evaluating and permitting new water right projects. The assessment includes recommendations to strengthen climate change adaptation and response.
27.2 Support California Water Plan planning-area scale analysis of future flood risk, water demand, supply reliability, and water for the environment for a range of climate and growth scenarios. Incorporate climate change forecasts into permitting processes.	Preliminary runs of future scenarios have been completed and analyzed. Refinement of modeling and reporting continues to occur. Refinements will help ensure best available data and tools are used and maximize the relevance and utility of the technical information in making effective decisions. Separately, in February 2021, the State Water Board released an assessment of the role that climate change could play in evaluating and permitting new water right projects; the assessment includes potential recommendations to strengthen climate change adaptation and response.
27.3 In cooperation with the U.S. Army Corps of Engineers and reservoir owners, evaluate the potential for implementing forecast-informed reservoir operations in watersheds where improved weather forecasting capabilities would allow reservoir operators to improve flood control and surface and groundwater supply storage.	DWR continues to support (and co-lead in the case of Lake Oroville) FIRO assessments in California. FIRO is in use at Lake Mendocino on the Russian River. In 2020, FIRO increased Lake Mendocino water storage by nearly 20 percent, roughly equivalent to the water used by 22,000 households. DWR is working with the U.S. Army Corps of Engineers to assess the viability of adjusting reservoir operation manuals to incorporate FIRO at Prado Dam on the Santa Ana River, Lake

	Oroville on the Feather River, New Bullards Bar Reservoir on the Yuba River, and at federal facilities on the Truckee River. DWR and the Corps continue to seek state and federal funding to support FIRO; the 2021-22 state budget includes $10 million for FIRO.
27.4 Support utilization of emerging technologies and partnerships to improve forecasts of precipitation seasonal snowpack, and runoff at all time scales to support more efficient water management now and to help estimate the impacts of climate change on future flood and drought conditions.	DWR continues to fund research partners at NASA, NOAA, and universities to prepare experimental seasonal precipitation forecasts and related climate diagnostic products to support drought preparedness and response. For fall 2021, three new research forecasts have been developed and one existing NOAA research forecast has been continued; these forecasts were presented at a November workshop for invited water agencies held in partnership with the Water Education Foundation. Related new climate diagnostics work will also be presented. These products will be served on the California Water Watch hydrological monitor when it goes live in late 2021 or early 2022. DWR continues to partner with Scripps' Center for Western Weather and Water Extremes and NOAA on research observations and short-term weather forecasts associated with atmospheric river storms; the state funding to Scripps also helps support work to advance forecast-informed reservoir operations pilot projects. During winter and spring 2021, DWR utilized atmospheric river guidance from Scripps to help prepare for the late January/early February atmospheric rivers that resulted in most of California's snowpack and runoff from the Sierra Nevada. The guidance enabled DWR and other emergency managers to pre-deploy resources in burn-scar areas in anticipation of mud and debris flows. DWR continues to partner with the University of Colorado for production of satellite-based estimates of Sierra Nevada

	snowpack. These estimates, especially when coupled with aircraft-based observations, can vastly improve the understanding of how much water is contained in the Sierra Nevada snowpack. During winter and spring 2021, DWR utilized satellite technologies to help estimate Sierra Nevada snowpack to aid in preparing the traditional Bulletin 120 runoff forecasts. DWR has been developing a long-term effort (Aerial Remote Sensing of Snow program) to improve estimation of Sierra Nevada snowpack through aircraft-based remote sensing performed by Airborne Snow Observatory Inc. (ASO), building off initial efforts to apply this technology in selected San Joaquin River tributary watersheds. Partners in this effort include the U.S. Bureau of Reclamation and local water agencies. ASO flights were conducted in late 2020 and winter/spring 2021; some of the flights were funded through a FEMA hazard mitigation grant to cover wildfire burn scar areas to assess wildfire impacts on future runoff and collect baseline data for understanding erosion and debris flow risks. ASO flew 11 flights over the central and southern Sierra Nevada to measure the snowpack in the Tuolumne, Merced, San Joaquin, Kings, Kaweah, and Mono Lakes basins. The flights cost approximately $1.36 million, with $500,000 coming from DWR general fund and $856,000 tied to Forecast Coordinated Operations (F-CO) grant programs. The FY 2021-22 state budget includes $6 million for continued flights in southern Sierra basins and to conduct bare ground (baseline) flights over other Sierra Nevada watersheds for future ARSS, including in the Feather River watershed. The SWP is providing an additional roughly $1.5 million to fly the Feather River in spring 2022 to collect snowpack data. The Feather River gridded

	snowpack data will be the first data used in DWR's transition to physically based watershed models for runoff forecasting. In response to the significant Bulletin 120 runoff forecast errors in spring 2021, DWR is beginning a transition to modern methodologies that can take the effects of climate change into account. The transition to physically based watershed models will begin in the Sacramento River Basin, although the new model will not be operational until spring 2023.
30.5 Coordinate with federal land management agencies to improve forest resilience and watershed function on federal lands.	In August 2020, California signed a historic Shared Stewardship Agreement with the U.S. Forest Service that committed both parties to a comprehensive approach to forest and wildland resilience in the age of climate change. California and the Forest Service released the Forest and Wildfire Resilience Action Plan to outline the long-term vision of the Shared Stewardship Agreement and address obstacles to a coordinated approach. California also has dramatically increased its budget (from $75 million to $1.5 billion) to fully fund California's commitments within the Shared Stewardship Agreement. A dramatic increase in funding is required for Federal partners to meet the requirements of the joint strategy. The Forest Service owns 57 percent of the wildlands in California, and billions of federal dollars are needed to meet the joint goals.