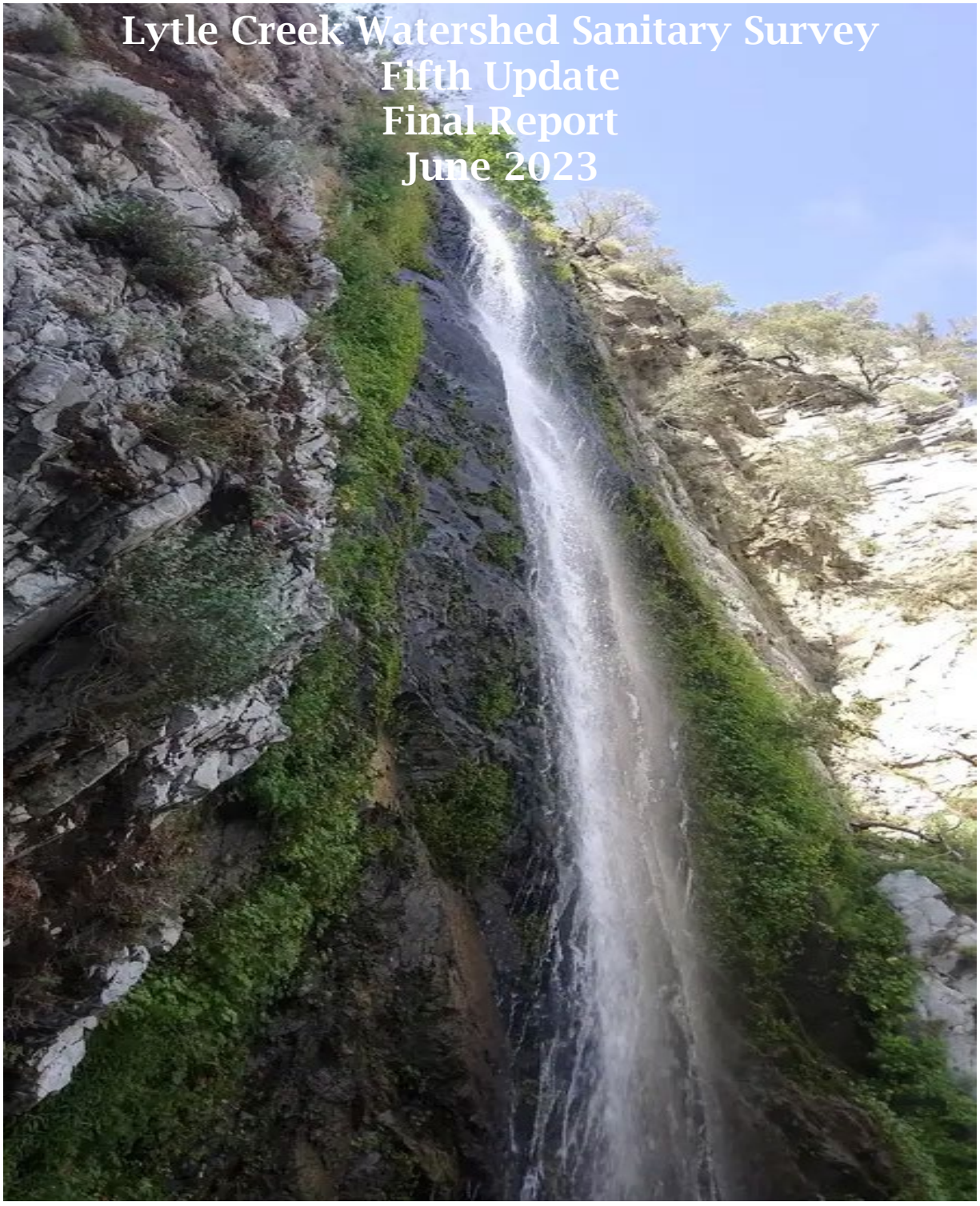
Lytle Creek Watershed Sanitary Survey
Fifth Update
Final Report
June 2023



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Fifth Update
FINAL REPORT
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LIST OF ABBREVIATIONS

ACH – aluminum chlorohydrate
Alum - aluminum sulfate

BAER – Burned Area Emergency Response
BMP – Best Management Practice
BOD – Biological Oxygen Demand

CAP – *Cryptosporidium* Action Plan
CCTV – Closed circuit television
CDPH – California Department of Public Health
CEDEN – California Environmental Data Exchange
CEQA – California Environmental Quality Act
CFE – Combined Filter Effluent
cfs – cubic feet per second
CIWQS – California Integrated Water Quality System
CSBSDD – County of San Bernardino Special Districts Department
CT – Contact Time
CUPA – Certified Unified Program Agency

D/DBP – Disinfectants/Disinfection By-Products
DDW – Division of Drinking Water
DBP – disinfection by-product

E. coli – *Escherichia coli*
EPDS –Entry Point to the Distribution System

FUWC – Fontana Union Water Company
FWC – Fontana Water Company

GAC – granular activated carbon
gpd – gallons per day
gpm – gallons per minute

HAA5 – haloacetic acids

IDSE – Initial Distribution System Evaluation
IESWTR – Interim Enhanced Surface Water Treatment Rule
IFE – individual filter effluent

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
µg/L - micrograms per liter
mgd – million gallons per day
mg/L – milligrams per liter
MPN/100 mL – most probable number per 100 milliliters

NOI – Notice of Intent
NPDES – National Pollution Discharge Elimination System
NTU – nephelometric turbidity unit

OES – California Office of Emergency Services
OWTS – Onsite Wastewater Treatment System

PCAs – Potential Contaminating Activities
PVC – Polyvinyl Chloride

RAA – running annual average
Regional Board – Santa Ana Regional Water Quality Control Board
RIMS – Response Information Management System
RV – Recreational Vehicle

SBCFCD – San Bernardino County Flood Control District
SCE – Southern California Edison
SDWA – Safe Drinking Water Act
SEMS – Standardized Emergency Management System
SOC – synthetic organic compound
SSMP – Sewer System Management Plan
SSO – Sanitary Sewer Overflow
SPW – State Project Water
SWAMP – Surface Water Ambient Monitoring Program
SWTR – Surface Water Treatment Rule

TMDL – Total Maximum Daily Load
TOC – total organic carbon
TTHM – total trihalomethanes

ug/L – micrograms per liter
USFS – United States Forest Service
USEPA – US Environmental Protection Agency
USGS – US Geological Survey
UV – Ultraviolet light

VOC – volatile organic compound

WDR – Waste Discharge Requirement

WFF – water filtration facility
WQMP – Water Quality Management Plan
WVWD – West Valley Water District
WWTP – Wastewater Treatment Plant

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INTRODUCTION

Drinking water utilities that use surface water are required to conduct a watershed sanitary survey for that source, under the California Surface Water Treatment Rule (SWTR). This survey must be updated every five years. This Fifth Update to the Lytle Creek Watershed Sanitary Survey covers the period January 1, 2018 through December 31, 2022.

OBJECTIVES OF THE UPDATE

The overall objective of this Fifth Update is to assess the source water quality of Lytle Creek to ensure the ability of the Oliver P. Roemer Water Filtration Facility (WFF) to continue to provide their customers with drinking water that meets all current drinking water standards. This Fifth Update also accomplishes some other specific objectives including:

- Review and evaluation of selected constituents of interest to identify potential water quality or treatment issues at the water treatment plant. Assess the ability of the Roemer WFF to meet drinking water standards based on current regulatory framework, as well as comment on the appropriate level of treatment for pathogens, specifically for *Giardia*, viruses, and *Cryptosporidium*.

- Review and evaluation of selected potential contaminating activities to identify potential impacts on source water quality.

- Development of recommendations that are economically feasible and within the authority of the West Valley Water District (WVWD) to implement.

KEY FINDINGS AND CONCLUSIONS

The key findings and conclusions for this report are organized as they pertain to source water quality, treatment and regulatory compliance, and watershed contaminant sources. Highlights of these findings and conclusions are presented below.

Source Water Quality

Overall, Lytle Creek provides excellent quality raw water. The raw water can be treated to meet all drinking water standards using conventional treatment processes. Key findings for the constituents of interest are presented below.

Turbidity

- The raw water turbidity data reflects the plant influent water, after the Lytle Creek source is blended with State Project Water (SPW).
- The Roemer WFF has relatively low levels of raw water turbidity, with an average value less than 1 nephelometric turbidity unit (NTU).
- There are no clear trends in the data, turbidity peaks can occur throughout the year.
- The four highest turbidity peaks were not clearly associated with a cause and effect from the Lytle Creek source.

Coliform

- The majority of peak coliform levels occur between late spring and early fall, possibly associated with peak recreational use in the watershed.
- Total coliform data show generally low levels. Individual samples had an average value of 139 most probable number per 100 milliliter (MPN/100 mL), a median value of 49 MPN/100 mL, and 98.5 percent of samples were less than 1,000 MPN/100 mL. Monthly medians had an average value of 99 MPN/100 mL, a median value of 64 MPN/100 mL and all monthly median values were less than 1,000 MPN/100 mL.
- Fecal coliform data show generally low levels. Individual samples had an average value of 27 MPN/100 mL, a median value of 7.8 MPN/100 mL, and 97.8 percent of samples were less than 200 MPN/100 mL. Monthly medians had an average value of 16 MPN/100 mL, a median value of 9.4 MPN/100 mL and all monthly median values were less than 200 MPN/100 mL.
- Fecal coliform data support 3/4-log treatment for *Giardia*/viruses is appropriate for all source water quality conditions during the study period.

Giardia/Cryptosporidium

- Two years of monthly data show no detect of either *Giardia* or *Cryptosporidium.*
- No detect of *Giardia* supports 3-log reduction is appropriate for the Roemer WFF.
- Maximum running annual average value for *Cryptosporidium* was 0 oocysts/L, well below the Bin 1 limit of 0.075 oocysts/L, which results in a continued Bin 1 classification with no additional action required under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR).

Disinfection By-Product Precursors

- The total organic carbon (TOC) data for Lytle Creek Influent show very low levels, with average and median values less than 1 mg/L in Lytle Creek.

- There were two sample events with TOC greater than 1 mg/L that were not associated with precipitation or any other specific activity in the watershed. Since these occurred during summer months, they could be associated with algae growth or illicit discharges.
- The peak TOC concentrations occur in early September, and can be twice as high as August and September results.

Intake Evaluation

Oliver P. Roemer Water Filtration Facility

The Roemer WFF is currently in compliance with all existing drinking water regulations. The Roemer WFF implements conventional filtration processes and meets all current drinking water standards, including maximum contaminant levels (MCLs) and treatment technology requirements. Below is a summary of the selected treatment and regulatory compliance issues.

Turbidity

- All combined filter effluent (CFE) turbidity measurements between January 2018 and December 2022 met the turbidity treatment technique limit and were less than 0.085 NTU.
- The peak daily settled water had an average value of 0.04 NTU and the average daily CFE had an average value of 0.03 NTU. This shows that a large amount of the solids removal is achieved during the pretreatment process of flocculation and sedimentation.
- Solids removal through plant averages 91 percent, meeting the 80 percent goal for conventional treatment. Removal is most challenging under low raw water turbidity periods.
- There has been a slight increasing trend in CFE since 2020, which does not appear to be solely related to source use at the Roemer WFF.

Microbiological Constituent Review

Distribution system monitoring for coliforms as part of the Total Coliform Rule resulted in a few detections of total coliform in the distribution system during the study period. In each month with a detect, less than five percent of samples were positive. Therefore, there were no violations of the total coliform MCL.

Disinfection Precursors

- Lytle Creek provides water relatively low in total organic carbon (TOC), with a range of non-detectable to 1.2 mg/L and an average of 0.41 mg/L.

- State Project Water has significantly higher TOC, with an average of 2.63 mg/L, which contributes to a higher blended water concentration through the Roemer WFF.
- Pretreatment facility provides an average of 21 percent reduction in TOC, with an average effluent TOC value of 1.86 mg/L.
- Roemer WFF CFE data show an average TOC value of 0.93 mg/L.
- GAC facility provides an average of 34 percent reduction in TOC, with an average effluent TOC value of 0.62 mg/L.
- The Plant Effluent sample site was evaluated for quarterly averages and running annual averages and showed that all were less than 2 mg/L.
- WVWD complies with the Stage 1 D/DBP Rule by meeting an alternative compliance criterion for the enhanced coagulation treatment technique, less than 2 mg/L in source or treated water.

Disinfection By-Products

- Total Trihalomethanes (TTHM) data is within the primary MCL of 80 µg/L, with all locational running annual average (LRAA)s less than or equal to 60 µg/L.
- Total Haloacetic Acid (HAA)5 data is well within the primary MCL of 60 µg/L, with all LRAAs less than or equal to 16 µg/L.
- Three of the distribution sites (sites 1, 2 and 6) with the higher disinfection byproduct (DBP) levels are associated with the Roemer WFF.
- DBP levels tend to increase during warmer months and there was an increasing trend for TTHMs seen from mid-2018 through early 2020.

Giardia/Virus/*Cryptosporidium* Reduction Requirements

Based on the total coliform, fecal coliform, *Giardia,* and *Cryptosporidium* data presented in **Section 3**, 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium* are appropriate reduction requirements for the Roemer WFF.

The Roemer WFF is classified as a conventional filtration water treatment plant, and is therefore granted reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. UV primary disinfection provides 4-log *Giardia,* 0.5-log viruses, and 4-log *Cryptosporidium* reduction credit. Residual disinfection with sodium hypochlorite provides a minimum of 1.5-log inactivation of viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Interim Enhanced SWTR, and the Long Term 2 ESWTR.

Unregulated Contaminant Monitoring Rule (UCMR) 4

WVWD participated in the USEPA's Fourth Unregulated Contaminant Monitoring Rule between January 2018 and October 2018. Three categories of monitoring were conducted:

- Quarterly monitoring at the Entry Point to the Distribution System (EPDS) for metals, alcohols, and pesticides was conducted and all results were non-detectable for the Roemer WFF. Samples represented a blend of Lytle Creek and SPW at the Roemer WFF as follows:
    - January 2018 (0-38 percent Lytle Creek in use)
    - April 2018 (76 percent Lytle Creek in use)
    - July 2018 (30-100 percent Lytle Creek in use)
    - October 2018 (18 percent Lytle Creek in use)
- Biweekly monitoring at the EPDS was conducted for cyanotoxins, and all results were non-detectable for the Roemer WFF. Samples represented a blend of Lytle Creek and SPW from April 4 through July 16, with Lytle Creek use ranging from 30-100 percent.
- Quarterly monitoring at four sites in the distribution system for haloacetic acids. Stage 2 D/DBP Rule sites 1, 2, 7, and 8 were included, with sites 1 and 2 representing Roemer WFF treated water. Samples were analyzed for HAA5, HAA6Br, and HAA9. The UCMR4 HAA samples were collected in the same month, but not the same day, as the Stage 2 D/DBP Rule samples. Therefore, the HAA5 levels are similar between the programs but not exactly the same. There was consistency with the historic detections of HAA5 and that the HAA6Br and HAA9 results should be reasonable predictors of typical concentrations of these constituents. Peak values typically occurred in the third quarter of the year at all sites, which represented warmer water and only 12 percent Lytle Creek source in the distribution system. Even with the addition of the key brominated species, HAA9 levels are still below the current HAA5 MCL of 60 ug/L.

Watershed Contaminant Sources

There are numerous types of potential contaminating activities (PCAs) in the watershed. Six activities were selected for evaluation in this report based on constituents of interest and predominance in the watershed. Overall, there have been no significant changes in the watershed since the 2018 Update. Selected findings for each of these activities are provided below.

Spills

- There were six spills/incidents listed in the State Office of Emergency Services (OES) Hazardous Materials Release database from 2018 to 2022.

- Two of the spills involved sewage and four of the spills involved petroleum products.

- The largest spill which entered Lytle Creek occurred on February 14, 2019. The spill was caused by infiltration of storm water into the private sewer collection system at Mountain Lakes. From the limited data collected, it appears that an increase of biological activity, likely fecal coliform in Lytle Creek occurred as a result for three days after the spill.

- There were no chemical related spills due to traffic accidents. The main transportation route through the watershed is Lytle Creek Road.

Recreation

- Recreational uses in the Lytle Creek watershed are primarily for camping, picnicking, hiking, fishing, hunting, off-highway vehicle use, and swimming in the creek. The watershed currently receives approximately 50,000 day-use visitors on an annual basis, and can experience as much as 10,000 visitors on peak summer weekends. The majority of recreational users are weekend users who are coming to the canyon during the summer.

- The United States Forest Service (USFS) does not have resources to actively manage people swimming in Lytle Creek. However, the USFS will begin implementing the Lytle Creek Recreational Management Plan in the fall of 2023 which will increase paved parking, restrooms, trails, garbage receptacles and informational kiosks. This should improve sanitation and litter issues, and reduce sediment load to Lytle Creek.

- Water quality data collected to date indicate that fecal coliform levels at the Southern California Edison (SCE) Afterbay increase in the summertime, likely as a result of body contact recreation in Lytle Creek.

Wastewater

- There are no wastewater treatment plants which discharge treated effluent directly to Lytle Creek.

- The Regional Board performs inspections of the Lytle Creek wastewater treatment plant, and the facility has been in compliance during the reporting period.

- The total number of sewer service connections for the Lytle Creek service area was 400 in 2022.

- About 90 percent of Lytle Creek residences receive centralized sewer services, while approximately 10 percent remains off-line. The locations of the remaining septic systems in the watershed are unknown.

- Completion of the Lytle Creek Force Main Replacement Project by the County of San Bernardino Special Districts Department (CSBSDD) will reduce the potential of sewage spills to Lytle Creek.

Developments

- Overall, there has been little to no development within the watershed within the past five years.

- There are little to no commercial and industrial uses within the watershed, as it is primarily residential and open space.

Fires

- The Lytle Creek watershed is entirely a high to extremely high fire risk based on vegetation. The largest wildfire over the reporting period was the South Fire which occurred from August 25 to September 2, 2021. The Roemer WFF was not impacted immediately by the South Fire as the plant was not treating Lytle Creek water from August 26 to September 14, 2021. Additionally, water quality samples collected on September 1, 2021 did not show detectable levels of per-and polyfluoroalkyl substances (PFAS) or polybrominated diphenyl ethers (PBDE). All other results did not show elevated levels.

- WVWD is able to minimize fire-related impacts to the Roemer WFF by shutting the plant down during times of degraded source water quality.

- The USFS will implement the Lytle Creek Hazardous Fuels Reduction Project which will reduce the risk of catastrophic wildfire in the watershed.

Floods/Erosion

- Flooding and debris flows occur in the Lytle Creek watershed as it is a natural canyon area with steep topography and can receive high amounts of rainfall in a short time period.

- Debris and flood flows are also uncontrolled in the upper reaches of Lytle Creek, since there are no flood control facilities upstream of the Lytle Creek communities.

- Flows in Lytle Creek were higher over this time period (compared to 2013 to 2017) with an average daily discharge of 9.4 cubic feet per second (cfs).

- WVWD typically avoids using Lytle Creek water during high storm events, in order to prevent high turbidity and china clay from entering the treatment plant.

RECOMMENDATIONS

A number of recommendations covering water quality and watershed management were developed for this Fifth Update. Please refer to **Section 6** for further information on the recommendations.

INTRODUCTION

This report presents the findings of the Fifth Update to the Lytle Creek Watershed Sanitary Survey. This study covers the period January 1, 2018 through December 31, 2022. The Fourth Update was completed in May 2018, the Third Update was completed in June 2013, the Second Update was completed in July 2008, the First Update was completed in August 2003, and the initial Watershed Sanitary Survey was completed in 1998 in accordance with the California Surface Water Treatment Rule (SWTR).

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

OBJECTIVES OF THE UPDATE

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. In order to fully assess the ability of the West Valley Water District (WVWD) to treat Lytle Creek water, some evaluation of treatment plant capabilities and treated water quality is also necessary.

This Fifth Update is intended to accomplish the following objectives:

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

2) Review and evaluation of selected constituents of interest to identify potential water quality or treatment issues at the Oliver P. Roemer Water Filtration Facility (Roemer WFF). Assess the ability of the treatment plant to meet standards based on current regulatory framework.

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

4) Identification of 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 WVWD to implement is critical.

CONSTITUENTS AND POTENTIAL CONTAMINATING ACTIVITIES COVERED IN THE FIFTH UPDATE

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

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

Constituent	Reason for Inclusion in Fifth Update
Turbidity	Turbidity is a measurement of suspended solids in water. Treated water turbidity levels are regulated in the SWTR and the IESWTR.
Total Coliform	Monthly medians are recommended for evaluation under the SWTR to determine appropriate level of treatment for *Giardia* and viruses.
Fecal Coliform	Fecal coliform is a surrogate for fecal contamination.
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* were 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 Rule (D/DBP).
Total Trihalomethanes	Total Trihalomethanes (TTHMs) are disinfection by-products formed in disinfected treated water. Treated water levels are regulated by the Stage 1 D/DBP Rule and further regulated under the Stage 2 D/DBP Rule.
Haloacetic Acids	Haloacetic acids (HAA5) are disinfection by-products formed in disinfected treated water. Treated water levels are regulated by the Stage 1 D/DBP Rule and further regulated under the Stage 2 D/DBP Rule.
Unregulated Contaminant Monitoring Rule (UCMR) 4	UCMR 4 data should be evaluated to verify the presence or absence of UCMR4 contaminants in the treated water.

Six potential contaminating activities were selected for review as part of the Fifth Update: spills, recreation, wastewater, development, fires, and floods/erosion. Each of these activities can contribute at least one of the constituents identified in **Table 1-1** to the source water. These activities were selected based on their presence in the watershed, and were identified by the WVWD as key contaminating activities.

DESCRIPTION OF HOW THE FIFTH UPDATE WAS CONDUCTED

The project team consisted of a Technical Committee comprised of representatives from the WVWD and the consultant team of Palencia Consulting Engineers and Starr Consulting. The Technical Committee participated in developing the scope of work and reviewed identification and development of key findings and recommendations.

The consultant team obtained information from the WVWD through a survey that addressed the Roemer WFF's process, including a discussion of treatment challenges and changes since the 2018 Watershed Sanitary Survey. Raw and treated water quality data was also provided by the WVWD.

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

REPORT ORGANIZATION

Section 1 – Introduction

This section describes the objectives of the Fifth Update, lists the main constituents and potentially contaminating activities covered in the Fifth Update, describes how the Fifth Update was conducted, and includes a description of the basic report organization.

Section 2- The Watershed and Supply Systems

This section is largely descriptive and provides: (1) a brief overview of the physical, hydrologic, and land use characteristics of the watershed, (2) a description of the existing water supply system, and (3) contains watershed maps delineating the watershed and outlining land use and land ownership in the watershed. For more detailed descriptive information on watershed characteristics, the reader is referred to the 2003 Watershed Sanitary Survey.

Section 3 – Lytle Creek Water Quality Review

This section 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.

Section 4 – Watershed Contaminant Sources Review

This section describes pertinent characteristics of each of the six potential contaminating activities that were reviewed as part of this Fifth Update. If applicable, each potential contaminating activity will include a discussion on background and occurrence, seasonal patterns, water quality issues and data review, regulation and management, and source water protection activities.

Section 5 - Intake Evaluation

This section contains an evaluation of the Roemer WFF's treated water quality, as well as an evaluation of the Roemer WFF's ability to meet the SWTR as well as other existing regulations.

Section 6 – Recommendations

This section consists of a list of recommendations for future source water protection efforts.

WATERSHED DESCRIPTION

This section provides an overall description of the watershed, which summarizes physical, hydrologic, and land use characteristics. Major watershed characteristics such as soils, geology, biology, and topography have changed little since the original 1998 and 2003 Survey. For a more detailed account of this information, the reader is referred to the 2003 Survey. This section provides a description of the West Valley Water District's (WVWD) existing water supply system, including a brief description of the Oliver P. Roemer Water Filtration Facility (Roemer WFF). There is also a discussion of how water is diverted off Lytle Creek and delivered to the Roemer WFF.

The Lytle Creek watershed is located in the Upper Santa Ana River basin at the easternmost extension of the San Gabriel Mountains and is approximately 60 square miles. Lytle Creek flows in a southeasterly direction where it joins Cajon Creek before finally reaching its confluence with the Santa Ana River near Colton. However, the entire watershed is not tributary to water treated by the WVWD as water is diverted from Lytle Creek at two diversion points which are well upstream of where Lytle and Cajon creeks intersect. The portion of the watershed which is tributary to the two diversion points is shown in **Figure 2-1**, and is approximately 47 square miles.

Lytle Creek is a perennial stream that begins at the top of Mt. San Antonio, at an elevation of approximately 10,000 feet and flows eastward in three forks (North Fork, Middle Fork, and South Fork). The area is highly dissected by deep canyons, steep slopes, cliffs, and narrow ridges (United States Forest Service [USFS] Land Management Plan, 2005).

A variety of habitats can be found from chaparral, to lush riparian to high elevation conifers. Vegetation consists of mature stands of mixed conifer with some black oak, scattered areas of scrub oak and chaparral, and some isolated pockets of bigcone Douglas fir (California Wilderness Coalition 2008).

The streams and wilderness areas in the canyon provide important habitats for mountain lion, bear, badger, bighorn sheep, great horned owls, red-tailed hawk, coyotes, kangaroo rats, bald eagles, golden eagles, and a variety of birds.

Land Ownership

The United States Forest Service (USFS) is the prime landowner in the Lytle Creek watershed, owning approximately 96 percent with the remaining 4 percent unclassified**.** The private lands in the watershed are associated with the communities of Scotland, Happy Jack, and Lytle Creek.

Land use

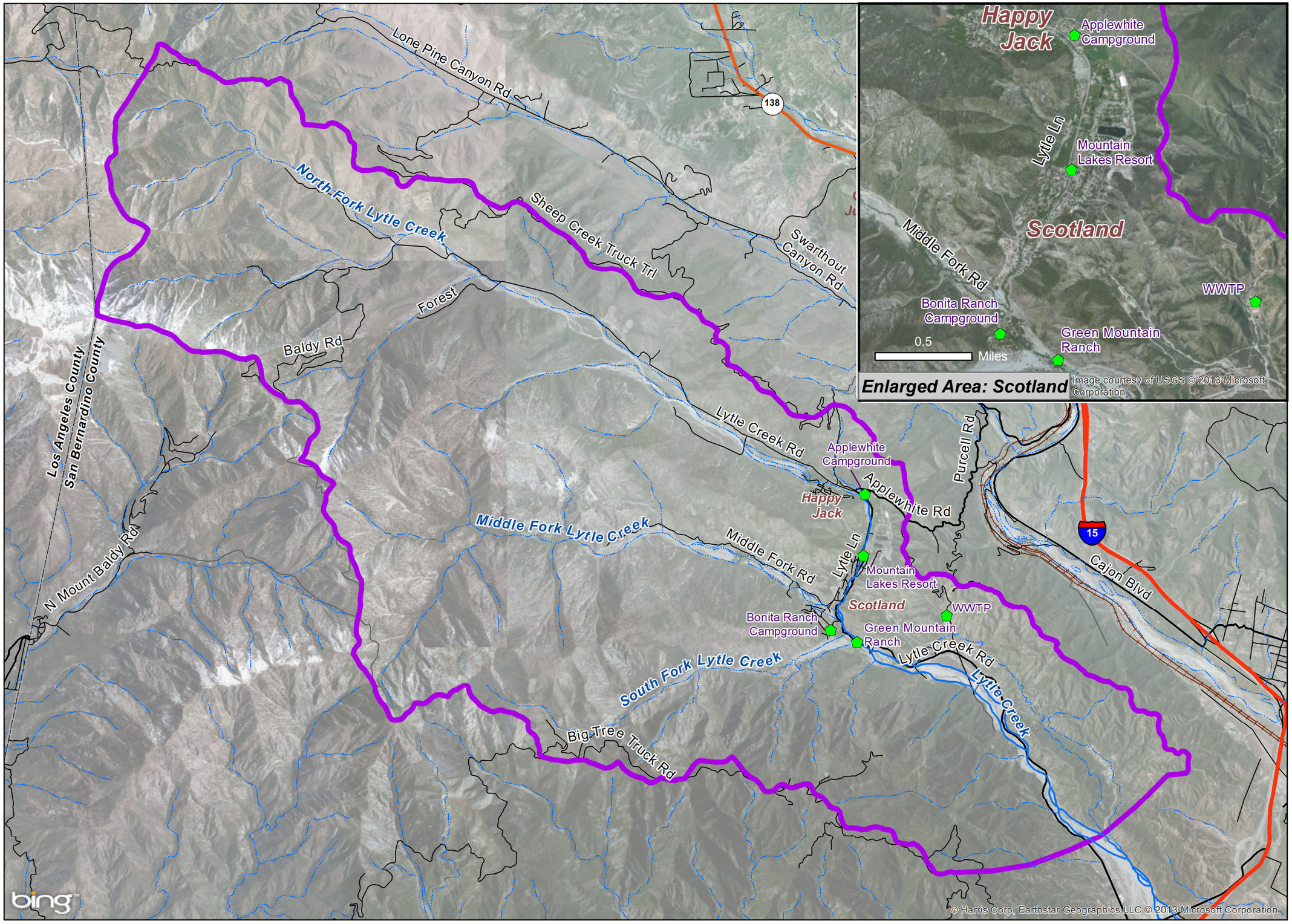
Most of the land use in the Lytle Creek watershed is vacant, as the majority of the land is owned by the USFS. Approximately 97 percent of the watershed is vacant, 2.2 percent is for open space/recreation, 0.5 percent is residential, and 0.1 percent is public/institutional. There are minimal commercial and no industrial uses in the watershed.

There are no incorporated cities within the watershed. There are several small community clusters such as Scotland, Happy Jack, and Lytle Creek. According to the 2020 Lytle Creek Canyon Recreation Management Plan, the population of the Lytle Creek Community is 900. The residents of Lytle Creek have a strong desire to maintain present mountain lifestyle, preferring development to be mainly residential. They are opposed to commercial development and would like to keep tourism to a minimum (Lytle Creek Community Plan, 2007). There are a few businesses along Lytle Creek Road, such as a grocery store, post office, restaurant, shooting range and fire station.

Climate and Precipitation

The climate of the watershed ranges from Mediterranean to mountain, from temperate to hot, with cooler temperatures at the higher elevations. Precipitation ranges throughout the watershed, with snow in the winter on the tallest peaks (USFS Land Management Plan, 2005).

Figure 2-2 shows daily precipitation totals from the USFS rain gauge in the Lytle Creek watershed from 2018 to 2022. The highest daily rainfall total was 5.93 inches on November 8, 2022. The highest annual rainfall from 2018 to 2022 was 2019 with an annual total of 56.6 inches, and the lowest year was 2018 at an annual total of 23.18 inches.



0 0.5 1 Miles

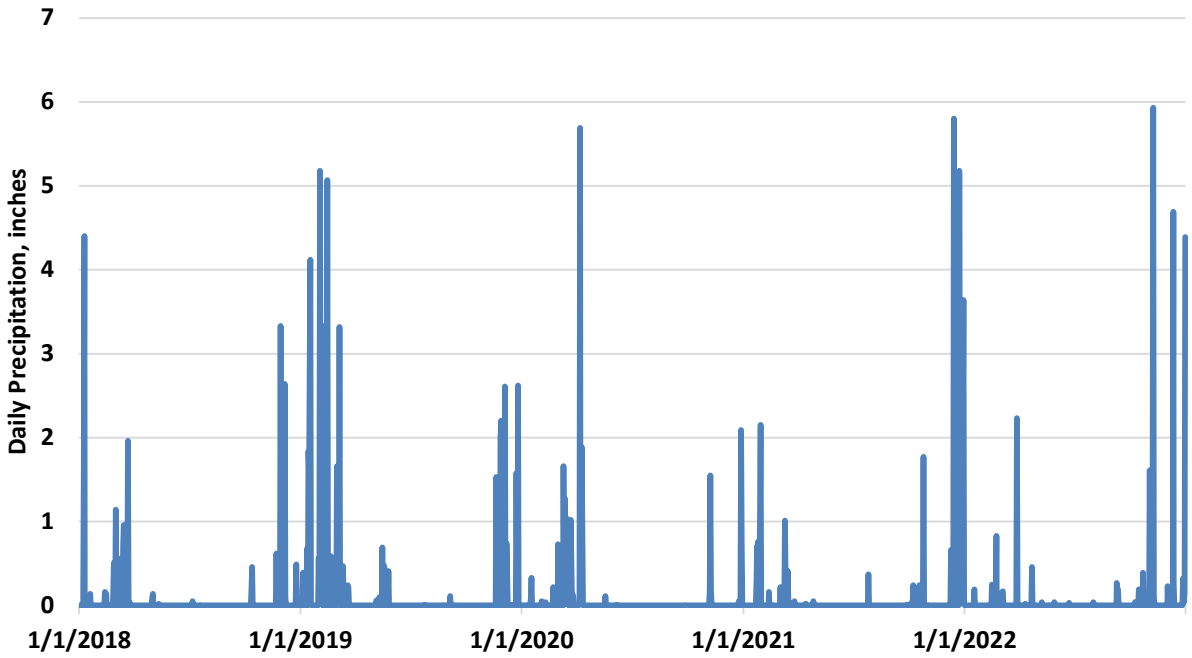
LEGEND

- Watershed Boundary
- Facility

Lytle Creek Watershed

WATERSHED
Figure 2-1

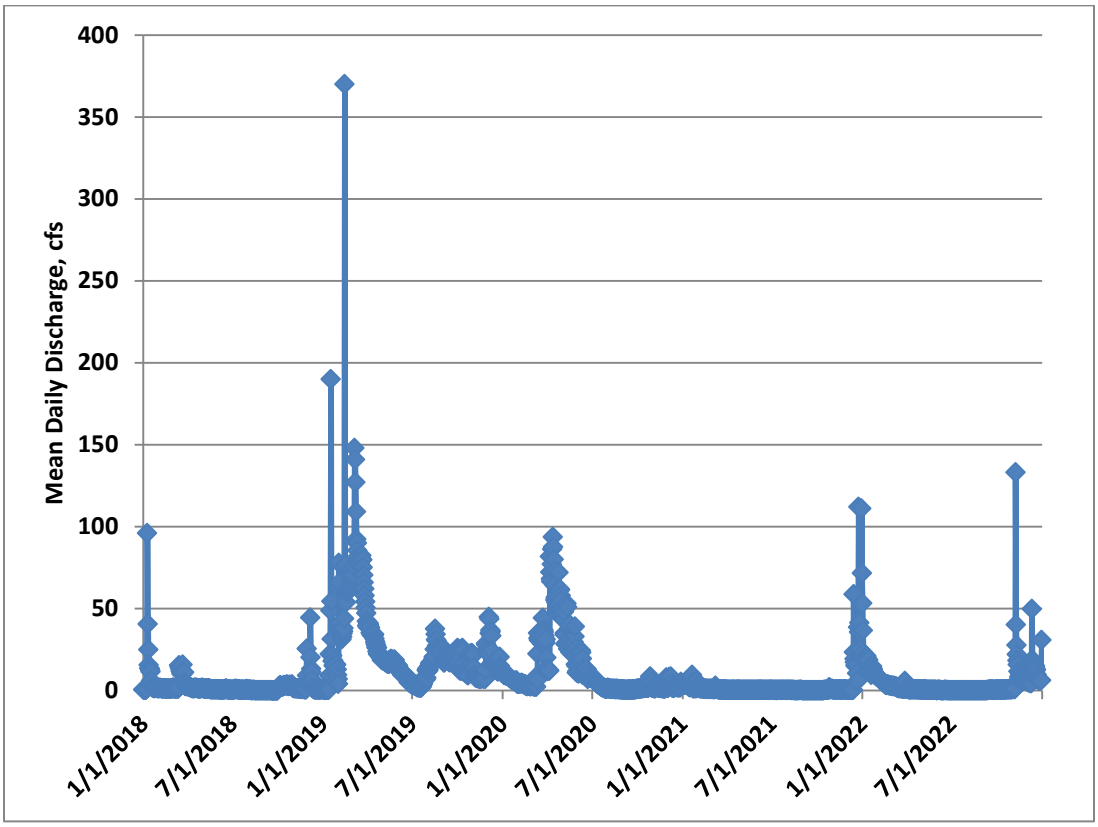
Figure 2-2
Daily Precipitation at USFS LYC Station, 2018 – 2022



Stream Flow

There is no stream flow gage upstream of the upper Southern California Edison (SCE) diversion. The USGS maintains a stream gauge in Lytle Creek which is located about 2.3 miles downstream from the upper SCE diversion and about a ¼ mile downstream from the end of infiltration gallery for the Grapeland Tunnel (site 11062000). **Figure 2-3** shows the flow in Lytle Creek from 2018 to 2022. Daily discharge flow averaged 9.4 cubic feet per second (cfs), compared to 2.2 cfs from 2013 to 2017.

Figure 2-3
Mean Daily Discharge for Lytle Creek at USGS station 11062000, 2018-2022



DIVERSION FROM LYTLE CREEK TO WEST VALLEY WATER DISTRICT

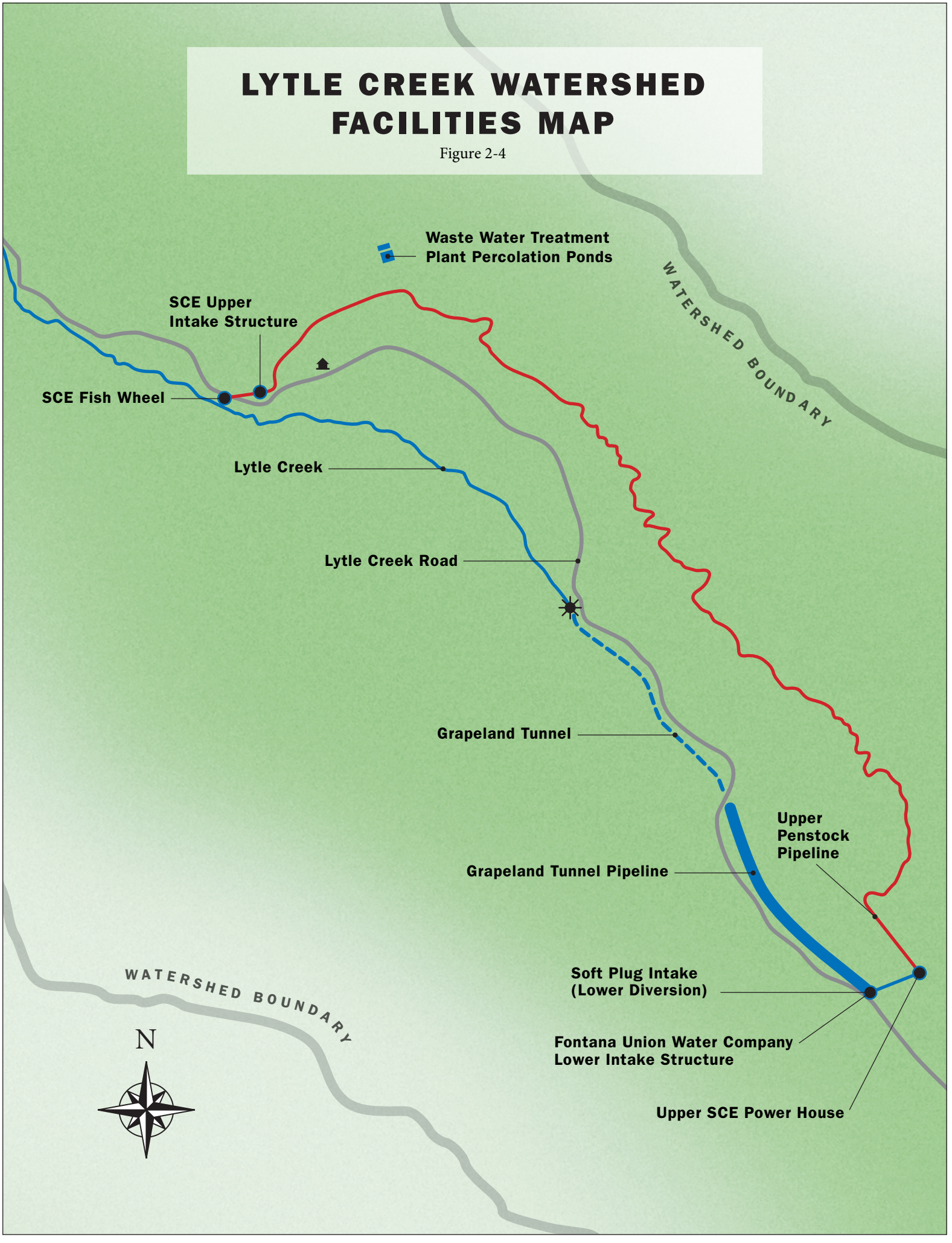
The Lytle Creek source for WVWD is diverted from Lytle Creek at two facilities along the creek. There is an upper diversion that is owned and operated by SCE and a lower intake structure that is owned by Fontana Union Water Company (FUWC) and operated by Fontana Water Company (FWC). Infiltrated groundwater is also collected from the Grapeland Tunnel by FUWC and blended with the diverted surface water.

SCE diverts water through the Fish Wheel and Sand Box into the upper diversion, and the flow is then conveyed by a penstock pipeline to the SCE Fontana Powerhouse where it is used for power generation. The upper SCE diversion is located approximately four miles north of the lower intake structure. Please see **Figure 2-4** for a diagram showing facility locations.

Creek flow remaining in Lytle Creek after the upper SCE diversion may either continue downstream or it can infiltrate into the ground and be captured in the Grapeland tunnel. According to the 2008 Watershed Sanitary Survey Update Report, the tunnel length was to be 2,850 feet and 4.5 feet wide and 6.5 feet high. Any surface flow in the creek remaining after the upper SCE diversion and infiltration into the Grapeland Tunnel is diverted into the lower intake structure through an earthen diversion dam (soft plug).

LYTLE CREEK WATERSHED FACILITIES MAP

Figure 2-4



This soft plug is constructed to blow out in times of high storm/runoff flows. During high storm/runoff flows all water flows are diverted back into the stream. The lower intake structure is located approximately three miles above the intersection of Riverside Avenue and Lytle Creek Road.

Water from the upper penstock pipeline and waters collected in the Grapeland Tunnel are joined at the FUWC weir 1 diversion structure intake, as well as additional surface flow. The blended water is then transported from the lower intake structure, via underground pipeline, approximately 25,000 feet to the Fontana Powerhouse Forebay owned by FUWC. Lytle Creek water is then transported from this Powerhouse Afterbay to an adjacent facility owned by WVWD. Raw water is delivered by gravity via a 30-inch diameter pipeline to the two 2.0 million gallon influent blending ponds at the Roemer WFF.

In order to reduce sunlight and reduce algal growth and evaporation, the Fontana Water Company added black hexagonal balls into the Powerhouse Afterbay in December 2022.

WATER SUPPLY SYSTEM – WEST VALLEY WATER DISTRICT

Background

WVWD is a county water district and a public agency of the State of California. The District was formed in 1952 under the name Bloomington County Water Company, which was changed to Semi-tropic County Water District in 1959, then to West San Bernardino County Water District in 1961, and then to West Valley Water District in 2003.

The service area is 29.5 square miles, providing water service to portions of Rialto, Colton, Fontana, North Riverside County and the community of Bloomington. Currently, the WVWD serves 96,738 water customers.

WVWD has four sources of water: local surface water from Lytle Creek, State Project Water, groundwater, and purchased water from the San Bernardino Valley Municipal Water District. WVWD currently utilizes water from five groundwater basins: Lytle Creek, Rialto, Bunker Hill, North Riverside, and Chino. **Table 2-1** provides the breakdown of water sources used for years 2018 through 2022.

Table 2-1. Percent Breakdown of Water Sources Utilized by WVWD, 2009-2022

Year	Surface Water (local and SPW)	Groundwater	Purchased Well Water
2009	21.5	66.6	11.9
2010	25	61	14
2011	27.5	58	14.4
2012	30.3	60.8	8.8
2013	25	60	15
2014	23	54	23
2015	23	54	23
2016	30	46	24
2017	32	51	17
2018	37	45	18
2019	41	40	19
2020	47.7	35	17.3
2021	41.7	47.2	11.1
2022	27.6	51	21.4

The Roemer WFF can treat 100 percent Lytle Creek water, 100 percent State Project Water, or a blend. Lytle Creek water is used when available, from November to May over this reporting period. During the previous reporting period, Lytle Creek was used primarily from December through May. Detailed information about the percent blends treated at the Roemer WFF over the reporting period is discussed in **Section 3**. WVWD treats Lytle Creek flow based on the combined legal entitlements of the cities of Rialto and San Bernardino, and the WVWD. When Lytle Creek is not in proration, the maximum flows for each are as follows:

City of Rialto - 1,034 gallons per minute (gpm)
City of San Bernardino - 1,350 gpm
WVWD - 2,291 gpm
FUWC – receives remaining flow above three combined entitlements.

Oliver P. Roemer Water Filtration Facility

The WFF currently operates under the 2012 permit which rates the plant capacity at 14.4 million gallons per day (mgd). The plant was classified as a conventional WTP by CDPH's Engineering Report and is therefore granted 2.5/2.0/2.0-log reduction credit for *Giardia*/viruses/*Cryptosporidium*. In October 2017, DDW issued a permit amendment allowing the WVWD to expand the existing granular activated carbon (GAC) system by four vessels at the Roemer WFF. The addition of four GAC vessels did not change the nameplate capacity of 14.4 mgd, but the addition improves the TOC removal rate to minimize formation of disinfection byproducts in the distribution system.

In order to provide additional solids removal for State Project Water, that water is sent to a pretreatment facility prior to blending with Lytle Creek water. The pretreatment

facilities include a flow splitting structure with design capacity of 21.6 mgd and three high-rate conventional treatment trains with a capacity of 7.2 mgd for each train. Each train includes one flocculation basin (serpentine with three stages) and sedimentation basin (inclined plate settlers). Aluminum sulfate was used as the primary coagulant, until July 2015 when aluminum chlorohydrate (ACH) replaced aluminum sulfate. Cationic polymer is also used as a coagulant aid, and there is an option of using sodium hydroxide for pH control during pretreatment. The Lytle Creek source is typically sent directly to the raw water blending reservoirs. The effluent from the raw water blending reservoirs is then sent to the filtration plant.

The Roemer WFF utilizes coagulation, contact clarification, filtration and post filtration process including a UV system, GAC, and chlorine disinfection. The filtration plant consists of six Siemens Microfloc Trident 840 package units which provide two-stage filtration. Chemical feed occurs at the influent to the plant and upstream of the Microfloc units. This includes pre-chlorination, coagulation with ACH, and cationic polymer as needed. Conventional filtration equivalent is provided by the package system consisting of contact absorption clarification and multi-media filtration. The filtered water is then sent through UV reactors for disinfection.

If TOC levels in the filter plant effluent water need to be further reduced prior to disinfection then a portion of the stream will be sent to the GAC filters and then blended back in the filter plant effluent. Finally, the water is post-chlorinated with liquid sodium hypochlorite in a chlorine contact tank to provide a distribution system disinfectant residual.

To provide existing customers with a reliable and drought resistant water supply and to meet rising peak summer demands and projected demands due to infill and growth, the District is implementing the Oliver P. Roemer Water Filtration Facility Upgrade and Expansion Project (Project). The Project will increase treatment capacity at the existing Roemer WFF by 7.2 mgd, for a total treatment capacity of 21.6 mgd and will upgrade critical facility components. The Project will replace aging infrastructure, increase system security, provide operational flexibility, and assist in responsibly managing regional groundwater basins. With the construction of this Project, the District is seeking to implement a conjunctive use strategy which is critical for the long term, sustainable water management for the region.

On October 31, 2022, WVWD entered into an Agreement with PCL Construction, Inc. (PCL) for the design-build of the Oliver P. Roemer WFF Upgrade and Expansion Project which consists of the design and construction of the new and upgraded facilities including an influent and effluent pump station, new filter building with three (3) Trident Filters, a laboratory/SCADA area, PLC room and improvements.

Upgrades include new ultraviolet disinfection reactors, new granulated activated carbon influent pumps and electrical/mechanical upgrades of the existing facility that will provide security and reliability enhancements

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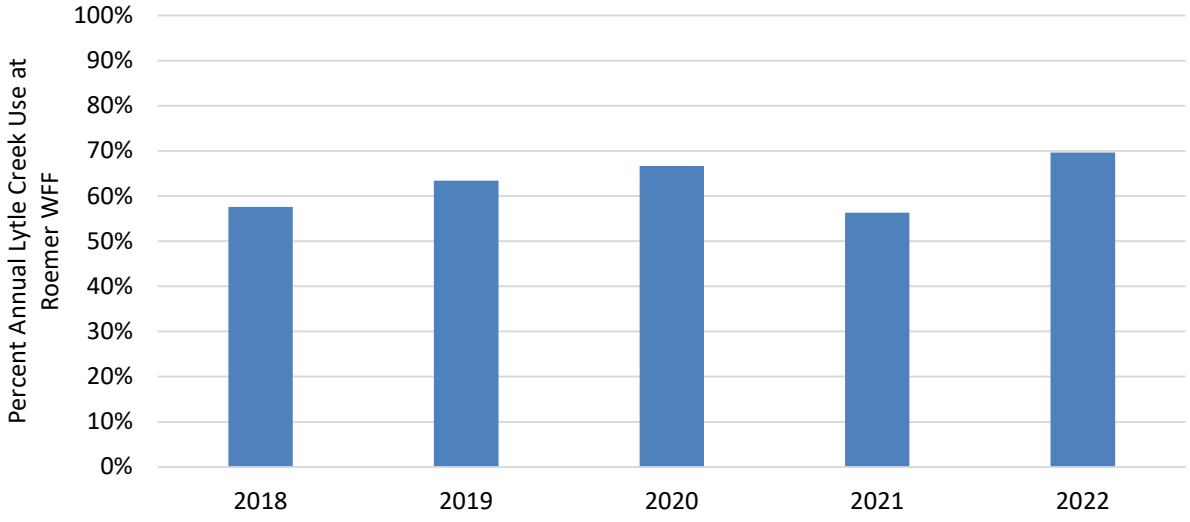
This section first provides an overall review of the water quality data available for Lytle Creek. A review of the California Environmental Data Exchange Network (CEDEN) website was conducted to identify applicable ambient monitoring data from other programs in the watershed. There were two outside ambient water quality monitoring programs in the study area with available drinking water constituent data for the study period; January 1, 2018 through December 31, 2022. One study was conducted by the Santa Ana Regional Water Quality Board's (Regional Board) Surface Water Ambient Monitoring Program (SWAMP) Stormwater Monitoring Coalition and one study was conducted by the Santa Ana River Regional Bacteria Monitoring Program. The studies included limited sites, constituents, and frequencies. Therefore, the data is not included in this report and the overall water quality review will be based on the data collected by West Valley Water District (WVWD). **Appendix B** contains a summary of the Oliver P. Roemer Water Filtration Facility (Roemer WFF) 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 during the study period. For assistance with abbreviations and acronyms, the reader is referred to the List of Abbreviations at the front of the Report.

It must be noted that the Roemer WFF can treat either 100 percent Lytle Creek or State Project Water (SPW), or a blend, and that the amount of Lytle Creek water used varies annually. Some raw water samples collected by WVWD represent the Lytle Creek influent, while others represent Roemer WFF raw water that is blended and depends on the source concentration. Understanding the timing of use of the Lytle Creek source helps with interpreting both raw and treated water quality data. **Figure 3-1** presents the percent annual use of Lytle Creek water at the Roemer WFF. It can be seen that Lytle Creek accounts for approximately 63 percent annually, but ranges from 56 to 70 percent. Peak use occurred in 2022 and 2020.

Figure 3-1
Percent Annual Lytle Creek Use at Roemer WFF, 2018 - 2022



In most years Lytle Creek is predominately used during the wet weather months, from November through May. **Figure 3-2** presents a comparison of the percent of Lytle Creek water at the Roemer WFF in each year, by month, during the study period. The general trend of decreased Lytle Creek use during the summer months was seen in all years except 2020.

Figure 3-2
Percent Monthly Lytle Creek Use at Roemer WFF, 2018 - 2022

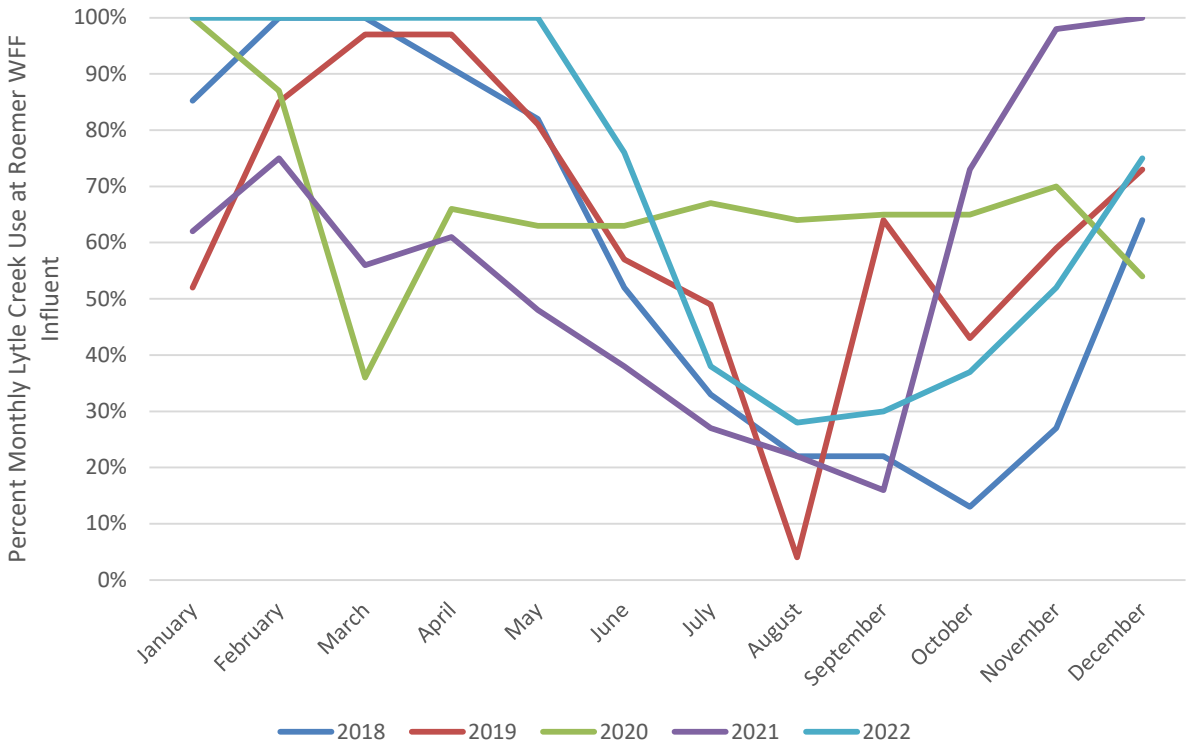
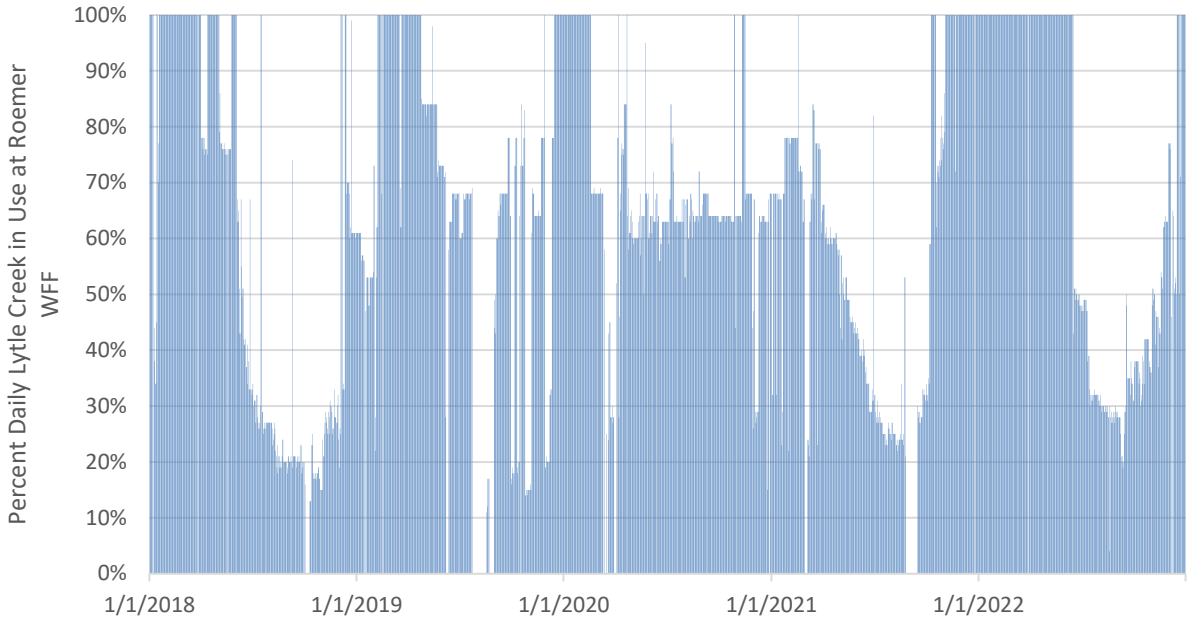


Figure 3-3 presents a time series plot of the percent of Lytle Creek water in the influent of the Roemer WFF on a daily basis during the study period. This chart provides insight on periods of particularly heavy use of Lytle Creek, such as the first half of 2022, and periods of limited use of Lytle Creek, especially in 2021. This data was used to confirm whether Lytle Creek was in use on specific sample dates.

Figure 3-3
Percent Daily Lytle Creek Use at Roemer WFF Influent, 2018 - 2022



Another factor affecting source water quality in Lytle Creek is the amount and timing of precipitation in the watershed. The United States Forest Service (USFS) has a rain monitoring station in the Lytle Creek watershed (LYC) that records daily precipitation. **Figure 3-4** shows that similar to historical patterns, most rainfall occurs during the winter months (November through April). Each year a peak storm event of 5 to 6 inches is seen in the Lytle Creek watershed.

Figure 3-4
Daily Precipitation at USFS LYC Station, 2018 – 2022

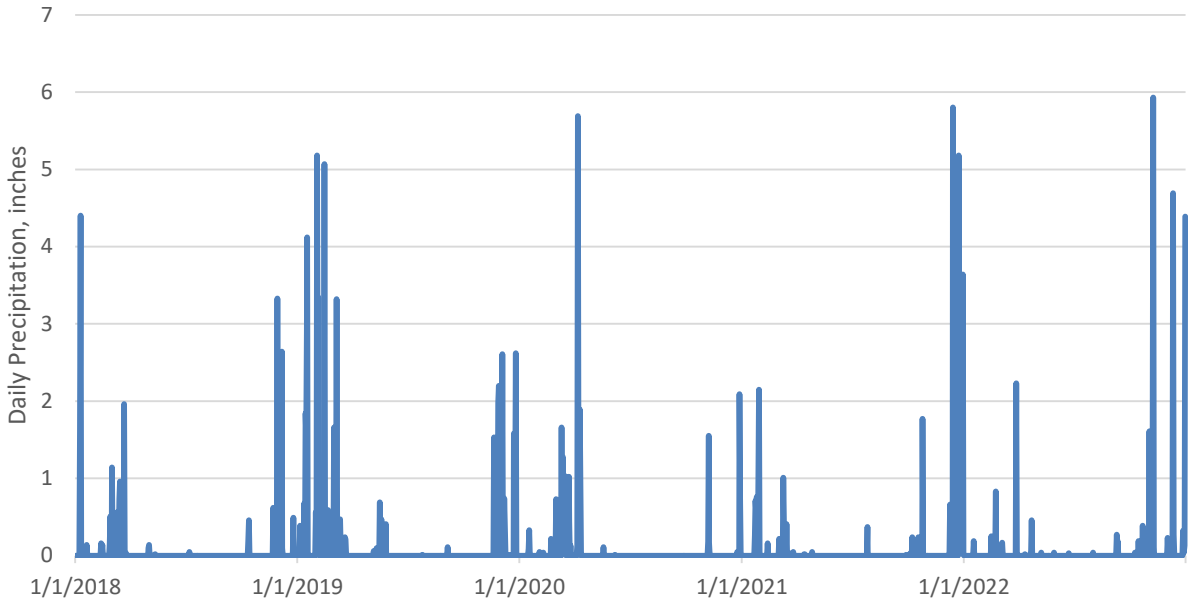
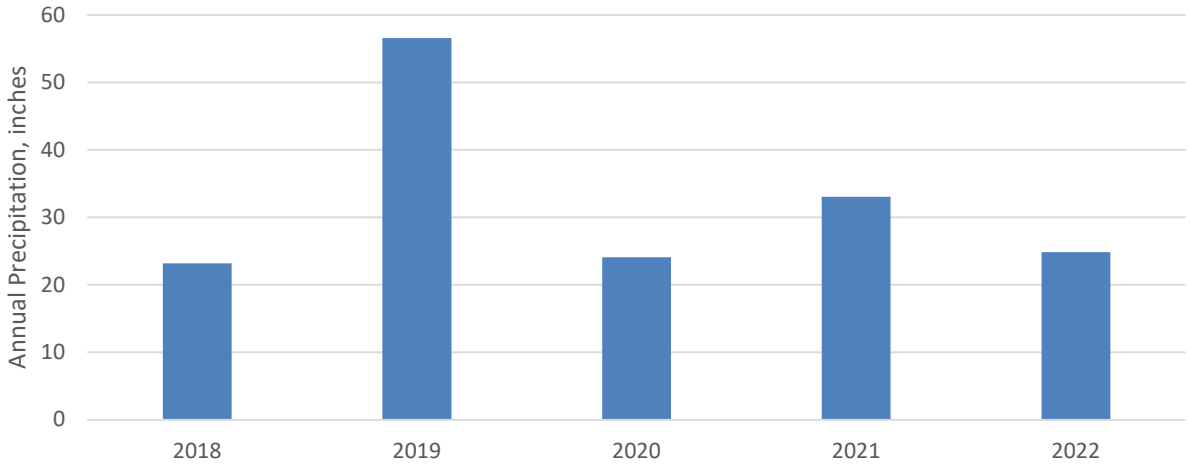


Figure 3-5 shows the annual precipitation each year of the study period. The average annual precipitation was just over 32 inches, but ranged widely from 23 to 56 inches. Most of the years were between 20 and 30 inches, while 2019 appears to be an extreme outlier.

Figure 3-5
Annual Precipitation at USFS LYC Station, 2018 – 2022



OVERALL WATER QUALITY REVIEW

The review of overall water quality is based on comparison of the Roemer WFF 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. There is an exception for aluminum because it is added to the water as the primary coagulant. Compliance with MCLs and Notification Levels is typically based on treated water sample results.

Overall, Lytle Creek provides excellent quality water. The raw water is treated to meet drinking water standards using conventional filtration processes. There are no constituents present in the raw water that consistently require additional treatment processes. The individual intake evaluation for treated water and regulatory compliance is presented in **Section 5**.

Selected raw water data has been summarized and is included in the summary table below. **Table 3-1** presents the statistics for each selected constituent.

Table 3-1
Summary of Raw Water Quality Data for the Roemer WFF, 2018 - 2022

Constituent	Units	Range	Average	Median	95th Percentile
Turbidity[1]	NTU	0.019 – 9.6	0.64	0.4	1.68
Total Coliform[2,3]	MPN/ 100 mL	<2 - >1600	139	49	540
Fecal Coliform[2,3]	MPN/ 100 mL	<2 - 920	27	7.8	83
Total Organic Carbon[2,4]	mg/L	<0.15 – 1.2	0.41	0.36	0.71

[1]Based on peak daily value for raw water turbidity, representing a blend of Lytle Creek and SPW, from January 1, 2018 through December 31, 2018 during operational periods only
[2]Based on Lytle Creek Influent
[3]Total and fecal coliform based on data from January 4, 2018 through December 26, 2022
[4]Based on data from January 4, 2018 through December 5, 2022

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, total coliform, fecal coliform, *E. coli*, *Giardia*, *Cryptosporidium*, and total organic carbon (TOC). 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**.

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 3-2** shows the relationship between potential contaminating activities and water quality constituents.

Table 3-2
Relationship Between Potential Contaminating Activities and Water Quality

	Wastewater	Recreation	Floods/ Erosion	Spills	Fires	Development
Turbidity	√	√	√		√	√
Microbial Constituents	√	√	√	√		√
TOC	√		√		√	√

Turbidity

General Characteristics and Background

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

Turbidity was selected for further evaluation since most utilities, including WVWD, optimize pretreatment processes to maximum turbidity removal in order to reduce the potential for pathogens, such as *Giardia* and *Cryptosporidium*, in treated drinking water. Turbidity is monitored throughout the water treatment plant to ensure that particles are removed. Turbidity has been assumed to be an indicator organism 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 monthly measurements and the turbidity may never exceed 1 NTU. Continuous turbidity monitoring for individual filters is required. Turbidity has also been indirectly regulated in drinking water as part of the Filter Backwash Rule. This rule requires that recycled waste streams return to the plant headworks upstream of all chemical feed systems and recommends return at a controlled, small percentage of total flow (less than 10 percent) to ensure that chemical feed is adjusted for blended water quality, including potential increases in turbidity caused by recycle streams.

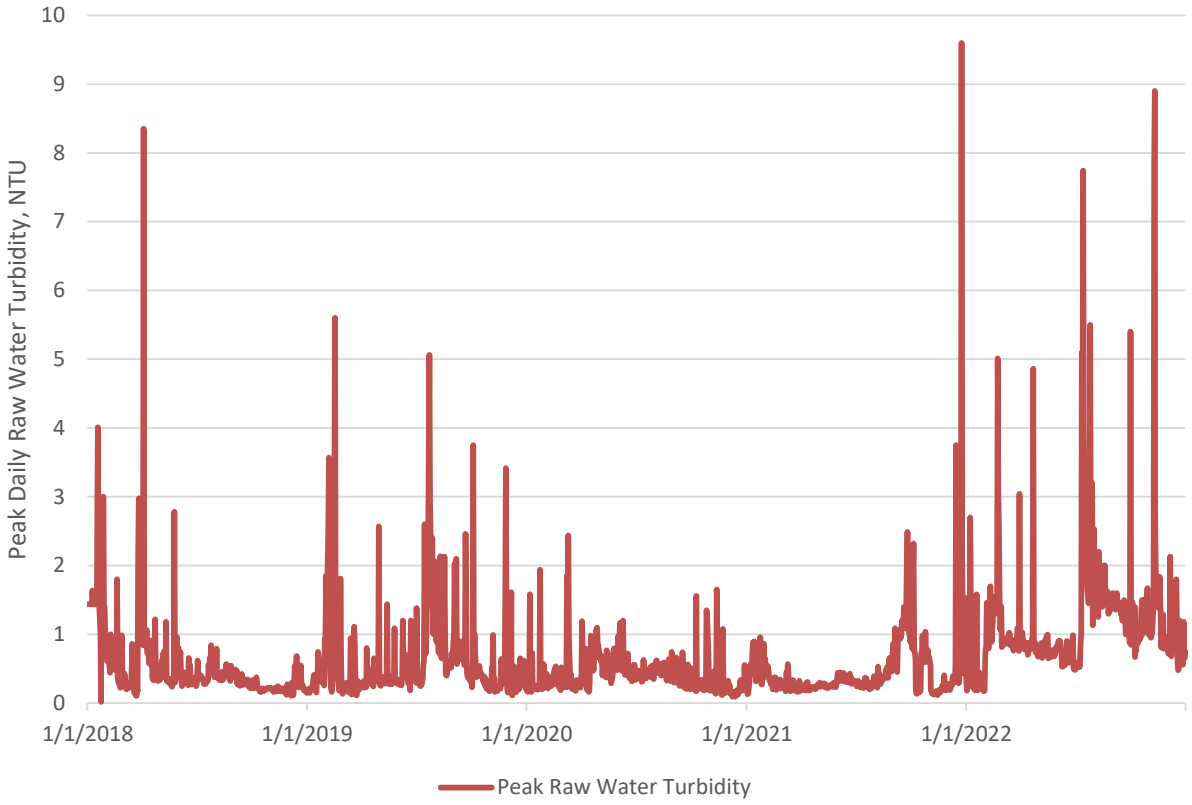
High turbidity levels in surface water sources, such as creeks and lakes, are typically the result of erosion and sediment transport during precipitation and high flow events, and are undesirable because high turbidity can mask the presence of harmful particulates. The principal source of turbidity is general watershed runoff, and can also be contributed by other potential contaminating activities such as fires, floods/erosion, and wastewater. It is common for turbidities to vary seasonally as a result of precipitation and flow. It has also been found that the presence of suspended matter can interfere with disinfection of microorganisms.

Evaluation

Turbidity has been selected for evaluation not only because it is a regulated constituent, but also because it is commonly used as an indicator of general water quality and overall plant performance. The average, median, minimum, maximum, and 95th percentile has been summarized for the plant influent at the Roemer WFF in **Table 3-1,** keep in mind that this represents Lytle Creek blended with SPW. A time series plot has

been developed for peak daily raw water turbidity from January 1, 2018 through December 31, 2022 for the Roemer WFF (**Figure 3-6)**.

Figure 3-6
Peak Daily Raw Water Turbidity for the Roemer WFF



Turbidity at the Roemer WFF influent did not correlate well with local precipitation in Lytle Creek or percent Lytle Creek at Roemer WFF influent. This is likely due to the blending at the influent, upstream of the plant raw water turbidity reading location. Turbidity fluctuated through the study period, with peaks occurring throughout the year and without consistent trends. The four highest peaks were evaluated to ascertain possible connection to Lytle Creek and none was able to be identified:

- Peaks occur throughout year, multiple causes, influenced by source water
  - 12/24/21 – 9.6 NTU – 0% Lytle Creek
  - 11/10/22 – 8.9 NTU - 46% Lytle Creek (precipitation in watershed days before sample event)
  - 4/4/18 – 8.35 NTU – 78% Lytle Creek (dry)
  - 7/14/22 – 7.74 NTU – 39% Lytle Creek (dry)

Summary of Results for Turbidity

- The raw water turbidity data reflects the plant influent water, after the Lytle Creek source is blended with SPW.

- The Roemer WFF has relatively low levels of raw water turbidity, with an average value less than 1 NTU.
- There are no clear trends in the data, turbidity peaks can occur throughout the year.
- The four highest turbidity peaks were not clearly associated with a cause and effect from the Lytle Creek source.

Microbiological Constituents

General Characteristics and Background

The major microbiological constituents of concern include total coliform, fecal coliform, *Escherichia coli (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 micrororganism. 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.

Coliform and *E. coli* have been used to indicate the potential presence of pathogenic microorganisms in source waters. Although coliform levels have not been shown to correlate well with pathogenic microorganisms, they continue to be used as indicators due to the lack of affordable and reliable direct analytical methods for detecting pathogens. The United States Environmental Protection Agency (USEPA) has determined that the most practical surrogate for protozoa at this time is *E. coli*, as required under the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). Potential sources of coliform bacteria include general watershed runoff, agricultural drainage, recreation, wastewater, urban runoff, and animal populations. Coliform levels in treated water are currently regulated directly through the Total Coliform Rule, to ensure the effectiveness of the disinfection process throughout the distribution system.

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

Giardia lamblia is currently regulated by the Surface Water Treatment Rule (SWTR) 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 USEPA provided guidance with the SWTR that indicated additional reduction would be appropriate if measured *Giardia* levels in the source water were greater than 0.01 cysts per liter. However, in the 1980's there was no practical means to measure *Giardia*, therefore the California Division of Drinking Water (DDW, formerly the California Department of Public Health) prepared guidance under the SWTR that indicated that 3-log reduction would likely be appropriate when monthly median levels of total coliform in the raw water were less than 1,000 most probable number per 100 milliliter (MPN/100 mL). In recent years DDW has allowed for the substitution of fecal coliform or *E. coli* levels in raw water since they are more specific indicators. The DDW have set the guidance level for increased treatment at raw water monthly fecal or *E. coli* median levels greater than 200 MPN/100 mL, based on the historic ratio of five total coliform to one fecal coliform.

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

Cryptosporidium is currently regulated through the IESWTR and the 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 and LT1ESWTR well-operated conventional and direct treatment plants are granted a 2-log removal credit for *Cryptosporidium* if they meet all treated water turbidity standards. The LT2ESWTR further regulates *Cryptosporidium* and requires additional action (treatment or protection) if the source water quality is determined to be impaired based on direct *Cryptosporidium* monitoring of the source, with a running annual average level greater than 0.075 oocysts per liter.

The DDW also developed the *Cryptosporidium* Action Plan (CAP) in the mid-1990's to address *Cryptosporidium* while federal regulations were being formed. The CAP identified recommended turbidity limits for settled water, treated water and recycled water in lieu of treated water *Cryptosporidium* levels. The CAP was developed to help utilities optimize treatment processes to ensure maximum removal of *Cryptosporidium*

oocysts and reduce the risk of waterborne illness. This plan was intended for utilities with over 1,000 service connections.

Evaluation for Total Coliform and Fecal Coliform

WVWD monitored the raw water for total coliform and fecal coliform on a weekly basis for the Lytle Creek source, at the Influent which is indicative of Lytle Creek water only. WVWD currently has a DDW water supply permit requirement that triggers additional log reduction for *Giardia* and viruses when the monthly median value, calculated weekly, for total coliform exceeds 1,000 MPN/100 mL.

Alternatively, DDW does allow other water utilities to use monthly median fecal coliform or *E. coli* levels as a guide for increased *Giardia*/virus treatment requirements, with 200 MPN/100mL as the designated level for increased log reduction. Many water utilities have opted to change their monitoring programs to focus on either fecal or *E. coli*, instead of total coliform, based on USEPA and DDW regulatory direction.

Figures 3-7 and 3-8 provide timeseries plots of the coliform data during the study period. From the charts there is no strong seasonal trend, however most of the highest coliform peaks occur during the dry, summer months. The potential contaminating activity (PCA) research conducted as part of this report that summer season recreation upstream on Lytle Creek may contribute to the increases.

Figure 3-7
Lytle Creek Influent Total Coliform, 2018 - 2022

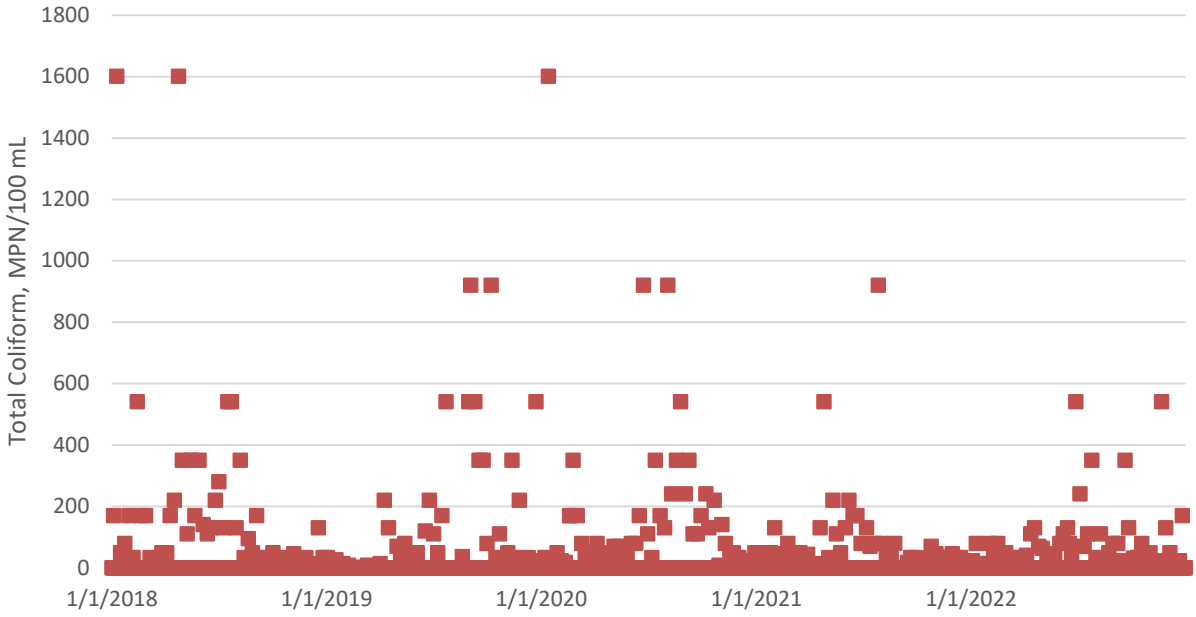
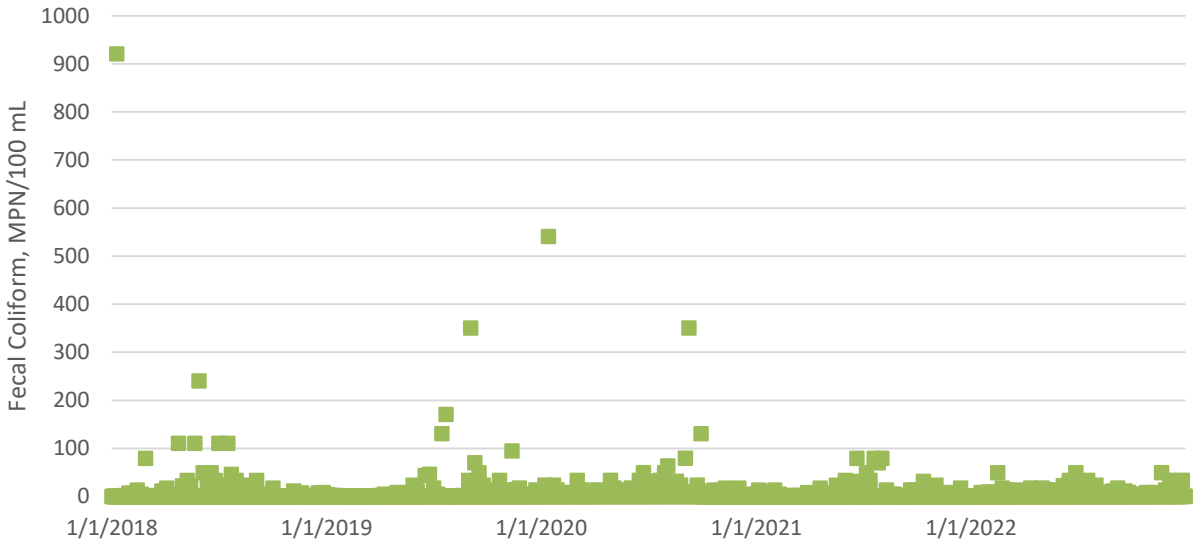


Figure 3-8
Lytle Creek Influent Fecal Coliform, 2018 - 2022



Monthly median data, calculated weekly, for total coliform is used to determine the appropriateness of the level of treatment for *Giardia* and viruses. A monthly median was calculated each week (based on the previous four samples) during the study period for total coliform and fecal coliform, that data is summarized in **Table 3-3**.

Table 3-3
Calculated Monthly Medians for Coliform, MPN/100 mL

	Minimum	Maximum	Average	Median
Total Coliform	1	540	99	64
Fecal Coliform	<1	101.5	16	9.4

The total coliform calculations show that none of the calculated monthly medians were greater than 1,000 MPN/100 mL. The calculations for fecal coliform also show that there were no monthly median values above 200 MPN/100 mL. **Figures 3-9 and 3-10** show the monthly medians for total coliform and fecal coliform, respectively. These figures show a much more obvious trend of increasing concentrations during the summer months.

Figure 3-9
Lytle Creek Influent Total Coliform Monthly Medians, 2018 - 2022

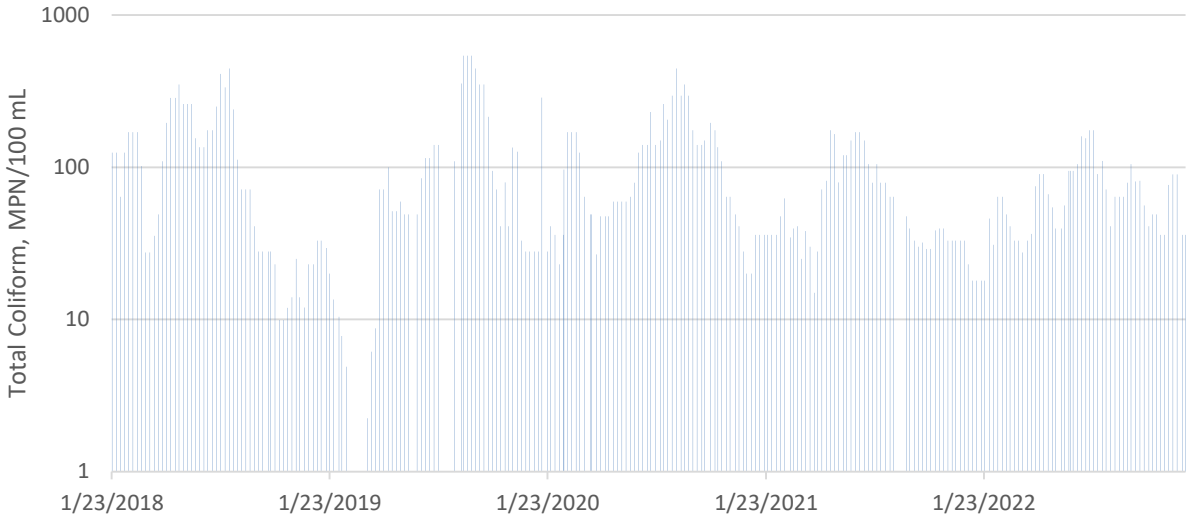
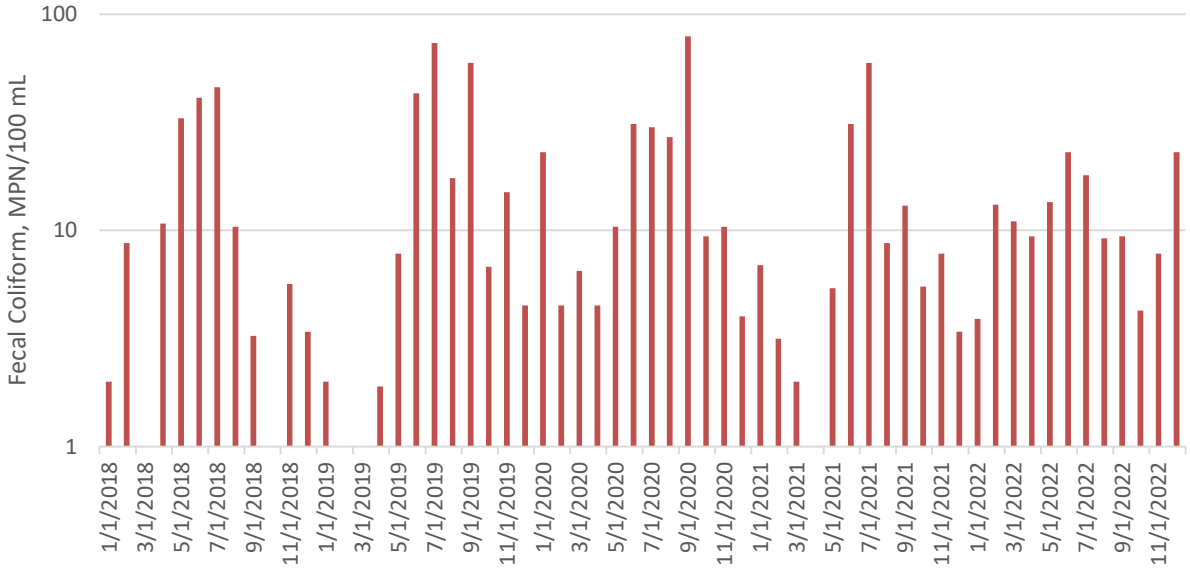


Figure 3-10
Lytle Creek Influent Fecal Coliform Monthly Medians, 2018 - 2022



Summary of Results for Total Coliform and Fecal Coliform

- The majority of peak coliform levels occur between late spring and early fall, possibly associated with peak recreational use in the watershed.
- Total coliform data show generally low levels. Individual samples had an average value of 139 MPN/100 mL, a median value of 49 MPN/100 mL, and 98.5 percent of samples were less than 1,000 MPN/100 mL. Monthly medians had an average value of 99 MPN/100 mL; a median value of 64 MPN/100 mL and all monthly median values were less than 1,000 MPN/100 mL.

- Fecal coliform data show generally low levels. Individual samples had an average value of 27 MPN/100 mL, a median value of 7.8 MPN/100 mL, and 97.8 percent of samples were less than 200 MPN/100 mL. Monthly medians had an average value of 16 MPN/100 mL; a median value of 9.4 MPN/100 mL and all monthly median values were less than 200 MPN/100 mL.
- Fecal coliform data support 3/4-log treatment for *Giardia*/viruses is appropriate for all source water quality conditions during the study period.

Evaluation for Giardia and Cryptosporidium

WVWD conducted the second round of required monthly source water monitoring for *Cryptosporidium*, under the LT2ESWTR, from October 2015 through September 2017. The samples from October 2015 through February 2017 were also analyzed for *Giardia*. The sample was collected at the plant influent sample site, which represents a blend of Lytle Creek and SPW. During the sampling period monthly Lytle Creek use ranged from 26 to 100 percent, with an average of 61 percent.

The data show that there were no detects of *Cryptosporidium* during the 24 month sample period. The maximum running annual average of the immunofluorescence assay (IFA) results for *Cryptosporidium* is the regulatory compliance point under the LT2ESWTR. The maximum running annual average was 0 oocysts/L, well below the Bin 1 limit of 0.075 oocysts/L. The Roemer WFF continues to receive a Bin 1 classification of *Cryptosporidium* under the LT2ESWTR. In addition, for the 17 samples with available *Giardia* data there were no detects, for an average concentration of 0 cysts/L.

Summary of Results for Giardia and Cryptosporidium

- Two years of monthly data show no detect of either *Giardia* or *Cryptosporidium.*
- No detect of *Giardia* supports 3-log reduction is appropriate for the Roemer WFF.
- Maximum running annual average value for *Cryptosporidium* was 0 oocysts/L, well below the Bin 1 limit of 0.075 oocysts/L, which results in a continued Bin 1 classification with no additional action required under the LT2ESWTR.

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. Since Lytle Creek does not have detectable levels of bromide, total organic carbon is the key precursor for DBPs. The most common DBPs are total trihalomethanes (TTHMs), which are suspected carcinogens. Other DBPs, including haloacetic acids (HAA5), are suspected mutagens and teratogens. Potential sources of these organic precursors are plant matter, animal matter, and soil, which can be contributed by general watershed

runoff, urban runoff, agricultural runoff, recreation, grazing, wastewater sources, and algae growing in the source water or conveyance system.

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

Evaluation

The Lytle Creek source water was monitored at the Influent for TOC from January 2018 through December 2022. The data ranged from non-detectable to 1.2 mg/L, with an average of 0.41 mg/L and a median of 0.36 mg/L. Ninety-five percent of samples were less than 0.72 mg/L. **Figure 3-11** presents the TOC data over the study period.

Figure 3-11
Lytle Creek Influent TOC, 2018 - 2022

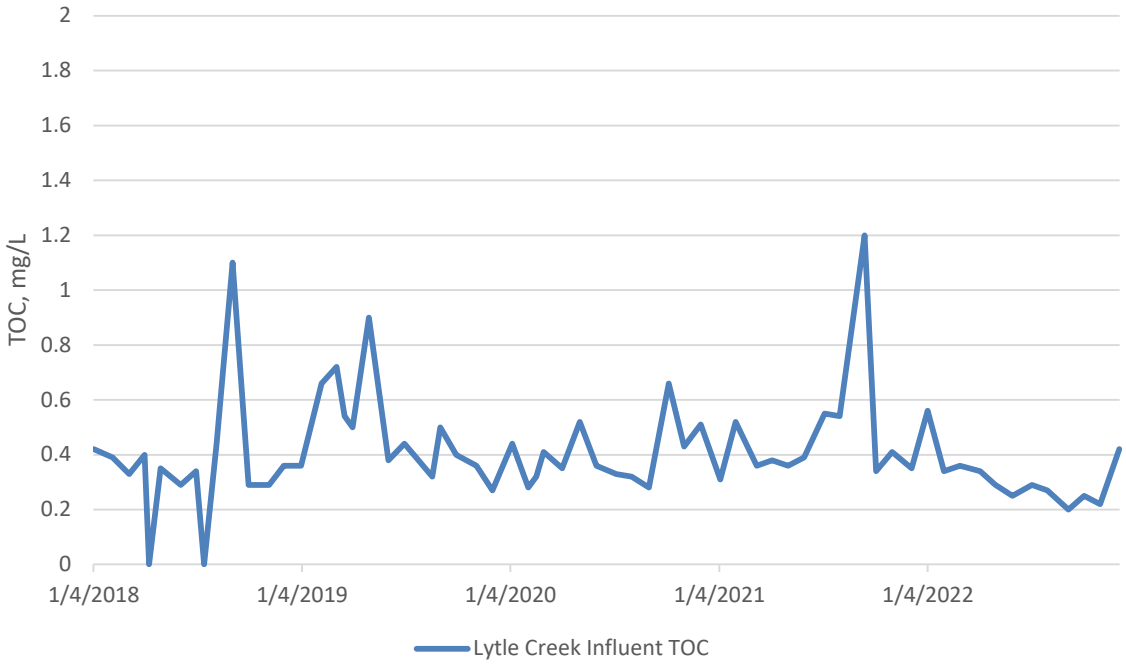
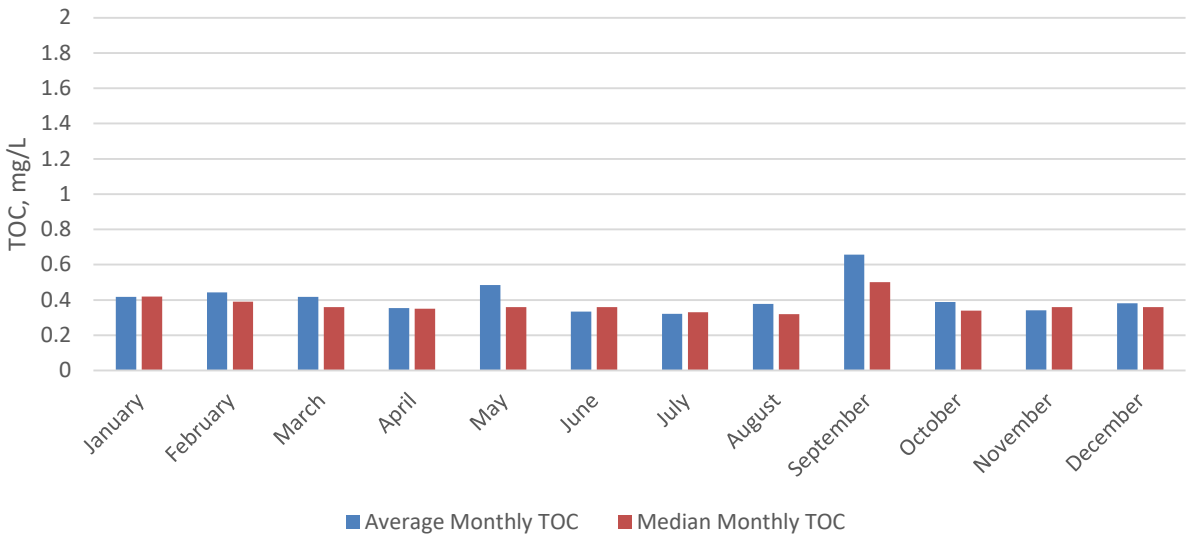


Figure 3-11 shows that the TOC levels in Lytle Creek are very low; however there were two periods that peaked over 1 mg/L. These both occurred in September (2018 and 2021). There was no rain occurring on these dates, and the conditions were largely dry for weeks prior to the sampling. A review of the PCAs did not indicate any reported spill associated with these dates. It is possible that algae growth either in Lytle Creek, or the SCE Afterbay, could have contributed to these increases in TOC or that an illicit discharge had occurred.

Figure 3-12 presents the average and median TOC levels each month. This data shows that September is the peak month for TOC concentrations. This sample is typically taken in the first week of the month, so these increases could also be seen in late August but are generally cleared by early October.

Figure 3-12
Lytle Creek Influent TOC Monthly Average and Median, 2018 - 2022



Summary of Results

- The TOC data for Lytle Creek Influent show very low levels, with average and median values less than 1 mg/L in Lytle Creek.
- There were two sample events with TOC greater than 1 mg/L that were not associated with precipitation or any other specific activity in the watershed. Since these occurred during summer months, they could be associated with algae growth or illicit discharges.
- The peak TOC concentrations occur in early September, and can be twice as high as August and September results.

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SECTION 4 – WATERSHED CONTAMINANT SOURCES REVIEW

This section contains an evaluation of six potential contaminant activities (PCAs) which were selected for review for this Fifth Update of the Lytle Creek Watershed Sanitary Survey. The six potential contaminant activities are: (1) spills, (2) recreation, (3) wastewater, (4) development, (5) fires, and (6) floods/erosion. These PCAs were selected based on their presence in the watershed and their potential to impact Lytle Creek water quality.

SPILLS

Background

A hazardous material spill or leak into a surface water body could occur as the result of a vehicular traffic 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.

Spills of raw or partially treated wastewater 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 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; 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 the capacity of the wastewater treatment plant is exceeded.

Seasonal Patterns

SSOs typically occur more frequently during the wet season, when stormwater can infiltrate a wastewater collection system or washout a pipeline carrying sewage.

Related Constituents

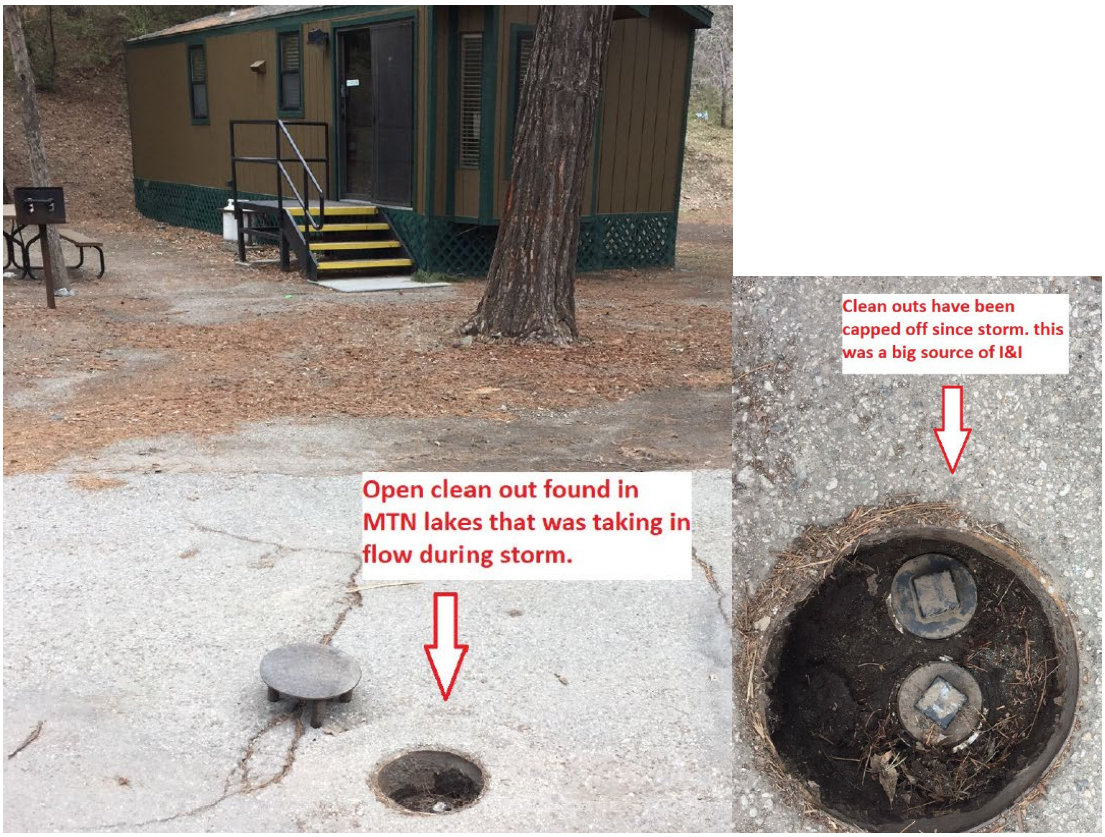
The most common spills are related to oil and petroleum products or sewage. Therefore, typical constituents of concern range from volatile organic compounds (VOCs) and hydrocarbons to microbial constituents (i.e. viruses, pathogens, *Giardia, Cryptosporidium*). However, hazardous materials emergencies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

Occurrence in Watershed

There were six spills/incidents listed in the State Office of Emergency Services (OES) Hazardous Materials Release database from 2018 to 2022 within the watershed. Two of the spills involved sewage and four of the spills involved a petroleum based product as listed in **Table 4-1**.

Out of the six spills, there was one spill which entered Lytle Creek. This spill occurred on February 14, 2019. On this day, 5.6 inches of rain was measured, with high flows of 370 cfs (mean daily discharge) in Lytle Creek. The cause of the spill was due to infiltration/inflow; storm water entered the private sewer collection system at several clean outs in Mountain Lakes. **Figure 4-1** shows an example of where storm water entered into the sewage collection system.

Figure 4-1. Clean out at Mountain Lakes Where Storm Water Infiltrated in February 2019



The total volume of the spill was estimated to be 112,000 gallons, of which 97,000 gallons was storm water and 15,000 gallons was raw sewage. The location of the spill was described as Lytle Creek at South Fork.

Table 4-1
Summary of Spills/Incidents Occurring in Lytle Creek Watershed as reported to OES, 2018-2022

Discharger	Spill Date	Spill Location	Type of Spill	Cause of Spill	Volume (gallons)	Receiving Water
Southern California Edison	9/30/2019	284 Lytle Lane	Hydraulic Oil	RP states a boom was up and the hydraulic line failed due to mechanical failure. Contractor will be conducting cleanup.	2 gallons	None
Southern California Edison	2/4/2019	1400 Meadow Lane	Mineral Oil non PCB	RP states approximately one gallon of Non-PCB Mineral oil released, due to inclement weather, impacting a road surface and possibly a storm drain. The release is stopped. A contractor will be performing the clean-up.	1 gallons	Unknown
San Bernardino County Special District Water and Sanitation	2/6/2019	1209 Lytle creek Rd	Raw Sewage	Per the caller the release occurred due to a manhole overflow post storm surge. Per the caller the release is stopped and contained.	7800 gallons	None
San Bernardino County Special District Water and Sanitation	2/14/2019	Lytle Creek and South Fork	Raw Sewage and Storm Water	Inflow and Infiltration; storm water entering sewage collection system for Mountain Lakes	112,000 gallons; 15,000 gallons of raw sewage and 97,000 gallons of storm water	Lytle Creek
Southern California Edison	8/26/2020	Lytle Creek Rd South of County Fire Station 20	Mineral Oil non PCB	Caller states vehicle struck a pole mounted transformer causing the release of approx. 5 gallons of Mineral Oil non PCB onto asphalt and soil. A contractor will be handling the cleanup.	5 gallons	None
Unknown	5/31/2022	South Lytle Creek Road, with a nearest cross Green Mountain Rd.	Used Oil	15, 5 gallon containers were illegally dumped into a trash dumpster. One of the containers broke open and released into the dumpster causing the release.	75 gallons	None

There were no chemical related spills due to traffic accidents. The main transportation route through the watershed is Lytle Creek Road.

The West Valley Water District (WVWD) is on the notification list to be contacted by the County of San Bernardino Special Districts Department (CSBSDD), County Service Area 70-S3 if a sewage overflow occurs. The time, location, and all known information concerning the overflow will be given. However, the WVWD do not recall receiving notification for the February 14, 2019 SSO from the CSBSDD, but WVWD was notified by the Fontana Water Company.

Related Water Quality Issues and Data Review

As mentioned above, the only spill which entered Lytle Creek over the reporting period occurred on February 14, 2019. **Table 4-2** contains turbidity data at the Roemer Water Filtration Facility (WFF) influent on the day of the spill, and 6 days afterwards. SB County also collected heterotrophic plate counts (HPCs) downstream of the spill, as shown in **Table 4-2**. HPCs indicate general biological growth after the spill, but it does not enumerate fecal coliform similar to the testing conducted by West Valley Water District. Based on this information, it appears the spill did increase the biological growth in the creek, and *E. coli* was detected as present. The fecal coliform sample collected by WVWD on February 20, 2019 was likely collected too long after the spill had already passed to detect any concern.

Turbidity was also higher than normal on February 15 and 16, which are respectively one and two days after the spill, but turbidity is likely elevated due to precipitation and high flows in Lytle Creek, and not caused by the sewage spill.

Table 4-2. Summary of Water Quality Data within one week of February 14, 2019 spill

Date	Percent of Lytle Creek treated at Roemer WFF	Turbidity, NTU	Heterotrophic Plate Count, cfu/mL (Collected by County)	Fecal coliform (collected by WVWD), MPN/100mL
2/14/2019	68%	0.61		
2/15/2019	0%	2.9	490	
2/16/2019	100%	5.6		
2/17/2019	100%	1.34	450	
2/18/2019	100%	0.574		
2/19/2019	100%	0.511	43	
2/20/2019	100%	0.432		ND

Regulation and Management

When a hazardous materials spill or leak of a reportable quantity occurs, notification to an emergency response agency is required by state and federal law. A sewage spill is required to be reported if 1,000 gallons or more are released or if discharge goes to surface water or a drainage channel. An oil or petroleum product spill is required to be reported if 42 gallons or more are released. Any other hazardous materials 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. When a hazardous materials 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 OES.

For the Lytle Creek watershed, the local CUPA is the San Bernardino Fire Department. The emergency response program is also under the jurisdiction of the San Bernardino Fire Department. As part of the emergency response program, the San Bernardino Fire Department would evaluate whether or not the material is hazardous, determine the extent of contamination, and would secure the site. Depending on the type of spill and where it occurred, other agencies such as California Department of Fish and Game, and the Santa Ana Regional Water Quality Control Board (Regional Board) may be involved. An incident report would then be sent to OES.

Historical hazardous hazmat spills were queried from the California Emergency Management Agency website:

https://www.caloes.ca.gov/office-of-the-director/operations/response-operations/fire-rescue/hazardous-materials/spill-release-reporting/

The CSBSDD County Service Area 70 S-3 is mandated to comply with the State Water Resources Control Board Order No. 2022-0103-DWQ which was adopted on December 6, 2022, and effective on June 5, 2023. The 2022 Order replaces the 16-year old Order No. 2006-0003-DWQ.

In general, the orders were developed to have a consistent statewide approach to reducing SSOs. The SSO Order requires public and now private 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. The SSO Order requires the owners and operators of sanitary sewer systems to take all feasible steps to eliminate SSOs and to develop and implement a system-specific SSMP. SSMPs must include provisions to provide proper operation and maintenance while considering risk management and cost. 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 six years. The CSBSDD completed their SSMP in February 2011, and it was updated in March 2017. The CSBSDD is in the process of updating the 2017 SSMP.

Some of the changes in the 2022 SSO Order are:

- Regulates private systems of any size and public systems less than one mile in length
- Includes a new prohibition of any discharge of sewage from a sanitary sewer system that has the potential to discharge waters of the State unless promptly cleaned up
- Expands on prioritization of system-specific management, operations, and maintenance activities to address system resilience
- Addresses underground sewage exfiltration from a sanitary sewer system
- Requires sewer system owners to coordinate with stormwater, drinking water, and other utility agencies for planning and emergency spill response
- Reduces timeframe for water quality sampling of a surface water receiving a spill of 50,000 gallons or greater, from 48 hours to 12 hours.
- Implements full electronic reporting through the California Integrated Water Quality System

The CSBSDD has an active wastewater spill response and reporting procedure for the Lytle Creek watershed. The SSMP states that all efforts will be made to contain, control and clean-up after all SSO occurrences. Also, corrective actions will be taken to prevent future occurrences.

Some of the major highlights for spill response procedures (as stated in the 2011 and 2017 SSMP) are:

1) Assess spill and what is needed to contain or control spill and make work area safe;
2) Contain or control spill (i.e. direct spill with sandbags to a safe place or divert to a downstream manhole);
3) Sampling may be required;
4) Begin to relieve the stoppage using hydroflushing or mechanical rodding;
5) Provide rough estimate on spill volume;
6) Post area with proper warning signage;
7) Thoroughly clean the mainline sewer;
8) Conduct clean-up measures and ensure all liquids and solids are removed from the affected area, including washdown water;
9) Closed circuit television (CCTV) the sewer line following the cleaning;
10) Complete the spill report form to OES and local agencies.

Source Water Protection Activities

In order to prevent sewage overflows, the CSBSDD has an annual goal of cleaning or televising ten percent of a service area's linear footage every year. Since the linear footage of Lytle Creek sewer lines is approximately 10.7 miles, at least one mile of sewer lines are cleaned or televised every year. There are known hot spots within the Lytle Creek area that are subject to infiltration during storm events, and the County

targets these areas for more frequent cleaning. In addition, the CSBSDD televises five percent of recently cleaned sewer lines as a quality assurance procedure to ensure the cleaning process was effective. The County also has on-going programs for manhole rehabilitation, smoke testing and slip lining the sewer lines.

After the February 14, 2019 spill, CSBSDD staff inspected the manholes and clean outs at the Mountain Lakes facility, and ensured that all were covered and closed to prevent future infiltration into the sewer collection system.

Summary of Findings for Spills

- There were six spills/incidents listed in the State OES Hazardous Materials Release database from 2018 to 2022.

- Two of the spills involved sewage and four of the spills involved petroleum products.

- The largest spill which entered Lytle Creek occurred on February 14, 2019. The spill was caused by infiltration of storm water into the private sewer collection system at Mountain Lakes. From the limited data collected, it appears that an increase of biological activity, likely fecal coliform in Lytle Creek occurred as a result for three days after the spill.

- There were no chemical related spills due to traffic accidents. The main transportation route through the watershed is Lytle Creek Road.

RECREATION

Background

Recreational uses in the Lytle Creek watershed consist primarily of camping, picnicking, hiking, fishing, hunting, off-highway vehicle use, and swimming in the creek. The lack of open space in nearby urban areas, as well as hot temperatures in San Bernardino Valley, may explain why many people visit Lytle Creek on summer weekend days.

As the population of San Bernardino County is projected to increase from 1.72 million to 2.56 million by 2025 (48.9 percent increase), the continued increase of visitors to Lytle Creek is expected. The watershed currently receives approximately 50,000 day-use visitors on an annual basis (Email, Jon Rishi, U.S. Forest Service (USFS), March 2018).

Seasonal Patterns

Although recreation occurs year-round, camping and swimming occur primarily from Memorial Day to Labor Day weekend.

Related Constituents

Body contact recreation in general has long been known to be a source of pathogen contamination, resulting partly from personal sanitary conduct and partly from a natural shedding process. Pathogens shed by recreationalists include bacteria, viruses, and protozoa. Moreover, because their origin is human, microorganisms shed by recreationalists are transmittable to other humans.

Occurrence in Watershed

San Bernardino National Forest

As stated above, Lytle Creek serves as year-round stream gathering place for urban families. The 2005 United States Forest Service (USFS) Land Management Plan states that water resources are affected by the large numbers of recreationalists that come into contact with the water. Access to the area is primarily gained through the County Road system with further dispersal of recreation via the national forest road system.

The USFS Land Management Plan states that unlawful activities, such as trash dumping, shooting, fire-building, unauthorized off-road vehicle use, graffiti, and property vandalism are reoccurring difficulties. Dispersed picnicking by large groups near the creek bed has resulted in large amounts of litter in the watershed. Heavy, continuous dispersed recreation impacts Lytle Creek, especially sanitation issues.

Fortunately, the US Forest Service developed a Lytle Creek Canyon Recreation Management Plan in January 2020. The purpose of the plan is to provide recreational facilities that are sustainable and meet the needs of current and future recreational users. The plan discusses various impacts to the environment due to recreational uses. Some of the impacts noted in the plan are: 1) User-created trails have compacted soils, resulting in more sediment to Lytle Creek during storms, 2) Excessive litter and toilet paper near Lytle Creek, 3) Creek slope has been impacted by creation of “pools” by users. The plan also notes that Lytle Creek exhibits high turbidity after weekends and holidays.

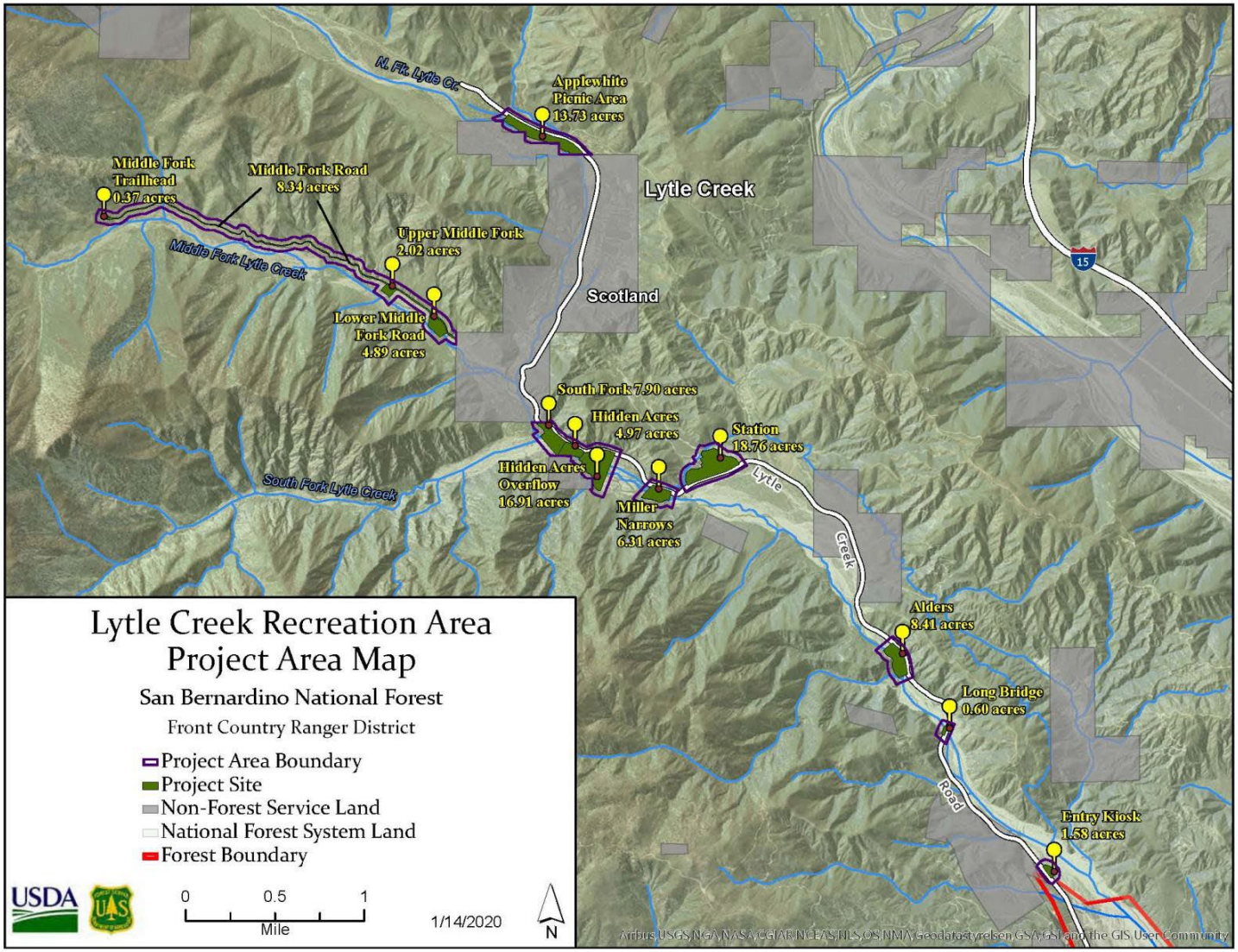
The Lytle Creek Canyon Recreation Management Plan conducted car counts on a few summer weekends, with 10,422 counted on Sunday July 26, 2020 and 6,669 cars counted on Sunday May 2, 2021. In order to maintain access for emergency vehicles, K rail has been installed on the right hand side of the road, to prevent parking on both sides of the road during the summer.

The San Bernardino National Forest has one developed campground located on the North Fork of Lytle Creek, the Applewhite Campground. The Applewhite Campground has 44 sites and no reservations are required. There are flush restrooms, but no showers or dump station. Across the road from the campground is a picnic area where visitors can find drinking water, tables, restrooms, and barbecues. There is easy access to Lytle Creek, where fishing and water play are popular.

Lytle Creek is a popular location for swimming in the summertime. According to the USFS, people access the creek for swimming or water play at multiple locations along the creek, concentrated primarily along the canyon bottoms of the Middle and North Forks of Lytle Creek. The most popular sites are the Applewhite picnic area, the Middle Fork area, the Green Mountain area, and just upstream of where Southern California Edison (SCE) diverts water from the creek. In order to provide sanitation services for visitors to Lytle Creek, portable restrooms were installed at the start of the Bonita Falls hiking trail and at the Long Bridge (where road crosses creek) year-round. Permanent restrooms are located at the Lytle Creek ranger station, Applewhite campground, Applewhite picnic area, and Middle Fork.

The Lytle Creek Canyon Recreation Management Plan will address recreational impacts by providing additional paved parking, restrooms, garbage receptacles, and trails. The first phase will start construction in fall 2023 at Hidden Acres (as shown in **Figure 4-2**) and the access point to the Bonita Falls Trail which is South Fork. Phase 2 will be two to three years after Phase 1.

Figure 4-2 Areas for Lytle Creek Canyon Recreational Management Plan



There are also a number of undeveloped campsites located within the watershed, as shown in **Table 4-3.** The undeveloped campsites have no facilities or amenities, just a post and a fire ring.

Table 4-3
Undeveloped Campgrounds Within Lytle Creek Watershed

Campground Name	Location
Paiute	North Fork Lytle Creek
Gobbler's Knob	North Fork Lytle Creek
Big Horn	North Fork Lytle Creek
Coldwater	North Fork Lytle Creek
Third Stream Crossing	Middle Fork Lytle Creek
Stone House	Middle Fork Lytle Creek
Commanche	Middle Fork Lytle Creek
Joe Elliot Tree Memorial	South Fork Lytle Creek

Portions of the Pacific Crest Trail border the northern edge of the watershed, and the trailhead into the Cucamonga Wilderness area is the Middle Fork Trail Head**.** According to the USFS Land Management Plan, there is a lack of designated trails originating from the Applewhite campground and picnic area, as well as easy access loops for families hiking in the canyons.

The USFS also has a number of homes which are located on USFS land within the Lytle Creek watershed, primarily concentrated in the Happy Jack area. According to the USFS, there are approximately 33 residences in the Lytle Creek area (Personal Communication, Jon Rishi, USFS, April 2018). All of the current 33 residences are on a centralized sewer system. The 20-year permits for the recreational residences located in the Lytle Creek area expired in 2008, but were renewed with no changes to the previous permit. There were no additional or new permits issued.

The Lytle Creek Firing Line is located on USFS land, but is operated by a private concessionaire.

Private Campgrounds

The Bonita Ranch Recreational Vehicle (RV) Campground is located at 900 South Fork Road in Lytle Creek. There are 90 RV campsites, with 30 sites providing electrical, water and sewer hookups, and 60 sites providing electrical hookup only. There are two dump stations, showers, and public restrooms. Lytle Creek runs through the campground on the east end of the park. The creek is mostly for water play rather than swimming during the summer months, as the creek flow is low and the stream bed is fairly rocky. There is also a waterfall within one mile of the campground.

Mountain Lakes Resort is a members-only resort located at 277 Lytle Creek Road in Lytle Creek. There are 514 campsites with full hookups and six cabins available for overnight stay. The resort has two fishing lakes and Lytle Creek runs through the

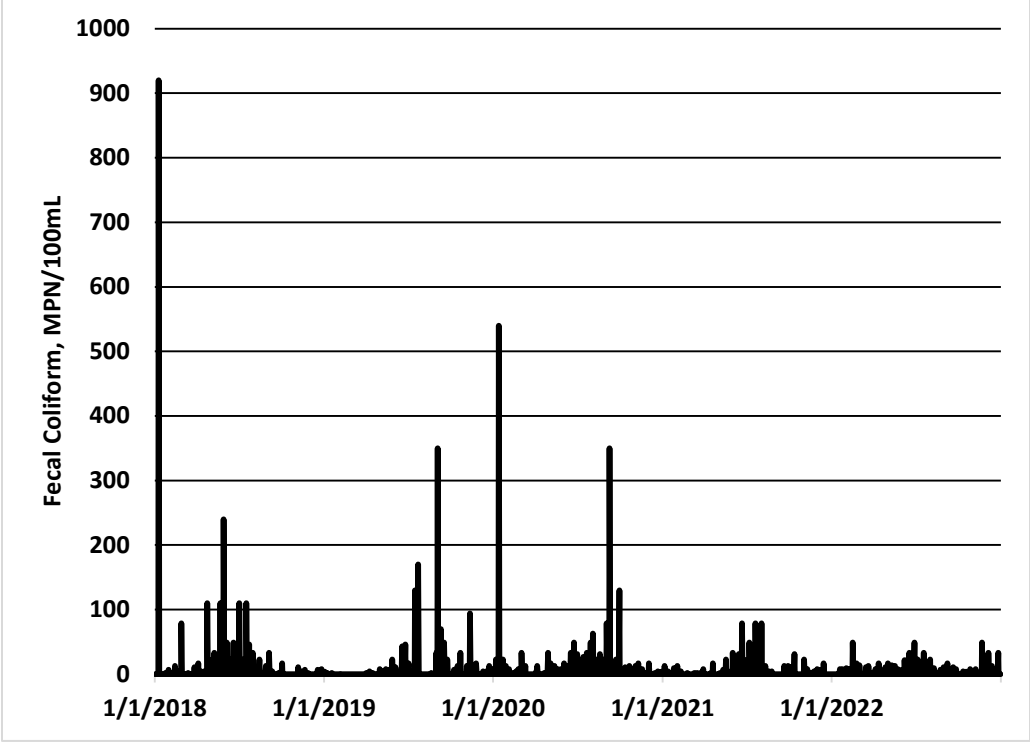
property. Other amenities are an on-site restaurant, three swimming pools, country store, paddle boats, and picnic areas.

Related Water Quality Issues and Data Review

As shown in **Figure 4-3**, there is a seasonal trend for fecal coliform. Although peaks may occur throughout the year, there is an increase from approximately May to September, and lower levels from October to April. Therefore, it is likely that these increased concentrations are due to body-contact recreation in Lytle Creek. However, the median for fecal coliform over the reporting period is 7.8 MPN/100mL.

Additionally, WVWD conducted the second round of required monthly source water monitoring for *Cryptosporidium*, under the LT2ESWTR, from October 2015 through September 2017. The samples from October 2015 through February 2017 were also analyzed for *Giardia*. The data show that there were no detects of *Cryptosporidium* during the 24 month sample period. In addition, for the 17 samples with available *Giardia* data there were no detects, for an average concentration of 0 cysts/L.

Figure 4-3 Lytle Creek Influent Fecal Coliform 2018 – 2022



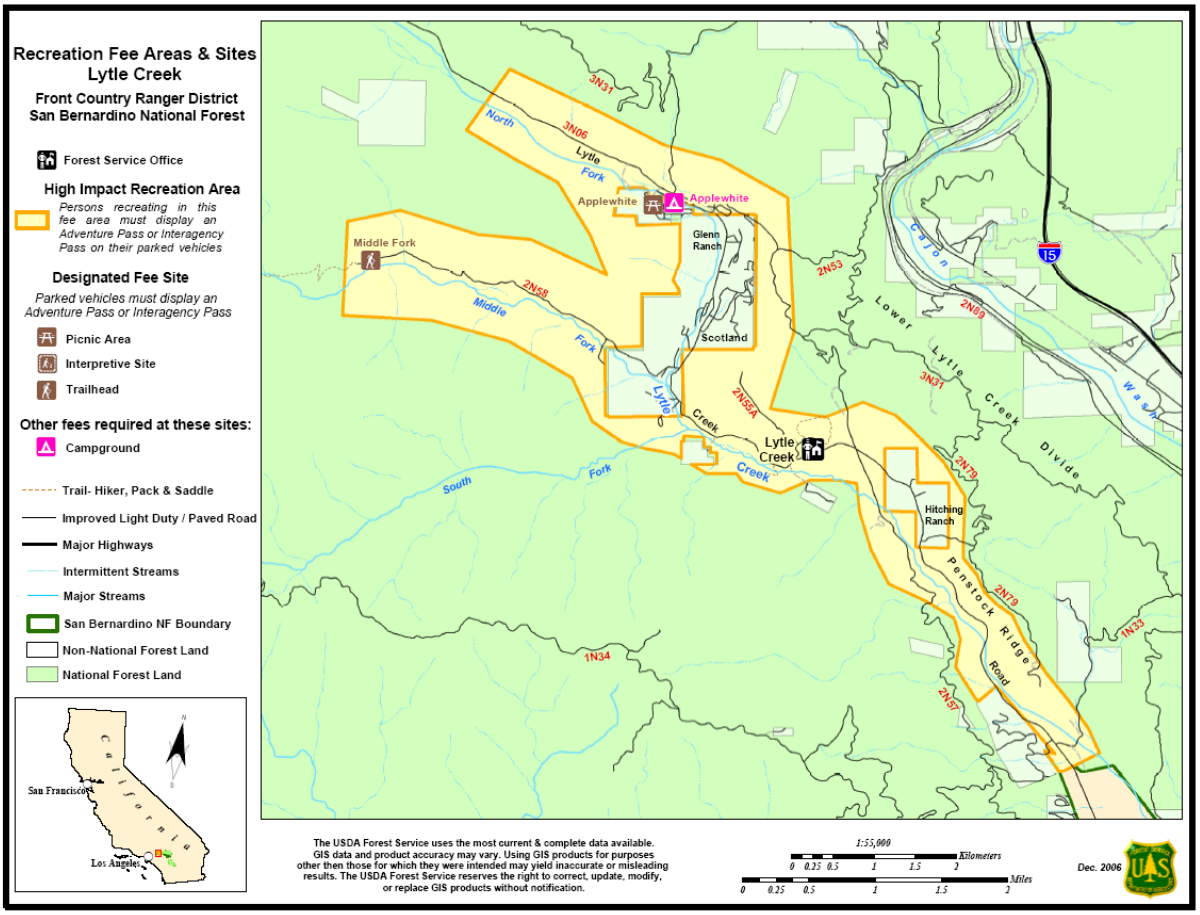
Regulation and Management

United States Forest Service

In 1996, the USFS began requiring an Adventure Pass for vehicles traveling to specific sites in the San Bernardino National Forest, and for heavily impacted recreation areas that have specific amenities including toilets, parking, trash receptacles, picnic tables, interpretation, and security. An adventure pass is required in high impact recreation areas, or at sites such as the Applewhite campground and picnic area, the Middle Fork Trail Head and the Lytle Creek Firing Line. **Figure 4-4** shows the designated fee sites and the high impact recreation area for the Lytle Creek watershed.

At the same time the Adventure Pass was implemented, the USFS began controlling the number of visitors by setting up a checkpoint at the mouth of the canyon on the five predicted busiest days of the year and closing the road when the vehicle capacity is reached. According to the USFS, road closures still occur for Memorial Day, Fourth of July, and Labor Day.

Figure 4-4
San Bernardino National Forest Recreation Fee Areas and Designated Fee Sites for the Lytle Creek Watershed



Source: San Bernardino National Forest Website

The USFS is the site operator for the Applewhite Campground and picnic area. The USFS does not have resources to actively manage people swimming in Lytle Creek, but

have installed portable restrooms along the creek to minimize contamination of the creek.

Mountain Lakes Resort

The Mountain Lakes Resort used to hold a National Pollutant Discharge Elimination System (NPDES) permit for lake overflow and lake drainage discharge for their two fishing lakes and recreational lagoon. According to the permit (Order 86-93), the waters in the lakes and lagoon were treated with chemicals containing copper for weed and algae control. The permit was rescinded by the Regional Board in 1992. WVWD staff has visited the Mountain Lakes Resort in the past and noted the use of aluminum sulfate for the fishing lakes.

According to the Regional Board, the Mountain Lakes Resort diverted Lytle Creek water into their recreational fishing ponds and continuously flowed the same amount of water back into the creek at the time the permit was rescinded. Occasionally, discharge would occur during heavy storms, but the facility was not allowed to drain their ponds. (Personal Communication, Gary Stewart, Regional Board, February 13, 2008).

The permit was rescinded in 1992 for a number of reasons: 1) chemical use at the Mountain Lakes Resort was minimal, 2) the facility had been monitored by the Regional Board for ten years without any issues, and 3) the discharge was considered not to be a waste discharge. The WVWD was previously very concerned about the Mountain Lakes facility, and the possibility that the facility was flushing/draining their fishing lakes.

Hidden Acres (previously Green Mountain Ranch)

Hidden Acres is located at 955 Lytle Creek Road, and is currently used for weddings, special events and private parties. There is one pond on the property which is fed by diverted water from Lytle creek, and the pond outlet then returns water back to the main stem of Lytle Creek. There is no body contact or fishing conducted at the pond.

Summary of Findings for Recreation

- Recreational uses in the Lytle Creek watershed are primarily for camping, picnicking, hiking, fishing, hunting, off-highway vehicle use, and swimming in the creek. The watershed currently receives approximately 50,000 day-use visitors on an annual basis, and can experience as much as 10,000 visitors on peak summer weekends. The majority of recreational users are weekend users who are coming to the canyon during the summer.

- The USFS does not have resources to actively manage people swimming in Lytle Creek. However, the USFS will begin implementing the Lytle Creek Recreational Management Plan which will increase paved parking, restrooms, trails, garbage receptacles and informational kiosks. This should improve sanitation and litter issues, and reduce sediment load to Lytle Creek.

- Water quality data collected to date indicate that fecal coliform levels at the SCE Afterbay increase in the summertime, likely as a result of body contact recreation in Lytle Creek.

WASTEWATER

Background

Various types of wastewater facilities such as wastewater treatment plants and septic systems will be discussed in this section.

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.

Seasonal Patterns

There are no wastewater treatment plants which discharge treated effluent directly to Lytle Creek. There is one wastewater treatment plant in the watershed, the Lytle Creek wastewater treatment plant, which is operated year-round by the CSBSDD County Service Area (CSA) 70-S3.

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), TOC, nutrients, VOCs, and synthetic organic compounds (SOCs). Septic tank effluent typically contains high concentrations of total dissolved solids (TDS), chlorides, phosphates, nitrates, bacteria, and viruses.

Occurrence in Watershed

Lytle Creek Wastewater Treatment Plant

About 90 percent of the residences within the Lytle Creek watershed area are provided centralized sewer service by the CSBSDD CSA 70-S3 (Lytle Creek Community Plan, 2007). The main communities within the watershed are Happy Jack, Scotland, Bonita, and the Applewhite Campground. According to the CSBSDD website, the sewer system serves approximately 400 connections. **Figure 4-5** shows the CSA 70-S3.

Figure 4-5. County of San Bernardino Special Districts
County Service Area 70-S3

Source: County of San Bernardino Special Districts

The sewer collection system is approximately eleven miles of gravity flow pipeline, ranging in size from 4-inches to 10-inches in diameter. Lift Station #1 is located on the western portion of Lytle Creek Canyon near the Bonita RV Park. Lift Station #2 is located on the eastern most portion of Lytle Creek Canyon, 1,000 feet east of the Lytle Creek Ranger Station and approximately 1,300 feet downstream of the Lytle Creek Wastewater Treatment Plant. The collection system discharges to the Lytle Creek wastewater treatment plant which was designed for a maximum flow of 160,000 gallons per day (gpd).

In 2022, CSBSDD completed the CAS 70-S3 Lytle Creek Sewer Force Main Replacement Project. The sewer force main was 38 years old, in poor condition and needing replacement. The completed project replaced 665 linear feet of sewer force

main line with new 4" line and replaced the asphalt road. The installation of two new pumps for the sewer lift station was also included. The new line and lift station upgrade will eliminate sewer clogging, and will avoid potential sewage spills into Lytle Creek.

The Lytle Creek wastewater treatment plant consists of preliminary treatment with bar screening, secondary treatment with an oxidation ditch and clarification, two percolation ponds, and six sludge drying beds. The effluent is discharged to land. According to the CSBSDD, there have been no changes to the treatment train since 1982, and the wastewater treatment plant does not use any chemicals, including chlorine (Personal communication, CSBSDD, March 2018). Additionally, the Regional Board who conducts inspections of the facility indicated that there have been no major changes to the treatment process in the last 5 years (Ryan Harris, Regional Board, April 2023). There are also no downstream monitoring wells for the percolation ponds (Personal communication, Kathy Whalen, CSBSDD, February 14, 2008).

Although the wastewater treatment plant does not directly discharge treated wastewater effluent into Lytle Creek, there is a possibility that the percolation ponds may eventually impact water received by the WVWD through the Grapeland Tunnel, as the tunnel infiltrates groundwater. Based on a 1997 groundwater contour map developed for the Regional Board, the general direction of groundwater flow is to the southeast (Wildermuth Environmental, 2000) indicating a potential impact from the percolation ponds to the Grapeland Tunnel. Based on the Wildermuth report, predominant recharge to the groundwater reservoirs in the San Bernardino Valley is from infiltration of stream flow out of the San Gabriel and San Bernardino Mountains. In general, groundwater flow mimics surface drainage patterns (Wildermuth Environmental, 2000) for the San Bernardino Valley.

Percolation ponds associated with the Lytle Creek wastewater treatment plant have also overflowed in the past during heavy rains, resulting in surface discharge to Lytle Creek. However, this did not occur over the current or the previous reporting period.

Septic Systems

As stated above, about 90 percent of Lytle Creek residences receive centralized sewer services, while approximately 10 percent remains off-line. The off-line areas are isolated sites that have been developed with septic tanks and leach field systems. . The locations of the existing septic systems in the watershed are difficult to quantify as the County Department of Public Health's database can only be queried with specific addresses or assessor's parcel numbers (APN). All of the APNs in the watershed would have to be queried one by one, in order to obtain the location of septic systems.

A public records request was sent to the San Bernardino County Land Use Services to check on issued permits for new septic systems over the reporting period. No new permits for septic systems were on file.

Due to a 1973 Discharge Prohibition issued by the Regional Board, it is prohibited to have a septic system installed above elevation 2600 feet in the Lytle Creek area, unless approved by the Regional Board. According to the County of San Bernardino Department of Public Health, there have been no septic systems installed above elevation 2600 feet in the last ten years.

Related Water Quality Issues and Data Review

The Waste Discharge Requirement Order 95-32 for the Lytle Creek wastewater treatment plant specifies discharge limitations for biochemical oxygen demand, total suspended solids, total dissolved solids and pH, and requires monitoring for electrical conductivity, total hardness, chloride, sulfate, boron, fluoride, and sodium. As stated in the WDR, "these requirements are intended to meet the water quality objectives established to protect groundwater and to ensure that the discharge will not create conditions of pollution or nuisance."

As the Lytle Creek wastewater treatment plant discharges to land through the percolation ponds, the monitored constituents in the effluent are focused on protecting groundwater quality. Therefore, this data has limited value in evaluating surface water quality of Lytle Creek.

According to the State Water Resources Control Board's California Integrated Water Quality System (CIWQS) database, there have been no violations with this WDR over the reporting period. Additionally, the Regional Board staff inspected the plant in 2018, 2019, and 2022 and indicated that the plant was in good working order.

Regulation and Management

Lytle Creek Wastewater Treatment Plant

The discharge of treated wastewater to percolation ponds at the Lytle Creek wastewater plant is regulated under WDR Order No. 95-32, which was issued by the Regional Board on September 1, 1995.

The Regional Board performs inspections of the Lytle Creek wastewater treatment plant, and the facility has been in compliance during the reporting period. Under Order 95-32, the Regional Board requires that the effluent is sampled prior to discharge into the percolation ponds.

The discharge limits and sample frequency are shown in **Table 4-4**.

Table 4-4
Lytle Creek Wastewater Treatment Plant Discharge Limits and Sample Frequency

Parameter	Effluent Limit	Sample Frequency
Biological Oxygen Demand	30 mg/L (30 day average)	Weekly
Suspended Solids	30 mg/L (30 day average)	Weekly
pH	6.5 to 8.5 at all times	Weekly
Total Dissolved Solids	490 mg/L (12 month average)	Bi-monthly
Electrical Conductivity	none	Bi-monthly
Total Hardness	none	Annually
Chloride	none	Annually
Sodium	none	Annually
Sulfate	none	Annually
Fluoride	none	Annually
Boron	none	Annually

Septic Systems

San Bernardino County Code of Enforcement is responsible for responding to reports of overflowing sewage and failed systems. However, they do not keep an electronic database of inspection results. Additional information may have been extracted by reviewing individual reports, but this level of review was not warranted for this report. Again, ninety percent of the Lytle Creek area receives centralized sewer service.

San Bernardino County does not have any specific ordinances for septic tanks in the Lytle Creek area. Construction requirements for septic systems must follow the Uniform Plumbing Code.

The State Water Resources Control Board developed a draft State Policy for Water Quality Control for Siting, Design, Operation, and Management of Onsite Wastewater Treatment Systems (OWTS) which took effect on May 13, 2013. In response, the San Bernardino County Environmental Health revised their Local Area Management Plan in May 2017 to address the new requirements of the OWTS policy.

A brief review of the policy indicates that each septic system will need to be placed into one of four tiers, which will indicate what action is needed. Refer to the OWTS policy for detailed information on the design requirements for each tier.

- **Tier 0** – These are existing septic systems that are properly functioning and do not require corrective action. No further action is needed.
- **Tier 1** – These are either new or replacement septic system that are considered low risk. These systems must meet Tier 1 design requirements.
- **Tier 2** – This tier is to be defined by local agency management programs, as California has an extreme range of geological and climatic conditions. In other words, local agencies may need to specify certain design requirement to address local conditions, in lieu of the Tier 1 design requirements.
- **Tier 3** – Septic systems within 600 feet of an impaired water body for either nitrogen or pathogens. If there is a total maximum daily load (TMDL), these septic systems will need to be addressed through the TMDL implementation program, or any special provisions by the local management agency. If there is no TMDL or special provisions, new or replacement septic systems must meet the requirements of Tier 3.
- **Tier 4**- Septic systems that require corrective action or are either presently failing or fail at any time, must meet Tier 4 requirements.

Source Water Protection Activities

The WVWD is not currently engaged in specific source water activities regarding wastewater as a potential contaminant source.

Summary of Findings for Wastewater

- There are no wastewater treatment plants which discharge treated effluent directly to Lytle Creek.

- The Regional Board performs inspections of the Lytle Creek wastewater treatment plant, and the facility has been in compliance during the reporting period.

- The total number of sewer service connections for the Lytle Creek service area was 400 in 2022.

- About 90 percent of Lytle Creek residences receive centralized sewer services, while approximately 10 percent remains off-line. The locations of the remaining septic systems in the watershed are unknown.

- Completion of the Lytle Creek Force Main Replacement Project by the CSBSDD will reduce the potential of sewage spills to Lytle Creek.

DEVELOPMENT

Background

In general, conversion of natural lands to developed areas can affect surface and groundwater quality. Because of the high degree of imperviousness, urban areas typically generate higher per acre volumes of runoff than undeveloped or agricultural lands.

Seasonal Patterns

Urban runoff occurs on a year-round basis and includes wet and dry weather discharges. Wet weather runoff results from seasonal storms. Wet weather runoff is of relatively short duration and can have highly variable pollutant concentrations. Dry weather runoff results from activities such as lawn irrigation and car washing.

Related Constituents

Urban runoff can be a source of TOC, suspended solids, nutrients, metals, bacteria, and other constituents such as pesticides and other organic compounds. Generally, the impact is greater during the wet season, immediately following a first-flush event.

Occurrence in Watershed

The San Bernardino County Land Use Service Department reviews all land development applications, such as subdivision and conditional use permits to assure conformance with adopted plans, regulations, and state law, including state and county environmental guidelines. The San Bernardino County Land Use Service Department was contacted to verify the number of private construction projects in the watershed over the reporting period. There was one project; a single family residence located at 1351 Lytle Creek Road which is south of the ranger station.

The 2020-2021 Annual Storm Water Report for San Bernardino County Flood Control District (SBCFCD) was also reviewed. As required by the municipal storm water permit for San Bernardino County, (per the Regulation and Management section below), the SBCFCD is responsible for maintaining a database of commercial, industrial, and construction sites which could potentially impact water quality discharged through the storm drain system on a yearly basis. There were none listed within the Lytle Creek watershed.

Related Water Quality Issues and Data Review

As there are limited urbanized areas within the Lytle Creek watershed, the area is not monitored for urban runoff by the SBCFCD. Over the reporting period, there were no other storm water monitoring programs relevant to the Lytle Creek watershed.

Regulation and Management

Prior to any construction and/or land disturbing activity, the San Bernardino County Land Use Services Department requires a pre-construction inspection report permit or erosion control permit as well an on-site inspection. This is required in order to obtain approval or clearance for subsequent building permits. A grading permit is required for an excavation greater than two feet in depth, or a fill one foot or more in thickness, or if the grading is over 5,000 cubic yards.

Urban runoff from the unincorporated communities in the Lytle Creek watershed are regulated through a municipal storm water permit for San Bernardino County and all the incorporated cities within its jurisdiction. The San Bernardino County NPDES permit number is R8-2010-0036. The permit named the SBCFCD the principal permittee and San Bernardino County and the incorporated cities as the co-permittees.

For construction projects within the unincorporated areas of San Bernardino County, such as the Lytle Creek watershed, urban runoff and stormwater issues are addressed through the California Environmental Quality Act (CEQA) process, through inspection of construction sites, and by requiring a project-specific Water Quality Management Plan (WQMP).

A project-specific WQMP is intended to identify potential post-project pollutants and hydrologic impacts associated with the development; identify proposed mitigation measures for identified impacts including site design, source control and treatment control post-development best management practices (BMPs); and identify sustainable funding and maintenance mechanisms for the BMPs.

Additionally, for projects that disturb at least one acre of land, a Notice of Intent (NOI) must be filed with the Regional Board to obtain coverage under the General Stormwater Permit for Construction Activities. Proof of submittal of an NOI must be provided prior to issuance of a grading or building permit.

Source Water Protection Activities

No specific source water protection activities have been conducted by WVWD during the study period.

Summary of Findings for Development

- Overall, there has been little to no development within the watershed within the past five years.

- There are little to no commercial and industrial uses within the watershed, as it is primarily residential and open space.

FIRES

Background

The aftermath of a wildfire or prescribed burn can impact source water quality. In general, the load of dissolved substances to streams will increase following a wildfire, due to increased runoff. Increased runoff can occur following a fire because the formation of a hydrophobic organic layer in the soil increases the water repellency of soils (DeBano, 2000). A U.S. Geological Survey (USGS) study concluded that measurable effects of fires on stream water quality are most likely to occur if the fire was severe enough to burn large amounts of organic matter, if windy conditions were present during the fire, if heavy rain occurred following the fire, and if the fire occurred in a watershed with steep slopes and soils with little cation-exchange capacity (USGS, 2004).

Seasonal Patterns

In the literature reviewed, many of the highest nitrate concentrations in streams and rivers have been measured during storms in the weeks to months following a fire. In general, elevated concentrations of phosphorus decline one to two years post-fire, while the elevated concentrations of nitrogen, particularly nitrate, decline at a slower rate, three to five years post-fire.

Related Constituents

The magnitude of the effects of fire on water quality is dependent on how fire characteristics (frequency, intensity, duration, and spatial extent of burning) interact with watershed characteristics (weather, slope, soil type, geology, land use, timing of regrowth of vegetation, and burn history). This interaction is complex and highly variable so that even fires in the same watershed can burn with different characteristics and produce variable effects on water quality. Typically, stormwater runoff from burned forested areas contains high concentrations of phosphorus, nitrogen, dissolved organic carbon, sediment, and metals such as mercury, lead, and arsenic.

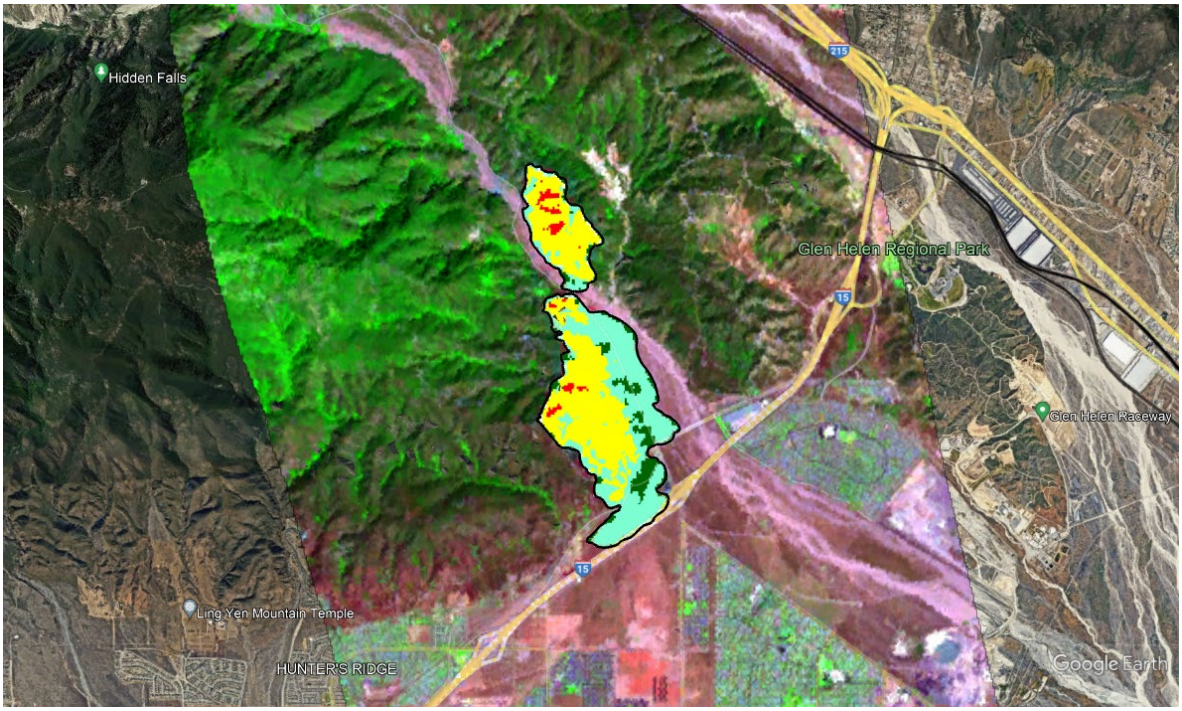
Occurrence in Watershed

There were two wildfires in the watershed over the reporting period:

- Brook Fire which burned 185 acres in 2020
- South Fire which burned 819 acres from August 25 to September 2, 2021.

Figure 4-6 shows a map of the burn area for the South Fire. The shaded colors do not represent the fire burn intensity. The majority of the fire was located on the west side of Lytle Creek Road which falls outside of the watershed boundary. The US Forest Service also confirmed that no Burned Area Emergency Response (BAER) report was prepared for the South Fire.

Figure 4-6. South Fire Burn Perimeter



Prepared by Inland Empire Resources Conservation District

Related Water Quality Issues and Data Review

WVWD collected water quality samples from the Afterbay on September 1, 2021 which was a day prior to the end of the fire. Samples were collected for coliforms, general physical, metals, per-and polyfluoroalkyl substances (PFAS) and polybrominated diphenyl ethers (PBDE) flame retardants. PFAS and PBDE were nondetectable (ND). All other results did not show elevated levels. The Roemer WFF was not impacted immediately by the South Fire as the plant was not treating Lytle Creek water from August 26 to September 14, 2021.

Regulation and Management

Fire protection services are mainly provided by the San Bernardino County Service Area 38. The San Bernardino County Fire Department provides services to Lytle Creek through the West Valley Division of their department, as the West Valley Division has a station located within the Lytle Creek community. Other agencies providing fire protection services include the California Department of Forestry and Fire Protection, the USFS, and the Fire Safe Council.

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 U.S.

Forest Service Wildland Fire Chemical Systems website (http://www.fs.fed.us/rm/fire). According to the USFS, the fire retardant commonly used is Phos-Check. The use of fire retardants can impact water quality if chemicals are accidentally dropped into a water body, or if heavy rains occur before the product has had time to naturally degrade.

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

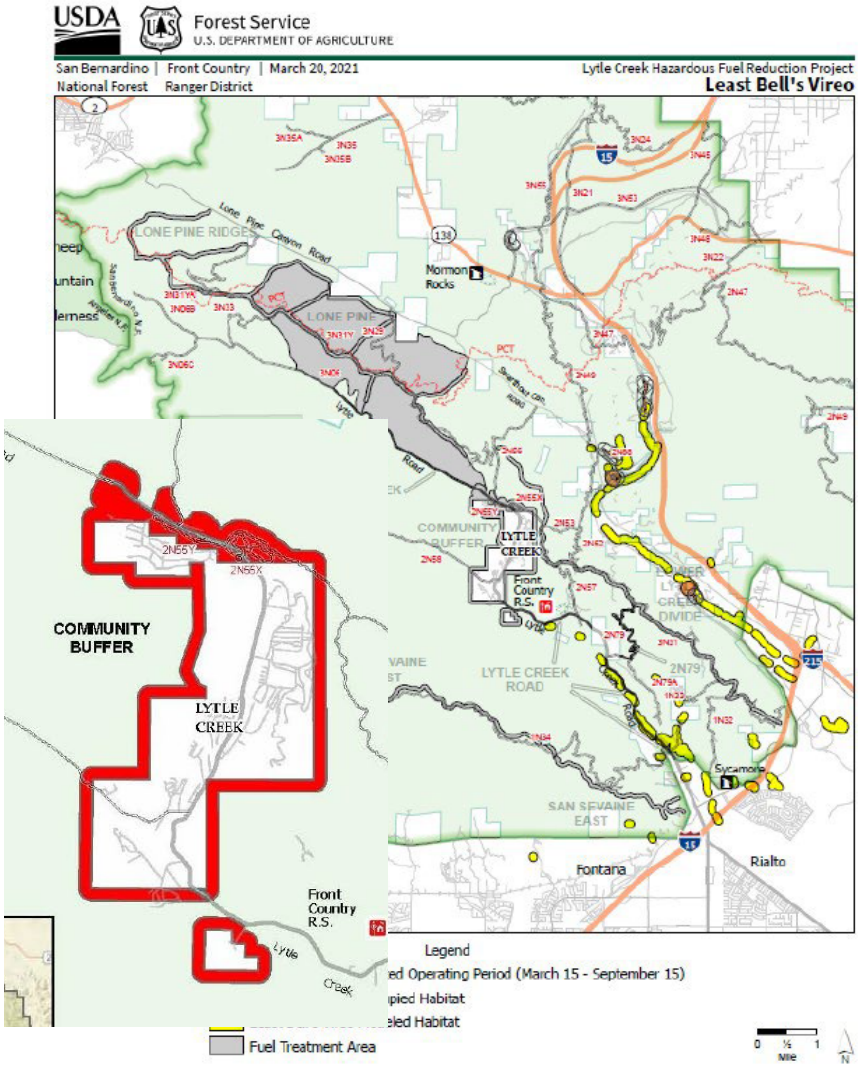
The National Interagency Fire Center has developed *Interagency Standards for Fire and Fire Aviation Operations* which are annually revised. The *Interagency Standards for Fire and Fire Aviation Operations* states, references, or supplements policy for the U.S. Bureau of Land Management, the USFS, the 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 upheld in a December 2011 Record of Decision, Nationwide Aerial Application of Fire Retardant on National Forest System Land, USFS.

Source Water Protection Activities

The US Forest Service will implement the Lytle Creek Hazardous Fuels Reduction Project which will reduce the risk of catastrophic wildfire in the watershed. The main activities for this project are to reestablish new fuel breaks along ridgelines and create a 300 feet fuelbreak around the community of Lytle Creek, as shown in shaded gray areas and red borders in **Figure 4-7.** This will be achieved by mechanical and manual removal of trees and shrubs, prescribed burning, tree thinning, and use of herbicides (glyphosate and triclopyr).

The plan details the herbicide application process, which is called cut stump application. The plant is cut and the stump is immediately sprayed at close range which is effective and limits the amount of herbicide used. A dye will also be added to the herbicide mixture to manage applications. Additionally, the herbicide application is not allowed within 100 feet of the high water mark, and no application is predicted if precipitation is predicted at 30 percent or higher within 48 hours of planned application.

Figure 4-7 Map of Proposed Work for Lytle Creek Hazardous Fuels Reduction Project



Additionally, source water protection from fire-related impacts is generally in place as the Roemer WFF can be shutdown when turbidity increases, or other changes in source water quality occur. It is recommended to contact the Lytle Creek Ranger Station whenever there is a wildfire within the watershed and attend BAER team meetings if possible. Another recommendation is to consider timing specialty monitoring related to post-wildfire event to the first significant rain event (>0.1 inch) to assess potential impacts to Lytle Creek source water. Typical constituents to monitor for are metals, general physical, TOC, PFAS and nutrients.

Summary of Findings for Fires

- The Lytle Creek watershed is entirely a high to extremely high fire risk based on vegetation. The largest wildfire over the reporting period was the South Fire which occurred from August 25 to September 2, 2021. The Roemer WFF was not impacted immediately by the South Fire as the plant was not treating Lytle

Creek water from August 26 to September 14, 2021. Additionally, water quality samples collected on September 1, 2021 did not show detectable levels of PFAS or PBDE. All other results did not show elevated levels.

- WVWD is able to minimize fire-related impacts to the Roemer WFF by shutting the plant down during times of degraded source water quality.

- The US Forest Service will implement the Lytle Creek Hazardous Fuels Reduction Project which will reduce the risk of catastrophic wildfire in the watershed.

FLOODS/EROSION

Background

Floods and erosion are naturally-occurring phenomenon for the Lytle Creek watershed. Erosion can be caused by either wind, gravity, or running water. Lytle Creek is an erosive watershed, particularly because the San Gabriel Mountains are considered a fast growing mountain range. Therefore, erosion occurs in both dry and wet conditions.

Although no major flood problems exist within the Lytle Creek study area as defined by the National Flood Insurance maps, the steepness of the terrain can cause flooding and flood related problems for properties adjacent to major drainage courses. The steep slopes in Lytle Creek create a high velocity of water flow in streambeds. This high velocity causes greater than normal erosion to occur in, and adjacent to, drainage courses. Residents want to prevent the conversion of natural watercourses to culverts, storm drains, or other underground structures except by special permit (2007 Lytle Creek Community Plan).

Additionally, Lytle Creek is a high to very high fire risk watershed. Rainfall on burned basins can transport and deposit large volumes of sediment, both within and down-channel from the burned area (Cannon et al 2003). Debris flows are among the most hazardous consequences of rainfall on burned hillslopes. Debris flows and landslides pose a distinct hazard because of their unique destructive power.

Seasonal Patterns

On average, about 75 percent of California's average annual precipitation falls between November and March; half occurs between December and February. The Lytle Creek watershed is also subject to short-duration, high-intensity summer monsoon rains. Please refer to **Section 2** for rainfall records from 2018 to 2022 in the Lytle Creek watershed.

Related Constituents

Debris flows may consist of mud, rocks, trees, and boulders. It is generally a muddy slurry, capable of transporting a mixture of materials**,** including very large boulders over gentle slopes.

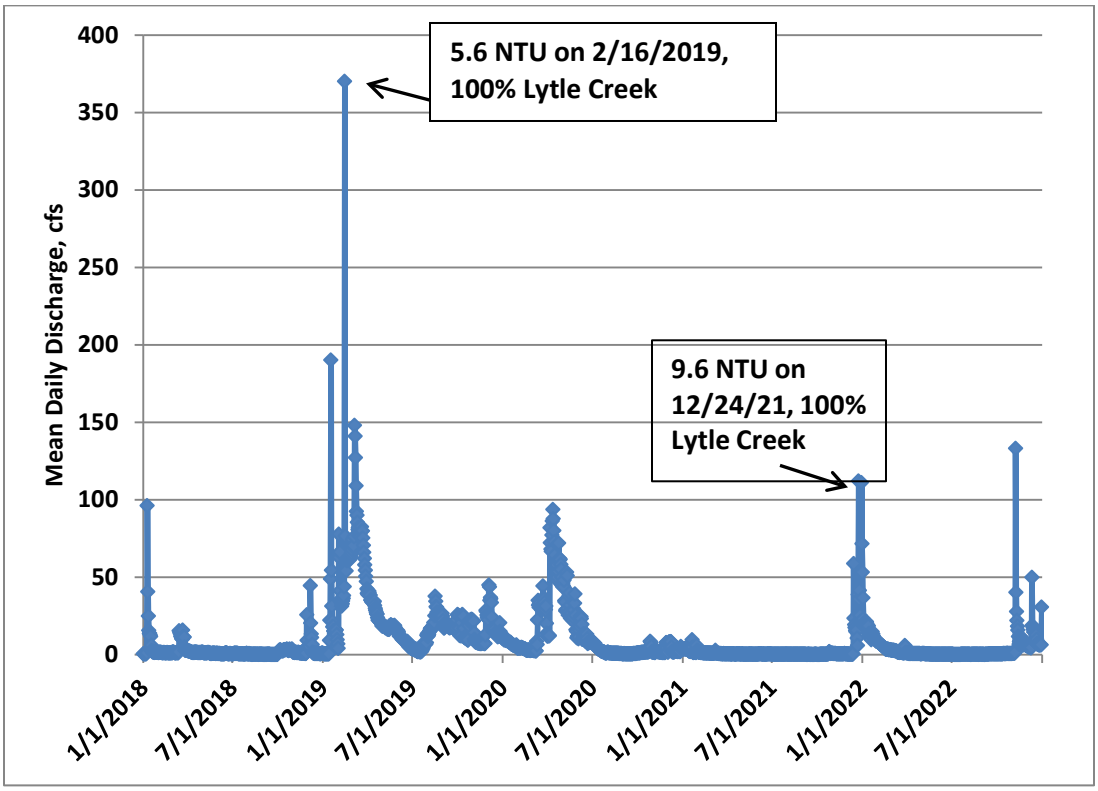
WVWD staff report that china clay, or kaolinite, is eroded and then transported from the stream bed during storms. Kaolinite is a clay mineral with the chemical composition $Al_2Si_2O_5(OH)_4$. It is a soft, earthy, usually white mineral (dioctahedral phyllosilicate clay), produced by the chemical weathering of aluminum silicate minerals like feldspar.

Occurrence in Watershed

Flooding and debris flows occur in the Lytle Creek watershed as it is a natural canyon area with steep topography and can receive high amounts of rainfall in a short time period. Debris and flood flows are also uncontrolled in the upper reaches of Lytle Creek, since there are no major flood-control facilities upstream of the Lytle Creek communities.

Stream flow data for Lytle Creek was obtained over the reporting time period to study the occurrence of high flows. **Figure 4-6** shows the total flow in Lytle Creek from 2018 to 2022. Daily discharge flow averaged 9.4 cfs, compared to 2.2 cfs from 2013 to 2017.

Figure 4-6
Mean Daily Discharge for Lytle Creek, Station 11062000, 2018-2022



Related Water Quality Issues and Data Review

When flows increase in Lytle Creek, and assuming that the Roemer WFF is treating 100 percent Lytle Creek, one of the most immediate changes in water quality is typically an increase in plant influent turbidity due to sediment being washed into the creek from watershed runoff. As an example, **Figure 4-6** shows the raw water turbidity increase on or close to the dates of certain peak flows when 100% Lytle Creek was being treated.

Regulation and Management

The SBCFCD is responsible for providing flood control and related services throughout San Bernardino County, including the city incorporated areas. However, there are no major flood-control facilities in the watershed.

Source Water Protection Activities

West Valley Water District

Similar to fires, source water protection from flooding and erosion is generally in place as the Roemer WFF can be shutdown when turbidity increases, or other changes in source water quality occur. For example, the WVWD typically avoids using Lytle Creek

water during high storm events, in order to prevent china clay from entering the treatment plant.

Summary of Findings for Floods/Erosion

- Flooding and debris flows occur in the Lytle Creek watershed as it is a natural canyon area with steep topography and can receive high amounts of rainfall in a short time period.

- Debris and flood flows are also uncontrolled in the upper reaches of Lytle Creek, since there are no flood control facilities upstream of the Lytle Creek communities.

- Flows in Lytle Creek were higher over this time period (compared to 2013 to 2017) with an average daily discharge of 9.4 cfs.

- WVWD typically avoids using Lytle Creek water during high storm events, in order to prevent high turbidity and china clay from entering the treatment plant.

The purpose of this section is to evaluate the Oliver P. Roemer Water Filtration Facility (Roemer WFF) for its compliance with existing drinking water regulations.

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

See the discussion in **Section 3** on the influence of source water contribution to the Roemer WFF influent. Lytle Creek is used as a source throughout the year, but with the most significant contribution from November through May. Therefore, treated water quality at Roemer WFF represents varying amounts of Lytle Creek. In addition, West Valley Water District (WVWD) uses several treated water sources in its distribution system, including the Roemer WFF, local groundwater supplies, and the baseline feeder system. **Figure 5-1** presents the monthly amount of Lytle Creek supply in the distribution system. Lytle Creek contributes from 2 to 56 percent of monthly distribution system supply, with an average and median of 26 percent. Therefore, Lytle Creek is a minority supply in the distribution system most of the time with peak use in the winter months.

Highlights of Selected Existing Drinking Water Regulations

NIPDWR and Phase I, II, and V Regulations. Set MCLs for many inorganic chemicals, synthetic organic compounds (SOCs), and volatile organic compounds (VOCs).

Surface Water Treatment Rule (SWTR). Set minimum 3/4-log reduction requirement for *Giardia* and viruses, respectively. Set turbidity requirements, which have since been tightened by the Interim Enhanced Surface Water Treatment Rule.

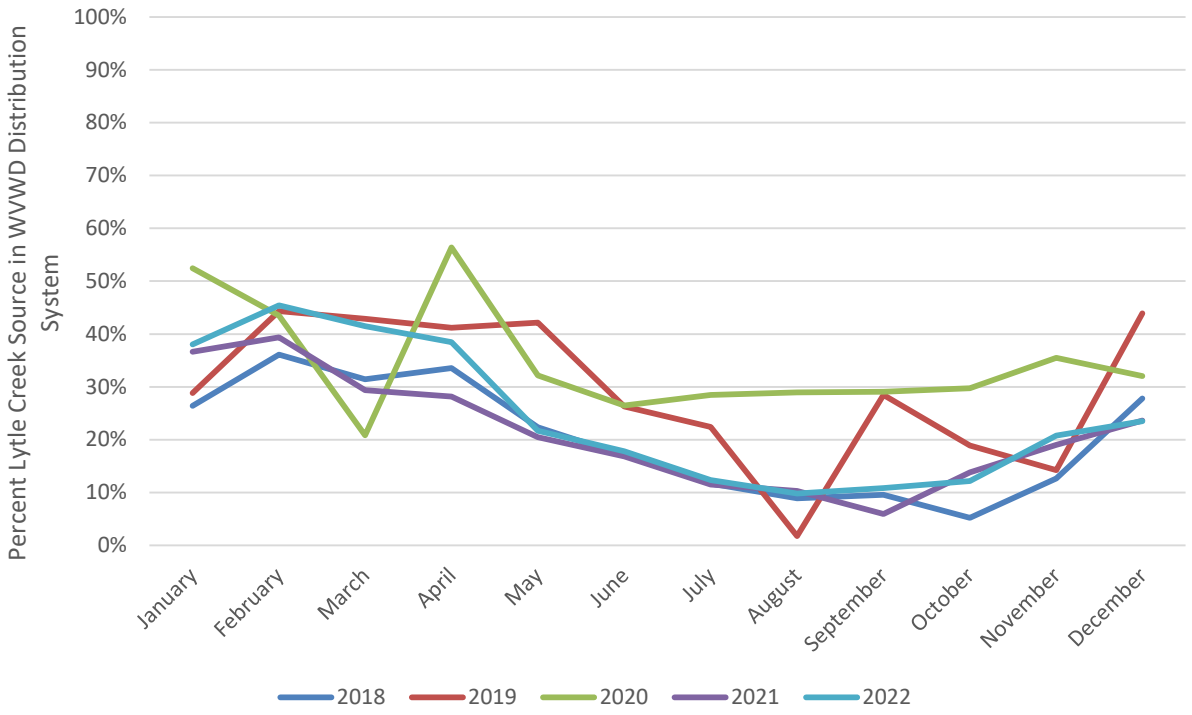
Interim Enhanced SWTR (IESWTR) and Filter Backwash Rule. Set minimum 2-log reduction requirement for *Cryptosporidium*. Requires continuous monitoring of individual filter effluents (IFE) and combined filter effluent (CFE). Tightened treated water turbidity requirements: CFE < 0.3 NTU in 95 percent of monthly measurements, and not to exceed 1 NTU. Set IFE reporting and evaluation requirements. Requires recycling of all return flows to the headworks, upstream of chemical feed.

Stage 1 Disinfection/Disinfection By-Product (D/DBP) Rule. Set a treatment technology for DBP precursor removal (enhanced coagulation) based on source water total organic carbon (TOC) levels. Varying levels of removal are required if the source water concentrations are > 2 mg/L. Sets maximum contaminant levels (MCLs) for TTHMs and HAA5 at 80/60 µg/L, respectively, in the distribution system as system-wide running annual average (RAA).

Long Term 2 Enhanced SWTR. Requires *Cryptosporidium*, or *Escherichia coli (E. coli)* source water monitoring depending on system size. Source water bin classification dependent on monitoring results. If average *Cryptosporidium* value is > 0.075 oocysts/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 monitoring for *Cryptosporidium*. A second round of source water monitoring was conducted six years after initial bin classification.

Stage 2 D/DBP Rule. Requires compliance with distribution system MCLs for TTHM and HAA5 to be based on locational running annual average (LRAA). In Stage 2 compliance is based on LRAA of 80/60 µg/L. Initial Distribution System Evaluations were completed to identify long term routine monitoring locations. Compliance schedules will depend on system size and source type. For combined distributions systems, all systems will be on schedule of earliest system.

Figure 5-1
Monthly Percent Lytle Creek Source in WVWD Distribution System



OLIVER P. ROEMER WATER FILTRATION FACILITY

System Description

The Roemer WFF receives Lytle Creek water from the Fontana Union Water Company (FUWC) Powerhouse Afterbay. This water consists of a blend of source waters from the Southern California Edison (SCE) upper diversion, the FUWC lower intake structure, and the Grapeland Tunnel groundwater infiltration. In addition to the Lytle Creek source, the Roemer WFF receives State Project Water. Typically, these waters are blended based on source water availability and to achieve optimum raw water quality. **Section 3** presented a summary of the monthly use of Lytle Creek at the Roemer WFF.

WVWD's California Division of Drinking Water (DDW) Water Supply Permit was most recently amended in October 2017 to add new granular activated carbon (GAC) units to the plant, which has a capacity of 14.4 million gallons per day (mgd). The permit confirms:

- 3/4/2-log reduction requirements for *Giardia*/viruses/*Cryptosporidium*,
- Classification of the treatment process as equivalent to conventional filtration and awards 2.5/2/2-log reduction credit for physical removal of *Giardia*/viruses/*Cryptosporidium*,
- UV disinfection as the primary disinfectant and awards 4/0.5/4-log inactivation credit for *Giardia*/viruses/*Cryptosporidium*, and

- Chlorination disinfection as the residual disinfect and requires 1.5-log virus inactivation via chlorination.

The Roemer WFF currently consists of a series of treatment processes. The plant was expanded in 2007, 2012, and 2017 to increase capacity and upgrade the facilities to allow for increased use of State Project Water and during periods of lower Lytle Creek quality. The Roemer WFF has a pretreatment facility to provide additional solids removal primarily for the State Project Water, and possibly the Lytle Creek source during periods of lower water quality. This facility includes flocculation and sedimentation. The pretreatment effluent is sent to the two raw water blending reservoirs. The Lytle Creek source is typically sent directly to the raw water blending reservoirs. The effluent from the raw water blending reservoirs is then sent to the filtration plant.

The filtration plant consists of six Microfloc Trident 840E package units which provide two-stage filtration. Chemical feed occurs at the influent to the plant and includes pre-chlorination, coagulation (aluminum-based), and cationic polymer as needed. Conventional filtration equivalent is provided by the package system consisting of contact absorption clarification and multi-media filtration. The filter loading rate is 6 gallons per minute per square foot (gpm/sf) and the filters are backwashed based on filter run time, effluent turbidity, and head loss. The filter backwash water is sent to the decant basins and is now recycled to the inlet header upstream of the pretreatment basins the plant. After backwashing, the filters are normally wasted for 10-15 minutes before returning to service.

The filtered water is then sent through three parallel ultraviolet (UV) light reactors for disinfection. This is a Trojan UV Swift TM Model 6L24. If total organic carbon (TOC) levels in the plant effluent water need to be further reduced prior to disinfection then a portion of the stream will be sent to the GAC units and then blended back in the plant effluent. Approximately one-third of the flow is generally sent to the GAC units. Finally, the water is post-chlorinated in a chlorine contact tank to provide a distribution system disinfectant residual. The typical residual leaving the plant ranges from 1.0 – 1.5 milligrams per liter (mg/L).

WVWD is currently constructing an expansion to the Roemer WFF that will: add three new Trident package filtration units, add one new UV reactor, and install new GAC feeder pumps. This will increase the treatment capacity from 14.4 mgd to 21.6 mgd.

Highlights of Changes Since the 2018 Update

There were no significant changes in the Roemer WFF during the study period.

Significant Potential Contaminating Activities

The diverted water from Lytle Creek is subject to recreation, development, fires, floods/erosion, spills, and wastewater. The most significant watershed activities which

impact the water quality of Lytle Creek is body-contact and dispersed recreation in Lytle Creek, as well as spills..

Water Quality Summary

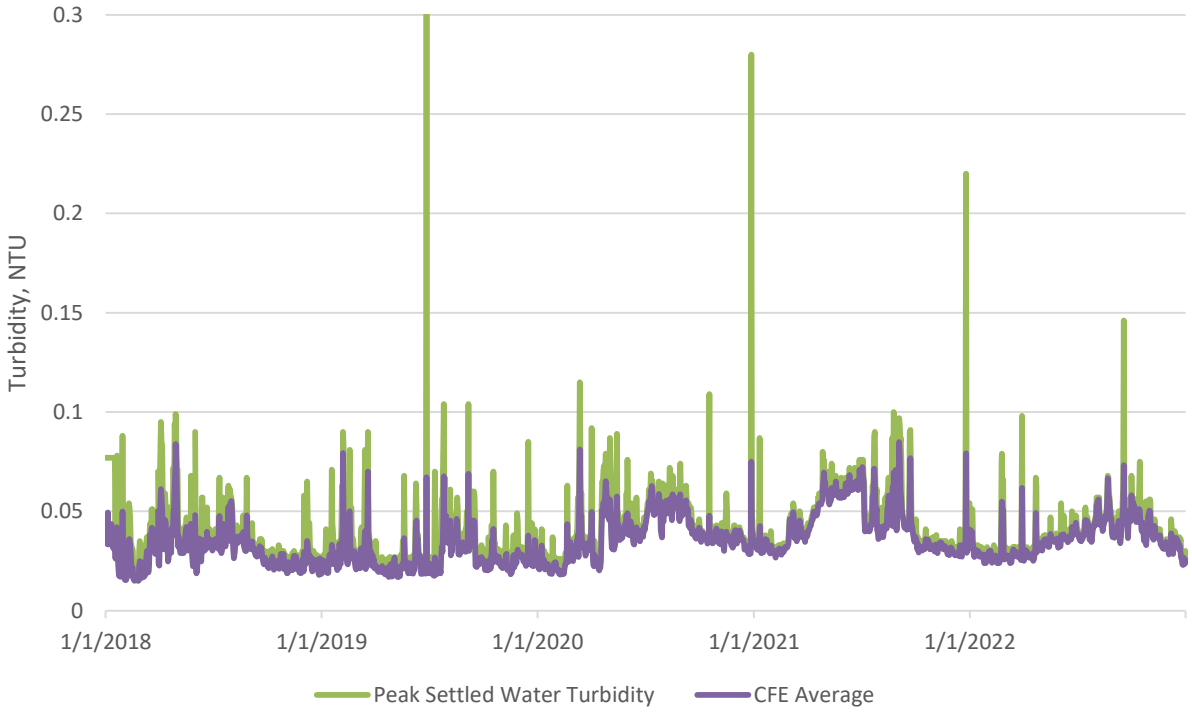
Below is a discussion of each of the constituents of interest and any notable compliance issues for each constituent during the period of study.

Turbidity

The turbidity measurements of the peak daily settled water and combined filter effluent (CFE) from January 2018 through December 2022 were included in this evaluation. A review of the data shows that the CFE was well within regulatory limits, with all average daily measurements below 0.085 nephelometric turbidity units (NTU), well below the treatment technique requirement of 0.3 NTU.

Figure 5-2 shows a time series plot of settled and treated water turbidities. The Roemer WFF meets all current treated water turbidity standards.

Figure 5-2
Peak Daily Settled and Average Daily CFE Turbidity at Roemer WFF, 2018 - 2022



The peak daily settled water ranged from 0.015 to 0.302 NTU, with an average value of 0.04 NTU and a median value of 0.037 NTU over the entire study period. These numbers are slightly lower than those reported in the 2018 Update.

The average daily CFE ranged from 0.015 to 0.085 NTU, with an average value of 0.03 NTU and a median value of 0.033 NTU over the entire study period. These numbers are also slightly lower than those reported in the 2018 Update, and well within the regulatory threshold of 0.3 NTU.

When comparing the peak daily raw water turbidity to the average daily CFE, the percent solids reduction can be calculated. Conventional filtration is required to provide 80 percent solids reduction. The daily solids reduction at the Roemer WFF ranged from 8 to 100 percent, with an average and median value of 91 percent, exceeding the 80 percent requirement. Although there were individual days where the solids reduction was less than 80 percent (in all of these cases it was due to extremely low raw water turbidity), all monthly reduction requirements exceeded the 80 percent requirement. See **Appendix B**.

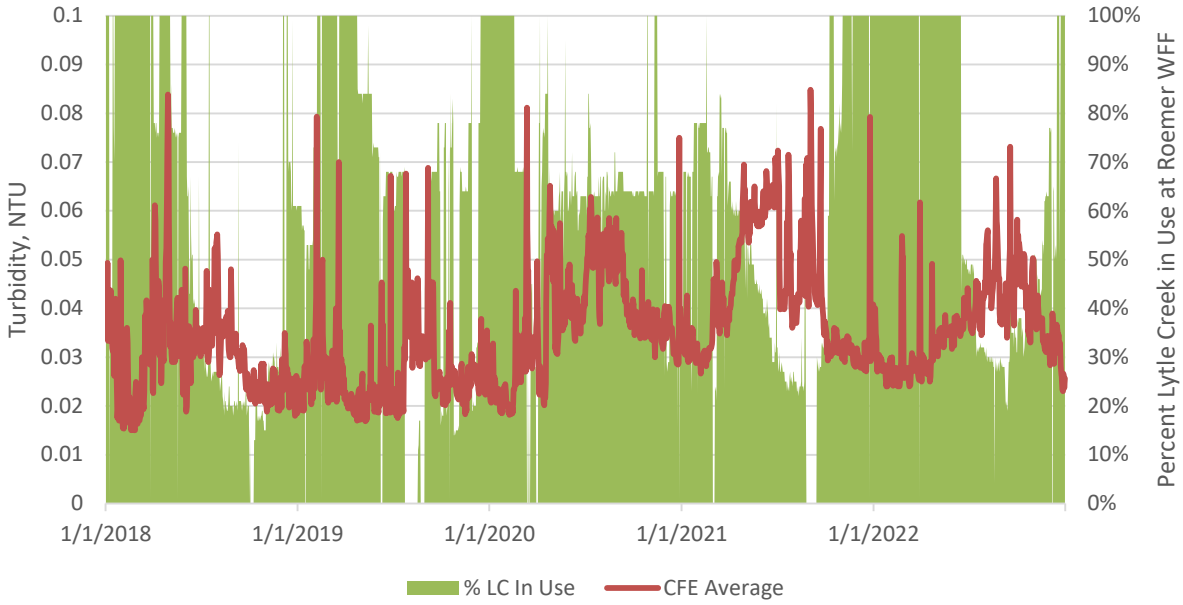
Figure 5-2 shows an increasing trend in CFE turbidity from 2020 through 2022. The annual average CFE was calculated for each year of the study period and compared to the percent Lytle Creek use at Roemer WFF. **Table 5-1** provides a summary of that data. The data indicates that the year with the lowest Lytle Creek use, 2021, had the highest CFE turbidity. However, the other years do not consistently correlate turbidity to source. Therefore, it appears that there has been an increase in CFE levels since 2020 but there are probably more specific seasonal impacts associated with source management and treatment.

Table 5-1
Annual Average CFE and Lytle Creek Use at Roemer WFF, 2018 - 2022

Year	Annual Average CFE, NTU	Percent Lytle Creek Use, %
2018	0.03	58
2019	0.027	63
2020	0.038	67
2021	0.043	56
2022	0.036	70

Figure 5-3 presents the daily CFE turbidity along with the daily contribution of Lytle Creek at the Roemer WFF. This chart allows identification of a more pronounced seasonal increasing trend in the CFE in 2020, 2021, and 2022 with higher CFE from spring through fall months, when increased amounts of SPW are in use at Roemer WFF. This period also shows higher base levels of CFE than the 2018 and 2019 during extended periods of Lytle Creek use. This seems to indicate that the increased CFE levels occur in spite of the source water and therefore may be related to operational practices at the Roemer WFF. It should be noted that all CFE levels are well below the regulatory thresholds.

Figure 5-3
Average Daily CFE Turbidity and Percent Lytle Creek Use at Roemer WFF, 2018 - 2022



Summary of Results for Turbidity

- All CFE turbidity measurements between January 2018 and December 2022 met the turbidity treatment technique limit and were less than 0.085 NTU.
- The peak daily settled water had an average value of 0.04 NTU and the average daily CFE had an average value of 0.03 NTU. This shows that a large amount of the solids removal is achieved during the pretreatment process of flocculation and sedimentation.
- Solids removal through plant averages 91 percent, meeting the 80 percent goal for conventional treatment. Removal is most challenging under low raw water turbidity periods.
- There has been a slight increasing trend in CFE since 2020, which does not appear to be solely related to source use at the Roemer WFF.

Microbiological Constituent Review

Distribution system monitoring for coliforms as part of the Total Coliform Rule resulted in a few detections of total coliform in the distribution system during the study period. In each month with a detect, less than five percent of samples were positive. Therefore, there were no violations of the total coliform maximum contaminant level (MCL). Positive total coliform detects occurred during the following months; May and August 2018, March, May, August, and December 2019, May and November 2020, July, September and November 2021, and May, July, and December 2022. There were no detections of fecal coliform in the distribution system during the study period.

Disinfection By-Products and Precursors

WVWD monitored TOC levels at several locations in the treatment process during the study period in order to determine compliance with the TOC removal requirement of the Stage 1 D/DBP Rule. The Lytle Creek and State Project Water sources are typically blended to provide a raw water and treated water TOC levels less than 2.0 mg/L to comply with the alternative compliance criterion. As presented in **Section 3**, the Lytle Creek Influent is monitored and has an average TOC of 0.41 mg/L. The State Project Water Influent is also monitored and has an average TOC of 2.63 mg/L, significantly higher than Lytle Creek.

The Lytle Creek source water enters the Roemer WFF and is frequently blended with State Project Water (SPW), which has higher TOC levels. The SPW is sent through the pre-treatment facility first, which provides TOC reduction prior to blending with the Lytle Creek source at the raw water blending reservoirs. Lytle Creek water can also be supplied to the pretreatment facility. The water moves through the filtration plant to the Granular Activated Carbon (GAC) filters. During the study period, TOC was monitored regularly at the following locations in the Roemer WFF (upstream to downstream); Lytle Creek Influent, State Project Water Influent, Pretreatment Influent and Effluent, CFE, GAC Influent and Effluent, and Plant Effluent. **Table 5-2** provides a summary of the TOC results at each of these sites.

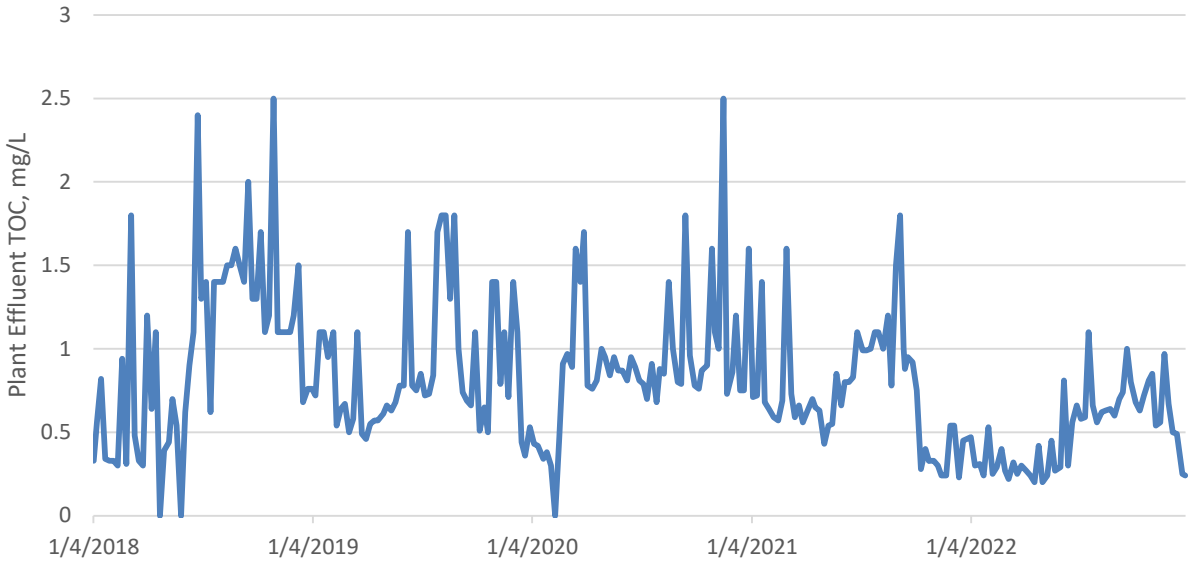
Table 5-2
TOC Levels Through Roemer WFF, 2018 - 2022

Sample Site	Range, mg/L	Average, mg/L	Median, mg/L
Lytle Creek Influent[1]	<0.33 – 1.2	0.41	0.36
SPW Influent[1]	1.5 - 6	2.63	2.6
Pretreatment Influent[2]	0.26 - 15	2.42	2.45
Pretreatment Effluent[2]	0.21 – 4.7	1.86	1.9
CFE[2]	0.2 - 2.4	0.93	0.88
GAC Influent[1]	<0.3 - 2	0.94	0.91
GAC Effluent[1]	<0.3 – 1.5	0.62	0.61
Plant Effluent[2]	<0.3 – 2.5	0.81	0.74

[1] Samples collected monthly
[2] Samples collected weekly

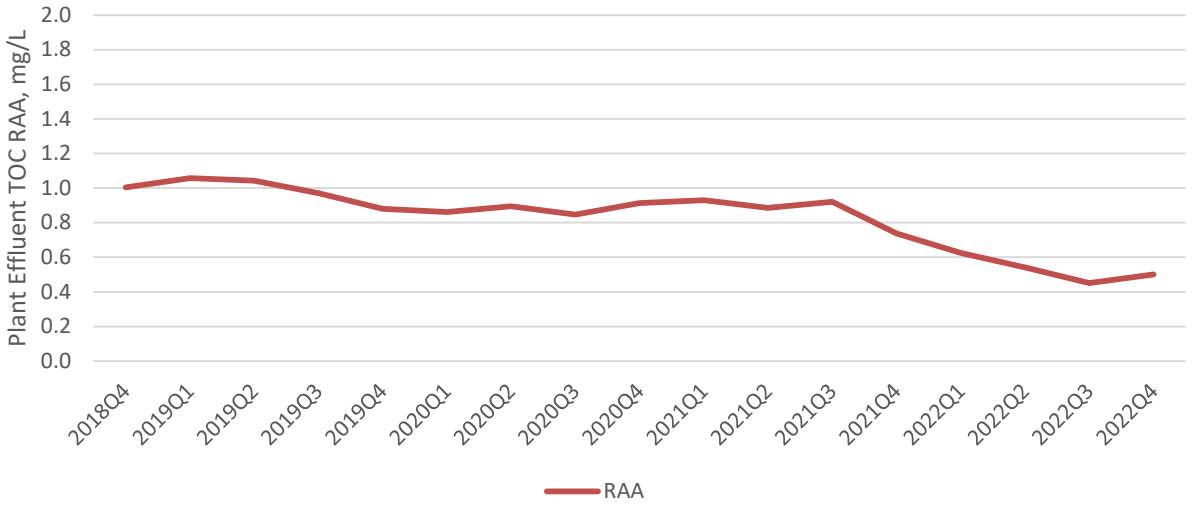
The plant effluent location is the final sample point before the water enters the distribution system and the site used for compliance with the Enhanced Coagulation requirement of the Stage 1 D/DBP Rule. This location is less than 2.0 mg/L in 98.9 percent of the individual samples collected. **Figure 5-4** shows the plant effluent TOC levels during the study period. Only three individual samples exceeded 2 mg/L (June 26, 2018, October 30, 2018, and November 17, 2020) and Lytle Creek was a minority source at Roemer WFF in two of those samples (33 percent, 15 percent, and 68 percent, respectively).

Figure 5-4
Roemer WFF Plant Effluent TOC Levels, 2018 - 2022



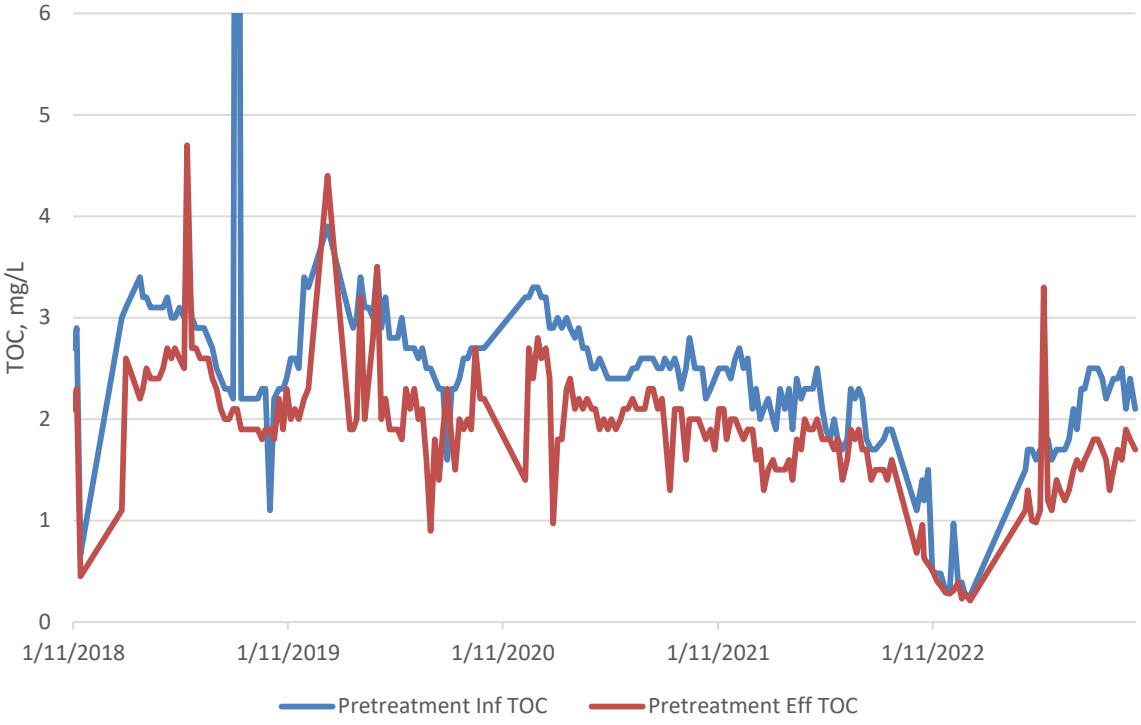
For source or treated waters with a running annual average TOC less than 2.0 mg/L (calculated from quarterly averages), the alternative compliance criterion is met and no TOC removal ratio is required to be calculated. The quarterly averages for the plant effluent sample site range from 0.32 to 1.42 mg/L. The running annual average TOC at the plant effluent site ranged from 0.45 to 1.06 mg/L, well within the 2 mg/L limit and meeting the alternative compliance criterion. **Figure 5-5** shows the RAA over the study period and a significant decrease can be seen in the second half of 2021 and through 2022, likely due to the increased use of Lytle Creek water as a source at the Roemer WFF.

Figure 5-5
Roemer WFF Plant Effluent TOC RAA, 2018 - 2022



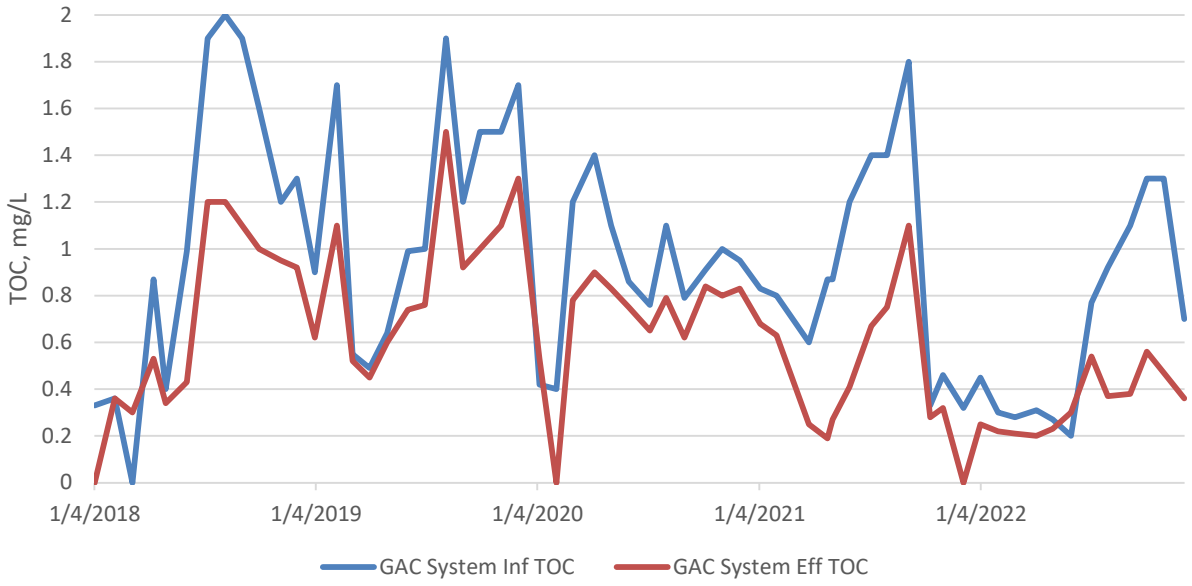
The pretreatment facility is operated to reduce turbidity and TOC in State Project Water, as well as Lytle Creek. The TOC reduction through the pretreatment facility ranges from zero to 86 percent, with an average reduction of 21 percent and a median reduction of 20 percent. **Figure 5-6** shows the pretreatment influent and effluent TOC levels during the study period. The pretreatment data in **Figure 5-6** also shows the clear decreasing trend since mid-2020, likely associated with an increase in the use of Lytle Creek source water.

Figure 5-6
Roemer WFF Pretreatment Influent and Effluent TOC Levels, 2018 - 2022



The GAC units are operated to further reduce TOC after the filtration plant. The TOC reduction through the GAC units ranges from zero to 100 percent, with an average reduction of 34 percent and a median reduction of 30 percent. **Figure 5-7** shows the GAC influent and effluent TOC levels during the study period. The GAC data in **Figure 5-7** shows the clear seasonal increase in TOC over the summer months in each year except 2020, which used significantly more Lytle Creek water during that year as discussed in **Section 3**. This seasonal increase is likely due to the increased use of SPW during this period, but could also be attributable to potential sources in Lytle Creek such as algae blooms or illicit discharges. In addition, there is an evident decreasing trend over the study period.

Figure 5-7
Roemer WFF GAC Influent and Effluent TOC Levels, 2018 - 2022

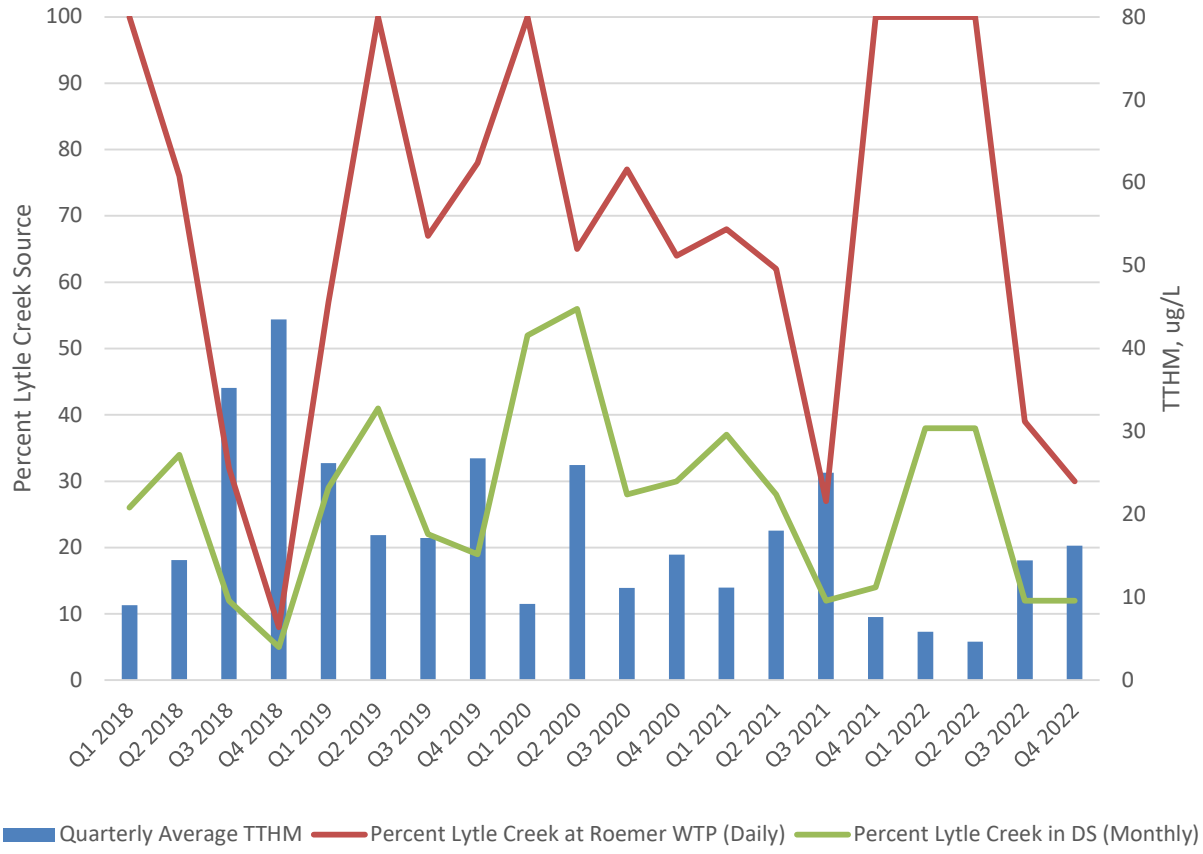


Summary of Results for Disinfection By-Product Precursors

- Lytle Creek provides water relatively low in TOC, with a range of non-detectable to 1.2 mg/L and an average of 0.41 mg/L.
- State Project Water has significantly higher TOC, with an average of 2.63 mg/L, that contributes to a higher blended water concentration through the Roemer WFF.
- Pretreatment facility provides an average of 21 percent reduction in TOC, with an average effluent TOC value of 1.86 mg/L.
- Roemer WFF CFE data show an average TOC value of 0.93 mg/L.
- GAC facility provides an average of 34 percent reduction in TOC, with an average effluent TOC value of 0.62 mg/L.
- The Plant Effluent sample site was evaluated for quarterly averages and running annual averages and showed that all were less than 2 mg/L.
- WVWD complies with the Stage 1 D/DBP Rule by meeting an alternative compliance criterion for the enhanced coagulation treatment technique, less than 2 mg/L in source or treated water.

Overall, the levels of total trihalomethanes (TTHMs) are very low in the distribution system with the individual samples ranging from non-detectable to 74.6 micrograms per liter (ug/L) and an average of 17.7 ug/L and a median of 11.1 ug/L. The quarterly averages for TTHMs ranged from 4.6 to 43.5 ug/L. **Figure 5-8** provides the quarterly average for the eight distribution system sites monitored as part of the Stage 2 D/DBP Rule for TTHM during the study period. Also included are the percent Lytle Creek use at the Roemer WFF and the percent Lytle Creek source in the distribution system.

Figure 5-8
Quarterly Average TTHM for WVWD Distribution System, 2018 - 2022



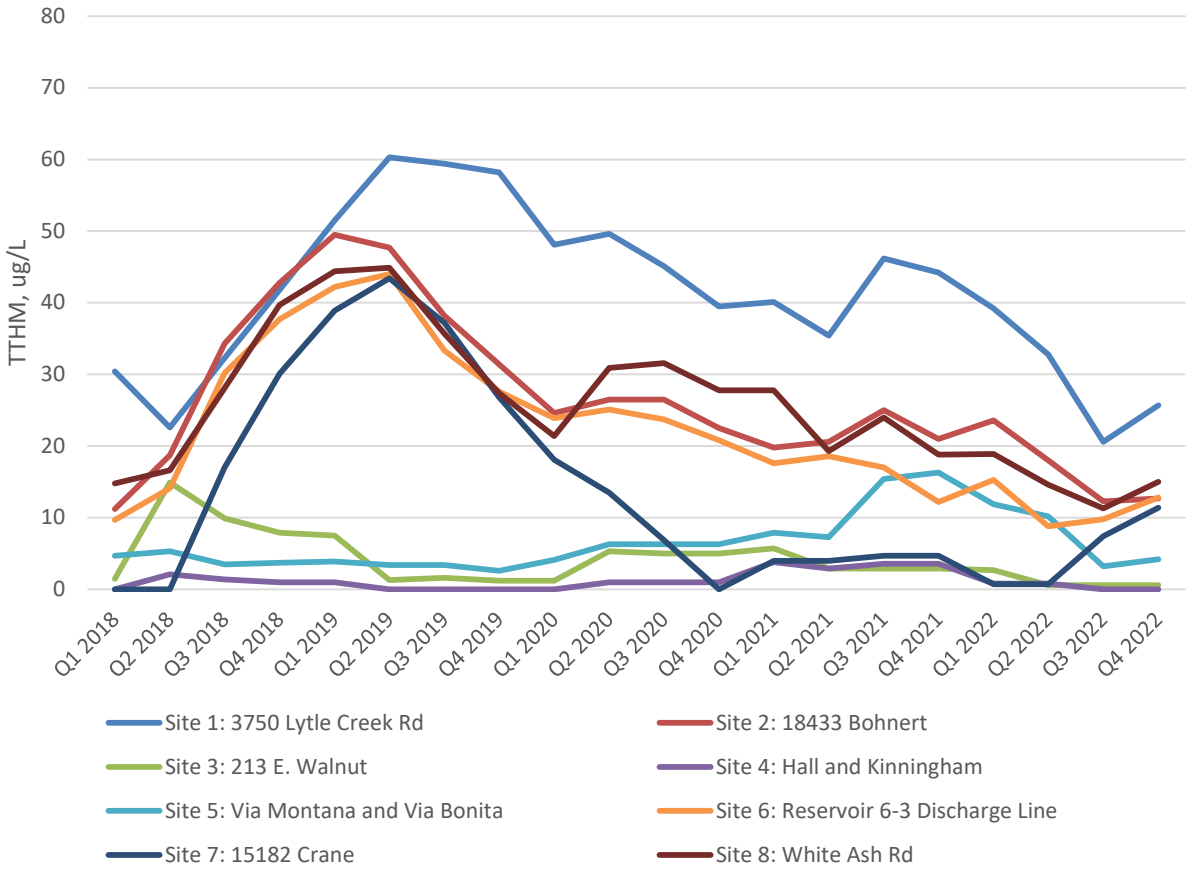
Generally speaking, the TTHM quarterly averages are highest in months with the lowest use of Lytle Creek and significantly lower during periods of higher use of Lytle Creek at the Roemer WFF. Typically, the highest concentrations occur during warmer months, which can cause higher water temperatures and higher chlorine demands that lead to increased production of DBPs.

WVWD complies with the Stage 2 D/DBP Rule by monitoring eight sites in the distribution system quarterly. Six of those (sites 1 through 6) are located in the zones that represent water from the Roemer WFF (Zones 4 through 8). Locational running annual averages (LRAA) were calculated for all the distribution sites. The LRAAs ranged from non-detect to 60.3 µg/L, all below the MCL of 80 µg/L. The highest levels of TTHMs occur at sites 1, 2, 6, 7, and 8, of which three (sites 1, 2 and 6) are in zones fed by Roemer WFF.

Figure 5-9 shows the LRAAs for the WVWD distribution system. Sites 3, 4 and 5 have the lowest TTHM LRAA levels and were relatively constant over the study period. Sites 1, 2, 6, 7 and 8 have the highest TTHM LRAA levels and showed a significant peak starting in mid-2018 through early 2020. This includes three sites representing the Roemer WFF (1, 2, and 6) and during this period there was a significant reduction in the amount of Lytle Creek water used at the Roemer WFF. The increases were likely

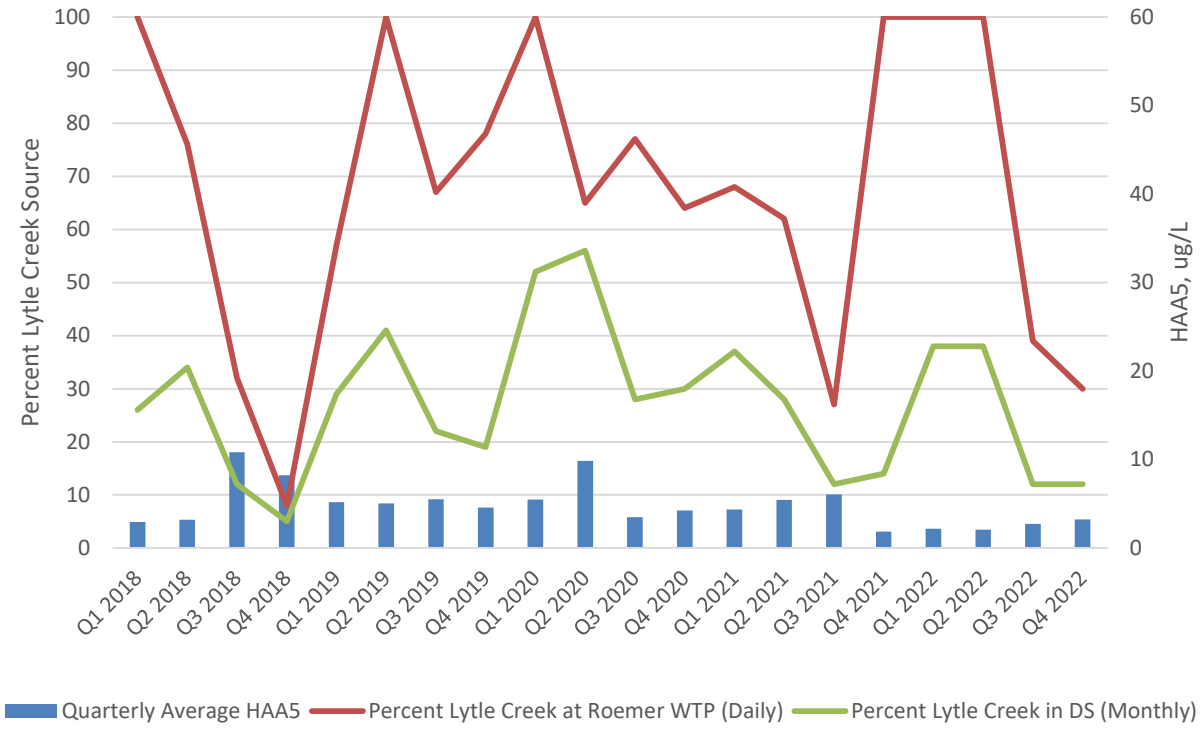
related to higher TOC levels of the SPW in use at the Roemer WFF. Another peak was seen in the third quarter of 2021, when Lytle Creek use decreased significantly again at the Roemer WFF.

Figure 5-9
TTHM LRAAs for WVWD Distribution System, 2018 - 2022



Similar to TTHMs, the levels of haloacetic acids (HAA5) are very low in the distribution system with the individual samples ranging from non-detectable to 25.7 ug/L and an average of 4.8 ug/L and a median of 3.7 ug/L. The quarterly averages for TTHMs ranged from 1.9 to 10.8 ug/L. **Figure 5-10** provides the quarterly average for the eight distribution system sites monitored as part of the Stage 2 D/DBP Rule for HAA5 during the study period. Also included are the percent Lytle Creek use at the Roemer WFF and the percent Lytle Creek source in the distribution system.

Figure 5-10
Quarterly Average HAA5 for WVWD Distribution System, 2018 - 2022

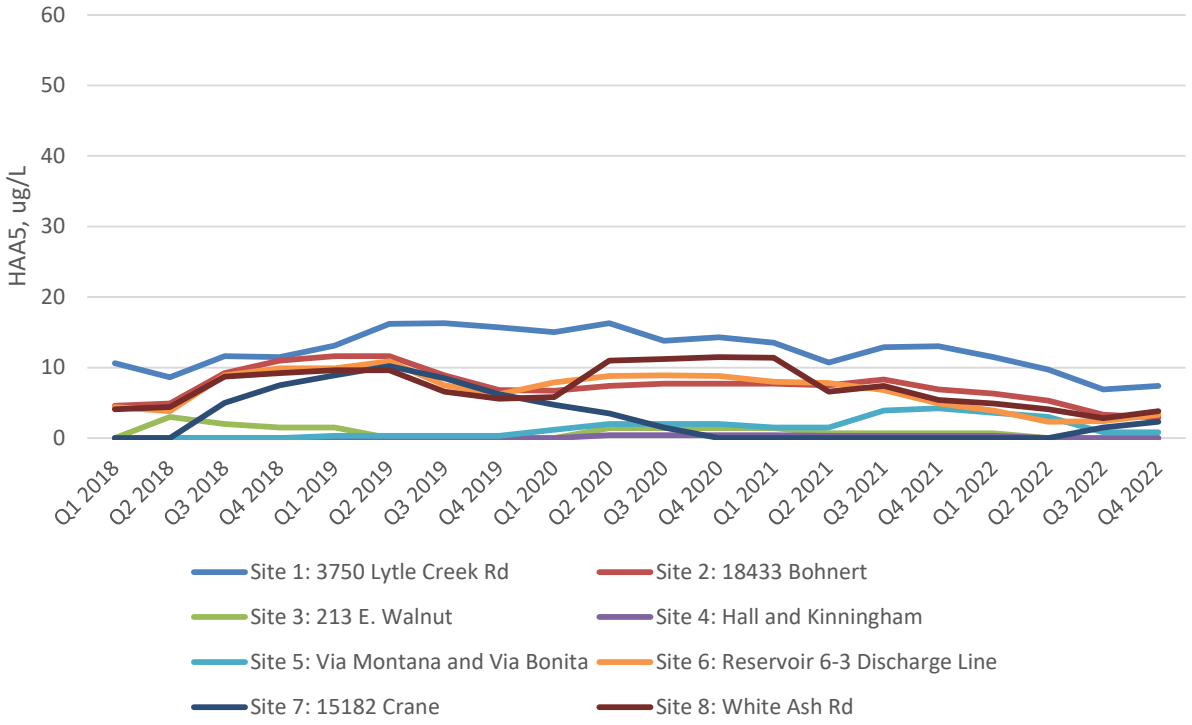


Generally speaking, the HAA5 quarterly averages are highest in months with the lowest use of Lytle Creek and lower during periods of higher use of Lytle Creek at the Roemer WFF, with the exception of the second quarter of 2020. Typically, the highest concentrations occur during warmer months, which can cause higher water temperatures and higher chlorine demands that lead to increased production of DBPs.

WVWD complies with the Stage 2 D/DBP Rule by monitoring eight sites in the distribution system quarterly. Six of those (sites 1 through 6) are located in the zones that represent water from the Roemer WFF (Zones 4 through 8). LRAAs were calculated for all the distribution sites. The LRAAs ranged from non-detect to 16.3 µg/L, all below the MCL of 60 µg/L. The highest levels of HAA5s occur at sites 1, 2, 6, 7, and 8, of which three (sites 1, 2 and 6) are in zones fed by Roemer WFF.

Figure 5-11 shows the HAA5 LRAAs for the WVWD distribution system. Sites 3, 4 and 5 have the lowest HAA5 LRAA levels and were relatively constant over the study period. Sites 1, 2, 6, 7 and 8 have slightly higher HAA5 LRAA, but do not show a similar peak starting in mid-2018 through early 2020 as the TTHMs.

Figure 5-11
HAA5 LRAAs for WVWD Distribution System, 2018 - 2022



Summary of Results for Disinfection By-Products

- TTHM data is within the primary MCL of 80 µg/L, with all LRAAs less than or equal to 60 µg/L.
- HAA5 data is well within the primary MCL of 60 µg/L, with all LRAAs less than or equal to 16 µg/L.
- Three of the distribution sites (sites 1, 2 and 6) with the higher DBP levels are associated with the Roemer WFF.
- DBP levels tend to increase during warmer months and there was an increasing trend for TTHMs seen from mid-2018 through early 2020.

Unregulated Contaminant Monitoring Rule 4

In addition, WVWD participated in the USEPA's Fourth Unregulated Contaminant Monitoring Rule (UCMR4) between January 2018 and October 2018. Three categories of monitoring were conducted:

- Quarterly monitoring at the Entry Point to the Distribution System (EPDS) for metals, alcohols, and pesticides.
    - All results were non-detectable for the Roemer WFF.
    - Samples represented a blend of Lytle Creek and SPW at the Roemer WFF as follows:

        - January 2018 (0-38 percent Lytle Creek in use)
        - April 2018 (76 percent Lytle Creek in use)
        - July 2018 (30-100 percent Lytle Creek in use)
        - October 2018 (18 percent Lytle Creek in use)
- Biweekly monitoring at the EPDS for cyanotoxins.
    - All results were non-detectable for the Roemer WFF.
    - Samples represented a blend of Lytle Creek and SPW from April 4 through July 16, with Lytle Creek use ranging from 30-100 percent.
- Quarterly monitoring at four sites in the distribution system for haloacetic acids.
    - Sample results are presented below.
    - Stage 2 D/DBP Rule sites 1, 2, 7, and 8 were included, with sites 1 and 2 representing Roemer WFF treated water.
    - Samples were analyzed for HAA5, HAA6Br, and HAA9 as follows:
        - HAA5: dibromoacetic acid, dichloroacetic acid, monobromoacetic acid, monochloroacetic acid, trichloroacetic acid.
        - HAA6Br: dibromoacetic acid, monobromoacetic acid, bromochloroacetic acid, bromodichloroacetic acid, dibromochloroacetic acid, tribromoacetic acid.
        - HAA9: HAA5 plus bromochloroacetic acid, bromodichloroacetic acid, chlorodibromoacetic acid, tribromoacetic acid.
    - Lytle Creek influent was sampled for a paired sample for bromide and TOC.
    - Samples represented various amounts Lytle Creek in the distribution system for each month as follows:
        - January 2018 (26 percent Lytle Creek contribution)
        - April 2018 (34 percent Lytle Creek contribution)
        - July 2018 (12 percent Lytle Creek contribution)
        - October 2018 (5 percent Lytle Creek contribution)

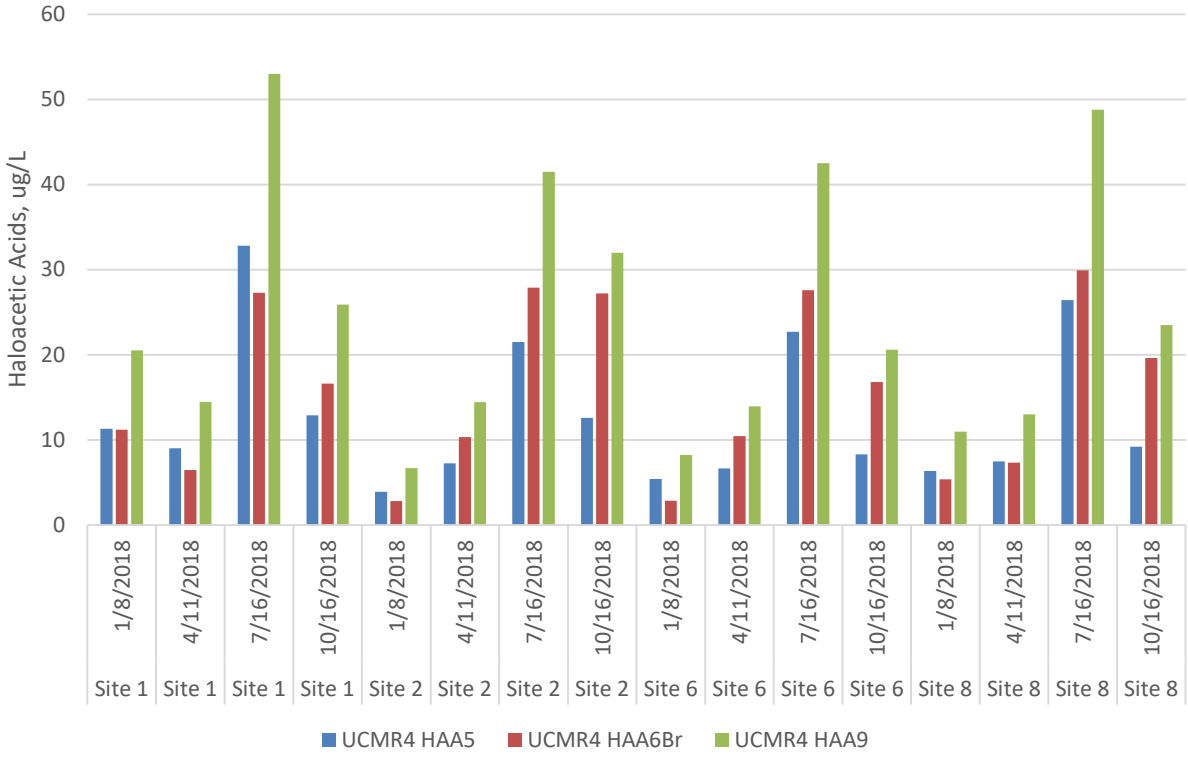
The source water samples from Lytle Creek influent for bromide and TOC showed non-detectable levels of both precursors in all four quarters.

The UCMR4 HAA samples were collected in the same month, but not the same day, as the Stage 2 D/DBP Rule samples. Therefore, the HAA5 levels are similar between the programs but not exactly the same. This comparison is presented in **Figure 5-12**. This indicates that there is consistency with the historic detections of HAA5 and that the HAA6Br and HAA9 results should be reasonable predictors of typical concentrations of these constituents. This also showed peak values typically occurring in the third quarter of the year at all sites, which represented warmer water and only 12 percent Lytle Creek source in the distribution system.

Figure 5-13 presents the concentrations of HAA5, HAA6Br, and HAA9 from the UCMR4 sampling program. This shows the presence of the brominated HAA species, especially in the third and fourth quarters when more SPW is in use. It should also be noted that even with the addition of the key brominated species, HAA9 levels are still below the current HAA5 MCL of 60 ug/L.

Figure 5-12
WVWD Distribution System Stage 2 D/DBP Rule and UCMR4 HAA5 Data, 2018

Figure 5-13
WVWD Distribution System UCMR4 HAA5, HAA6Br, and HAA9 Data, 2018



Giardia/Virus/*Cryptosporidium* Reduction Requirements

Based on the total coliform, fecal coliform, *Giardia,* and *Cryptosporidium* data presented in **Section 3**, 3/4/2-log reduction of *Giardia*/virus/*Cryptosporidium* are appropriate reduction requirements for the Roemer WFF.

The Roemer WFF is classified as a conventional filtration water treatment plant, and is therefore granted reduction credit for 2.5-log *Giardia,* 2.0-log viruses, and 2-log *Cryptosporidium* for physical removal. UV primary disinfection provides 4-log *Giardia,* 0.5-log viruses, and 4-log *Cryptosporidium* reduction credit. Residual disinfection with sodium hypochlorite provides a minimum of 1.5-log inactivation of viruses. This meets all of the current microbial removal/inactivation requirements of the SWTR, the Interim Enhanced SWTR, and the Long Term 2 ESWTR.

Regulatory Compliance Evaluation

WVWD has been monitoring the raw and treated water for the Roemer WFF for all required Title 22 compliance constituents. **Table 5-3** lists the existing drinking water regulations and a compliance evaluation for these standards at the Roemer WFF. The Roemer WFF is currently in compliance with existing regulations.

Table 5-3
Regulatory Compliance Evaluation
West Valley Water District – Roemer WFF

	Targeted Compounds	Key Issues Compliance Status
Existing Regulations		
Phase I, II, and V	IOCs, VOCs, SOCs	Monitored as required. The Annual Consumer Confidence Reports from the study period indicate that all MCLs are met in the treated water.
SWTR	Microbial and Turbidity	Coliform and *Giardia* data support 3/4—log reduction requirement for *Giardia*/viruses. All operations, monitoring and reporting requirements are met and all treated water turbidity standards are met.
Interim Enhanced SWTR 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	TOC <1.0 mg/L in Lytle Creek source. Blending of SPW and Lytle Creek is implemented, along with pre-treatment to bring plant influent levels to <2 mg/L. Treated water running annual averages are consistently <2 mg/L. Therefore, no TOC removal ratio is required to be calculated. TTHM/HAA5 RAAs at D/DBP Rule sites comply with drinking water standards (<80/60 µg/L, respectively).
Long Term 2 Enhanced SWTR	Microbial	*Cryptosporidium* second round LT2 monitoring resulted in a maximum running annual average concentration of 0 oocysts/L and a continued Bin 1 classification. No further action required.
Stage 2 D/DBP Rule	Disinfectants and Disinfection By-Products	TTHM/HAA5 LRAAs for Stage 2 data are well below drinking water standards (<80/60 µg/L, respectively).

RECOMMENDATIONS

The following recommendations have been developed for this Fifth Update, and are 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 WVWD is critical. Recommendations will be implemented by the WVWD as resources are available.

Water Quality

- Continue to provide 3/4/2-log reduction of *Giardia*/virus/ *Cryptosporidium* at the Roemer WFF.

- Continue to optimize treatment at the Roemer WFF during times of potentially reduced source water quality in Lytle Creek, such as peak summer recreational periods and winter storm events – i.e. adjust coagulant dose, optimize polymers, implement alternative treatment processes (granular activated carbon [GAC]/ultraviolet light [UV]), reduce flow if possible to increase hydraulic detention times, reduce filtration loading rates, and ensure adequate disinfection contact time (CT).

- Ensure maximum TOC removal at Roemer WFF during periods of reduced Lytle Creek source water contribution to prevent increased distribution system DBP levels.

- Consider conversion to source water monitoring for Total Coliform and *E. coli*, rather than fecal coliform, as a more specific surrogate.

- Consider timing specialty monitoring related to post-wildfire event to the first significant rain event (>0.1 inch) to assess potential impacts to Lytle Creek source water.

- Consider investigate potential source of peak TOC levels and impact of Lytle Creek Afterbay cover in mid-August to mid-September 2023, including; weekly monitoring for TOC and DOC at the Lytle Creek influent and several locations upstream (including upstream and downstream of Mountain Lakes Resort).

Watershed Contaminant Sources

- Contact County of San Bernardino Special Districts Department (CSBSDD), to update WVWD's contact information for spill notification for County Service Area 70-S3 (Lytle Creek).

- Contact the Lytle Creek Ranger Station whenever there is a wildfire within the watershed and attend Burned Area Emergency Report (BAER) team meetings if possible.

- Contact San Bernardino County to inspect Mountain Lakes Facility annually through the County's storm water program.

APPENDIX A
BIBLIOGRAPHY AND LIST OF CONTACTS

BIBLIOGRAPHY

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Joseph Rechsteiner	USFS – Recreational Management Plan and Lytle Creek Hazardous Fuels Reduction Project	(909)382-2860 Joseph.rechsteiner@usda.gov
Ryan Harris	Santa Ana Regional Water Quality Control Board – Lytle Creek WWTP	Ryan.harris@waterboards.ca.gov
Arlene Chun	San Bernardino County Dept. Public Works – Storm Water Program Manager	arlene.chun@dpw.sbcounty.gov (909) 387-8109

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APPENDIX B
WATER QUALITY DATA

Date	% LC In Use	Annual Average
1/1/2018	100%	57%
1/2/2018	100%	
1/3/2018	100%	
1/4/2018	100%	
1/5/2018	100%	
1/6/2018	100%	
1/7/2018	100%	
1/8/2018	0%	
1/9/2018	44%	
1/10/2018	38%	
1/11/2018	34%	
1/12/2018	34%	
1/13/2018	45%	
1/14/2018	100%	
1/15/2018	100%	
1/16/2018	77%	
1/17/2018	70%	
1/18/2018	100%	
1/19/2018	100%	
1/20/2018	100%	
1/21/2018	100%	
1/22/2018	100%	
1/23/2018	100%	
1/24/2018	100%	
1/25/2018	100%	
1/26/2018	100%	
1/27/2018	100%	
1/28/2018	100%	
1/29/2018	100%	
1/30/2018	100%	
1/31/2018	100%	
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2/3/2018	100%	
2/4/2018	100%	
2/5/2018	100%	
2/6/2018	100%	
2/7/2018	100%	
2/8/2018	100%	
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3/1/2018	100%	
3/2/2018	100%	
3/3/2018	100%	
3/4/2018	100%	
3/5/2018	100%	
3/6/2018	100%	
3/7/2018	100%	
3/8/2018	100%	
3/9/2018	100%	
3/10/2018	100%	
3/11/2018	100%	
3/12/2018	100%	
3/13/2018	100%	
3/14/2018	100%	
3/15/2018	100%	
3/16/2018	100%	
3/17/2018	100%	
3/18/2018	100%	
3/19/2018	100%	
3/20/2018	100%	
3/21/2018	100%	
3/22/2018	100%	
3/23/2018	100%	
3/24/2018	100%	
3/25/2018	100%	
3/26/2018	100%	
3/27/2018	No data	

Date	% LC In Use	Annual Average
3/28/2018	100%	
3/29/2018	100%	
3/30/2018	100%	
3/31/2018	100%	
4/1/2018	100%	
4/2/2018	78%	
4/3/2018	78%	
4/4/2018	78%	
4/5/2018	76%	
4/6/2018	78%	
4/7/2018	78%	
4/8/2018	75%	
4/9/2018	76%	
4/10/2018	76%	
4/11/2018	76%	
4/12/2018	75%	
4/13/2018	100%	
4/14/2018	100%	
4/15/2018	100%	
4/16/2018	100%	
4/17/2018	100%	
4/18/2018	100%	
4/19/2018	100%	
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4/23/2018	100%	
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4/25/2018	100%	
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4/28/2018	100%	
4/29/2018	100%	
4/30/2018	100%	
5/1/2018	100%	
5/2/2018	100%	
5/3/2018	100%	
5/4/2018	79%	
5/5/2018	86%	
5/6/2018	77%	
5/7/2018	77%	
5/8/2018	77%	
5/9/2018	76%	
5/10/2018	76%	
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5/12/2018	77%	
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5/14/2018	75%	
5/15/2018	76%	
5/16/2018	75%	
5/17/2018	76%	
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5/20/2018	76%	
5/21/2018	76%	
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5/31/2018	100%	
6/1/2018	100%	
6/2/2018	100%	
6/3/2018	100%	
6/4/2018	67%	
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6/6/2018	63%	
6/7/2018	65%	
6/8/2018	51%	
6/9/2018	43%	
6/10/2018	43%	
6/11/2018	67%	
6/12/2018	55%	
6/13/2018	50%	
6/14/2018	51%	
6/15/2018	51%	
6/16/2018	42%	
6/17/2018	41%	
6/18/2018	41%	
6/19/2018	42%	
6/20/2018	37%	
6/21/2018	37%	

Date	% LC In Use	Annual Average
6/22/2018	34%	
6/23/2018	41%	
6/24/2018	38%	
6/25/2018	33%	
6/26/2018	33%	
6/27/2018	67%	
6/28/2018	33%	
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6/30/2018	32%	
7/1/2018	33%	
7/2/2018	34%	
7/3/2018	30%	
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7/6/2018	31%	
7/7/2018	27%	
7/8/2018	32%	
7/9/2018	32%	
7/10/2018	28%	
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7/15/2018	30%	
7/16/2018	100%	
7/17/2018	100%	
7/18/2018	29%	
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8/5/2018	26%	
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8/7/2018	24%	
8/8/2018	25%	
8/9/2018	27%	
8/10/2018	26%	
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8/15/2018	18%	
8/16/2018	21%	
8/17/2018	21%	
8/18/2018	19%	
8/19/2018	20%	
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8/28/2018	20%	
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8/30/2018	20%	
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9/2/2018	21%	
9/3/2018	21%	
9/4/2018	20%	
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9/6/2018	20%	
9/7/2018	21%	
9/8/2018	20%	
9/9/2018	19%	
9/10/2018	74%	
9/11/2018	21%	
9/12/2018	21%	
9/13/2018	21%	
9/14/2018	21%	
9/15/2018	21%	

Date	% LC In Use	Annual Average
9/16/2018	20%	
9/17/2018	19%	
9/18/2018	20%	
9/19/2018	21%	
9/20/2018	20%	
9/21/2018	21%	
9/22/2018	20%	
9/23/2018	20%	
9/24/2018	23%	
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10/2/2018	16%	
10/3/2018	0%	
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10/14/2018	23%	
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10/17/2018	17%	
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10/22/2018	17%	
10/23/2018	18%	
10/24/2018	18%	
10/25/2018	19%	
10/26/2018	19%	
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12/5/2018	100%	
12/6/2018	100%	
12/7/2018	33%	
12/8/2018	33%	
12/9/2018	34%	
12/10/2018	33%	

Date	% LC In Use	Annual Average
12/11/2018	100%	
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12/13/2018	100%	
12/14/2018	68%	
12/15/2018	70%	
12/16/2018	70%	
12/17/2018	70%	
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12/31/2018	61%	
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1/2/2019	61%	
1/3/2019	61%	
1/4/2019	61%	
1/5/2019	61%	
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1/7/2019	61%	
1/8/2019	61%	
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1/10/2019	57%	
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1/14/2019	56%	
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1/18/2019	53%	
1/19/2019	53%	
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1/31/2019	73%	
2/1/2019	73%	
2/2/2019	28%	
2/3/2019	22%	
2/4/2019	53%	
2/5/2019	62%	
2/6/2019	62%	
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2/9/2019	100%	
2/10/2019	100%	
2/11/2019	100%	
2/12/2019	100%	
2/13/2019	100%	
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2/16/2019	100%	
2/17/2019	100%	
2/18/2019	100%	
2/19/2019	100%	
2/20/2019	100%	
2/21/2019	100%	
2/22/2019	100%	
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2/24/2019	100%	
2/25/2019	100%	
2/26/2019	100%	
2/27/2019	100%	
2/28/2019	100%	
3/1/2019	100%	
3/2/2019	100%	
3/3/2019	100%	
3/4/2019	100%	
3/5/2019	100%	
3/6/2019	100%	

Date	% LC In Use	Annual Average
3/7/2019	100%	
3/8/2019	100%	
3/9/2019	100%	
3/10/2019	100%	
3/11/2019	100%	
3/12/2019	100%	
3/13/2019	100%	
3/14/2019	100%	
3/15/2019	100%	
3/16/2019	100%	
3/17/2019	100%	
3/18/2019	69%	
3/19/2019	62%	
3/20/2019	62%	
3/21/2019	100%	
3/22/2019	100%	
3/23/2019	100%	
3/24/2019	100%	
3/25/2019	100%	
3/26/2019	100%	
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3/30/2019	100%	
3/31/2019	100%	
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4/7/2019	100%	
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4/9/2019	100%	
4/10/2019	100%	
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5/22/2019	84%	
5/23/2019	71%	
5/24/2019	72%	
5/25/2019	74%	
5/26/2019	73%	
5/27/2019	73%	
5/28/2019	73%	
5/29/2019	73%	
5/30/2019	73%	
5/31/2019	73%	

Date	% LC In Use	Annual Average
6/1/2019	73%	
6/2/2019	73%	
6/3/2019	73%	
6/4/2019	71%	
6/5/2019	71%	
6/6/2019	28%	
6/7/2019	72%	
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6/17/2019	63%	
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6/22/2019	68%	
6/23/2019	68%	
6/24/2019	67%	
6/25/2019	67%	
6/26/2019	68%	
6/27/2019	68%	
6/28/2019	68%	
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8/16/2019	0%	
8/17/2019	0%	
8/18/2019	11%	
8/19/2019	12%	
8/20/2019	17%	
8/21/2019	17%	
8/22/2019	17%	
8/23/2019	0%	
8/24/2019	0%	
8/25/2019	0%	

Date	% LC In Use	Annual Average
8/26/2019	0%	
8/27/2019	0%	
8/28/2019	0%	
8/29/2019	0%	
8/30/2019	0%	
8/31/2019	44%	
9/1/2019	49%	
9/2/2019	43%	
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11/6/2019	69%	
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11/8/2019	68%	
11/9/2019	68%	
11/10/2019	64%	
11/11/2019	64%	
11/12/2019	64%	
11/13/2019	64%	
11/14/2019	64%	
11/15/2019	64%	
11/16/2019	64%	
11/17/2019	65%	
11/18/2019	64%	
11/19/2019	64%	

Date	% LC In Use	Annual Average
11/20/2019	64%	
11/21/2019	64%	
11/22/2019	78%	
11/23/2019	78%	
11/24/2019	78%	
11/25/2019	78%	
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12/9/2019	33%	
12/10/2019	33%	
12/11/2019	78%	
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12/13/2019	78%	
12/14/2019	78%	
12/15/2019	100%	
12/16/2019	100%	
12/17/2019	100%	
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2/11/2020	100%	
2/12/2020	100%	
2/13/2020	100%	

Date	% LC In Use	Annual Average
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2/16/2020	100%	
2/17/2020	100%	
2/18/2020	68%	
2/19/2020	68%	
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5/8/2020	60%	
5/9/2020	60%	

Date	% LC In Use	Annual Average
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5/11/2020	60%	
5/12/2020	63%	
5/13/2020	64%	
5/14/2020	68%	
5/15/2020	57%	
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7/30/2020	67%	
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8/1/2020	53%	
8/2/2020	53%	
8/3/2020	66%	

Date	% LC In Use	Annual Average
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8/6/2020	67%	
8/7/2020	60%	
8/8/2020	60%	
8/9/2020	64%	
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Date	% LC In Use	Annual Average
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1/19/2021	23%	
1/20/2021	29%	
1/21/2021	68%	
1/22/2021	68%	

Date	% LC In Use	Annual Average
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1/26/2021	78%	
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4/13/2021	59%	
4/14/2021	62%	
4/15/2021	60%	
4/16/2021	60%	
4/17/2021	59%	
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Date	% LC In Use	Annual Average
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7/12/2021	27%	
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Date	% LC In Use	Annual Average
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7/17/2021	25%	
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10/4/2021	35%	
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10/6/2021	59%	
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Date	% LC In Use	Annual Average
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10/11/2021	100%	
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11/16/2021	100%	
11/17/2021	100%	
11/18/2021	100%	
11/19/2021	100%	
11/20/2021	100%	
11/21/2021	72%	
11/22/2021	100%	
11/23/2021	100%	
11/24/2021	100%	
11/25/2021	100%	
11/26/2021	100%	
11/27/2021	100%	
11/28/2021	100%	
11/29/2021	100%	
11/30/2021	100%	
12/1/2021	100%	
12/2/2021	100%	
12/3/2021	100%	
12/4/2021	100%	
12/5/2021	100%	
12/6/2021	100%	
12/7/2021	100%	
12/8/2021	100%	
12/9/2021	100%	
12/10/2021	100%	
12/11/2021	100%	
12/12/2021	100%	
12/13/2021	100%	
12/14/2021	100%	
12/15/2021	100%	
12/16/2021	100%	
12/17/2021	100%	
12/18/2021	100%	
12/19/2021	100%	
12/20/2021	100%	
12/21/2021	100%	
12/22/2021	100%	
12/23/2021	100%	
12/24/2021	zero received	
12/25/2021	100%	
12/26/2021	100%	
12/27/2021	100%	
12/28/2021	100%	
12/29/2021	100%	
12/30/2021	100%	
12/31/2021	100%	
1/1/2022	100%	70%

Date	% LC In Use	Annual Average
1/2/2022	100%	
1/3/2022	100%	
1/4/2022	100%	
1/5/2022	100%	
1/6/2022	100%	
1/7/2022	100%	
1/8/2022	100%	
1/9/2022	100%	
1/10/2022	100%	
1/11/2022	100%	
1/12/2022	100%	
1/13/2022	100%	
1/14/2022	100%	
1/15/2022	100%	
1/16/2022	100%	
1/17/2022	100%	
1/18/2022	100%	
1/19/2022	100%	
1/20/2022	100%	
1/21/2022	100%	
1/22/2022	100%	
1/23/2022	100%	
1/24/2022	100%	
1/25/2022	100%	
1/26/2022	100%	
1/27/2022	100%	
1/28/2022	100%	
1/29/2022	100%	
1/30/2022	100%	
1/31/2022	100%	
2/1/2022	100%	
2/2/2022	100%	
2/3/2022	100%	
2/4/2022	100%	
2/5/2022	100%	
2/6/2022	100%	
2/7/2022	100%	
2/8/2022	100%	
2/9/2022	100%	
2/10/2022	100%	
2/11/2022	100%	
2/12/2022	100%	
2/13/2022	100%	
2/14/2022	100%	
2/15/2022	100%	
2/16/2022	100%	
2/17/2022	100%	
2/18/2022	100%	
2/19/2022	100%	
2/20/2022	100%	
2/21/2022	100%	
2/22/2022	100%	
2/23/2022	100%	
2/24/2022	100%	
2/25/2022	100%	
2/26/2022	100%	
2/27/2022	100%	
2/28/2022	100%	
3/1/2022	100%	
3/2/2022	100%	
3/3/2022	100%	
3/4/2022	100%	
3/5/2022	100%	
3/6/2022	100%	
3/7/2022	100%	
3/8/2022	100%	
3/9/2022	100%	
3/10/2022	100%	
3/11/2022	100%	
3/12/2022	100%	
3/13/2022	100%	
3/14/2022	100%	
3/15/2022	100%	
3/16/2022	100%	
3/17/2022	100%	
3/18/2022	100%	
3/19/2022	100%	
3/20/2022	100%	
3/21/2022	100%	
3/22/2022	100%	
3/23/2022	100%	
3/24/2022	100%	
3/25/2022	100%	
3/26/2022	100%	
3/27/2022	100%	
3/28/2022	100%	

Date	% LC In Use	Annual Average
3/29/2022	Off	
3/30/2022	100%	
3/31/2022	100%	
4/1/2022	100%	
4/2/2022	100%	
4/3/2022	100%	
4/4/2022	100%	
4/5/2022	100%	
4/6/2022	100%	
4/7/2022	100%	
4/8/2022	100%	
4/9/2022	100%	
4/10/2022	100%	
4/11/2022	100%	
4/12/2022	100%	
4/13/2022	100%	
4/14/2022	100%	
4/15/2022	100%	
4/16/2022	100%	
4/17/2022	100%	
4/18/2022	100%	
4/19/2022	100%	
4/20/2022	100%	
4/21/2022	100%	
4/22/2022	100%	
4/23/2022	100%	
4/24/2022	100%	
4/25/2022	100%	
4/26/2022	100%	
4/27/2022	100%	
4/28/2022	100%	
4/29/2022	100%	
4/30/2022	100%	
5/1/2022	100%	
5/2/2022	100%	
5/3/2022	100%	
5/4/2022	100%	
5/5/2022	100%	
5/6/2022	100%	
5/7/2022	100%	
5/8/2022	100%	
5/9/2022	100%	
5/10/2022	100%	
5/11/2022	100%	
5/12/2022	100%	
5/13/2022	100%	
5/14/2022	100%	
5/15/2022	100%	
5/16/2022	100%	
5/17/2022	100%	
5/18/2022	100%	
5/19/2022	100%	
5/20/2022	100%	
5/21/2022	100%	
5/22/2022	100%	
5/23/2022	100%	
5/24/2022	100%	
5/25/2022	100%	
5/26/2022	100%	
5/27/2022	100%	
5/28/2022	100%	
5/29/2022	100%	
5/30/2022	100%	
5/31/2022	100%	
6/1/2022	100%	
6/2/2022	100%	
6/3/2022	100%	
6/4/2022	100%	
6/5/2022	100%	
6/6/2022	100%	
6/7/2022	100%	
6/8/2022	100%	
6/9/2022	100%	
6/10/2022	100%	
6/11/2022	100%	
6/12/2022	100%	
6/13/2022	100%	
6/14/2022	100%	
6/15/2022	100%	
6/16/2022	100%	
6/17/2022	43%	
6/18/2022	51%	
6/19/2022	51%	
6/20/2022	49%	
6/21/2022	51%	
6/22/2022	50%	

Date	% LC In Use	Annual Average
6/23/2022	50%	
6/24/2022	49%	
6/25/2022	49%	
6/26/2022	50%	
6/27/2022	50%	
6/28/2022	48%	
6/29/2022	48%	
6/30/2022	48%	
7/1/2022	47%	
7/2/2022	48%	
7/3/2022	47%	
7/4/2022	47%	
7/5/2022	49%	
7/6/2022	49%	
7/7/2022	49%	
7/8/2022	49%	
7/9/2022	47%	
7/10/2022	49%	
7/11/2022	47%	
7/12/2022	38%	
7/13/2022	39%	
7/14/2022	39%	
7/15/2022	33%	
7/16/2022	30%	
7/17/2022	32%	
7/18/2022	31%	
7/19/2022	32%	
7/20/2022	31%	
7/21/2022	32%	
7/22/2022	32%	
7/23/2022	33%	
7/24/2022	32%	
7/25/2022	32%	
7/26/2022	32%	
7/27/2022	32%	
7/28/2022	32%	
7/29/2022	32%	
7/30/2022	32%	
7/31/2022	31%	
8/1/2022	31%	
8/2/2022	30%	
8/3/2022	32%	
8/4/2022	30%	
8/5/2022	29%	
8/6/2022	30%	
8/7/2022	30%	
8/8/2022	30%	
8/9/2022	30%	
8/10/2022	29%	
8/11/2022	29%	
8/12/2022	30%	
8/13/2022	30%	
8/14/2022	29%	
8/15/2022	29%	
8/16/2022	30%	
8/17/2022	28%	
8/18/2022	28%	
8/19/2022	4%	
8/20/2022	30%	
8/21/2022	28%	
8/22/2022	27%	
8/23/2022	29%	
8/24/2022	27%	
8/25/2022	28%	
8/26/2022	29%	
8/27/2022	28%	
8/28/2022	27%	
8/29/2022	29%	
8/30/2022	30%	
8/31/2022	29%	
9/1/2022	28%	
9/2/2022	29%	
9/3/2022	28%	
9/4/2022	28%	
9/5/2022	28%	
9/6/2022	28%	
9/7/2022	28%	
9/8/2022	25%	
9/9/2022	21%	
9/10/2022	20%	
9/11/2022	21%	
9/12/2022	19%	
9/13/2022	20%	
9/14/2022	25%	
9/15/2022	29%	
9/16/2022	29%	

Date	% LC In Use	Annual Average
9/17/2022	30%	
9/18/2022	50%	
9/19/2022	48%	
9/20/2022	35%	
9/21/2022	35%	
9/22/2022	35%	
9/23/2022	35%	
9/24/2022	35%	
9/25/2022	32%	
9/26/2022	38%	
9/27/2022	35%	
9/28/2022	34%	
9/29/2022	34%	
9/30/2022	31%	
10/1/2022	31%	
10/2/2022	38%	
10/3/2022	37%	
10/4/2022	38%	
10/5/2022	38%	
10/6/2022	38%	
10/7/2022	38%	
10/8/2022	38%	
10/9/2022	38%	
10/10/2022	34%	
10/11/2022	36%	
10/12/2022	35%	
10/13/2022	30%	
10/14/2022	31%	
10/15/2022	32%	
10/16/2022	34%	
10/17/2022	39%	
10/18/2022	38%	
10/19/2022	34%	
10/20/2022	42%	
10/21/2022	42%	
10/22/2022	42%	
10/23/2022	42%	
10/24/2022	42%	
10/25/2022	42%	
10/26/2022	42%	
10/27/2022	42%	
10/28/2022	38%	
10/29/2022	37%	
10/30/2022	36%	
10/31/2022	37%	
11/1/2022	36%	
11/2/2022	48%	
11/3/2022	51%	
11/4/2022	51%	
11/5/2022	49%	
11/6/2022	50%	
11/7/2022	50%	
11/8/2022	41%	
11/9/2022	47%	
11/10/2022	46%	
11/11/2022	46%	
11/12/2022	46%	
11/13/2022	46%	
11/14/2022	37%	
11/15/2022	43%	
11/16/2022	44%	
11/17/2022	43%	
11/18/2022	54%	
11/19/2022	53%	
11/20/2022	53%	
11/21/2022	51%	
11/22/2022	62%	
11/23/2022	62%	
11/24/2022	63%	
11/25/2022	63%	
11/26/2022	64%	
11/27/2022	63%	
11/28/2022	63%	
11/29/2022	63%	
11/30/2022	63%	
12/1/2022	77%	
12/2/2022	77%	
12/3/2022	77%	
12/4/2022	76%	
12/5/2022	77%	
12/6/2022	46%	
12/7/2022	0%	
12/8/2022	0%	
12/9/2022	65%	
12/10/2022	64%	
12/11/2022	51%	

Date	% LC In Use	Annual Average
12/12/2022	50%	
12/13/2022	52%	
12/14/2022	53%	
12/15/2022	50%	
12/16/2022	100%	
12/17/2022	100%	
12/18/2022	100%	
12/19/2022	100%	
12/20/2022	100%	
12/21/2022	50%	
12/22/2022	71%	
12/23/2022	100%	
12/24/2022	100%	
12/25/2022	100%	
12/26/2022	100%	
12/27/2022	100%	
12/28/2022	100%	
12/29/2022	100%	
12/30/2022	100%	
12/31/2022	100%	
MIN	0%	
MAX	100%	
AVERAGE	63%	
MEDIAN	64%	

	2018	2019	2020	2021	2022	avg
January	85%	52%	100%	62%	100%	80%
February	100%	85%	87%	75%	100%	89%
March	100%	97%	36%	56%	100%	78%
April	91%	97%	66%	61%	100%	83%
May	82%	81%	63%	48%	100%	75%
June	52%	57%	63%	38%	76%	57%
July	33%	49%	67%	27%	38%	43%
August	22%	4%	64%	22%	28%	28%
September	22%	64%	65%	16%	30%	39%
October	13%	43%	65%	73%	37%	46%
November	27%	59%	70%	98%	52%	61%
December	64%	73%	54%	100%	75%	73%
ANNUAL AVERAGE	**58%**	**63%**	**67%**	**56%**	**70%**	

	2018	2019	2020	2021	2022
ANNUAL A\	58%	63%	67%	56%	70%

Percent Lytle Creek in DS

	2018	2019	2020	2021	2022	avg
January	26%	29%	52%	37%	38%	36%
February	36%	44%	43%	39%	45%	42%
March	31%	43%	21%	29%	42%	33%
April	34%	41%	56%	28%	38%	40%
May	22%	42%	32%	20%	22%	28%
June	17%	26%	26%	17%	18%	21%
July	12%	22%	28%	12%	12%	17%
August	9%	2%	29%	10%	10%	12%
September	10%	28%	29%	6%	11%	17%
October	5%	19%	30%	14%	12%	16%
November	13%	14%	35%	19%	21%	20%
December	28%	44%	32%	24%	24%	30%
Annual Averages	20%	30%	35%	21%	21%	

2%	min	12%
56%	max	42%
26%		
26%		

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
1/1/2018	0	23.18
1/2/2018	0	
1/3/2018	0	
1/4/2018	0	
1/5/2018	0	
1/6/2018	0	
1/7/2018	0	
1/8/2018	1.63	
1/9/2018	4.4	
1/10/2018	0	
1/11/2018	0	
1/12/2018	0	
1/13/2018	0	
1/14/2018	0	
1/15/2018	0	
1/16/2018	0	
1/17/2018	0	
1/18/2018	0	
1/19/2018	0.14	
1/20/2018	0.01	
1/21/2018	0	
1/22/2018	0	
1/23/2018	0	
1/24/2018	0	
1/25/2018	0	
1/26/2018	0	
1/27/2018	0	
1/28/2018	0	
1/29/2018	0	
1/30/2018	0	
1/31/2018	0	
2/1/2018	0	
2/2/2018	0	
2/3/2018	0	
2/4/2018	0	
2/5/2018	0	
2/6/2018	0	
2/7/2018	0	
2/8/2018	0	
2/9/2018	0	
2/10/2018	0	
2/11/2018	0	
2/12/2018	0.16	
2/13/2018	0.03	
2/14/2018	0.14	
2/15/2018	0	
2/16/2018	0	
2/17/2018	0	
2/18/2018	0	
2/19/2018	0	
2/20/2018	0	
2/21/2018	0	
2/22/2018	0	
2/23/2018	0	
2/24/2018	0	
2/25/2018	0	
2/26/2018	0.16	
2/27/2018	0.51	
2/28/2018	0	
3/1/2018	0	
3/2/2018	1.14	
3/3/2018	0.23	
3/4/2018	0.01	
3/5/2018	0	
3/6/2018	0	
3/7/2018	0	
3/8/2018	0	
3/9/2018	0	
3/10/2018	0.56	
3/11/2018	0.18	
3/12/2018	0	
3/13/2018	0.12	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
3/14/2018	0.73	
3/15/2018	0.96	
3/16/2018	0.36	
3/17/2018	0.27	
3/18/2018	0	
3/19/2018	0	
3/20/2018	0	
3/21/2018	0.23	
3/22/2018	1.96	
3/23/2018	0.04	
3/24/2018	0	
3/25/2018	0.03	
3/26/2018	0	
3/27/2018	0	
3/28/2018	0	
3/29/2018	0	
3/30/2018	0	
3/31/2018	0	
4/1/2018	0	
4/2/2018	0	
4/3/2018	0	
4/4/2018	0	
4/5/2018	0	
4/6/2018	0	
4/7/2018	0	
4/8/2018	0	
4/9/2018	0	
4/10/2018	0	
4/11/2018	0	
4/12/2018	0	
4/13/2018	0	
4/14/2018	0	
4/15/2018	0	
4/16/2018	0	
4/17/2018	0	
4/18/2018	0	
4/19/2018	0	
4/20/2018	0	
4/21/2018	0	
4/22/2018	0	
4/23/2018	0	
4/24/2018	0	
4/25/2018	0	
4/26/2018	0	
4/27/2018	0	
4/28/2018	0	
4/29/2018	0	
4/30/2018	0	
5/1/2018	0.1	
5/2/2018	0.14	
5/3/2018	0	
5/4/2018	0	
5/5/2018	0	
5/6/2018	0	
5/7/2018	0	
5/8/2018	0	
5/9/2018	0	
5/10/2018	0	
5/11/2018	0.01	
5/12/2018	0.02	
5/13/2018	0	
5/14/2018	0	
5/15/2018	0	
5/16/2018	0	
5/17/2018	0	
5/18/2018	0	
5/19/2018	0	
5/20/2018	0	
5/21/2018	0	
5/22/2018	0	
5/23/2018	0	
5/24/2018	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
5/25/2018	0	
5/26/2018	0	
5/27/2018	0	
5/28/2018	0	
5/29/2018	0	
5/30/2018	0	
5/31/2018	0	
6/1/2018	0	
6/2/2018	0	
6/3/2018	0	
6/4/2018	0	
6/5/2018	0	
6/6/2018	0	
6/7/2018	0	
6/8/2018	0	
6/9/2018	0	
6/10/2018	0	
6/11/2018	0	
6/12/2018	0	
6/13/2018	0	
6/14/2018	0	
6/15/2018	0	
6/16/2018	0	
6/17/2018	0	
6/18/2018	0	
6/19/2018	0	
6/20/2018	0	
6/21/2018	0	
6/22/2018	0	
6/23/2018	0	
6/24/2018	0	
6/25/2018	0	
6/26/2018	0	
6/27/2018	0	
6/28/2018	0	
6/29/2018	0	
6/30/2018	0	
7/1/2018	0	
7/2/2018	0	
7/3/2018	0	
7/4/2018	0	
7/5/2018	0	
7/6/2018	0	
7/7/2018	0.05	
7/8/2018	0	
7/9/2018	0	
7/10/2018	0	
7/11/2018	0	
7/12/2018	0	
7/13/2018	0	
7/14/2018	0	
7/15/2018	0	
7/16/2018	0	
7/17/2018	0	
7/18/2018	0	
7/19/2018	0	
7/20/2018	0	
7/21/2018	0	
7/22/2018	0	
7/23/2018	0	
7/24/2018	0	
7/25/2018	0	
7/26/2018	0	
7/27/2018	0	
7/28/2018	0	
7/29/2018	0	
7/30/2018	0	
7/31/2018	0	
8/1/2018	0	
8/2/2018	0	
8/3/2018	0	
8/4/2018	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
8/5/2018	0	
8/6/2018	0	
8/7/2018	0	
8/8/2018	0	
8/9/2018	0	
8/10/2018	0	
8/11/2018	0	
8/12/2018	0	
8/13/2018	0	
8/14/2018	0	
8/15/2018	0	
8/16/2018	0	
8/17/2018	0	
8/18/2018	0	
8/19/2018	0	
8/20/2018	0	
8/21/2018	0	
8/22/2018	0	
8/23/2018	0	
8/24/2018	0	
8/25/2018	0	
8/26/2018	0	
8/27/2018	0	
8/28/2018	0	
8/29/2018	0	
8/30/2018	0	
8/31/2018	0	
9/1/2018	0	
9/2/2018	0	
9/3/2018	0	
9/4/2018	0	
9/5/2018	0	
9/6/2018	0	
9/7/2018	0	
9/8/2018	0	
9/9/2018	0	
9/10/2018	0	
9/11/2018	0	
9/12/2018	0	
9/13/2018	0	
9/14/2018	0	
9/15/2018	0	
9/16/2018	0	
9/17/2018	0	
9/18/2018	0	
9/19/2018	0	
9/20/2018	0	
9/21/2018	0	
9/22/2018	0	
9/23/2018	0	
9/24/2018	0	
9/25/2018	0	
9/26/2018	0	
9/27/2018	0	
9/28/2018	0	
9/29/2018	0	
9/30/2018	0	
10/1/2018	0	
10/2/2018	0	
10/3/2018	0	
10/4/2018	0	
10/5/2018	0	
10/6/2018	0	
10/7/2018	0	
10/8/2018	0	
10/9/2018	0	
10/10/2018	0	
10/11/2018	0	
10/12/2018	0.2	
10/13/2018	0.46	
10/14/2018	0	
10/15/2018	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
10/16/2018	0	
10/17/2018	0	
10/18/2018	0	
10/19/2018	0	
10/20/2018	0	
10/21/2018	0	
10/22/2018	0	
10/23/2018	0	
10/24/2018	0	
10/25/2018	0	
10/26/2018	0	
10/27/2018	0	
10/28/2018	0	
10/29/2018	0	
10/30/2018	0	
10/31/2018	0	
11/1/2018	0	
11/2/2018	0	
11/3/2018	0	
11/4/2018	0	
11/5/2018	0	
11/6/2018	0	
11/7/2018	0	
11/8/2018	0	
11/9/2018	0	
11/10/2018	0	
11/11/2018	0	
11/12/2018	0	
11/13/2018	0	
11/14/2018	0	
11/15/2018	0	
11/16/2018	0	
11/17/2018	0	
11/18/2018	0	
11/19/2018	0	
11/20/2018	0	
11/21/2018	0	
11/22/2018	0.62	
11/23/2018	0	
11/24/2018	0	
11/25/2018	0	
11/26/2018	0	
11/27/2018	0	
11/28/2018	0.02	
11/29/2018	3.33	
11/30/2018	0.03	
12/1/2018	0	
12/2/2018	0	
12/3/2018	0	
12/4/2018	0	
12/5/2018	0.93	
12/6/2018	2.64	
12/7/2018	0.1	
12/8/2018	0	
12/9/2018	0	
12/10/2018	0	
12/11/2018	0	
12/12/2018	0	
12/13/2018	0	
12/14/2018	0	
12/15/2018	0	
12/16/2018	0	
12/17/2018	0	
12/18/2018	0	
12/19/2018	0	
12/20/2018	0	
12/21/2018	0	
12/22/2018	0	
12/23/2018	0	
12/24/2018	0.04	
12/25/2018	0.49	
12/26/2018	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
12/27/2018	0	
12/28/2018	0	
12/29/2018	0	
12/30/2018	0	
12/31/2018	0	
1/1/2019	0	56.58
1/2/2019	0	
1/3/2019	0	
1/4/2019	0	
1/5/2019	0.39	
1/6/2019	0.2	
1/7/2019	0.11	
1/8/2019	0	
1/9/2019	0	
1/10/2019	0	
1/11/2019	0	
1/12/2019	0.68	
1/13/2019	0	
1/14/2019	1.84	
1/15/2019	1.54	
1/16/2019	2.91	
1/17/2019	4.12	
1/18/2019	0.04	
1/19/2019	0	
1/20/2019	0	
1/21/2019	0	
1/22/2019	0	
1/23/2019	0	
1/24/2019	0	
1/25/2019	0	
1/26/2019	0	
1/27/2019	0	
1/28/2019	0	
1/29/2019	0	
1/30/2019	0	
1/31/2019	0.56	
2/1/2019	0.03	
2/2/2019	5.18	
2/3/2019	2.14	
2/4/2019	3.34	
2/5/2019	0.5	
2/6/2019	0	
2/7/2019	0	
2/8/2019	0	
2/9/2019	0.27	
2/10/2019	0.48	
2/11/2019	0	
2/12/2019	0	
2/13/2019	0.3	
2/14/2019	5.07	
2/15/2019	0.56	
2/16/2019	0	
2/17/2019	0.29	
2/18/2019	0	
2/19/2019	0	
2/20/2019	0.59	
2/21/2019	0.19	
2/22/2019	0.01	
2/23/2019	0	
2/24/2019	0	
2/25/2019	0	
2/26/2019	0	
2/27/2019	0	
2/28/2019	0.15	
3/1/2019	0	
3/2/2019	1.66	
3/3/2019	0.32	
3/4/2019	0.01	
3/5/2019	0.09	
3/6/2019	3.32	
3/7/2019	0.06	
3/8/2019	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
3/9/2019	0	
3/10/2019	0	
3/11/2019	0.2	
3/12/2019	0.47	
3/13/2019	0.08	
3/14/2019	0	
3/15/2019	0	
3/16/2019	0	
3/17/2019	0	
3/18/2019	0	
3/19/2019	0	
3/20/2019	0.24	
3/21/2019	0.21	
3/22/2019	0	
3/23/2019	0	
3/24/2019	0	
3/25/2019	0	
3/26/2019	0	
3/27/2019	0	
3/28/2019	0	
3/29/2019	0	
3/30/2019	0	
3/31/2019	0	
4/1/2019	0	
4/2/2019	0	
4/3/2019	0	
4/4/2019	0	
4/5/2019	0	
4/6/2019	0	
4/7/2019	0	
4/8/2019	0	
4/9/2019	0	
4/10/2019	0	
4/11/2019	0	
4/12/2019	0	
4/13/2019	0	
4/14/2019	0	
4/15/2019	0	
4/16/2019	0	
4/17/2019	0	
4/18/2019	0	
4/19/2019	0	
4/20/2019	0	
4/21/2019	0	
4/22/2019	0	
4/23/2019	0	
4/24/2019	0	
4/25/2019	0	
4/26/2019	0	
4/27/2019	0	
4/28/2019	0	
4/29/2019	0	
4/30/2019	0	
5/1/2019	0	
5/2/2019	0	
5/3/2019	0	
5/4/2019	0	
5/5/2019	0	
5/6/2019	0.06	
5/7/2019	0.02	
5/8/2019	0	
5/9/2019	0	
5/10/2019	0.05	
5/11/2019	0.1	
5/12/2019	0	
5/13/2019	0	
5/14/2019	0	
5/15/2019	0	
5/16/2019	0.69	
5/17/2019	0	
5/18/2019	0.01	
5/19/2019	0.47	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
5/20/2019	0.01	
5/21/2019	0.05	
5/22/2019	0.2	
5/23/2019	0.07	
5/24/2019	0	
5/25/2019	0	
5/26/2019	0.41	
5/27/2019	0	
5/28/2019	0	
5/29/2019	0	
5/30/2019	0	
5/31/2019	0	
6/1/2019	0	
6/2/2019	0	
6/3/2019	0	
6/4/2019	0	
6/5/2019	0	
6/6/2019	0	
6/7/2019	0	
6/8/2019	0	
6/9/2019	0	
6/10/2019	0	
6/11/2019	0	
6/12/2019	0	
6/13/2019	0	
6/14/2019	0	
6/15/2019	0	
6/16/2019	0	
6/17/2019	0	
6/18/2019	0	
6/19/2019	0	
6/20/2019	0	
6/21/2019	0	
6/22/2019	0	
6/23/2019	0	
6/24/2019	0	
6/25/2019	0	
6/26/2019	0	
6/27/2019	0	
6/28/2019	0	
6/29/2019	0	
6/30/2019	0	
7/1/2019	0	
7/2/2019	0	
7/3/2019	0	
7/4/2019	0	
7/5/2019	0	
7/6/2019	0	
7/7/2019	0	
7/8/2019	0	
7/9/2019	0	
7/10/2019	0	
7/11/2019	0	
7/12/2019	0	
7/13/2019	0	
7/14/2019	0	
7/15/2019	0	
7/16/2019	0	
7/17/2019	0	
7/18/2019	0	
7/19/2019	0	
7/20/2019	0	
7/21/2019	0	
7/22/2019	0	
7/23/2019	0	
7/24/2019	0	
7/25/2019	0.01	
7/26/2019	0	
7/27/2019	0	
7/28/2019	0	
7/29/2019	0	
7/30/2019	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
7/31/2019	0	
8/1/2019	0	
8/2/2019	0	
8/3/2019	0	
8/4/2019	0	
8/5/2019	0	
8/6/2019	0	
8/7/2019	0	
8/8/2019	0	
8/9/2019	0	
8/10/2019	0	
8/11/2019	0	
8/12/2019	0	
8/13/2019	0	
8/14/2019	0	
8/15/2019	0	
8/16/2019	0	
8/17/2019	0	
8/18/2019	0	
8/19/2019	0	
8/20/2019	0	
8/21/2019	0	
8/22/2019	0	
8/23/2019	0	
8/24/2019	0	
8/25/2019	0	
8/26/2019	0	
8/27/2019	0	
8/28/2019	0	
8/29/2019	0	
8/30/2019	0	
8/31/2019	0	
9/1/2019	0	
9/2/2019	0	
9/3/2019	0	
9/4/2019	0	
9/5/2019	0.11	
9/6/2019	0	
9/7/2019	0	
9/8/2019	0	
9/9/2019	0	
9/10/2019	0	
9/11/2019	0	
9/12/2019	0	
9/13/2019	0	
9/14/2019	0	
9/15/2019	0	
9/16/2019	0	
9/17/2019	0	
9/18/2019	0	
9/19/2019	0	
9/20/2019	0	
9/21/2019	0	
9/22/2019	0	
9/23/2019	0	
9/24/2019	0	
9/25/2019	0	
9/26/2019	0	
9/27/2019	0	
9/28/2019	0	
9/29/2019	0	
9/30/2019		
10/1/2019	0	
10/2/2019	0	
10/3/2019	0	
10/4/2019	0	
10/5/2019	0	
10/6/2019	0	
10/7/2019	0	
10/8/2019	0	
10/9/2019	0	
10/10/2019	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
10/11/2019	0	
10/12/2019	0	
10/13/2019	0	
10/14/2019	0	
10/15/2019	0	
10/16/2019	0	
10/17/2019	0	
10/18/2019	0	
10/19/2019	0	
10/20/2019	0	
10/21/2019	0	
10/22/2019	0	
10/23/2019	0	
10/24/2019	0	
10/25/2019	0	
10/26/2019	0	
10/27/2019	0	
10/28/2019	0	
10/29/2019	0	
10/30/2019	0	
10/31/2019	0	
11/1/2019	0	
11/2/2019	0	
11/3/2019	0	
11/4/2019	0	
11/5/2019	0	
11/6/2019	0	
11/7/2019	0	
11/8/2019	0	
11/9/2019	0	
11/10/2019	0	
11/11/2019	0	
11/12/2019	0	
11/13/2019	0	
11/14/2019	0	
11/15/2019	0	
11/16/2019	0	
11/17/2019	0	
11/18/2019	0	
11/19/2019	0	
11/20/2019	1.53	
11/21/2019	0.03	
11/22/2019	0	
11/23/2019	0	
11/24/2019	0	
11/25/2019	0	
11/26/2019	0	
11/27/2019	1.98	
11/28/2019	2.2	
11/29/2019	1.24	
11/30/2019	0.1	
12/1/2019	0	
12/2/2019	0	
12/3/2019	0.01	
12/4/2019	2.61	
12/5/2019	0	
12/6/2019	0.14	
12/7/2019	0.74	
12/8/2019	0.37	
12/9/2019	0.01	
12/10/2019	0	
12/11/2019	0	
12/12/2019	0	
12/13/2019	0	
12/14/2019	0	
12/15/2019	0.01	
12/16/2019	0	
12/17/2019	0	
12/18/2019	0	
12/19/2019	0	
12/20/2019	0	
12/21/2019	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
12/22/2019	0	
12/23/2019	1.58	
12/24/2019	0.22	
12/25/2019	0.78	
12/26/2019	2.62	
12/27/2019	0	
12/28/2019	0	
12/29/2019	0	
12/30/2019	0	
12/31/2019	0	
1/1/2020	0	24.06
1/2/2020	0	
1/3/2020	0	
1/4/2020	0	
1/5/2020	0	
1/6/2020	0	
1/7/2020	0	
1/8/2020	0	
1/9/2020	0	
1/10/2020	0	
1/11/2020	0	
1/12/2020	0	
1/13/2020	0	
1/14/2020	0	
1/15/2020	0	
1/16/2020	0.09	
1/17/2020	0.33	
1/18/2020	0	
1/19/2020	0	
1/20/2020	0	
1/21/2020	0	
1/22/2020	0	
1/23/2020	0	
1/24/2020	0	
1/25/2020	0	
1/26/2020	0	
1/27/2020	0	
1/28/2020	0	
1/29/2020	0	
1/30/2020	0	
1/31/2020	0	
2/1/2020	0	
2/2/2020	0	
2/3/2020	0.05	
2/4/2020	0	
2/5/2020	0	
2/6/2020	0	
2/7/2020	0	
2/8/2020	0	
2/9/2020	0.04	
2/10/2020	0	
2/11/2020	0	
2/12/2020	0	
2/13/2020	0	
2/14/2020	0	
2/15/2020	0	
2/16/2020	0	
2/17/2020	0	
2/18/2020	0	
2/19/2020	0	
2/20/2020	0	
2/21/2020	0	
2/22/2020	0.22	
2/23/2020	0.01	
2/24/2020	0	
2/25/2020	0	
2/26/2020	0	
2/27/2020	0	
2/28/2020	0	
2/29/2020	0	
3/1/2020	0.73	
3/2/2020	0.01	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
3/3/2020	0	
3/4/2020	0	
3/5/2020	0	
3/6/2020	0	
3/7/2020	0	
3/8/2020	0	
3/9/2020	0.01	
3/10/2020	1.66	
3/11/2020	0.01	
3/12/2020	1.28	
3/13/2020	0.69	
3/14/2020	0.03	
3/15/2020	0.03	
3/16/2020	1.03	
3/17/2020	0.04	
3/18/2020	0	
3/19/2020	0.89	
3/20/2020	0.24	
3/21/2020	0	
3/22/2020	1.02	
3/23/2020	0.44	
3/24/2020	0	
3/25/2020	0.13	
3/26/2020	0	
3/27/2020	0	
3/28/2020	0	
3/29/2020	0	
3/30/2020	0	
3/31/2020	0	
4/1/2020	0	
4/2/2020	0	
4/3/2020	0	
4/4/2020	0	
4/5/2020	0.13	
4/6/2020	5.69	
4/7/2020	1.04	
4/8/2020	0.48	
4/9/2020	1.89	
4/10/2020	0.93	
4/11/2020	0	
4/12/2020	0	
4/13/2020	0	
4/14/2020	0	
4/15/2020	0	
4/16/2020	0	
4/17/2020	0	
4/18/2020	0	
4/19/2020	0	
4/20/2020	0	
4/21/2020	0	
4/22/2020	0	
4/23/2020	0	
4/24/2020	0	
4/25/2020	0	
4/26/2020	0	
4/27/2020	0	
4/28/2020	0	
4/29/2020	0	
4/30/2020	0	
5/1/2020	0	
5/2/2020	0	
5/3/2020	0	
5/4/2020	0	
5/5/2020	0	
5/6/2020	0	
5/7/2020	0	
5/8/2020	0	
5/9/2020	0	
5/10/2020	0	
5/11/2020	0	
5/12/2020	0	
5/13/2020	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
5/14/2020	0	
5/15/2020	0	
5/16/2020	0	
5/17/2020	0	
5/18/2020	0.11	
5/19/2020	0	
5/20/2020	0	
5/21/2020	0	
5/22/2020	0	
5/23/2020	0	
5/24/2020	0	
5/25/2020	0	
5/26/2020	0	
5/27/2020	0	
5/28/2020	0	
5/29/2020	0	
5/30/2020	0	
5/31/2020	0	
6/1/2020	0	
6/2/2020	0	
6/3/2020	0	
6/4/2020	0	
6/5/2020	0	
6/6/2020	0.01	
6/7/2020	0	
6/8/2020	0	
6/9/2020	0	
6/10/2020	0	
6/11/2020	0	
6/12/2020	0	
6/13/2020	0	
6/14/2020	0	
6/15/2020	0	
6/16/2020	0	
6/17/2020	0	
6/18/2020	0	
6/19/2020	0	
6/20/2020	0	
6/21/2020	0	
6/22/2020	0	
6/23/2020	0	
6/24/2020	0	
6/25/2020	0	
6/26/2020	0	
6/27/2020	0	
6/28/2020	0	
6/29/2020	0	
6/30/2020	0	
7/1/2020	0	
7/2/2020	0	
7/3/2020	0	
7/4/2020	0	
7/5/2020	0	
7/6/2020	0	
7/7/2020	0	
7/8/2020	0	
7/9/2020	0	
7/10/2020	0	
7/11/2020	0	
7/12/2020	0	
7/13/2020	0	
7/14/2020	0	
7/15/2020	0	
7/16/2020	0	
7/17/2020	0	
7/18/2020	0	
7/19/2020	0	
7/20/2020	0	
7/21/2020	0	
7/22/2020	0	
7/23/2020	0	
7/24/2020	0	

OBS DATE	Daily Precip, in	Annual Pre
7/25/2020	0	
7/26/2020	0	
7/27/2020	0	
7/28/2020	0	
7/29/2020	0	
7/30/2020	0	
7/31/2020	0	
8/1/2020	0	
8/2/2020	0	
8/3/2020	0	
8/4/2020	0	
8/5/2020	0	
8/6/2020	0	
8/7/2020	0	
8/8/2020	0	
8/9/2020	0	
8/10/2020	0	
8/11/2020	0	
8/12/2020	0	
8/13/2020	0	
8/14/2020	0	
8/15/2020	0	
8/16/2020	0	
8/17/2020	0	
8/18/2020	0	
8/19/2020	0	
8/20/2020	0	
8/21/2020	0	
8/22/2020	0	
8/23/2020	0	
8/24/2020	0	
8/25/2020	0	
8/26/2020	0	
8/27/2020	0	
8/28/2020	0	
8/29/2020	0	
8/30/2020	0	
8/31/2020	0	
9/1/2020	0	
9/2/2020	0	
9/3/2020	0	
9/4/2020	0	
9/5/2020	0	
9/6/2020	0	
9/7/2020	0	
9/8/2020	0	
9/9/2020	0	
9/10/2020	0	
9/11/2020	0	
9/12/2020	0	
9/13/2020	0	
9/14/2020	0	
9/15/2020	0	
9/16/2020	0	
9/17/2020	0	
9/18/2020	0	
9/19/2020	0	
9/20/2020	0	
9/21/2020	0	
9/22/2020	0	
9/23/2020	0	
9/24/2020	0	
9/25/2020	0	
9/26/2020	0	
9/27/2020	0	
9/28/2020	0	
9/29/2020	0	
9/30/2020	0	
10/1/2020	0	
10/2/2020	0	
10/3/2020	0	
10/4/2020	0	

OBS DATE	Daily Precip, in	Annual Pre
10/5/2020	0	
10/6/2020	0	
10/7/2020	0	
10/8/2020	0	
10/9/2020	0	
10/10/2020	0	
10/11/2020	0	
10/12/2020	0	
10/13/2020	0	
10/14/2020	0	
10/15/2020	0	
10/16/2020	0	
10/17/2020	0	
10/18/2020	0	
10/19/2020	0	
10/20/2020	0	
10/21/2020	0	
10/22/2020	0	
10/23/2020	0	
10/24/2020	0	
10/25/2020	0	
10/26/2020	0	
10/27/2020	0	
10/28/2020	0	
10/29/2020	0	
10/30/2020	0	
10/31/2020	0	
11/1/2020	0	
11/2/2020	0	
11/3/2020	0	
11/4/2020	0	
11/5/2020	0	
11/6/2020	0.18	
11/7/2020	1.55	
11/8/2020	0.17	
11/9/2020	0.01	
11/10/2020	0	
11/11/2020	0	
11/12/2020	0	
11/13/2020	0	
11/14/2020	0	
11/15/2020	0	
11/16/2020	0	
11/17/2020	0	
11/18/2020	0	
11/19/2020	0	
11/20/2020	0	
11/21/2020	0	
11/22/2020	0	
11/23/2020	0	
11/24/2020	0	
11/25/2020	0	
11/26/2020	0	
11/27/2020	0	
11/28/2020	0	
11/29/2020	0	
11/30/2020	0	
12/1/2020	0	
12/2/2020	0	
12/3/2020	0	
12/4/2020	0	
12/5/2020	0	
12/6/2020	0	
12/7/2020	0	
12/8/2020	0	
12/9/2020	0	
12/10/2020	0	
12/11/2020	0	
12/12/2020	0	
12/13/2020	0	
12/14/2020	0	
12/15/2020	0	

OBS DATE	Daily Precip, in	Annual Pre
12/16/2020	0	
12/17/2020	0	
12/18/2020	0	
12/19/2020	0	
12/20/2020	0	
12/21/2020	0	
12/22/2020	0	
12/23/2020	0	
12/24/2020	0.05	
12/25/2020	0	
12/26/2020	0	
12/27/2020	0	
12/28/2020	2.09	
12/29/2020	0.75	
12/30/2020	0	
12/31/2020	0	
1/1/2021	0	33.05
1/2/2021	0	
1/3/2021	0	
1/4/2021	0	
1/5/2021	0	
1/6/2021	0	
1/7/2021	0	
1/8/2021	0	
1/9/2021	0	
1/10/2021	0	
1/11/2021	0	
1/12/2021	0	
1/13/2021	0	
1/14/2021	0	
1/15/2021	0	
1/16/2021	0	
1/17/2021	0	
1/18/2021	0	
1/19/2021	0	
1/20/2021	0	
1/21/2021	0	
1/22/2021	0.26	
1/23/2021	0.71	
1/24/2021	0.57	
1/25/2021	0.76	
1/26/2021	0	
1/27/2021	0	
1/28/2021	0.99	
1/29/2021	2.15	
1/30/2021	0	
1/31/2021	0	
2/1/2021	0	
2/2/2021	0	
2/3/2021	0	
2/4/2021	0	
2/5/2021	0	
2/6/2021	0	
2/7/2021	0	
2/8/2021	0	
2/9/2021	0	
2/10/2021	0	
2/11/2021	0	
2/12/2021	0.16	
2/13/2021	0	
2/14/2021	0	
2/15/2021	0	
2/16/2021	0	
2/17/2021	0	
2/18/2021	0	
2/19/2021	0	
2/20/2021	0	
2/21/2021	0	
2/22/2021	0	
2/23/2021	0	
2/24/2021	0	
2/25/2021	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
2/26/2021	0	
2/27/2021	0	
2/28/2021	0	
3/1/2021	0	
3/2/2021	0	
3/3/2021	0.22	
3/4/2021	0	
3/5/2021	0	
3/6/2021	0	
3/7/2021	0	
3/8/2021	0	
3/9/2021	0.01	
3/10/2021	1.01	
3/11/2021	0.42	
3/12/2021	0.05	
3/13/2021	0	
3/14/2021	0	
3/15/2021	0.41	
3/16/2021	0	
3/17/2021	0	
3/18/2021	0	
3/19/2021	0	
3/20/2021	0.03	
3/21/2021	0	
3/22/2021	0	
3/23/2021	0	
3/24/2021	0	
3/25/2021	0.03	
3/26/2021	0.05	
3/27/2021	0	
3/28/2021	0	
3/29/2021	0	
3/30/2021	0	
3/31/2021	0	
4/1/2021	0	
4/2/2021	0	
4/3/2021	0	
4/4/2021	0	
4/5/2021	0	
4/6/2021	0	
4/7/2021	0	
4/8/2021	0	
4/9/2021	0	
4/10/2021	0	
4/11/2021	0	
4/12/2021	0	
4/13/2021	0.02	
4/14/2021	0.02	
4/15/2021	0	
4/16/2021	0	
4/17/2021		
4/18/2021	0	
4/19/2021	0	
4/20/2021	0	
4/21/2021	0	
4/22/2021	0	
4/23/2021	0	
4/24/2021	0	
4/25/2021	0	
4/26/2021	0.05	
4/27/2021	0	
4/28/2021	0	
4/29/2021	0	
4/30/2021	0	
5/1/2021	0	
5/2/2021	0	
5/3/2021	0	
5/4/2021	0	
5/5/2021	0	
5/6/2021	0	
5/7/2021	0	
5/8/2021	0	

OBS DATE	Daily Precip, in	Annual Pre
5/9/2021	0	
5/10/2021	0	
5/11/2021	0	
5/12/2021	0	
5/13/2021	0	
5/14/2021	0	
5/15/2021	0	
5/16/2021	0	
5/17/2021	0	
5/18/2021	0	
5/19/2021	0	
5/20/2021	0	
5/21/2021	0	
5/22/2021	0	
5/23/2021	0	
5/24/2021	0	
5/25/2021	0	
5/26/2021	0	
5/27/2021	0	
5/28/2021	0	
5/29/2021	0	
5/30/2021	0	
5/31/2021	0	
6/1/2021	0	
6/2/2021	0	
6/3/2021	0	
6/4/2021	0	
6/5/2021	0	
6/6/2021	0	
6/7/2021	0	
6/8/2021	0	
6/9/2021	0	
6/10/2021	0	
6/11/2021	0	
6/12/2021	0	
6/13/2021	0	
6/14/2021	0	
6/15/2021	0	
6/16/2021	0	
6/17/2021	0	
6/18/2021	0	
6/19/2021	0	
6/20/2021	0	
6/21/2021	0	
6/22/2021	0	
6/23/2021	0	
6/24/2021	0	
6/25/2021	0	
6/26/2021	0	
6/27/2021	0	
6/28/2021	0	
6/29/2021	0	
6/30/2021	0	
7/1/2021	0	
7/2/2021	0	
7/3/2021	0	
7/4/2021	0	
7/5/2021	0	
7/6/2021	0	
7/7/2021	0	
7/8/2021	0	
7/9/2021	0	
7/10/2021	0	
7/11/2021	0	
7/12/2021	0	
7/13/2021	0	
7/14/2021	0	
7/15/2021	0	
7/16/2021	0	
7/17/2021	0	
7/18/2021	0	
7/19/2021	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
7/20/2021	0	
7/21/2021	0	
7/22/2021	0	
7/23/2021	0	
7/24/2021	0	
7/25/2021	0	
7/26/2021	0.37	
7/27/2021	0	
7/28/2021	0	
7/29/2021	0	
7/30/2021	0	
7/31/2021	0	
8/1/2021	0	
8/2/2021	0	
8/3/2021	0	
8/4/2021	0	
8/5/2021	0	
8/6/2021	0	
8/7/2021	0	
8/8/2021	0	
8/9/2021	0	
8/10/2021	0	
8/11/2021	0	
8/12/2021	0	
8/13/2021	0	
8/14/2021	0	
8/15/2021	0	
8/16/2021	0	
8/17/2021	0	
8/18/2021	0	
8/19/2021	0	
8/20/2021	0	
8/21/2021	0	
8/22/2021	0	
8/23/2021	0	
8/24/2021	0	
8/25/2021	0	
8/26/2021	0	
8/27/2021	0	
8/28/2021	0	
8/29/2021	0	
8/30/2021	0	
8/31/2021	0	
9/1/2021	0	
9/2/2021	0	
9/3/2021	0	
9/4/2021	0	
9/5/2021	0	
9/6/2021	0	
9/7/2021	0	
9/8/2021	0	
9/9/2021	0	
9/10/2021	0	
9/11/2021	0	
9/12/2021	0	
9/13/2021	0	
9/14/2021	0	
9/15/2021	0	
9/16/2021	0	
9/17/2021	0	
9/18/2021	0	
9/19/2021	0	
9/20/2021	0	
9/21/2021	0	
9/22/2021	0	
9/23/2021	0	
9/24/2021	0	
9/25/2021	0	
9/26/2021	0	
9/27/2021	0	
9/28/2021	0.01	
9/29/2021	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
9/30/2021	0	
10/1/2021	0	
10/2/2021	0	
10/3/2021	0	
10/4/2021	0	
10/5/2021	0.03	
10/6/2021	0	
10/7/2021	0	
10/8/2021	0.24	
10/9/2021	0	
10/10/2021	0	
10/11/2021	0	
10/12/2021	0	
10/13/2021	0	
10/14/2021	0	
10/15/2021	0	
10/16/2021	0	
10/17/2021	0	
10/18/2021	0.24	
10/19/2021	0	
10/20/2021	0	
10/21/2021	0	
10/22/2021	0	
10/23/2021	0.05	
10/24/2021	0	
10/25/2021	1.77	
10/26/2021	0.01	
10/27/2021	0	
10/28/2021	0	
10/29/2021	0	
10/30/2021	0	
10/31/2021	0	
11/1/2021	0	
11/2/2021	0	
11/3/2021	0	
11/4/2021	0	
11/5/2021	0	
11/6/2021	0	
11/7/2021	0	
11/8/2021	0	
11/9/2021	0	
11/10/2021	0	
11/11/2021	0	
11/12/2021	0	
11/13/2021	0	
11/14/2021	0	
11/15/2021	0	
11/16/2021	0	
11/17/2021	0	
11/18/2021	0	
11/19/2021	0	
11/20/2021	0	
11/21/2021	0	
11/22/2021	0	
11/23/2021	0	
11/24/2021	0	
11/25/2021	0	
11/26/2021	0	
11/27/2021	0	
11/28/2021	0	
11/29/2021	0	
11/30/2021	0	
12/1/2021	0	
12/2/2021	0	
12/3/2021	0	
12/4/2021	0	
12/5/2021	0	
12/6/2021	0	
12/7/2021	0.01	
12/8/2021	0	
12/9/2021	0.66	
12/10/2021	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
12/11/2021	0	
12/12/2021	0	
12/13/2021	0.07	
12/14/2021	5.8	
12/15/2021	0.01	
12/16/2021	0	
12/17/2021	0	
12/18/2021	0	
12/19/2021	0	
12/20/2021	0	
12/21/2021	0	
12/22/2021	0	
12/23/2021	5.18	
12/24/2021	2.03	
12/25/2021	1.38	
12/26/2021	0.65	
12/27/2021	0.92	
12/28/2021	0.08	
12/29/2021	1.97	
12/30/2021	3.64	
12/31/2021	0.01	
1/1/2022	0	24.86
1/2/2022	0	
1/3/2022	0	
1/4/2022	0	
1/5/2022	0	
1/6/2022	0	
1/7/2022	0	
1/8/2022	0	
1/9/2022	0	
1/10/2022	0	
1/11/2022	0	
1/12/2022	0	
1/13/2022	0	
1/14/2022	0	
1/15/2022	0	
1/16/2022	0	
1/17/2022	0.19	
1/18/2022	0	
1/19/2022	0	
1/20/2022	0	
1/21/2022	0	
1/22/2022	0	
1/23/2022	0	
1/24/2022	0	
1/25/2022	0	
1/26/2022	0	
1/27/2022	0	
1/28/2022	0	
1/29/2022	0	
1/30/2022	0	
1/31/2022	0	
2/1/2022	0	
2/2/2022	0	
2/3/2022	0	
2/4/2022	0	
2/5/2022	0	
2/6/2022	0	
2/7/2022	0	
2/8/2022	0	
2/9/2022	0	
2/10/2022	0	
2/11/2022	0	
2/12/2022	0	
2/13/2022	0	
2/14/2022	0	
2/15/2022	0.25	
2/16/2022	0	
2/17/2022	0	
2/18/2022	0	
2/19/2022	0	
2/20/2022	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
2/21/2022	0	
2/22/2022	0.83	
2/23/2022	0.01	
2/24/2022	0	
2/25/2022	0	
2/26/2022	0	
2/27/2022	0	
2/28/2022	0	
3/1/2022	0	
3/2/2022	0	
3/3/2022	0	
3/4/2022	0.16	
3/5/2022	0.17	
3/6/2022	0	
3/7/2022	0	
3/8/2022		
3/9/2022		
3/10/2022		
3/11/2022		
3/12/2022		
3/13/2022		
3/14/2022		
3/15/2022		
3/16/2022		
3/17/2022		
3/18/2022		
3/19/2022	0	
3/20/2022	0	
3/21/2022	0	
3/22/2022	0	
3/23/2022	0	
3/24/2022	0	
3/25/2022	0	
3/26/2022	0	
3/27/2022	0	
3/28/2022	2.23	
3/29/2022	0.04	
3/30/2022	0	
3/31/2022	0	
4/1/2022	0	
4/2/2022	0	
4/3/2022	0	
4/4/2022	0	
4/5/2022	0	
4/6/2022	0	
4/7/2022	0	
4/8/2022	0	
4/9/2022	0	
4/10/2022	0	
4/11/2022	0.02	
4/12/2022	0.01	
4/13/2022	0	
4/14/2022	0	
4/15/2022	0	
4/16/2022	0	
4/17/2022	0	
4/18/2022	0	
4/19/2022	0	
4/20/2022	0.02	
4/21/2022	0.02	
4/22/2022	0.46	
4/23/2022	0	
4/24/2022	0	
4/25/2022	0	
4/26/2022	0	
4/27/2022	0	
4/28/2022	0	
4/29/2022	0	
4/30/2022	0	
5/1/2022	0	
5/2/2022	0	
5/3/2022	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
5/4/2022	0	
5/5/2022	0	
5/6/2022	0	
5/7/2022	0	
5/8/2022	0.04	
5/9/2022	0	
5/10/2022	0	
5/11/2022	0	
5/12/2022	0	
5/13/2022	0	
5/14/2022	0	
5/15/2022	0	
5/16/2022	0	
5/17/2022	0	
5/18/2022	0	
5/19/2022	0	
5/20/2022	0	
5/21/2022	0	
5/22/2022	0	
5/23/2022	0	
5/24/2022	0	
5/25/2022	0	
5/26/2022	0	
5/27/2022	0	
5/28/2022	0	
5/29/2022	0.04	
5/30/2022	0	
5/31/2022	0	
6/1/2022	0	
6/2/2022	0	
6/3/2022	0	
6/4/2022	0	
6/5/2022	0	
6/6/2022	0	
6/7/2022	0	
6/8/2022	0	
6/9/2022	0	
6/10/2022	0	
6/11/2022	0	
6/12/2022	0	
6/13/2022	0	
6/14/2022	0	
6/15/2022	0	
6/16/2022	0	
6/17/2022	0	
6/18/2022	0	
6/19/2022	0	
6/20/2022	0	
6/21/2022	0	
6/22/2022	0.03	
6/23/2022	0	
6/24/2022	0	
6/25/2022	0	
6/26/2022	0	
6/27/2022	0	
6/28/2022	0	
6/29/2022	0	
6/30/2022	0	
7/1/2022	0	
7/2/2022	0	
7/3/2022	0	
7/4/2022	0	
7/5/2022	0	
7/6/2022	0	
7/7/2022	0	
7/8/2022	0	
7/9/2022	0	
7/10/2022	0	
7/11/2022	0	
7/12/2022	0	
7/13/2022	0	
7/14/2022	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
7/15/2022	0	
7/16/2022	0	
7/17/2022	0	
7/18/2022	0	
7/19/2022	0	
7/20/2022	0	
7/21/2022	0	
7/22/2022	0	
7/23/2022	0	
7/24/2022	0	
7/25/2022	0	
7/26/2022	0	
7/27/2022	0	
7/28/2022	0	
7/29/2022	0	
7/30/2022	0	
7/31/2022	0	
8/1/2022	0.04	
8/2/2022	0	
8/3/2022	0	
8/4/2022	0	
8/5/2022	0	
8/6/2022	0	
8/7/2022	0	
8/8/2022	0	
8/9/2022	0	
8/10/2022	0	
8/11/2022	0	
8/12/2022	0	
8/13/2022	0	
8/14/2022	0	
8/15/2022	0	
8/16/2022	0	
8/17/2022	0	
8/18/2022	0	
8/19/2022	0	
8/20/2022	0	
8/21/2022	0	
8/22/2022	0	
8/23/2022	0	
8/24/2022	0	
8/25/2022	0	
8/26/2022	0	
8/27/2022	0	
8/28/2022	0	
8/29/2022	0	
8/30/2022	0	
8/31/2022	0	
9/1/2022	0	
9/2/2022	0	
9/3/2022	0	
9/4/2022	0	
9/5/2022	0	
9/6/2022	0	
9/7/2022	0	
9/8/2022	0.01	
9/9/2022	0.27	
9/10/2022	0	
9/11/2022	0.19	
9/12/2022	0	
9/13/2022	0	
9/14/2022	0	
9/15/2022	0	
9/16/2022	0	
9/17/2022	0	
9/18/2022	0	
9/19/2022	0	
9/20/2022	0	
9/21/2022	0	
9/22/2022	0	
9/23/2022	0	
9/24/2022	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
9/25/2022	0	
9/26/2022	0	
9/27/2022	0	
9/28/2022	0	
9/29/2022	0	
9/30/2022	0	
10/1/2022	0	
10/2/2022	0	
10/3/2022	0	
10/4/2022	0	
10/5/2022	0	
10/6/2022	0	
10/7/2022	0	
10/8/2022	0	
10/9/2022	0.04	
10/10/2022	0	
10/11/2022	0	
10/12/2022	0	
10/13/2022	0	
10/14/2022	0	
10/15/2022	0.19	
10/16/2022	0.01	
10/17/2022	0	
10/18/2022	0	
10/19/2022	0	
10/20/2022	0	
10/21/2022	0	
10/22/2022	0.39	
10/23/2022	0.02	
10/24/2022	0	
10/25/2022	0	
10/26/2022	0	
10/27/2022	0	
10/28/2022	0	
10/29/2022	0	
10/30/2022	0	
10/31/2022	0	
11/1/2022	0	
11/2/2022	1.61	
11/3/2022	0	
11/4/2022	0	
11/5/2022	0	
11/6/2022	0	
11/7/2022	1.31	
11/8/2022	5.93	
11/9/2022	0.11	
11/10/2022	0	
11/11/2022	0	
11/12/2022	0	
11/13/2022	0	
11/14/2022	0	
11/15/2022	0	
11/16/2022	0	
11/17/2022	0	
11/18/2022	0	
11/19/2022	0	
11/20/2022	0	
11/21/2022	0	
11/22/2022	0	
11/23/2022	0	
11/24/2022	0	
11/25/2022	0	
11/26/2022	0	
11/27/2022	0	
11/28/2022	0	
11/29/2022	0	
11/30/2022	0	
12/1/2022	0	
12/2/2022	0.23	
12/3/2022	0	
12/4/2022	0	
12/5/2022	0	

Daily Precip at USFS LYC

OBS DATE	Daily Precip, in	Annual Pre
12/6/2022	0	
12/7/2022	0	
12/8/2022	0	
12/9/2022	0	
12/10/2022	0.07	
12/11/2022	4.69	
12/12/2022	0.27	
12/13/2022	0	
12/14/2022	0	
12/15/2022	0	
12/16/2022	0	
12/17/2022	0	
12/18/2022	0	
12/19/2022	0	
12/20/2022	0	
12/21/2022	0	
12/22/2022	0	
12/23/2022	0	
12/24/2022	0	
12/25/2022	0	
12/26/2022	0	
12/27/2022	0.32	
12/28/2022	0.03	
12/29/2022	0.09	
12/30/2022	0.13	
12/31/2022	4.39	

Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
1/1/2018	1.3	1.44	0.077	0.033833	98%
1/2/2018	0.999	1.44	0.077	0.037	97%
1/3/2018	0.8	1.44	0.077	0.037	97%
1/4/2018	1	1.44	0.077	0.049333	97%
1/5/2018	1.1	1.44	0.077	0.033333	98%
1/6/2018	1.2	1.44	0.077	0.0345	98%
1/7/2018	1.1	1.44	0.077	0.0365	97%
1/8/2018	1.3	1.44	0.077	0.037667	97%
1/9/2018	1.1	1.64	0.077	0.04	98%
1/10/2018	1.2	1.44	0.077	0.043667	97%
1/11/2018	1.1	1.44	0.077	0.0405	97%
1/12/2018	1.1	1.44	0.077	0.035	98%
1/13/2018	1.1	1.44	0.077	0.031833	98%
1/14/2018	0.989	1.44	0.077	0.031167	98%
1/15/2018	1.71	1.44	0.077	0.035333	98%
1/16/2018	1.7	1.44	0.077	0.034833	98%
1/17/2018	1.549	2.54	0.031	0.026167	99%
1/18/2018	1.46	4.01	0.077	0.038167	99%
1/19/2018	1.94	2.06	0.077	0.042	98%
1/20/2018	1.77	1.44	0.078	0.036333	97%
1/21/2018	1.71	1.24	0.046	0.028167	98%
1/22/2018	1.28	1.006	0.03	0.0215	98%
1/23/2018	1	0.019	0.02	0.0175	8%
1/24/2018	1	1.98	0.028	0.019667	99%
1/25/2018	1	0.98	0.03	0.023333	98%
1/26/2018	1.1	1.2	0.022	0.017	99%
1/27/2018	1.1	3	0.052	0.030333	99%
1/28/2018	1	1.42	0.046	0.026667	98%
1/29/2018	1.3	1.4	0.088	0.049833	96%
1/30/2018	1.1	1.025	0.046	0.032833	97%
1/31/2018	1.2	0.705	0.024	0.032898	95%
2/1/2018	1.1	0.685	0.03	0.018167	97%
2/2/2018	1.2	0.612	0.017	0.0155	97%
2/3/2018	1.1	0.605	0.022	0.017167	97%
2/4/2018	1.1	0.621	0.016	0.015333	98%
2/5/2018	0.998	0.685	0.019	0.016333	98%
2/6/2018	1	0.538	0.02	0.017333	97%
2/7/2018	1.63	0.44	0.03	0.02	95%
2/8/2018	1.68	0.999	0.05	0.030333	97%
2/9/2018	1.86	0.7326	0.054	0.035833	95%
2/10/2018	1.77	0.494	0.052	0.036	93%
2/11/2018	1.32	0.578	0.046	0.033	94%
2/12/2018	1.46	0.53	0.033	0.027833	95%
2/13/2018	0.888	0.512	0.033	0.0205	96%
2/14/2018	1	0.488	0.019	0.017667	96%
2/15/2018	0.999	0.492	0.031	0.021833	96%
2/16/2018	1	0.48	0.023	0.016333	97%
2/17/2018	0.899	0.62	0.019	0.016667	97%
2/18/2018		0.5	0.015	0.015	97%
2/19/2018	1.2	1.8	0.02	0.018	99%
2/20/2018	1.2	0.376	0.016	0.015333	96%
2/21/2018	1.1	0.305	0.016	0.015167	95%
2/22/2018	1.5	0.281	0.022	0.017	94%
2/23/2018	1.15	0.326	0.02	0.016167	95%
2/24/2018	1.13	0.222	0.015	0.015	93%
2/25/2018	1.3	0.239	0.015	0.015	94%
2/26/2018	1.91	0.985	0.03	0.0225	98%
2/27/2018	1.64	0.736	0.035	0.0249	97%
2/28/2018	1.9	0.356	0.033	0.024	93%
3/1/2018	1.9	0.266	0.017	0.016333	94%
3/2/2018	1	0.3	0.017	0.016333	95%
3/3/2018	1.77	0.429	0.033	0.024	94%
3/4/2018	1.77	0.377	0.032	0.024233	94%
3/5/2018	0.899	0.23	0.017	0.017	93%
3/6/2018	0.899	0.2	0.017	0.017	92%
3/7/2018		0.211	0.019	0.017833	92%
3/8/2018		0.249	0.019	0.018	93%
3/9/2018	1	0.222	0.02	0.018167	92%

Date	% Reduction	Peak Raw Water Turbidity
10/31/2020	79%	0.18
7/25/2021	79%	0.261
3/20/2021	79%	0.188
3/30/2021	79%	0.187
4/29/2018	79%	0.405
11/11/2020	79%	0.144
11/23/2020	79%	0.159
4/14/2021	79%	0.231
6/12/2021	79%	0.313
3/17/2019	79%	0.13
11/9/2020	79%	0.185
11/29/2020	79%	0.187
5/30/2021	79%	0.269
11/13/2021	79%	0.157
11/24/2020	79%	0.152
12/5/2018	78%	0.109
3/31/2021	78%	0.183
3/23/2021	78%	0.179
10/11/2021	78%	0.142
11/10/2021	78%	0.144
5/7/2021	78%	0.251
6/29/2021	78%	0.316
10/8/2020	78%	0.172
12/8/2019	78%	0.113
11/5/2021	78%	0.141
5/22/2021	78%	0.266
5/6/2021	78%	0.27
7/4/2021	78%	0.309
7/1/2021	78%	0.311
4/19/2021	78%	0.239
4/18/2021	78%	0.224
6/25/2021	78%	0.287
11/30/2020	78%	0.183
3/27/2021	78%	0.167
5/23/2021	78%	0.27
4/6/2021	78%	0.194
11/25/2020	78%	0.146
3/26/2021	78%	0.163
5/1/2021	78%	0.289
5/12/2021	78%	0.276
6/28/2021	78%	0.315
11/9/2021	78%	0.146
11/17/2020	77%	0.157
4/28/2018	77%	0.319
5/10/2021	77%	0.244
5/4/2021	77%	0.263
12/2/2020	77%	0.148
4/17/2021	77%	0.209
5/5/2021	77%	0.258
5/21/2021	77%	0.257
4/21/2021	77%	0.233
10/10/2021	77%	0.135
12/16/2020	77%	0.131
6/24/2021	77%	0.279
7/27/2021	77%	0.219
11/12/2021	76%	0.146
12/9/2020	76%	0.164
4/30/2021	76%	0.27
5/26/2021	76%	0.241
5/20/2021	76%	0.261
3/23/2019	76%	0.121
11/10/2020	76%	0.135
4/22/2021	76%	0.226
3/24/2019	76%	0.111
5/24/2021	76%	0.237
1/3/2021	76%	0.135
5/11/2021	76%	0.229
6/30/2021	76%	0.281

Year	annual avg cfe
2018	0.030
2019	0.027
2020	0.038
2021	0.043
2022	0.036

Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
3/10/2018	1.81	0.239	0.033	0.0255	89%
3/11/2018	1.77	0.224	0.037	0.03	87%
3/12/2018	1.35	0.29	0.022	0.019833	93%
3/13/2018	1.2	0.272	0.022	0.020167	93%
3/14/2018	1.3	0.289	0.02	0.019333	93%
3/15/2018		0.546	0.03	0.022833	96%
3/16/2018	1.3	0.86	0.041	0.033333	96%
3/17/2018	1.2	0.65	0.044	0.038667	94%
3/18/2018	1.5	0.433	0.033	0.031833	93%
3/19/2018	1.6	0.165	0.051	0.041667	75%
3/20/2018	1.54	0.139	0.046	0.04	71%
3/21/2018	1.61	0.205	0.051	0.041333	80%
3/22/2018	1.26	0.109	0.048	0.038833	64%
3/23/2018	1.26	0.109	0.048	0.038833	64%
3/24/2018	1.53	0.211	0.044	0.034	84%
3/25/2018	1.44	0.169	0.03	0.028667	83%
3/26/2018	0.998	2.2	0.031	0.0285	99%
3/27/2018	1	2.98	0.048	0.037833	99%
3/28/2018		2.88	0.039	0.039	99%
3/29/2018					
3/30/2018		2.22	0.07	0.05	98%
3/31/2018	1.1	1.95	0.024	0.023333	99%
4/1/2018	0.999	1.3	0.026	0.022667	98%
4/2/2018	1.3	1.4	0.06	0.0365	97%
4/3/2018	1.2	0.844	0.078	0.051667	94%
4/4/2018	1.3	8.35	0.095	0.061167	99%
4/5/2018	1.3	0.939	0.085	0.058	94%
4/6/2018	1.3	0.842	0.083	0.05	94%
4/7/2018	1.2	0.835	0.054	0.040833	95%
4/8/2018	1.2	1.04	0.035	0.031	97%
4/9/2018	1.92	1.063	0.039	0.036667	97%
4/10/2018	1.96	0.737	0.048	0.040667	94%
4/11/2018	1.94	0.718	0.059	0.045667	94%
4/12/2018	1.84	0.749	0.052	0.0445	94%
4/13/2018	1.79	0.576	0.033	0.030333	95%
4/14/2018	1.88	0.571	0.033	0.030833	95%
4/15/2018	1.81	0.908	0.041	0.032167	96%
4/16/2018	0.8	0.865	0.028	0.024667	97%
4/17/2018	0.8	0.785	0.028	0.026	97%
4/18/2018	1	0.565	0.052	0.039667	93%
4/19/2018	1	0.35	0.046	0.040167	89%
4/20/2018	0.999	0.612	0.031	0.029833	95%
4/21/2018	0.989	0.331	0.031	0.029167	91%
4/22/2018	1.1	0.856	0.05	0.038833	95%
4/23/2018	1.3	1.22	0.05	0.041833	97%
4/24/2018	1.3	0.463	0.054	0.037667	92%
4/25/2018	1.3	0.377	0.072	0.0495	87%
4/26/2018	1.3	0.342	0.06	0.052333	85%
4/27/2018	1.3	0.344	0.094	0.0635	82%
4/28/2018	1.3	0.319	0.082	0.071833	77%
4/29/2018	1.4	0.405	0.099	0.083833	79%
4/30/2018	1.93	0.375	0.087	0.075333	80%
5/1/2018	1.88	0.334	0.072	0.058	83%
5/2/2018	1.92	0.368	0.071	0.0415	89%
5/3/2018	1.78	0.543	0.036	0.032167	94%
5/4/2018	1.9	0.614	0.039	0.037167	94%
5/5/2018	1.78	0.487	0.042	0.035833	93%
5/6/2018	1.9	0.712	0.031	0.030833	96%
5/7/2018	1	0.7	0.031	0.029	96%
5/8/2018	0.98	0.76	0.031	0.0295	96%
5/9/2018	0.999	0.425	0.031	0.030833	93%
5/10/2018	1.1	0.374	0.032	0.030167	92%
5/11/2018	1	1.18	0.031	0.03	97%
5/12/2018	0.8	0.325	0.03	0.029	91%
5/13/2018	0.8	0.328	0.03	0.029333	91%
5/14/2018	1.2	0.314	0.036	0.033333	89%
5/15/2018	1.3	0.309	0.043	0.037167	88%
5/16/2018	1.2	0.322	0.042	0.040667	87%

Date	% Reduction	Peak Raw Water Turbidity
7/20/2021	76%	0.237
5/16/2021	76%	0.241
4/20/2021	76%	0.218
3/7/2021	76%	0.179
5/29/2021	75%	0.231
3/6/2021	75%	0.174
11/18/2020	75%	0.146
7/2/2021	75%	0.281
7/21/2021	75%	0.225
4/10/2021	75%	0.185
4/16/2021	75%	0.193
4/23/2021	75%	0.218
4/28/2021	75%	0.261
5/19/2021	75%	0.261
4/9/2021	75%	0.183
5/3/2021	75%	0.239
12/17/2020	75%	0.122
4/13/2021	75%	0.191
3/19/2018	75%	0.165
5/13/2021	75%	0.237
12/4/2020	75%	0.154
5/28/2021	75%	0.236
4/25/2021	75%	0.215
4/29/2021	74%	0.272
4/24/2021	74%	0.206
12/8/2018	74%	0.125
5/18/2021	74%	0.233
5/17/2021	74%	0.229
11/8/2021	74%	0.128
5/14/2021	74%	0.224
4/26/2021	74%	0.211
11/19/2020	74%	0.142
12/9/2018	74%	0.116
4/27/2021	74%	0.233
12/14/2020	73%	0.13
5/15/2021	73%	0.218
1/2/2021	73%	0.132
12/27/2020	73%	0.281
4/15/2021	73%	0.182
7/22/2021	72%	0.223
12/5/2020	72%	0.141
12/6/2020	72%	0.141
3/20/2018	71%	0.139
11/20/2020	71%	0.128
11/14/2021	71%	0.116
12/10/2020	70%	0.12
7/3/2021	70%	0.24
11/21/2020	69%	0.117
7/24/2021	67%	0.202
7/23/2021	67%	0.218
12/7/2020	67%	0.122
12/11/2020	65%	0.102
3/22/2018	64%	0.109
3/23/2018	64%	0.109
12/13/2020	64%	0.101
12/12/2020	62%	0.095
12/8/2020	59%	0.095
1/23/2018	8%	0.019

Year	annual avg cfe

Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
5/17/2018	1.2	0.287	0.047	0.042167	85%
5/18/2018	1.2	0.348	0.043	0.039333	89%
5/19/2018	1.3	0.347	0.038	0.035667	90%
5/20/2018	1.2	0.253	0.031	0.030167	88%
5/21/2018	1.2	0.238	0.036	0.0315	87%
5/22/2018	0.888	0.259	0.035	0.031833	88%
5/23/2018	1	0.3	0.035	0.0315	90%
5/24/2018	1.1	0.32	0.04	0.036667	89%
5/25/2018	1.82	2.784	0.068	0.0438	98%
5/26/2018	1.74	0.3	0.039	0.035333	88%
5/27/2018	1.79	0.469	0.028	0.026333	94%
5/28/2018	1.8	0.579	0.028	0.022333	96%
5/29/2018	1.87	0.96	0.033	0.023667	98%
5/30/2018	1.87	0.61	0.033	0.033	95%
5/31/2018					
6/1/2018	0.9	0.805	0.09	0.048167	94%
6/2/2018	0.899	0.42	0.028	0.022333	95%
6/3/2018	0.8	0.62	0.019	0.018833	97%
6/4/2018	1.2	0.744	0.022	0.019833	97%
6/5/2018	1.3	0.342	0.031	0.0265	92%
6/6/2018	1.2	0.278	0.035	0.032833	88%
6/7/2018	1.3	0.248	0.04	0.035333	86%
6/8/2018	1.2	0.307	0.037	0.036333	88%
6/9/2018	1.2	0.357	0.039	0.035833	90%
6/10/2018	1.2	0.444	0.039	0.029667	93%
6/11/2018	1.2	0.448	0.032	0.024667	94%
6/12/2018	0.999	0.444	0.057	0.033	93%
6/13/2018	1.63	0.32	0.057	0.0355	89%
6/14/2018	1.73	0.302	0.035	0.032167	89%
6/15/2018	1.87	0.373	0.039	0.033833	91%
6/16/2018	1.92	0.277	0.033	0.03	89%
6/17/2018	1.9	0.259	0.039	0.033	87%
6/18/2018	1.3	0.657	0.033	0.030667	95%
6/19/2018	1.2	0.431	0.033	0.031	93%
6/20/2018	1.2	0.555	0.035	0.0315	94%
6/21/2018	1.1	0.32	0.052	0.039667	88%
6/22/2018	1.1	0.294	0.037	0.033833	88%
6/23/2018	1.2	0.27	0.035	0.032833	88%
6/24/2018	1.21	0.34	0.037	0.034333	90%
6/25/2018	1.2	0.329	0.041	0.036	89%
6/26/2018	1.2	0.374	0.039	0.0355	91%
6/27/2018	1.2	0.34	0.038	0.033667	90%
6/28/2018	1.3	0.316	0.035	0.033167	90%
6/29/2018	1.2	0.276	0.033	0.031167	89%
6/30/2018	1.2	0.245	0.033	0.030167	88%
7/1/2018	1.2	0.281	0.035	0.031167	89%
7/2/2018	1.78	0.34	0.035	0.0325	90%
7/3/2018	1.92	0.618	0.039	0.035167	94%
7/4/2018	1.86	0.368	0.036	0.033333	91%
7/5/2018	1.91	0.384	0.041	0.036	91%
7/6/2018	1.87	0.392	0.037	0.0345	91%
7/7/2018	1.87	0.409	0.041	0.034833	91%
7/8/2018	1.85	0.348	0.041	0.034833	90%
7/9/2018	1.2	0.39	0.037	0.0315	92%
7/10/2018	1	0.352	0.033	0.031167	91%
7/11/2018	1	0.352	0.051	0.041667	88%
7/12/2018	1.1	0.333	0.067	0.047667	86%
7/13/2018	1	0.28	0.033	0.0305	89%
7/14/2018	1.3	0.289	0.031	0.029667	90%
7/15/2018	1.1	0.3	0.03	0.029	90%
7/16/2018	1.1	0.28	0.033	0.030333	89%
7/17/2018	1.2	0.296	0.039	0.033833	89%
7/18/2018	1.2	0.329	0.057	0.043833	87%
7/19/2018	1.2	0.327	0.036	0.032833	90%
7/20/2018	1.2	0.329	0.036	0.033	90%
7/21/2018	1.2	0.558	0.036	0.033667	94%
7/22/2018	1.4	0.395	0.034	0.032333	92%
7/23/2018	1.76	0.656	0.048	0.036333	94%

Date	% Reduction	Peak Raw Water Turbidity	Year	annual avg cfe

Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
7/24/2018	1.94	0.645	0.039	0.035167	95%
7/25/2018	1.88	0.844	0.044	0.036167	96%
7/26/2018	1.94	0.45	0.052	0.042333	91%
7/27/2018	1.9	0.78	0.063	0.052333	93%
7/28/2018	1.63	0.472	0.039	0.035	93%
7/29/2018	1.68	0.51	0.049	0.0365	93%
7/30/2018	1	0.45	0.061	0.0535	88%
7/31/2018	1	0.377	0.057	0.0545	86%
8/1/2018	1.2	0.384	0.057	0.055167	86%
8/2/2018	1.4	0.45	0.054	0.050667	89%
8/3/2018	1.4	0.79	0.048	0.038333	95%
8/4/2018	1.2	0.442	0.037	0.030833	93%
8/5/2018	1.2	0.377	0.028	0.026333	93%
8/6/2018	1.2	0.368	0.032	0.027333	93%
8/7/2018	1.2	0.344	0.033	0.029667	91%
8/8/2018	1.2	0.335	0.039	0.034	90%
8/9/2018	1.2	0.398	0.041	0.036667	91%
8/10/2018	1.3	0.372	0.043	0.037333	90%
8/11/2018	1.2	0.423	0.039	0.037167	91%
8/12/2018	1.2	0.455	0.038	0.034167	92%
8/13/2018	1.63	0.331	0.038	0.034667	90%
8/14/2018	1.83	0.385	0.04	0.036333	91%
8/15/2018	1.79	0.357	0.039	0.03675	90%
8/16/2018	1.4	0.4	0.0378	0.035133	91%
8/17/2018	1.1	0.474	0.039	0.037667	92%
8/18/2018	1.5	0.409	0.039	0.038333	91%
8/19/2018	1.6	0.567	0.042	0.037333	93%
8/20/2018	1.5	0.396	0.035	0.0345	91%
8/21/2018	2	0.551	0.048	0.0395	93%
8/22/2018	1.1	0.398	0.033	0.033	92%
8/23/2018	0.999	0.386	0.033	0.0315	92%
8/24/2018	1.2	0.377	0.031	0.030333	92%
8/25/2018	1.03	0.34	0.03	0.03	91%
8/26/2018	1	0.32	0.03	0.03	91%
8/27/2018	1.5	0.546	0.067	0.048	91%
8/28/2018	1.5	0.435	0.044	0.039333	91%
8/29/2018	1.3	0.377	0.036	0.033667	91%
8/30/2018	1.5	0.374	0.036	0.032833	91%
8/31/2018	1.81	0.381	0.035	0.0325	91%
9/1/2018	1.891	0.457	0.036	0.033	93%
9/2/2018	1.81	0.4	0.034	0.031167	92%
9/3/2018	1.26	0.488	0.037	0.0325	93%
9/4/2018	1.76	0.407	0.033	0.030833	92%
9/5/2018	1.91	0.422	0.044	0.034833	92%
9/6/2018	1.87	0.477	0.033	0.031533	93%
9/7/2018	1.94	0.277	0.033	0.031333	89%
9/8/2018	1.73	0.428	0.031	0.030167	93%
9/9/2018	1.85	0.306	0.034	0.031333	90%
9/10/2018	0.999	0.26	0.0333	0.029217	89%
9/11/2018	1.01	0.25	0.028	0.027833	89%
9/12/2018	1.78	0.4	0.03	0.028333	93%
9/13/2018	1.2	0.26	0.03	0.027167	90%
9/14/2018	1	0.422	0.028	0.027333	94%
9/15/2018	0.9	0.34	0.031	0.03	91%
9/16/2018	1	0.36	0.028	0.027667	92%
9/17/2018	1.3	0.358	0.031	0.029333	92%
9/18/2018	1.3	0.272	0.036	0.0325	88%
9/19/2018	1.3	0.268	0.035	0.031667	88%
9/20/2018	1.3	0.304	0.035	0.031167	90%
9/21/2018	1.3	0.334	0.036	0.031667	91%
9/22/2018	1.4	0.305	0.035	0.0285	91%
9/23/2018	1.3	0.265	0.028	0.026167	90%
9/24/2018	1.3	0.346	0.028	0.024167	93%
9/25/2018	1.93	0.263	0.026	0.023333	91%
9/26/2018	1.9	0.239	0.027	0.025667	89%
9/27/2018	1.74	0.318	0.03	0.026667	92%
9/28/2018	1.96	0.218	0.026	0.025167	88%
9/29/2018	1.77	0.222	0.026	0.025	89%

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9/30/2018	1.86	0.215	0.026	0.0245	89%
10/1/2018	1.2	0.228	0.025	0.022167	90%
10/2/2018	1.3	0.337	0.022	0.022	93%
10/3/2018	1	0.22	0.022	0.021333	90%
10/4/2018	1	0.23	0.022	0.021667	91%
10/5/2018	1	0.235	0.03	0.023	90%
10/6/2018	0.997	0.222	0.03	0.025167	89%
10/7/2018	1.1	0.236	0.024	0.023333	90%
10/8/2018	1.3	0.379	0.03	0.025333	93%
10/9/2018	1.6	0.335	0.031	0.027333	92%
10/10/2018	1.2	0.257	0.03	0.025833	90%
10/11/2018	1	0.212	0.028	0.022667	89%
10/12/2018	1.3	0.212	0.022	0.0205	90%
10/13/2018	1.2	0.202	0.029	0.024167	88%
10/14/2018	1.3	0.168	0.026	0.022667	87%
10/15/2018	1.94	0.186	0.026	0.023333	87%
10/16/2018	1.79	0.162	0.028	0.023333	86%
10/17/2018	1.86	0.187	0.028	0.024833	87%
10/18/2018	1.93	0.213	0.023	0.021667	90%
10/19/2018	1.8	0.191	0.027	0.022833	88%
10/20/2018	1.71	0.176	0.033	0.024833	86%
10/21/2018	1.79	0.189	0.022	0.021	89%
10/22/2018	1	0.182	0.03	0.0255	86%
10/23/2018	1	0.199	0.03	0.027833	86%
10/24/2018	1	0.198	0.03	0.028667	86%
10/25/2018	1	0.212	0.028	0.026167	88%
10/26/2018	1	0.204	0.029	0.025167	88%
10/27/2018	1	0.215	0.028	0.027833	87%
10/28/2018	1	0.214	0.03	0.028667	87%
10/29/2018	1	0.224	0.028	0.025667	89%
10/30/2018	1.3	0.216	0.027	0.020667	90%
10/31/2018	1	0.223	0.027	0.024333	89%
11/1/2018	1	0.213	0.028	0.020833	90%
11/2/2018	1	0.219	0.027	0.020667	91%
11/3/2018	1.2	0.193	0.02	0.018833	90%
11/4/2018	1.3	0.189	0.019	0.019	90%
11/5/2018	1.8	0.183	0.027	0.0245	87%
11/6/2018	1.63	0.163	0.022	0.0205	87%
11/7/2018	1.88	0.185	0.021	0.020167	89%
11/8/2018	1	0.201	0.021	0.020167	90%
11/9/2018	1.86	0.224	0.026	0.021333	90%
11/10/2018	1.3	0.183	0.022	0.0205	89%
11/11/2018	1.86	0.169	0.022	0.020333	88%
11/12/2018	1.89	0.222	0.029	0.023167	90%
11/13/2018	1.5	0.248	0.022	0.0205	92%
11/14/2018	1	0.244	0.029	0.0265	89%
11/15/2018	1	0.196	0.03	0.027667	86%
11/16/2018	1	0.174	0.029	0.025167	86%
11/17/2018	1.1	0.187	0.027	0.022667	88%
11/18/2018	1	0.19	0.028	0.027333	86%
11/19/2018	1	0.179	0.027	0.021833	88%
11/20/2018	1	0.213	0.025	0.020833	90%
11/21/2018	1.3	0.167	0.028	0.024333	85%
11/22/2018	1.2	0.216	0.024	0.020667	90%
11/23/2018	1.3	0.207	0.024	0.021	90%
11/24/2018	1.3	0.185	0.02	0.019167	90%
11/25/2018	1.2	0.183	0.027	0.020333	89%
11/26/2018	1.94	0.151	0.02	0.0195	87%
11/27/2018	1.94	0.122	0.019	0.019	84%
11/28/2018	1.1	0.144	0.021	0.02	86%
11/29/2018	1.77	0.276	0.03	0.025833	91%
11/30/2018	1	0.196	0.029	0.023833	88%
12/1/2018	1.63	0.238	0.02	0.019667	92%
12/2/2018	1	0.243	0.058	0.0295	88%
12/3/2018	1	0.186	0.029	0.025833	86%
12/4/2018	1	0.183	0.025	0.023167	87%
12/5/2018	1	0.109	0.026	0.0235	78%
12/6/2018	1	0.296	0.03	0.0265	91%

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12/7/2018	1	0.23	0.065	0.035	85%
12/8/2018	1	0.125	0.044	0.0325	74%
12/9/2018	1	0.116	0.039	0.030667	74%
12/10/2018	1	0.235	0.044	0.027167	88%
12/11/2018	1	0.54	0.044	0.027667	95%
12/12/2018	1	0.537	0.03	0.027667	95%
12/13/2018	1	0.385	0.031	0.02635	93%
12/14/2018	1.3	0.684	0.03	0.0265	96%
12/15/2018	1.4	0.404	0.029	0.0215	95%
12/16/2018	1.3	0.27	0.02	0.019667	93%
12/17/2018	1.3	0.36	0.027	0.022	94%
12/18/2018	1.79	0.228	0.03	0.025667	89%
12/19/2018	1.93	0.246	0.022	0.0215	91%
12/20/2018	1.91	0.302	0.024	0.021833	93%
12/21/2018	1.64	0.55	0.025	0.021167	96%
12/22/2018	1.89	0.296	0.027	0.022833	92%
12/23/2018	1.78	0.276	0.027	0.0215	92%
12/24/2018	1.66	0.237	0.028	0.0245	90%
12/25/2018	1.6	0.251	0.027	0.025667	90%
12/26/2018	1	0.199	0.02	0.019	90%
12/27/2018	0.12	0.18	0.019	0.018	90%
12/28/2018		0.174	0.019	0.018333	89%
12/29/2018	1	0.172	0.027	0.026167	85%
12/30/2018	1	0.176	0.027	0.026	85%
12/31/2018	1.3	0.15	0.02	0.0185	88%
1/1/2019	1.2	0.198	0.026	0.019	90%
1/2/2019	1.2	0.165	0.026	0.023333	86%
1/3/2019	1	0.163	0.026	0.021833	87%
1/4/2019	1.1	0.163	0.028	0.025167	85%
1/5/2019	1.1	0.15	0.027	0.023667	84%
1/6/2019	1.2	0.221	0.027	0.022667	90%
1/7/2019	1.2	0.22	0.027	0.019833	91%
1/8/2019	1.79	0.187	0.041	0.0225	88%
1/9/2019	1.88	0.192	0.02	0.019167	90%
1/10/2019	1.89	0.232	0.021	0.019833	91%
1/11/2019	1.98	0.341	0.027	0.0235	93%
1/12/2019	1.93	0.411	0.024	0.019	95%
1/13/2019	1.97	0.322	0.037	0.025833	92%
1/14/2019	1.2	0.195	0.033	0.028167	86%
1/15/2019	1.3	0.204	0.03	0.027	87%
1/16/2019	1	0.155	0.028	0.025667	83%
1/17/2019	1.2	0.287	0.028	0.023833	92%
1/18/2019	1	0.337	0.071	0.033167	90%
1/19/2019	1	0.746	0.044	0.031167	96%
1/20/2019	1	0.657	0.039	0.028333	96%
1/21/2019	1.5	0.438	0.029	0.023333	95%
1/22/2019	1.2	0.357	0.028	0.024667	93%
1/23/2019	1.3	0.32	0.028	0.027	92%
1/24/2019	1.3	0.31	0.028	0.023667	92%
1/25/2019	1.3	0.357	0.034	0.029	92%
1/26/2019	1	0.313	0.03	0.0275	91%
1/27/2019	1.1	0.294	0.022	0.020333	93%
1/28/2019	1.1	0.375	0.03	0.026167	93%
1/29/2019	1.789	0.255	0.0289	0.023483	91%
1/30/2019	1.96	0.926	0.025	0.0215	98%
1/31/2019	1.69	0.911	0.035	0.033667	96%
2/1/2019	1.81	1.85	0.027	0.023833	99%
2/2/2019	1.94	1.22	0.029	0.0235	98%
2/3/2019		0.814	0.044	0.032833	96%
2/4/2019	1.1	2	0.063	0.035833	98%
2/5/2019	1.3	2.5	0.06	0.042167	98%
2/6/2019	1.1	3.57	0.09	0.079333	98%
2/7/2019	1.2	2.2	0.082	0.044167	98%
2/8/2019	1	0.451	0.03	0.026667	94%
2/9/2019	1	0.241	0.03	0.029333	88%
2/10/2019	1	0.179	0.032	0.029833	83%
2/11/2019	1.2	0.163	0.03	0.026	84%
2/12/2019	1.2	0.32	0.028	0.0255	92%

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2/13/2019	1.2	0.335	0.025	0.023667	93%
2/14/2019	1.2	0.61	0.025	0.023333	96%
2/15/2019	1	2.9	0.027	0.024833	99%
2/16/2019	1	5.6	0.064	0.049167	99%
2/17/2019	1.1	1.336	0.081	0.05	96%
2/18/2019		0.574	0.045	0.034833	94%
2/19/2019	1.68	0.511	0.039	0.031	94%
2/20/2019	1.79	0.432	0.052	0.029333	93%
2/21/2019	1.87	1.12	0.035	0.030167	97%
2/22/2019	1.92	0.269	0.035	0.026333	90%
2/23/2019	1.86	0.181	0.036	0.028833	84%
2/24/2019	1.69	0.32	0.03	0.025667	92%
2/25/2019	1.41	1.81	0.031	0.029833	98%
2/26/2019	1.3	0.644	0.031	0.024167	96%
2/27/2019	1.1	0.19	0.025	0.021667	89%
2/28/2019	1.6	0.172	0.023	0.020667	88%
3/1/2019	1	0.133	0.028	0.026333	80%
3/2/2019	1	0.204	0.028	0.025833	87%
3/3/2019	1	0.172	0.03	0.0275	84%
3/4/2019	1.3	0.198	0.028	0.022667	89%
3/5/2019	1.89	0.22	0.028	0.021667	90%
3/6/2019	1.69	0.177	0.028	0.021333	88%
3/7/2019	1.92	0.3	0.025	0.021333	93%
3/8/2019	2.5	0.27	0.039	0.031333	88%
3/9/2019	1.3	0.205	0.042	0.027667	87%
3/10/2019	1	0.168	0.025	0.021833	87%
3/11/2019	1.86	0.159	0.03	0.0255	84%
3/12/2019	1.88	0.152	0.028	0.023	85%
3/13/2019	1.9	0.229	0.03	0.023167	90%
3/14/2019	1.77	0.945	0.055	0.034667	96%
3/15/2019	1.77	0.756	0.081	0.040033	95%
3/16/2019	1.89	0.124	0.023	0.020833	83%
3/17/2019	1.67	0.13	0.033	0.0275	79%
3/18/2019	1	0.32	0.037	0.0296	91%
3/19/2019	1	0.882	0.06	0.042167	95%
3/20/2019	1.1	1.113	0.09	0.07	94%
3/21/2019	0.899	0.842	0.037	0.029667	96%
3/22/2019	0.89	0.306	0.038	0.0355	88%
3/23/2019	0.9	0.121	0.033	0.028667	76%
3/24/2019	1	0.111	0.028	0.026667	76%
3/25/2019	1.1	0.281	0.031	0.029667	89%
3/26/2019	1.2	0.32	0.03	0.022667	93%
3/27/2019	1.1	0.24	0.03	0.028333	88%
3/28/2019	1.3	0.195	0.031	0.027833	86%
3/29/2019	1.3	0.2	0.028	0.024833	88%
3/30/2019	1.3	0.296	0.027	0.025667	91%
3/31/2019	1.1	0.273	0.027	0.021333	92%
4/1/2019	1.89	0.279	0.028	0.022833	92%
4/2/2019	1.79	0.242	0.035	0.022833	91%
4/3/2019	1.91	0.247	0.03	0.022167	91%
4/4/2019	1.89	0.251	0.024	0.020333	92%
4/5/2019	1.93	0.322	0.023	0.0205	94%
4/6/2019	1.82	0.224	0.023	0.020333	91%
4/7/2019	1.77	0.238	0.022	0.0195	92%
4/8/2019	1.49	0.3	0.023	0.021167	93%
4/9/2019	1.1	0.232	0.022	0.0205	91%
4/10/2019	1.2	0.799	0.022	0.019833	98%
4/11/2019	1.12	0.566	0.022	0.0205	96%
4/12/2019	1.3	0.509	0.024	0.0195	96%
4/13/2019	1.2	0.326	0.027	0.0225	93%
4/14/2019	1.12	0.348	0.026	0.021	94%
4/15/2019	1.3	0.357	0.021	0.019667	94%
4/16/2019	1.1	0.285	0.021	0.019667	93%
4/17/2019	1.3	0.283	0.021	0.0185	93%
4/18/2019	1.2	0.331	0.021	0.018333	94%
4/19/2019	1.3	0.318	0.022	0.019833	94%
4/20/2019	1.5	0.27	0.021	0.018667	93%
4/21/2019	1.2	0.242	0.02	0.018	93%

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4/22/2019	1.77	0.65	0.026	0.021667	97%
4/23/2019	1.62	0.503	0.025	0.018833	96%
4/24/2019	1.93	0.381	0.017	0.017	96%
4/25/2019	1.94	0.354	0.026	0.0211	94%
4/26/2019	1.77	0.364	0.027	0.022167	94%
4/27/2019	1.3	0.327	0.027	0.023167	93%
4/28/2019	1.69	0.361	0.026	0.0235	93%
4/29/2019	1.5	0.341	0.018	0.017167	95%
4/30/2019	1.5	2.57	0.018	0.017167	99%
5/1/2019	1.3	0.282	0.026	0.02	93%
5/2/2019	1.3	0.259	0.026	0.021833	92%
5/3/2019	1.3	0.252	0.026	0.0245	90%
5/4/2019	1	0.283	0.027	0.026667	91%
5/5/2019	1	0.319	0.027	0.0225	93%
5/6/2019	1.3	0.329	0.024	0.019667	94%
5/7/2019	1.2	0.38	0.026	0.019167	95%
5/8/2019	1.3	0.34	0.024	0.0185	95%
5/9/2019	1.2	0.348	0.021	0.017	95%
5/10/2019	1.1	0.285	0.018	0.016833	94%
5/11/2019	1.2	0.283	0.018	0.017	94%
5/12/2019	1.2	0.317	0.02	0.018333	94%
5/13/2019	1.2	0.345	0.02	0.017333	95%
5/14/2019	1.87	1.44	0.028	0.0225	98%
5/15/2019	1.89	0.326	0.026	0.021167	94%
5/16/2019	1.67	0.366	0.026	0.021833	94%
5/17/2019	1.74	0.305	0.026	0.0215	93%
5/18/2019	1.88	0.274	0.035	0.024	91%
5/19/2019	1.91	0.392	0.026	0.0212	95%
5/20/2019	1.2	0.369	0.068	0.0365	90%
5/21/2019	1.1	0.344	0.033	0.025	93%
5/22/2019	1.1	0.275	0.026	0.0215	92%
5/23/2019	0.925	0.318	0.026	0.022	93%
5/24/2019	0.884	0.372	0.026	0.021833	94%
5/25/2019	0.875	0.329	0.027	0.0245	93%
5/26/2019	0.965	1.09	0.026	0.020167	98%
5/27/2019	1.2	0.385	0.02	0.018833	95%
5/28/2019	1.1	0.322	0.024	0.0195	94%
5/29/2019	0.98	0.349	0.022	0.020167	94%
5/30/2019	1.3	0.34	0.02	0.018833	94%
5/31/2019	1.1	0.279	0.021	0.019	93%
6/1/2019	1.83	0.317	0.027	0.023833	92%
6/2/2019	1.89	0.336	0.027	0.020167	94%
6/3/2019	1.94	0.272	0.021	0.019167	93%
6/4/2019	0.777	0.27	0.021	0.018667	93%
6/5/2019	1.82	0.282	0.028	0.0235	92%
6/6/2019	1.88	0.261	0.021	0.02	92%
6/7/2019	1.89	0.263	0.022	0.02065	92%
6/8/2019		0.405	0.041	0.030833	92%
6/9/2019	1.7	1.2	0.064	0.044667	96%
6/10/2019	1.83	0.58	0.052	0.045333	92%
6/11/2019	1.88	0.633	0.034	0.033167	95%
6/12/2019	1.69	0.714	0.039	0.036667	95%
6/13/2019	1.88	0.401	0.035	0.029833	93%
6/14/2019	0.956	0.696	0.029	0.024333	97%
6/15/2019	1.1	0.638	0.028	0.027	96%
6/16/2019	0.952	0.366	0.028	0.027667	92%
6/17/2019	1.1	0.373	0.027	0.022333	94%
6/18/2019	1.2	0.282	0.024	0.0185	93%
6/19/2019	1.1	0.278	0.022	0.019	93%
6/20/2019	1.1	0.329	0.025	0.019667	94%
6/21/2019	1.1	0.187	0.02	0.018667	90%
6/22/2019	1.1	1.2	0.02	0.018667	98%
6/23/2019	1	0.516	0.025	0.019833	96%
6/24/2019	1.1	0.472	0.026	0.022833	95%
6/25/2019	0.675	0.372	0.026	0.019167	95%
6/26/2019	1.79	0.345	0.021	0.018667	95%
6/27/2019	1.79	0.446	0.302	0.067167	85%
6/28/2019	1.81	0.377	0.022	0.019333	95%

Date	% Reduction	Peak Raw Water Turbidity	Year	annual avg cfe

Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
6/29/2019	1.93	0.357	0.022	0.019333	95%
6/30/2019	1.91	0.405	0.026	0.020833	95%
7/1/2019	0.757	0.293	0.026	0.023333	92%
7/2/2019	0.845	1.38	0.026	0.018833	99%
7/3/2019	0.92	0.301	0.026	0.02	93%
7/4/2019	0.654	0.324	0.026	0.023	93%
7/5/2019	0.821	0.311	0.027	0.0235	92%
7/6/2019	0.654	0.285	0.026	0.0215	92%
7/7/2019	0.785	0.27	0.026	0.019833	93%
7/8/2019	1.1	0.248	0.02	0.018	93%
7/9/2019	1.2	0.371	0.02	0.0185	95%
7/10/2019	1.3	0.265	0.02	0.0175	93%
7/11/2019	1.3	0.309	0.07	0.026833	91%
7/12/2019	1.2	0.347	0.021	0.018167	95%
7/13/2019	1.3	0.547	0.02	0.0185	97%
7/14/2019	1.3	0.609	0.02	0.018333	97%
7/15/2019	1.3	2.6	0.024	0.019833	99%
7/16/2019	1.3	0.83	0.026	0.02	98%
7/17/2019	0.852	0.723	0.026	0.023333	97%
7/18/2019	0.744	0.968	0.027	0.022333	98%
7/19/2019	0.841	1.59	0.03	0.023333	99%
7/20/2019	1.87	1.97	0.022	0.020333	99%
7/21/2019	1.91	2.13	0.022	0.018817	99%
7/22/2019	1.3	3.6	0.048	0.028	99%
7/23/2019	1.1	5.06	0.056	0.032167	99%
7/24/2019	0.612	2.92	0.051	0.0295	99%
7/25/2019	0.784	2.4	0.078	0.043833	98%
7/26/2019	1.2	2.03	0.104	0.067667	97%
7/27/2019	0.874	1.4	0.048	0.041333	97%
7/28/2019	1.1	2.4	0.067	0.044167	98%
7/29/2019	1.85	1.02	0.049	0.0395	96%
7/30/2019	1.2	1	0.06	0.047833	95%
7/31/2019	1.1	1.5	0.041	0.034333	98%
8/1/2019	1.1	2.06	0.041	0.036167	98%
8/2/2019	1.1	1.1	0.045	0.034167	97%
8/3/2019	1	1.12	0.041	0.036	97%
8/4/2019	1.2	0.895	0.039	0.035	96%
8/5/2019	1.93	1.69	0.042	0.036	98%
8/6/2019	1.84	1.33	0.061	0.045333	97%
8/7/2019	1.45	0.751	0.035	0.027833	96%
8/8/2019	1.87	0.771	0.032	0.030333	96%
8/9/2019	1.81	0.718	0.037	0.029667	96%
8/10/2019	1.79	2.136	0.041	0.035333	98%
8/11/2019	1.93	0.71	0.043	0.038167	95%
8/12/2019	1.35	0.653	0.042	0.036833	94%
8/13/2019	1.3	0.666	0.048	0.0395	94%
8/14/2019	1.2	0.833	0.046	0.037333	96%
8/15/2019	1.65	0.783	0.044	0.040333	95%
8/16/2019	1.5	1.055	0.047	0.038333	96%
8/17/2019	1.5	2.13	0.048	0.046167	98%
8/18/2019	1.14	1.07	0.057	0.0435	96%
8/19/2019	1.2	0.424	0.05	0.038	91%
8/20/2019	1.2	0.43	0.03	0.028333	93%
8/21/2019	1.2	0.401	0.033	0.03	93%
8/22/2019	1.2	0.509	0.035	0.028167	94%
8/23/2019	1.3	0.486	0.036	0.031667	93%
8/24/2019	1.2	0.609	0.036	0.0305	95%
8/25/2019	1	0.572	0.033	0.03	95%
8/26/2019	1.93	0.603	0.037	0.033667	94%
8/27/2019	1.83	0.562	0.039	0.034333	94%
8/28/2019	1.79	0.519	0.0311	0.030017	94%
8/29/2019	1.81	0.723	0.035	0.031833	96%
8/30/2019	1.66	0.659	0.036	0.033333	95%
8/31/2019	1.12	0.694	0.037	0.033	95%
9/1/2019	1.89	0.891	0.041	0.0295	97%
9/2/2019	1.5	1.034	0.041	0.032167	97%
9/3/2019	1.34	2.03	0.05	0.034167	98%
9/4/2019	1.8	0.72	0.038	0.0305	96%

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9/5/2019	1.2	1.398	0.042	0.0395	97%
9/6/2019	0.985	2.1	0.104	0.068833	97%
9/7/2019	0.895	0.57	0.038	0.03	95%
9/8/2019	0.848	0.879	0.061	0.037333	96%
9/9/2019	0.958	0.755	0.044	0.035167	95%
9/10/2019	1.1	0.905	0.059	0.0455	95%
9/11/2019	0.985	0.632	0.05	0.038333	94%
9/12/2019	0.985	0.714	0.05	0.042	94%
9/13/2019	1	0.696	0.04	0.032667	95%
9/14/2019	0.952	0.75	0.048	0.035167	95%
9/15/2019	0.983	0.677	0.06	0.045333	93%
9/16/2019	1.25	0.799	0.058	0.044333	94%
9/17/2019	1.873	0.805	0.046	0.032167	96%
9/18/2019	1.79	0.91	0.029	0.0225	98%
9/19/2019	1.91	0.553	0.025	0.0225	96%
9/20/2019	1.84	0.561	0.022	0.022	96%
9/21/2019	1.88	2.46	0.026	0.023667	99%
9/22/2019	1.94	1.233	0.03	0.025667	98%
9/23/2019	0.985	0.622	0.03	0.0265	96%
9/24/2019	1	0.414	0.028	0.023333	94%
9/25/2019	0.145	0.376	0.029	0.025667	93%
9/26/2019	1.1	0.359	0.03	0.026333	93%
9/27/2019	0.887	0.463	0.032	0.0265	94%
9/28/2019	1.25	0.363	0.033	0.027	93%
9/29/2019	1.45	0.318	0.03	0.023833	93%
9/30/2019	1.1	0.324	0.031	0.0255	92%
10/1/2019	1.1	0.347	0.03	0.025667	93%
10/2/2019	1.1	0.228	0.03	0.025333	89%
10/3/2019	1	0.418	0.03	0.0245	94%
10/4/2019	1	3.75	0.022	0.020333	99%
10/5/2019	1	0.552	0.029	0.023	96%
10/6/2019	1	1	0.025	0.0215	98%
10/7/2019	1.87	0.725	0.029	0.024333	97%
10/8/2019	1.24	0.54	0.031	0.0235	96%
10/9/2019	1.79	0.377	0.021	0.020167	95%
10/10/2019	1.79	0.498	0.037	0.023333	95%
10/11/2019	1.5	0.542	0.024	0.023667	96%
10/12/2019	1.89	0.502	0.03	0.025833	95%
10/13/2019	1.88	0.396	0.022	0.021	95%
10/14/2019	1.35	0.542	0.029	0.023833	96%
10/15/2019	1.4	0.455	0.043	0.028667	94%
10/16/2019	1.35	0.416	0.042	0.0355	91%
10/17/2019	0.954	0.435	0.031	0.024167	94%
10/18/2019	1.45	0.41	0.07	0.041167	90%
10/19/2019	1.14	0.384	0.038	0.029333	92%
10/20/2019	1.54	0.357	0.031	0.025333	93%
10/21/2019	1	0.307	0.034	0.027167	91%
10/22/2019	1.1	0.385	0.03	0.028	93%
10/23/2019	1.1	0.255	0.03	0.026333	90%
10/24/2019	1.1	0.361	0.031	0.027333	92%
10/25/2019	1	0.255	0.03	0.024333	90%
10/26/2019	1	0.215	0.031	0.0265	88%
10/27/2019	1.1	0.222	0.03	0.027167	88%
10/28/2019	1.79	0.194	0.03	0.0245	87%
10/29/2019	1.64	0.32	0.03	0.023833	93%
10/30/2019	1.47	0.226	0.028	0.022833	90%
10/31/2019	1.81	0.174	0.024	0.022167	87%
11/1/2019	1.79	0.211	0.022	0.021833	90%
11/2/2019	1.97	0.194	0.022	0.021667	89%
11/3/2019	1.81	0.2412	0.024	0.021333	91%
11/4/2019	1.84	0.51	0.03	0.023833	95%
11/5/2019	1.12	0.371	0.029	0.024833	93%
11/6/2019	1.45	0.992	0.028	0.023	98%
11/7/2019	1.24	0.22	0.03	0.024	89%
11/8/2019	1.45	0.361	0.043	0.028167	92%
11/9/2019	1.32	0.163	0.032	0.028667	82%
11/10/2019	1.23	0.192	0.027	0.0225	88%
11/11/2019	1.1	0.195	0.027	0.020333	90%

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11/12/2019	1.1	0.175	0.025	0.0205	88%
11/13/2019	1.1	0.179	0.027	0.020667	88%
11/14/2019	1.1	0.197	0.025	0.0205	90%
11/15/2019	1.1	0.211	0.026	0.02	91%
11/16/2019	1.81	0.232	0.019	0.018333	92%
11/17/2019	1.2	0.263	0.026	0.02	92%
11/18/2019	1.78	0.211	0.021	0.019	91%
11/19/2019	1.79	0.564	0.03	0.022667	96%
11/20/2019	1.89	0.64	0.03	0.025167	96%
11/21/2019	1.87	0.519	0.038	0.028	95%
11/22/2019	1.93	0.278	0.022	0.021667	92%
11/23/2019	1.83	0.317	0.024	0.022333	93%
11/24/2019	1.83	0.552	0.031	0.025833	95%
11/25/2019	1.24	0.352	0.03	0.026167	93%
11/26/2019	1.55	1.45	0.03	0.024	98%
11/27/2019	1.01	3.414	0.049	0.028667	99%
11/28/2019	0.954	2.418	0.045	0.030667	99%
11/29/2019	1.25	0.314	0.031	0.028	91%
11/30/2019	1.45	0.163	0.032	0.0285	83%
12/1/2019	1.34	0.155	0.032	0.028667	82%
12/2/2019	1.2	0.167	0.032	0.028	83%
12/3/2019	1.2	0.161	0.032	0.027333	83%
12/4/2019	1.2	0.161	0.032	0.027	83%
12/5/2019	1.4	0.161	0.032	0.028333	82%
12/6/2019	1.14	1.61	0.032	0.027833	98%
12/7/2019	1.5	0.133	0.031	0.025833	81%
12/8/2019	1.2	0.113	0.03	0.024667	78%
12/9/2019	1.87	0.155	0.028	0.024667	84%
12/10/2019	1.94	0.22	0.03	0.024833	89%
12/11/2019	1.45	0.537	0.026	0.023333	96%
12/12/2019	1.88	0.191	0.024	0.0225	88%
12/13/2019	1.89	0.168	0.024	0.023	86%
12/14/2019	1.69	0.159	0.028	0.023833	85%
12/15/2019	1.94	0.205	0.036	0.027	87%
12/16/2019	1.45	0.244	0.085	0.037833	84%
12/17/2019	1.19	0.202	0.03	0.024667	88%
12/18/2019	1.16	0.22	0.029	0.023833	89%
12/19/2019	1.1	0.202	0.032	0.023667	88%
12/20/2019	1.35	0.217	0.032	0.024333	89%
12/21/2019	1.15	0.651	0.027	0.023167	96%
12/22/2019	1.61	0.475	0.044	0.027833	94%
12/23/2019	1.2	0.351	0.028	0.022667	94%
12/24/2019	1.3	0.405	0.027	0.022333	94%
12/25/2019	1.2	0.283	0.03	0.025167	91%
12/26/2019	1.2	0.604	0.037	0.026667	96%
12/27/2019	1.3	0.618	0.041	0.0355	94%
12/28/2019	1.3	0.335	0.037	0.029833	91%
12/29/2019	1.2	0.285	0.03	0.026167	91%
12/30/2019	1.79	0.212	0.026	0.024	89%
12/31/2019	1.77	0.2	0.028	0.024	88%
1/1/2020	1.91	0.19	0.026	0.023667	88%
1/2/2020	1.87	0.17	0.024	0.021667	87%
1/3/2020	1.94	0.182	0.024	0.021	88%
1/4/2020	1.78	0.17	0.022	0.020667	88%
1/5/2020	1.89	0.237	0.03	0.025333	89%
1/6/2020	1.51	1.58	0.032	0.026167	98%
1/7/2020	1.23	0.207	0.037	0.0325	84%
1/8/2020	1.22	0.248	0.041	0.032833	87%
1/9/2020	1.12	0.165	0.031	0.024167	85%
1/10/2020	1.32	0.733	0.028	0.0255	97%
1/11/2020	1.15	0.222	0.027	0.025833	88%
1/12/2020	0.975	0.229	0.03	0.025	89%
1/13/2020	1.2	0.239	0.028	0.020667	91%
1/14/2020	1.3	0.242	0.027	0.022167	91%
1/15/2020	1.3	0.235	0.027	0.021667	91%
1/16/2020	1.3	0.211	0.028	0.023	89%
1/17/2020	1.3	0.253	0.025	0.022	91%
1/18/2020	1.79	0.215	0.027	0.0235	89%

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Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
1/19/2020	1.2	0.196	0.022	0.020667	89%
1/20/2020	1.89	0.211	0.022	0.020833	90%
1/21/2020	1.94	0.237	0.022	0.018833	92%
1/22/2020	1.88	0.239	0.022	0.018733	92%
1/23/2020	1.14	1.94	0.022	0.018667	99%
1/24/2020	1.97	0.216	0.022	0.018667	91%
1/25/2020	1.88	0.211	0.02	0.0185	91%
1/26/2020	1.858	0.2	0.037	0.022333	89%
1/27/2020	1.65	0.224	0.027	0.022	90%
1/28/2020	1.78	0.213	0.026	0.023167	89%
1/29/2020	1.2	0.566	0.027	0.024	96%
1/30/2020	1.2	0.294	0.027	0.022667	92%
1/31/2020	1.15	0.255	0.026	0.0245	90%
2/1/2020	1.35	0.271	0.026	0.023	92%
2/2/2020	1.45	0.316	0.026	0.02	94%
2/3/2020	1.2	0.427	0.024	0.02	95%
2/4/2020	1.2	0.374	0.025	0.020167	95%
2/5/2020	1.2	0.215	0.026	0.0205	90%
2/6/2020	1.2	0.315	0.021	0.018667	94%
2/7/2020	1.93	0.233	0.022	0.0195	92%
2/8/2020	1.67	0.312	0.021	0.018167	94%
2/9/2020	1.2	0.355	0.026	0.019833	94%
2/10/2020	1.9	0.294	0.022	0.018667	94%
2/11/2020	1.3	0.248	0.02	0.018333	93%
2/12/2020	1.76	0.326	0.022	0.019	94%
2/13/2020	1.76	0.389	0.022	0.019667	95%
2/14/2020	1.69	0.276	0.02	0.0185	93%
2/15/2020	1.69	0.449	0.026	0.020833	95%
2/16/2020	1.24	0.487	0.027	0.023333	95%
2/17/2020	1.35	0.508	0.029	0.023333	95%
2/18/2020	1.61	0.537	0.029	0.024167	95%
2/19/2020	1.2	0.298	0.03	0.026667	91%
2/20/2020	1.16	0.293	0.063	0.0436	85%
2/21/2020	1.61	0.293	0.029	0.0245	92%
2/22/2020	1.17	0.257	0.028	0.025833	90%
2/23/2020	1.18	0.237	0.032	0.024833	90%
2/24/2020	1.3	0.238	0.035	0.029167	88%
2/25/2020	1.1	0.221	0.036	0.0345	84%
2/26/2020	1.3	0.187	0.035	0.028833	85%
2/27/2020	1.3	0.52	0.034	0.026667	95%
2/28/2020	1.2	0.227	0.03	0.027667	88%
2/29/2020	1.2	0.239	0.032	0.026	89%
3/1/2020	1.3	0.229	0.03	0.024833	89%
3/2/2020	1.89	0.309	0.035	0.029833	90%
3/3/2020	1.12	0.274	0.035	0.026833	90%
3/4/2020	1.67	0.287	0.037	0.032667	89%
3/5/2020	1.93	0.228	0.033	0.028	88%
3/6/2020	1.86	0.254	0.035	0.030333	88%
3/7/2020	1.94	0.238	0.04	0.035	85%
3/8/2020	0.948	1.86	0.041	0.034333	98%
3/9/2020	1.18	0.238	0.057	0.038167	84%
3/10/2020	1.3	2.44	0.037	0.027	99%
3/11/2020	1.3	0.981	0.066	0.055167	94%
3/12/2020	1.3	0.649	0.115	0.081167	87%
3/13/2020	1.18	0.339	0.08	0.056	83%
3/14/2020	1.61	0.355	0.052	0.048	86%
3/15/2020	1.48	0.413	0.059	0.047667	88%
3/16/2020	1.3	0.21	0.035	0.031667	85%
3/17/2020	1.2	0.309	0.037	0.0345	89%
3/18/2020	1.3	0.253	0.038	0.034167	86%
3/19/2020	1.3	0.198	0.035	0.032167	84%
3/20/2020	1.2	0.194	0.037	0.032333	83%
3/21/2020	1.2	0.192	0.034	0.030833	84%
3/22/2020	1.3	0.177	0.029	0.027667	84%
3/23/2020	1.79	0.204	0.033	0.03	85%
3/24/2020	1.83	0.334	0.033	0.030667	91%
3/25/2020	1.84	0.245	0.035	0.032833	87%
3/26/2020	1.74	0.244	0.037	0.034167	86%

Date	% Reduction	Peak Raw Water Turbidity	Year	annual avg cfe

Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
3/27/2020	1.89	0.25	0.031	0.030333	88%
3/28/2020	1.87	0.268	0.037	0.033167	88%
3/29/2020	1.87	0.253	0.033	0.031333	88%
3/30/2020	1.85	0.223	0.038	0.036	84%
3/31/2020	1.79	0.373	0.039	0.038167	90%
4/1/2020	1.81	0.376	0.092	0.049667	87%
4/2/2020	1.81	1.19	0.038	0.035833	97%
4/3/2020	1.89	0.768	0.033	0.0295	96%
4/4/2020	1.45	0.279	0.028	0.023333	92%
4/5/2020	1.3	0.342	0.03	0.022333	93%
4/6/2020	1.2	0.272	0.035	0.028167	90%
4/7/2020	1.2	0.57	0.03	0.026833	95%
4/8/2020	1.3	0.549	0.03	0.024667	96%
4/9/2020	1.2	0.792	0.03	0.024833	97%
4/10/2020	1.2	0.2	0.03	0.024	88%
4/11/2020	1.2	0.196	0.03	0.0245	88%
4/12/2020	1.2	0.202	0.03	0.024333	88%
4/13/2020	1.93	0.163	0.024	0.020667	87%
4/14/2020	1.88	0.181	0.021	0.020167	89%
4/15/2020	1.98	0.524	0.028	0.022667	96%
4/16/2020	1.92	0.563	0.028	0.021667	96%
4/17/2020	1.91	0.981	0.028	0.024667	97%
4/18/2020	1.97	0.622	0.053	0.041	93%
4/19/2020	1.92	0.581	0.065	0.051	91%
4/20/2020	1.84	0.575	0.064	0.047333	92%
4/21/2020	1.74	0.473	0.071	0.054333	89%
4/22/2020	1.87	0.636	0.073	0.047833	92%
4/23/2020	1.87	0.654	0.07	0.053	92%
4/24/2020	1.79	0.654	0.07	0.058667	91%
4/25/2020	1.79	1.07	0.079	0.065167	94%
4/26/2020	1.84	1.04	0.07	0.061	94%
4/27/2020	1.3	1.1	0.06	0.0535	95%
4/28/2020	1.3	0.842	0.069	0.056833	93%
4/29/2020	1.2	0.833	0.074	0.055167	93%
4/30/2020	1.2	0.762	0.074	0.049	94%
5/1/2020	1.2	0.655	0.056	0.0455	93%
5/2/2020	1.91	0.703	0.087	0.056	92%
5/3/2020	1.2	0.608	0.07	0.050833	92%
5/4/2020	1.2	0.687	0.05	0.039	94%
5/5/2020	1.9	0.66	0.036	0.031667	95%
5/6/2020	1.9	0.401	0.035	0.0327	92%
5/7/2020	1.91	0.574	0.033	0.030833	95%
5/8/2020	1.87	0.47	0.035	0.031667	93%
5/9/2020	1.389	0.501	0.032	0.030667	94%
5/10/2020	1.72	0.589	0.038	0.032	95%
5/11/2020	1.2	0.646	0.039	0.034	95%
5/12/2020	1.76	0.374	0.041	0.037833	90%
5/13/2020	1.94	0.768	0.065	0.046667	94%
5/14/2020	1.89	0.582	0.089	0.0575	90%
5/15/2020	1.89	0.521	0.042	0.04	92%
5/16/2020	1.91	0.641	0.049	0.0435	93%
5/17/2020	1.87	0.696	0.044	0.041167	94%
5/18/2020	1.2	0.662	0.043	0.040167	94%
5/19/2020	1.2	0.346	0.041	0.0355	90%
5/20/2020	1.2	0.289	0.043	0.038167	87%
5/21/2020	1.3	0.326	0.041	0.036167	89%
5/22/2020	1.2	0.346	0.044	0.038167	89%
5/23/2020	1.3	0.424	0.039	0.036667	91%
5/24/2020	1.3	0.742	0.044	0.040833	94%
5/25/2020	1.92	0.794	0.041	0.040333	95%
5/26/2020	1.2	0.761	0.042	0.040833	95%
5/27/2020	1.91	0.55	0.048	0.043	92%
5/28/2020	1.79	0.514	0.046	0.043833	91%
5/29/2020	1.87	0.494	0.044	0.042333	91%
5/30/2020	1.88	0.478	0.059	0.048	90%
5/31/2020	1.88	0.695	0.044	0.040167	94%
6/1/2020	1.87	0.973	0.076	0.049	95%
6/2/2020	1.89	0.627	0.042	0.038333	94%

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6/3/2020	1.89	1.003	0.053	0.044167	96%
6/4/2020	1.87	1.17	0.054	0.0405	97%
6/5/2020	1.88	0.729	0.043	0.038	95%
6/6/2020	1.89	0.483	0.052	0.044833	91%
6/7/2020	1.89	0.472	0.047	0.040833	91%
6/8/2020	1.2	0.68	0.054	0.0425	94%
6/9/2020	1.2	1.2	0.05	0.039	97%
6/10/2020	1.2	0.641	0.039	0.036	94%
6/11/2020	1.3	0.529	0.037	0.033667	94%
6/12/2020	1.3	0.411	0.037	0.033333	92%
6/13/2020	1.2	0.47	0.043	0.037667	92%
6/14/2020	1.3	0.566	0.039	0.0355	94%
6/15/2020	1.87	0.608	0.039	0.038167	94%
6/16/2020	1.88	0.445	0.057	0.042	91%
6/17/2020	1.89	0.723	0.046	0.039	95%
6/18/2020	1.87	0.483	0.042	0.039	92%
6/19/2020	1.49	0.379	0.041	0.039	90%
6/20/2020	1.65	0.359	0.041	0.037667	90%
6/21/2020	1.74	0.482	0.041	0.039333	92%
6/22/2020	1.3	0.466	0.041	0.034833	93%
6/23/2020	1.2	0.405	0.04	0.038833	90%
6/24/2020	1.2	0.318	0.042	0.038333	88%
6/25/2020	1.3	0.335	0.043	0.0405	88%
6/26/2020	1.2	0.457	0.043	0.039	91%
6/27/2020	1.3	0.557	0.041	0.037167	93%
6/28/2020	1.3	0.558	0.042	0.0395	93%
6/29/2020	1.3	0.475	0.047	0.0425	91%
6/30/2020	1.2	0.342	0.042	0.0405	88%
7/1/2020	1.3	0.387	0.044	0.043	89%
7/2/2020	1.3	0.387	0.047	0.044667	88%
7/3/2020	1.3	0.447	0.048	0.047	89%
7/4/2020	1.2	0.471	0.051	0.048167	90%
7/5/2020	1.3	0.465	0.054	0.050333	89%
7/6/2020	1.68	0.472	0.052	0.050833	89%
7/7/2020	1.68	0.463	0.061	0.055	88%
7/8/2020	1.62	0.435	0.061	0.0545	87%
7/9/2020	1.64	0.407	0.057	0.0545	87%
7/10/2020	1.89	0.311	0.069	0.0605	81%
7/11/2020	1.93	0.31	0.056	0.055167	82%
7/12/2020	1.97	0.481	0.066	0.062833	87%
7/13/2020	1.3	0.628	0.065	0.058667	91%
7/14/2020	1.2	0.534	0.058	0.052167	90%
7/15/2020	1.3	0.378	0.05	0.048333	87%
7/16/2020	1.7	0.363	0.05	0.048667	87%
7/17/2020	1.8	0.357	0.049	0.048333	86%
7/18/2020	1.7	0.472	0.051	0.049667	89%
7/19/2020	1.3	0.42	0.054	0.0515	88%
7/20/2020	1.2	0.431	0.056	0.052333	88%
7/21/2020	1.3	0.422	0.057	0.054167	87%
7/22/2020	1.2	0.405	0.057	0.055167	86%
7/23/2020	1.3	0.427	0.061	0.056167	87%
7/24/2020	1.3	0.521	0.065	0.058667	89%
7/25/2020	1.3	0.377	0.059	0.052667	86%
7/26/2020	1.3	0.38	0.056	0.055333	85%
7/27/2020	1.79	0.411	0.056	0.040333	90%
7/28/2020	1.97	0.549	0.043	0.038333	93%
7/29/2020	1.88	0.379	0.042	0.036833	90%
7/30/2020		0.351	0.064	0.054333	85%
7/31/2020	1.93	0.451	0.052	0.044667	90%
8/1/2020	1.5	0.476	0.05	0.044833	91%
8/2/2020	1.55	0.535	0.0578	0.052633	90%
8/3/2020	1.83	0.607	0.056	0.049667	92%
8/4/2020	1.78	0.622	0.063	0.051	92%
8/5/2020	1.79	0.555	0.061	0.055333	90%
8/6/2020	1.82	0.436	0.051	0.05	89%
8/7/2020	1.74	0.442	0.051	0.048833	89%
8/8/2020	1.79	0.501	0.056	0.051667	90%
8/9/2020	1.79	0.572	0.057	0.055333	90%

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8/10/2020	1.74	0.554	0.059	0.055167	90%
8/11/2020	1.3	0.401	0.072	0.056167	86%
8/12/2020	1.3	0.418	0.056	0.053	87%
8/13/2020	1.3	0.405	0.059	0.054	87%
8/14/2020	1.3	0.492	0.054	0.048333	90%
8/15/2020	1.2	0.47	0.052	0.0455	90%
8/16/2020	1.3	0.593	0.068	0.0585	90%
8/17/2020	1.72	0.552	0.056	0.053667	90%
8/18/2020	1.74	0.4	0.056	0.052	87%
8/19/2020	1.45	0.445	0.054	0.051833	88%
8/20/2020	1.83	0.357	0.054	0.051833	85%
8/21/2020	1.9	0.324	0.059	0.054333	83%
8/22/2020	1.73	0.363	0.054	0.052	86%
8/23/2020	1.91	0.512	0.061	0.0565	89%
8/24/2020	1.89	0.636	0.053	0.051917	92%
8/25/2020	1.78	0.575	0.053	0.051833	91%
8/26/2020	1.78	0.55	0.053	0.050833	91%
8/27/2020	1.82	0.362	0.048	0.0465	87%
8/28/2020	1.45	0.315	0.048	0.045	86%
8/29/2020	1.79	0.746	0.074	0.0585	92%
8/30/2020	1.79	0.694	0.059	0.05	93%
8/31/2020	1.3	0.453	0.05	0.0475	90%
9/1/2020	1.3	0.324	0.05	0.048333	85%
9/2/2020	1.4	0.299	0.05	0.048167	84%
9/3/2020	1.3	0.386	0.052	0.05	87%
9/4/2020	1.4	0.465	0.054	0.051833	89%
9/5/2020	1.2	0.659	0.056	0.053667	92%
9/6/2020	1.2	0.659	0.061	0.0545	92%
9/7/2020	1.88	0.644	0.054	0.052	92%
9/8/2020	1.91	0.551	0.063	0.0555	90%
9/9/2020	1.93	0.511	0.056	0.051	90%
9/10/2020	1.78	0.272	0.052	0.050333	81%
9/11/2020	1.89	0.2525	0.052	0.051167	80%
9/12/2020	1.73	0.25	0.054	0.042667	83%
9/13/2020	1.79	0.42	0.046	0.043333	90%
9/14/2020	1.84	0.31	0.044	0.0425	86%
9/15/2020	1.79	0.274	0.042	0.041333	85%
9/16/2020	1.79	0.739	0.052	0.045667	94%
9/17/2020	1.81	0.462	0.049	0.044333	90%
9/18/2020	1.81	0.253	0.041	0.038667	85%
9/19/2020	1.84	0.225	0.042	0.040833	82%
9/20/2020	1.87	0.221	0.041	0.040333	82%
9/21/2020	1.3	0.239	0.041	0.039333	84%
9/22/2020	1.3	0.298	0.043	0.039	87%
9/23/2020	1.3	0.204	0.04	0.037	82%
9/24/2020	1.3	0.215	0.041	0.038	82%
9/25/2020	1.3	0.562	0.039	0.036167	94%
9/26/2020	1.3	0.241	0.04	0.038167	84%
9/27/2020	1.2	0.222	0.04	0.037667	83%
9/28/2020	1.79	0.216	0.041	0.039667	82%
9/29/2020	1.79	0.199	0.042	0.038333	81%
9/30/2020	1.79	0.512	0.046	0.041833	92%
10/1/2020	1.89	0.309	0.042	0.040833	87%
10/2/2020	1.89	0.222	0.037	0.036333	84%
10/3/2020	1.9	0.224	0.037	0.0345	85%
10/4/2020	1.84	0.228	0.038	0.035667	84%
10/5/2020	1.81	0.233	0.04	0.038167	84%
10/6/2020	1.78	0.23	0.04	0.039333	83%
10/7/2020	1.81	0.189	0.038	0.037	80%
10/8/2020	1.78	0.172	0.038	0.0375	78%
10/9/2020	1.81	1.56	0.038	0.038	98%
10/10/2020	1.81	0.191	0.038	0.037333	80%
10/11/2020	1.79	0.222	0.038	0.037333	83%
10/12/2020	1.81	0.279	0.038	0.036167	87%
10/13/2020	1.2	0.241	0.038	0.035167	85%
10/14/2020	1.3	0.215	0.035	0.033833	84%
10/15/2020	1.2	0.209	0.038	0.0345	83%
10/16/2020	1.3	0.218	0.038	0.036667	83%

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10/17/2020	1.3	0.242	0.109	0.047833	80%
10/18/2020	1.3	0.34	0.039	0.036167	89%
10/19/2020	1.89	0.249	0.035	0.0345	86%
10/20/2020	1.88	0.283	0.043	0.037667	87%
10/21/2020	1.89	0.188	0.037	0.0365	81%
10/22/2020	1.94	0.188	0.035	0.034	82%
10/23/2020	1.94	0.201	0.036	0.034	83%
10/24/2020	1.69	0.204	0.035	0.0345	83%
10/25/2020	1.69	0.213	0.038	0.035833	83%
10/26/2020	1.81	1.35	0.041	0.039167	97%
10/27/2020	1.74	1.25	0.04	0.037167	97%
10/28/2020	1.74	0.993	0.041	0.035667	96%
10/29/2020	1.76	0.69	0.043	0.041333	94%
10/30/2020	1.78	0.313	0.038	0.037333	88%
10/31/2020	1.79	0.18	0.037	0.037	79%
11/1/2020	1.74	0.185	0.037	0.036833	80%
11/2/2020	1.3	0.2	0.037	0.034167	83%
11/3/2020	1.2	0.191	0.037	0.034167	82%
11/4/2020	1.2	0.192	0.036	0.033667	82%
11/5/2020	1.3	0.2	0.036	0.033833	83%
11/6/2020	1.2	0.174	0.036	0.0335	81%
11/7/2020	1.59	0.461	0.044	0.039833	91%
11/8/2020	1.2	0.313	0.044	0.037167	88%
11/9/2020	1.89	0.185	0.043	0.039167	79%
11/10/2020	1.69	0.135	0.037	0.032333	76%
11/11/2020	1.88	0.144	0.033	0.03	79%
11/12/2020	1.86	1.65	0.044	0.035167	98%
11/13/2020	1.91	0.226	0.042	0.034833	85%
11/14/2020	1.79	0.419	0.047	0.038833	91%
11/15/2020	1.86	0.368	0.059	0.039667	89%
11/16/2020	1.74	0.193	0.052	0.0365	81%
11/17/2020	1.72	0.157	0.037	0.035333	77%
11/18/2020	1.76	0.146	0.036	0.036	75%
11/19/2020	1.71	0.142	0.04	0.0375	74%
11/20/2020	1.71	0.128	0.038	0.037	71%
11/21/2020	1.69	0.117	0.037	0.036667	69%
11/22/2020	1.78	1.08	0.036	0.036	97%
11/23/2020	1.3	0.159	0.036	0.033167	79%
11/24/2020	1.3	0.152	0.036	0.032667	79%
11/25/2020	1.2	0.146	0.036	0.0325	78%
11/26/2020	1.2	0.178	0.036	0.031667	82%
11/27/2020	1.3	0.285	0.037	0.032833	88%
11/28/2020	1.3	0.298	0.043	0.039	87%
11/29/2020	1.2	0.187	0.043	0.039667	79%
11/30/2020	1.91	0.183	0.042	0.0405	78%
12/1/2020	1.89	0.328	0.041	0.036333	89%
12/2/2020	1.86	0.148	0.035	0.033833	77%
12/3/2020	1.79	0.259	0.035	0.033833	87%
12/4/2020	1.89	0.154	0.041	0.039	75%
12/5/2020	1.93	0.141	0.039	0.038833	72%
12/6/2020	1.79	0.141	0.041	0.0395	72%
12/7/2020	1.72	0.122	0.042	0.040333	67%
12/8/2020	1.78	0.095	0.04	0.039333	59%
12/9/2020	1.79	0.164	0.04	0.038667	76%
12/10/2020	1.81	0.12	0.037	0.0355	70%
12/11/2020	1.81	0.102	0.037	0.036167	65%
12/12/2020	1.79	0.095	0.036	0.036	62%
12/13/2020	1.81	0.101	0.036	0.036	64%
12/14/2020	1.5	0.13	0.037	0.0345	73%
12/15/2020	1.2	0.187	0.036	0.033333	82%
12/16/2020	1.2	0.131	0.031	0.030667	77%
12/17/2020	1.2	0.122	0.031	0.030667	75%
12/18/2020	1.2	0.156	0.031	0.030667	80%
12/19/2020	1.89	0.161	0.031	0.0305	81%
12/20/2020	1.77	0.268	0.035	0.032533	88%
12/21/2020	1.83	0.333	0.031	0.029667	91%
12/22/2020	1.84	0.285	0.03	0.028667	90%
12/23/2020	1.88	0.279	0.03	0.028783	90%

Date	% Reduction	Peak Raw Water Turbidity	Year	annual avg cfe

Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
12/24/2020	1.94	0.246	0.03	0.028667	88%
12/25/2020	1.92	0.183	0.03	0.02845	84%
12/26/2020	1.87	0.241	0.03	0.028833	88%
12/27/2020	1.86	0.281	0.28	0.075	73%
12/28/2020	1.9	0.553	0.04	0.0375	93%
12/29/2020	1.86	0.285	0.046	0.04	86%
12/30/2020	1.81	0.21	0.039	0.037	82%
12/31/2020	1.81	0.208	0.038	0.036	83%
1/1/2021	1.79	0.252	0.036	0.033667	87%
1/2/2021	1.74	0.132	0.036	0.035167	73%
1/3/2021	1.74	0.135	0.035	0.0325	76%
1/4/2021	1.2	0.205	0.035	0.031667	85%
1/5/2021	1.2	0.305	0.035	0.031667	90%
1/6/2021	1.2	0.546	0.035	0.030833	94%
1/7/2021	1.3	0.568	0.033	0.0305	95%
1/8/2021	1.1	0.414	0.036	0.031	93%
1/9/2021	1.3	0.479	0.035	0.0315	93%
1/10/2021	1.2	0.71	0.087	0.041333	94%
1/11/2021	1.2	0.884	0.063	0.042667	95%
1/12/2021	1.86	0.818	0.031	0.029667	96%
1/13/2021	1.87	0.899	0.031	0.029	97%
1/14/2021	1.88	0.557	0.031	0.029833	95%
1/15/2021	1.93	0.503	0.031	0.029833	94%
1/16/2021	1.79	0.315	0.03	0.029333	91%
1/17/2021	1.93	0.414	0.036	0.0325	92%
1/18/2021	1.89	0.453	0.037	0.0335	93%
1/19/2021	1.92	0.49	0.035	0.034167	93%
1/20/2021	1.88	0.636	0.038	0.036	94%
1/21/2021	1.91	0.727	0.036	0.0345	95%
1/22/2021	1.77	0.555	0.037	0.035667	94%
1/23/2021	1.88	0.96	0.036	0.031667	97%
1/24/2021	1.78	0.379	0.034	0.032333	91%
1/25/2021	1.3	0.281	0.035	0.0315	89%
1/26/2021	1.2	0.268	0.034	0.03	89%
1/27/2021	1.2	0.368	0.032	0.029333	92%
1/28/2021	1.1	0.363	0.033	0.028833	92%
1/29/2021	1.2	0.866	0.04	0.032833	96%
1/30/2021	1.2	0.511	0.035	0.032833	94%
1/31/2021	1.3	0.65	0.031	0.030167	95%
2/1/2021	1.77	0.51	0.03	0.029333	94%
2/2/2021	1.8	0.553	0.03	0.029333	95%
2/3/2021	1.91	0.507	0.03	0.029333	94%
2/4/2021	1.82	0.5	0.03	0.029333	94%
2/5/2021	1.96	0.533	0.03	0.029	95%
2/6/2021	1.86	0.461	0.028	0.026667	94%
2/7/2021	1.76	0.339	0.032	0.03	91%
2/8/2021	1.88	0.327	0.032	0.03	91%
2/9/2021	1.69	0.318	0.032	0.03	91%
2/10/2021	1.82	0.274	0.032	0.029	89%
2/11/2021	1.68	0.368	0.033	0.030833	92%
2/12/2021	1.8	0.362	0.032	0.031	91%
2/13/2021	1.59	0.198	0.0321	0.03135	84%
2/14/2021	1.91	0.267	0.033	0.030833	88%
2/15/2021	1.8	0.229	0.032	0.028667	87%
2/16/2021	1.6	0.215	0.033	0.028167	87%
2/17/2021	1.5	0.379	0.032	0.0295	92%
2/18/2021	1.2	0.275	0.033	0.029333	89%
2/19/2021	1.4	0.191	0.034	0.030333	84%
2/20/2021	1.4	0.205	0.033	0.029667	86%
2/21/2021	1.3	0.204	0.033	0.03	85%
2/22/2021	1.89	0.257	0.033	0.031917	88%
2/23/2021	1.89	0.241	0.033	0.031667	87%
2/24/2021	1.87	0.308	0.034	0.032	90%
2/25/2021	1.91	0.344	0.033	0.031667	91%
2/26/2021	1.94	0.213	0.033	0.032	85%
2/27/2021	1.93	0.212	0.033	0.032667	85%
2/28/2021	1.8	0.303	0.036	0.0335	89%
3/1/2021	1.7	0.317	0.043	0.0395	88%

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Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
3/2/2021	1.65	0.313	0.047	0.046017	85%
3/3/2021	1.91	0.267	0.047	0.0455	83%
3/4/2021	1.77	0.305	0.046	0.045	85%
3/5/2021	1.88	0.232	0.049	0.045833	80%
3/6/2021	1.74	0.174	0.044	0.042833	75%
3/7/2021	1.88	0.179	0.045	0.043833	76%
3/8/2021	1.2	0.451	0.054	0.0495	89%
3/9/2021	1.3	0.308	0.052	0.046833	85%
3/10/2021	1.3	0.566	0.041	0.0365	94%
3/11/2021	1.3	0.445	0.042	0.039	91%
3/12/2021	1.3	0.192	0.038	0.036333	81%
3/13/2021	1.3	0.179	0.038	0.035833	80%
3/14/2021	1.3	0.174	0.039	0.034833	80%
3/15/2021	1.63	0.204	0.041	0.038167	81%
3/16/2021	1.79	0.203	0.041	0.038833	81%
3/17/2021	1.77	0.237	0.043	0.039833	83%
3/18/2021	1.77	0.27	0.041	0.036833	86%
3/19/2021	1.87	0.333	0.05	0.045333	86%
3/20/2021	1.86	0.188	0.041	0.038667	79%
3/21/2021	1.86	0.258	0.046	0.042167	84%
3/22/2021	1.77	0.208	0.042	0.039333	81%
3/23/2021	1.89	0.179	0.042	0.038833	78%
3/24/2021	1.66	0.21	0.041	0.038333	82%
3/25/2021	1.77	0.2	0.04	0.0375	81%
3/26/2021	1.7	0.163	0.037	0.036333	78%
3/27/2021	1.69	0.167	0.039	0.037	78%
3/28/2021	1.75	0.169	0.038	0.0345	80%
3/29/2021	1.3	0.324	0.04	0.037	89%
3/30/2021	1.5	0.187	0.04	0.0385	79%
3/31/2021	1.3	0.183	0.04	0.0395	78%
4/1/2021	1.5	0.183	0.04	0.0375	80%
4/2/2021	1.3	0.211	0.044	0.04	81%
4/3/2021	1.3	0.229	0.044	0.04	83%
4/4/2021	1.3	0.23	0.043	0.040667	82%
4/5/2021	1.88	0.251	0.044	0.042333	83%
4/6/2021	1.8	0.194	0.044	0.043167	78%
4/7/2021	1.93	0.268	0.044	0.042833	84%
4/8/2021	1.88	0.237	0.047	0.0445	81%
4/9/2021	1.94	0.183	0.048	0.045667	75%
4/10/2021	1.92	0.185	0.048	0.045833	75%
4/11/2021	1.89	0.303	0.051	0.049667	84%
4/12/2021	1.71	0.309	0.052	0.049833	84%
4/13/2021	1.91	0.191	0.05	0.048167	75%
4/14/2021	1.78	0.231	0.052	0.0485	79%
4/15/2021	1.79	0.182	0.051	0.048833	73%
4/16/2021	1.94	0.193	0.049	0.047833	75%
4/17/2021	1.87	0.209	0.049	0.048167	77%
4/18/2021	1.88	0.224	0.052	0.0495	78%
4/19/2021	1.3	0.239	0.057	0.052667	78%
4/20/2021	1.4	0.218	0.057	0.053333	76%
4/21/2021	1.3	0.233	0.059	0.054	77%
4/22/2021	1.3	0.226	0.059	0.054167	76%
4/23/2021	1.3	0.218	0.059	0.054167	75%
4/24/2021	1.4	0.206	0.057	0.0535	74%
4/25/2021	1.3	0.215	0.056	0.054667	75%
4/26/2021	1.9	0.211	0.06	0.0555	74%
4/27/2021	1.83	0.233	0.08	0.061667	74%
4/28/2021	1.79	0.261	0.07	0.065	75%
4/29/2021	1.93	0.272	0.076	0.0695	74%
4/30/2021	1.86	0.27	0.067	0.063667	76%
5/1/2021	1.94	0.289	0.07	0.0645	78%
5/2/2021	1.94	0.3	0.063	0.059167	80%
5/3/2021	1.88	0.239	0.064	0.06	75%
5/4/2021	1.79	0.263	0.07	0.059667	77%
5/5/2021	1.85	0.258	0.063	0.0595	77%
5/6/2021	1.89	0.27	0.068	0.059167	78%
5/7/2021	1.94	0.251	0.056	0.054667	78%
5/8/2021	1.81	0.277	0.055	0.0535	81%

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5/9/2021	1.74	0.288	0.059	0.0555	81%
5/10/2021	1.3	0.244	0.059	0.055167	77%
5/11/2021	1.3	0.229	0.059	0.0555	76%
5/12/2021	1.3	0.276	0.074	0.061833	78%
5/13/2021	1.3	0.237	0.065	0.06	75%
5/14/2021	1.3	0.224	0.063	0.058833	74%
5/15/2021	1.3	0.218	0.063	0.058	73%
5/16/2021	1.3	0.241	0.061	0.058833	76%
5/17/2021	1.94	0.229	0.061	0.059667	74%
5/18/2021	1.94	0.233	0.065	0.060667	74%
5/19/2021	1.79	0.261	0.068	0.065	75%
5/20/2021	1.94	0.261	0.065	0.061667	76%
5/21/2021	1.88	0.257	0.061	0.059333	77%
5/22/2021	1.93	0.266	0.061	0.058167	78%
5/23/2021	1.89	0.27	0.063	0.059933	78%
5/24/2021	1.84	0.237	0.058	0.057	76%
5/25/2021	1.75	0.295	0.065	0.058	80%
5/26/2021	1.79	0.241	0.058	0.056833	76%
5/27/2021	1.74	0.297	0.065	0.059167	80%
5/28/2021	1.85	0.236	0.067	0.059833	75%
5/29/2021	1.88	0.231	0.058	0.056833	75%
5/30/2021	1.9	0.269	0.058	0.057167	79%
5/31/2021	1.3	0.35	0.063	0.059833	83%
6/1/2021	1.3	0.442	0.063	0.058833	87%
6/2/2021	1.3	0.346	0.061	0.057167	83%
6/3/2021	1.3	0.37	0.063	0.059833	84%
6/4/2021	1.5	0.321	0.065	0.061333	81%
6/5/2021	1.83	0.446	0.067	0.064	86%
6/6/2021	1.88	0.337	0.067	0.060333	82%
6/7/2021	1.89	0.339	0.067	0.064	81%
6/8/2021	1.93	0.397	0.063	0.058667	85%
6/9/2021	1.95	0.384	0.065	0.0595	85%
6/10/2021	1.89	0.32	0.067	0.065	80%
6/11/2021	1.93	0.438	0.072	0.068167	84%
6/12/2021	1.88	0.313	0.07	0.066	79%
6/13/2021	1.76	0.4	0.067	0.0635	84%
6/14/2021	1.87	0.389	0.067	0.0625	84%
6/15/2021	1.81	0.364	0.067	0.060667	83%
6/16/2021	1.88	0.363	0.067	0.060833	83%
6/17/2021	1.91	0.304	0.068	0.062167	80%
6/18/2021	1.8	0.322	0.068	0.061833	81%
6/19/2021	1.81	0.301	0.062	0.061333	80%
6/20/2021	1.85	0.344	0.072	0.064167	81%
6/21/2021	1.4	0.426	0.068	0.062333	85%
6/22/2021	1.3	0.331	0.068	0.065	80%
6/23/2021	1.3	0.3814	0.068	0.065333	83%
6/24/2021	1.4	0.279	0.068	0.065333	77%
6/25/2021	1.5	0.287	0.07	0.0635	78%
6/26/2021	1.5	0.324	0.062	0.060667	81%
6/27/2021	1.5	0.33	0.063	0.061333	81%
6/28/2021	1.92	0.315	0.076	0.070833	78%
6/29/2021	1.88	0.316	0.07	0.068833	78%
6/30/2021	1.9	0.281	0.07	0.068333	76%
7/1/2021	1.87	0.311	0.07	0.068333	78%
7/2/2021	1.93	0.281	0.071	0.0695	75%
7/3/2021	1.94	0.24	0.076	0.072333	70%
7/4/2021	1.73	0.309	0.076	0.067833	78%
7/5/2021	1.84	0.328	0.067	0.065	80%
7/6/2021	1.91	0.287	0.064	0.048833	83%
7/7/2021	1.74	0.287	0.041	0.039833	86%
7/8/2021	1.77	0.246	0.042	0.039833	84%
7/9/2021	1.69	0.228	0.049	0.042167	82%
7/10/2021	1.5	0.239	0.042	0.040167	83%
7/11/2021	1.4	0.287	0.047	0.042167	85%
7/12/2021	1.4	0.286	0.046	0.042167	85%
7/13/2021	1.5	0.266	0.043	0.041667	84%
7/14/2021	1.4	0.22	0.046	0.042	81%
7/15/2021	1.48	0.28	0.043	0.039833	86%

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Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
7/16/2021	1.5	0.37	0.045	0.041	89%
7/17/2021	1.5	0.273	0.046	0.043667	84%
7/18/2021	1.6	0.33	0.045	0.042833	87%
7/19/2021	1.94	0.359	0.048	0.044833	88%
7/20/2021	1.3	0.237	0.063	0.057667	76%
7/21/2021	1.86	0.225	0.059	0.055667	75%
7/22/2021	1.94	0.223	0.067	0.061333	72%
7/23/2021	1.93	0.218	0.088	0.0715	67%
7/24/2021	1.89	0.202	0.09	0.065833	67%
7/25/2021	1.93	0.261	0.061	0.053667	79%
7/26/2021	1.84	0.292	0.058	0.048833	83%
7/27/2021	1.71	0.219	0.061	0.051333	77%
7/28/2021	1.85	0.225	0.043	0.0405	82%
7/29/2021	1.91	0.258	0.047	0.039833	85%
7/30/2021	1.9	0.245	0.044	0.036	85%
7/31/2021	1.81	0.389	0.039	0.036333	91%
8/1/2021	1.88	0.274	0.043	0.0385	86%
8/2/2021	1.3	0.272	0.045	0.039333	86%
8/3/2021	1.3	0.289	0.044	0.042167	85%
8/4/2021	1.3	0.246	0.04	0.0375	85%
8/5/2021	1.5	0.24	0.052	0.041	83%
8/6/2021	1.6	0.224	0.039	0.037333	83%
8/7/2021	1.5	0.531	0.04	0.037	93%
8/8/2021	1.86	0.407	0.046	0.039333	90%
8/9/2021	1.93	0.42	0.048	0.041	90%
8/10/2021	1.89	0.316	0.047	0.043	86%
8/11/2021	1.94	0.28	0.057	0.042667	85%
8/12/2021	1.8	0.314	0.045	0.041167	87%
8/13/2021	1.93	0.311	0.043	0.041333	87%
8/14/2021	1.89	0.333	0.059	0.051667	84%
8/15/2021	1.92	0.357	0.059	0.052	85%
8/16/2021	1.77	0.377	0.067	0.058	85%
8/17/2021	1.88	0.376	0.055	0.0485	87%
8/18/2021	1.9	0.36	0.053	0.048833	86%
8/19/2021	1.76	0.4	0.055	0.0485	88%
8/20/2021	1.91	0.48	0.047	0.043333	91%
8/21/2021	1.75	0.435	0.046	0.043333	90%
8/22/2021	1.69	0.522	0.087	0.0555	89%
8/23/2021	1.5	0.452	0.085	0.0625	86%
8/24/2021	1.2	0.369	0.058	0.0425	88%
8/25/2021	1.3	0.622	0.1	0.0695	89%
8/26/2021	1.3	0.654	0.087	0.064333	90%
8/27/2021	1.3	0.586	0.059	0.055	91%
8/28/2021	1.3	0.601	0.085	0.070833	88%
8/29/2021	1.3	0.67	0.054	0.0455	93%
8/30/2021	1.84	0.463	0.043	0.040333	91%
8/31/2021	1.93	0.617	0.061	0.0495	92%
9/1/2021	1.97	0.863	0.081	0.062167	93%
9/2/2021	1.97	0.538	0.067	0.058267	89%
9/3/2021	1.9	0.611	0.097	0.084833	86%
9/4/2021	1.91	1.09	0.093	0.076983	93%
9/5/2021	1.4	0.583	0.085	0.061333	89%
9/6/2021	1.97	0.589	0.087	0.059	90%
9/7/2021	1.9	0.485	0.075	0.055167	89%
9/8/2021	1.88	0.452	0.052	0.049333	89%
9/9/2021	1.8	0.914	0.048	0.047333	95%
9/10/2021	1.95	1	0.047	0.045833	95%
9/11/2021	1.99	1.03	0.044	0.043333	96%
9/12/2021	1.79	0.933	0.043	0.042	95%
9/13/2021	1.3	1.08	0.043	0.0415	96%
9/14/2021	1.3	0.945	0.044	0.043167	95%
9/15/2021	1.3	1.01	0.043	0.042333	96%
9/16/2021	1.2	1.2	0.042	0.040667	97%
9/17/2021	1.4	1.11	0.043	0.041667	96%
9/18/2021	1.2	1.11	0.042	0.0415	96%
9/19/2021	1.3	1.4	0.042	0.041	97%
9/20/2021	1.55	1.117	0.043	0.0415	96%
9/21/2021	1.77	1.09	0.09	0.062	94%

Date	% Reduction	Peak Raw Water Turbidity	Year	annual avg cfe

Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
9/22/2021	1.89	1.231	0.091	0.076833	94%
9/23/2021	1.93	1.34	0.069	0.048167	96%
9/24/2021	1.8	2.07	0.043	0.042167	98%
9/25/2021	1.9	2.49	0.043	0.042067	98%
9/26/2021	1.89	1.78	0.043	0.039833	98%
9/27/2021	1.88	1.05	0.042	0.038167	96%
9/28/2021	1.76	1	0.036	0.036	96%
9/29/2021	1.9	0.945	0.036	0.0345	96%
9/30/2021	1.95	0.887	0.039	0.037333	96%
10/1/2021	1.91	0.938	0.046	0.036667	96%
10/2/2021	1.82	1.02	0.042	0.035833	96%
10/3/2021	1.74	0.791	0.036	0.034833	96%
10/4/2021	1.88	1.863	0.031	0.030833	98%
10/5/2021	1.93	2.32	0.037	0.033333	99%
10/6/2021	1.79	0.763	0.031	0.029333	96%
10/7/2021	1.79	0.742	0.035	0.0325	96%
10/8/2021	1.3	0.634	0.033	0.031167	95%
10/9/2021	1.3	0.186	0.034	0.031167	83%
10/10/2021	1	0.135	0.035	0.0315	77%
10/11/2021	1.79	0.142	0.0332	0.030867	78%
10/12/2021	1.79	0.177	0.033	0.030167	83%
10/13/2021		0.168	0.035	0.032	81%
10/14/2021	1.89	0.153	0.033	0.030833	80%
10/15/2021		0.224	0.033	0.031167	86%
10/16/2021	1.69	0.174	0.033	0.030833	82%
10/17/2021		0.185	0.036	0.033333	82%
10/18/2021	1.4	0.732	0.041	0.036	95%
10/19/2021		0.71	0.035	0.034833	95%
10/20/2021		0.98	0.037	0.034333	96%
10/21/2021	1.25	0.649	0.036	0.0345	95%
10/22/2021		0.653	0.036	0.035667	95%
10/23/2021		0.598	0.036	0.034833	94%
10/24/2021	1.3	0.738	0.036	0.033833	95%
10/25/2021	1.2	1.04	0.035	0.030833	97%
10/26/2021		0.652	0.035	0.031	95%
10/27/2021	1.3	0.625	0.035	0.031667	95%
10/28/2021	1.3	0.6	0.035	0.031333	95%
10/29/2021	1.3	0.766	0.035	0.032833	96%
10/30/2021		0.635	0.037	0.032333	95%
10/31/2021	1.3	0.659	0.035	0.032	95%
11/1/2021	1.93	0.598	0.031	0.030333	95%
11/2/2021	1.79	0.549	0.031	0.029667	95%
11/3/2021	1.93	0.187	0.033	0.030333	84%
11/4/2021	1.74	0.174	0.035	0.033333	81%
11/5/2021		0.141	0.038	0.0308	78%
11/6/2021		0.152	0.03	0.029367	81%
11/7/2021		0.148	0.03	0.029	80%
11/8/2021	1.01	0.128	0.035	0.0335	74%
11/9/2021		0.146	0.035	0.032833	78%
11/10/2021		0.144	0.033	0.031333	78%
11/11/2021		0.172	0.035	0.032833	81%
11/12/2021		0.146	0.035	0.034333	76%
11/13/2021	1.12	0.157	0.035	0.0335	79%
11/14/2021		0.116	0.035	0.034	71%
11/15/2021		0.17	0.035	0.031667	81%
11/16/2021	1.2	0.189	0.035	0.031167	84%
11/17/2021		0.168	0.035	0.030833	82%
11/18/2021		0.152	0.035	0.030833	80%
11/19/2021	1.2	0.191	0.035	0.031667	83%
11/20/2021		0.17	0.035	0.0325	81%
11/21/2021		0.196	0.035	0.031667	84%
11/22/2021		0.263	0.031	0.030667	88%
11/23/2021		0.263	0.03	0.029333	89%
11/24/2021		0.223	0.03	0.0285	87%
11/25/2021		0.403	0.03	0.028333	93%
11/26/2021		0.194	0.03	0.0285	85%
11/27/2021	1.97	0.239	0.03	0.028	88%
11/28/2021		0.187	0.032	0.030383	84%

Date	% Reduction	Peak Raw Water Turbidity	Year	annual avg cfe

Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
11/29/2021		0.262	0.033	0.030833	88%
11/30/2021		0.284	0.033	0.031833	89%
12/1/2021		0.213	0.035	0.031167	85%
12/2/2021		0.218	0.032	0.030667	86%
12/3/2021	1.1	0.242	0.033	0.029833	88%
12/4/2021		0.189	0.031	0.028833	85%
12/5/2021		0.2	0.032	0.0285	86%
12/6/2021		0.276	0.03	0.028	90%
12/7/2021		0.244	0.031	0.027833	89%
12/8/2021	1.3	0.255	0.032	0.028167	89%
12/9/2021		0.379	0.032	0.0285	92%
12/10/2021	1.4	0.396	0.031	0.028833	93%
12/11/2021	1.4	0.294	0.032	0.028667	90%
12/12/2021	1.3	0.322	0.032	0.028167	91%
12/13/2021		0.375	0.032	0.03	92%
12/14/2021	1.91	0.594	0.032	0.027333	95%
12/15/2021	1.7	3.75	0.041	0.033	99%
12/16/2021		0.541	0.0285	0.02775	95%
12/17/2021		0.345	0.028	0.027667	92%
12/18/2021		0.49	0.029	0.0271	94%
12/19/2021		0.29	0.033	0.030833	89%
12/20/2021		0.303	0.033	0.032167	89%
12/21/2021		1.079	0.033	0.032667	97%
12/22/2021	1.5	1.1	0.036	0.0335	97%
12/23/2021	1.6	0.816	0.037	0.032167	96%
12/24/2021		9.6	0.035	0.033667	100%
12/25/2021		2.1	0.22	0.07925	96%
12/26/2021	1.3	1.2	0.032	0.029167	98%
12/27/2021	1.3	0.435	0.039	0.032667	92%
12/28/2021	1.3	0.929	0.038	0.034833	96%
12/29/2021	1.2	1.3	0.043	0.034167	97%
12/30/2021	1.3	1.53	0.054	0.032833	98%
12/31/2021	1.2	0.585	0.054	0.040833	93%
1/1/2022	1.3	0.313	0.037	0.034667	89%
1/2/2022	1.2	0.18	0.033	0.031333	83%
1/3/2022	1.89	1.4	0.039	0.033667	98%
1/4/2022	1.93	0.94	0.051	0.04	96%
1/5/2022	1.89	0.911	0.051	0.034833	96%
1/6/2022	1.91	0.58	0.035	0.0335	94%
1/7/2022	1.94	2.7	0.031	0.028833	99%
1/8/2022	1.67	2.19	0.03	0.027	99%
1/9/2022	1.89	0.281	0.032	0.029333	90%
1/10/2022	1.79	0.241	0.033	0.029167	88%
1/11/2022	1.87	0.32	0.031	0.0305	90%
1/12/2022		0.287	0.031	0.0285	90%
1/13/2022	1.69	0.213	0.03	0.028	87%
1/14/2022	1.77	0.228	0.033	0.03	87%
1/15/2022	1.9	0.187	0.031	0.0295	84%
1/16/2022	1.81	0.195	0.031	0.0295	85%
1/17/2022	1.2	0.222	0.031	0.027167	88%
1/18/2022	1.97	1.58	0.032	0.028333	98%
1/19/2022	1.2	0.194	0.031	0.027333	86%
1/20/2022	1.2	0.187	0.032	0.027333	85%
1/21/2022	1.2	0.211	0.03	0.028	87%
1/22/2022		0.45	0.031	0.027667	94%
1/23/2022		0.22	0.031	0.028333	87%
1/24/2022		0.231	0.031	0.025667	89%
1/25/2022		0.213	0.024	0.024	89%
1/26/2022	1.88	0.24	0.026	0.02475	90%
1/27/2022	1.97	0.2	0.024	0.024	88%
1/28/2022		0.222	0.026	0.024333	89%
1/29/2022	1.79	0.218	0.031	0.027167	88%
1/30/2022	1.91	0.172	0.032	0.0285	83%
1/31/2022	1.89	0.185	0.031	0.028667	85%
2/1/2022		0.673	0.031	0.029167	96%
2/2/2022	1.8	0.779	0.03	0.029833	96%
2/3/2022	1.79	0.826	0.03	0.0285	97%
2/4/2022		1.46	0.03	0.029833	98%

Date	% Reduction	Peak Raw Water Turbidity	Year	annual avg cfe

Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
2/5/2022	1.85	1.2	0.03	0.03	98%
2/6/2022	1.77	0.82	0.03	0.027333	97%
2/7/2022	1.3	0.794	0.03	0.024167	97%
2/8/2022	1.3	1.35	0.026	0.024333	98%
2/9/2022	1.3	1.36	0.028	0.024667	98%
2/10/2022	1.5	1.7	0.033	0.0275	98%
2/11/2022	1.2	1.2	0.031	0.027167	98%
2/12/2022	1.2	0.889	0.031	0.026333	97%
2/13/2022	1.3	1.09	0.031	0.027833	97%
2/14/2022	1.85	1.19	0.031	0.02625	98%
2/15/2022	1.9	1.469	0.028	0.02525	98%
2/16/2022		1.54	0.024	0.024	98%
2/17/2022	1.94	1.387	0.03	0.026	98%
2/18/2022		1.311	0.025	0.024167	98%
2/19/2022	1.76	1.375	0.024	0.024	98%
2/20/2022	1.93	1.302	0.026	0.024333	98%
2/21/2022		1.47	0.031	0.0265	98%
2/22/2022		5.01	0.031	0.029	99%
2/23/2022	1.8	3.04	0.075	0.045	99%
2/24/2022	1.77	2.46	0.079	0.054833	98%
2/25/2022	1.87	1.49	0.053	0.050167	97%
2/26/2022	1.89	1.068	0.066	0.0505	95%
2/27/2022		1.122	0.031	0.027333	98%
2/28/2022	1.3	1.4	0.03	0.0257	98%
3/1/2022	1.3	0.814	0.031	0.0275	97%
3/2/2022	1.5	0.847	0.032	0.026833	97%
3/3/2022	1.3	0.845	0.03	0.027333	97%
3/4/2022	1.4	0.891	0.031	0.027167	97%
3/5/2022	1.2	0.893	0.03	0.027833	97%
3/6/2022	1.2	0.855	0.031	0.026167	97%
3/7/2022		0.876	0.031	0.027333	97%
3/8/2022	1.79	0.914	0.031	0.027167	97%
3/9/2022		0.914	0.028	0.025	97%
3/10/2022	1.89	0.96	0.024	0.024	98%
3/11/2022	1.92	0.951	0.0247	0.024117	97%
3/12/2022	1.94	0.948	0.026	0.024333	97%
3/13/2022	1.93	1.025	0.031	0.027333	97%
3/14/2022	1.9	0.995	0.032	0.029833	97%
3/15/2022	1.78	0.843	0.032	0.030833	96%
3/16/2022	1.77	0.844	0.031	0.0295	97%
3/17/2022	1.74	0.856	0.032	0.03	96%
3/18/2022	1.84	0.881	0.031	0.028	97%
3/19/2022	1.88	0.869	0.032	0.029667	97%
3/20/2022	1.91	0.763	0.031	0.028667	96%
3/21/2022	1.1	0.804	0.031	0.027167	97%
3/22/2022	1.2	0.837	0.031	0.027333	97%
3/23/2022	1.2	0.896	0.031	0.027667	97%
3/24/2022	1.2	0.932	0.032	0.028167	97%
3/25/2022	1	0.904	0.031	0.027167	97%
3/26/2022	1.1	0.912	0.03	0.027	97%
3/27/2022	1.94	1.094	0.026	0.026	98%
3/28/2022	1.87	0.993	0.026	0.025333	97%
3/29/2022		0.76	0.031	0.030667	96%
3/30/2022		3.041	0.098	0.06175	98%
3/31/2022	1.97	0.909	0.033	0.029833	97%
4/1/2022		0.914	0.031	0.027333	97%
4/2/2022	1.89	0.989	0.026	0.025	97%
4/3/2022		0.991	0.03	0.027667	97%
4/4/2022	1.78	1.03	0.031	0.0305	97%
4/5/2022	1.77	0.885	0.031	0.029333	97%
4/6/2022	1.91	0.902	0.031	0.028	97%
4/7/2022	1.88	0.788	0.032	0.029833	96%
4/8/2022	1.94	0.775	0.031	0.0275	96%
4/9/2022	1.88	0.844	0.031	0.028	97%
4/10/2022	1.91	0.881	0.031	0.027833	97%
4/11/2022	1.1	0.806	0.03	0.026667	97%
4/12/2022	1.2	0.88	0.031	0.026667	97%
4/13/2022	1.1	0.701	0.03	0.026667	96%

Date	% Reduction	Peak Raw Water Turbidity	Year	annual avg cfe

Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
4/14/2022	1.1	0.767	0.031	0.0265	97%
4/15/2022	1.3	0.776	0.03	0.0265	97%
4/16/2022	1.2	0.83	0.031	0.027667	97%
4/17/2022	1.75	0.774	0.032	0.029	96%
4/18/2022	1.93	0.811	0.026	0.025	97%
4/19/2022	1.97	0.888	0.026	0.026	97%
4/20/2022	1.93	0.933	0.033	0.028333	97%
4/21/2022	1.81	0.898	0.033	0.0295	97%
4/22/2022	1.69	4.86	0.067	0.049167	99%
4/23/2022	1.86	0.86	0.063	0.037333	96%
4/24/2022	1.94	0.887	0.032	0.029333	97%
4/25/2022	1.81	0.878	0.035	0.032333	96%
4/26/2022	1.85	0.741	0.035	0.033833	95%
4/27/2022	1.77	0.736	0.036	0.032	96%
4/28/2022	1.96	0.754	0.036	0.033667	96%
4/29/2022		0.722	0.033	0.030833	96%
4/30/2022	1.77	0.677	0.035	0.0335	95%
5/1/2022	1.82	0.727	0.036	0.034167	95%
5/2/2022		0.824	0.032	0.030333	96%
5/3/2022	1.2	0.724	0.031	0.030167	96%
5/4/2022	1.2	0.793	0.037	0.031833	96%
5/5/2022	1.2	0.854	0.037	0.033833	96%
5/6/2022	1.3	0.877	0.038	0.035667	96%
5/7/2022	1.2	0.658	0.037	0.034833	95%
5/8/2022	1.3	0.81	0.037	0.0355	96%
5/9/2022	1.88	0.83	0.038	0.036	96%
5/10/2022		0.781	0.037	0.034833	96%
5/11/2022	1.77	0.786	0.037	0.035333	96%
5/12/2022	1.79	0.911	0.036	0.0335	96%
5/13/2022	1.94	0.937	0.038	0.032833	96%
5/14/2022	1.936	0.951	0.033	0.032	97%
5/15/2022		0.988	0.036	0.032167	97%
5/16/2022	1.86	0.998	0.037	0.035667	96%
5/17/2022	1.91	0.65	0.047	0.038667	94%
5/18/2022	1.79	0.71	0.038	0.037167	95%
5/19/2022	1.77	0.717	0.037	0.035	95%
5/20/2022	1.81	0.722	0.037	0.036	95%
5/21/2022	1.85	0.664	0.038	0.035667	95%
5/22/2022	1.95	0.723	0.037	0.035667	95%
5/23/2022	1.2	0.706	0.037	0.034833	95%
5/24/2022	1.3	0.768	0.037	0.0345	96%
5/25/2022	1.2	0.75	0.037	0.0345	95%
5/26/2022	1.2	0.725	0.037	0.034833	95%
5/27/2022	1.2	0.681	0.039	0.035333	95%
5/28/2022	1.85	0.731	0.037	0.036333	95%
5/29/2022	1.84	0.724	0.037	0.036	95%
5/30/2022	1.2	0.81	0.033	0.031667	96%
5/31/2022		0.811	0.033	0.032667	96%
6/1/2022	1.97	0.822	0.033	0.032667	96%
6/2/2022	1.94	0.859	0.033	0.032667	96%
6/3/2022	1.91	0.903	0.033	0.032333	96%
6/4/2022	1.94	0.903	0.054	0.038167	96%
6/5/2022	1.83	0.871	0.043	0.037833	96%
6/6/2022	1.74	0.905	0.039	0.037667	96%
6/7/2022	1.79	0.803	0.039	0.037333	95%
6/8/2022	1.92	0.742	0.048	0.0385	95%
6/9/2022	1.69	0.53	0.038	0.037	93%
6/10/2022	1.8	0.54	0.038	0.036667	93%
6/11/2022	1.77	0.54	0.038	0.036167	93%
6/12/2022	1.92	0.595	0.037	0.035667	94%
6/13/2022	1.2	0.551	0.038	0.036	93%
6/14/2022	1.2	0.57	0.037	0.035333	94%
6/15/2022	1.2	0.611	0.037	0.034333	94%
6/16/2022	1.2	0.628	0.037	0.035	94%
6/17/2022	1.2	0.903	0.039	0.037	96%
6/18/2022	1.3	0.694	0.041	0.0375	95%
6/19/2022	1.2	0.612	0.037	0.036333	94%
6/20/2022		0.588	0.037	0.035667	94%

Date	% Reduction	Peak Raw Water Turbidity	Year	annual avg cfe

Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
6/21/2022	1.96	0.659	0.037	0.036	95%
6/22/2022	1.93	0.81	0.05	0.042167	95%
6/23/2022	1.93	0.811	0.044	0.038833	95%
6/24/2022	1.97	0.842	0.041	0.039	95%
6/25/2022	1.93	0.877	0.039	0.038067	96%
6/26/2022	1.97	0.896	0.04	0.038333	96%
6/27/2022	1.8	0.986	0.041	0.039333	96%
6/28/2022	1.74	0.499	0.044	0.0415	92%
6/29/2022	1.69	0.487	0.048	0.044167	91%
6/30/2022	1.8	0.509	0.046	0.0405	92%
7/1/2022	1.62	0.485	0.04	0.039333	92%
7/2/2022	1.91	0.517	0.041	0.039	92%
7/3/2022	1.74	0.586	0.039	0.0385	93%
7/4/2022	1.8	0.586	0.039	0.0365	94%
7/5/2022	1.2	0.586	0.038	0.035833	94%
7/6/2022	1.3	0.526	0.039	0.035333	93%
7/7/2022	1.2	0.6	0.038	0.035667	94%
7/8/2022	1.2	0.525	0.038	0.034917	93%
7/9/2022	1.97	0.586	0.039	0.036333	94%
7/10/2022	1.3	0.88	0.039	0.036	96%
7/11/2022	1.7	0.99	0.039	0.0385	96%
7/12/2022	1.85	5.1	0.039	0.037667	99%
7/13/2022	1.81	3.67	0.041	0.0395	99%
7/14/2022	1.79	7.74	0.046	0.041167	99%
7/15/2022	1.92	4	0.052	0.045667	99%
7/16/2022	1.8	3.09	0.046	0.042833	99%
7/17/2022	1.93	2.36	0.044	0.0435	98%
7/18/2022	1.94	2.16	0.047	0.045167	98%
7/19/2022	1.81	1.84	0.044	0.043	98%
7/20/2022	1.72	2	0.044	0.043167	98%
7/21/2022	1.85	1.65	0.042	0.039333	98%
7/22/2022	1.2	1.56	0.039	0.035667	98%
7/23/2022	1.3	1.45	0.037	0.036167	98%
7/24/2022	1.94	1.7	0.041	0.037833	98%
7/25/2022	1.5	1.7	0.037	0.0345	98%
7/26/2022	1.3	5.5	0.038	0.034833	99%
7/27/2022	1.3	1.6	0.041	0.039	98%
7/28/2022	1.3	1.45	0.043	0.0425	97%
7/29/2022	1.3	3.2	0.043	0.042	99%
7/30/2022	1.3	1.13	0.045	0.043333	96%
7/31/2022	1.89	1.41	0.044	0.042833	97%
8/1/2022	1.93	2.531	0.047	0.0455	98%
8/2/2022	1.9	1.85	0.047	0.0455	98%
8/3/2022	1.93	1.53	0.057	0.053167	97%
8/4/2022	1.93	1.703	0.057	0.0535	97%
8/5/2022	1.97	1.413	0.057	0.055167	96%
8/6/2022	1.93	1.41	0.057	0.056033	96%
8/7/2022	1.97	1.52	0.057	0.051333	97%
8/8/2022	1.79	1.25	0.046	0.043333	97%
8/9/2022	1.82	2.2	0.046	0.043333	98%
8/10/2022	1.72	1.52	0.047	0.044167	97%
8/11/2022	1.73	1.73	0.047	0.0445	97%
8/12/2022	1.88	1.7	0.048	0.0445	97%
8/13/2022	1.85	1.64	0.041	0.04	98%
8/14/2022	1.74	1.55	0.043	0.041833	97%
8/15/2022	1.2	1.4	0.046	0.043	97%
8/16/2022	1.2	1.7	0.047	0.044167	97%
8/17/2022	1.3	2	0.048	0.0475	98%
8/18/2022	1.2	1.51	0.047	0.046	97%
8/19/2022	1.2	2	0.047	0.045833	98%
8/20/2022	1.3	1.7	0.054	0.051167	97%
8/21/2022	1.2	1.49	0.058	0.0545	96%
8/22/2022	1.93	1.478	0.068	0.066667	95%
8/23/2022	1.97	1.63	0.067	0.057833	96%
8/24/2022	1.93	1.56	0.059	0.056933	96%
8/25/2022	1.97	1.3	0.056	0.052833	96%
8/26/2022	1.91	1.4	0.049	0.047833	97%
8/27/2022	1.91	1.33	0.048	0.0465	97%

Date	% Reduction	Peak Raw Water Turbidity	Year	annual avg cfe

Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
8/28/2022	1.93	1.56	0.05	0.046167	97%
8/29/2022	1.81	1.39	0.042	0.039	97%
8/30/2022	1.74	1.4	0.038	0.037	97%
8/31/2022	1.95	1.4	0.039	0.037833	97%
9/1/2022	1.89	1.6	0.038	0.037333	98%
9/2/2022	1.93	1.4	0.039	0.036667	97%
9/3/2022	1.88	1.4	0.039	0.038	97%
9/4/2022	1.75	1.5	0.041	0.039167	97%
9/5/2022	1.91	1.4	0.039	0.037833	97%
9/6/2022	1.97	1.36	0.047	0.0425	97%
9/7/2022	1.2	1.5	0.04	0.0375	98%
9/8/2022	1.2	1.6	0.044	0.038667	98%
9/9/2022	1.2	1.5	0.05	0.045167	97%
9/10/2022	1.3	1.45	0.044	0.0425	97%
9/11/2022	1.2	1.4	0.048	0.0405	97%
9/12/2022	1.93	1.46	0.037	0.034	98%
9/13/2022	1.93	1.45	0.04	0.036833	97%
9/14/2022	1.93	1.41	0.05	0.042833	97%
9/15/2022	1.91	1.3	0.046	0.044	97%
9/16/2022	1.3	1.3	0.054	0.048333	96%
9/17/2022	1.85	1.2	0.062	0.052167	96%
9/18/2022	1.94	1.2	0.146	0.073167	94%
9/19/2022	1.87	1.3	0.055	0.048	96%
9/20/2022	1.8	1.5	0.049	0.046333	97%
9/21/2022	1.94	1.3	0.056	0.0505	96%
9/22/2022	1.79	1.3	0.053	0.046833	96%
9/23/2022	1.87	1	0.047	0.0445	96%
9/24/2022	1.79	1	0.048	0.043167	96%
9/25/2022	1.96	1.31	0.041	0.0365	97%
9/26/2022	1.2	1.047	0.05	0.044167	96%
9/27/2022	1.2	1.02	0.048	0.0455	96%
9/28/2022	1.3	1.059	0.055	0.048667	95%
9/29/2022	1	0.879	0.048	0.044833	95%
9/30/2022	1.1	0.879	0.051	0.046333	95%
10/1/2022	1.98	5.4	0.068	0.058167	99%
10/2/2022	1.03	0.845	0.057	0.051833	94%
10/3/2022	1.97	1.41	0.057	0.055	96%
10/4/2022	1.99	1.47	0.053	0.052167	96%
10/5/2022	1.93	1.34	0.056	0.053333	96%
10/6/2022	1.97	1.27	0.056	0.052	96%
10/7/2022	1.97	1.4	0.056	0.049833	96%
10/8/2022	1.84	0.668	0.047	0.045833	93%
10/9/2022	1.96	1.39	0.049	0.0445	97%
10/10/2022	1.87	0.755	0.054	0.049833	93%
10/11/2022	1.79	0.893	0.056	0.0495	94%
10/12/2022	1.85	0.915	0.048	0.044833	95%
10/13/2022	1.2	0.868	0.052	0.047	95%
10/14/2022	1.92	0.909	0.06	0.051167	94%
10/15/2022	1.91	1.1	0.075	0.0505	95%
10/16/2022	1.78	0.922	0.046	0.044167	95%
10/17/2022	1.3	0.967	0.052	0.044667	95%
10/18/2022	1.2	0.955	0.041	0.04	96%
10/19/2022	1.3	1.09	0.05	0.043833	96%
10/20/2022	1.2	1.5	0.05	0.044333	97%
10/21/2022	1.2	1	0.042	0.039667	96%
10/22/2022	1.2	1.1	0.038	0.035167	97%
10/23/2022	1.2	1.1	0.037	0.035667	97%
10/24/2022	1.96	1.21	0.037	0.034333	97%
10/25/2022	1.93	1.51	0.055	0.042833	97%
10/26/2022	1.93	1.41	0.035	0.033	98%
10/27/2022	1.94	1.22	0.045	0.0395	97%
10/28/2022	1.93	1.51	0.045	0.0385	97%
10/29/2022	1.97	1.67	0.054	0.0475	97%
10/30/2022	1.98	1.32	0.051	0.048667	96%
10/31/2022	1.2	1	0.056	0.050333	95%
11/1/2022	1.87	0.986	0.056	0.05	95%
11/2/2022	1.88	0.975	0.055	0.046167	95%
11/3/2022	1.91	1	0.043	0.040667	96%

Date	% Reduction	Peak Raw Water Turbidity	Year	annual avg cfe

Date	Peak Recycled Water Turbidity	Peak Raw Water Turbidity	Peak Settled Water Turbidity	CFE Average	% Reduction (Raw to CFE)
11/4/2022	1.74	0.949	0.039	0.038333	96%
11/5/2022	1.8	0.999	0.038	0.0375	96%
11/6/2022	1.74	1.03	0.038	0.036333	96%
11/7/2022	1.2	1.25	0.038	0.035667	97%
11/8/2022	1.3	1.4	0.039	0.037333	97%
11/9/2022	1.2	7.9	0.046	0.042667	99%
11/10/2022	1.2	8.9	0.043	0.040833	100%
11/11/2022	1.2	2.7	0.039	0.0385	99%
11/12/2022	1.3	1.9	0.039	0.037333	98%
11/13/2022	1.2	1.5	0.039	0.037833	97%
11/14/2022	1.97	1.49	0.0387	0.03695	98%
11/15/2022	1.97	1.41	0.041	0.037667	97%
11/16/2022	1.93	1.39	0.037	0.036333	97%
11/17/2022	1.97	1.38	0.037	0.035833	97%
11/18/2022	1.99	1.84	0.041	0.038	98%
11/19/2022	1.98	1.68	0.037	0.033333	98%
11/20/2022	1.93	1.3	0.036	0.033	97%
11/21/2022	1.81	0.81	0.036	0.033667	96%
11/22/2022	1.74	1.1	0.035	0.032167	97%
11/23/2022	1.2	1.13	0.033	0.031333	97%
11/24/2022	1.8	1.29	0.035	0.0335	97%
11/25/2022	1.74	0.792	0.034	0.031	96%
11/26/2022	1.8	0.847	0.033	0.032	96%
11/27/2022	1.79	0.801	0.035	0.034333	96%
11/28/2022	1.3	0.888	0.035	0.033333	96%
11/29/2022	1.3	0.96	0.036	0.034333	96%
11/30/2022	1.2	0.894	0.035	0.031167	97%
12/1/2022	1.3	0.902	0.035	0.032	96%
12/2/2022	1.2	0.748	0.033	0.0305	96%
12/3/2022	1.2	0.718	0.03	0.028333	96%
12/4/2022	1.93	0.912	0.033	0.030833	97%
12/5/2022	1.93	0.763	0.03	0.03	96%
12/6/2022	1.93	2.13	0.031	0.030667	99%
12/7/2022	1.98	0.811	0.046	0.039	95%
12/8/2022	1.97	0.68	0.041	0.038	94%
12/9/2022	1.93	0.77	0.037	0.035	95%
12/10/2022	1.9	0.78	0.03	0.028667	96%
12/11/2022	1.93	0.951	0.038	0.03325	97%
12/12/2022	1.94	1.2	0.036	0.033167	97%
12/13/2022	1.95	1.63	0.04	0.036167	98%
12/14/2022		1.33	0.036	0.034667	97%
12/15/2022	1.78	1.13	0.038	0.036667	97%
12/16/2022	1.8	1.8	0.037	0.036333	98%
12/17/2022	1.69	1.13	0.037	0.035333	97%
12/18/2022		0.59	0.036	0.033167	94%
12/19/2022		0.481	0.036	0.034667	93%
12/20/2022	1.94	0.5	0.032	0.030833	94%
12/21/2022	1.2	1.2	0.037	0.033	97%
12/22/2022	1.2	1	0.035	0.031833	97%
12/23/2022	1.3	0.7	0.036	0.028167	96%
12/24/2022	1.3	0.71	0.03	0.0265	96%
12/25/2022	1.2	0.72	0.03	0.026	96%
12/26/2022	1.3	0.678	0.025	0.023333	97%
12/27/2022	1.94	0.559	0.028	0.023	96%
12/28/2022	1.96	1.18	0.028	0.026667	98%
12/29/2022	1.96	0.648	0.028	0.025667	96%
12/30/2022	1.97	0.68	0.024	0.023667	97%
12/31/2022	1.93	0.749	0.03	0.025667	97%
MIN	0.12	0.019	0.015	0.015	8%
MAX	2.5	9.6	0.302	0.084833	100%
AVERAGE	1.51	0.64	0.04	0.03	91%
MEDIAN	1.500	0.400	0.037	0.033	92%
95th Percent	1.94	1.68	0.07	0.06	98%
					80%

Date	% Reduction	Peak Raw Water Turbidity	Year	annual avg cfe

93% better than 80% reduction

Raw Water Coliform

Date	Total Coliform	Fecal Coliform	TC Running	FC Running
1/4/2018	170	0		
1/9/2018	1600	920		
1/16/2018	49	0		
1/23/2018	79	2	124.5	1
1/30/2018	170	6.8	124.5	4.4
2/6/2018	33	2	64	2
2/13/2018	540	13	124.5	4.4
2/20/2018	170	4.5	170	5.65
2/27/2018	170	79	170	8.75
3/7/2018	33	0	170	8.75
3/13/2018	22	2	101.5	3.25
3/20/2018	13	0	27.5	1
3/27/2018	49	11	27.5	1
4/4/2018	49	17	35.5	6.5
4/10/2018	170	4.5	49	7.75
4/17/2018	220	4.5	109.5	7.75
4/24/2018	1600	110	195	10.75
5/1/2018	350	22	285	13.25
5/9/2018	110	33	285	27.5
5/15/2018	350	22	350	27.5
5/22/2018	170	110	260	27.5
5/29/2018	350	240	260	71.5
6/5/2018	140	49	260	79.5
6/12/2018	110	23	155	79.5
6/19/2018	130	49	135	49
6/26/2018	220	33	135	41
7/2/2018	280	110	175	41
7/10/2018	130	23	175	41
7/17/2018	540	110	250	71.5
7/23/2018	540	46	410	78
7/31/2018	130	33	335	39.5
8/7/2018	350	7.8	445	39.5
8/14/2018	33	23	240	28
8/21/2018	94	2	112	15.4
8/28/2018	49	13	71.5	10.4
9/4/2018	170	33	71.5	18
9/11/2018	33	4.5	71.5	8.75
9/18/2018	23	0	41	8.75
9/25/2018	23	2	28	3.25
10/2/2018	49	17	28	3.25
10/12/2018	33	0	28	1
10/16/2018	13	0	28	1
10/23/2018	6.8	0	23	0
10/30/2018	4.5	0	9.9	0
11/6/2018	46	11	9.9	0

Raw Water Coliform

Date	Total Coliform	Fecal Coliform	TC Running	FC Running
11/13/2018	17	4.5	11.9	2.25
11/20/2018	11	6.8	14	5.65
11/27/2018	33	2	25	5.65
12/3/2018	7.8	0	14	3.25
12/11/2018	13	0	12	1
12/18/2018	130	6.8	23	1
12/26/2018	33	7.8	23	3.4
1/2/2019	33	4	33	5.4
1/8/2019	14	2	33	5.4
1/17/2019	26	2	29.5	3
1/22/2019	7.8	0	20	2
1/29/2019	13	0	13.5	1
2/7/2019	7.8	0	10.4	0
2/12/2019	0	0	7.8	0
2/20/2019	2	0	4.9	0
3/5/2019	0	0	1	0
3/12/2019	7.8	0	1	0
3/19/2019	0	0	1	0
3/26/2019	4.5	0	2.25	0
4/2/2019	13	2	6.15	0
4/9/2019	220	4.5	8.75	1
4/16/2019	130	1.8	71.5	1.9
4/22/2019	0	0	71.5	1.9
5/1/2019	70	7.8	100	3.15
5/7/2019	33	4.5	51.5	3.15
5/14/2019	79	7.8	51.5	6.15
5/21/2019	49	6.8	59.5	7.3
5/28/2019	49	23	49	7.3
6/4/2019	49	11	49	9.4
6/18/2019	120	43	49	17
6/25/2019	220	46	84.5	33
7/2/2019	110	17	115	30
7/9/2019	49	4.5	115	30
7/16/2019	170	130	140	31.5
7/23/2019	540	170	140	73.5
8/20/2019	36	1.9	109.5	67.25
8/31/2019	540	33	355	81.5
9/3/2019	920	350	540	101.5
9/10/2019	540	70	540	51.5
9/17/2019	350	49	540	59.5
9/24/2019	350	23	445	59.5
10/1/2019	79	0	350	36
10/8/2019	920	7	350	14.9
10/16/2019	33	13	214.5	9.9
10/22/2019	110	33	94.5	9.9

Raw Water Coliform

Date	Total Coliform	Fecal Coliform	TC Running	FC Running
10/29/2019	13	0	71.5	9.9
11/5/2019	49	13	41	13
11/12/2019	350	94	79.5	23
11/18/2019	33	13	41	13
11/25/2019	220	17	134.5	15
12/3/2019	17	0	126.5	15
12/10/2019	33	5	33	8.75
12/17/2019	23	5	28	4.5
12/23/2019	540	13	28	4.5
12/31/2019	17	8	28	6.15
1/7/2020	33	23	28	10.4
1/13/2020	1600	540	286.5	18
1/22/2020	23	23	28	23
1/28/2020	49	13	41	23
2/4/2020	23	8	36	18
2/11/2020	17	2	23	10.4
2/18/2020	170	0	36	4.8
2/19/2020	170	5	96.5	3.15
2/24/2020	350	8	170	3.15
3/2/2020	170	33	170	6.15
3/10/2020	79	13	170	10.4
3/16/2020	49	0	124.5	10.4
3/24/2020	5	0	64	6.5
4/3/2020	49	5	49	2.25
4/5/2020	79	13	49	2.25
4/13/2020	2	0	26.75	2.25
4/20/2020	46	2	47.5	3.25
4/28/2020	49	33	47.5	7.5
5/4/2020	70	17	47.5	9.5
5/12/2020	70	13	59.5	15
5/19/2020	49	8	59.5	15
5/26/2020	49	8	59.5	10.4
6/2/2020	79	17	59.5	10.4
6/10/2020	79	13	64	10.4
6/16/2020	170	33	79	15
6/23/2020	920	49	124.5	25
6/30/2020	110	31	140	32
7/7/2020	33	2	140	32
7/13/2020	350	27	230	29
7/21/2020	170	33	140	29
7/29/2020	130	49	150	30
8/3/2020	920	63	260	41
8/10/2020	240	23	205	41
8/18/2020	350	31	295	40
8/25/2020	540	23	445	27

Raw Water Coliform

Date	Total Coliform	Fecal Coliform	TC Running	FC Running
9/2/2020	240	79	295	27
9/8/2020	350	350	350	55
9/15/2020	110	9	295	51
9/22/2020	110	23	175	51
9/29/2020	170	130	140	76.5
10/7/2020	240	8	140	16.15
10/12/2020	130	11	150	17
10/21/2020	220	13	195	12
10/29/2020	8	2	175	9.4
11/3/2020	140	13	135	12
11/9/2020	79	17	109.5	13
11/17/2020	49	8	64	10.4
11/23/2020	49	2	64	10.4
12/2/2020	33	17	49	12.4
12/8/2020	8	0	41	4.9
12/15/2020	23	2	28	2
12/21/2020	17	5	20	3.25
12/29/2020	49	4	20	3
1/5/2021	49	13	36	4.25
1/12/2021	23	5	36	4.5
1/20/2021	23	2	36	4.25
1/25/2021	49	9	36	6.9
2/1/2021	130	13	36	6.9
2/9/2021	23	5	36	6.9
2/16/2021	46	0	47.5	6.9
2/23/2021	79	2	62.5	3.15
3/4/2021	0	0	34.5	0.9
3/10/2021	33	2	39.5	0.9
3/16/2021	49	2	41	1.8
3/23/2021	17	2	25	1.9
3/29/2021	43	8	38	2
4/6/2021	4	0	30	1.9
4/14/2021	13	2	15	2
4/19/2021	130	17	28	4.9
4/26/2021	540	0	71.5	1
5/4/2021	33	2	81.5	2
5/11/2021	220	7	175	4.4
5/17/2021	110	23	165	4.4
5/24/2021	49	4	79.5	5.4
6/1/2021	130	33	120	14.9
6/7/2021	220	15	120	19
6/14/2021	170	31	150	23
6/21/2021	170	79	170	32
6/28/2021	79	22	170	26.5
7/7/2021	130	49	150	40

Raw Water Coliform

Date	Total Coliform	Fecal Coliform	TC Running	FC Running
7/13/2021	70	33	104.5	41
7/20/2021	79	79	79	41
7/27/2021	920	70	104.5	59.5
8/2/2021	79	79	79	74.5
8/10/2021	49	13	79	74.5
8/18/2021	46	5	64	41.5
8/24/2021	79	5	64	8.75
9/15/2021	17	0	47.5	4.5
9/20/2021	33	13	39.5	4.5
9/28/2021	33	13	33	8.75
10/5/2021	27	11	30	12
10/12/2021	31	31	32	13
10/19/2021	0	0	29	12
10/25/2021	70	0	29	5.5
11/2/2021	46	23	38.5	11.5
11/9/2021	33	8	39.5	3.9
11/15/2021	33	2	39.5	4.9
11/23/2021	33	5	33	6.15
11/30/2021	46	8	33	6.15
12/6/2021	33	7	33	5.65
12/14/2021	33	17	33	7.3
12/21/2021	5	0	33	7.3
12/27/2021	13	0	23	3.4
1/3/2022	23	0	18	0
1/10/2022	79	0	18	0
1/18/2022	13	8	18	0
1/24/2022	13	8	18	3.9
2/1/2022	79	9	46	7.8
2/8/2022	49	8	31	7.8
2/15/2022	79	49	64	8.55
2/23/2022	33	17	64	13.15
3/1/2022	49	14	49	15.5
3/7/2022	22	0	41	15.5
3/15/2022	33	11	33	12.5
3/21/2022	33	13	33	12
3/28/2022	17	2	27.5	6.5
4/5/2022	40	8	33	9.4
4/12/2022	110	17	36.5	10.4
4/19/2022	130	5	75	6.15
4/26/2022	70	11	90	9.4
5/2/2022	63	17	90	14
5/10/2022	46	14	66.5	12.5
5/17/2022	27	13	54.5	13.5
5/23/2022	33	8	39.5	13.5
6/1/2022	79	7	39.5	10.4

Raw Water Coliform

Date	Total Coliform	Fecal Coliform	TC Running	FC Running
6/7/2022	110	22	56	10.4
6/14/2022	130	23	94.5	14.9
6/17/2022	79	33	94.5	22.5
6/21/2022	33	23	94.5	23
6/28/2022	540	49	104.5	28
7/5/2022	240	23	159.5	28
7/12/2022	70	5	155	23
7/18/2022	110	33	175	28
7/25/2022	350	13	175	18
8/1/2022	33	23	90	18
8/9/2022	110	9	110	18
8/15/2022	23	2	71.5	11.1
8/23/2022	49	7	41	8
8/30/2022	79	11	64	8
9/7/2022	79	17	64	8.9
9/13/2022	23	0	64	8.9
9/20/2022	350	11	79	11
9/26/2022	130	8	104.5	9.4
10/4/2022	31	0	80.5	3.9
10/11/2022	33	5	81.5	6.15
10/18/2022	79	4	56	4.25
10/26/2022	49	8	41	4.25
11/1/2022	49	0	49	4.25
11/7/2022	23	8	49	5.9
11/14/2022	23	2	36	4.9
11/21/2022	540	49	36	4.9
11/28/2022	130	13	76.5	10.4
12/5/2022	49	33	89.5	23
12/12/2022	23	13	89.5	23
12/21/2022	23	0	36	13
12/26/2022	170	33	36	23
MIN	0	0	1	0
MAX	1600	920	540	101.5
AVERAGE	139	27	99	16
MEDIAN	49	7.8	64.0	9.4
95th Percent	540	83	311	60

Monthly TOC Data

Date	Lytle Creek Influen	GAC System Inf TOC	GAC Systen
1/4/2018	0.42	0.33	0
2/6/2018	0.39	0.36	0.36
3/7/2018	0.33	0	0.3
4/3/2018	0.4		
4/11/2018	0	0.87	0.53
5/1/2018	0.35	0.4	0.34
6/5/2018	0.29	0.99	0.43
7/2/2018	0.34	1.9	1.2
7/16/2018	0		
8/7/2018	0.44	2	1.2
9/4/2018	1.1	1.9	1.1
10/2/2018	0.29	1.6	1
11/7/2018	0.29	1.2	0.95
12/3/2018	0.36	1.3	0.92
1/2/2019	0.36	0.9	0.62
2/7/2019	0.66	1.7	1.1
3/5/2019	0.72	0.55	0.52
3/19/2019	0.54		
4/2/2019	0.5	0.49	0.45
5/1/2019	0.9	0.64	0.6
6/4/2019	0.38	0.99	0.74
7/2/2019	0.44	1	0.76
8/20/2019	0.32	1.9	1.5
9/3/2019	0.5	1.2	0.92
10/1/2019	0.4	1.5	1
11/5/2019	0.36	1.5	1.1
12/3/2019	0.27	1.7	1.3
1/7/2020	0.44	0.42	0.53
2/4/2020	0.28	0.4	0
2/18/2020	0.32		
3/2/2020	0.41	1.2	0.78
4/3/2020	0.35	1.4	0.9
5/4/2020	0.52	1.1	0.83
6/2/2020	0.36	0.86	0.75
7/7/2020	0.33	0.76	0.65
8/3/2020	0.32	1.1	0.79
9/2/2020	0.28	0.79	0.62
10/7/2020	0.66	0.91	0.84
11/3/2020	0.43	1	0.8
12/2/2020	0.51	0.95	0.83
1/5/2021	0.31	0.83	0.68
2/1/2021	0.52	0.8	0.63
3/10/2021	0.36	0.6	0.25
4/6/2021	0.38	0.87	0.19
5/4/2021	0.36	0.87	0.27
6/1/2021	0.39	1.2	0.41

Monthly TOC Data

Date	Lytle Creek Influen	GAC System Inf TOC	GAC Systen
7/7/2021	0.55	1.4	0.67
8/2/2021	0.54	1.4	0.75
9/15/2021	1.2	1.8	1.1
10/5/2021	0.34	0.33	0.28
11/2/2021	0.41	0.46	0.32
12/6/2021	0.35	0.32	0
1/3/2022	0.56	0.45	0.25
2/1/2022	0.34	0.3	0.22
3/1/2022	0.36	0.28	0.21
4/5/2022	0.34	0.31	0.2
5/2/2022	0.29	0.27	0.23
6/1/2022	0.25	0.2	0.3
7/5/2022	0.29	0.77	0.54
8/1/2022	0.27	0.92	0.37
9/7/2022	0.2	1.1	0.38
10/4/2022	0.25	1.3	0.56
11/1/2022	0.22	1.3	0.47
12/5/2022	0.42	0.7	0.36

min	0	0	0
max	1.2	2	1.5
avg	0.41	0.94	0.62
median	0.36	0.905	0.61
95th per	0.71	1.9	1.2

Pretreatment TOC

Date	Pretreatment Inf TOC	Pretreatment Eff TOC
1/11/2018	2.7	2.1
1/16/2018	2.9	2.3
1/23/2018	0.67	0.45
4/3/2018	3	1.1
4/10/2018	3.1	2.6
5/4/2018	3.4	2.2
5/9/2018	3.2	2.3
5/15/2018	3.2	2.5
5/22/2018	3.1	2.4
6/5/2018	3.1	2.4
6/12/2018	3.1	2.5
6/19/2018	3.2	2.7
6/26/2018	3	2.6
7/2/2018	3	2.7
7/10/2018	3.1	2.6
7/18/2018	3	2.5
7/23/2018	3.6	4.7
7/31/2018	3	2.7
8/7/2018	2.9	2.7
8/14/2018	2.9	2.6
8/21/2018	2.9	2.6
8/28/2018	2.8	2.6
9/4/2018	2.7	2.4
9/11/2018	2.5	2.3
9/18/2018	2.4	2.1
9/25/2018	2.3	2
10/2/2018	2.3	2
10/9/2018	2.2	2.1
10/16/2018	15	2.1
10/23/2018	2.2	1.9
10/30/2018	2.2	1.9
11/6/2018	2.2	1.9
11/13/2018	2.2	1.9
11/20/2018	2.2	1.9
11/27/2018	2.3	1.8
12/3/2018	2.3	1.9
12/11/2018	1.1	1.9
12/18/2018	2.2	1.8
12/26/2018	2.3	2.2
1/2/2019	2.3	1.9
1/8/2019	2.4	2.3
1/15/2019	2.6	2
1/22/2019	2.6	2.1
1/29/2019	2.5	2
2/7/2019	3.4	2.2
2/14/2019	3.3	2.3
3/19/2019	3.9	4.4
4/26/2019	3	1.9
5/1/2019	2.9	1.9
5/7/2019	3	2
5/14/2019	3.4	3.2
5/21/2019	3.1	2
5/28/2019	3.1	2.4
6/4/2019	3	2.8
6/11/2019	3.5	3.5
6/18/2019	2.9	2
6/25/2019	3.2	2.2
7/2/2019	2.8	1.9

Pretreatment TOC

Date	Pretreatment Inf TOC	Pretreatment Eff TOC
7/9/2019	2.8	1.9
7/16/2019	2.8	1.9
7/23/2019	3	1.8
7/30/2019	2.7	2.3
8/6/2019	2.7	2.1
8/13/2019	2.7	2.3
8/20/2019	2.6	2
8/27/2019	2.7	2.1
9/3/2019	2.5	1.6
9/10/2019	2.5	0.9
9/17/2019	2.4	1.8
9/24/2019	2.3	1.4
10/1/2019	2.3	1.9
10/8/2019	1.6	2.3
10/16/2019	2.3	1.8
10/22/2019	2.3	1.5
10/29/2019	2.4	2
11/5/2019	2.6	1.9
11/12/2019	2.6	2
11/18/2019	2.7	1.9
11/25/2019	2.7	2.7
12/3/2019	2.7	2.2
12/10/2019	2.7	2.2
2/18/2020	3.2	1.4
2/24/2020	3.2	2.7
3/2/2020	3.3	2.4
3/10/2020	3.3	2.8
3/16/2020	3.2	2.6
3/24/2020	3.2	2.7
3/30/2020	2.9	2.4
4/5/2020	2.9	0.97
4/13/2020	3	1.8
4/20/2020	2.9	1.8
4/28/2020	3	2.3
5/4/2020	2.9	2.4
5/12/2020	2.8	2.1
5/19/2020	2.9	2.2
5/26/2020	2.7	2.1
6/2/2020	2.7	2.2
6/10/2020	2.5	2.1
6/16/2020	2.5	2.1
6/23/2020	2.6	1.9
6/30/2020	2.5	2
7/7/2020	2.4	1.9
7/13/2020	2.4	2
7/21/2020	2.4	1.9
7/29/2020	2.4	2
8/3/2020	2.4	2.1
8/10/2020	2.4	2.1
8/18/2020	2.5	2.2
8/25/2020	2.5	2.1
9/2/2020	2.6	2.1
9/8/2020	2.6	2.1
9/15/2020	2.6	2.3
9/22/2020	2.6	2.3
9/30/2020	2.5	2.1
10/7/2020	2.5	2.2
10/12/2020	2.6	1.9

Pretreatment TOC

Date	Pretreatment Inf TOC	Pretreatment Eff TOC
10/21/2020	2.5	1.3
10/29/2020	2.6	2.1
11/3/2020	2.5	2.1
11/9/2020	2.3	2.1
11/17/2020	2.5	1.6
11/23/2020	2.8	2
12/2/2020	2.5	2
12/8/2020	2.5	2
12/15/2020	2.5	1.9
12/21/2020	2.2	1.8
12/29/2020	2.3	1.9
1/5/2021	2.4	1.7
1/12/2021	2.5	2.1
1/20/2021	2.5	2.1
1/25/2021	2.5	1.8
2/1/2021	2.4	2
2/9/2021	2.6	2
2/16/2021	2.7	1.9
2/23/2021	2.5	1.8
3/2/2021	2.6	1.9
3/10/2021	2.1	1.9
3/16/2021	2.3	1.6
3/23/2021	2	1.7
3/29/2021	2.1	1.3
4/6/2021	2.2	1.5
4/14/2021	2	1.6
4/19/2021	1.9	1.5
4/26/2021	2.3	1.5
5/4/2021	2.1	1.5
5/11/2021	2.3	1.6
5/17/2021	1.9	1.4
5/24/2021	2.4	1.8
6/1/2021	2.2	1.7
6/7/2021	2.3	2
6/14/2021	2.3	1.9
6/21/2021	2.3	1.9
6/28/2021	2.5	2
7/7/2021	2.1	1.8
7/13/2021	1.9	1.8
7/20/2021	1.8	1.8
7/27/2021	2	1.7
8/2/2021	1.8	1.8
8/10/2021	1.7	1.4
8/18/2021	1.8	1.6
8/24/2021	2.3	1.9
8/31/2021	2.2	1.8
9/7/2021	2.3	1.9
9/13/2021	2.2	1.7
9/20/2021	1.8	1.7
9/28/2021	1.7	1.4
10/5/2021	1.7	1.5
10/19/2021	1.8	1.5
10/25/2021	1.9	1.4
11/2/2021	1.9	1.6
12/14/2021	1.1	0.68
12/24/2021	1.4	0.96
12/27/2021	1.2	0.63
1/3/2022	1.5	0.57

Pretreatment TOC

Date	Pretreatment Inf TOC	Pretreatment Eff TOC
1/10/2022	0.5	0.51
1/18/2022	0.48	0.4
1/24/2022	0.48	0.36
2/1/2022	0.31	0.29
2/8/2022	0.28	0.28
2/15/2022	0.97	0.31
2/23/2022	0.37	0.39
3/1/2022	0.39	0.23
3/7/2022	0.26	0.28
3/15/2022	0.26	0.21
6/17/2022	1.5	1.1
6/21/2022	1.7	1.3
6/28/2022	1.7	1
7/5/2022	1.6	0.98
7/12/2022	1.7	1.1
7/18/2022	1.7	3.3
7/25/2022	1.8	1.2
8/1/2022	1.6	1.1
8/9/2022	1.7	1.4
8/15/2022	1.7	1.3
8/23/2022	1.7	1.2
8/30/2022	1.8	1.3
9/7/2022	2.1	1.5
9/13/2022	1.9	1.6
9/20/2022	2.3	1.5
9/26/2022	2.3	1.6
10/4/2022	2.5	1.7
10/11/2022	2.5	1.8
10/18/2022	2.5	1.8
10/26/2022	2.4	1.7
11/1/2022	2.2	1.6
11/7/2022	2.3	1.3
11/14/2022	2.4	1.5
11/21/2022	2.4	1.7
11/28/2022	2.5	1.6
12/5/2022	2.1	1.9
12/12/2022	2.4	1.8
12/21/2022	2.1	1.7
min	0.26	0.21
max	15	4.7
avg	2.42	1.86
median	2.45	1.9
95th per	3.2	2.7

Date	CFE TOC	MA	QA	RAA
1/4/2018	0.35	0.744	0.504667	
1/9/2018	1.9			
1/16/2018	0.82			
1/23/2018	0.33			
1/30/2018	0.32			
2/6/2018	0.36	0.3625		
2/13/2018	0.43			
2/20/2018	0.32			
2/27/2018	0.34			
3/7/2018	0.52	0.4075		
3/13/2018	0.41			
3/20/2018	0.38			
3/27/2018	0.32			
4/3/2018	0.96	0.62	0.827833	
4/10/2018	0.68			
4/17/2018	0.48			
4/24/2018	0.36			
5/1/2018	0.38	0.676		
5/9/2018	0.81			
5/15/2018	0.91			
5/22/2018	0.89			
5/29/2018	0.39			
6/5/2018	0.89	1.1875		
6/12/2018	0.86			
6/19/2018	1.1			
6/26/2018	1.9			
7/2/2018	1.7	1.7	1.725	
7/10/2018	1.9			
7/17/2018	1			
7/23/2018	1.9			
7/31/2018	2			
8/7/2018	1.9	1.95		
8/14/2018	2			
8/21/2018	2			
8/28/2018	1.9			
9/4/2018	1.7	1.525		
9/11/2018	1.3			
9/18/2018	1.6			
9/25/2018	1.5			
10/2/2018	1.6	1.78	1.355833	1.103333
10/9/2018	1.8			
10/16/2018	1.5			
10/23/2018	1.6			
10/30/2018	2.4			
11/6/2018	1.3	1.2		
11/13/2018	1			
11/20/2018	1.4			
11/27/2018	1.1			
12/3/2018	1.4	1.0875		
12/11/2018	1.4			
12/18/2018	0.85			
12/26/2018	0.7			
1/2/2019	0.87	1.046	0.873444	1.195528
1/8/2019	0.66			
1/15/2019	1.6			
1/22/2019	1.2			
1/29/2019	0.9			
2/7/2019	1.1	0.856		
2/7/2019	1.2			
2/12/2019	0.61			
2/19/2019	0.7			
2/26/2019	0.67			
3/5/2019	0.51	0.718333		
3/5/2019	0.56			
3/12/2019	0.58			
3/19/2019	1			
3/19/2019	1.1			

Date	CFE TOC	MA	QA	RAA
3/26/2019	0.56			
4/2/2019	0.54	0.524	0.768222	1.180625
4/2/2019	0.46			
4/9/2019	0.5			
4/16/2019	0.49			
4/22/2019	0.63			
5/1/2019	0.67	0.726667		
5/1/2019	0.64			
5/7/2019	0.69			
5/14/2019	0.71			
5/21/2019	0.68			
5/28/2019	0.97			
6/4/2019	0.93	1.054		
6/4/2019	0.83			
6/11/2019	1.8			
6/18/2019	0.94			
6/25/2019	0.77			
7/2/2019	0.98	1.085	1.301	1.074625
7/2/2019	0.98			
7/9/2019	0.74			
7/16/2019	0.84			
7/23/2019	0.87			
7/30/2019	2.1			
8/6/2019	2	1.9		
8/6/2019	2			
8/13/2019	1.9			
8/20/2019	1.6			
8/27/2019	2			
9/3/2019	1.2	0.918		
9/3/2019	1.1			
9/10/2019	0.76			
9/17/2019	0.82			
9/24/2019	0.71			
10/1/2019	1.4	1.085	1.059444	1.000528
10/1/2019	1.4			
10/8/2019	0.75			
10/16/2019	0.73			
10/22/2019	0.53			
10/29/2019	1.7			
11/5/2019	1.4	1.06		
11/5/2019	1.4			
11/12/2019	0.87			
11/18/2019	0.91			
11/25/2019	0.72			
12/3/2019	1.7	1.033333		
12/3/2019	1.6			
12/10/2019	1.4			
12/17/2019	0.53			
12/23/2019	0.39			
12/31/2019	0.58			
1/7/2020	0.47	0.402	0.789556	0.979556
1/7/2020	0.43			
1/13/2020	0.39			
1/22/2020	0.37			
1/28/2020	0.35			
2/4/2020	0.38	0.49		
2/4/2020	0.34			
2/11/2020	0.31			
2/18/2020	0.43			
2/18/2020	0.38			
2/24/2020	1.1			
3/2/2020	1.1	1.476667		
3/2/2020	1.1			
3/10/2020	0.96			
3/16/2020	2			
3/24/2020	1.7			
3/30/2020	2			

Date	CFE TOC	MA	QA	RAA
4/3/2020	1.9	1.054	0.996111	1.036528
4/5/2020	0.8			
4/13/2020	0.8			
4/20/2020	0.77			
4/28/2020	1			
5/4/2020	1.1	0.996		
5/4/2020	1			
5/12/2020	0.89			
5/19/2020	1.1			
5/26/2020	0.89			
6/2/2020	0.88	0.938333		
6/2/2020	1.2			
6/10/2020	0.87			
6/16/2020	0.91			
6/23/2020	0.93			
6/30/2020	0.84			
7/7/2020	0.78	0.812	0.885333	0.932611
7/7/2020	0.72			
7/13/2020	0.75			
7/21/2020	0.96			
7/29/2020	0.85			
8/3/2020	0.91	0.964		
8/3/2020	1			
8/10/2020	0.95			
8/18/2020	1			
8/25/2020	0.96			
9/2/2020	0.83	0.88		
9/2/2020	0.83			
9/8/2020	0.77			
9/15/2020	0.98			
9/22/2020	0.87			
9/30/2020	1			
10/7/2020	0.86	1.18	1.114444	0.946361
10/7/2020	1.6			
10/12/2020	0.94			
10/21/2020	1			
10/29/2020	1.5			
11/3/2020	0.92	0.99		
11/3/2020	1.1			
11/9/2020	1.3			
11/17/2020	0.72			
11/23/2020	0.91			
12/2/2020	0.99	1.173333		
12/2/2020	1			
12/8/2020	1.4			
12/15/2020	0.88			
12/21/2020	0.87			
12/29/2020	1.9			
1/5/2021	0.85	0.946	0.860444	0.964083
1/5/2021	0.87			
1/12/2021	0.79			
1/20/2021	1.5			
1/25/2021	0.72			
2/1/2021	0.76	0.712		
2/1/2021	0.72			
2/9/2021	0.65			
2/16/2021	0.64			
2/23/2021	0.79			
3/2/2021	1.9	0.923333		
3/10/2021	0.77			
3/10/2021	0.85			
3/16/2021	0.64			
3/23/2021	0.68			
3/29/2021	0.7			
4/6/2021	0.88	0.856	0.999111	0.964833
4/6/2021	0.85			
4/14/2021	0.86			

Date	CFE TOC	MA	QA	RAA
4/19/2021	0.84			
4/26/2021	0.85			
5/4/2021	0.91	0.958		
5/4/2021	0.9			
5/11/2021	0.94			
5/17/2021	0.94			
5/24/2021	1.1			
6/1/2021	1.1	1.183333		
6/1/2021	1.1			
6/7/2021	1.1			
6/14/2021	1.2			
6/21/2021	1.2			
6/28/2021	1.4			
7/7/2021	1.4	1.28	1.343333	1.079333
7/7/2021	1.3			
7/13/2021	1.4			
7/20/2021	1.1			
7/27/2021	1.2			
8/2/2021	1.2	1.266667		
8/2/2021	1.1			
8/10/2021	1.1			
8/18/2021	1.5			
8/24/2021	0.9			
8/31/2021	1.8			
9/7/2021	1.8	1.483333		
9/8/2021	1.9			
9/13/2021	1.5			
9/15/2021	1.3			
9/20/2021	1.2			
9/28/2021	1.2			
10/5/2021	1.1	0.694	0.474444	0.919333
10/5/2021	0.97			
10/12/2021	0.29			
10/19/2021	0.49			
10/25/2021	0.62			
11/2/2021	0.48	0.353333		
11/2/2021	0.42			
11/9/2021	0.27			
11/15/2021	0.3			
11/23/2021	0.28			
11/30/2021	0.37			
12/6/2021	0.44	0.376		
12/6/2021	0.46			
12/14/2021	0.21			
12/21/2021	0.28			
12/27/2021	0.49			
1/3/2022	0.47	0.466	0.354556	0.792861
1/3/2022	0.61			
1/10/2022	0.46			
1/18/2022	0.55			
1/24/2022	0.24			
2/1/2022	0.28	0.326		
2/1/2022	0.26			
2/8/2022	0.31			
2/15/2022	0.45			
2/23/2022	0.33			
3/1/2022	0.34	0.271667		
3/1/2022	0.24			
3/7/2022	0.27			
3/15/2022	0.23			
3/21/2022	0.23			
3/28/2022	0.32			
4/5/2022	0.35	0.272	0.339619	0.627988
4/5/2022	0.27			
4/12/2022	0.26			
4/19/2022	0.24			
4/26/2022	0.24			

Date	CFE TOC	MA	QA	RAA
5/2/2022	0.25	0.234		
5/2/2022	0.24			
5/10/2022	0.2			
5/17/2022	0.21			
5/23/2022	0.27			
6/1/2022	0.26	0.512857		
6/1/2022	0.23			
6/7/2022	0.39			
6/14/2022	0.3			
6/17/2022	0.63			
6/21/2022	0.78			
6/28/2022	1			
7/5/2022	0.75	0.846	1.039778	0.552099
7/5/2022	0.76			
7/12/2022	0.76			
7/18/2022	0.97			
7/25/2022	0.99			
8/1/2022	1	1.033333		
8/1/2022	0.91			
8/9/2022	1			
8/15/2022	1.1			
8/23/2022	0.99			
8/30/2022	1.2			
9/7/2022	1.1	1.24		
9/7/2022	1.1			
9/13/2022	1.4			
9/20/2022	1.3			
9/26/2022	1.3			
10/4/2022	1.4	1.32	1.011778	0.686433
10/4/2022	1.5			
10/11/2022	1.3			
10/18/2022	1.3			
10/26/2022	1.1			
11/1/2022	1.3	1.133333		
11/1/2022	1.2			
11/7/2022	1			
11/14/2022	1.2			
11/21/2022	1.1			
11/28/2022	1			
12/5/2022	0.68	0.582		
12/5/2022	0.75			
12/12/2022	0.86			
12/21/2022	0.28			
12/26/2022	0.34			

min	0.2	0.2	0.3	0.6
max	2.4	2.0	1.7	1.2
avg	0.93	0.9	0.9	0.9
median	0.88	1.0	0.9	1.0
95th per	1.9	1.7	1.4	1.2
	2.0			

Plant Effluent TOC

Date	Plant Efflue	MA	QA	RAA
1/4/2018	0.33	0.476	0.557833	
1/9/2018	0.56			
1/16/2018	0.82			
1/23/2018	0.34			
1/30/2018	0.33			
2/6/2018	0.33	0.47		
2/13/2018	0.3			
2/20/2018	0.94			
2/27/2018	0.31			
3/7/2018	1.8	0.7275		
3/13/2018	0.48			
3/20/2018	0.33			
3/27/2018	0.3			
4/3/2018	1.2	0.735	0.801333	
4/10/2018	0.64			
4/17/2018	1.1			
4/24/2018	0			
5/1/2018	0.39	0.414		
5/9/2018	0.44			
5/15/2018	0.7			
5/22/2018	0.54			
5/29/2018	0			
6/5/2018	0.62	1.255		
6/12/2018	0.9			
6/19/2018	1.1			
6/26/2018	2.4			
7/2/2018	1.3	1.224	1.424667	
7/10/2018	1.4			
7/17/2018	0.62			
7/23/2018	1.4			
7/31/2018	1.4			
8/7/2018	1.4	1.5		
8/14/2018	1.5			
8/21/2018	1.5			
8/28/2018	1.6			
9/4/2018	1.5	1.55		
9/11/2018	1.4			
9/18/2018	2			
9/25/2018	1.3			
10/2/2018	1.3	1.56	1.231667	1.003875
10/9/2018	1.7			
10/16/2018	1.1			
10/23/2018	1.2			
10/30/2018	2.5			
11/6/2018	1.1	1.1		
11/13/2018	1.1			
11/20/2018	1.1			
11/27/2018	1.1			
12/3/2018	1.2	1.035		
12/11/2018	1.5			
12/18/2018	0.68			
12/26/2018	0.76			
1/2/2019	0.76	0.926	0.777	1.058667
1/8/2019	0.72			
1/15/2019	1.1			
1/22/2019	1.1			
1/29/2019	0.95			
2/7/2019	1.1	0.7375		
2/12/2019	0.54			
2/19/2019	0.64			
2/26/2019	0.67			
3/5/2019	0.5	0.6675		
3/12/2019	0.58			
3/19/2019	1.1			
3/26/2019	0.49			
4/2/2019	0.46	0.5375	0.737333	1.042667
4/9/2019	0.55			

Plant Effluent TOC

Date	Plant Effluc	MA	QA	RAA
4/16/2019	0.57			
4/22/2019	0.57			
5/1/2019	0.61	0.672		
5/7/2019	0.66			
5/14/2019	0.63			
5/21/2019	0.68			
5/28/2019	0.78			
6/4/2019	0.78	1.0025		
6/11/2019	1.7			
6/18/2019	0.78			
6/25/2019	0.75			
7/2/2019	0.85	0.968	1.1385	0.971125
7/9/2019	0.72			
7/16/2019	0.73			
7/23/2019	0.84			
7/30/2019	1.7			
8/6/2019	1.8	1.675		
8/13/2019	1.8			
8/20/2019	1.3			
8/27/2019	1.8			
9/3/2019	1	0.7725		
9/10/2019	0.74			
9/17/2019	0.69			
9/24/2019	0.66			
10/1/2019	1.1	0.832	0.866	0.879708
10/8/2019	0.51			
10/16/2019	0.65			
10/22/2019	0.5			
10/29/2019	1.4			
11/5/2019	1.4	1		
11/12/2019	0.79			
11/18/2019	1.1			
11/25/2019	0.71			
12/3/2019	1.4	0.766		
12/10/2019	1.1			
12/17/2019	0.44			
12/23/2019	0.36			
12/31/2019	0.53			
1/7/2020	0.43	0.3925	0.708167	0.8625
1/13/2020	0.42			
1/22/2020	0.34			
1/28/2020	0.38			
2/4/2020	0.3	0.42		
2/11/2020	0			
2/18/2020	0.47			
2/24/2020	0.91			
3/2/2020	0.97	1.312		
3/10/2020	0.89			
3/16/2020	1.6			
3/24/2020	1.4			
3/30/2020	1.7			
4/5/2020	0.78	0.8375	0.868667	0.895333
4/13/2020	0.76			
4/20/2020	0.81			
4/28/2020	1			
5/4/2020	0.95	0.9025		
5/12/2020	0.84			
5/19/2020	0.95			
5/26/2020	0.87			
6/2/2020	0.87	0.866		
6/10/2020	0.81			
6/16/2020	0.95			
6/23/2020	0.89			
6/30/2020	0.81			
7/7/2020	0.79	0.77	0.942833	0.846417
7/13/2020	0.7			
7/21/2020	0.91			

Plant Effluent TOC

Date	Plant Efflue	MA	QA	RAA
7/29/2020	0.68			
8/3/2020	0.88	1.0325		
8/10/2020	0.85			
8/18/2020	1.4			
8/25/2020	1			
9/2/2020	0.8	1.026		
9/8/2020	0.79			
9/15/2020	1.8			
9/22/2020	0.96			
9/30/2020	0.78			
10/7/2020	0.76	1.0325	1.132333	0.913
10/12/2020	0.87			
10/21/2020	0.9			
10/29/2020	1.6			
11/3/2020	1.1	1.3325		
11/9/2020	1			
11/17/2020	2.5			
11/23/2020	0.73			
12/2/2020	0.86	1.032		
12/8/2020	1.2			
12/15/2020	0.75			
12/21/2020	0.75			
12/29/2020	1.6			
1/5/2021	0.71	0.8775	0.776	0.929958
1/12/2021	0.72			
1/20/2021	1.4			
1/25/2021	0.68			
2/1/2021	0.64	0.6225		
2/9/2021	0.59			
2/16/2021	0.57			
2/23/2021	0.69			
3/2/2021	1.6	0.828		
3/10/2021	0.73			
3/16/2021	0.59			
3/23/2021	0.66			
3/29/2021	0.56			
4/6/2021	0.63	0.6525	0.694333	0.886375
4/14/2021	0.7			
4/19/2021	0.65			
4/26/2021	0.63			
5/4/2021	0.43	0.5925		
5/11/2021	0.54			
5/17/2021	0.55			
5/24/2021	0.85			
6/1/2021	0.66	0.838		
6/7/2021	0.8			
6/14/2021	0.8			
6/21/2021	0.83			
6/28/2021	1.1			
7/7/2021	0.99	1.02	1.082	0.921167
7/13/2021	0.99			
7/20/2021	1			
7/27/2021	1.1			
8/2/2021	1.1	1.116		
8/10/2021	1			
8/18/2021	1.2			
8/24/2021	0.78			
8/31/2021	1.5			
9/7/2021	1.8	1.11		
9/13/2021	1			
9/15/2021	0.88			
9/20/2021	0.95			
9/28/2021	0.92			
10/5/2021	0.75	0.44	0.396667	0.73725
10/12/2021	0.28			
10/19/2021	0.4			
10/25/2021	0.33			

Plant Effluent TOC

Date	Plant Efflue	MA	QA	RAA
11/2/2021	0.33	0.33		
11/9/2021	0.3			
11/15/2021	0.24			
11/23/2021	0.24			
11/30/2021	0.54			
12/6/2021	0.54	0.42		
12/14/2021	0.23			
12/21/2021	0.45			
12/27/2021	0.46			
1/3/2022	0.47	0.33	0.323167	0.624042
1/10/2022	0.3			
1/18/2022	0.31			
1/24/2022	0.24			
2/1/2022	0.53	0.3675		
2/8/2022	0.25			
2/15/2022	0.29			
2/23/2022	0.4			
3/1/2022	0.27	0.272		
3/7/2022	0.22			
3/15/2022	0.32			
3/21/2022	0.25			
3/28/2022	0.3			
4/5/2022	0.27	0.2825	0.3655	0.541833
4/12/2022	0.24			
4/19/2022	0.2			
4/26/2022	0.42			
5/2/2022	0.2	0.29		
5/10/2022	0.24			
5/17/2022	0.45			
5/23/2022	0.27			
6/1/2022	0.29	0.524		
6/7/2022	0.81			
6/14/2022	0.3			
6/21/2022	0.56			
6/28/2022	0.66			
7/5/2022	0.58	0.7325	0.7175	0.450708
7/12/2022	0.59			
7/18/2022	1.1			
7/25/2022	0.66			
8/1/2022	0.56	0.61		
8/9/2022	0.62			
8/15/2022	0.63			
8/23/2022	0.64			
8/30/2022	0.6			
9/7/2022	0.7	0.81		
9/13/2022	0.74			
9/20/2022	1			
9/26/2022	0.8			
10/4/2022	0.68	0.71	0.599333	0.501375
10/11/2022	0.63			
10/18/2022	0.72			
10/26/2022	0.81			
11/1/2022	0.85	0.718		
11/7/2022	0.54			
11/14/2022	0.56			
11/21/2022	0.97			
11/28/2022	0.67			
12/5/2022	0.5	0.37		
12/12/2022	0.49			
12/21/2022	0.25			
12/26/2022	0.24			

min	0.00	0.27	0.32	0.45
max	2.50	1.68	1.42	1.06
avg	0.81	0.81	0.81	0.83
median	0.74	0.77	0.78	0.89
95th per	1.70	1.50	1.24	1.05

Plant Effluent TOC

Date	Plant Efflue	MA	QA	RAA
		1.9997		
	98.9%<2 mg/L			

Distribution System TTHM

	Year:	2018				2019				2020				2021				2022			
	Quarter:	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
PS Code	Sample Date (month/date):	1/3	4/9, 4/10	7/2, 7/3	10/1, 10/2	1/10	4/11	7/11	10/10	1/10	4/9	7/9	10/13	1/14	4/8	7/8	10/14	1/13	4/14	7/14	10/13
Column1	Column3	Column16	Column17	Column18	Column19	Column20	Column21	Column22	Column23	Column2	Column4	Column5	Column6	Column24	Column7	Column8	Column9	26	Column10	Column11	Column12
3610004-602	Site 1: 3750 Lytle Creek Rd	30.4	14.8	51.7	70.1	69.3	50.0	48.0	65.3	28.9	56.0	30.2	42.7	31.4	37.1	73.5	34.7	11.4	11.4	24.9	54.9
3610004-606	Site 2: 18433 Bohnert	11.2	26.1	65.6	68.2	38.2	18.6	27.6	41.0	11.0	26.2	27.9	25.0	0.0	29.6	45.5	9.0	10.4	7.2	22.5	10.8
3610004-601	Site 3: 213 E. Walnut	1.5	28.3	0.0	1.6	0.0	3.7	1.0	0.0	0.0	20.0	0.0	0.0	2.9	8.7	0.0	0.0	2.2	0.0	0.0	0.0
3610004-608	Site 4: Hall and Kinningham	0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	0.0	0.0	11.4	0.0	3.0	0.0	0.0	0.0	0.0	0.0
3610004-607	Site 5: Via Montana and Via Bonita	4.7	5.8	0.0	4.1	5.6	3.8	0.0	1.1	11.3	12.9	0.0	1.0	17.8	10.4	32.5	4.6	0.0	3.5	4.7	8.6
3610004-605	Site 6: Reservoir 6-3 Discharge Line	9.7	18.5	62.5	60.1	27.6	25.6	19.9	37.3	12.6	30.6	14.1	25.8	0.0	34.3	7.8	6.7	12.5	8.2	11.8	18.8
3610004-603	Site 7: 15182 Crane	0.0	0.0	51.0	69.3	35.1	18.1	26.4	27.7	0.0	0.0	0.0	0.0	16.1	0.0	2.7	0.0	0.0	0.0	29.5	16.1
3610004-604	Site 8: White Ash Rd	14.8	18.3	51.1	74.6	33.7	20.1	14.2	41.7	9.7	58.1	16.8	26.7	9.7	24.1	35.3	5.9	10.3	6.8	22.2	20.7
	QA	9.0	14.5	35.2	43.5	26.2	17.5	17.1	26.8	9.2	26.0	11.1	15.2	11.2	18.0	25.0	7.6	5.9	4.6	14.5	16.2
Number of Samples Taken		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	9

	min	max	average	median
	11.4	73.5	41.835	39.9
	0.0	68.2	26.08	25.55
	0.0	28.3	3.495	0
	0.0	11.4	1.115	0
	0.0	32.5	6.62	4.65
	0.0	62.5	22.22	18.65
	0.0	69.3	14.6	1.35
	5.9	74.6	25.74	20.4
ND		74.6	17.7	11.1
OVERALL				

	Site 1: 3750 Lytle Creek Rd	30.4	22.6	32.3	41.8	51.5	60.3	59.4	58.2	48.1	49.6	45.1	39.5	40.1	35.4	46.2	44.2	39.2	32.8	20.6	25.7
	Site 2: 18433 Bohnert	11.2	18.7	34.3	42.8	49.5	47.7	38.2	31.4	24.6	26.5	26.5	22.5	19.8	20.6	25.0	21.0	23.6	18.0	12.3	12.7
	Site 3: 213 E. Walnut	1.5	14.9	9.9	7.9	7.5	1.3	1.6	1.2	1.2	5.3	5.0	5.0	5.7	2.9	2.9	2.9	2.7	0.6	0.6	0.6
	Site 4: Hall and Kinningham	0.0	2.1	1.4	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	3.8	2.9	3.6	3.6	0.8	0.8	0.0	0.0
	Site 5: Via Montana and Via Bonita	4.7	5.3	3.5	3.7	3.9	3.4	3.4	2.6	4.1	6.3	6.3	6.3	7.9	7.3	15.4	16.3	11.9	10.2	3.2	4.2
	Site 6: Reservoir 6-3 Discharge Line	9.7	14.1	30.2	37.7	42.2	44.0	33.3	27.6	23.9	25.1	23.7	20.8	17.6	18.6	17.0	12.2	15.3	8.8	9.8	12.8
	Site 7: 15182 Crane	0.0	0.0	17.0	30.1	38.9	43.4	37.2	26.8	18.1	13.5	6.9	0.0	4.0	4.0	4.7	4.7	0.7	0.7	7.4	11.4
	Site 8: White Ash Rd	14.8	16.6	28.1	39.7	44.4	44.9	35.7	27.4	21.4	30.9	31.6	27.8	27.8	19.3	24.0	18.8	18.9	14.6	11.3	15.0

	min	max	average	median
	11.2	49.5	26.3	24.1
	0.6	14.9	4.1	2.9
	0.0	3.8	1.2	1.0
	2.6	16.3	6.5	5.0
	8.8	44.0	22.2	19.7
	0.0	43.4	13.5	7.2
	11.3	44.9	25.7	25.7
ND		60.3	17.6	14.4
OVERALL				

LRAA Location	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022
Site 1: 3750 Lytle Creek Rd	30.4	22.6	32.3	41.8	51.5	60.3	59.4	58.2	48.1	49.6	45.1	39.5	40.1	35.4	46.2	44.2	39.2	32.8	20.6	25.7
Site 2: 18433 Bohnert	11.2	18.7	34.3	42.8	49.5	47.7	38.2	31.4	24.6	26.5	26.5	22.5	19.8	20.6	25	21	23.6	18	12.3	12.7
Site 3: 213 E. Walnut	1.5	14.9	9.9	7.9	7.5	1.3	1.6	1.2	1.2	5.3	5	5	5.7	2.9	2.9	2.9	2.7	0.6	0.6	0.6
Site 4: Hall and Kinningham	0	2.1	1.4	1	1	0	0	0	0	1	1	1	3.8	2.9	3.6	3.6	0.8	0.8	0	0
Site 5: Via Montana and Via Bonita	4.7	5.3	3.5	3.7	3.9	3.4	3.4	2.6	4.1	6.3	6.3	6.3	7.9	7.3	15.4	16.3	11.9	10.2	3.2	4.2
Site 6: Reservoir 6-3 Discharge Line	9.7	14.1	30.2	37.7	42.2	44	33.3	27.6	23.9	25.1	23.7	20.8	17.6	18.6	17	12.2	15.3	8.8	9.8	12.8
Site 7: 15182 Crane	0	0	17	30.1	38.9	43.4	37.2	26.8	18.1	13.5	6.9	0	4	4	4.7	4.7	0.7	0.7	7.4	11.4
Site 8: White Ash Rd	14.8	16.6	28.1	39.7	44.4	44.9	35.7	27.4	21.4	30.9	31.6	27.8	27.8	19.3	24	18.8	18.9	14.6	11.3	15

	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022
Quarterly Average TTHM	9.0375	14.4875	35.2375	43.5	26.1875	17.4875	17.1375	26.7625	9.1875	25.95	11.125	15.15	11.1625	18.025	25.0375	7.6125	5.85	4.6375	14.45	16.2375
Percent Lytle Creek at Roemer WTP (Daily)	100	76	32	8	57	100	67	78	100	65	77	64	68	62	27	100	100	100	39	30
Percent Lytle Creek in DS (Monthly)	26	34	12	5	29	41	22	19	52	56	28	30	37	28	12	14	38	38	12	12

Distribution System HAA5

	Year:	2018				2019				2020				2021				2022			
	Quarter:	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
PS Code	Sample Date (month/date):	1/3	4/9, 4/10	7/2, 7/3	10/1, 10/2	1/10	4/11	7/11	10/10	1/9	4/9	7/9	10/13	1/14	4/8	7/8	10/14	1/13	4/14	7/14	10/13
Column1	Column3	Column20	Column21	Column22	Column23	Column202	Column213	Column224	Column235	Column2022	Column2	Column4	Column5	Column20222	Column24	Column45	Column56	Column20222	Column243	Column454	Column565
3610004-602	Site 1: 3750 Lytle Creek Rd	10.6	6.5	17.8	11.0	17.2	18.6	18.5	8.5	14.3	23.9	8.3	10.7	11.1	12.5	17.1	11.2	5.1	5.5	5.6	13.4
3610004-606	Site 2: 18433 Bohnert	4.6	5.2	17.7	16.3	7.2	5.0	7.2	7.9	6.7	7.9	8.3	8.0	6.6	7.2	11.5	2.4	4.1	3.0	3.5	1.1
3610004-601	Site 3: 213 E. Walnut	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.7	0.0	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0	0.0
3610004-608	Site 4: Hall and Kinningham	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
3610004-607	Site 5: Via Montana and Via Bonita	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	4.6	3.4	0.0	0.0	2.4	3.7	9.5	1.2	0.0	1.1	1.0	1.0
3610004-605	Site 6: Reservoir 6-3 Discharge Line	4.4	3.2	19.0	12.8	4.7	7.0	5.3	7.7	11.6	10.7	5.4	7.5	8.4	10.0	1.2	0.0	4.3	3.6	1.8	3.3
3610004-603	Site 7: 15182 Crane	0.0	0.0	14.9	15.0	5.8	5.0	8.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	3.2
3610004-604	Site 8: White Ash Rd	4.1	4.7	17.2	10.8	5.7	4.8	5.1	6.6	6.7	25.7	5.8	7.7	6.3	6.4	9.0	0.0	4.0	3.3	3.9	4.0
	QA	3.0	3.2	10.8	8.2	5.2	5.1	5.5	4.6	5.5	9.8	3.5	4.2	4.4	5.4	6.0	1.9	2.2	2.1	2.7	3.3
Number of Samples Taken		8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8

	min	max	average	median
	5.1	23.9	12.37	11.15
	1.1	17.7	7.07	6.95
	0.0	5.9	0.71	0
	0.0	1.4	0.12	0
	0.0	9.5	1.445	0.5
	0.0	19	6.595	5.35
	0.0	15	3.185	0
	0.0	25.7	7.09	5.75
	ND	25.7	4.8	3.7

OVERALL

	Site 1: 3750 Lytle Creek Rd	10.6	8.6	11.6	11.5	13.1	16.2	16.3	15.7	15.0	16.3	13.8	14.3	13.5	10.7	12.9	13.0	11.5	9.7	6.9	7.4
	Site 2: 18433 Bohnert	4.6	4.9	9.2	11.0	11.6	11.6	8.9	6.8	6.7	7.4	7.7	7.7	7.7	7.5	8.3	6.9	6.3	5.3	3.3	2.9
	Site 3: 213 E. Walnut	0.0	3.0	2.0	1.5	1.5	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4	0.7	0.7	0.7	0.7	0.0	0.0	0.0
	Site 4: Hall and Kinningham	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.0	0.0	0.0
	Site 5: Via Montana and Via Bonita	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	1.2	2.0	2.0	2.0	1.5	1.5	3.9	4.2	3.6	3.0	0.8	0.8
	Site 6: Reservoir 6-3 Discharge Line	4.4	3.8	8.9	9.9	9.9	10.9	7.5	6.2	7.9	8.8	8.9	8.8	8.0	7.8	6.8	4.9	3.9	2.3	2.4	3.3
	Site 7: 15182 Crane	0.0	0.0	5.0	7.5	8.9	10.2	8.5	6.2	4.7	3.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	2.3
	Site 8: White Ash Rd	4.1	4.4	8.7	9.2	9.6	9.6	6.6	5.6	5.8	11.0	11.2	11.5	11.4	6.6	7.4	5.4	4.9	4.1	2.8	3.8

LRAA Location	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022
Site 1: 3750 Lytle Creek Rd	10.6	8.6	11.6	11.5	13.1	16.2	16.3	15.7	15.0	16.3	13.8	14.3	13.5	10.7	12.9	13.0	11.5	9.7	6.9	7.4
Site 2: 18433 Bohnert	4.6	4.9	9.2	11.0	11.6	11.6	8.9	6.8	6.7	7.4	7.7	7.7	7.7	7.5	8.3	6.9	6.3	5.3	3.3	2.9
Site 3: 213 E. Walnut	0.0	3.0	2.0	1.5	1.5	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4	0.7	0.7	0.7	0.7	0.0	0.0	0.0
Site 4: Hall and Kinningham	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.0	0.0	0.0
Site 5: Via Montana and Via Bonita	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.3	1.2	2.0	2.0	2.0	1.5	1.5	3.9	4.2	3.6	3.0	0.8	0.8
Site 6: Reservoir 6-3 Discharge Line	4.4	3.8	8.9	9.9	9.9	10.9	7.5	6.2	7.9	8.8	8.9	8.8	8.0	7.8	6.8	4.9	3.9	2.3	2.4	3.3
Site 7: 15182 Crane	0.0	0.0	5.0	7.5	8.9	10.2	8.5	6.2	4.7	3.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	2.3
Site 8: White Ash Rd	4.1	4.4	8.7	9.2	9.6	9.6	6.6	5.6	5.8	11.0	11.2	11.5	11.4	6.6	7.4	5.4	4.9	4.1	2.8	3.8

min	max	average	median
6.9	16.3	12.4	13.0
2.9	11.6	7.3	7.5
0.0	3.0	0.8	0.7
0.0	0.4	0.1	0.0
0.0	4.2	1.4	1.0
2.3	10.9	6.8	7.7
0.0	10.2	3.0	1.5
2.8	11.5	7.2	6.6
ND	16.3	4.9	3.9

OVERALL

	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019	Q3 2019	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022
Quarterly Average HAA5	2.9625	3.1875	10.825	8.2375	5.2	5.05	5.5125	4.5625	5.4875	9.8375	3.475	4.2375	4.35	5.425	6.0375	1.85	2.1875	2.0625	2.725	3.25
Percent Lytle Creek at Roemer WTP (D	100	76	32	8	57	100	67	78	100	65	77	64	68	62	27	100	100	100	39	30
Percent Lytle Creek in DS (Monthly)	26	34	12	5	29	41	22	19	52	56	28	30	37	28	12	14	38	38	12	12

UCMR4 Results

PWSID	PWSName	FacilityName	SamplePointName	CollectionDate	Contaminant	MRL	AnalyticalR	AnalyticalR	Monitoring
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	1/10/2018	1-butanol	2	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	1-butanol	2	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	1-butanol	2	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	1-butanol	2	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	1/10/2018	2-methoxyethanol	0.4	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	2-methoxyethanol	0.4	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	2-methoxyethanol	0.4	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	2-methoxyethanol	0.4	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	1/10/2018	2-propen-1-ol	0.5	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	2-propen-1-ol	0.5	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	2-propen-1-ol	0.5	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	2-propen-1-ol	0.5	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	2/28/2018	alpha-hexachlorocyclohexane	0.01	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	alpha-hexachlorocyclohexane	0.01	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	alpha-hexachlorocyclohexane	0.01	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	alpha-hexachlorocyclohexane	0.01	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/4/2018	anatoxin-a	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/18/2018	anatoxin-a	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	5/3/2018	anatoxin-a	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	5/17/2018	anatoxin-a	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	6/7/2018	anatoxin-a	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	6/20/2018	anatoxin-a	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	anatoxin-a	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/16/2018	anatoxin-a	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	1/10/2018	butylated hydroxyanisole	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	butylated hydroxyanisole	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	butylated hydroxyanisole	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	butylated hydroxyanisole	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	2/28/2018	chlorpyrifos	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	chlorpyrifos	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	chlorpyrifos	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	chlorpyrifos	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/4/2018	cylindrospermopsin	0.09	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/18/2018	cylindrospermopsin	0.09	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	5/3/2018	cylindrospermopsin	0.09	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	5/17/2018	cylindrospermopsin	0.09	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	6/7/2018	cylindrospermopsin	0.09	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	6/20/2018	cylindrospermopsin	0.09	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	cylindrospermopsin	0.09	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/16/2018	cylindrospermopsin	0.09	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	2/28/2018	dimethipin	0.2	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	dimethipin	0.2	<		AM

UCMR4 Results

PWSID	PWSName	FacilityName	SamplePointName	CollectionDate	Contaminant	MRL	AnalyticalR	AnalyticalR	Monitoring
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	dimethipin	0.2	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	dimethipin	0.2	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	2/28/2018	ethoprop	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	ethoprop	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	ethoprop	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	ethoprop	0.03	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	1/10/2018	germanium	0.3	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	germanium	0.3	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	germanium	0.3	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	germanium	0.3	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	1/10/2018	manganese	0.4	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	manganese	0.4	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	manganese	0.4	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	manganese	0.4	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	1/10/2018	o-toluidine	0.007	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	o-toluidine	0.007	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	o-toluidine	0.007	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	o-toluidine	0.007	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	2/28/2018	oxyfluorfen	0.05	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	oxyfluorfen	0.05	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	oxyfluorfen	0.05	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	oxyfluorfen	0.05	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	2/28/2018	profenofos	0.3	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	profenofos	0.3	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	profenofos	0.3	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	profenofos	0.3	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	1/10/2018	quinoline	0.02	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	quinoline	0.02	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	quinoline	0.02	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	quinoline	0.02	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	2/28/2018	tebuconazole	0.2	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	tebuconazole	0.2	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	tebuconazole	0.2	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	tebuconazole	0.2	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/4/2018	total microcystin	0.3	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/18/2018	total microcystin	0.3	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	5/3/2018	total microcystin	0.3	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	5/17/2018	total microcystin	0.3	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	6/7/2018	total microcystin	0.3	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	6/20/2018	total microcystin	0.3	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	total microcystin	0.3	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/16/2018	total microcystin	0.3	<		AM

UCMR4 Results

PWSID	PWSName	FacilityName	SamplePointName	CollectionDate	Contaminant	MRL	AnalyticalR	AnalyticalR	Monitoring
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	2/28/2018	total permethrin	0.04	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	total permethrin	0.04	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	total permethrin	0.04	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	total permethrin	0.04	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	2/28/2018	tribufos	0.07	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	4/11/2018	tribufos	0.07	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	7/3/2018	tribufos	0.07	<		AM
CA3610004	West Valley Water District	Roemer WTP	EP #36 - 5-3 Reservoir	10/16/2018	tribufos	0.07	<		AM

Location	Date	UCMR4 HAA5	Date	St 2 HAA5
Site 1	1/8/2018	11.3	1/3/2018	10.6
Site 1	4/11/2018	9	4/10/2018	6.5
Site 1	7/16/2018	32.8	7/3/2018	17.8
Site 1	10/16/2018	12.9	10/2/2018	11.0
Site 2	1/8/2018	3.9	1/3/2018	4.6
Site 2	4/11/2018	7.23	4/10/2018	5.2
Site 2	7/16/2018	21.5	7/3/2018	17.7
Site 2	10/16/2018	12.6	10/2/2018	16.3
Site 6	1/8/2018	5.4	1/3/2018	4.4
Site 6	4/11/2018	6.64	4/10/2018	3.2
Site 6	7/16/2018	22.7	7/3/2018	19.0
Site 6	10/16/2018	8.3	10/2/2018	12.8
Site 8	1/8/2018	6.34	1/3/2018	4.1
Site 8	4/11/2018	7.47	4/10/2018	4.7
Site 8	7/16/2018	26.4	7/3/2018	17.2
Site 8	10/16/2018	9.2	10/2/2018	10.8

Location	Date	UCMR4 HAA6Br
Site 1	1/8/2018	11.2
Site 1	4/11/2018	6.45
Site 1	7/16/2018	27.3
Site 1	10/16/2018	16.6
Site 2	1/8/2018	2.8
Site 2	4/11/2018	10.33
Site 2	7/16/2018	27.9
Site 2	10/16/2018	27.2
Site 6	1/8/2018	2.83
Site 6	4/11/2018	10.44
Site 6	7/16/2018	27.6
Site 6	10/16/2018	16.8
Site 8	1/8/2018	5.36
Site 8	4/11/2018	7.31
Site 8	7/16/2018	29.9
Site 8	10/16/2018	19.6

Location	Date	UCMR4 HAA9
Site 1	1/8/2018	20.5
Site 1	4/11/2018	14.45
Site 1	7/16/2018	53
Site 1	10/16/2018	25.9
Site 2	1/8/2018	6.7
Site 2	4/11/2018	14.43
Site 2	7/16/2018	41.5
Site 2	10/16/2018	32
Site 6	1/8/2018	8.23
Site 6	4/11/2018	13.94
Site 6	7/16/2018	42.5
Site 6	10/16/2018	20.6
Site 8	1/8/2018	10.96
Site 8	4/11/2018	13.01
Site 8	7/16/2018	48.8
Site 8	10/16/2018	23.5