2021 Watershed Sanitary Survey Update
Salinas Reservoir

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October 2021

CITY OF SAN LUIS OBISPO

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Section 1
Summary of 2021 Watershed Sanitary Survey Update

1.1 Report Organization

This report contains five sections with information as detailed below:

Section 1 - Summary

Section 1 shows how the report is organized and contains the major conclusions and recommendations determined as a result of the preparation of this 2021 Watershed Sanitary Survey Update.

Section 2 - Background and 2016 Water Quality Summary

Section 2 provides a brief description and background of the Salinas Reservoir watershed. Furthermore, the section states the project purpose and describes the approach for completion of this 2021 Update.

Section 3 – Past Recommendations and Current Status

Section 3 lists the recommendations contained in the 2011 Update and provides the implementation status of each recommendation.

Section 4 - Comments in Relation to the 2016 Watershed Sanitary Survey Update

Section 4 contains the comments and conclusions from the 2016 Update that are still applicable and updated watershed changes.

Section 5 - Updated Water Quality Information

Section 5 provides the updated water quality data for the raw water from Salinas Reservoir as sampled by the City of San Luis Obispo and County of San Luis Obispo for the City's Water Treatment Plant. A narrative of each water quality table is provided.

1.2 Major Conclusions

1. There have been no significant changes in the watershed since the 2016 Sanitary Survey Update.

2. Overall, the Salinas Reservoir watershed is well managed and remains favorable from a water quality protection perspective.

3. Cattle and wild animals are the major potential contamination sources that may cause the entry of parasitic cysts (Giardia Lamblia/Cryptosporidium) into the water.

4. Blue-green algae is an increasing concern affecting water quality in the summer months.

5. Human recreational users in the Santa Margarita Lake Regional Park and Natural Area are also potential sources for pathogens as a result of private sewage disposal practices and the proximity of recreational users to surface waters (Salinas Reservoir does not permit body contact sports activities at the lake).

6. Potential contamination resulting from wastewater treatment plants, urban/industrial runoff, concentrated animal facilities, solid/hazardous waste disposal facilities, and seawater intrusion is insignificant and highly unlikely due to the lack of such contamination sources within the confines of the Salinas Reservoir watershed.

7. The City of San Luis Obispo is not a landowner or lessee in the Salinas reservoir watershed and has no control over land use activities in the watershed, including cattle grazing.

8. The City of San Luis Obispo's Water Treatment Plant provides a high degree of treatment and consistently and reliably meets the applicable potable water standards for treated surface water.

9. The recommendations made in the 2011 Update and their implementation statuses are discussed in Section 3 of this 2021 Update.

10. Efforts should continue to exclude direct access of grazing animals to Salinas Reservoir and areas at or near the tributaries. Currently, grazing is not permitted within the boundaries of the Santa Margarita Lake Regional Park and Natural Area. On May 31, 1997 the County of San Luis Obispo terminated the last grazing access lease to the public property adjacent to the Santa Margarita Lake Regional Park and Natural Area.

1.3 Recommendations

Recommendations Still Applicable From the 2011 and 2016 Updates

1. The City and the County of San Luis Obispo should continue with their current level of effort to protect the watershed and the reservoir from pollution and/or contamination.

2. The current sampling program performed by both City and County staff has been demonstrated to be adequate and should continue at the present levels and frequencies.

3. Monitoring for invasive species should be evaluated on an ongoing basis. The current invasive mussel monitoring program should continue.

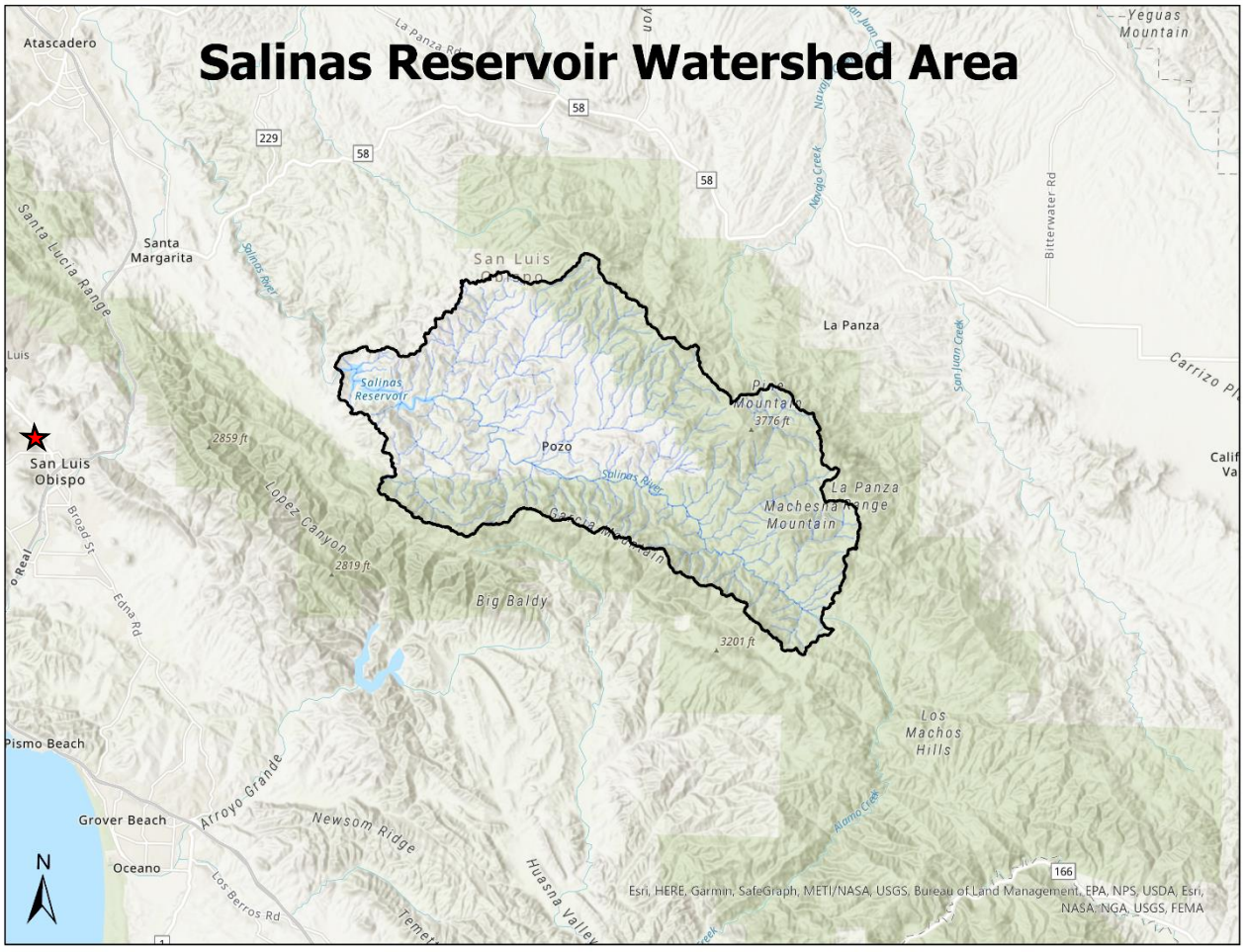
4. Development of new recreational activities, such as adventure racing, have potential impacts. It is recommended that the City and County continue to ensure that potential impacts to the watershed and water quality (such as erosion, trash and "no body contact") be addressed by organizers in the planning and holding of events.

New Recommendations as a Result of this Update

1. The County should continue monitoring for algal blooms and algal toxins that can contribute to water quality degradation and pose a threat to human health. When significant algal blooms are present, the City does not utilize water from the reservoir for drinking water purposes until testing confirms it is safe. Additionally, it is required by the State to post advisory signs throughout a waterbody that may be experiencing a harmful algal bloom. As of 2020, the County is conducting algal counts and working to identify different algal groups, including blue-green algae, golden and green algae, and the potential effects each group has on water quality of the reservoir.

2. The County and City should continue to monitor new development activities in the watershed area including new cannabis cultivation activities that have the potential to affect water quality of the reservoir.

Section 2
Background and 2016 Water Quality Summary



2.1 Project Background and Purpose

The City of San Luis Obispo (City) contracted with Metcalf & Eddy to prepare the initial Watershed Sanitary Survey of the Salinas Reservoir Watershed in 1995. In 2000, the City retained Boyle Engineering Corporation to prepare the 5-year update to the Sanitary Survey in order to further their understanding of the potential for surface water contamination within the watershed and to comply with the State Water Resources Control Board (SWRCB) requirements. In 2005, 2011, and 2016, City staff prepared the next 5-year updates. This current update to the Salinas Reservoir Watershed Sanitary Survey has also been prepared by City staff.

The Salinas Reservoir watershed is comprised of approximately 71,680 acres located between the east slope of the Santa Lucia range and the west slope of the La Panza Range in central San Luis Obispo County, California. It is comprised of three tributaries – Alamo Creek, Salsipuedes Creek, and Toro Creek. The focal point of the watershed is Salinas Reservoir (also known as Santa Margarita Lake), which is a major source of drinking water for the City of San Luis Obispo. The Salinas Reservoir watershed is also a major source of drinking water for the other water purveyors along the Salinas River. These downstream water utilities have wells that are recharged by the Salinas River.

The watershed, as noted in Metcalf and Eddy's 1996 report, is sparsely populated and minimally developed with nearly half of the watershed located within the boundaries of the Los Padres National Forest. Approximately 65% of the land within the watershed is publicly owned, with the largest of the public land lying within the boundaries of the Los Padres National Forest and the Santa Margarita Lake Regional Park and Natural Area. The remaining 35% of the land comprising the watershed is privately owned.

The City of San Luis Obispo water system includes the Salinas Dam and reservoir, intake structure and conveyance pipelines, Water Treatment Plant, and treated water distribution pipelines. When originally constructed in 1941, the Salinas reservoir had an estimated storage capacity of 26,000 acre-feet. Raw water from the reservoir is conveyed through 9.2 miles of distribution pipeline to the Santa Margarita booster pump station. From the booster pump station, raw water is sent through the Cuesta Tunnel and delivered to the City's Treatment Plant near the Cal Poly campus.

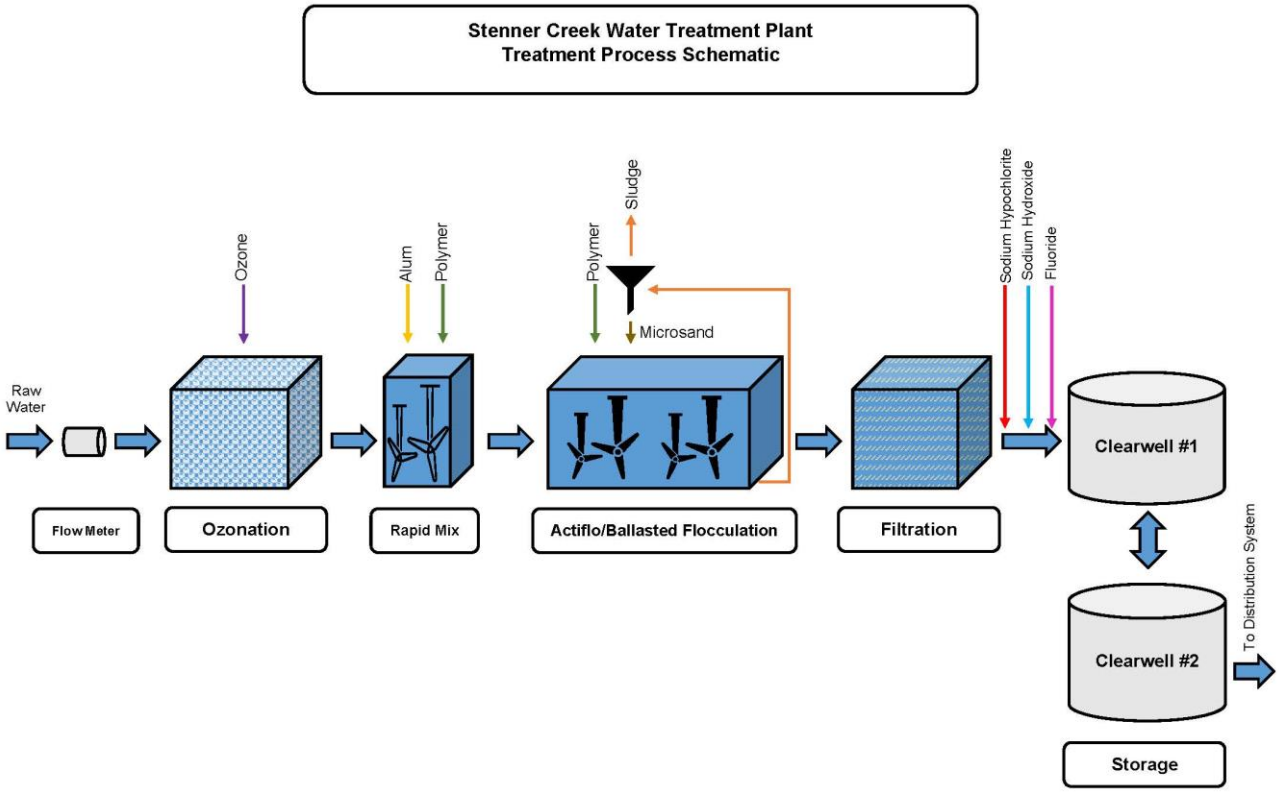


Fig. 1: Diagram of City's Water Treatment Plant Flow Processes.

The City's Water Treatment Plant treats raw water from Salinas Reservoir, Whale Rock Reservoir, and Nacimiento Lake and serves a distribution system of approximately 16,000 connections throughout the City of San Luis Obispo. The Water Treatment Plant is designated as a T5 facility by SWRCB-DDW and utilizes ozone for primary disinfection, rapid mix coagulation, ballasted flocculation (Actiflo), conventional anthracite filtration, and the addition of Fluoride, Sodium Hydroxide for pH/corrosion control, and Sodium Hypochlorite to maintain disinfection in the distribution system.

2.2 2016 Watershed Sanitary Survey Update Summary

The 2016 Update was completed by City staff in 2017. Little has changed within the Salinas Reservoir watershed since the completion of the 2016 Update which included Raw Water Quality data from 2012-2016.

See Section 5 of this report for updated 2021 Raw Water Quality information.

2.3 Project Approach

The approach to the 2021 update is to build upon the information contained in the initial 1996 Watershed Sanitary Survey and the subsequent 2001, 2005, 2011, and 2016 updates. The current 2021 update describes any significant changes that have occurred and updates important water quality information. The update provides the current status of each of the recommendations made in the 2016 update and provides additional conclusions and recommendations where appropriate. The additional recommendations are as outlined in Section 1 and Section 4 of this update.

2.4 Watershed Inspection

The Salinas watershed was physically inspected in order to document major activities that could have an effect on water quality. The County conducted visual inspections of the reservoir during quarterly sampling events wherein overall stream health and development in the surrounding areas are documented. Results are published in the County's yearly Water Quality Reports. In addition, raw water quality results are analyzed by both the City and County to determine overall health of the reservoir and its tributaries.

Similarly, State and County self-reporting and permit databases were reviewed to determine land use and agricultural data. Agricultural pesticide/herbicide use and permit information was reviewed from the County of San Luis Obispo, Department of Agriculture/Measurement Standards database as well as from the Department of Pesticide Regulation database. Hazardous material incident and information was reviewed from the County of San Luis Obispo, Department of Public Health Services/Environmental Health and Regional Water Quality Control Board databases. Building permit information was reviewed from the County of San Luis Obispo, Department of Planning and Building database. Information for activities and management of the immediately surrounding public lands was obtained from County of San Luis Obispo Park Ranger staff and County data. Review of all permits and use information applicable to this watershed indicated that there were no significant projects or events that should affect water quality. This was confirmed by reviewing satellite imagery and applicable databases.

Section 3
Prior Recommendations and Current Implementation Status

The 2011 Watershed Sanitary Survey Update contained specific recommendations for additional sampling previously identified in the 2001 and 2005 Watershed Sanitary Surveys. Those recommendations and statuses continue with this current update and are as follows:

Recommendation No. 1

- The City should consider implementing the following raw water sampling program at the Salinas Reservoir outlet works and at the treatment plant influent.

Constituent	Salinas Reservoir Effluent	Treatment Plant Influent
Turbidity	Twice monthly	Continuously
pH	Twice monthly	Continuously
Temperature	Twice monthly	Daily
Apparent Color	Twice monthly	Daily
Odor	Twice monthly	Weekly
T. Alkalinity (CaCO3)	Twice monthly	Weekly
Hardness	Twice monthly	Yearly

Status

The County continues to conduct these physical analyses on the raw water twice per month minimum and provides this data to the City. The City Water Treatment Plant continues to monitor the raw water turbidity and pH every 4 hours minimum or more frequently if needed. Temperature, apparent color, odor, total alkalinity and hardness are sampled and tested daily, as required by the State or more frequently as needed. Frequency of testing is often increased during storms and other events that are known to impact water quality metrics.

Recommendation No. 2

- The City should consider implementing the following raw water sampling program at the Salinas Reservoir outlet works and at the treatment plant influent:

Constituent	Salinas Reservoir Effluent	Treatment Plant Influent
Total Coliform and Fecal Coliform Bacteria	Monthly	Weekly

Status

The County continues to conduct these weekly bacterial analyses on the raw reservoir water and provides this data to the City. The City also performs its own monthly bacterial analyses on each of the raw surface water sources delivered to the Water Treatment Plant. It is assumed that the raw water has some non-human coliform and fecal coliform bacteria. The treatment process is designed and operated to disinfect and remove coliform bacteria to required levels. For these reasons, the current level of sampling and testing continues to be considered adequate.

Recommendation No. 3

- The City should consider implementing the following raw water sampling program at the Salinas Reservoir outlet works and at the treatment plant influent.

General Mineral Constituents	Salinas Reservoir Effluent	Treatment Plant Influent
Constituents listed on Table 5-3.	Yearly	Yearly

Status

The constituents listed in Table 5-3 are tested by the County at the Salinas Reservoir outlet on a monthly basis. The City samples and tests the Water Treatment Plant influent for these same constituents annually.

Recommendation No. 4

- The City should consider implementing the following raw water sampling program at the Salinas Reservoir outlet works and at the treatment plant influent:

Constituent	Salinas Reservoir Effluent	Treatment Plant Influent
Manganese	Monthly	Monthly
Constituents listed on Table 5-4.	Yearly	Yearly

Status

The County continues to sample the Salinas Reservoir effluent and tests for manganese at least once per month. The remaining constituents on Table 5-4 are tested annually. The City performs similar tests on samples from the Water Treatment Plant influent on an annual basis. The City disagrees with the recommendation for monthly testing of the treatment plant influent for manganese since the test is redundant. The Water Treatment Plant's ozone system oxidizes soluble manganese, allowing the coagulation/flocculation and filtration processes to remove the majority of manganese. There have been minimal issues with manganese in the treated water.

Recommendation No. 5

- Past results have shown Salinas raw water to not indicate much radiological parameter presence. Therefore, radiological sampling of the raw water should be discontinued. It should be continued in the treated water sampling.

Status

The City performs radiological sampling of raw water every nine years in accordance with the SWRCB, Division of Drinking Water. The last sampling event was conducted in 2013 and will happen again in 2022.

Recommendation No. 6

- The current yearly sampling program should be continued with emphasis on the types of herbicides and pesticides known to be used in the watershed tributary to the reservoir. This has not been done since 1996.

Status

The City samples and tests the Water Treatment Plant influent for herbicides and pesticides as required by SWRCB.

Recommendation No. 7

- The City should consider performing additional raw water sampling at either the reservoir or the filtration plant influent for the following additional constituents. This should be done because of specific treatment considerations and/or treatment concerns.

- If the raw water is found to contain Giardia/Cryptosporidium cysts, the treated water from the filter plant should then also be sampled quarterly (for at least the next 2 years) for viable Giardia/Cryptosporidium cyst levels to demonstrate that the existing treatment facilities remove/deactivate them.

Parameter	Recommended Sampling Frequency	Concerns
Bromide (µg/L)	Yearly	Bromate formation
Total Organic Carbon (mg/L)	Monthly	Disinfection by-product formation
Total Algae Counts	Monthly	Taste and odor control
Giardia/Cryptosporidium Cysts	Quarterly[1]	Public health/safe water

[1]For at least the next 2 years beginning with the fall quarter of October-December 2001.

Status

The City is regulated for bromate, rather than bromide. The City's treated water is tested for bromate on a monthly basis and has never exceeded the regulatory limit of 0.010 mg/L. Total organic carbon is analyzed monthly in accordance with SWRCB requirements. Giardia and Cryptosporidium cysts are assumed to be present in the raw water although there were no Cryptosporidium detections during the City's LT2ESWTR sampling in 2008-2010. No Cryptosporidium detections occurred during the City's 2nd round of LT2ESWTR sampling beginning in 2016.

The County tested for algal toxins in August and September 2016 and both results were below detectable levels. In 2016, the County implemented routine monthly monitoring for algal toxins. When algae are found to affect water quality, effective measures are taken until quality improves. In

2020 and 2021, County and Regional Board staff confirmed cyanobacteria blooms, however no toxic levels of mycrocystins were found. Although the reservoir is a non-contact reservoir, caution signs were posted per State guidelines to mitigate any potential exposure. The City and County remain committed to ensuring routine screening for algal toxins is conducted.

Section 4
Comments in Relation to the 2016 Watershed Sanitary Survey Update

4.1 Comments Still Applicable From the 2016 Report

- No municipal or industrial wastewater treatment plants are located within the Salinas Reservoir watershed.

- Wastewater treatment and disposal within the watershed is via septic tank systems. No significant problems with failing septic tank systems have been identified. Care must continue to be taken to monitor septic tank leach field efficiency if development occurs adjacent to Santa Margarita Lake.

- There are no wastewater collection systems within the watershed.

- There continues to be no use of reclaimed water within the watershed.

- The only area within the Salinas Reservoir watershed designated as "urban lands" by San Luis Obispo County is within the community of Pozo. However, the population of Pozo remains relatively small and is once again expected to have an insignificant impact upon the watershed and reservoir water quality.

- The principal agricultural crops grown within the watershed are grain and hay commodities.

- Cattle grazing continues on much of the public and private land throughout the Salinas Reservoir watershed and in many instances grazing animals have direct access to the influent streams tributary to the reservoir. Cattle grazing however is not permitted within the Santa Margarita Lake Park and Recreational Area and the County of San Luis Obispo has terminated the grazing permits for the two grazing areas adjacent to the reservoir.

- As a result of this direct access to the tributary streams within the private and public property (grazing is still permitted within the USFS land within the watershed), the grazing livestock continue to represent a potential-source for Giardia Lamblia and Cryptosporidium cysts.

- No large-scale concentrated animal facilities are located within the watershed.

- Pesticide and herbicide use continues to be limited to the agricultural croplands within the watershed. However, due to the minimal quantity of land utilized as cropland, the contamination potential remains insignificant.

- In general, wildlife populations within the watershed are considered to be low to moderate and continue to represent a potential source of pathogens in the watershed.

- There are no active mines within the watershed. Mining activity was ceased in the region in the early 1970's.

- There are no known solid or hazardous waste handling and/or disposal facilities located within the watershed.

- No large-scale commercial logging operations are conducted within the watershed. However, permits can be obtained for minor fuel woodcutting. To date, no known impacts to surface water quality from the minor logging activities within the watershed have been noted.

- Three public recreation areas are located within the Salinas Reservoir watershed: Santa Margarita Lake/Salinas Reservoir Regional Park, Santa Margarita Lake Natural Area, and the Los Padres National Forest.

- Body contact recreation is not permitted at Salinas Reservoir and the portion of the reservoir and shoreline approximately 1/2 mile upstream from the Salinas Dam intake structure is restricted from use by the public.

- The Santa Margarita Lake Regional Park and Natural Area continues to maintain permanent toilets with septic tanks and leach fields, pit toilets, and various portable chemical toilets. These toilets constitute the most significant source of potential sewage contamination associated with the recreational activities within the watershed.

- Equestrian access continues to be allowed on all of the Santa Margarita Lake Regional Park trails. As a result, horse manure continues to represent a potential source of bacteriological contamination.

- Minor dumping of solid waste and littering continues to occur within the watershed. However, no incident of water quality degradation due to illegal dumping or littering has been noted.

- No known accidental or intentional traffic-related waste spills impacting surface water within the watershed have occurred since 2001.

- There are no known surface water quality issues associated with the natural discharge from uncapped artesian wells located within the watershed.

- The watershed is located in an inland area not subject to seawater intrusion.

- The potential for the contribution of large quantities of suspended solids into Salinas Reservoir due to landslides, earthquakes, and floods remains quite low.

- Portions of the watershed continue to be listed as high and very high hazard with regard to wildfire potential by the California Department of Forestry due to the type of vegetation, terrain and quantity of precipitation prevalent throughout the watershed. No major fire activity has occurred in the watershed since 2001.

- Due to the high potential for wildfire activity within the watershed, the possibility for water quality degradation due to the use of chemical fire retardants exists.

- Due to the high potential for wildfire activity within the watershed the potential for water quality degradation due to increased sediment loading resulting from a lack of groundcover remains.

- The City is not a landowner in the Salinas Reservoir watershed. Therefore, the City must continue to rely upon the control measures of the major landowners in the watershed, the U.S. Army Corp of Engineers, U.S. Forest Service, and their lessees, as well as the government agencies which regulate land use and contaminant discharge.

- The City has not developed a formalized and effective watershed protection plan due to their lack of jurisdictional authority over activities carried out upon land owned by others.

- Portions of the watershed do however fall under the San Luis Obispo County Santa Margarita Lake Natural Area Resource Management Plan and the Land and Resource Management Plan for the Los Padres National Forest as developed by the U.S. Forest Service.

- The City does not conduct routine inspections of the watershed due to their lack of authority to conduct such inspection on private lands and their respective land uses.

- Those portions of the watershed located within the Santa Margarita Lake Regional Park and Natural Area are inspected on a routine basis by the park rangers. Their ongoing activities continue to protect the watershed.

- Those portions of the watershed within the Los Padres National Forest are inspected periodically by the U.S. Forest Service in order to evaluate watershed conditions. Their ongoing activities continue to protect the watershed.

- The County of San Luis Obispo's General Plan contains elements which affect the watershed with respect to Land Use, Agriculture, and Open Space.

- The County Land Use Ordinance/Code contains sections relevant to watershed protection.

- The Agriculture and Open Space element of the County of San Luis Obispo General Plan is directed toward preserving and sustaining open space within the County.

- The watershed is located within the County's Las Pilitas and Los Padres Planning Areas.

- The land use elements within the Las Pilitas and Los Padres Planning Areas contain development standards related to specific land use issues. These standards contain provisions that provide watershed protection.

- The County of San Luis Obispo continues to maintain land use and building permit authority for much of the watershed. The City of San Luis Obispo Utilities Department has requested the County Planning and Building Department route all development proposals within the Salinas Reservoir watershed to the City for review.

- With regard to the County of San Luis Obispo's Land Use Ordinance/Code, specific areas that relate to water quality and water management address the minimum parcel size for the rural lands within the watershed, the specific uses of Santa Margarita Lake, and the maximum allowable animal densities per acre for the specific land uses.

- The land use element also identifies those areas which have features that are sensitive, hazardous, or fragile and which have potential cultural, educational, or economic value, thereby requiring a more detailed review of development proposals.

- The Salinas River, generally upstream of Santa Margarita Lake, and Pozo Creek, upstream of the town of Pozo, remain classified as a flood hazard area and are subject to specific construction standards as outlined in the County of San Luis Obispo Land Use Ordinance.

- The areas along the upper reaches of Salsipuedes Creek and along Hi Mountain Lookout Road are designated as a Geologic Study Area (GSA).

- The Santa Margarita Lake watershed and much of the surrounding area is designated as a Sensitive Resource Area.

- The principal federal agencies with significant responsibility with regard to the management of the Salinas Reservoir watershed are the U.S. Army Corps of Engineers and the U.S. Forest Service.

- The Central Coast Regional Water Quality Control Board establishes the wastewater discharge requirements for those areas within the Salinas Reservoir watershed.

- There are no known point pollution sources of waste discharge within the watershed.

- Urban runoff: construction, agricultural operations, timber harvesting, and on-site waste disposal constitute the non-point pollution sources of waste within the watershed.

- The City owns no land within the watershed and therefore has no lease agreements with other agencies or private parties.

- Water quality from mining activities, including abandoned mines, continues to be monitored by the Regional Water Quality Control Board.

- The only mine (inactive) known to be located in the Salinas Reservoir watershed, the Mercury Belle, does not have a discharge permit from the RWQCB.

- Recreational activities within the Santa Margarita Lake Regional Park and Natural Areas are limited to minimize potential contamination of the lake by sewage and erosion.

- Water-based recreation at the Lake is restricted to non-contact water sports and with the exception of boat launch and support facilities; there is limited vehicular access to the lake.

- Fire management practices within the watershed, as outlined in the USFS Land and Resource Management Plan, are focused upon reducing the incidence of human-caused wildfires.

- Furthermore, the U.S. Forest Service fire management practices specify that methods and equipment used be such that disturbance to the landscape and land surface is minimized. Also, those areas which are disturbed are to be rehabilitated to as natural a state as possible.

- The U.S. Forest Service Land and Resource Management Plan also contains management plan provisions related to improving water quality with regard to maintaining equilibrium conditions in streams, as well as identifying appropriate sanitary engineering practices for waste disposal to prevent effluent leaching into streams.

- The majority of the Salinas Reservoir watershed, as determined by the San Luis Obispo County General Plan, is designated Agriculture, Open Space, and Rural Land.

- The raw water has exceeded the USEPA drinking water MCL's for turbidity, pH, color, and odor during the period of record.

- The treated water produced by the City's filtration plant continues to be in compliance with applicable drinking water and treatment standards.

- Turbidity levels vary with seasonal trends such that the turbidity is typically higher in the winter months due to the increased sediment loading associated with winter rain and runoff.

- The raw water has shown varying concentrations of total and fecal coliforms for the period of record.

- The City has consistently met the applicable drinking water standards for coliform bacteria in treated water.

- The raw water quality has consistently been below the applicable MCLs for trace elements, with the exception of manganese.

- For the period of record, the raw water quality has consistently been below the applicable MCL's for radiological constituents.

- The concentrations of organic chemicals in the raw water remained well below the USEPA and California MCL's and action levels.

4.2 Conclusions from the 2016 Update That Are Still Applicable

- The most significant potential sources of Giardia Lamblia cysts, Cryptosporidium cysts, and enteric viruses regulated under the Surface Water Treatment Rule are cattle and wild animals.

- Human recreational users in the Santa Margarita Lake Regional Park and Natural Area are also a potential source of pathogens as a result of private sewage disposal and unapproved water contact at the reservoir.

- Potential contamination resulting from wastewater treatment plants, urban/industrial runoff, concentrated animal facilities, solid/hazardous waste disposal facilities, and seawater intrusion is not a concern in the Salinas Reservoir watershed.

- The City of San Luis Obispo is not a landowner or lessee in the Salinas Reservoir watershed and therefore does not have control over land use activities in the watershed.

- The City of San Luis Obispo's Water Treatment Plant provides a high degree of treatment and consistently meets or exceeds the applicable drinking water and treatment standards for surface water treatment and effluent quality. A more detailed evaluation was completed in conjunction with the 2001 Salinas Reservoir Watershed Sanitary Survey Update and was submitted to SWRCB in 2001.

4.3 Major Changes and Comments since the 2011 and 2016 Updates

- In 2017, 12,710 acres within the watershed area were put under a permanent conservation easement in partnership with the California Rangeland Trust to reduce impact to the headwaters of the Salinas River and areas downstream.

- Wildfires have occurred outside the Salinas Watershed Area from 2011-2021, however no fires have occurred within the watershed area boundary according to the CAL Fire archived incident reports.

- Small-scale vineyards exist in and around the town of Pozo within the watershed boundary and have the potential to contribute to water quality degradation due to reported pesticide use, however reported use is minimal and poses no significant threat to water quality.

- The City's Water Treatment Plant has undergone several upgrades to improve the Plant's technology, efficiency, and resilience.

- According to San Luis County Department of Building and Planning, permits exist for cannabis cultivation within the watershed area. Activity and new development within the watershed area

are managed by the County, however the City has requested to be included in development review when activities may pose a risk to the reservoir water quality.

Section 5
Updated Water Quality Information

This section presents the updated raw water quality as provided by the City of San Luis Obispo. In order to simplify the organization of this section, the updated water quality tables are placed at the end of this section. The raw water sampling results described below are from samples collected at the treatment plant influent line from Salinas Reservoir rather than at the Salinas Reservoir outlet tower.

Raw water sampling is not clearly defined by regulations. Most raw water sampling programs consist of monitoring activities that constitute good practices and informing the water purveyor of the conditions within various watershed components, the overall impoundment (laterally and vertically), and, finally, the extracted water quality being conveyed to the Water Treatment Plant.

5.1 Raw Water Quality – General Physical Characteristics

The City conducts general physical water quality testing on a yearly frequency at the City's filtration plant influent. The test results obtained during 2017-2021 are summarized in Table 5-1.

5.2 Raw Water Quality – Total/Fecal Coliform Bacteria

The City conducts sampling for bacteriological parameters on the raw water received from Salinas Reservoir. The data collected during 2017-2021 is summarized on Table 5-2. The test results show the water to be of excellent quality. Plate count bacteria sampling of the raw water is not felt necessary. This opinion is shared by water purveyors treating surface water sources and by the regulators. Untreated surface water is expected to have elevated levels of HPC bacteria.

5.3 Raw Water Quality – General Mineral Constituents

The City conducts general mineral on the raw water received from Salinas Reservoir once per year. The results obtained during 2017-2021 are summarized in Table 5-3. The raw water meets all of the applicable treated water MCL's. There have been no observable increases in any constituent, and nitrate/nitrite levels are extremely low.

5.4 Raw Water Quality – Inorganic Constituents

The City conducts inorganic chemical testing on the raw water received from Salinas Reservoir once per year. The results obtained during 2017-2021 are summarized in Table 5-4. The raw water meets all of the applicable treated water MCL's, except for manganese. Manganese is sufficiently

treated at the City's Water Treatment Plant, and the treated water exceeds State standards for these constituents.

5.5 Raw Water Quality –Radiological Constituents

Table 5-5 indicates the concentration of gross alpha and total radium 228 radioactivity in the raw water received from Salinas Reservoir. Testing for gross alpha radioactivity was last conducted during 2013. The 2013 sample verified that the concentration of gross alpha radioactivity in the raw water was well below the MCL of 15 pCi/L and the 2006 samples verified that the concentration of radium 228 was below the 1 pCi/L trigger for continued monitoring. Sampling for radiological constituents was not conducted during the 2021 update period. SWRCB Division of Drinking Water requires sampling for radiological constituents every nine years, with the last sampling performed in 2013 and the next one is scheduled to be in 2022.

5.6 Raw Water Quality – Organic Chemical Constituents

The City has been sampling the raw water on the raw water received from Salinas Reservoir annually for certain organic chemicals. The sampling results generated during 2017-2021 are summarized in Table 5-6. To date, no organic chemicals have been found at levels above laboratory detection levels.

5.7 Raw Water – Miscellaneous Sampling

Due to the limited activity in the Salinas Reservoir watershed and results of current sampling indicating adequate water quality, additional sampling and testing of the water flowing into the reservoir is not warranted.

5.8 Overall Conclusions

The existing Water Treatment Plant, owned and operated by the City of San Luis Obispo, is more than adequate to effectively and reliably process raw water from Salinas Reservoir for turbidity reduction, disinfection, and taste/odor control. This conclusion is supported by the treatment plant evaluation that was performed by Boyle Engineering in conjunction with the 2001 watershed sanitary survey update. The Water Treatment Plant Review, dated February 2002, was submitted to SWRCB following the 2001 Watershed Sanitary Survey.

The City of San Luis Obispo continues to anticipate more stringent water quality regulations and considers the potential for such requirements with every periodic upgrade to water treatment plant facilities. Since the 2016 update, several upgrades have been made to improve the treatment technology, efficiency, and infrastructure of the plant. The water treatment plant recently completed an extensive replacement of the ozone disinfection system. The new ozone system allows for increased operational flexibility and reliability, increases overall ozone generation capacity while using liquid oxygen to increase ozone concentration. The City continues to monitor for emerging technology to improve plant processes and operations.

To address water quality concerns related to Total Trihalomethane (TTHM), a trihalomethane (THM) removal system was added in 2020 to two of the City's treated water storage facilities, including Clearwell #2 located on-site at the Water Treatment Plant. An automated THM analyzer was added to the Treatment Plant's laboratory to allow for control of the THM removal equipment based on daily real time speciated THM sampling data and historical trending of the WTP's effluent THM data via the plant SCADA system. The onsite THM analyzer also allows for analysis of grab samples from the City's water distribution system. Lastly, in the Edna Saddle storage tank, an automated chlorine feed system, tank mixer, and vent blower were installed to mitigate THM formation in the distribution system. The City will continue to incorporate and address water quality concerns in future upgrades to the water treatment and water distribution systems.

Security of the sparsely populated watershed continues to be considered adequate. This is reinforced with the City's Emergency Response Plan which is currently being updated. The City maintains positive ongoing relationships with County staff, law enforcement, and nearby residents. The likelihood that something detrimental to water quality could happen within the watershed without the City being notified is considered remote.

Security of the Water Treatment Plant is considered to be adequate. The Water Treatment Plant maintains a fenced perimeter with a locked security gate limiting access. Water Treatment Plant buildings are protected by an alarm system, and contract security patrol is maintained for additional after-hours security. Finally, security is addressed in the 2004 City's Emergency Response Plan. As part of the America's Water Infrastructure Act of 2018, the City of San Luis Obispo has conducted a risk assessment and is updating its Emergency Response Plan which is scheduled to be completed in December 2021.

Table 5-1
Raw Water Quality - General Characteristics
Upper Salinas Watershed Sanitary Survey
City of San Luis Obispo

Constituent	Units	MCL[1]	9/17	9/18	9/19	9/20	9/21
Turbidity	NTU	0.3	1.5	0.6	1.1	3.5	0.78
pH	pH units	6.0 - 8.5	7.1	8.2	8.1	8.6	8.15
Temperature	°C	None	--	--	--	--	--
A. Color	pcu	15	12	ND	17	30	15
Odor	TON	3	4	ND	ND	ND	--*
T. Alkalinity	mg/L	None	90	110	100	100	110
Hardness	mg/L	None	161	175	152	151	150

[1]MCLs for treated water.
*Odor was not analyzed within required holding time and therefore not included in this report.

Table 5-2
Raw Water Quality - Total and Fecal Coliform Bacteria
Upper Salinas Watershed Sanitary Survey
City of San Luis Obispo
(MPN/100 mL)

Date	Total Coliform	Fecal Coliform	Date	Total Coliform	Fecal Coliform
1/17	-*	-	7/19	-	-
2/17	-	-	8/19	141	<1
3/17	-	-	9/19	2419.6	<1
4/17	-	-	10/19	2419.6	<1
5/17	31	2.0	11/19	1203	1.0
6/17	2.0	<1.8	12/19	91	1.0
7/17	33	2	1/20	>2420	2.0
8/17	4.5	<1.8	2/20	649	1.0
9/17	7.8	4.8	3/20	-	-
10/17	23	7.8	4/20	-	-
11/17	-	-	5/20	20.1	<1
12/17	33	<1.8	6/20	1025	<1
1/18	4.5	4.5	7/20	1120	<1
2/18	7.8	<1.8	8/20	72419.6	<1.0
3/18	-	-	9/20	>2420	<1

Date	Total Coliform	Fecal Coliform
4/18	-	-
5/18	65	<1
6/18	71.7	<1
7/18	>2420	<1
8/18	1203	<1
9/18	236	<1
10/18	326	<1
11/18	1120	<1
12/18	387	2.0
1/19	477	<1
2/19	435	3.1
3/19	350	<1
4/19	461	<1
5/19	394	<1
6/19	248	<1

Date	Total Coliform	Fecal Coliform
10/20	1986	1.0
11/20	816.4	1.0
12/20	365	<1
1/21	12.1	<1
2/21	613.1	3.0
3/21	-	-
4/21	236	<1
5/21	285	<1
6/21	-	-
7/21	-	-
8/21	-	-
9/21	-	-
10/21	-	-
11/21	-	-
12/21	-	-

*The City's Water Treatment Plant does not sample when there are no raw water deliveries to the City's WTP from Salinas Reservoir.

Table 5-3
General Mineral Water Quality
Upper Salinas Watershed Sanitary Survey
City of San Luis Obispo

Constituent	Units	MCL[1]	9/17	9/18	9/19	9/20	9/21
Calcium	mg/L	--	35	37	33	26	24
Magnesium	mg/L	--	18	20	17	21	22
Sodium	mg/L	--	18	22	21	24	27
Potassium	mg/L	--	2	3	2	3	3
Hydroxide	mg/L	--	ND	ND	ND	ND	ND
Carbonate	mg/L	--	ND	ND	ND	ND	ND
Bicarbonate	mg/L	--	110	140	120	120	130
Sulfate	mg/L	500	77.1	79.7	72.0	81.4	85.1
Chloride	mg/L	500	13	13	12	15	17
Nitrate (NO_3)	mg/L	45	ND	ND	ND	ND	ND
Fluoride	mg/L	2	0.2	0.2	0.2	0.2	0.2

[1]MCLs for treated water.

Raw Water Quality - Trace Minerals
Upper Salinas Watershed Sanitary Survey
City of San Luis Obispo

Constituent	Units	MCL	9/17	10/18	9/19	9/20	9/21
Aluminum	µg/L	1000	ND	ND	ND	ND	ND
Antimony	µg/L	6	ND	ND	ND	ND	ND
Arsenic	µg/L	10	ND	ND	ND	2	2
Barium	µg/L	1000	ND	ND	ND	ND	ND
Beryllium	µg/L	4	ND	ND	ND	ND	ND
Boron	µg/L	1000	ND	ND	ND	ND	ND
Cadmium	µg/L	5	ND	ND	ND	ND	ND
Chromium, total	µg/L	50	ND	ND	ND	ND	ND
Copper	µg/L	1000	ND	ND	ND	ND	ND
Cyanide	µg/L	150	ND	ND	ND	ND	ND
Iron	µg/L	300	ND	ND	60	ND	ND
Lead	µg/L	15	ND	ND	ND	ND	ND
Manganese	µg/L	50	20	60	100	70	ND
Mercury	µg/L	2	ND	ND	ND	ND	ND
Nickel	µg/L	100	ND	ND	ND	ND	ND
Selenium	µg/L	50	ND	ND	ND	ND	ND
Silver	µg/L	100	ND	ND	ND	ND	ND
Thallium	µg/L	2	ND	ND	ND	ND	ND
Zinc	µg/L	5000	ND	ND	ND	ND	ND

Table 5-5
Raw Water Quality - Radiological Constituents
Upper Salinas Watershed Sanitary Survey
City of San Luis Obispo

Date	Total Alpha (pCi/L)	Total Beta (pCi/L)
MCL	15	50
8/96	0.0±1.0	2.0±2.0
5/04	2.25±1.38	--
8/04	0.686±1.08	--
11/04	1.25±1.18	--
2/05	1.16±0.625	--
10/13	1.79±1.11	--

Date	Total Radium 228	Counting Error
3/06	0.034	±0.405
6/06	0.120	±0.528

***Radiological sampling is conducted every nine years per State Division of Drinking Water. The next sampling event will be conducted during the subsequent Sanitary Survey.**

Table 5-6
Raw Water Quality - Organic Chemicals
Upper Salinas Watershed Sanitary Survey
City of San Luis Obispo

Constituent	Units	9/17	9/18	9/19	9/20	9/21
Bromodichloromethane	µg/L	ND	ND	ND	ND	ND
Bromoform	µg/L	ND	ND	ND	ND	ND
Chloroform	µg/L	ND	ND	ND	ND	ND
Dibromochloromethane	µg/L	ND	ND	ND	ND	ND
Total Trihalomethanes	µg/L	ND	ND	ND	ND	ND
Benzene	µg/L	ND	ND	ND	ND	ND
Carbon tetrachloride	µg/L	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	µg/L	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	µg/L	ND	ND	ND	ND	ND
1,1-Dichloroethane	µg/L	ND	ND	ND	ND	ND
1,2-Dichloroethane	µg/L	ND	ND	ND	ND	ND
1,1-Dichloroethylene	µg/L	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	µg/L	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	µg/L	ND	ND	ND	ND	ND
Dichloromethane	µg/L	ND	ND	ND	ND	ND
1,2-Dichloropropane	µg/L	ND	ND	ND	ND	ND
Ethylbenzene	µg/L	ND	ND	ND	ND	ND
Monochlorobenzene	µg/L	ND	ND	ND	ND	ND
Styrene	µg/L	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	µg/L	ND	ND	ND	ND	ND
Tetrachloroethylene	µg/L	ND	ND	ND	ND	ND
Toluene	µg/L	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	µg/L	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	µg/L	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	µg/L	ND	ND	ND	ND	ND
Trichloroethylene	µg/L	ND	ND	ND	ND	ND
Trichlorofluoromethane(Freon 11)	µg/L	ND	ND	ND	ND	ND

Constituent	Units	9/17	9/18	9/19	9/20	9/21
Vinyl Chloride	µg/L	ND	ND	ND	ND	ND
m,p-xylene	µg/L	ND	ND	ND	ND	ND
o-xylene	µg/L	ND	ND	ND	ND	ND
Total xylenes	µg/L	ND	ND	ND	ND	ND
Methyl tert-Butyl Ether (MTBE)	µg/L	ND	ND	ND	ND	ND
Cis-1,3-Dichloropropene	µg/L	ND	ND	ND	ND	ND
Trans-1,3-Dichloropropene	µg/L	ND	ND	ND	ND	ND
Bromobenzene	µg/L	ND	ND	ND	ND	ND
Bromochloromethane	µg/L	ND	ND	ND	ND	ND
Bromomethane	µg/L	ND	ND	ND	ND	ND
n-Butylbenzene	µg/L	ND	ND	ND	ND	ND
sec-Butylbenzene	µg/L	ND	ND	ND	ND	ND
Tert-Butylbenzene	µg/L	ND	ND	ND	ND	ND
Chloroethane	µg/L	ND	ND	ND	ND	ND
Chloromethane	µg/L	ND	ND	ND	ND	ND
2-Chlorotoluene	µg/L	ND	ND	ND	ND	ND
4-Chlorotoluene	µg/L	ND	ND	ND	ND	ND
Dibromomethane	µg/L	ND	ND	ND	ND	ND
1,3-Dichlorobenzene (m-DCB)	µg/L	ND	ND	ND	ND	ND
1,3-Dichloropropane	µg/L	ND	ND	ND	ND	ND
2,2-Dichloropropene	µg/L	ND	ND	ND	ND	ND
1,1-Dichloropropene	µg/L	ND	ND	ND	ND	ND
Hexachlorobutadiene	µg/L	ND	ND	ND	ND	ND
p-Isopropylroluene	µg/L	ND	ND	ND	ND	ND
Isopropyl benzene	µg/L	ND	ND	ND	ND	ND
Naphthalene	µg/L	ND	ND	ND	ND	ND
n-Propyl benzene	µg/L	ND	ND	ND	ND	ND
1,1,1,20Tetrachloroethane	µg/L	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	µg/L	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	µg/L	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	µg/L	ND	ND	ND	ND	ND
Ethyl tert-Butyl Ether	µg/L	ND	ND	ND	ND	ND
Tert-amyl-methyl Ether	µg/L	ND	ND	ND	ND	ND
Diisopropyl Ether	µg/L	ND	ND	ND	ND	ND
Tert-Butanol	µg/L	ND	ND	ND	ND	ND

Section 6
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