DATE: April 4, 2018

TO: Jeff Densmore, P.E.
Santa Barbara District Engineer

FROM: Jason Cunningham, E.I.T.
Water Resource Control Engineer, Santa Barbara District

SUBJECT: San Luis Obispo County Water District 10
Cayucos Water Treatment Plant - 4010025
2018 Sanitary Survey Report
San Luis Obispo County

I. Introduction

On March 28, 2018, Mr. Jeff Densmore and Mr. Jason Cunningham of the Santa Barbara District, Division of Drinking Water (hereinafter known as "Division") of the State Water Resources Control Board (SWRCB) inspected the San Luis Obispo County Water District 10 - Cayucos Water Treatment Plant (hereinafter known as "District 10"). Mr. Mark Chiaramonte, Public Water Systems Superintendent; Mr. Kyle James, Chief Plant Operator; and Mr. Justin Smith, Shift Plant Operator were in attendance. The last annual inspection was conducted by Ms. Ashley Jones on March 6, 2014.

The purpose of this sanitary survey report is to document the inspection of District 10, to describe the facilities and operational practices as they exist today, and to describe any deficiencies needing follow-up.

1.1 Sources of Information

Information for this sanitary survey report was obtained from District 10 personnel, DDW files, and the 2018 Sanitary Survey of the water system.

1.2 Brief Description of System

The San Luis Obispo County Water District 10 - Cayucos Water Treatment Plant (District 10) is classified as a community water system, located in San Luis Obispo County. District 10 is a wholesale water system and supplies treated water to San Luis Obispo County Service Area – 10A Cayucos, Paso Robles Beach Water Association and Morro Rock Mutual Water Company to a total population of approximately 2,600 people. District 10 consists of two active sources (Whale Rock Well and Whale Rock Reservoir), a surface water treatment plant, a 250,000 gallon baffled clearwell reservoir, and the associated distribution system.

II. INVESTIGATION FINDINGS

III. Area Served

District 10 is physically located at 1675 Cabrillo Street Cayucos, CA 93430. District 10 serves a daily population of approximately 2,600 customers year round.

3.2 Source of Supply

3.2.1 Surface Water

District 10 receives surface water from a single surface water source; Whale Rock Reservoir. The water is treated by District 10's approved alternative filtration treatment plant. District 10 relies on the surface water for most of the system's water demands. District 10 has a total of 582 AF from Whale Rock for the three participating agencies (Morro Rock Mutual Water Company (170 AF), Paso Robles Beach Water Association (222 AF), and San Luis Obispo County Service Area – Cayucos 10A (190 AF)). When District 10 utilizes the CAWO Well the amount produced from the well is counted towards the Whale Rock Reservoir entitlement.

District 10 can take an additional 25 AF of water via the Nacimiento Water Project on top of the allocated 582 Acre Feet from Whale Rock Reservoir through a water wheeling agreement with the City of San Luis Obispo metered at the City of San Luis Obispo Nacimiento turnout. The 25 AF amount would be used when the 582 AF total from Whale Rock Reservoir has been exceeded.

Whale Rock Reservoir
The Whale Rock Reservoir has a capacity of 40,660 acre-feet and was constructed in 1961 as a joint venture by the City of San Luis Obispo and the State of California. The reservoir supplies water to District 10, the California Men's Colony and the City of San Luis Obispo.

The Whale Rock Reservoir is a non-body contact reservoir. The Whale Rock Reservoir Commission operates the recreational facilities at the reservoir. Controlled recreation is permitted at the reservoir, including shoreline fishing and picnicking in designated areas. Vault toilets are located along the lakeshore and a septic tank leach line system is located at the parking facility. The leach line is located over 200 feet from the high water line. The San Luis Obispo County Health Department inspects the recreational area on a routine basis to evaluate the sanitary facilities.

The watershed is comprised about 20.3 square miles, the majority of which is privately owned. The drainage area, 2 miles upstream from the dam, consists of grass-covered hills used for cattle grazing. The reservoir has a maximum inundation area of 650 acres, which together with a 300-foot perimeter area, has been acquired by the State of California. There are a few rural residences on the watershed. Sewage disposal is by means of septic tanks and leaching systems, which have been reviewed by the San Luis Obispo County Health Department. The

City of San Luis Obispo conducts a monthly inspection of the reservoir and submits a monthly report to this office.

The section of the reservoir 1,000 feet from the intake and the adjacent shoreline are closed to public use. The water supply is obtained from a multiport outlet tower. The water is transported through the Whale Rock Conduit to District 10's turnout.

3.2.2 Groundwater Sources

Whale Rock Well – CAWO – Active (PS Code 4010025-006)
The Whale Rock Well - CAWO Well was constructed in 1989 to a depth of 85 feet. No sewer lines or sewage disposal facilities are located within 50 and 100 feet of the well site respectively. The well is not housed but the site is fenced for protection. The well is equipped with a 10-inch plastic casing and is gravel packed. The perforations begin at 35 feet. The well has a 33-foot annular seal and is surface sealed. A clay layer is located at a depth of 3 feet (17 feet thick). The well is equipped with an electric motor and a submersible pump that produces approximately 175 gpm. The well discharges above ground directly to the clearwell reservoir.

3.3 Adequacy of Supply

District 10 sells treated surface water to three water systems. Per the California Waterworks Standards all public water systems are required to record the production from their source on a monthly basis. The Maximum Day Demand (MDD) and Peak Hour Demand (PHD) were calculated using the reported average day demand and maximum day demand and a peaking factor of 1.5. District 10's average day, maximum day, and peak hour demands during the last seven years are listed in Table 2.

Table 1: Active Source Capacity

Source	Capacity (gpm)
Whale Rock Well	175
Whale Rock Reservoir	1,050
Total	**1,225**

Table 2: Production Data (2010-2016)

Year	Annual Production (MG)		Average Day Demand (gpm)	*Maximum Day Demand (gpm)	*Peak Hour Demand (gpm)
	Groundwater	Surface Water			
2016	1.97	104.21	202.02	411.36	617.05
2015	1.63	106.40	205.54	383.33	575.00
2014	1.50	121.85	234.69	468.08	702.12
2013	1.55	136.15	261.99	525.54	788.31
2012	0.10	125.92	239.76	480.56	720.85
2011	3.08	120.98	236.04	490.79	736.19
2010	2.93	123.80	241.06	515.46	773.19

*These values were estimated using peaking factors. Calculations with peaking factors are provided below.

$$\text{Average Day Demand (gpm)} = \frac{\text{Annual production (gallons)}}{\left(365\,\frac{\text{days}}{\text{year}}\right) * \left(24\,\frac{\text{hrs}}{\text{day}}\right) * \left(60\,\frac{\text{min}}{\text{hr}}\right)}$$

$$\text{Max Day Demand (MDD)} = \text{Max Month (gpm)} * (1.5)$$

$$\text{Peak Hour (PHD)} = \left(\text{Max Day (gpm)}\right) * (1.5)$$

According to the California Waterworks Standards, public water systems should have water sources that have the capacity to meet the maximum day demand (MDD) at all times. The total source capacity of District 10 is 1,225 gpm, which is greater than the highest calculated MDD in the ten seven years of 788 gpm in 2013.

According to the California Waterworks Standards, a public water system serving less than 1,000 service connections, shall have storage capacity equal to or greater than the MDD, unless the system can demonstrate that is has an additional source of supply or has an emergency source connection that can meet the MDD requirement. District 10 has a total of 250,000 gallons of storage. Using the highest calculated PHD demand in the last seven years (526 gpm in 2013), District 10 could provide approximately 8 hours of storage. Therefore, District 10 does not provide enough storage capacity to meet the Division's MDD criteria. However, based on the 2013 EAR, District 10 did not report or project any water outages.

Drought Impact and Preparedness

The State will continue to update water conservation measures depending on current weather conditions. Therefore, the States measures continue to change based on current conditions. The Division recommends that District 10 stay informed by visiting the State's Water Conservation Portal at http://www.water boards.ca.gov/water_issues/programs/conservation_portal/. The Division also recommends that District 10 conduct an ongoing well production and groundwater level monitoring program as well as ensuring any water conservation measures are achieved that are required by the State. The well production data shall be recorded on minimum of a monthly basis and reported in the EAR.

Groundwater Management

In 2014, California signed historic legislation for groundwater management throughout the State, specifically providing local agencies (also known as Groundwater Sustainability Agencies, or GSA's) the authority to manage groundwater basins and usage through the Sustainable Groundwater Management Act of 2014. This is important as groundwater levels are declining, water quality contamination is increasing, and the drought persists. GSA's located in high and medium priority basins in critical overdraft as identified by DWR need to develop groundwater sustainability plans by 2020 and adopt and implement the plan by 2040. GSA's are made up of local public water agencies such as Cities, Counties, Public Utility Districts, Community Services Districts, Irrigation Districts, Water Conservation Districts, etc. District 10 is encouraged to attend and engage in the local GSA meetings to provide input in the process.

3.4 Surface Water Treatment

3.4.1 Raw Water

The water supply is obtained from a multi-port intake tower located in the reservoir. Water quality samples and field characteristics of the lake water at the intake tower are sampled every other week and the data is reported to all of the systems which receive water from the reservoir. The measurements are taken at each gate level available for use. Measurements include temperature and dissolved oxygen. Lake elevation, draft gate and depth, weather conditions, wind direction, air temperature, lake appearance and odor are also recorded.

The water drawn from the intake tower is transported to the Whale Rock Conduit. District 10 diverts their allotment for the water treatment plant from the Whale Rock Reservoir. The raw water gravity feeds from the conduit and is controlled by an influent control valve at the treatment plant.

3.4.2 Direct Additives

3.4.2.1 Sodium Hypochlorite

Sodium hypochlorite is used for pre-disinfection. The sodium hypochlorite is 12.5% and is stored in day tanks which hold approximately 60 gallons. When dosing at 1.3 mg/L the storage typically lasts for a week. The chemical is injected upstream of the inline static mixer. The operators try to dose just enough to control biological growth in the filters and to help oxidize the iron and manganese but not enough to get a detectable residual at the influent to the GAC filters. Generally the target chlorine residual at the Trident filters in less than 0.5 mg/L.

In addition, sodium hypochlorite is used as a disinfectant in order to meet CT requirements. There are two post chlorination injection points. The primary injection point is located after the GAC filters and prior to the clearwell. The secondary injection point is located upstream of the bypass to the GAC filters and prior to the water entering the clearwell. The secondary injection point is not used when the water is treated by the GAC filters.

3.4.2.2 Flocculant

District 10 is currently using polyaluminum hydroxychlorosulfate which is produced by CalChem (CC 2310) as the flocculant. The chemical is injected upstream of the in-line static mixer. District 10 has a 580 gallon storage container which typically will supply enough chemical for a month when dosing at 5 mg/L.

3.4.2.3 Polymer

A liquid cationic polymer is used to aid in the coagulation process; District 10 is currently using Floquat FL 4420. The chemical is injected upstream of the in-line static mixer, typically at a dose of 2 mg/L. The polymer is stored in the chemical storage container which has a capacity of 150 gallons. The chemical will supply one and a half months based on normal dosages.

3.4.2.4 Chemicals (ANSI/ NSF Standard 60)

The following chemicals are used in the treatment process.

Table 3: Chemicals Used

Chemical	Purpose	ANSI/ NSF Standard 60	Dosage
Polyaluminum Hydroxychlorosulfate	Coagulant	Yes	5 mg/L
Cationic Polymer	Coagulant Aid	Yes	2 mg/L
Sodium Hypochlorite	Disinfectant	Yes	Varies

3.4.3 Treatment Process

3.4.3.1 In-Line Static Mixer

An in-line static mixer is used to mix the chlorine, coagulant and the coagulant aid prior to entering the clarification/ filtration process.

3.4.3.2 Trident Clarification/ Filtration

3.4.3.2.1 Contact Clarification

The clarification takes place in three, parallel Trident clarification/filtration units. The water enters the adsorption clarifier compartment where it passes upward through a bed of buoyant adsorption media. The adsorption clarifier combines the process of coagulation, flocculation and clarification in a single unit process. In passing through the adsorption media the chemically coagulated water is mixed, flocculated and clarified. Flocculation is accomplished by turbulence as water passes through the adsorption media and the removal is enhanced by contact with flocculated solids attached to the media. Typically the upflow clarifiers are rinsed after 40 hours of run time. The clarifiers are rinsed with an air scour for 5 minutes followed by a raw water flush for 10 minutes.

3.4.3.2.2 Filters

The clarification and filtration process take place in three, parallel Trident clarification/ filtration units. Each unit has a maximum capacity of 350 gpm. The overall capacity of the filter plant is 1,050 gpm and operates at 5.0 gpm/ft^2 with all three filters in operation. The filtration plant is considered an approved alternative filtration technology for the treatment of surface water.

3.4.3.2.3 Filter Backwash

The filters are backwashed every 20 to 45 hours or when the effluent turbidity reaches 0.2 NTU. They are backwashed with air scour for 5 minutes and filtered water from the clearwell at a flow rate of 15 -18 gpm/ft^2 for 12 minutes on the filters and 8 minutes for the clarifier. After the backwash, the filters discharge to waste for about 4 minutes or until the effluent turbidity is below 0.3 NTU.

3.4.3.2.4 Finished Water Storage

The clearwell was constructed in 1996 and provides a storage capacity of 250,000 gallons. The steel reservoir is constructed above ground and located at the treatment plant site. The reservoir is equipped with screened vents and overflow. The reservoir was recoated with an epoxy coating in 2007. The reservoir is baffled to help meet the CT requirements. The clearwell also receives chlorinated water from the CAWO Well when it is used. An on-line chlorine analyzer records the chlorine residual of the water leaving the reservoir.

3.4.3.2.5 Backwash Recovery

District 10 reclaims water from filter backwashes and filter rinse cycles. Settling basins, in-line polymer injection & mixing, and a 64 gpm capacity Everfilt multi-media pressure filtration system are used to reduce the reclaimed water turbidity levels to less than 2.0 NTU before being returned to the head-works of the treatment plant.

The recycle rate is not more than 10% (average 60 to 70 gpm) of the overall plant flow (average 600 to 700 gpm). Use of the two settling ponds is rotated; one is used while the other is allowed to settle for 24 hours (typical duration, minimum is 2 hours when turbidity is low). The settling pond's sludge is pumped approximately three times a year or when the sludge depth is 12 inches deep after settling.

The 64 gpm capacity Everlift multi-media pressure filtration system consists of four (4) skid mounted 24-inch diameter vertical pressure filters with automatic valves and controls. The filter media is 32-inches deep. It consists of anthracite, silica sand, and garnet, over two layers of crushed gravel. There are provisions to add chemical feed (polymer) to the influent to enhance turbidity removal if needed. The chemical feed system consists of a chemical pump, static mixer, and an injection port. The filtration system utilizes effluent from its own filters as a backwash source. The backwashes are initiated, manually or automatically, based on run-time or pressure differential. The filtration system is taken off-line during the backwash cycle and once backwashing of all filter vessels has been completed, a filter-to-waste cycle is implemented before the filters are placed back into service. The system is equipped with on-line turbidimeters to continually monitor and record the turbidity levels from the reclamation basin and reclaim filtration system. The reclaim filtration system is equipped with an automatic shut-off mechanism, which initiates when effluent turbidity levels exceed 2.0 NTU.

3.4.3.2.6 GAC Filters

District 10 uses two 600 gpm capacity US Filter GAC filters to aid in the removal of odor producing compounds and to remove TTHM precursors. The GAC filters are located after the existing trident package treatment and before final disinfection and the clearwell. District 10 can utilize series, parallel, or individual filter flow configurations but typically uses the series configuration. District 10 also has the capability to bypass the GAC filters.

Historically, District 10 retailers periodically experienced TTHMs in their distribution systems exceeding 80 mg/L. District 10 failed the TTHM standard in 2004/05. District 10 received Proposition 50 money to address the water quality failure and installed GAC treatment for controlling DBP precursors. District 10 and each of their retailers currently comply with the TTHM and HAA5 standards.

Additionally, the Cayucos Water Treatment Plant (Cayucos WTP) has experienced seasonal taste and odor problems since it began operation in 1997. District 10 evaluated several solutions for the seasonal taste and odor problems at the Cayucos WTP. The existing PAC treatment did not provide sufficient contact time to reduce 2-methylisoborneol (MIB) levels satisfactorily. The addition of GAC filter units to the existing treatment train has been effective in removing taste and odor causing MIB by 60 to 80%.

3.4.4 CT Compliance

Chlorination is achieved using a liquid chlorinator with capacity of 21 gpd. District 10 uses 12.5% hypochlorite solution which is stored in a 2,500-gallon tank. Sufficient free chlorine residual is maintained leaving the 250,000 gallon baffled clearwell to meet the required CT. The chlorine concentration is continuously monitored prior to entering and leaving the clearwell reservoir. The post chlorination analyzer is equipped with a low level alarm that is set at 1.0 mg/L.

The SWTR requires 3-log inactivation for Giardia, 4-log inactivation for viruses, and 2-log inactivation for Cryptosporidium for all surface water supplies. District 10's removal credits are as follows on Table 4:

Table 4: Removal Credits

Effluent Turbidity	Credits	Required Inactivation
<0.2 NTU 95% of time	2.5 log Giardia	0.5 log Giardia
	2.0 log Virus	2.0 log Virus
	2.0 log Cryptosporidium	---

If 0.5 NTU or less 95% of time	2.0 log Giardia	Log Giardia
	1.0 log Virus	3.0 log Virus
	2.0 log Cryptosporidium	---

Contact time within the clearwell is dependent on the amount of water the filtered water pumps are sending to the retailers. There is a booster station for each of the three retailers. The highest daily combined flow rate from the filtered pumps shall be used to determine compliance with the CT requirement. The Division reviewed last year's surface water treatment monthly reports and selected the lowest chlorine residual and temperature and highest pH.

- Temperature = 12.9
- pH = 8.7
- Cl_2 = 1.10

The treatment plant consistently produces water with a combined filter effluent of 0.2 NTU at least 95% of the time. Therefore the required log removal for *Giardia* is 0.5-log. The CT required, based on worst case conditions, is approximately 37 mg-min/L.

The actual CT provided by District 10 shall continue to be calculated using the highest daily flow from the clearwell and the lowest chlorine residual for the day. The chlorine concentration used is representative of the chlorine concentration at the end of the contact time (i.e. clearwell effluent).

District 10 uses daily flow rate of 1,250 gpm during days when a backwash has not occurred and 2,250 gpm on backwash days. The three treated water pumps are capable of producing a maximum flow rate of 1,250 gpm. The filter backwash pump draws from the clearwell at a rate of 1,000 gpm.

The storage tank provides 10,870 gallons for every vertical foot. The clearwell has a separate inlet and outlet and has internal baffling. A short circuiting factor of 0.5 is applied to the clearwell. The lowest level set point for the reservoir is approximately 14 feet. District 10 reports the daily lowest level in the tank. At 14 feet the tank has an effective volume of 76,090 gallons. At the maximum flow rate, this provides approximately 33.8 min.

A chlorine concentration at the end of the contact time of 1.0 mg/L will provide 33.8 min-mg/L of actual CT. The CT ratio under all worst case conditions is approximately 0.91, which is less than the required CT ratio of greater than 1.0. District 10 is not likely to experience all worst case conditions since each condition occurred in different seasons. Based on last year's surface water treatment monthly reports, the lowest CT ratio was 2.0.

3.4.5 Turbidity Monitoring

District 10 monitoring turbidity at the plant influent, the individual filter effluents, the clearwell, the backwash reclaim and the plant effluent.

3.4.6 Cryptosporidium Action Plan

The treatment facility has been evaluated for Cryptosporidium Action Plan compliance. The following is an evaluation of the Crypto Action Plan Optimization Criteria.

Table 5: Crypto Action Plan Optimization Criteria

Location	Optimization Goals
Sedimentation/Clarification Basin Effluent	1 to 2 NTU

Combined Filter Effluent	Less than 0.1 NTU
Reclaimed Backwash Water Effluent	Less than 2.0 NTU
After Filter Backwash/Filter -to-Waste	Less than 0.3 NTU

3.4.7 Treatment Plant Staffing

The treatment plant is staffed by certified operators from 7 am to 3:30 pm on weekdays. The treatment staff is composed of operators, ranging from a Grade T3 through Grade T5, and each receives adequate training through District 10. The treatment plant is staffed with a certified operator in the evening when the plant is producing water. A certified operator is also on call.

3.4.8 Equipment

Spare parts and equipment are available at the treatment plant. The staff can make most repairs. A generator is located at the plant and is tested routinely. The generator is capable of automatically providing power to maintain treatment plant operations in the event of a power failure. The generator will run the entire plant for a couple of days.

3.5 Groundwater Treatment

The CAWO Well is chlorinated with 12.5% hypochlorite solution is used. District 10 maintains a chlorine residual of 1.0 to 1.5 mg/L leaving the well site. The well has the ability to pump directly into the PRBWA and MRMWC distribution system or to the treatment facility clearwell reservoir. Most often, the well pumps to the clearwell reservoir and blends with the treatment plant effluent.

3.6 Storage Facilities

District 10 storage consists of a single water storage reservoir, which also serves as the chlorine contactor providing a total storage capacity of 250,000 gallons. The clearwell is constructed of welded steel. The clearwell was upgraded in 2012. The clearwell has a separate inlet and outlet. The tank is equipped with cathodic protection. The water can either be directly from the filters or the GAC units. The water is delivered to the three booster stations for each of the participating agencies. At the time of the inspection, baffle connection on top of the storage reservoir was corroded and could pose as a potential cause of contamination. **By July 31, 2018, District 10 needs to repair the baffle connection on the outside of the storage reservoir and submit photo documentation to the Division of the repair.**

3.7 Distribution System

The distribution system consists of an 8 inch diameter main to the booster stations which serve the systems purchasing water. Most of the main is composed of PVC, but a section to the San Luis Obispo County Service Area 10A – Cayucos is steel. Maps of the distribution system are maintained and kept up to date.

3.7.1 Booster Stations

There are three booster pumps in the treatment building, one for each of the three retail systems; Morro Rock MWC, Paso Robles Beach Water Association and SLO County District 10A. The pumps have individual capacities of 450 gpm. The combined capacity of the pump station is 1250 gpm. The pumps deliver water from the clearwell to the mains serving each of the retail water systems. District 10 does not own, operate or maintain the mains to Morro

Rock MWC or Paso Robles Beach WA. District 10 is able to use a standby generator to power the booster station and treatment facility. The generator is tested every Monday and tested under load every month. The booster stations are as follows:

3.7.1.1 Morro Rock Mutual Water Company Booster Station

The Morro Rock Booster Station consists of a single 40 HP, 350 gpm Floway VFD pump. The booster pump transfers water from the clearwell. The incoming water is approximately 10 – 20 psi and is boosted to 90 – 110 psi. The booster pump comes on when needed. There is an emergency generator on site which will automatically come on in the event of a power outage. The booster station is located inside the treatment plant facility and only District 10 has access to the site. The booster station is controlled by the Morro Rock tank elevation.

3.7.1.2 Paso Robles Beach Water Association Booster Station

The Paso Robles Beach Booster Station consists of a single 40 HP, 350 gpm Floway VFD pump. The booster pump transfers water from the clearwell. The incoming water is approximately 10 – 20 psi and is boosted to 90 – 110 psi. The booster pump comes on when needed. There is an emergency generator on site which will automatically come on in the event of a power outage. The booster station is located inside the treatment plant facility and only District 10 has access to the site. The booster station is controlled by the Paso Robles Beach tank elevation.

3.7.1.3 San Luis Obispo County District 10A Cayucos Booster Station

The San Luis Obispo County District 10A Cayucos Booster Station consists of a two 50 HP, 400 gpm VFD pumps. The booster pumps transfer water from the clearwell. The incoming water is approximately 10 – 20 psi and is boosted to 90 – 110 psi. The booster pumps come on when needed. There is an emergency generator on site which will automatically come on in the event of a power outage. The booster station is located inside the treatment plant facility and only District 10 has access to the site. The booster station is controlled by the San Luis Obispo County District 10A Cayucos tank elevation.

3.7.2 Lead Service Line Inventory Requirement

Existing law prohibits the use of any pipe, pipe or plumbing fitting or fixture, solder, or flux that is not “lead free” in the installation or repair of any water system or any plumbing in a facility providing water for human consumption. Senate Bill (SB) 1398 became effective on September 27, 2016, and added Section 116885 to the Health and Safety Code (HSC). HSC Section 116885 requires water systems to compile an inventory of known lead user service lines in use in its distribution system and identify areas that may have lead user service lines in use in its distribution by July 1, 2018. After completing the inventory, water systems are required to provide a timeline for replacement of known lead user service lines in the distribution system to the SWRCB. In addition, water systems with areas that may have lead user service lines in use in its distribution system must either determine the existence or absence of lead service lines in these areas and provide that information to the SWRCB, or provide a timeline for replacement of the user service lines whose content cannot be determined by July 1, 2020. The SWRCB must approve the replacement timeline.

3.8 Operation and Maintenance

District 10's water system is classified as a D1 distribution system and a T3 treatment system. Therefore, at minimum, District 10 must have a T3 certified treatment system operator to oversee all aspects of the water system. Mr. Kyle James, Chief Operator possesses a T3 operator license and Mr. Justin Smith, Shift Operator possesses a T3 operator license, which satisfies the T3 treatment classification.

Water systems shall utilize either certified distribution operators or treatment operators to make decisions addressing the following operational activities:

1. Operate pumps and related flow and pressure control and storage facilities manually or by using a system control and data acquisition (SCADA) system.
2. Maintain and/or adjust system flow and pressure requirements, control flows to meet consumer demands including fire flow demands and minimum pressure requirements.

Water systems shall utilize either certified distribution operators or treatment operators to make decisions addressing the following operational activities:

1. Determine and control proper chemical dosage rates for wellhead disinfection and distribution residual maintenance.
2. Investigate water quality problems in the distribution system.

DISTRIBUTION OPERATOR CERTIFICATION REQUIREMENTS
Regulations also require the chief distribution operator to have at least a D3 certification and the shift distribution operator to have at least a D2 certificate. Water systems shall utilize only certified distribution operators to make decisions addressing the following operational activities:

1. Install, tap, re-line, disinfect, test and connect water mains and appurtenances.
2. Shutdown, repair, disinfect and test broken water mains.
3. Oversee the flushing, cleaning, and pigging of existing water mains.
4. Pull, reset, rehabilitate, disinfect and test domestic water wells.
5. Stand-by emergency response duties for afterhours distribution system operational emergencies.
6. Drain, clean, disinfect, and maintain distribution reservoirs.

3.9 Cross-Connection Control Program

District 10 has an established cross-connection control program, which is run through the County of San Luis Obispo Environmental Health Department (SLOEHD). Jon Williams is a certified Cross-Connection Specialist who is in charge of the program. SLOEHD reviews the services on a routine basis and requires yearly testing of the backflow prevention devices installed in parks, industrial services, sewage treatment plants, and other services. New services are evaluated for backflow prevention device requirements.

Since the backflow devices are maintained by District 10, the backflow devices are tested each year when SLO-EHD sends a letter stating the backflow devices are due for the annual test. District 10 reported the following backflow prevention assemblies in 2012 Annual Report to the Division.

According to the 2016 EAR, District 10 is equipped with one backflow prevention device and the device was tested in 2016. All backflow prevention devices are to be tested and certified by a licensed Backflow Prevention Device Tester on an annual basis. District 10 needs to

ensure that all backflow prevention devices are tested annually and that all of the backflow prevention devices that fail are repaired or replaced.

3.10 Emergency Notification Plan

District 10A has an Emergency Notification Plan (ENP) dated January 7, 2016. The ENP lists Mark Chiaramonte, Chief Plant Operator; Charles Christian, Water Systems Chemist; and Dean Benedix, Utilities Division Manager as the primary contacts in the event of an emergency. The ENP shall be updated whenever necessary, although DDW recommends submitting the ENP on an annual basis to ensure that the information remains current.

3.11 Emergency Response Plan

District 10's most recent version of the Emergency Response Plan (ERP) was completed in June 2010. At any time District 10 updates their ERP, a copy should be provided to the Division. The ERP lists the priorities and corrective actions that will be undertaken in the event of emergencies such as major damage to system facilities, power failure, chlorination failure, water quality failure, water outage, pressure loss, etc. All consumers will be notified in the event of hazards. A list of contractors is maintained who will be contacted immediately for repairs. All damages and needed repairs will be recorded.

3.12 Bacteriological Sample Siting Plan (BSSP)

Based on the size of the population served and the number of service connections, District 10 is required to collect and analyze a minimum of two bacteriological samples per month from within the distribution system. District 10 has a Bacteriological Sample Siting Plan (BSSP) on file with the Division dated November 18, 2016, and entails the collection of two samples per month from the service line that ties to San Luis Obispo County Service Area District 10A – Cayucos. District 10 collects the samples in the first, third, and fifth week of the month. In the event of a routine distribution system total coliform bacteria positive sample, District 10 has identified repeat sample sites upstream and downstream for each of the site locations. The BSSP must be updated any time there is a change in the procedures used for bacteriological monitoring or at a minimum, once every ten years.

3.13 Complaints

District 10 maintains records of all complaints received and actions taken to correct the problems related to complaints. According to the 2016 EAR, there were no complaints reported by customers.

3.14 Consumer Confidence Report (CCR)

District 10 is required to distribute a CCR to each customer in their service area by July 1st of each year. A copy of the CCR for the year ending December 31, 2016 and the CCR certification form were submitted to the Division on May 16, 2017.

3.15 Electronic Annual Report (EAR)

The California Health and Safety Code Section 116530 states that all public water systems shall submit a technical report as required by the Division on an annual basis. The Division requires all water systems to submit the Electronic Annual Report (EAR) by March 31 of each

year for the previous year, detailing population served and number of service connections, water produced and used status of various monitoring requirements and operator certification, system improvements and other information. District 10 submitted the 2016 EAR on April 26, 2017, and the Division deemed the EAR complete. The 2017 EAR will be available in March 2018, and the 2017 EAR is not due until June 1, 2018.

IV. WATER QUALITY MONITORING

District 10 has two types of water quality monitoring requirements: source water and distribution system. The source water quality monitoring is collected from four active wells and the distribution system monitoring is collected from sample sites within the distribution system. The sampling requirements and frequencies for the two types of monitoring are discussed in the following sections:

3.1 Vulnerability Assessment for Sources

A Source Water Assessment Program (SWAP) for both active sources have been assessed. Copies of the SWAPs are one file at the Santa Barbara District office. The Division recommends that SWAPs be updated when changes are made to the source or changes to the surrounding area that have the potential to affect the water quality of the source. The active sources are considered most vulnerable to the following activities not associated with any detected contaminants:

Table 6: Possible Contaminating Activities

Source	Report Date	Possible Contaminating Activity
Whale Rock Reservoir	March 2003	Grazing [>5 large animals or equivalent per acre]
Whale Rock Well - CAWO	July 2002	Agricultural Drainage NPDES/WDR permitted discharges Salt Water Intrusion Sewer collection systems Wells - Agricultural/ Irrigation

3.2 Source Water Monitoring

For purposes of water quality monitoring, District 10 is classified as a community water system. This designation determines the chemical monitoring schedule for District 10. All source water quality monitoring compliance is based on the Division's Water Quality Inquiry (WQI) database. All chemical water quality monitoring from the sources must be submitted to the Division via electronic data transfer (EDT). In order for EDT to work properly, District 10 must identify the samples with the correct primary station code. The past water quality monitoring results for District 10 are included in the WQI database. A copy of the last sample results and next due monitoring schedule is included in Attachment B.

3.2.1 General Mineral and General Physical Monitoring Requirements

District 10 is required to monitor active groundwater sources for general mineral and general physical (GM/GP) once every three years and annually for surface water sources. A summary of the water quality analysis for general mineral and general physical monitoring is provided in Table 7 below:

Table 7: GM/GP Chemical Monitoring

Source	Whale Rock Reservoir			Whale Rock Well		
Chemical:	**Last Sample**	**Result**	**Sample Due**	**Last Sample**	**Result**	**Sample Due**
Bicarbonate Alkalinity (mg/L)	5/2/2017	251	**2018**	5/12/2015	403	**2018**
Calcium (mg/L)	5/2/2017	26	**2018**	5/12/2015	56	**2018**
Carbonate Alkalinity(mg/L)	5/2/2017	ND	**2018**	5/12/2015	ND	**2018**
Chloride (mg/L)	5/2/2017	6.6	**2018**	5/12/2015	45.8	**2018**
Color (units)	5/16/2017	8	**2018**	5/12/2015	2	**2018**
Copper (µg/L)	5/2/2017	ND	**2018**	5/12/2015	BD	**2018**
Foaming Agents [MBAS] (mg/L)	5/2/2017	ND	**2018**	5/12/2015	BD	**2018**
Total Hardness as $CaCO_3$ (mg/L)	5/2/2017	282	**2018**	5/12/2015	400	**2018**
Hydroxide Alkalinity (mg/L)	5/2/2017	ND	**2018**	5/12/2015	BD	**2018**
Iron (µg/L)	5/16/2017	49	**2018**	5/12/2015	12	**2018**
Magnesium (mg/L)	5/2/2017	53	**2018**	5/12/2015	62	**2018**
Manganese (µg/L)	5/16/2017	5.5	**2018**	5/12/2015	37	**2018**
Odor (TON)	5/16/2017	4	**2018**	5/12/2015	1	**2018**
pH	5/2/2017	8.1	**2018**	5/12/2015	7.7	**2018**
Silver (µg/L)	5/2/2017	ND	**2018**	5/12/2015	BD	**2018**
Sodium (mg/L)	5/2/2017	32	**2018**	5/12/2015	49	**2018**
Specific Conductance (µS)	5/2/2017	640	**2018**	5/12/2015	840	**2018**
Sulfate (mg/L)	5/2/2017	82.6	**2018**	5/12/2015	51.3	**2018**
Total Dissolved Solids (mg/L)	5/2/2017	380	**2018**	5/12/2015	510	**2018**
Turbidity (NTU)	5/16/2017	1.3	**2018**	5/12/2015	0.11	**2018**
Zinc (µg/L)	5/2/2017	ND	**2018**	5/12/2015	ND	**2018**

3.2.2 Inorganic Chemical Monitoring

Inorganic chemical monitoring is required every three years for active groundwater sources and annually for surface water sources. The tables below provide the information of the last sample, result and when the next sample is due.

Table 8: Inorganic Chemical Monitoring

Source	Whale Rock Reservoir			Whale Rock Well		
Chemical:	**Last Sample**	**Result**	**Sample Due**	**Last Sample**	**Result**	**Sample Due**
Aluminum (µg/L)	5/2/2017	76	**2018**	5/12/2015	ND	**2018**
Antimony (µg/L)	5/2/2017	ND	**2018**	5/12/2015	ND	**2018**
Arsenic (µg/L)	5/2/2017	ND	**2018**	5/12/2015	ND	**2018**
Barium (µg/L)	5/2/2017	ND	**2018**	5/12/2015	110	**2018**
Beryllium (µg/L)	5/2/2017	ND	**2018**	5/12/2015	ND	**2018**
Cadmium (µg/L)	5/2/2017	ND	**2018**	5/12/2015	ND	**2018**
Chromium, Total (µg/L)	5/2/2017	ND	**2018**	12/7/2016	ND	**2019**
Fluoride (mg/L)	5/2/2017	0.4	**2018**	5/12/2015	0.27	**2018**
Lead (µg/L)	5/2/2017	ND	**2018**	5/12/2015	ND	**2018**
Mercury (µg/L)	5/2/2017	ND	**2018**	5/12/2015	ND	**2018**
Nickel (µg/L)	5/2/2017	ND	**2018**	5/12/2015	ND	**2018**
Perchlorate (µg/L)	5/16/2017	ND	**2018**	5/3/2016	ND	**2019**
Selenium (µg/L)	5/2/2017	ND	**2018**	5/12/2015	ND	**2018**
Thallium (µg/L)	5/2/2017	ND	**2018**	5/12/2015	ND	**2018**

3.2.3 Nitrate and Nitrite

District 10 is required to monitor each active source (groundwater and surface water) for nitrate (as N) on an annual frequency. A sample result that is greater than one-half the nitrate MCL will trigger quarterly monitoring. The maximum contaminant level for nitrate (as N) is 10 milligrams per liter (mg/L). Table 9 lists the last nitrate sample (as N) result for each active source, along with the next sample due date.

Table 9: Last Results for Nitrate (as N)

Source	Last Sample	Result (mg/L)	Next Sample
Whale Rock Reservoir	5/5/2017	0.55	**2018**
Whale Rock Well	5/2/2017	1.5	**2018**

Nitrite (NO_2-) monitoring is required once every three years. The lab must quantify the results as nitrogen (N). The Whale Rock Reservoir and the Whale Rock Well were last sampled in May 2017 and May 2015, respectively. The results were both non-detect. As such, District 10 is next due for nitrite (as N) monitoring in 2020 for the Whale Rock Reservoir and in 2018 for the Whale Rock Well.

3.3 Volatile Organic Chemicals (VOC)

Monitoring for VOCs is required once every three years for surface water sources and once every six years for groundwater sources. The Whale Rock Reservoir was last sampled for VOCs in August 2016, and the results were all non-detect. The Whale Rock Well was last sampled for VOCs in August 2013, and the results were all non-detect. Both active sources are next due for VOC monitoring in 2019.

Table 10: Last Sample for VOC's

Source Name	Last Sample	Next Sample
Whale Rock Reservoir	8/2/2016	**2019**
Whale Rock Well	8/6/2013	**2019**

3.4 Synthetic Organic Chemicals (SOC)

Monitoring for SOCs without waivers must be sampled at a minimum of a 3-year frequency for groundwater sources, after initial monitoring has been completed. District 10 has completed the initial monitoring for SOCs, and is now on a 9-year monitoring frequency. Monitoring for SOCs at surface water sources is waived, with the exception of 1,2,3-Trichloroprone. District 10 last sampled for SOC's in August 2016, and the results were non-detect. District 10 is next due for SOC monitoring in 2025.

Table 11: Last Sample for SOC's

Source Name	Last Sample	Next Sample
Whale Rock Reservoir	N/A	**Waived**
Whale Rock Well	9/13/2016	**2025**

3.4.1 1,2,3-Trichloropropane (1,2,3-TCP)

1,2,3-TCP is a manufactured chemical that is found at industrial and hazardous waste sites. It is typically found in discharges related to cleaning and degreasing solvents and it is also associated with pesticide products. Groundwater wells that are located in agricultural areas

are, in particular, vulnerable to 1,2,3-TCP contamination. In 1999, the Division established a 0.005 µg/L drinking water notification level for 1,2,3–TCP. Notification levels are health-based advisory levels established by the Division for chemicals in drinking water that currently lack MCLs, but in the future will be regulatory candidates based on numerous source detections and potential for adverse health effects. 1,2,3-TCP is reasonably anticipated to be a human carcinogen based on sufficient evidence of carcinogenicity from various experimental studies of animals.

On December 14, 2017, the California regulation for 1,2,3-TCP became effective. The 1,2,3-TCP's MCL and DLR are both set at 0.005 µg/L or 5 ppt. The regulation requires public water systems to begin quarterly monitoring for 1,2,3-TCP in their drinking water sources in January of 2018. All water systems (community and non-transient non-community) need to begin quarterly monitoring of their sources, groundwater and surface water, in January, February or March 2018. All water systems need to complete four quarters of monitoring in 2018 unless a previous "grandfathered" request has been approved by DDW (explained below).

Water system compliance with 1,2,3-TCP is determined by the average of four consecutive quarterly samples. Results from groundwater samples collected during 2016 and 2017, using the laboratory method, SRL 524M analytical method, may be used to satisfy initial monitoring requirements ("grandfathered") based on a written request to DDW. Water systems may only substitute samples in like calendar quarters (e.g. Q2 2016 for Q2 2018) and only three out of the four quarterly samples may be substituted. Grandfathered data needs to be submitted to the Division via hardcopy with a written request.

Unless a grandfathered request has been approved by DDW, water systems need to sample all of their active sources by March 31, 2018 using the SRL 524M testing method, and quarterly for all of 2018. No distribution samples or treated water samples are required at this time. Water systems need to monitor standby sources once every three years for three consecutive cycles, before water systems may be reduced to monitoring once every nine years. The first round of monitoring for 1,2,3-TCP for standby sources is due by January 1, 2021.

District 10 monitored the Whale Rock Reservoir and the Whale Rock Well for 1,2,3-TCP on February 27, 2018, and both of the results where non-detect. **As such, the next quarterly monitoring for 1,2,3-TCP is due to be collected by June 30, 2018.**

3.5 Radiological Monitoring

Initial monitoring requirements under the California Radionuclide Rule consist of four consecutive quarters of sampling. If the first two quarterly sample results are less than the DLR of 3 pCi/L, the final two quarters may be waived. If the gross alpha (GA) activity is more than 5 pCi/L, uranium must be analyzed from the same sample and the analysis results for uranium may be used to obtain the total radium activity (gross-alpha – uranium = total radium). If the GA activity is below the DLR, the GA monitoring frequency is set to once every nine years. The MCL for GA is 15 pCi/L.

District 10 completed the initial monitoring and the subsequent monitoring frequency for GA is based on the most recent sample result. Table 12 lists the last sample result and the next sample due date for each active source.

Table 12: Radiological Monitoring

Source Name	Gross Alpha Monitoring Frequency	Last Sample	Gross Alpha Result (pCi/L)	Next Sample
Whale Rock Reservoir	Once Every 9 Years	3/1/2016	1.78	**2025**
Whale Rock Well	Once Every 9 Years	1/8/2013	2.42	**2022**

3.6 Bacteriological Monitoring – Raw Water

Because District 10 continuously chlorinates the Whale Rock Well – CAWO, District 10 is required to conduct quarterly bacteriological monitoring of raw well water. Additionally, District 10 is required to monitor the Whale Rock Reservoir on a monthly basis, prior to any treatment. The bacteriological samples must be collected at a location ahead of chloramination and shall be analyzed for total coliform and *E. coli* bacteria. All bacteriological monitoring shall be submitted directly to the Division by the 10th day of the following month. Table 13 summarizes the amount of results collected in 2017 that were positive for total coliform and/or *E. coli* bacteria.

Table 13: Positive Total Coliform and/or *E. coli* Bacteria Samples

Year/Month	1/17	2/17	3/17	4/17	5/17	6/17	7/17	8/17	9/17	10/17	11/17	12/17
Whale Rock Reservoir												
Total Samples	4	0	0	0	0	0	0	0	4	4	4	4
Total Coliform +	4								4	4	4	4
E. coli/Fecal +	4								1	2	2	3
Whale Rock Well – CAWO												
Total Samples	1	0	0	0	1	0	0	0	0	0	1	0
Total Coliform +	0				0						0	
E. coli/Fecal +	0				0						0	

3.7 Lead and Copper Rule Monitoring

District 10 completed the seventh triennial lead and copper sample tap monitoring on August 14, 2017. The 90th percentile lead and copper concentrations were 0.0058 mg/L and 0.62 mg/L, respectively. The next triennial monitoring for lead and copper is required to be collected between the summer months of June 1st and September 30th of 2020. The lead and copper samples are to be collected as first-flush samples from the tap. District 10 needs to submit the results to the Division by October 1, 2020. A summary of the lead and copper tap monitoring results is provided below.

Table 14: Historical Lead and Copper Rule Monitoring

Sample Type	Date	# of samples required	# of samples Taken	90% Lead (mg/L) AL = 0.015 mg/L	90% Copper (mg/L) AL = 1.3 mg/L
1st 6 month	10/1/1993	20	20	ND	1.07
2nd 6 month	3/1/1994	20	20	ND	1.01
1st Annual	8/1/1995	10	10	ND	0.80
2nd Annual	9/1/1996	10	10	ND	0.93
1st Triennial	9/1/199	10	10	ND	0.70
2nd Triennial	8/27/2002	10	10	ND	0.11
3rd Triennial	9/16/2005	10	10	ND	0.48
4th Triennial	8/13/2008	10	11	ND	0.56
5th Triennial	7/29/2011	10	10	ND	0.35
6th Triennial	8/13/2014	10	10	ND	0.18

Sample Type	Date	# of samples required	# of samples Taken	90% Lead (mg/L) AL = 0.015 mg/L	90% Copper (mg/L) AL = 1.3 mg/L
7th Triennial	8/14/2017	10	11	0.0058	0.62
8th Triennial	**10 Samples due in June, July, August, September 2020**				

3.8 Stage 2 Disinfection Byproduct Monitoring

Since continuous chlorination treatment is provided, District 10 is required to comply with the Disinfection Byproduct (DBP) Rule. The Stage 2 DBP Rule took effect on October 1, 2013. To comply with the Stage 2 DBP Rule monitoring requirements, District 10 is required to collect one sample per quarter for trihalomethanes (TTHM) and haloacetic acids (HAA5) from the Cemetery Road (CAY-05) sampling location. The results of Stage 2 DBP monitoring must be submitted to the Division via EDT. Table 15 summarizes the last monitoring completed for the Stage 2 DBPs. **District 10 is due to monitor for DBPs by May 31, 2018.**

Table 15: Last Results for Stage 2 DBP Monitoring.

PS Code	Sample Site Location	Sample Date	TTHM Result (µg/L)	HAA5 Result (µg/L)
4010025-008	Cemetery Road (CAY-05)	2/20/2018	33.1	5.4
Next monitoring due by May 31, 2018				

3.9 Maximum Residual Disinfection Level (MRDL)

District 10 needs to continue to submit the monthly system average chlorine residual to the Division on a quarterly basis. The Maximum Residual Disinfectant Level (MRDL) of 4.0 mg/L needs to be complied with based on a running annual average (RAA). The chlorine residual RAA is 1.47 mg/L.

V. SYSTEM APPRAISAL

The San Luis Obispo County Service Area 10 - Cayucos Water Treatment Plant (District 10) water supply facilities are in good sanitary condition and appear to be operating satisfactorily under competent supervision. District 10 has two active sources (Whale Rock Reservoir and Whale Rock Well – CAWO). The treatment facilities, distribution system, and storage reservoir are constructed in accordance with California Waterworks Standards.

VI. CONCLUSION AND RECOMMENDATIONS

The San Luis Obispo County Service Area District 10 – Cayucos Water Treatment Plant must address the following items that were noted during the 2018 inspection and a subsequent file review:

1. By **May 31, 2018**, District 10 is due to monitor for DBPs at the Cemetery Road (CAY-05) sampling location.

2. By **June 30, 2018**, District 10 needs to continue quarterly monitoring for 1,2,3-TCP at each active source using the SRL 524M testing method.

3. By **July 1, 2018**, District 10 needs to compile an inventory of known lead user service lines in use in its distribution system and identify areas that may have lead user service lines in use in its distribution.

4. By **July 31, 2018**, District 10 needs to repair the baffle connection on the outside of the storage reservoir and submit photo documentation to the Division of the repair. The baffle connection was corroded and could pose a potential cause of contamination.

Report By: Jason Cunningham, E.I.T.
Water Resource Control Engineer

Attachment A: SLO CWD Map and Inspection Photos – March 28, 2018
Attachment B: Last Sample/ Next Due Monitoring Schedule

ATTACHMENT A

Nipomo CSD Map and Inspection Photos – February 15, 2018

ATTACHMENT B

Last Sample/ Next Due Monitoring Schedule