

2023 Annual GCSD Report

GUALALA COMMUNITY SERVICES DISTRICT

2023

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Introduction

The Gualala Wastewater facility is maintained and operated by the Gualala Community Services District (GCSD). The wastewater plant receives its water from the town of Gualala, California and from north end of Sea Ranch, California. The collection system for the town of Gualala is a unique system known as a Septic Step System. This system utilizes septic tanks, which collect the domestic wastewater from the homes and businesses. The solids settle in the septic tank and the effluent water that remains on top is either pumped out or leaves the tank by gravity to four sewer lift stations. The main lift station is LS#4, which consists of five pumps (two low flow pumps and three high flow pumps) that pump the wastewater to the treatment facility. The domestic wastewater from the North end of Sea Ranch is collected in a traditional sewer collection system and flows to their North Treatment Plant (CSA6). From there it is stored in an aerated lagoon and is then pumped to the Gualala Wastewater facility for further treatment.

The Gualala treatment facility utilizes the Extended Aeration process to treat its wastewater. After the wastewater is initially treated the wastewater goes through a tertiary treatment process in order to meet Title 22 requirements set forth by the State Water Resources Control Board (SWRCB). After this process the treated water is then stored in four storage ponds (three at the Gualala Wastewater facility and one located at CSA6 in Sea Ranch), combined there is a maximum capacity of 28.4 million gallons of water storage. This stored water is then sent to the Sea Ranch Golf Links for irrigation on the golf course.

GCSD renewed its WDR permit in April 2022 (WDID No. 1B89005RMEN). The GCSD now has a Master Reclamation permit. The new permit eliminated the WDR permits for The Sea Ranch Golf Links and Sonoma County Water Agency. All of the tertiary treated effluent is used for irrigation on the SRGL.

Operations

a. Influent Treatment

Traditionally there is a preliminary treatment process before the influent enters the wastewater plant, but because GCSD utilizes a step collection system there is no need for a pretreatment process. However, the raw influent that enters the North Treatment Plant (CSA6) located in the North Sea Ranch uses of a comminutor and a manual bar screen for preliminary treatment. This is done in order to remove non-organic material from the wastewater stream, which can include rags, grease, and other material that if allowed to continue downstream would cause damage to equipment necessary for various other treatment processes. The table on the following page shows the average BOD (Biochemical Oxygen Demand), TSS (Total Suspended Solids), and combined Influent flows from both the town of Gualala and from CSA6. BOD is the amount of dissolved oxygen needed (i.e., demanded) by aerobic biological organisms to break down organic material present in a given water sample at certain temperature over a specific time period. It also shows the total flow our WWTP receives from both locations.

A summary of the average influent flows, TSS, and BOD for the past three years is listed in the table below:

Year	2021	2022	2023
Influent Flow (Mean Monthly Avg.), MG	2.11	1.82	2.35
Influent TSS, (Monthly Avg.) mg/l	61	73	49
Influent BOD, (Monthly Avg.) mg/l	168	148	185
Total Annual Flow, MG (Million Gallons)	25.29	21.96	28.25

In 2023 the plant operated at an average dry weather total flow of 1.91 MGD (Million Gallons a Day), and during the wet weather the plant experienced total flow of 2.79 MGD from both Gualala and the North Treatment plant at Sea Ranch.

b. Effluent Treatment

In an Extended Aeration process the influent from the collection system is mixed with Returned Activated Sludge (RAS) in an aeration basin. When RAS is mixed with the collection system flow it becomes Mixed Liquor or MLSS (Mixed Liquor Suspended Solids). The aeration basin is then mixed, and Dissolved oxygen is added to allow the microorganisms to multiply and feed. This process allows the microorganisms to breakdown the waste. In the next process the wastewater enters a mixing chamber, where coagulate is added to the wastewater before it enters two secondary clarifiers. Clarifiers allow the separation of heavy sludge and lighter sludge that floats. The lighter sludger is skimmed off the surface and collected then returned back into the aeration basin. The coagulate attaches itself to the heavier sludge and allows this sludge to settle more efficiently in the clarifiers. This sludge is either returned to the aeration basin or is wasted to a sludge holding basin.

The water that flows from the clarifier to the filters is considered secondary treated wastewater. GCSD treats its wastewater further through a process known as Tertiary treatment, so it can meet Title 22 standards. These standards are put in place by the state of California and must be met before the wastewater can be used for irrigation on the Sea Ranch Golf Links. The following section explains the advanced steps of wastewater treatment known as tertiary treatment.

c. Tertiary Treatment

After the wastewater leaves the clarifiers, it flows to either a Sand Traveling Bridge Filter or a Nova Disc Filter. Title 22 requirements state that the clarity of the wastewater must be lower than 2.0 NTU's (Nephelometric Turbidity Unit). The clarity of the water must be clean enough to allow bacteria and viruses to come into contact with chlorine. The table on the next page shows that GCSD effluent turbidity levels are well below State requirements of 2.0 NTU's.

Year	2021	2022	2023
Effluent Daily NTU Avg.	.61	.65	.74

As the wastewater leaves the filter it enters the Chlorine Contact Chamber (CCC). As the name implies Chlorine is added to the chamber in order to disinfect the wastewater. The purpose of the CCC is to neutralize viruses and kill any bacteria that may still be in the water. Our current contact time is 210 minutes. This contact time well exceeds the State requirement for disinfection, which is 90 minutes. Our state requirements are to maintain an average chlorine residual of at least 1.5 mg/l. The table below shows the monthly average for chlorine residual for the past three years.

Year	2021	2022	2023
Effluent Chlorine Residual Daily Avg.	3.67	3.43	3.39

After the wastewater leaves the CCC it is disbursed into three storage ponds located at the GCSD wastewater facility and a storage pond located at the North Treatment Plant (CSA6). It is then transferred to two holding ponds located at the Sea Ranch Golf Links where it is then pumped into the irrigation system to irrigate the golf course. The new WDR requirements requires us to maintain a Contact Time (CT) Value of 450 Mg-min/L. For the calendar year 2023 our CT value maintained an average of 1235.91, which well exceeded the state requirement.

The new WDR order also requires us to monitor and sample for Total Dissolved Solids (TDS), Nitrite, Chloride, Sodium, and Boron when discharging from the storage ponds located at the SRGL. The monthly averages for 2023 are shown in the table below:

Total Dissolved Solids (TDS)	Nitrite N mg/L	Chloride mg/L	Sodium mg/L	Boron mg/L
283	<0.40	83	64	0

d. Solids Handling

The sludge that settles to the bottom of the clarifier is either returned back to the aeration basin or is wasted to the sludge holding basin. When the sludge is wasted it becomes Waste Activated Sludge (WAS). WAS is the excess quantity measured in mg/l of microorganisms that must be removed in order to maintain a biological balance within the system. The WAS is stored during the winter months and is discharged to the sludge drying bed in the dry months. It was past practice to bury the sludge onsite once it was dry enough, but GCSD is no longer burying its sludge onsite and is currently storing until a landfill is found that will accept our Biosolids.

Laboratory Analysis

Because of the location of GCSD and its WWTP all reportable lab analysis is sent to Brelje, and Race Laboratories located in Santa Rosa. GCSD has to meet certain criteria in order to meet the State requirements. The table on the following page shows what GCSD currently has to test for and the parameters we cannot exceed:

Constituent	30-day Avg.	7-day Avg.	Monthly Median	Daily Maximum
BOD	10 mg/l	15 mg/l	N/A	20 mg/l
TSS	10 mg/l	15 mg/l	N/A	20 mg/l
Total Coliform	N/A	N/A	2.2 MPN/100 ml	23 MPN/100 ml
Turbidity	2.0 NTU *	N/A	N/A	5 NTU
Chlorine Residual	1.5 mg/l *	N/A	N/A	N/A

*Daily Average and is monitored onsite.

Chemicals

Chemicals are used for a variety of treatment processes. Because of the small size of GCSD and its WWTP, GCSD utilizes only three chemicals, which are as follows:

1. Sodium Hypochlorite (Liquid Chlorine) .8 % - This is used for disinfection purposes in the Chlorine Contact Chamber. Title 22 requires that treated wastewater have a residual on a 30-day average with a minimum 1.5 mg/l. Liquid Chlorine is generated on-site beginning in May 2020.
2. JC- 1679 (Coagulate) – Coagulate is used before the wastewater enters the clarifiers to assist in the settling capabilities of the sludge.

Maintenance

The WWTP personnel performs a variety of scheduled, preventative, predictive, and breakdown maintenance on variety of equipment. The main goal of our maintenance plan is to ensure our equipment meets plant process requirements. The maintenance plan minimizes call outs, reduces the need for overtime, and greatly reduces the potential for discharge violations due to mechanical failure.

With the process of issuing a new WDR permit GCSD became aware that we are not meeting current Title 22 standards and had to install and implement new processes and equipment. With these latest changes an updated maintenance plan will be implemented. Some of the additional items that have been implemented are as follows:

3. Complete SCADA system upgrade (completed in May 2018).
4. Adding additional alarms required for current Title 22 standards (completed in the SCADA upgrade).
5. Adding redundancy to certain processes required by Title 22 standards (completed in the SCADA upgrade).
6. New VFD controls for the WAS/RAS pumps (completed in the SCADA upgrade).

7. Remove the surface aerator in the aeration basin and replace the aerator with an Aqua DDM mixer (completed in February 2018).
8. Replacing the influent and effluent flow meters, added a flow meter upstream of the Sand filter, and replaced the RAS/WAS flow meter (completed in February 2018).
9. Add flow paced dosage control for both the chlorine and coagulate (completed in the SCADA upgrade).
10. Adding flow control on SCADA for effluent discharge to the golf course (completed in the SCADA upgrade).
11. Updated the alarm notification program (completed in the SCADA upgrade).
12. Completed a complete rehab of Clarifier #1 (completed in October 2019).
13. Completed epoxy lining on Lift Stations #1, #2, and #3 (completed in May 2019).
14. Installation of an onsite chlorine generation (completed in May 2020).
15. Planning Grant- WWTP Title 22 Upgrade and Collection System Rehab (Completed 2022).
16. Construction Grant- WWTP Title 22 Upgrade and Collection System rehab (In Process 2022).
17. Replaced control panel at Lift Station #2 (Completed 2022).
18. Sodium Bicarbonate – This is added periodically to the aeration basin for PH control.

Staffing and Training

GCSD employs 5 individuals, which consists of the District Manager/ Chief Plant Operator, Operations Supervisor (Grade 2), one Grade 1 Operator, a Finance Director, and an Admin Assistant. GCSD has an extensive training program that allows its employees to expand their abilities and knowledge, which results in better service not only to GCSD but to the public as well. Throughout the year GCSD staff is encouraged to attend various training seminars that cover the following topics:

1. Accident, Reporting, and Incident procedures
2. Confined Space
3. Fall Protection
4. Sexual Harassment
5. Chemical and Fire Safety
6. Septic Tank Inspections
7. Test preparation for the State Wastewater License

Sanitary Sewer Overflows (SSO)/ Violations

There were no SSO in 2023.

Certification of Report

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including fine and imprisonment for withholding information regarding permit violations.

If you have any questions or need additional information, please feel free to contact me via email at ctroyan@gualalacsd.org or gcsdplant@gmail.com. If you would like to call instead of communicating by email my office number is (707) 785-2331.

Sincerely,



Chris Troyan

General Manager/CPO – WW Grade V #28295

Gualala Community Services District

Appendix A Meter Calibration Reports

Gualala Influent Flow Meter

See Attachment

Influent Filter Flow Meter

See Attachment

Effluent Flow Meter

See Attachment

CSA6 Influent Flow Meter

See Attachment

Appendix B Performance Data and Charts

2023	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
GCS D Inf.-MG	1.721	.9350	1.581	.9330	.7070	.6300	.7600	.7400	.6600	.6670	.6820	.9850
Eff Comb.-MG	0	0	0	1.070	3.409	4.314	7.016	5.999	3.427	.7792	.6608	.1195
CSA6 Inf-MG	3.276	1.7186	2.0760	1.8285	.9097	1.306	1.2009	.8361	.9636	.8213	.9682	1.3554
Coliform-mg/l	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
BOD-mg/l	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TSS-mg/l	1.7	1.5	1.8	4.8	5.5	4.2	1.3	1.8	1.0	<1.0	<1.0	<1.0
Chlorine-mg/l	4.15	3.68	3.21	3.13	2.76	3.03	3.22	3.56	3.48	3.35	3.42	3.69
Turbidity-NTU	.793	.769	.737	1.427	1.323	1.097	.312	.493	.418	.935	.309	.275
Rain-inches	15.1	5.05	13.97	1.97	1.65	0	0	0	.61	1.33	2.90	10.96
CT Value	854.91	1086.87	819.68	1033.88	1576.43	1081.37	1262.60	1613.95	1324.44	1381.79	1491.72	1303.22
Ammonia Eff.-mg/l	<0.20	<0.20		.6	.2		.2	.3		.3	<0.20	<0.20
TON Eff.-mg/l	1	<0.40		<0.40	6		<0.40	<0.40		<0.40	<0.40	.40
TKN Eff.-mg/l	1.1	<0.40		<0.40	.8		<0.40	<0.40		<0.40	<0.40	<0.40
Nitrite Eff.-mg/l	<0.40	<0.40		<0.40	<0.40		<0.40	<0.40		<0.40	<0.40	<0.40
Nitrate Eff.-mg/l	17	32		26	43		42	49		47	48	52
Perc Pond-MG	0	0	4.6148	0	0	0	0	0	0	0	0	0

