GOLETA SANITARY
Water Resource Recovery District

Board of Directors:

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Steve D. Wagner, PE
General Manager
District Engineer

January 14, 2022

California Regional Water Quality Control Board
Central Coast Region
Attn: Monitoring and Reporting Review Section
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401

Facility Name:	Goleta Sanitary District
Address:	One William Moffett Place Goleta, CA 93117
Contact Person: **Job Title:** **Phone Number:**	John Crisman Operations Manager 805-967-4519
WDR/NPDES Order Number: **WDID Number:**	**R3-2017-0021** 3 420102002

Type of Report (circle one)**:** **Monthly** **Quarterly** **Semi-Annual** (**Annual**)

Month(s) (circle applicable months*)**:** (**JAN**) **FEB** **MAR** **APR** **MAY** **JUN** **JUL** **AUG** **SEP** **OCT** **NOV** **DEC**

***Annual Reports** (circle the first month of the reporting period)

Year: 2021

Violation(s) (Place an X by the appropriate choice)**:** **X** **No** (there are no violations to report) ____ **Yes**

If Yes is marked (complete a-g):

a) Parameter(s) in Violation: _____

b) Section(s) of Order No. R3-2017-0021 Violated: _____

c) Reported Value(s): _____

d) Order No. R3-2017-0021 Limit/Condition: _____

One William Moffett Place, Goleta CA 93117
(805) 967-4519 office (805) 964-3583 fax
www.GoletaSanitary.org

GOLETA SANITARY
Water Resource Recovery District

e) Dates of Violation(s):
(reference page of report/data sheet) _____

f) Explanation of Cause(s):
(attach additional information as needed) _____

g) Corrective Action(s):
(attach additional information as needed) _____

COMMENTS

In accordance with the Standard Provisions and Reporting Requirements, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision following a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my knowledge of the person(s) who manage the system, or those directly responsible for data gathering, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

If you have any questions or require additional information, please contact me at the number provided below.

Sincerely,

Steve Wagner

Name: Steve D. Wagner, P.E.

Title: General Manager / District Engineer

Enclosure

cc: Mr. Chris Borges, Goleta Water District
Mr. Jeff Densmore, State Water Resources Control Board, Drinking Water Division
Mr. Mark Nation, Goleta West Sanitary District

Prepared By: Lena Cox

Reviewed By: _____

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WATER RECLAMATION FACILITIES ANNUAL SUMMARY OF OPERATIONS

GOLETA SANITARY DISTRICT WATER RECLAMATION 2021 ANNUAL REPORT

GOLETA SANITARY
Water Resource Recovery District

"Protecting Public Health and the Environment"

Submitted: January 2022

"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 that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

John Crisman
Operations Manager
Goleta Sanitary District

Date: January 14, 2022

LIST OF TABLES

LIST OF GRAPHS

INTRODUCTION

The Goleta Sanitary District owns and operates a wastewater treatment facility located at One William Moffett Place in the unincorporated Goleta area of Santa Barbara County. In 1992, the District expanded its treatment plant to include water reclamation facilities with the capacity to treat up to 3.3 million gallons per day of secondary treated effluent to tertiary standards. Reclaimed water distribution to the Goleta community began in August 1994. Reclaimed water is available to the community for unrestricted recreational uses such as landscape irrigation. In addition to incidental uses that include construction dust control, compaction and irrigation of landscaping at the wastewater treatment plant; the reclaimed water is used in the restroom facilities at the United States Postal Service, Goleta Beach County Park and on one floor of the Bren Building at UCSB.

The Goleta Sanitary District (GSD) is responsible for the production and on-site storage of the reclaimed water. The Goleta Water District independently owns and operates a reclaimed water distribution system used to deliver the reclaimed water to the reclamation customer sites. The Goleta Water District is regulated under separate water reclamation requirements.

Goleta Sanitary District produces reclaimed water in accordance with the monitoring and reporting requirements stipulated in the California Regional Water Quality Control Board, Central Coast Region, Waste Discharge Requirements Order No. R3-2017-0021. The prior Monitoring and Reporting Program No. 91-03 was terminated on December 13, 2019 by Order No. R3-2019-099.

This annual report contains summaries of the monitoring data obtained throughout 2021 and discusses the District's compliance record regarding the operation of the reclamation facility.

FACILITY OPERATION

The wastewater treatment plant upgrade project to full secondary treatment was completed in 2013. Although the upgraded facility did not include the construction of any new reclamation facilities, full secondary treatment could allow for an expansion of the reclamation facilities in the future. The reclamation facility is designed to treat up to 3.3 million gallons per day of secondary effluent to tertiary standards.

Secondary effluent enters the reclamation facilities where a flash mixer disperses aluminum sulfate (alum) and polymer into the water. The flocculated secondary effluent is then gravity filtered through a bed of anthracite coal where the floc is removed. The filtered water then flows to a chlorine contact tank where sodium hypochlorite is added for disinfection.

The chlorinated filtered water is then stored in an underground 3 million-gallon storage tank until distribution. Reclaimed water is distributed throughout the Goleta Valley by a distribution system operated and maintained by the Goleta Water District.

FACILITY MAINTENANCE

A number of maintenance repairs were performed on the reclamation facility equipment during 2021. Repairs can be expected to increase as the facility ages. The following is a list of the equipment that was repaired or replaced during 2021:

- Communications equipment and controls for telemetry were upgraded and updated.

- The filter control gallery ventilations fans were replaced.

- A comprehensive filter surveillance was completed and it was determined that the filter media is in excellent condition and of sufficient volume.

- Dosing pumps were replaced to match the new dosing requirements determined by the filter surveillance.

- New chemical injection points were added to the existing system.

- Sodium hypochlorite chemical feed lines were replaced from the metering pumps to the chlorine contact tank.

A facility operation and maintenance manual specifically for the reclamation facilities was supplied as part of the original project by the facility design engineers and is dated March 1993. There have been no significant changes to the operation or maintenance requirements of the facility and the manual continues to be current and valid with regards to this facility.

STAFF

Mr. Steve D. Wagner, PE, served as GSD's General Manager and District Engineer during 2021. The General Manager is responsible for overall operations and performance of the treatment plant.

Ten state certified operators, operated the reclamation facility under the direction of the Plant Operations Manager, Mr. John Crisman. The Plant Operations Manager also supervises the treatment plant's industrial waste staff. Chuck Smolnikar supervises the reclamation facility's maintenance staff and the laboratory staff and laboratory operations are under the direction of Lena Cox, the Laboratory Manager. The grade and certification number of operations, maintenance, environmental compliance and laboratory personnel, employed during the 2021 operational year, are shown in Table 1.

TABLE 1. Goleta Sanitary District Operation Staff, 2021

Staff	Grade	California Certification No.
Operators		
John Crisman	V	28857
Matthew Hayden	V	43906
Pete Regis	IV	28277
Stephen Conklin	III	7065
Ricardo Lopez	III	10756
Francisco M. Lemus	III	10893
Morgan Lea	III	28400
Jes Hulbert	I	28266
River Ferrara	I	28488
Justin Graves	I	43450
Bronson Thomas	OIT-I	Issued 2/3/2020
Lab Analysts		
Lena Cox	IV	90334003
Matthew Hayden	II	1308217625
Teresa Kistner	I	99076111
River Ferrara	I	1308214257
John Crisman	I	1308214787
Justin Graves	I	1308219530
Maintenance Technologist		
Alejandro Bautista	III	1308216605
Torrey Jones	I	1308217681
Electrical / Instrumentation		
Charles Smolnikar	II	60172004
Ramon Garza	II	1308216032
Dept. of Industrial Relations – Electrician		
Charles Smolnikar	NA	107709
Ramon Garza	NA	160174
Environmental Compliance		
Teresa Kistner	IV	1308218096
Biosolids Land Application Management		
Lena Cox	I	70711001

MONITORING PROGRAM

The Goleta Sanitary District monitoring and reporting program was conducted in accordance with the requirements of Order No. R3-2017-0021. Reclaimed water samples were collected by treatment plant personnel and analyses were performed for routine parameters by the Goleta Sanitary District's certified in-house laboratory. Metals and priority pollutant samples were analyzed by commercial environmental laboratories: OEC of Santa Maria, CA and the dioxin sample analysis was performed by Ceres Analytical of El Dorado Hills, CA. All samples were collected and all analyses were performed according to conditions specified in Table 2.

Analytical methodologies used by GSD, OEC and Ceres laboratories are based on approved U.S. Environmental Protection Agency (EPA) methods and other methods found in Standard Methods for the Examination of Water and Wastewater.

TABLE 2. Reclaimed Water Sampling Plan

Parameter	Frequency	Analytical Lab	Sample Type	Standard Method
Turbidity	Continuous	GSD	Metered	2130 B.
Chlorine Residual	Continuous	GSD	Metered	4500-Cl G.
Total Coliform	Daily	GSD	Grab	9223 B.
pH	Daily	GSD	Grab	4500-H+ B.
BOD	Monthly	GSD	24 hr Comp	5210 B.
TSS	5 days/week	GSD	24 hr Comp	2540 D.
TDS	Quarterly	GSD	24 hr Comp	2540 C.
Cadmium	Semi-annually	OEC	24 hr Comp	EPA 200.8
Lead	Semi-annually	OEC	24 hr Comp	EPA 200.8
Priority Pollutants	Annually	OEC Ceres	24 hr Comp & Grab	Various

RECLAIMED WATER CHARACTERIZATION

Results of the reclaimed water chemical analyses used to monitor proper operation of the reclamation facility during 2021 are presented in Table 3. All monthly averaged data presented in this table are calculated from daily values with the exception of the monthly values for total coliform, which are reported as monthly averages of the 7-day median values. Permit limits if applicable are also shown in Table 3. Graphical summaries of the reclaimed water flows and results of chemical analyses are presented in Graphs 1 through 6.

TABLE 3. Monthly Average Reclamation Parameters, 2021

GOLETA SANITARY DISTRICT WASTEWATER LABORATORY
2021 MONTHLY AVERAGES
RECLAMATION FACILITIES

MONTH	Total Monthly Volume Filtered gallons	Average Monthly Volume Filtered gallons	Turbidity Daily Maximum NTU	Turbidity Daily Average NTU	Total Suspended Solids mg/L	BOD mg/L	pH units	Total Coliform MPN per 100 mL	Contact Time Average mg-min/L	Contact Time Minimum mg-min/L	Total Dissolved Solids mg/L	Cadmium mg/L	Lead mg/L
Jan													
Feb													
Mar	25,472,599	979,715	1.19	0.62	1.7	3.5	7.3	< 1.0	2,504	1,946	1,208		
Apr	36,237,883	1,207,929	1.62	0.62	2.6	13.6	7.2	1.3	1,523	1,151	1,154	< 0.00050	< 0.00050
May	41,982,619	1,354,278	1.85	0.70	4.1	10.4	7.1	< 1.0	1,318	1,001			
Jun	42,540,521	1,418,017	1.15	0.62	2.0	8.0	7.3	2.5	1,220	957			
Jul	47,473,683	1,531,409	0.83	0.57	1.1	5.9	7.4	3.0	1,279	1,073	1,160		
Aug	43,800,075	1,412,906	0.71	0.51	1.3	7.4	7.3	8.2	1,400	1,075			
Sep	35,543,848	1,184,795	0.79	0.59	1.3	3.1	7.3	10.6	1,749	1,394			
Oct	26,287,105	1,011,043	0.91	0.62	1.8	7.4	7.3	17.6	1,853	1,398	1,082	< 0.00050	< 0.00050
Nov	22,919,381	916,775	1.30	1.11	2.2	5.6	7.4	1.8	2,379	2,012			
Dec	16,136,204	1,241,246	2.51	1.62	1.9	4.5	7.5	12.9	1,619	1,314			
Total	338,393,919												
Average		1,225,811	1.29	0.76	2.0	6.9	7.3	6.0	1,684	1,332	1,151	< 0.00050	< 0.00050
NPDES Limit		3,300,000	5	2	10	10		2.2	> or = 450	> or = 450	1,500	0.01	5

Treatment Flow

A total of 338 million gallons of secondary effluent was filtered through the reclamation facility during 2021. Demand for reclaimed water increased dramatically from the time the treatment plant was first put on-line in 1994 and continued to increase until 1997 when the Goleta Water District completed construction of the current distribution system. Since then, the amount of reclaimed water produced by the Goleta Sanitary District has remained somewhat constant.

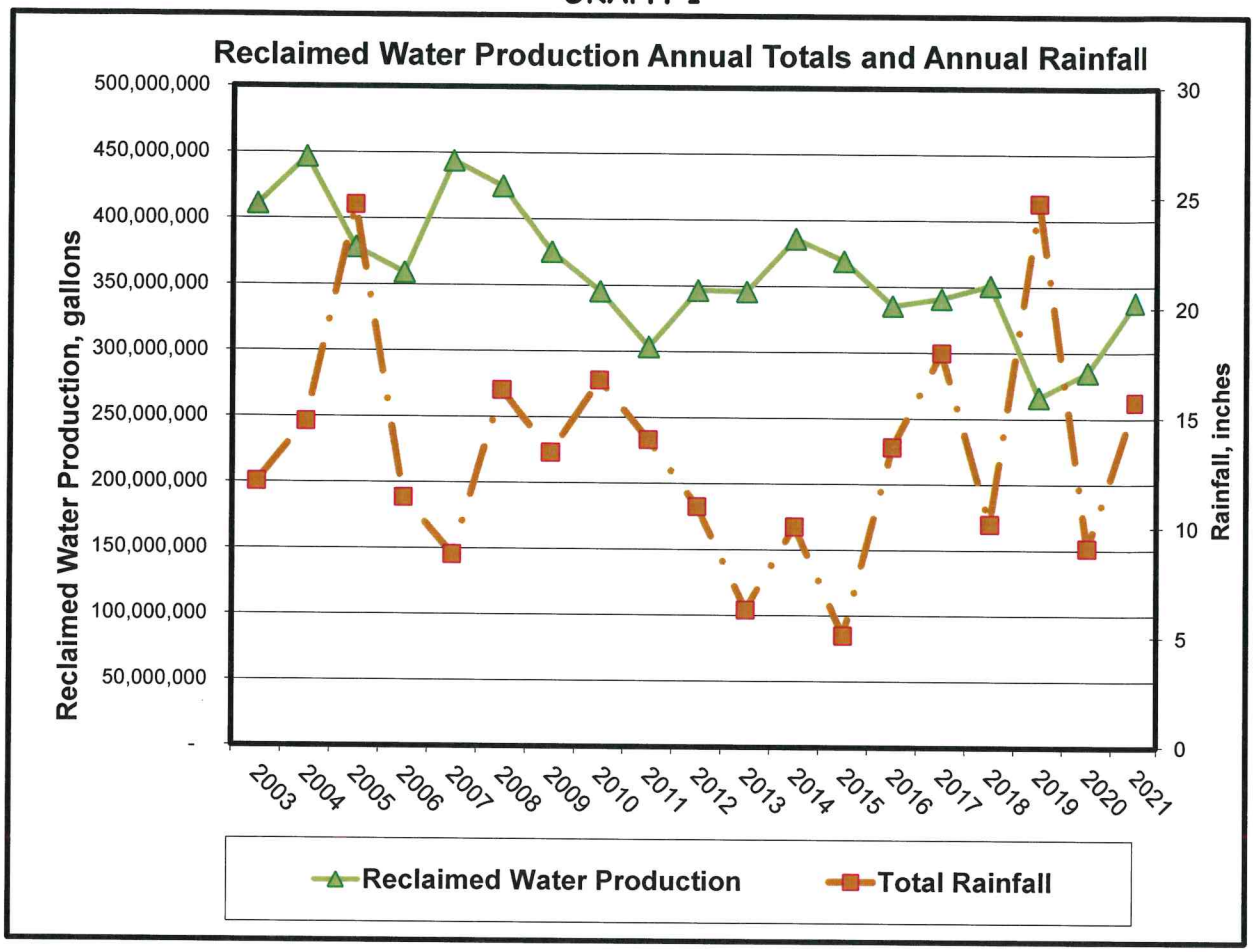
As shown in Table 4, and Graph 1, the volume of reclaimed water produced during 2021 is typical of the amount since the distribution system was expanded in 1997. The average annual amount produced over the 25 years is 357 million gallons, approximately 6% more than what was produced during 2021.

Table 4. Annual Total Reclaimed Water Production, 1996 – 2021		
Year	**Production, gallons**	**Rainfall, inches**
1996	109,112,000	23.2
1997	385,753,500	10.0
1998	329,447,300	37.7
1999	421,075,600	8.3
2000	406,875,900	19.8
2001	334,096,500	25.1
2002	445,230,100	12.3
2003	411,137,500	12.0
2004	446,849,300	14.8
2005	378,554,300	24.6
2006	359,285,400	11.3
2007	443,866,170	8.7
2008	424,763,757	16.2
2009	375,384,904	13.4
2010	345,683,190	16.7
2011	303,619,600	14.0
2012	346,706,200	11.0
2013	346,046,100	6.3
2014	386,142,088	10.1
2015	369,363,600	5.1
2016	335,564,700	13.7
2017	341,084,200	18.4
2018	351,056,869	10.2
2019	266,265,434	24.8
2020	285,357,966	9.1
2021	338,393,919	15.8

Although there was a rainfall increase during 2021 compared to the previous year, the volume of water produced was approximately 53 million gallons more than 2020. As seen in Table 4, the reclaimed water production peaked in 2004 and 2007 then declined every year until 2012 where it stabilized. In general, the amount of reclaimed water produced each year can be loosely correlated with the amount of total rainfall. Under this observation and due to the drought conditions since 2006, the amount of rainfall will be a significant factor in reclaimed water production for 2021. The relationship between the reclaimed water demand and annual rainfall is demonstrated in Graph 1.

Graph 1 shows the total annual reclaimed water production and the total annual rainfall in the Goleta Valley as measured at the wastewater treatment plant rain gauge. In general, as the total precipitation increases, the amount of reclaimed water needed in the community for landscape irrigation decreases. However, the community has increased water conservation practices in response to the continued drought conditions.

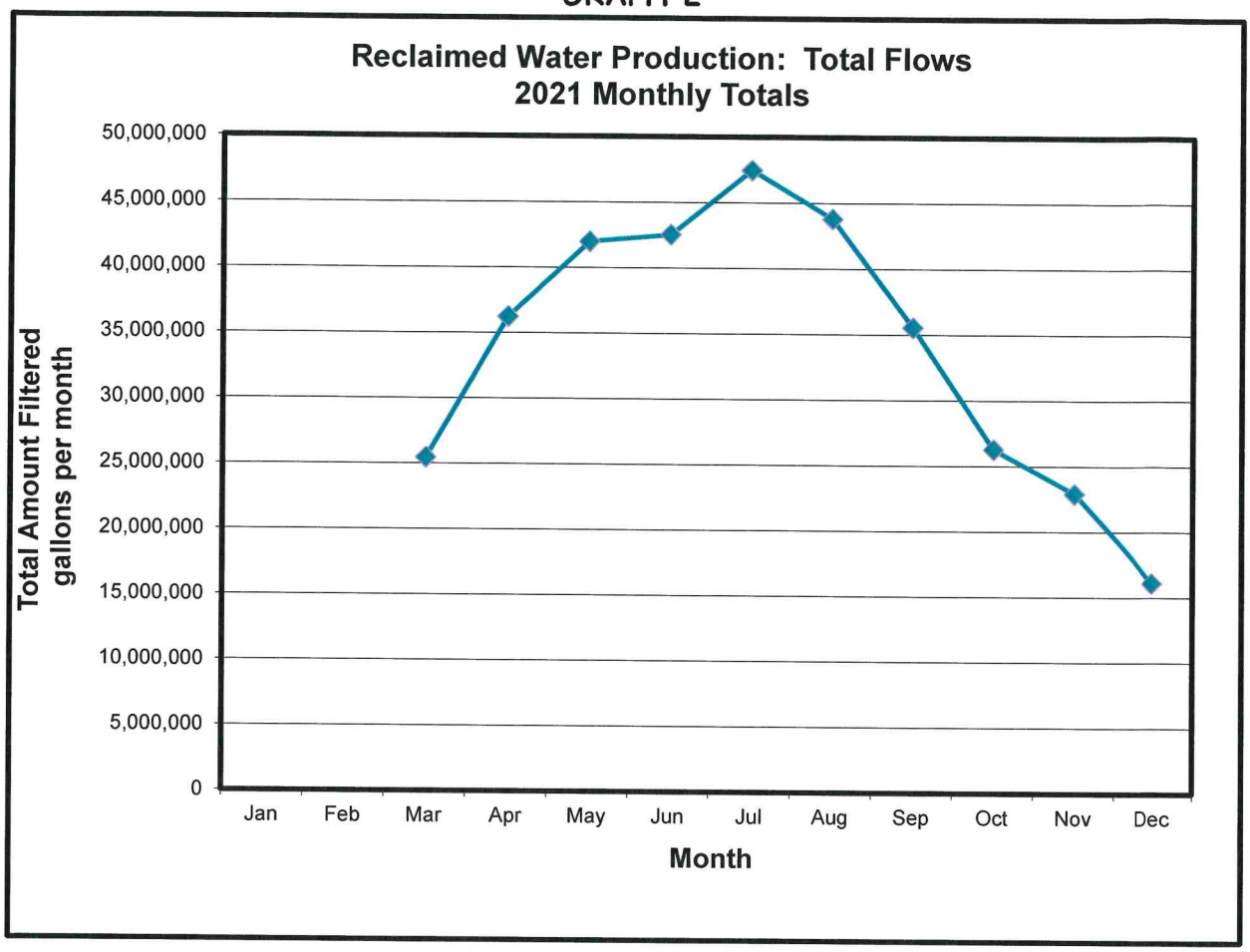
GRAPH 1



Higher volumes of reclaimed water are produced during the dry summer months when the reclaimed water demand for irrigation is greatest due to the lack of rainfall and hotter weather patterns. During 2021, the maximum reclaimed water production occurred in July, when over 47 million gallons were produced. The lowest months for reclaimed water production occurred during November and December. An increase in production occurred during April through September to meet the demand.

With the drop in daytime temperatures during the fall and winter and the occasional rainstorm, the production of reclaimed water tends to decrease throughout the fall. Graph 2 illustrates the variations in the total amount of reclaimed water produced each month. These variations are due to fluctuations in landscape irrigation demands throughout the year with the greatest demands occurring during the dry summer months.

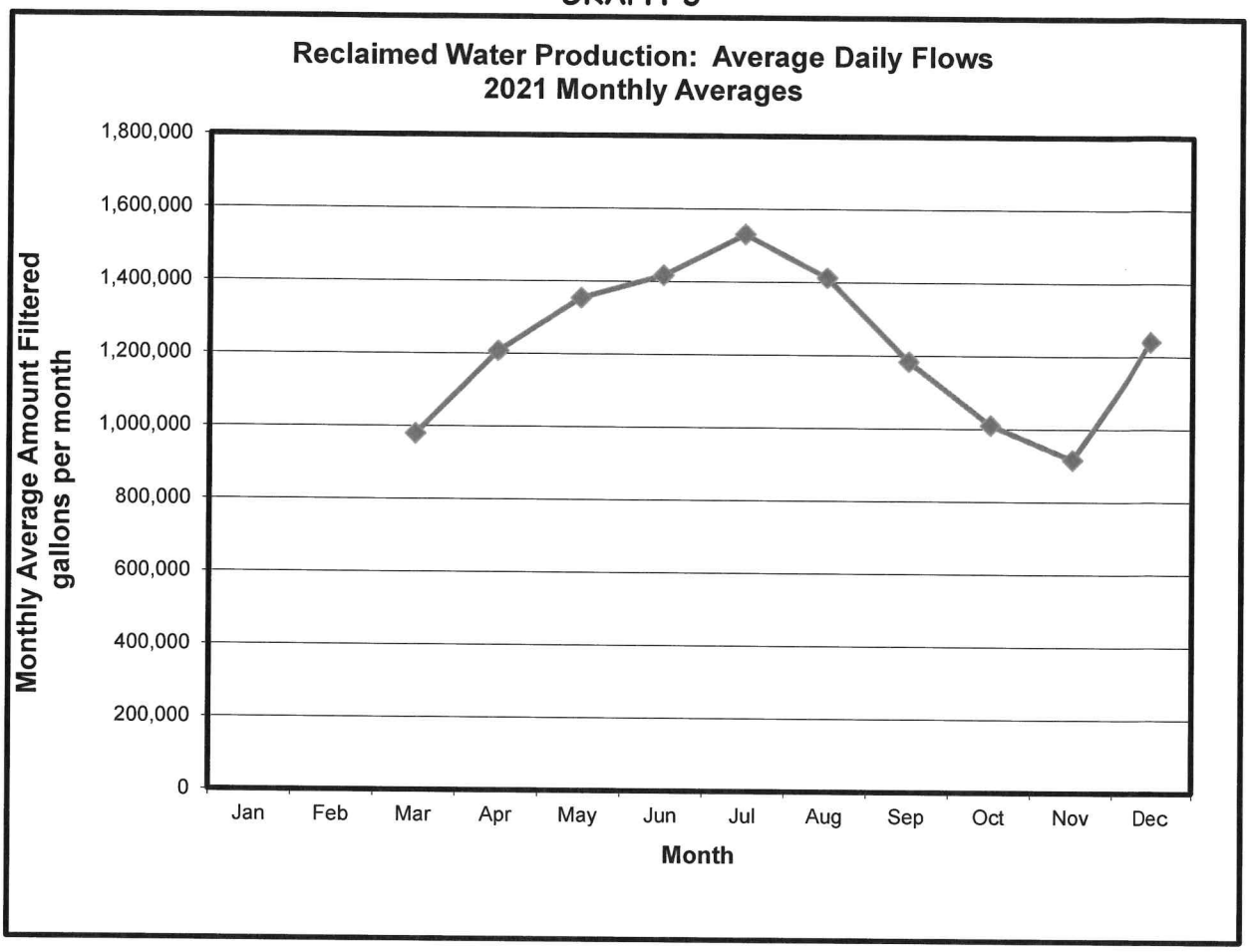
GRAPH 2



The high for a single day of operation occurred on November 7th when 2.5 million gallons of secondary effluent was filtered in a 24-hour period. The reclamation plant operated 274 days during 2021, a slight increase from the 239 days in 2020 and the 233 days of operation recorded during 2019.

The December data, may be skewed because of the small number of days the facility was operating; however, the average monthly increases and decreases closely follow the same pattern as seen in the total volume of reclaimed water production shown in Graph 2. The average monthly production is somewhat higher by reporting per day of operation than it would be if reporting by the number of days in the month. The average monthly volume of reclaimed water produced per day of operation throughout 2021 ranged from a low of 0.92 MGD during November to a high of 1.5 MGD during July. However, no reclaimed water was produced during the months of January and February. The overall average annual reclaimed water produced per day of plant operation was 1.22 MGD. Graph 3 illustrates the average monthly amount of reclaimed water produced per day of operation for 2021.

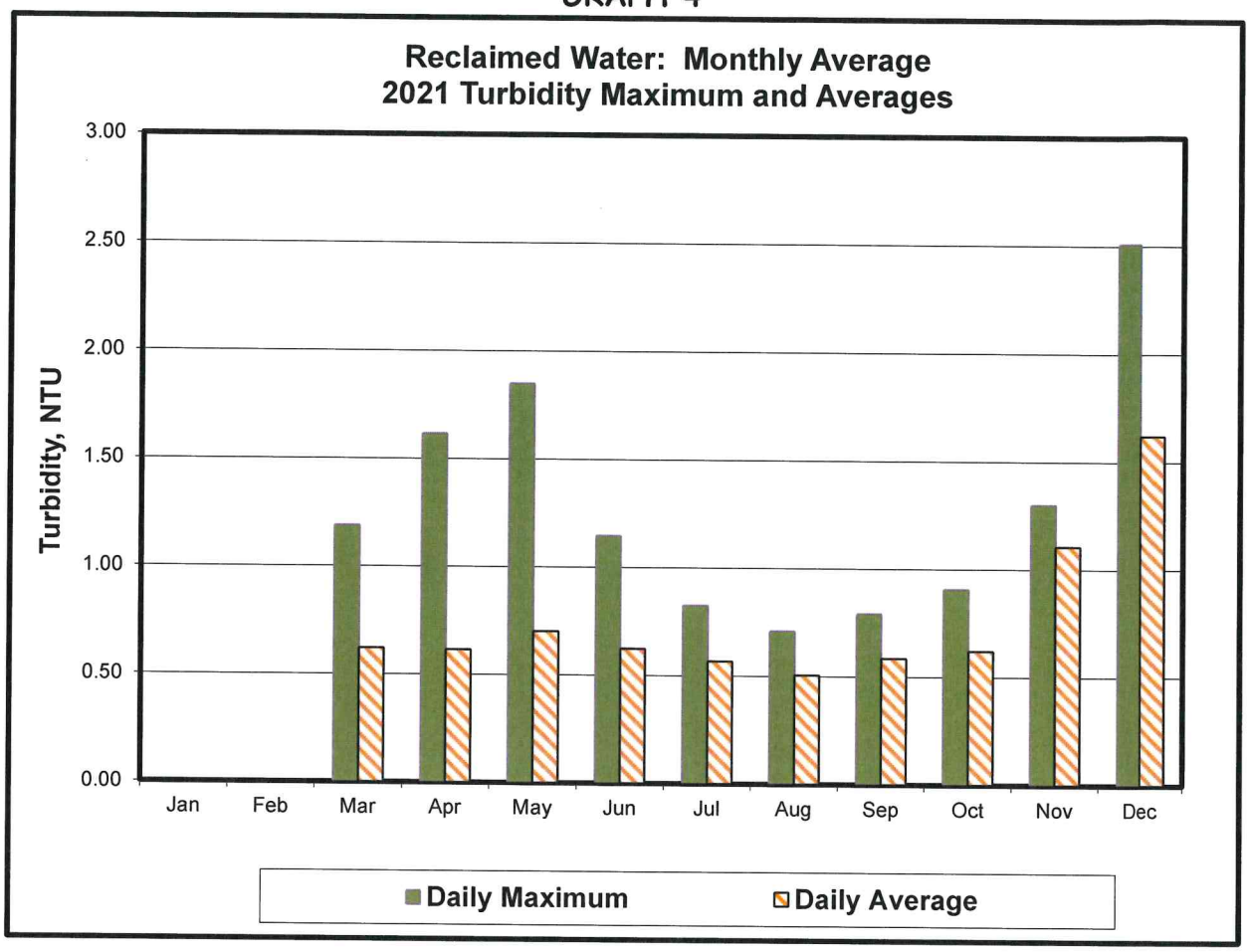
GRAPH 3



Turbidity

Reclaimed water effluent turbidity is monitored continuously with two on-line HACH turbidimeters. Permit limits for reclaimed water effluent turbidity must be met following filtration and may not exceed a mean of 2 NTU. Permit limitations specify a maximum turbidity of 5 NTU, which cannot be exceeded, more than 5 percent of the time during any 24 hour period. The highest maximum turbidity value during 2021 was 5.00 NTU on four days during April: April 3rd, April 6th, April 11th and April 27th. Monthly averages were very consistent throughout the year and were well below all permit limits. Graph 4 illustrates the small amount of monthly variations in the average reclaimed water turbidity. Monthly average mean values were very stable and fluctuated between a low of 0.51 to a high of 1.62 NTU. At no time during the year did the mean turbidity exceed the 2 NTU limit.

GRAPH 4

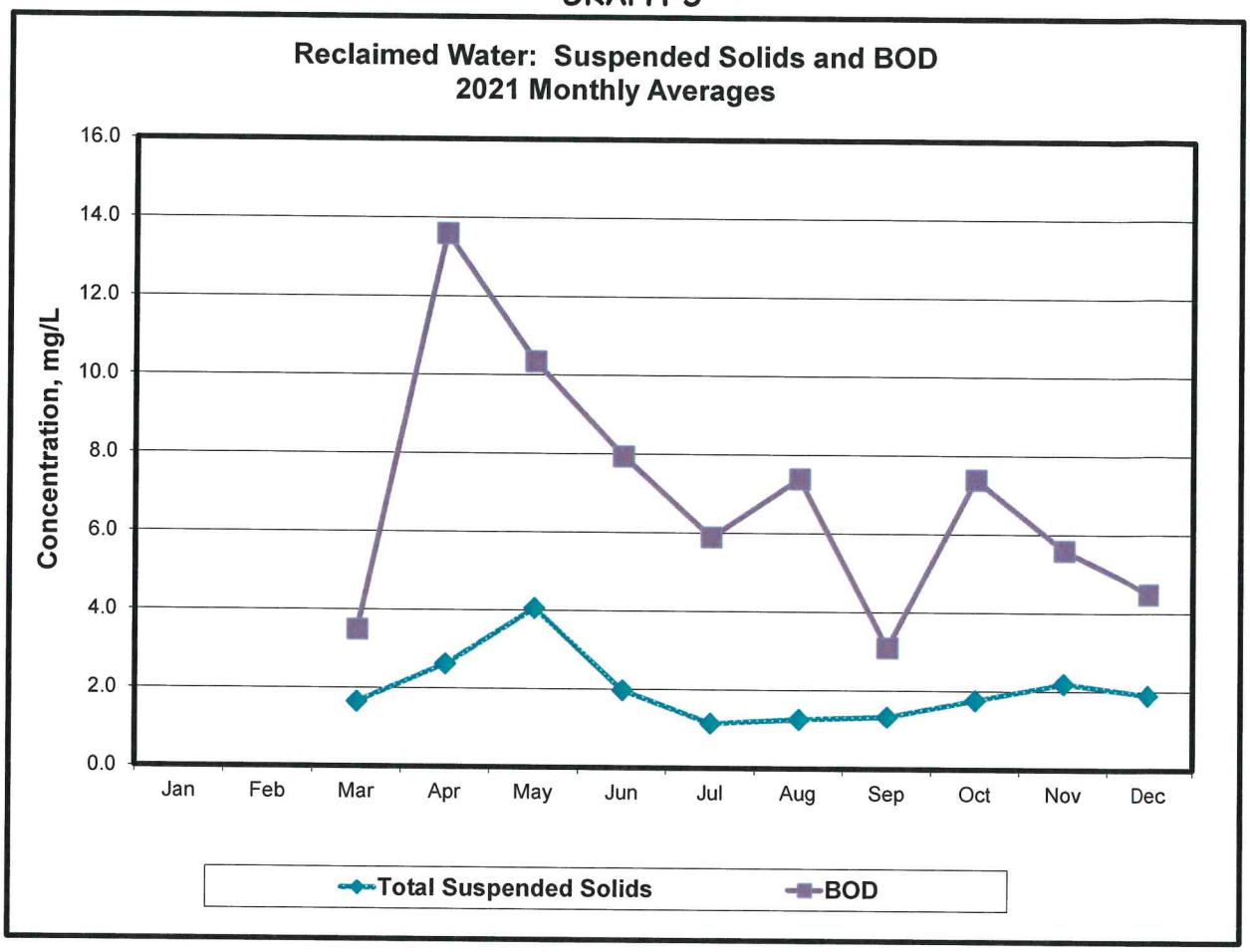


Total Suspended Solids

Total suspended solids (TSS) are measured on 24-hour composite samples, 5 days per week, when the reclamation filter plant is operating on a daily basis. When plant operation is sporadic, as is often the case during the winter months, total suspended solids are collected and analyzed whenever the reclamation treatment plant is in operation.

The reclamation facility is very effective at removing suspended solids from the secondary effluent, as evidenced by the consistently low suspended solids concentrations in the reclamation water. The TSS concentrations ranged from a monthly averaged low of 1.1 mg/L to an averaged high of 4.1 mg/L in May. The 2021 annual high total suspended solids concentration for the reclaimed water was 6.3 mg/L in May and June, which is below the 10 mg/L permit limit. Graph 5 demonstrates the very consistent and low suspended solids concentrations obtained throughout 2021.

GRAPH 5



Biochemical Oxygen Demand

GSD's current NPDES permit, WDR Order R3-2017-0021, incorporates the operating and monitoring requirements for the reclamation facility which includes monthly BOD monitoring. BOD values of the reclamation water can fluctuate due to the nitrifying bacteria present in the sample which is collected after coagulation and filtration but prior to disinfection. The reclaimed water BOD was below the monthly average limit of 10 mg/L the majority of 2021 with exception of April and May. Graph 5 summarizes BOD monthly average data.

pH

Hydrogen ion concentrations are measured daily on a grab reclaimed water effluent sample whenever the treatment plant is in operation. Daily pH values have been relatively stable throughout the year and therefore so are the monthly averages. pH varied by a less than 1.0 pH units throughout the year from 6.9 to 7.7.

Total Coliform

The reclamation effluent is analyzed for total coliform organisms each day that the plant is in operation. The GSD laboratory is certified for the total coliform analysis by the IDEXX method using Colilert and Quanti-tray. The analytical method provides results in 24 to 28 hours which provides the operators with information to make adjustments, if necessary.

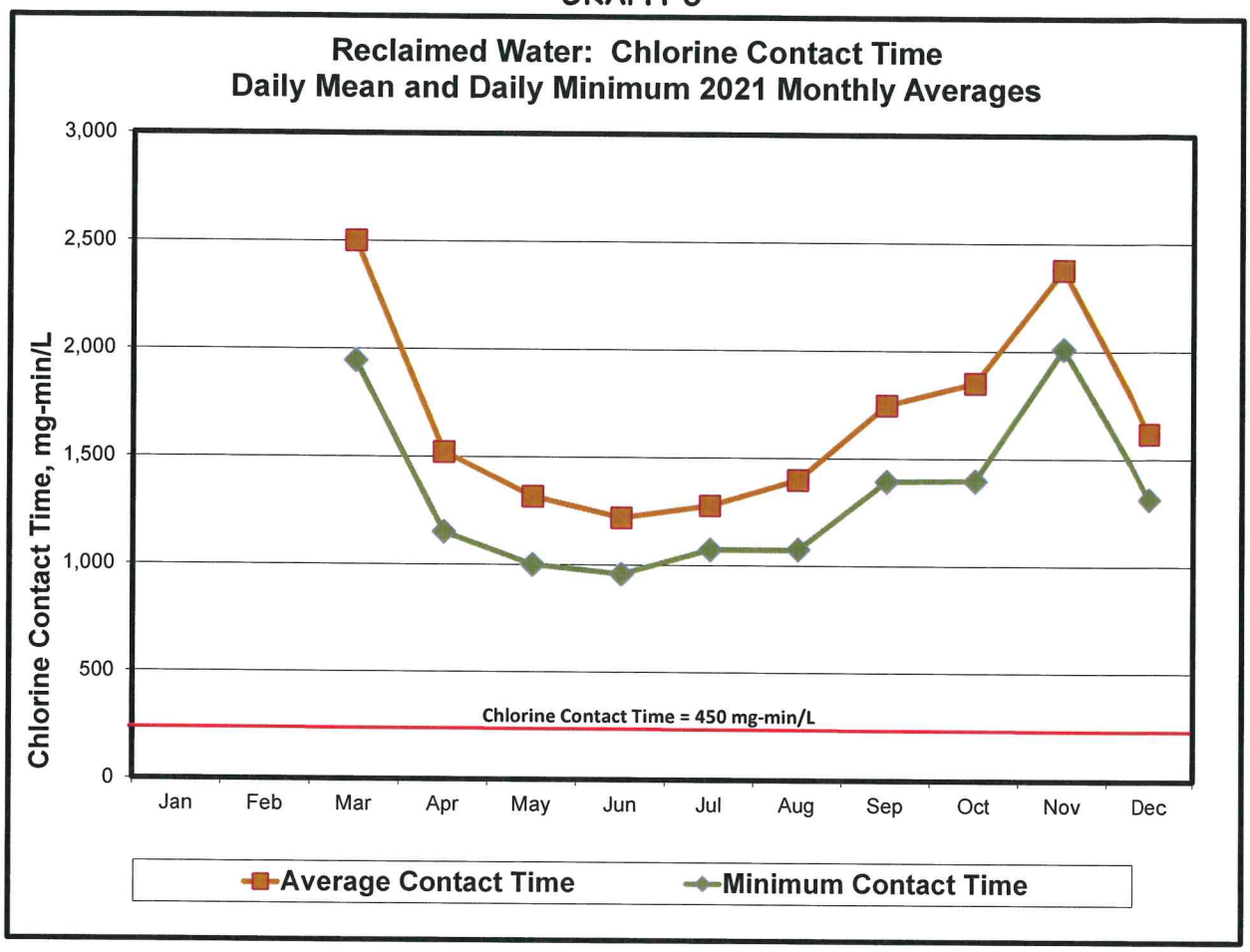
Elevated total coliform results were observed throughout the year beginning in April due to interferences that affect the biological portion of the treatment process. The interferences were observed to cause inhibition of the microorganisms in the biological treatment process resulting in the reclamation facility receiving abnormally higher levels of coliform bacteria. To help resolve this issue, the District conducted investigations into the process interferences and performed experimentations with different approaches to enhance the efficiency of the filtration process. An engineering consulting firm has been hired to evaluate the options to optimize or augment the current disinfection process to achieve consistent compliance with the total coliform limits for the reclaimed effluent.

Reclaimed Water Disinfection

Reclaimed water disinfection at the GSD is achieved by adding liquid sodium hypochlorite at the front end of the chlorine contact channel. Chlorine residuals are continuously monitored both at the beginning and at the end of the chlorine contact tank. The disinfection system has been inconsistently effective in removing coliform bacteria from reclaimed wastewater.

Chlorine contact tank design parameters indicate that the total detention time of the reclaimed water in the contact tank at maximum flow is 92 minutes, which meets the 90-minute minimum requirement. The current permit limit is to achieve no less than 450 mg-min/L of chlorine concentration contact time. Graph 6 illustrates the average monthly mean and average monthly minimum contact times for 2021.

GRAPH 6



Total Dissolved Solids

Total dissolved solids are monitored on a quarterly basis in January, April, July, and October. Since the facility wasn't operated during January or February, the first quarter sample was analyzed during March. The total dissolved solids concentrations reported in 2021 were consistent throughout the year and ranged from a low of 1,082 mg/L in October to a high of 1,208 mg/L in March. The annual average was 1,151 mg/L. All values were below the permit limit of 1,500 mg/L. Total dissolved solids results are reported in Table 3.

Metals

The reclaimed water permit requires semi-annual metals testing for cadmium and lead in April and October. Metals analyses are performed on 24-hour composite samples, which are collected and sent to an outside, contract laboratory. All analyses indicated that the concentrations of cadmium and lead were well below the permit limits of 0.01 mg/L for cadmium and 5 mg/L for lead. The actual values are reported in Table 3.

Priority Pollutants& Metals

The recycling permit specifications requires analysis of priority pollutants to be performed on the reclaimed water annually. Detected organic compounds results are presented in Table 5 as well as metals, asbestos and dioxin results; complete copies of all the laboratory reports listing all the chemical compounds and analytical methods are available upon request. Eleven compounds were detected at reportable levels in the reclaimed water. Concentrations of detected chemicals are noted next to the parameter and corresponding units in the table.

Table 5. Detected Priority Pollutants, 2021

Parameter, units	Result
Antimony, mg/L	0.0012
Arsenic, mg/L	< 0.0015
Benzoic acid, ug/L	3.6
Beryllium, mg/L	< 0.00050
Bromodichloromethane, ug/L	0.34
Cadmium, mg/L	< 0.00050
Carbon Tetrachloride, ug/L	0.040
Chloroform, ug/L	1.4
Chromium, mg/L	< 0.0015
Copper, mg/L	0.013
Cyanide, mg/L	< 0.010
Dibromochloromethane, ug/L	0.16
Lead, mg/L	< 0.00050
Nickel, mg/L	0.0049
Mercury, mg/L	< 0.00010
Selenium, mg/L	0.0019
Silver, mg/L	< 0.00050
TCDD, equivalents, pg/L	0
Thallium, mg/L	0.00050
Zinc, mg/L	0.032
Asbestos, MFL	ND
ND = Not Detected	

DISCHARGE COMPLIANCE

Throughout 2021, the chlorine contact time as measured at the end of the chlorine contact channel met the minimum limitation as required by RWQCB Order No. R3-2017-0021 on all days. All turbidity limits were met following filtration. Total suspended solids were determined to be well below the permit limits of 10 mg/L. All other detected constituents were below their respective limitations with the exception of total coliform bacteria and biochemical oxygen demand (BOD).

The Goleta Sanitary District will continue to work with the contracted engineering firm to return to consistent compliance with all applicable monitoring and reporting program limitations.