NORTH SAN MATEO COUNTY SANITATION DISTRICT
a subsidiary of the City of Daly City
OPERATION OFFICES
153 Lake Merced Blvd., Daly City, California 94015
(650) 991-8200
(650) 991-8220 (Fax)

January 28, 2021

Robert Schlipf
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Dear Mr. Schlipf

The attached 2020 Annual Self-Monitoring Report is submitted in accordance with the requirements of Order No. R2-2017-0026 for the North San Mateo County Sanitation District. The entire year has been submitted electronically through CIWQS.

It should be noted that there is a discrepancy in the plant influent flow data, in that the data submitted electronically for influent flow for year 2020 is inaccurate. In August of 2020, I suspected a calibration issue with either the influent or effluent flow meter as I noticed a discrepancy on SCADA in real time. I then had the effluent meter replaced with a new meter and moved the new equipment to take measurements from a different location, to improve accuracy. I also had the influent flow meter calibrated, by an outside contractor, but the totalized monthly influent flow data is still inaccurate. To identify the issue, the influent flow meter has a temporary totalizer set up as part of the troubleshooting process. In an addition to this effort to gather more data, a planned event to trouble shoot the meter in real time, is set up for next week, in order to gather the data needed so that an accurate calibration can be performed.

I certify under penalty of perjury that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on this inquiry of the person or persons who managed 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. {40 CRF 122.22(d)}

All correspondence regarding this transmittal or other matters concerning the North San Mateo County Sanitation District, should be addressed as follows:

Shawnna Maltbie
City Manager/District General Manager
333 – 90th Street
Daly City, CA 94015

A copy of all such correspondence shall be sent to the plant at the following address:

Thomas Piccolotti, Director
Water and Wastewater Resources Department
153 Lake Merced Boulevard
Daly City, CA 94015

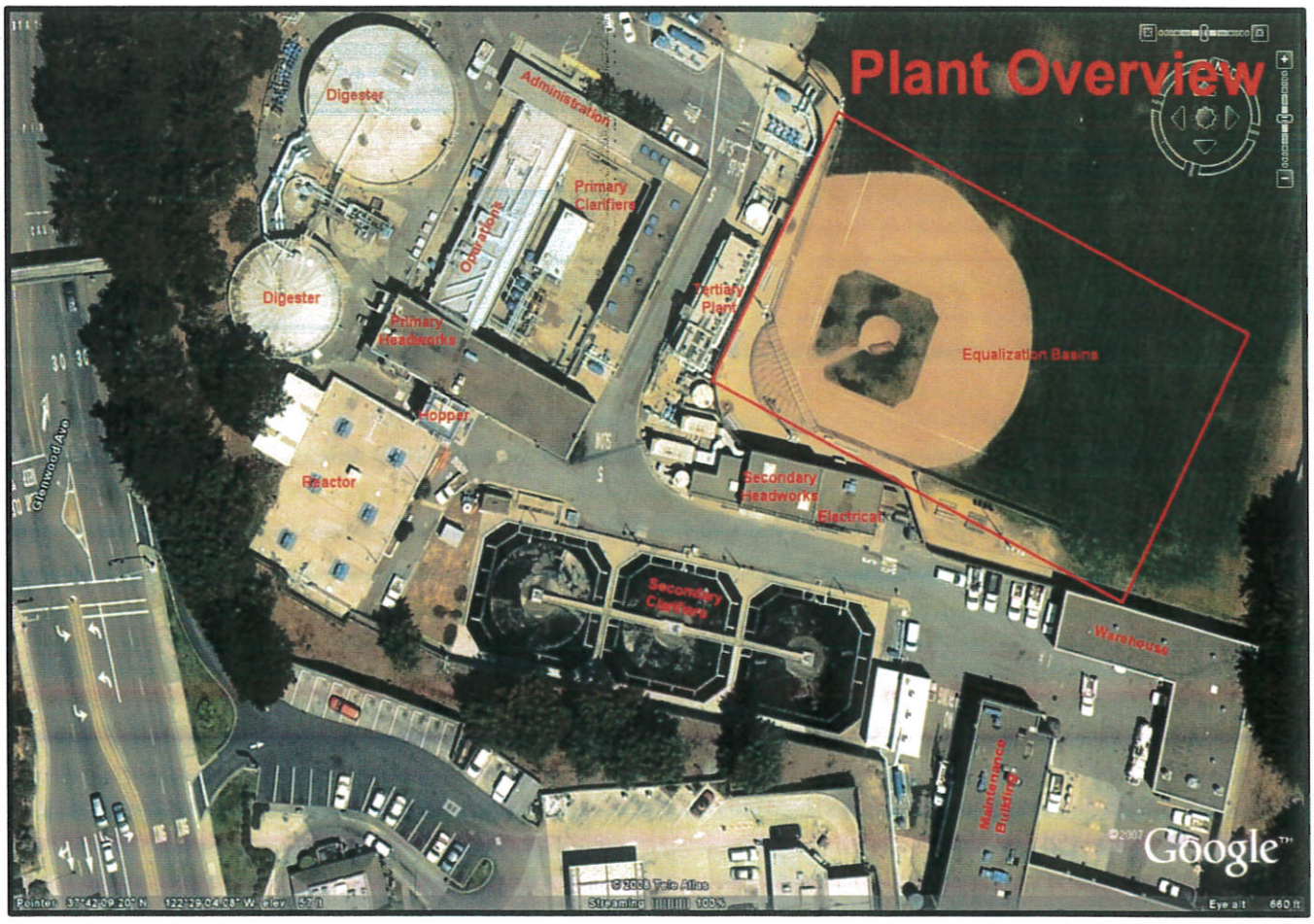
Questions of a technical nature may be directed to me at (650) 991-8204, Monday through Friday, between the hours of 5:30 a.m. and 3:00 p.m.

Sincerely yours,

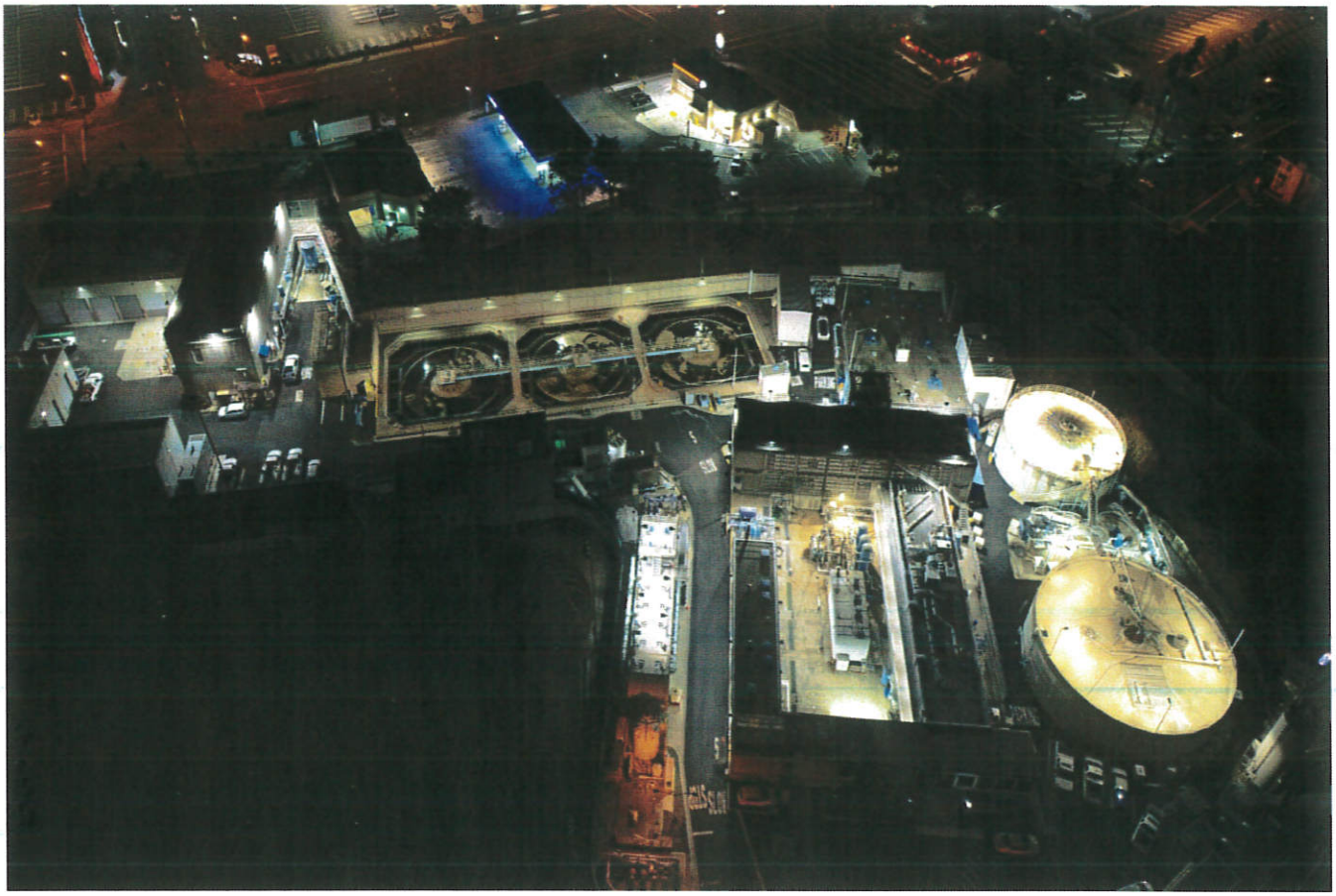
Gregory M Krauss
Chief of Operations
L21-005
Attachments
cc: State Waterboard
Shawnna Maltbie, City Manager/District General Manager

North San Mateo County Sanitation District – Annual Self-Monitoring Report (SMR)

NPDES Permit CA0038369
Order Number R2-2017-0026



January 2021



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FACILITY DESCRIPTION

Facility Overview

The North San Mateo County Sanitation District (District), a subsidiary of the City of Daly City, owns and operates a secondary wastewater treatment facility (Facility) that treats domestic wastewater from the City of Daly City, portions of San Mateo County, the Town of Colma, San Francisco County Jail, and the Westborough Water District within the City of South San Francisco. The combined service population is approximately 120,000.

The Facility treatment system consists of screening, compaction, primary clarification, flow equalization, activated sludge aeration, secondary clarification, chlorination by sodium hypochlorite, and dichlorination by sodium bisulfate. Biosolids generated during the treatment process are processed with de-gritting, gravity and air flotation thickening, anaerobic digestion, and dewatering by centrifuge. The treated biosolids are then hauled off-site for disposal.

The District conveys a portion of its treated wastewater through the Vista Grande Tunnel structure and a 27-inch force main located at Fort Funston in San Francisco County. Treated effluent is then discharged through a submerged diffuser extending 2,500 feet from the shoreline and terminating at a depth of approximately 32 feet (-32 MLLW). The remaining treated wastewater receives tertiary treatment and is recycled for reclamation projects.

Wastewater Treatment Process

Flow into the Facility is measured with a Parshall flume, and then flows through two micro-screens where it is dispersed evenly to six primary basins. Two additional primary basins (no. 7 and 8) are only brought into service when needed during wet weather flows. The primary effluent is then split with 70% of the flow pumped to the two pure oxygen activated sludge reactors that each has three turbine mixers. The other 30% of the flow is stored in equalization basins until the late evening when it is then pumped back into the secondary system for treatment. Flow from the activated sludge basins is then dispersed between three secondary clarifiers for settling. The effluent flow then flows over the weirs into the chlorine contact mixing chamber.

During all times of the year, treated effluent may then be discharged through the ocean outfall. Additionally, during the dry season, approximately 2.77 MGD of treated effluent can be pumped to the tertiary treatment system to support reclamation activities.

Biosolids Treatment Process

During the wastewater treatment process, the primary basins collect settable solids in a sump and then pumped to two gravity thickeners where ferrous chloride is added. The thickened solids are then removed and pumped to two anaerobic digesters. Overflow from the gravity thickeners flows back to the headworks.

Primary and secondary scum is pumped to an air flotation tank along with the waste activated sludge and treated with a polymer. The thickened sludge is then pumped to an anaerobic digester while the overflow discharges into the primary effluent sump and is pumped to the secondary system.

Digester temperatures are kept at 95° to 100°F. The laboratory performs total solids and volatile solids test each day to confirm vector reduction. The digested solids are then treated with polymer and centrifuged. The centrate from the centrifuge discharges into the headworks. Dewatered biosolids are then pumped to a storage silo were the contract hauler fills their trailer for disposal.

SUMMARY OF PLANT PERFORMANCE:

NSMCSD Wastewater Flows

The NSMCSD is permitted for an average dry weather flow of 8.0 million gallons per day (MGD) and the facility design flow is 10.3 million gallons per day (MGD). The average annual influent and effluent flow rates for the reporting period were 7.14 MGD and 4.88 MGD, respectively.

The following is an explanation of the chain of events that have caused plant effluent challenges (high Total Suspended Solids, high cBOD and low percent removal) for the year 2020.

Timeline:

7-15-2019 - Primary Digester labelled as Digester 1 was taken out of service for cleaning and repairs. Previous cleaning was performed 20 years ago.

08-2019 - Cleaning started. Most of the cleanup load (digester sludge and grit), was dewatered and hauled offsite by the contractor. Additional solids were added inadvertently to the plant as a byproduct of the cleaning process. We believe this occurred on the last day when the tank used to store solids prior to being dewatered was cleaned out by the contractor. Those solids, which were septic, were washed into the plant. This Material increased our plant load. Plant was unable to operate under normal parameters. Corrective Actions were taken to remediate the situation.

11-4-2019 - Digester 2 started going Sour. pH dropped below 6.0 s.u, volatile acids were over 2000mg/L and alkalinity was dropping below 2000 mg/L as CaCO3.

12-6-2019 - Digester 1 Seeding started. 120,000 gallons of Sludge was obtained from Burlingame Waste Treatment Plant.

2/3/2020, Digester 1 was not operating well, and it could not take complete feed. The volatile acids would spike up over 2000 mg/L. The digester was drained.

The district Hired Hazen and Sawyer to assist with the digester start up.

5/22/2020 - Seeding #2 for digester 1 started. 225,000 gallons of sludge was obtained from South San Francisco plant.

7/2/2020 we realized it was still unable to take complete feed. Volatile acids were spiking over 1000 mg/L. Digester was drained. 2 ft of sludge was left, and it was diluted with 2 ft of 3 ft water.

7/30/2020 - Seeding #3 for digester 1 started. 581,000 gallons of sludge was obtained from the South East Plant in San Francisco.

8/27/2020 - Digester 1 was operating under normal parameters. Taking full feed and all the data points (pH, Volatile Acids and Alkalinity) in normal range.

11/01/2020 – SVI increased due to the proliferation of filamentous organisms (bulking). High SVI's led to increased secondary clarifier blankets and periodic washout of solids leading to increased final effluent, cBOD, TSS and Turbidity.

12-1-2020 – Enlisted in the help of Hazzan and Sawyer for process control assistance. We began dosing RAS with sodium hypochlorite to reduce filaments causing poor settling.

Root Cause:

Two main causes were identified as by Hazen and Sawyer and the District as the main issues in February 2020. They were Digester 1 clean up and start up and the Reactor aerator dissolution system.

Digester 1: Due to the cleaning and rehabilitation of the WWTP's Digester 1, the smaller, secondary digester was overloaded. Due to overloading, there was insufficient detention time and increased volatile solids loading that prevented the establishment of a methanogenic population. Without the methanogenic population the digester volatile acid concentration increased significantly with resulting low pH. The resulting recycle from centrifuge dewatering of the sludge therefore contained significant BOD, which overloaded the inefficient mixer/aerator system.

Reactor (Mixer Aerator): The districts reactor is about 50 years old. The reactor was taken out of service, inspected, and cleaned. The inspection revealed the reactor diffusers were clogged with rags. This significantly impacts the ability to dissolve oxygen into the mixed liquor. Microscopic analysis of the activated sludge during the high SVI periods has determined the causative organism to be type 1701. Type 1701 appears due to low DO conditions for the applied F/M. These filaments produce the unhealthy settling and bulking. These are contributing factors for the current effluent limitation violations.

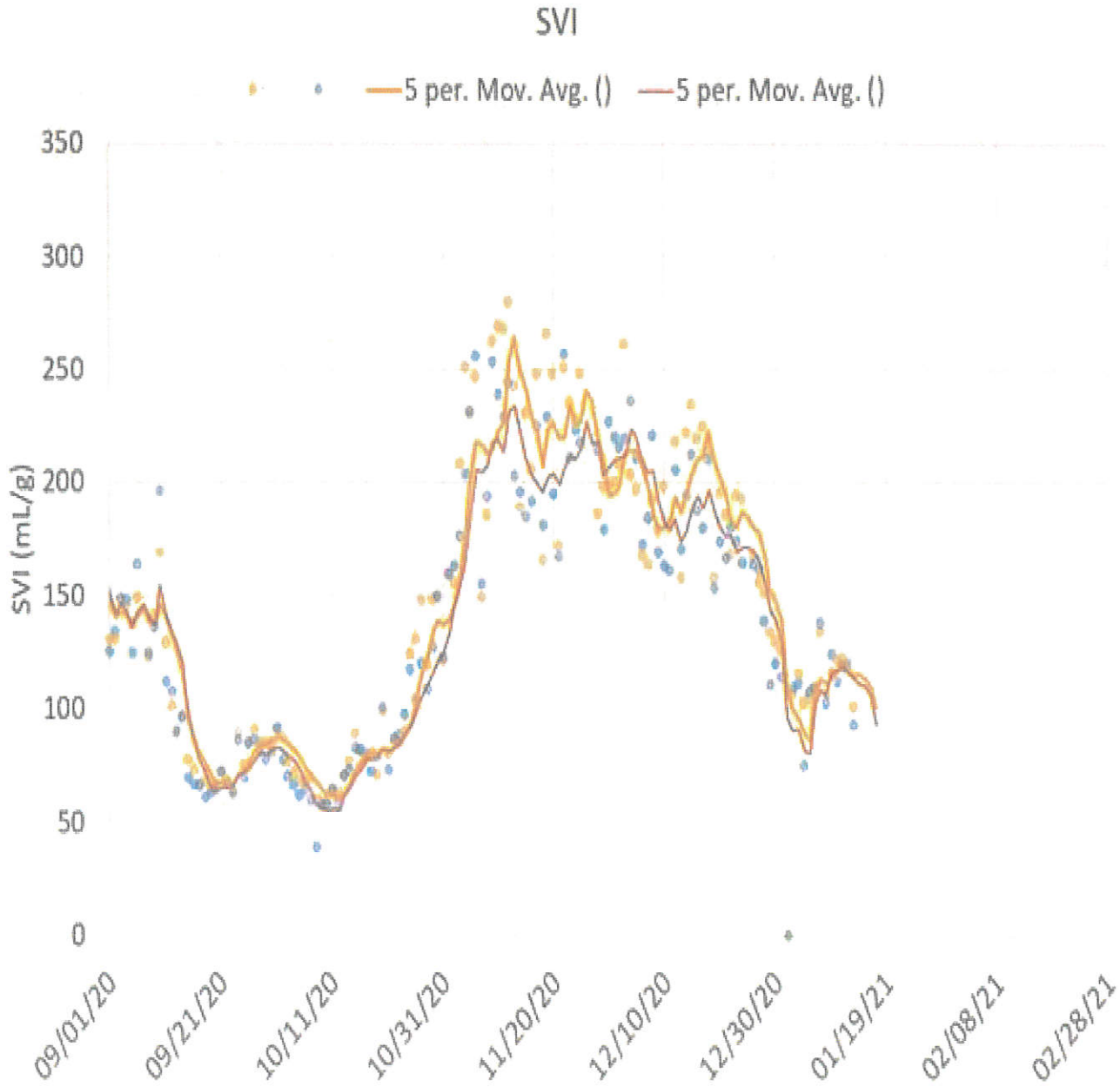
Corrective Actions:

Initial bulking during the digester clean up - Samples from the secondary system were sent out for analysis and as a result of the analysis, Microbial supplementation and nutrients were added to further increase our plant microorganism population. RAS rates were lowered to control secondary bulking.

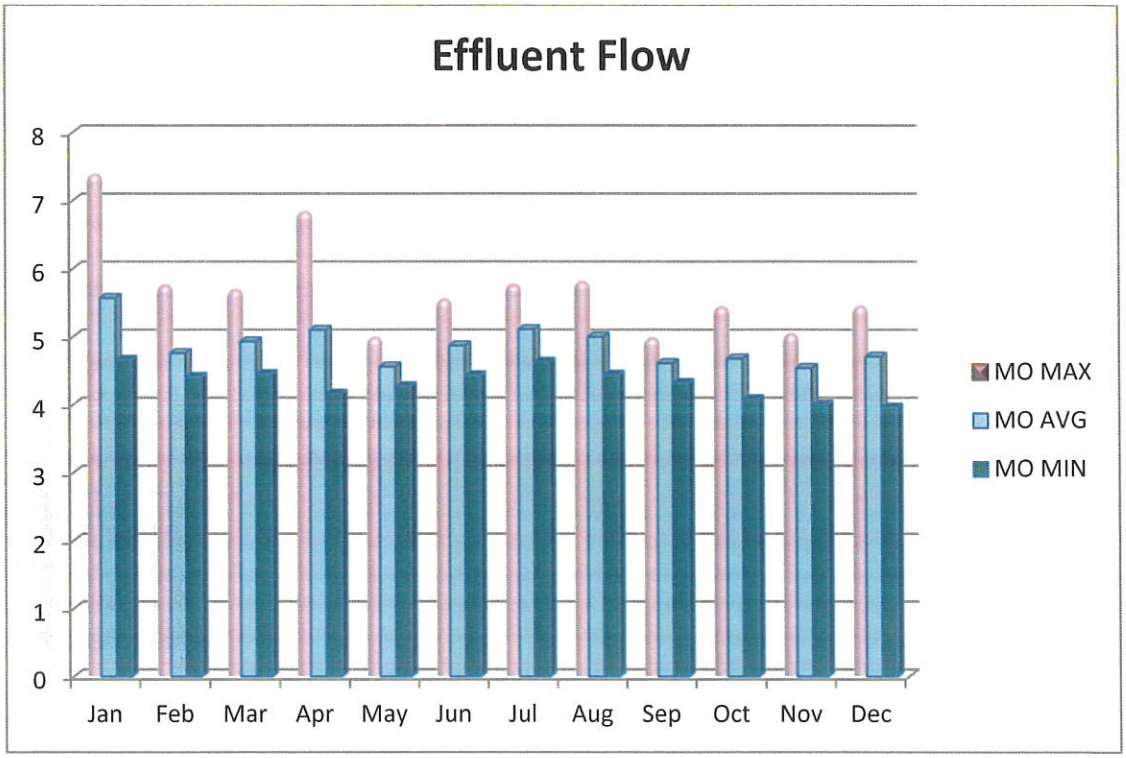
Reactor:
In managing reactor performance, the reactor will be continually monitored for reduction in residual dissolved oxygen. When lower dissolved oxygen residuals are identified the rector will be inspected and or cleaned. The district has also entered into a professional services agreement with Hazen and Sawyer, for the design and replacement of existing surface aerators. The surface aerators will be replaced with non-clogging aerators. In addition, Hazen and Sawyer will be assisting Daly City with a detailed process analysis that will result in corrective actions to help mitigate the impacts from the activated sludge bulking.

Conclusion:
The plant has recovered and is operation under normal parameters as of December 2020. The TSS, CBOD and Percent Removal are all within permit Effluent limits.

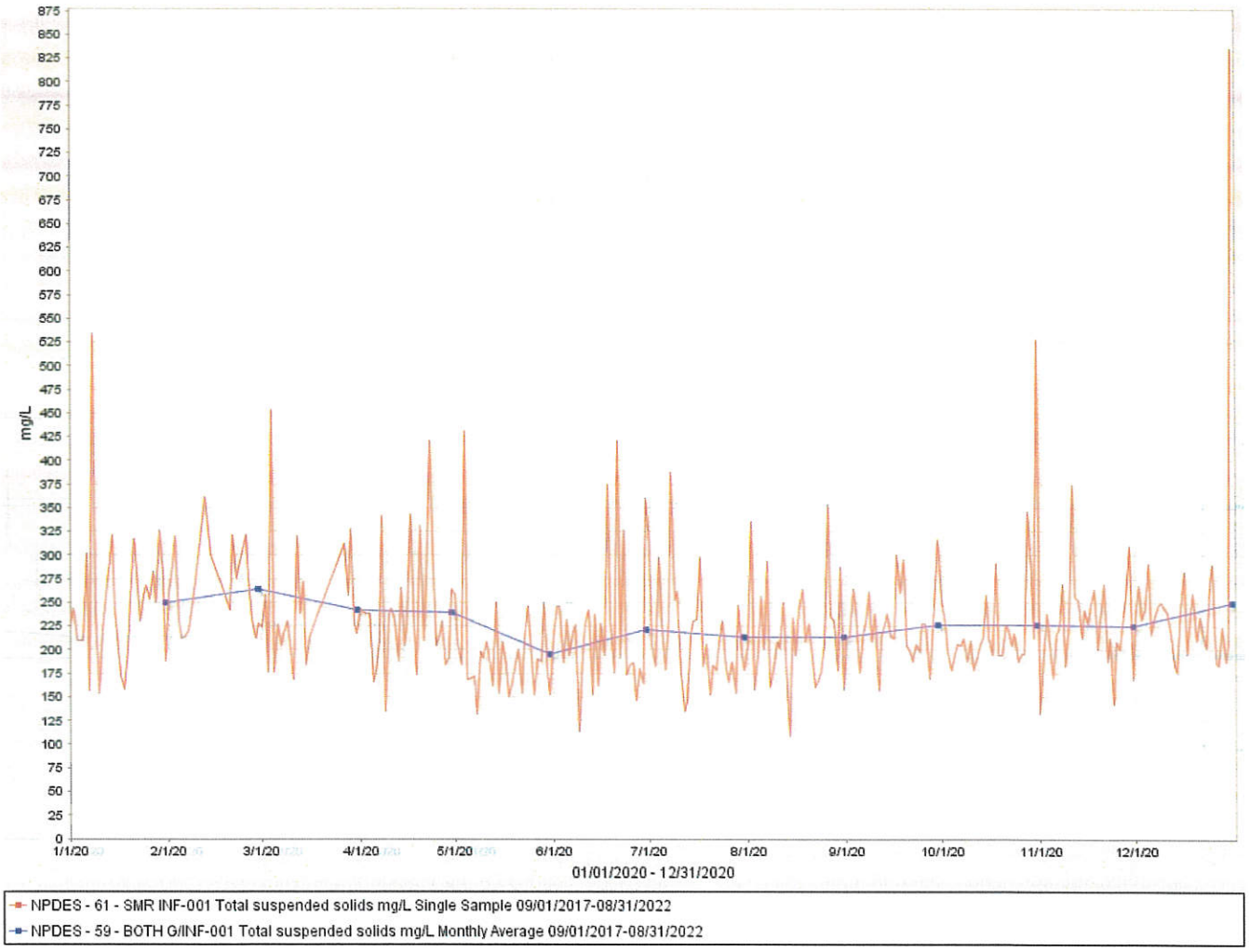
Digester 1: Seeded the Digester and now the digester is operating under normal parameters. The effluent is currently within permit parameters. Graph attached of trend over the past several months.



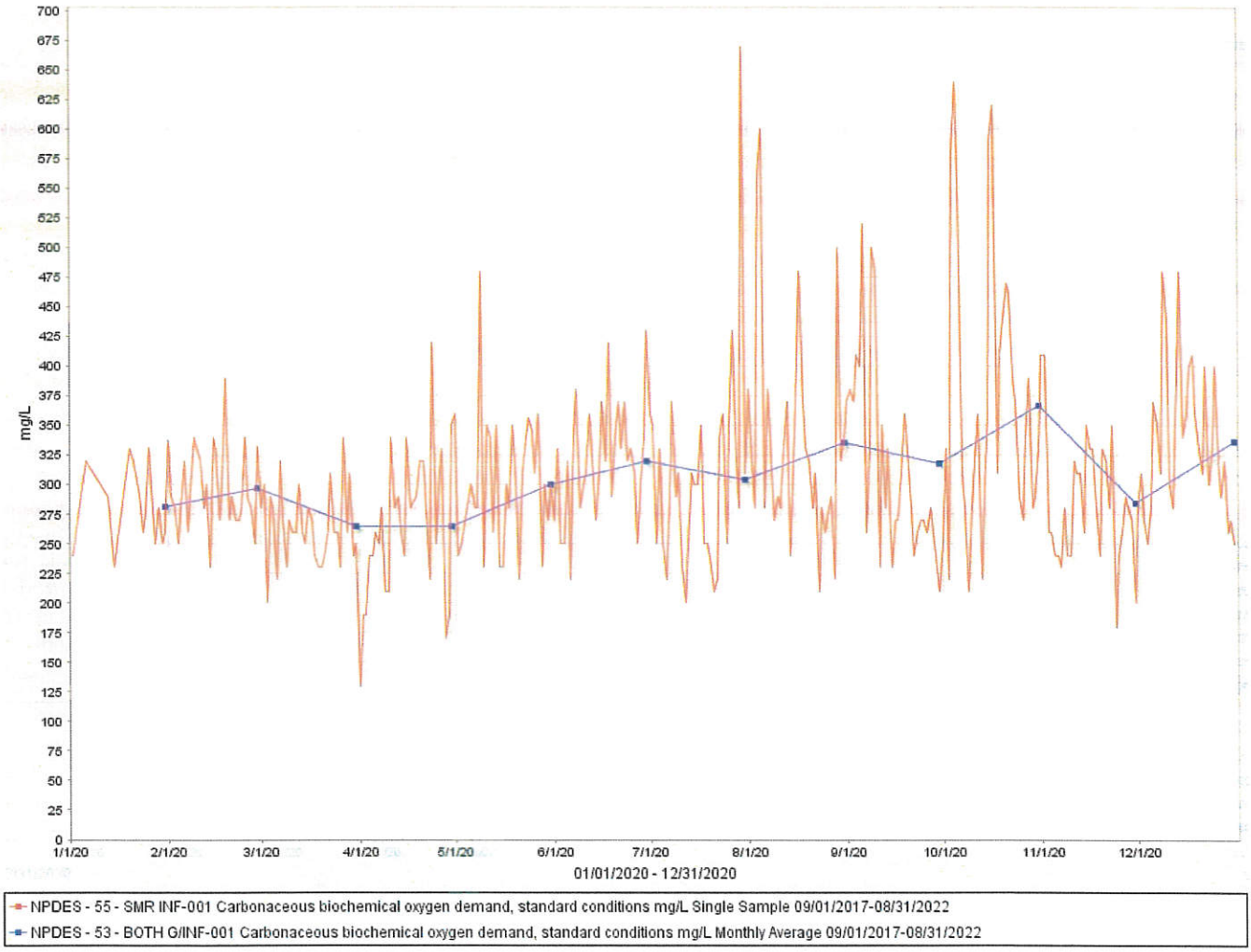
GRAPHICAL COMPLIANCE SUMMARY



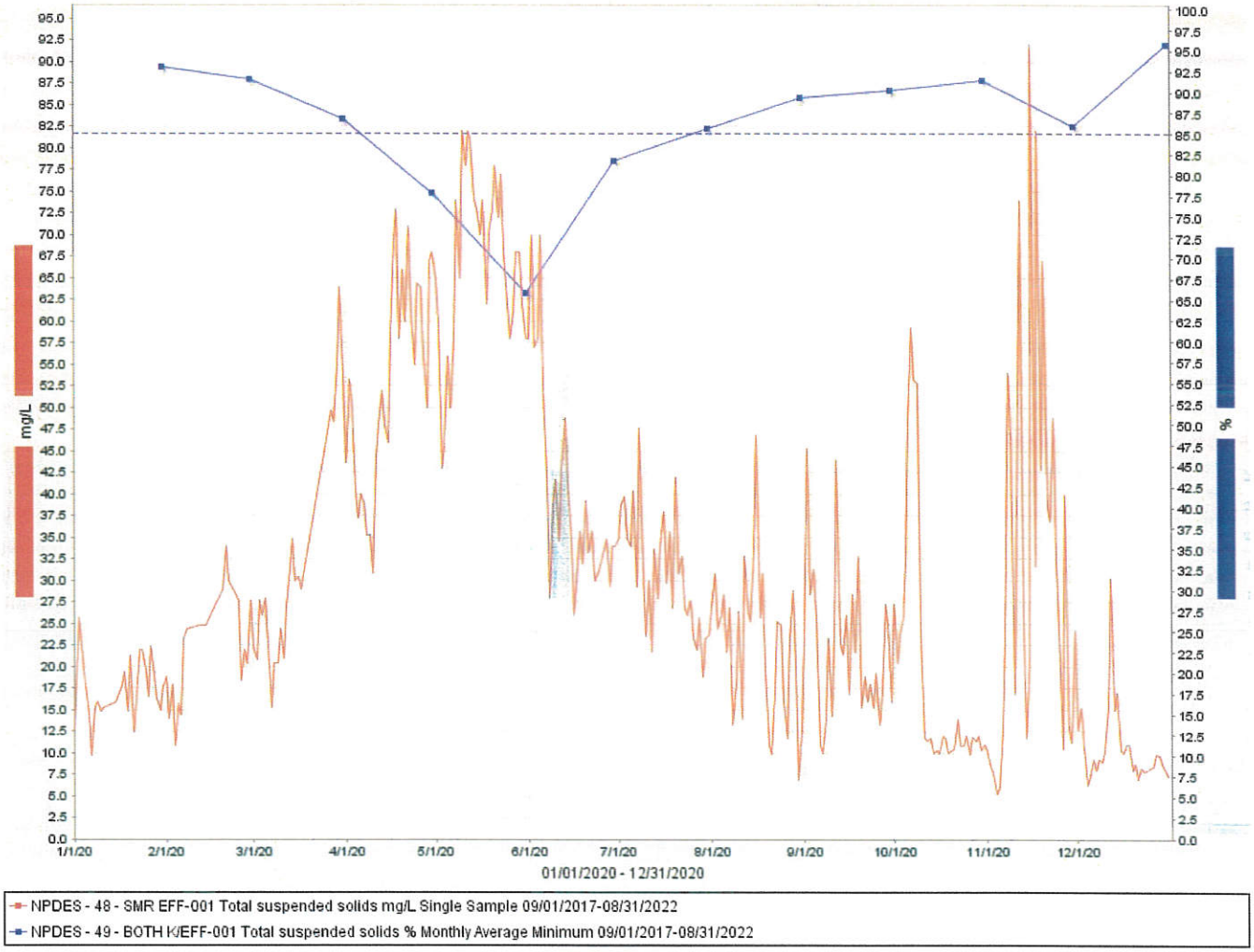
Influent Total Suspended Solids



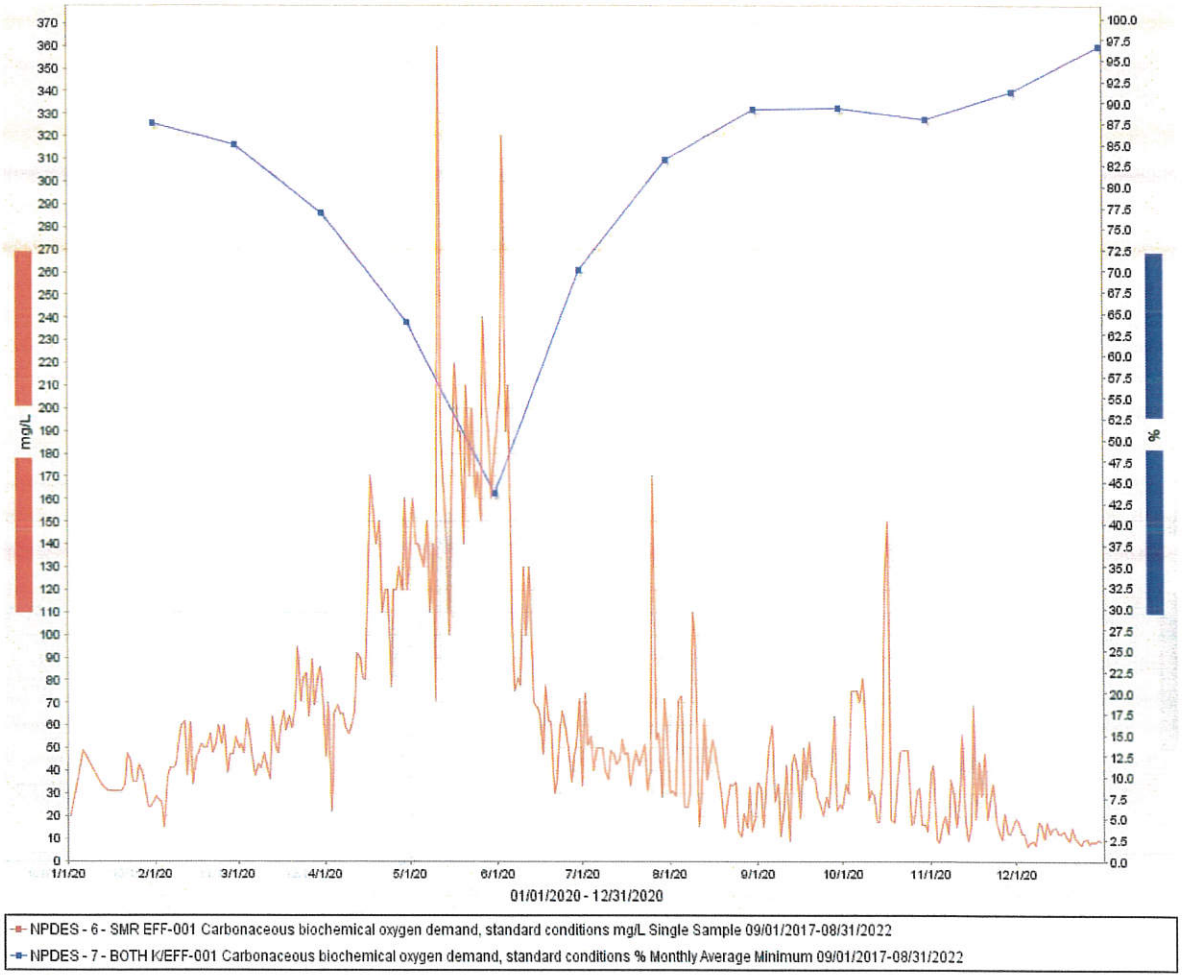
Influent Biochemical Oxygen Demand



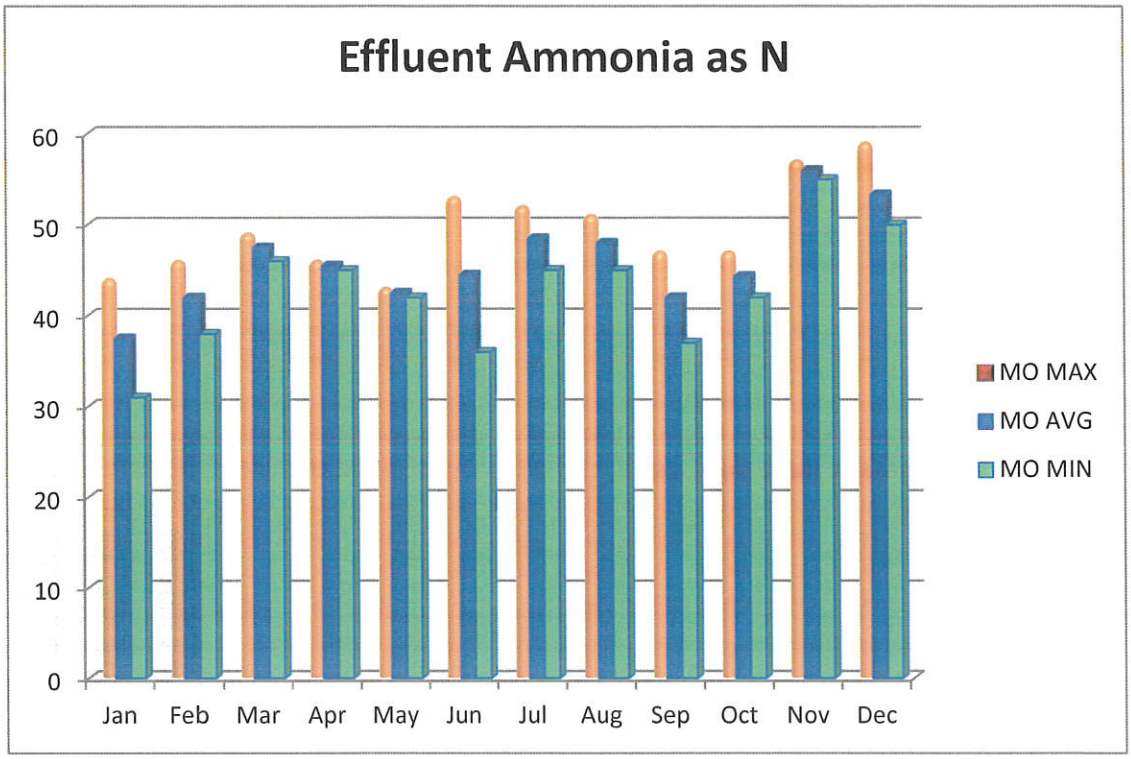
Effluent Total Suspended Solids & % Removal



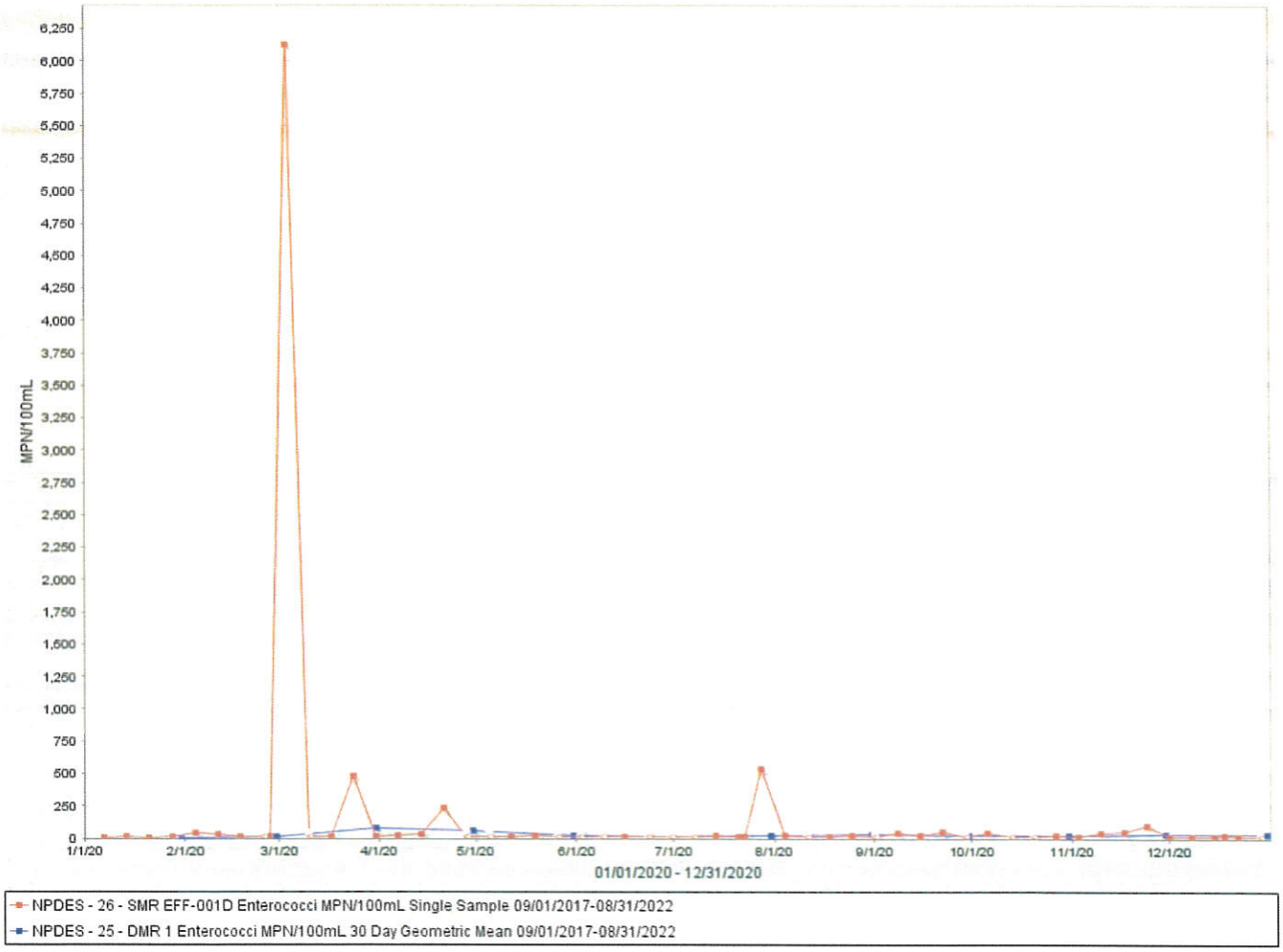
Effluent Biochemical Demand & % Removal



Effluent Ammonia



Effluent Enterococcus data



SLUDGE AND BIOSOLIDS MANAGEMENT

The Biosolids produced at the NSMCSD produced a total of approximately 1235.08 dry Metric tons. The biosolids treatment and disposal was in compliance with regulations set forth in 40 CFR, Part 503. All 1235.08 dry Metric tons of biosolids were disposed of at Synagro's Silva Ranch and Composting facility both located in Sacramento County, California, per contract with Synagro Inc. The average solids content for year 2018 was 25

TERTIARY RECYCLED WATER ANNUAL PRODUCTION

The NSMCSD tertiary treatment facility includes flocculation, filtration through its Dina-sand filtration system, and disinfection producing recycled water in compliance with Title 22, disinfected tertiary. The plant is permitted for 2.77 MGD for distribution to four golf courses, two parks, and various median strips along John Daly Blvd. and Junipero Serra Blvd. within the City of Daly City. In calendar year 2020, the District delivered 30.44 Acre-Ft of recycled water to its customers (see chart below). This total was lower than prior years due to low quality source water, which drastically limited production.


Tertiary Production
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Production
January
February
March
April
May
June
July
August
September
October
November
December
Total
Tertiary Production 2020 Tertiary Production in MG
Tertiary Production 2020 Tertiary Production in Acre-Feet
Tertiary Production 2020 Influent Production in MG
Tertiary Production 2020 Influent Production in Acre-Feet
Tertiary Production 2020 Final Effluent Production in MG
Tertiary Production 2020 Final Effluent Production in Acre-Feet

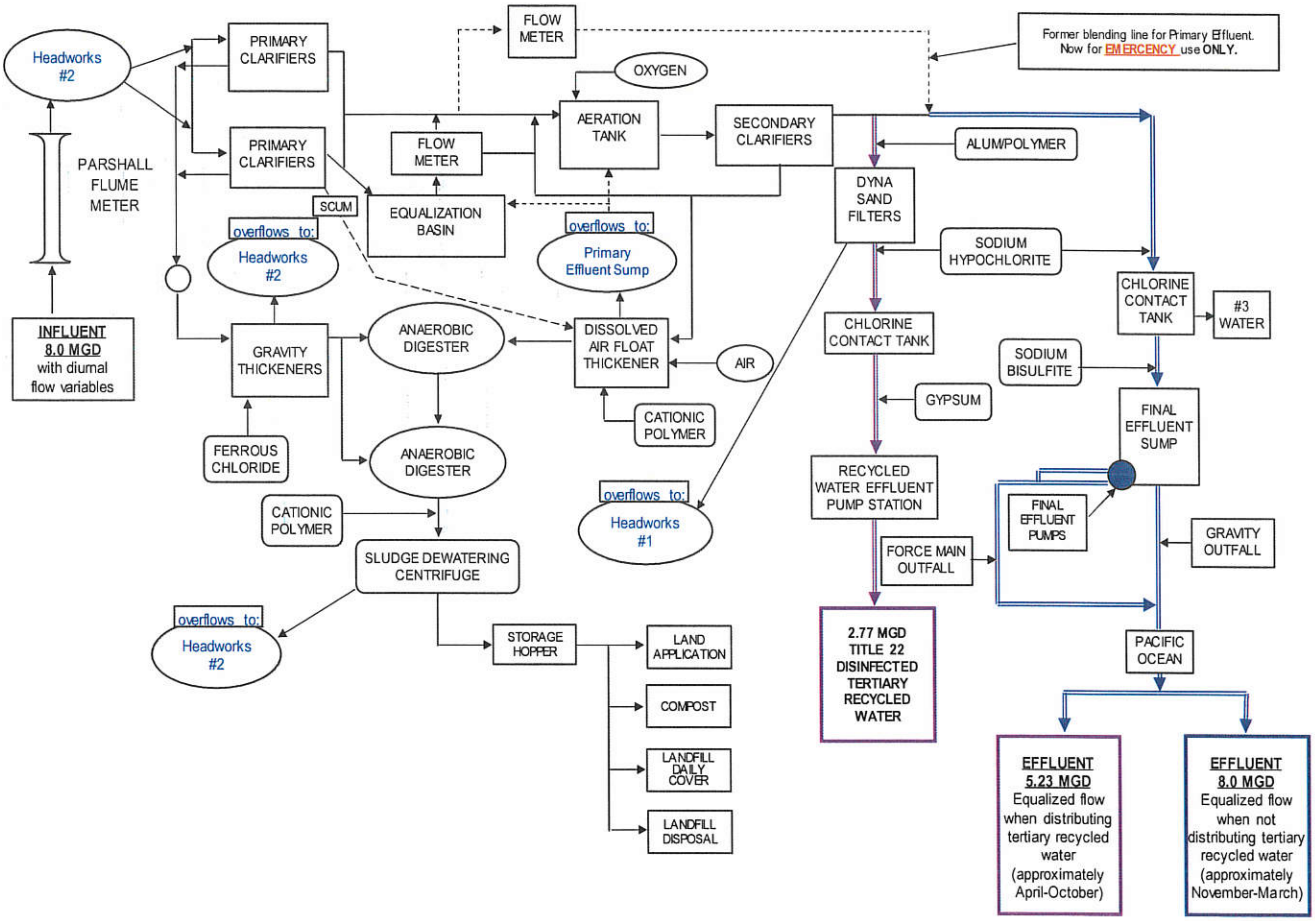
List of Analyses Performed for NSMCSD by Contract Certified Laboratory's

Method	Analysis	Lab
EPA 200.8	Metals	Alpha Analytical Laboratories, Inc.
10-204-00-1X	Cyanide	Alpha Analytical Laboratories, Inc.
EPA 624.1	Volatile Organic Compounds	Alpha Analytical Laboratories, Inc.
EPA 625.1	Semi Volatile Organic Compounds and Benzidines	Alpha Analytical Laboratories, Inc.
EPA 1631E	Mercury	Alpha Analytical Laboratories, Inc.
EPA 608.3	Pesticides, PCBs	Alpha Analytical Laboratories, Inc.
EPA 218.6	Hexavalent chromium	Alpha Analytical Laboratories, Inc.
EPA 900.0	Gross Alpha and Beta	Alpha Analytical Laboratories, Inc.
MAI-Organic Tin	Tributyltin	Alpha Analytical Laboratories, Inc.
EPA 625SIM	Polycyclic Aromatic Hydrocarbons (PAH)	Alpha Analytical Laboratories, Inc.
SM 4500-NH3	Ammonia as N	Alpha Analytical Laboratories, Inc.
EPA 600/3-79-091	Unionized Ammonia	Alpha Analytical Laboratories, Inc.
EPA 1613 B	Dioxins	Alpha Analytical Laboratories, Inc.
EPA 1664 B	Oil & Grease	Alpha Analytical Laboratories, Inc.
SM 9221	Fecal Coliform MPN	Cel Analytical, Inc.
SM 9221	Total Coliform MPN	Cel Analytical, Inc.
SM 9230D	Enterococcus MPN	Cel Analytical, Inc.
EPA/600/R-95-136 *Mytilus galloprovincialis*	Chronic Toxicity	Pacific Eco Risk

Laboratory	Address	Website
Alpha Analytical Laboratories, Inc.	208 Mason Street Ukiah, CA 95482	http://www.alphalab.com/
Cel Analytical, Inc	82 Mary Street, Suite #2 San Francisco, CA 94103	http://www.celanalytical.com/
Pacific EcoRisk	2250 Cordelia Rd. Fairfield, CA 94534	http://www.pacificecorisk.com/

Plan View Drawings of Facilities with Flow Routing

NORTH SAN MATEO COUNTY SANITATION DISTRICT
WASTEWATER TREATMENT PLANT SCHEMATIC



OPERATOR CERTIFICATION SUMMARY CHART

Name	Certificate #	Renewal-Expiration Date	Grade
Gregory M Krauss	V-27969	6/19/23	V
Tharanga Abeysekera	130821-4421	9/30/21	CWEA Lab IV
Michael Popiel	V-28415	7/18/23	V
Brandon Wardle	IV-28888	1/19/24	IV
Tony Pereur	II-43056	9/20/21	II
Lawrence Eubanks	III-10823	6/30/23	III
Norman Mallari	V-28481	9/26/21	V
Christopher Broadway	II-43180	4/3/21	II
Miguel Espinoza	I-34451	12/30/21	III
Darin Schumacker	III-11027	12/31/23	III
Kevin Coen	II-42752	11/13/21	II
John Grumley	I-40516	9/8/23	II
Anh Dao	II-43152	7/23/22	II
Ernie Alvarez	ii-40684	1/02/21	II

SEWER IMPROVEMENT PROJECTS

During North San Mateo County Sanitation District sewer projects, all connections to the City mains are inspected for integrity. Residences are notified if there is a problem with their lateral. The project contractor can make cost effective repairs if the owner elects to have them make the repairs.

The District recognized the opportunity to inspect and correct laterals through the building permit plan review process. Plan reviews require the applicant to state if they intent to keep or abandon the existing sewer lateral. If they intent to keep, they are required to CCTV their lateral with District staff present. If the lateral is found in bad condition, they are required to repair or replace as part of their work activity. Lastly, collection staff keeps records of parcels that have had the Districts collection system crew respond to a blockage. District staff TV the owner's lateral and documents the issues on an updated 'hot list'. Owners are sent a CCTV report of the lateral condition and the need to make repairs before a major incident occurs. If no repairs are made, the notice to repair remains on the City required Residential Requirement Report property record that is disclosed as part of any property sale. Moreover, the Sanitation District also adopted Ordinance # 90 on October 25, 2004. This Ordinance spells out owner responsibility on maintenance of their private service lateral, and enables District staff to proactively enforce corrective actions on discharge of wastewater onto the public right of way as a public nuisance should the owner fail to heed identified corrective actions.

EMERGENCY RESPONSE AND SPILL PREVENTION CONTROL PLAN

The District has updated and revised its Spill Prevention and Control Plant for 2018 to include a revision of posable plant discharges in addition to updating its chemicals used and stored throughout the treatment plant. Additionally, emergency contact personnel with and responsibilities and procedures have been included in the spill plan. Also, we have made an agreement with NCR to provide assistance with spill mitigation and removal

CAPITAL IMPROVEMENT PROJECT SUMMARY

At then end of 2019 and the first part of 2020, the district completed the rehabilitation of its primary digester. The digester was emptied and cleaned. All the valves, roof hatches, vents, flame arresters, and level sensing telemetry were replaced and the concrete on the roof was reconditioned.