State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
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June 7, 2023

Hailey Roessler, Clerk Treasurer
VILLAGE OF RIDGEWAY
208 Jarvis St
Ridgeway, WI 53582-9658

SUBJECT: Wastewater Facility Inspection
WPDES Permit No: WI-0031348-10-1
Inspection Date: 04/18/2023

Dear Ms. Roessler,

A compliance inspection of the Ridgeway Wastewater Treatment Facility was performed on 04/18/2023. The purpose of the inspection was to determine compliance with the conditions of the WPDES permit and review wastewater operations and management activities at the plant. Findings and recommendations are found in the attached report. Please take the time to read it carefully.

The treatment plant was found in compliance with the effluent limits and all terms and conditions of the permit. The following recommendations or follow-up actions are needed:

1. To prevent overdosing and toxicity, a chemical dosing SOP should be developed and implemented. Without an implemented SOP, Ridgeway may have more frequent WET testing in the upcoming permit.

2. Flow meter calibration needs to occur on at least an annual basis pursuant s. NR 218.06(1), Wis. Adm. Code.

3. pH probe is only being calibrated monthly and needs to be calibrated prior to each use. pH electrode should be kept moist in electrode solution per manufacturer. Buffers used for two-point calibration expired in August '21.

4. DO probe is only autocalibrated on a monthly basis. The DO probe needs to be calibrated prior to each use and following a correct calibration method. See attached documentation regarding DO calibration.

5. Bacteria testing needs to be started (sample placed in incubator) within 8 hours.

6. A sampling log that includes the sample collection date, time, temperature of the composite sampler, and the collector should be developed. This log can be kept at the sampler itself or in the main building.

7. A formal preventative maintenance plan should be developed and implemented.

I want to thank Dale Peterson for the time and cooperation in the performance of this inspection. Within 30 days, please provide a written response to this inspection report if any follow-up actions are noted above. If you have any questions regarding the report, feel free to call me at (262) 574-2135 or e-mail me at Amy.Garbe@wisconsin.gov.

Sincerely,
Amy Garbe, Wastewater Engineer

Wastewater Treatment Plant Compliance/Inspection Checklist

Ridgeway Wastewater Treatment Facility
206 Kirby St Ridgeway, WI 53582

OIC Name	DALE T PETERSON	WPDES Permit #	0031348-10-1	Effective Date	01/01/2021
On-Site Representative	Dale Peterson	Design Flow (Avg)	0.045	Expiration Date	12/31/2023
Responsible Official	Hailey Roessler 208 Jarvis St Ridgeway, WI 53582-9658				

Inspection Date 04/18/2023
Evaluated By Kenzie L Ostien

Part A: ON-SITE INSPECTION			
	Compliance Questions	Comments	Followup
Facility Site Review			
No	1. Is a schematic diagram available of the treatment plant? If yes, attach.	Current flow diagram on file is for the WWTP pre-upgrade. An updated flow diagram of the WWTP post construction is needed and will be needed as part of reissuance application.	
Yes	2. Are all liquid treatment train unit operations and processes operating satisfactorily?	New treatment plant (AeroMod package plant) built in 2019. Overall, treatment plan appeared to be operating very well and effluent quality supports these findings. See below for process specific questions and comments. Entire plant appeared clean and well maintained.	
Subclass A1: Biological Treatment - Suspended Growth Process			
Yes	A1-1. Does the appearance of the aeration basin look good?	Some grease balls present on surface, but there is not a good way to completely remove grease from system since it tends to recycle from aeration tanks to digester and back. AeroMod system has 2 basins that cycle between fill/aeration, react (with air) and mix (anoxic zone without air) for biological treatment prior to final clarifiers.	
Yes	A1-2. Does the aeration pattern show that all diffusers are working?	During aeration phase, even aeration noticeable throughout basin. Bubbles not too dark and not foam forming.	
N/E	A1-3. Is the dissolved oxygen level adequate?	DO levels in SCADA, not sure of set points	
Yes	A1-4. Is the MLSS level optimum, resulting in a good F/M ratio?	~3100 mg/L, trying to reduce MLSS	
Yes	A1-5. Is the 30 minute settling test and resultant SVI good?	Settles like a rock, reflective of old sludge	
Yes	A1-6. Do the bugs look good?	Filamentous, rotifers, some free swimmers	
Yes	A1-7. Is sludge wasted regularly to maintain an optimum and consistent sludge age?	Sludge is wasted out of aeration basins based on volume. Current wasting rates are higher to bring down mixed liquor.	
Yes	A1-8. Are all blowers or mechanical aerators operational and on a regular maintenance schedule?	Somewhat, maintenance does occur but facility needs to work on a formal PM plan.	
Yes	A1-9. Has the aeration basin been emptied, inspected and cleaned within the last five years, including diffusers?	New plant was installed in 2019.	Investigate partially draining to clean sides of tank.
No	A1-10. Are there safety flotation devices on the railings?		Install safety floatation devices on aeration basin railings.
Subclass B: Solids Separation			
No	B-1. Are clarifier surfaces free of floating sludge, grease and gas bubbles?	Some floating sludge not too much	
Yes	B-2. Does the operator measure and record clarifier sludge blankets on a regular basis?	Twice/week	
Yes	B-3. Is the effluent flow over the entire length of the weirs?		
N/A	B-4. If the clarifier is rectangular, are the flights and chains in sound shape and working correctly?	Clarifiers are rectangular with no regular flights and chains. Surface scrapers are instead tubes to collect floaters.	
N/A	B-5. If the clarifier is circular, do the surface skimmer and subsurface sludge scraper mechanism appear to be working well?		

No	B-6. Are the clarifier(s) drained, cleaned, and inspected on a regular basis?	The clarifiers have not been drained and cleaned since installation occurred in 2019.	Investigate partially draining to clean sides of tank.

Subclass D: Disinfection			
N/A	D-1. Is the chlorine contact tank cleaned regularly and absent of surface gas bubbles or floating clumps of sludge?	UV Disinfection as part of recent facility upgrade	
N/A	D-2. Is chlorine (gas or liquid) adequately and completely mixed into the contact basin?	UV Disinfection	
N/A	D-3. If using chlorine gas, does the storage room meet all safety requirements?	UV Disinfection	
Yes	D-4. Are uv lamps submerged in the effluent channel?	Lamps put into channel in preparation of disinfection season.	
Yes	D-5. Do uv sleeves need to be cleaned regularly to maintain disinfection efficiency?	UV sleeves are manually cleaned before regular rec season.	
N/A	D-6. Are residual chlorine samples tested within 15 minutes of collecting the sample?	UV Disinfection	

Subclass P: Biological Nutrient Removal (Phosphorus)			
Yes	P-1. Does the plant utilize in-line monitoring (ORP? dissolved oxygen) for monitoring anoxic, anaerobic and aerobic conditions?		
No	P-2. Does the plant monitor ortho-P across treatment units?	Effluent for ortho-P only	
No	P-3. Are side streams monitored for phosphorus?		
N/A	P-4. Are detention times in anoxic and anaerobic selector tanks short enough to achieve good phosphorus removal?	Alum addition into first basin	
N/A	P-5. Are process conditions optimized for BPR?	Only partial Bio-P, main way for phosphorus removal is chemical addition	To prevent overdoing and toxicity, a chemical dosing SOP should be developed and implemented. Without an implemented SOP, Ridgeway may have more frequent WET testing in the upcoming permit.
No	3. Are there any unique treatment units, processes or operations in the liquid treatment train? If yes, comment.		
Yes	4. Is effluent being discharged clear, free of floating solids or visible foam other than in trace amounts?	Discharge at treatment plant after UV appeared clear and free of solids. As stated in Q#36 comments, there were floating solids at the actual outfall which may have been algae sloughing off from pipe.	

Flow Measurement			
Yes	5. Is wastewater flow, influent and/or effluent, being accurately measured?	Influent - magmeter after the screen Effluent - none	
No	6. Are flow monitoring devices calibrated annually?	Unsure of when last calibrated, unable to find any records	Flow meter calibration needs to occur on at least an annual basis pursuant s. NR 218.06(1), Wis. Adm. Code.
No	7. Are there significant industrial/commercial contributors of wastewater to the plant? If yes, list in comments.	Accept ~1500 gpd holding tank and ~1500 gpd septic tank Only allow 1 hauler, comes in around 1-2 times/month No significant industrial contributors. 1 restaurant, no grease trap (not sure what grease trap requirements there are in the sewer use ordinance).	

Sampling and Testing

No	8. Are wastewater influent, effluent, biosolids and groundwater samples, as applicable, being collected and tested as required by the WPDES permit?	Influent - 24-hr flow proportional composite samples are taken after influent screening. Effluent - 24-hr time proportional composite samples shall be taken prior to UV disinfection. Grab samples shall be taken from the outfall prior to discharge to smith-conley creek.	pH probe is only being calibrated monthly and needs to be calibrated prior to each use. pH electrode should be kept moist in electrode solution per manufacturer. Buffers used for two-point calibration expired in August '21. DO probe is only autocalibrated on a monthly basis. The DO probe needs to be calibrated prior to each use and following a correct calibration method. See attached documentation regarding DO calibration. Bacteria testing needs to be started (sample placed in incubator) within 8 hours.
Yes	9. Are wastewater composite samplers being maintained at or less than 6C?	Influent - 3.5 ºC Effluent - no thermometer, but composite sampler read <6 ºC	
No	10. Are sampling logs being used to record sample days, times, temperatures and collector?		A sampling log that includes the sample collection date, time, temperature of the composite sampler, and the collector should be developed. This log can be kept at the sampler itself or in the main building.
No	11. Were samples collected as part of this inspection? If yes, include state lab results.	No samples collected as part of this inspection.	

Operations and Maintenance			
Yes	12. Is the Operator-in-Charge certified at the proper grade(s)?	Plant Classification: Basic - A1, B, C, D, P & SS OIC - Dale Peterson #37403 Held: Basic - A1, A3, B, C, D, P, & SS No back-up operators. Currently in the process	
Yes	13. Is the treatment works and disposal system being properly operated and maintained, when in operation?		
Yes	14. Are process control tests being performed and recorded to properly operate and maintain the plant?	M-F daily 30-min settling pH, DO, NH3, ortho-P, MLSS	
No	15. Does the plant have a documented and implemented preventative maintenance program for major equipment?	None, somewhat a spreadsheet	A formal preventative maintenance plan should be developed and implemented.
N/A	16. Is the permittee following the requirements contained in any approved management plan?		

Biosolids Treatment, Handling and Storage			
Yes	17. Are all unit operations and processes for biosolids/sludge treatment and storage operating satisfactorily?		
Yes	18. Are there any unique treatment units, processes or operations in the solids treatment train? If yes, comment.	Geotubes	
Yes	19. Are biosolids/solids meeting all applicable sludge quality standards and processes standards before disposal or distribution?	When land applied in 2018, metals were meeting high quality limits Pathogen Reduction - fecal coliform Vector Attraction - injection	
N/A	20. Are biosolids/solids being landspread meeting all NR 204 or NR 214 landspreading requirements?	Sludge last land applied in 2018. Sludge was hauled to Dodgeville WWTP in 2019, and was landfilled in 2022.	
No	21. Are all biosolids/solids and land application reports completed and submitted on time?	No sampling of solids occurred in 2019, 2020, 2021, or 2022. Required to sample annually regardless of distribution method. 52/55 forms submitted on time.	

Part B: PERMIT AND REPORTING REQUIREMENTS

Permit			
Yes	22. Is a copy of the current WPDES permit kept at the treatment plant?		Keep signed copy on site.
Yes	23. Was the WPDES permit reviewed with the operator-in-charge?	Permit Application - monitoring requirements (due 7/5/23) including E. coli this disinfection season New effluent limits - E. coli, nitrogen series, MDV P interim limit (based on current treatment), temperature, chloride Recommend increased monitoring frequency due to variable nature of discharge and previous limit violations.	

Records/Reports			
No	24. Are all Discharge Monitoring Reports completed correctly and submitted on time?	Several late submittals of reports, averages 2 late reports/year. Not a chronic issue.	
Yes	25. Are all other WPDES permit required reports completed correctly and submitted on time?		
Yes	26. Were there any CMAR compliance recommendations made or actions required because of low CMAR grades (C, D or F)?	Low grades for ammonia, biosolids, and TSS in 2017, 2019 and 2020. Actions taken were related to a facility upgrade and then issues with plant start-up.	
No	27. Were there any CMAR follow-up actions regardless of grades?	Only follow-up comments were for low grades.	

Compliance Schedules			
Yes	28. Is the permittee up to date on required actions as specified in the Schedule of Compliance?	MDV optimization, interim limit, and payment verification 2022 MDV Payment Verification Form Missing - due 3/31/2023, was resent during the inspection	

Sanitary Sewer Overflows			
No	29. Have any sanitary sewer overflows occurred since the last inspections?	Last overflow was in 2000.	
Yes	30. Have SSOs been reported as required?	Initial notification within 24 hours and written report to be submitted electronically within 5 days.	
Yes	31. Does the facility have a documented collection system O&M or CMOM program?	See attached for additional questions and comments related to the CMOM evaluation.	

Part C: EFFLUENT / RECEIVING WATERS

Effluent Limits			
No	32. Is the permittee in compliance with all effluent limits based on a review of discharge monitoring reports?	See attached graphs for summary of effluent data and violations. Dec 2019 and early 2020 violations were due to a mix of start up of the new treatment plant and cold weather. Late 2022 violations - unsure, current operator was not present and no paperwork was left Feb & March 2023 violations - high incoming flows due to I/I caused a washout of the plant	
N/A	33. Is the permittee in compliance with all groundwater standards based on a review of groundwater monitoring forms?	No groundwater requirements in current permit.	

Outfalls			
Yes	34. Have you physically observed the effluent outfall?		
Yes	35. If observable, does the outfall structure appear structurally sound and located as originally designed/constructed?		

Receiving Waters

No	36. Does the receiving water below the outfall appear acceptable compared to upstream water quality?	Floating clumps of algae or solids, either from the WWTP or from within the pipe were noticed being discharged. Clumps of either floating solids or algae was not noticeable upstream within the treatment plant, so it is thought that it is either growth within the pipe or right at the outfall in which sloughing off is occurring. Investigation should occur.	

General Comments			
No	37. Are there any general comments about this treatment facility?		

SUBSTANTIAL COMPLIANCE DETERMINATION			
No	38. Are all conditions of the permit, including standard conditions, being met?	Most conditions and standard requirements of the current WPDES permit are being met. As identified above, there are some follow-up actions related to paperwork items that need ot be developed and implemented.	
Yes	39. IS THE PERMITTEE IN SUBSTANTIAL COMPLIANCE WITH THE PERMIT? If not, please comment.	The permittee has been found to be in substantial compliance with their WPDES permit.	

SAMPLING COLLECTION & TESTING CHECKLIST

COMPOSITE SAMPLING COLLECTION, STORAGE, & TRANSPORTATION	
Are influent & effluent composite samplers flow or time proportional?	Influent is flow proportional; effluent is time proportional. Samples are missed prior to pouring into sample bottles for the labs.
Are composite samplers maintained between 0-6°C?	Effluent sampler did not have a thermometer, but automatic sampler indicated <6 ºC. Thermometers are typically checked or replaced on an annual basis.
Composite Sampling Collection, Storage, & Transportation	Automatic sampler is started at 7:30am and collected at 7:30am the next day. Certified Lab (LV Labs) picks up the samples and drives to the lab.
Equipment Care	Tubing is changed on a quarterly basis and carboys are cleaned in between samples.
pH	pH probe is only being calibrated monthly and needs to be calibrated prior to each use. pH electrode should be kept moist in electrode solution per manufacturer. Buffers used for two-point calibration expired in August '21.
Dissolved Oxygen	DO probe is only auto calibrated on a monthly basis. The DO probe needs to be calibrated prior to each use and following a correct calibration method. See attached documentation regarding DO calibration.
Fecal Coliform/E. coli	Outside lab (LV labs) tests for both fecal coliform and *E. coli*. Tests are not started within 8 hours.
Total Residual Chlorine	N/A
Temperature	Probe is in the stream. Oct 2022 data has the potential that it was reading ambient air. Now temperatures are being verified with both the pH and DO meters.

CMOM COMPLIANCE CHECKLIST SUMMARY

Permittee: Ridgeway	*Inspected by:* Amy Garbe, Reviewed by Jordan Matz
Permit No.: 0031348-10-1	*Date:* 5/30/2023

1.	☒Yes ☐No ☐N/A ☐N/E	*Is the facility implementing their CMOM program? (NR 210.23(1), Wis. Adm. Code)*	
2.	☐Yes ☒No ☐N/A ☐N/E	*Is the CMOM updated on an annual basis? If so, when was the date of the last review? (NR 210.23(5)(b), Wis. Adm. Code)*	version provided is 2019 minimum is annual should include an update tracking table
3.	☐Yes ☒No ☐N/A ☐N/E	*Are the goals manageable, quantifiable, realistic and being achieved? (NR 210.23(4)(a), Wis. Adm. Code)*	"annual" vs "as needed" contradictive Utilize clearly and specifically w/ a quantifiable metric →
4.	☐Yes ☒No ☐N/A ☐N/E	*Does the organization section include a detailed list of internal and external contacts, responsibility, and lines of communication? (NR 210.23(4)(b), Wis. Adm. Code)*	Public Utilities Director contact provided Add DNR contact Kenzie + Spills hotline could add President + clerk contacts
5.	☒Yes ☐No ☐N/A ☐N/E	*Does the facility have the documented legal authority to maintain and protect its sewer system? (NR 210.23(4)(c), Wis. Adm. Code)*	Sewer use ordinance in place Summary in S. 3.5 looks complete, has comprehensive considerations
6.	☒Yes ☐No ☐N/A ☐N/E	*Does the facility have an up to date collection system map, management system and capacity assessment program? (NR 210.23(4)(d), Wis. Adm. Code)*	no map in CMOM Table 3-2 condition Assessment to help w/ asset management S.O capacity assessment
7.	☒Yes ☐No ☐N/A ☐N/E	*Does the CMOM include a detailed list of O&M activities, building backups, and critical replacement parts? (NR 210.23(4)(d), Wis. Adm. Code)*	Records of maintenance and inspection kept e municip. garage Very detailed comments on activities to be performed & priority Section 4.9 parts inventory
8.	☒Yes ☐No ☐N/A ☐N/E	*Does the CMOM include a list of required training for new and experienced operators with an appropriate frequency? (NR 210.23(4)(d), Wis. Adm. Code)*	Section 3.3
9.	☒Yes ☐No ☐N/A ☐N/E	*Does the CMOM contain a detailed response plan for emergencies including; SSOs, TFOs, and various types of spills? (NR 210.23(4)(f), Wis. Adm. Code)*	Needs Spills hotline + DNR contact otherwise includes all actions for reporting.
10.	☒Yes ☐No ☐N/A ☐N/E	*Does the CMOM document the proper communication to be taken in the event of an emergency including public and DNR notification? (NR 210.23(4)(f), Wis. Adm. Code)*	Section 6.1, 6.2, 6.3 Sufficient, example public notice attached to CMOM but not provided.
11.	☒Yes ☐No ☐N/A ☐N/E	*Are lift stations properly maintained, powered, and monitored? (NR 210.23(4), Wis. Adm. Code)*	Section 3.1.2 no dedicated backup gen. but on-site light and alarm. portable generator stored in village.

Comments:

Actionable edits highlighted in yellow above, summary here:

- provide a table w/in the document tracking annual updates
- goals that can be quantified should have a goal value to better evaluate success
- Include DNR contacts for compliance engineer and Spills Hotline
- provide a map of the current sanitary system in the interim as the GIS mapping is a long-term goal

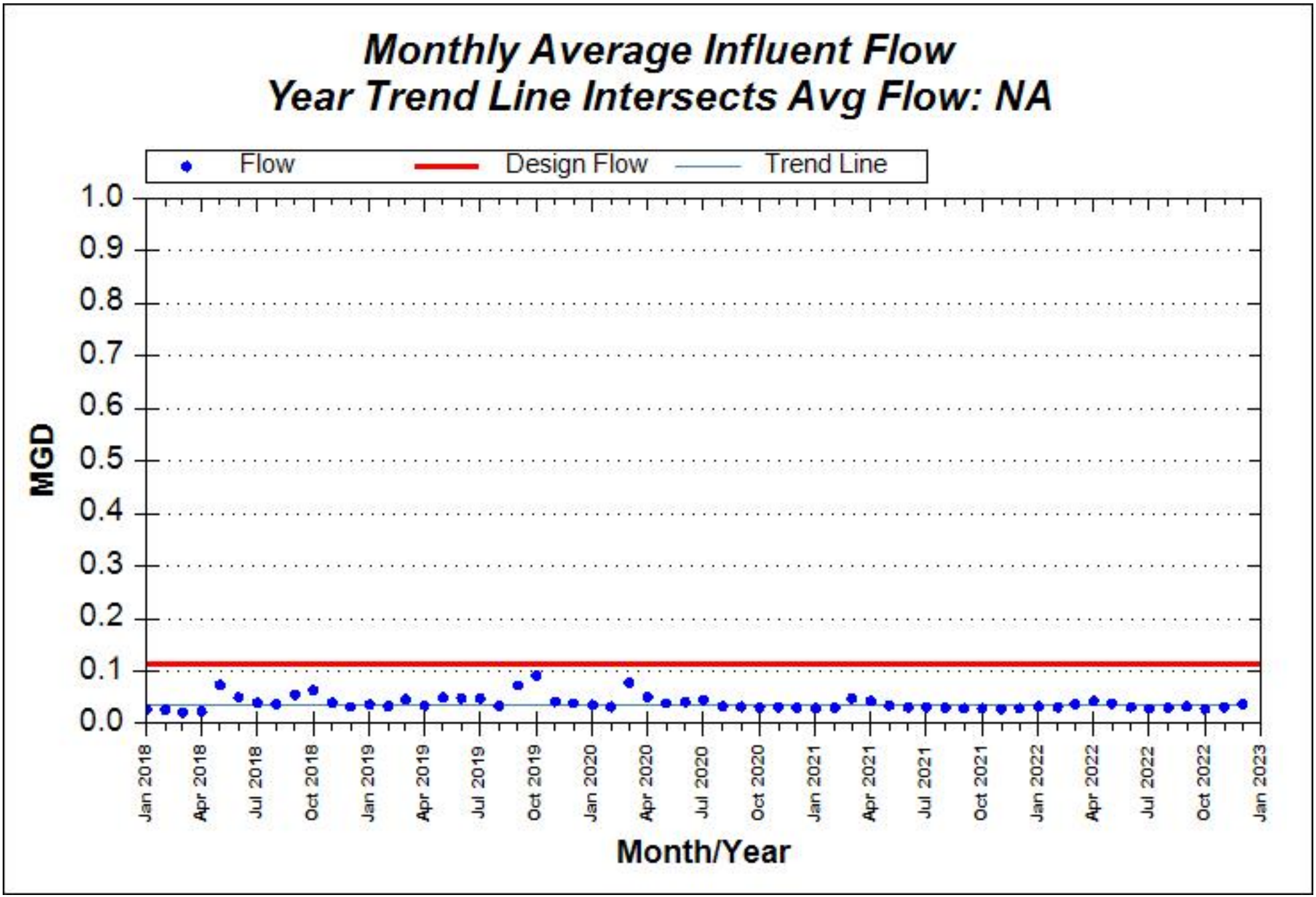
Goals: "annually" and "as needed" → should express in terms of % cleaned each year, or define "as needed" specifically

goals are comprehensive but should be more quantifiable to measure success more directly.

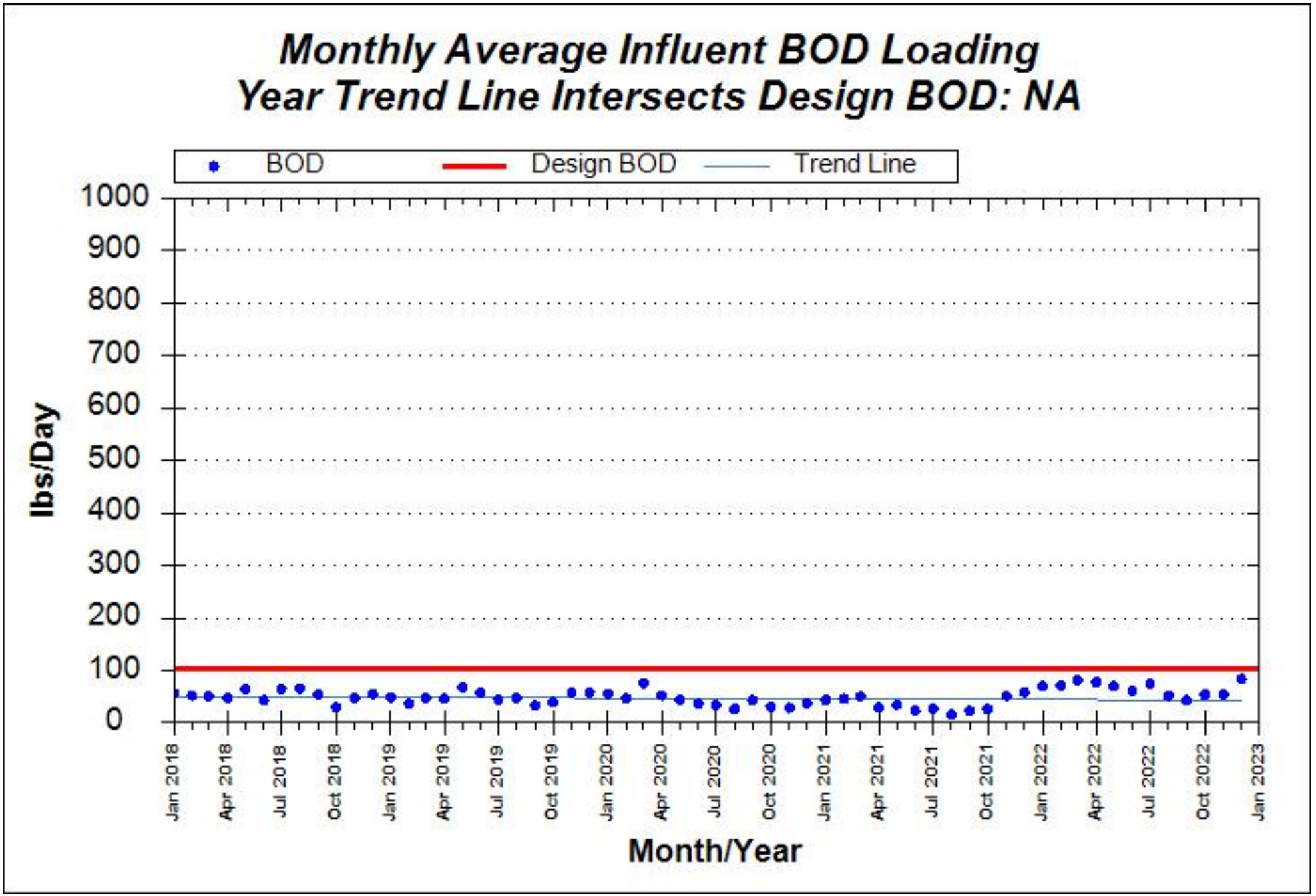
For example, state how often condition assessments are performed on what equipment

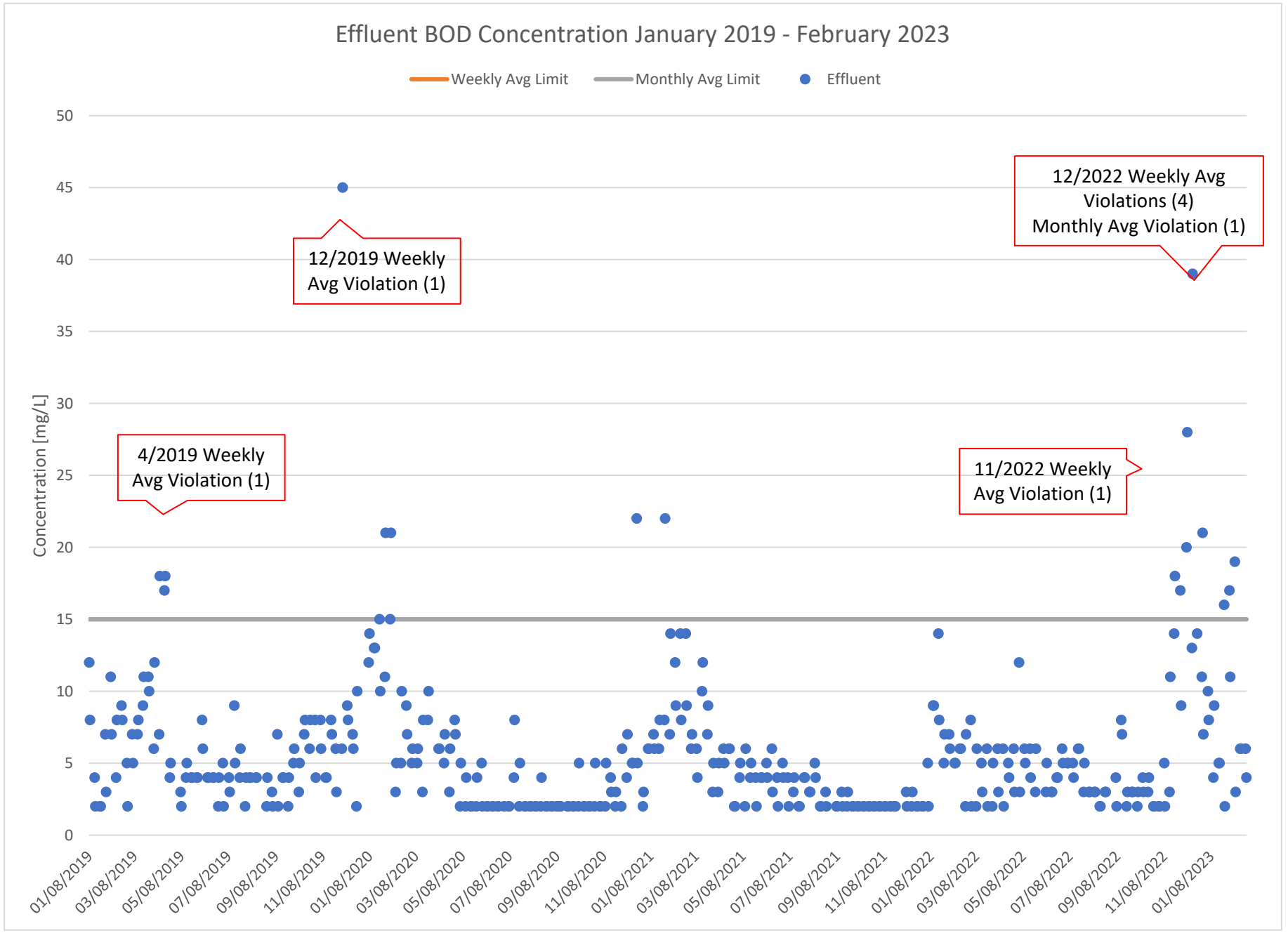
what % of manholes are looked @ each year (100%?)

Ridgeway Wastewater Treatment Facility
Linear equation uses 2004 - 2022 CMAR data
for Trend Line: y = -0.000032 x + 0.04



Ridgeway Wastewater Treatment Facility
Linear equation uses 2004 - 2022 CMAR data
for Trend Line: y = -0.119527 x + 50.13




Effluent BOD Concentration January 2019 - February 2023
Weekly Avg Limit
Monthly Avg Limit
Effluent
Concentration [mg/L]
50
45
40
35
30
25
20
15
10
5
0
12/2019 Weekly Avg Violation (1)
4/2019 Weekly Avg Violation (1)
12/2022 Weekly Avg Violations (4) Monthly Avg Violation (1)
11/2022 Weekly Avg Violation (1)
01/08/2019
03/08/2019
05/08/2019
07/08/2019
09/08/2019
11/08/2019
01/08/2020
03/08/2020
05/08/2020
07/08/2020
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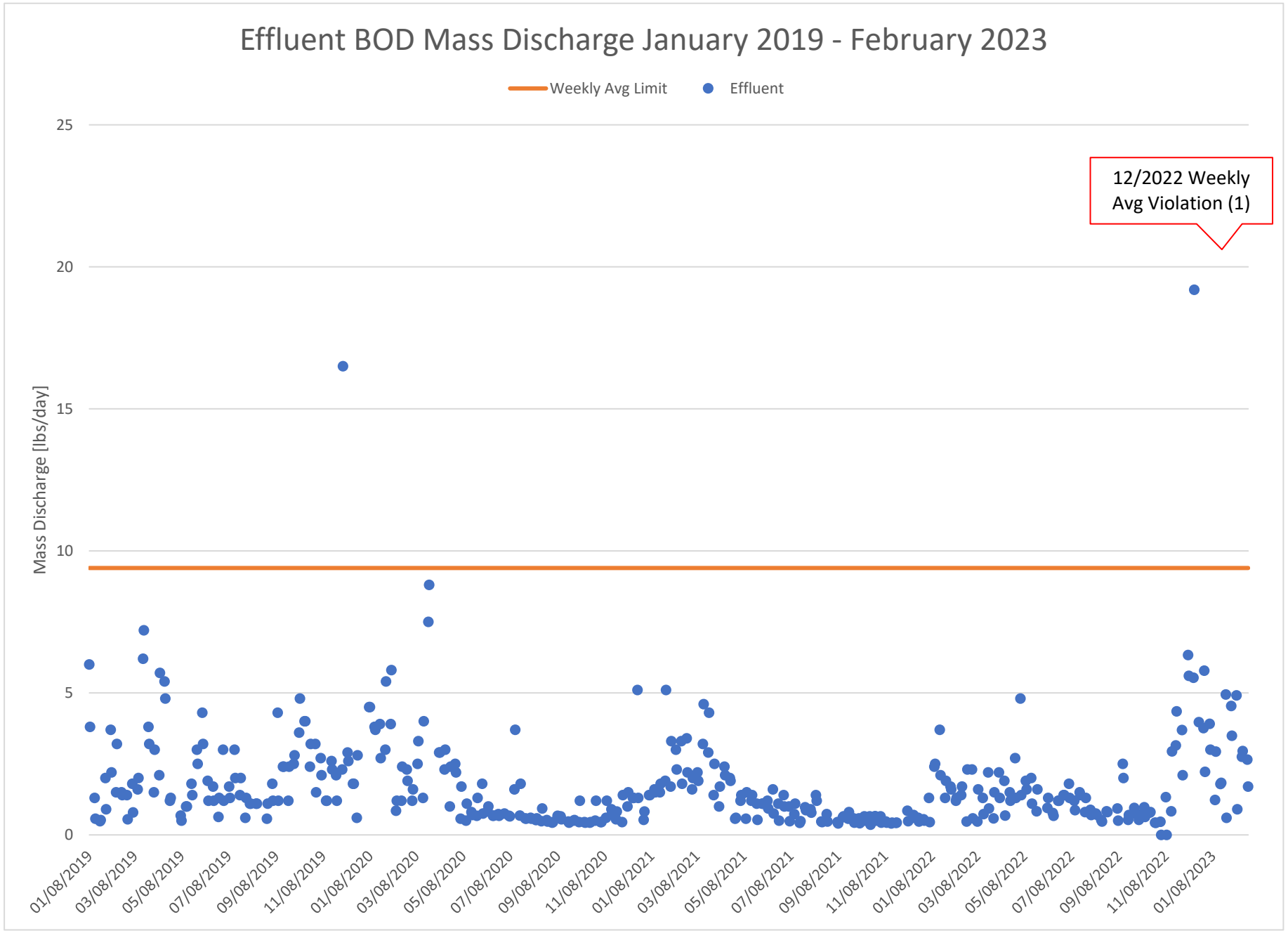
Effluent BOD Mass Discharge January 2019 - February 2023
Weekly Avg Limit
Effluent
Mass Discharge [lbs/day]
25
20
15
10
5
0
12/2022 Weekly Avg Violation (1)
01/08/2019
03/08/2019
05/08/2019
07/08/2019
09/08/2019
11/08/2019
01/08/2020
03/08/2020
05/08/2020
07/08/2020
09/08/2020
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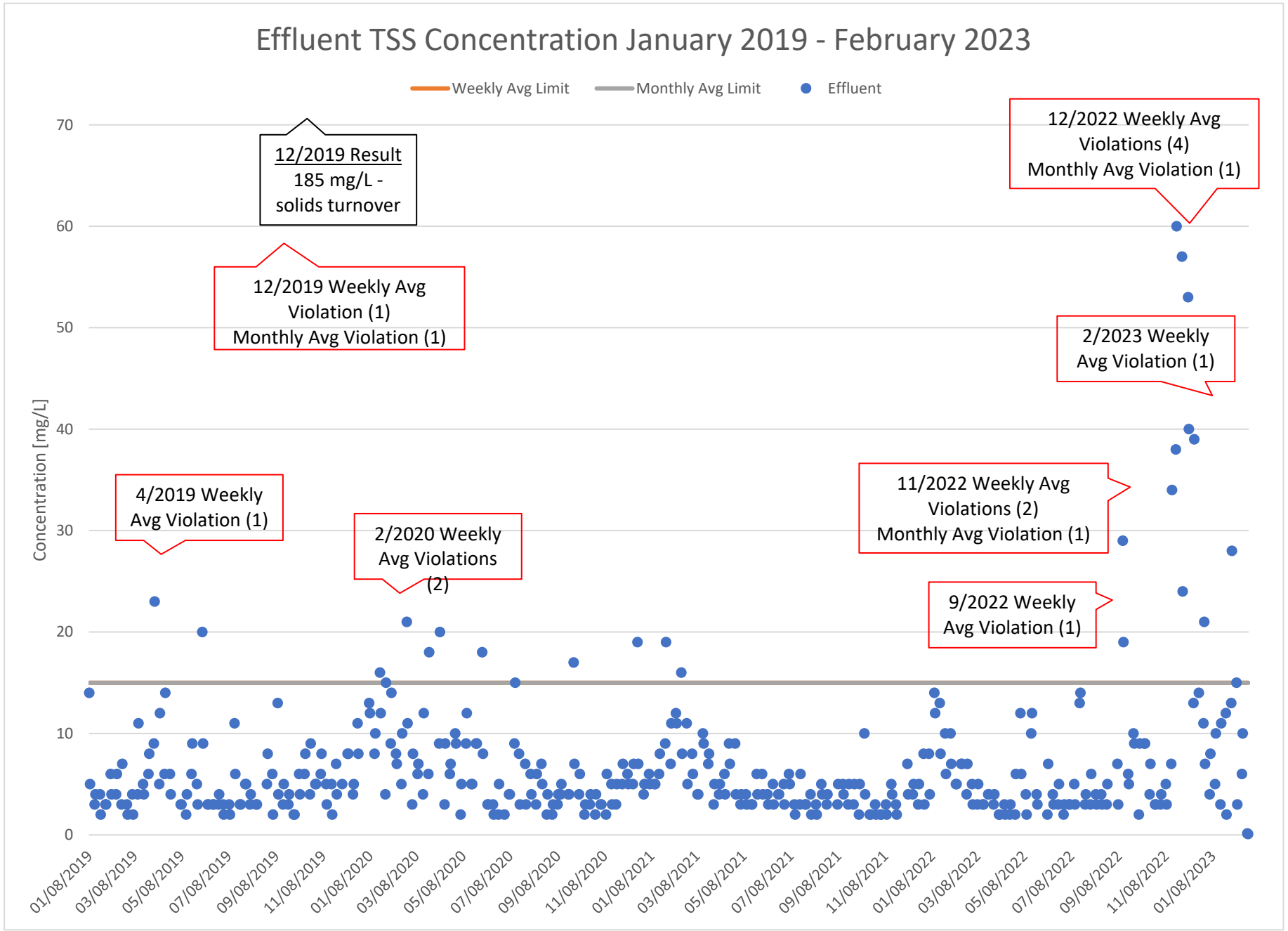
11/08/2022
01/08/2023


Effluent TSS Concentration January 2019 - February 2023
Weekly Avg Limit
Monthly Avg Limit
Effluent
Concentration [mg/L]
0
10
20
30
40
50
60
70
12/2019 Result
185 mg/L -
solids turnover
12/2019 Weekly Avg
Violation (1)
Monthly Avg Violation (1)
12/2022 Weekly Avg
Violations (4)
Monthly Avg Violation (1)
2/2023 Weekly
Avg Violation (1)
4/2019 Weekly
Avg Violation (1)
2/2020 Weekly
Avg Violations
(2)
11/2022 Weekly Avg
Violations (2)
Monthly Avg Violation (1)
9/2022 Weekly
Avg Violation (1)
01/08/2019
03/08/2019
05/08/2019
07/08/2019
09/08/2019
11/08/2019
01/08/2020
03/08/2020
05/08/2020
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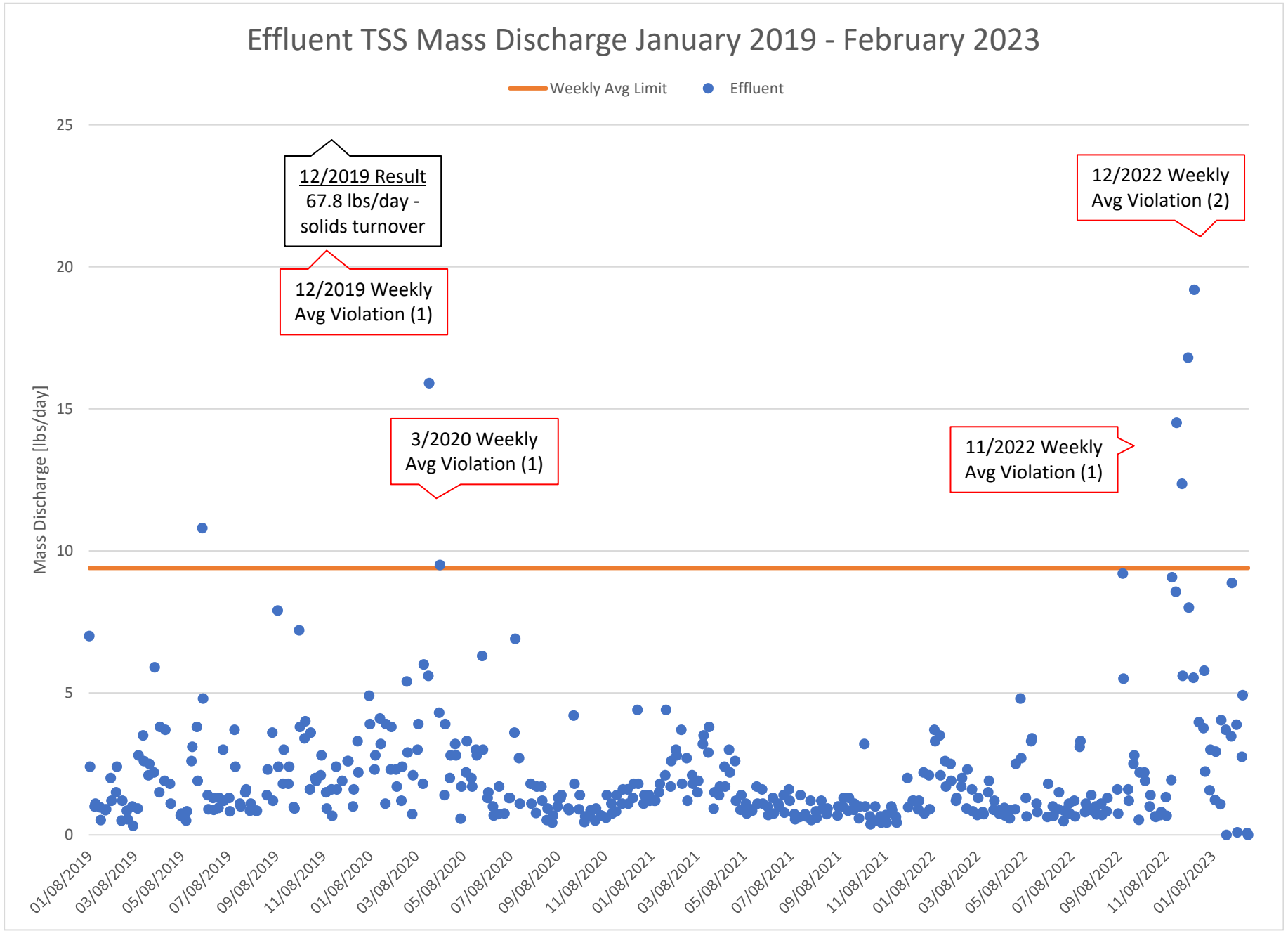
11/08/2022
01/08/2023


Effluent TSS Mass Discharge January 2019 - February 2023
Weekly Avg Limit
Effluent
Mass Discharge [lbs/day]
25
20
15
10
5
0
12/2019 Result
67.8 lbs/day -
solids turnover
12/2019 Weekly
Avg Violation (1)
3/2020 Weekly
Avg Violation (1)
11/2022 Weekly
Avg Violation (1)
12/2022 Weekly
Avg Violation (2)
01/08/2019
03/08/2019
05/08/2019
07/08/2019
09/08/2019
11/08/2019
01/08/2020
03/08/2020
05/08/2020
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11/08/2021
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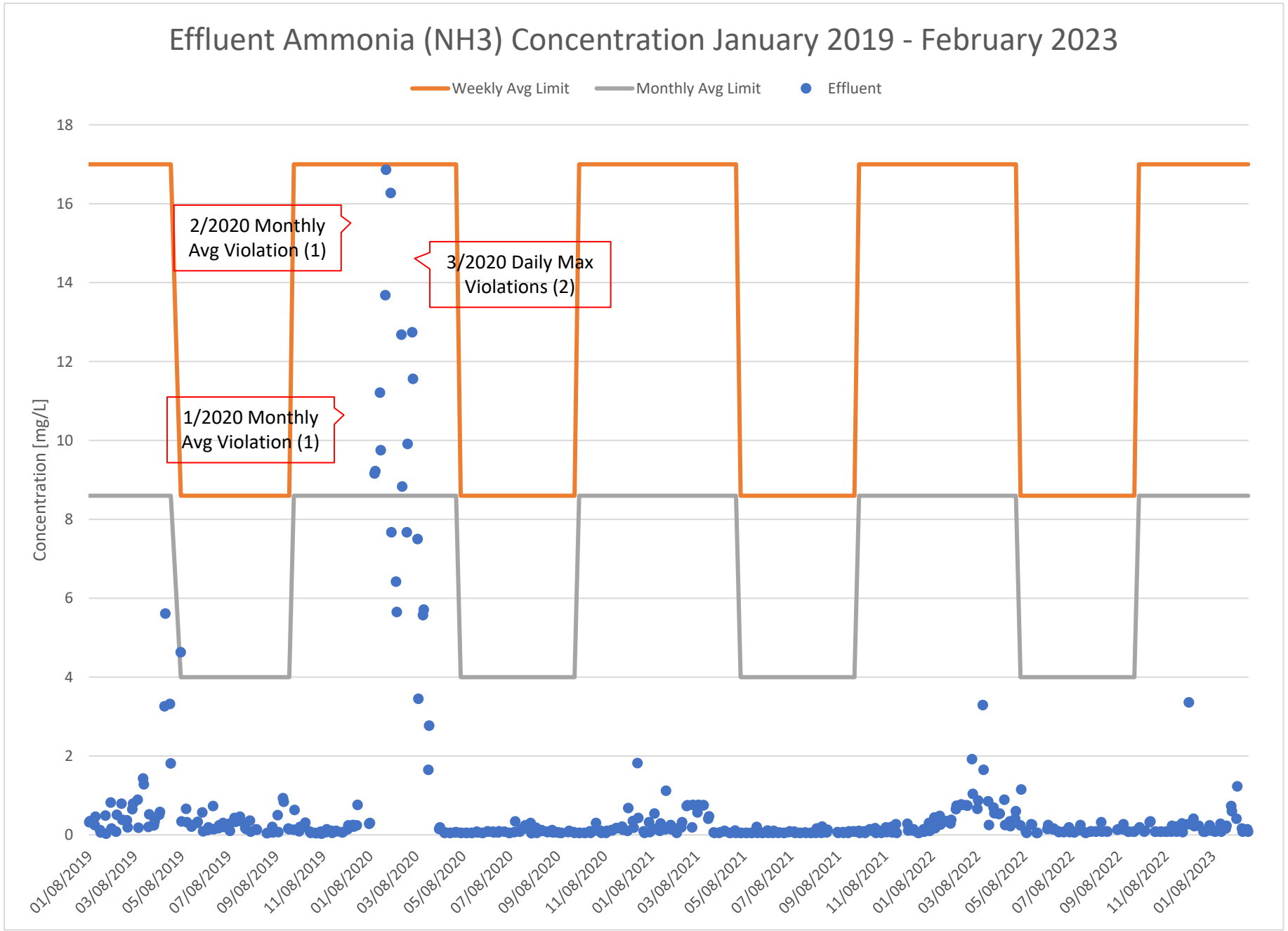
11/08/2022
01/08/2023


Effluent Ammonia (NH3) Concentration January 2019 - February 2023
Weekly Avg Limit
Monthly Avg Limit
Effluent
Concentration [mg/L]
18
16
14
12
10
8
6
4
2
0
2/2020 Monthly Avg Violation (1)
3/2020 Daily Max Violations (2)
1/2020 Monthly Avg Violation (1)
01/08/2019
03/08/2019
05/08/2019
07/08/2019
09/08/2019
11/08/2019
01/08/2020
03/08/2020
05/08/2020
07/08/2020
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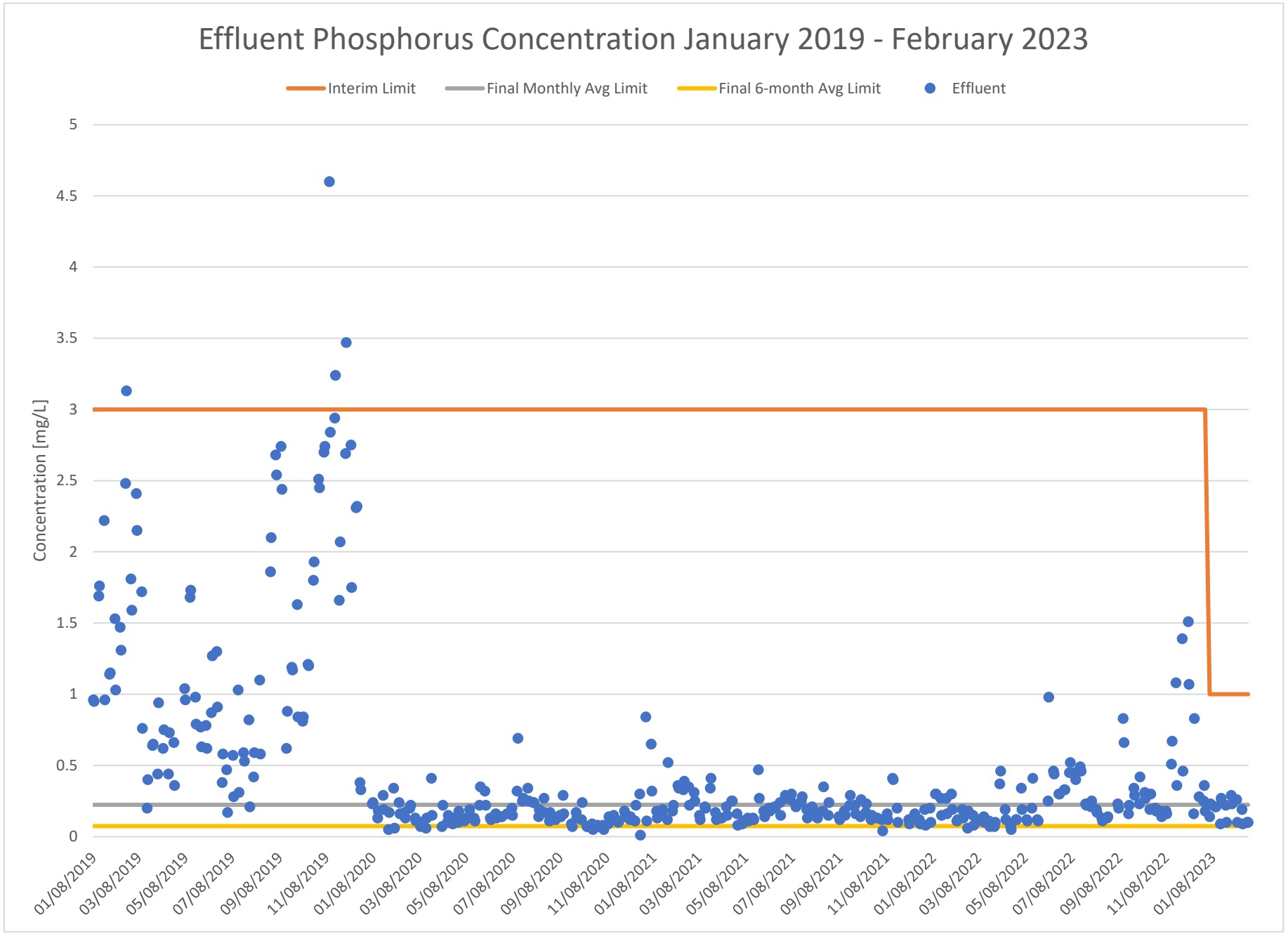
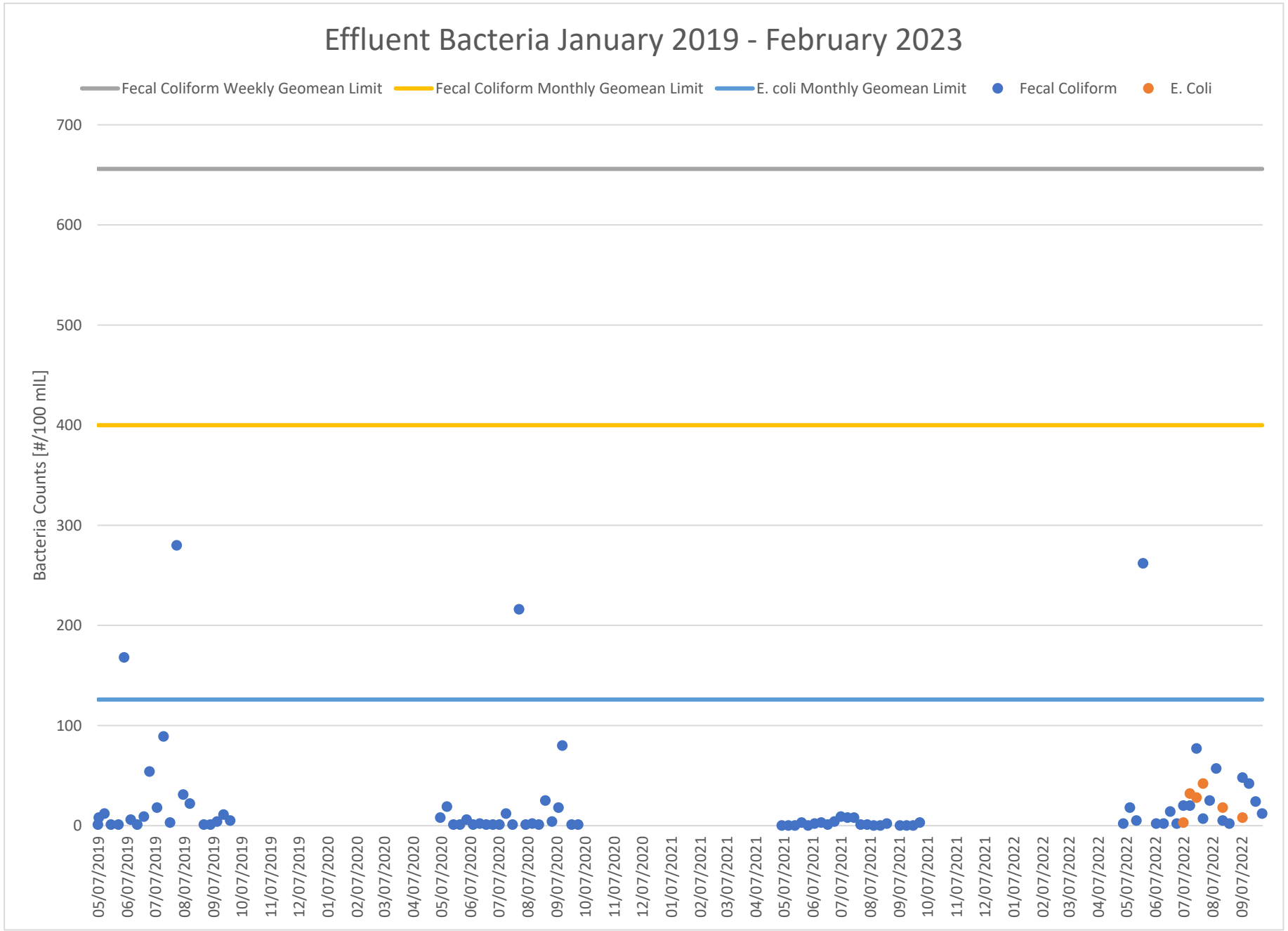
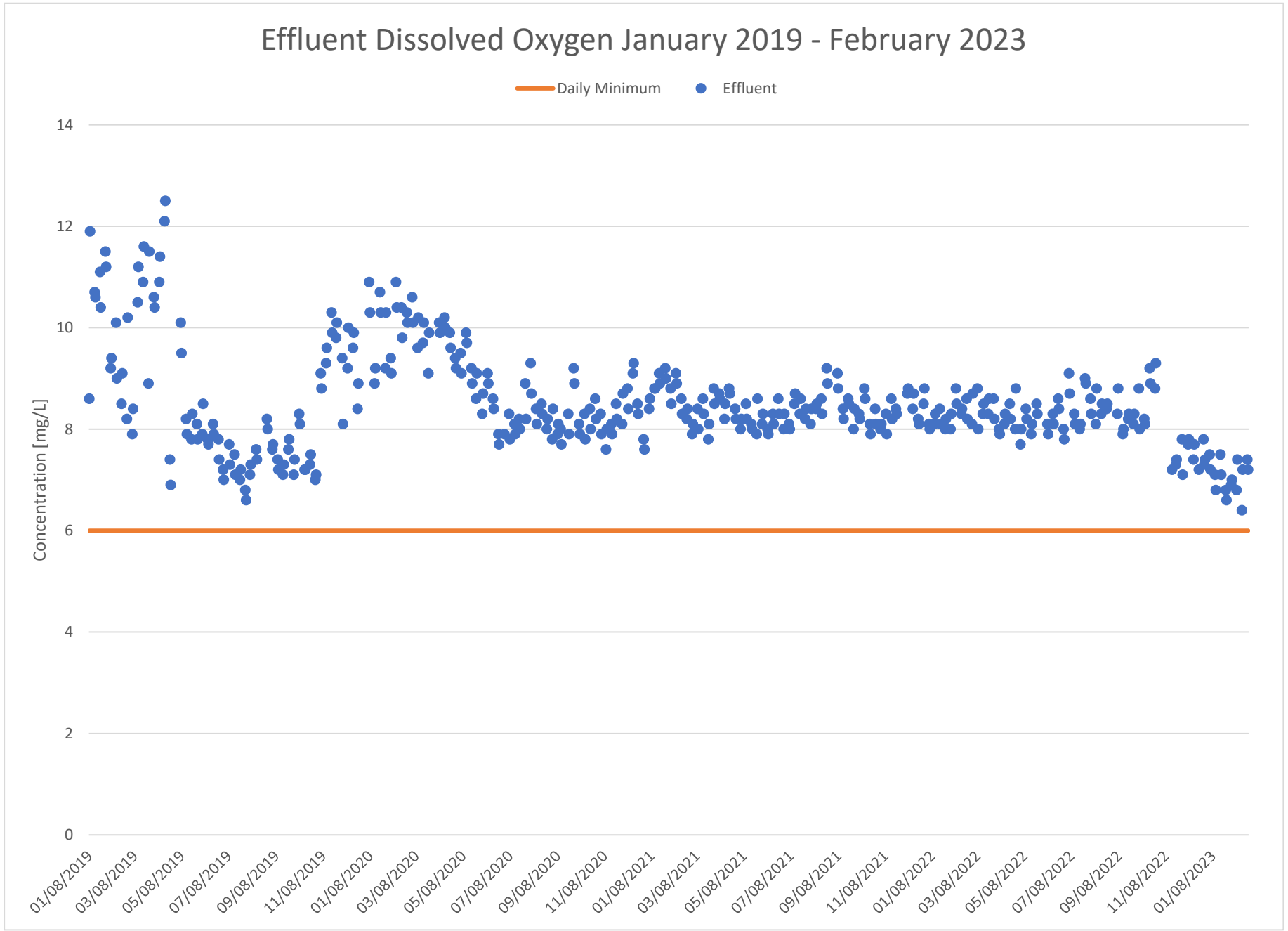
09/08/2021
11/08/2021
01/08/2022
03/08/2022
05/08/2022
07/08/2022
09/08/2022
11/08/2022
01/08/2023


Effluent Phosphorus Concentration January 2019 - February 2023
Interim Limit
Final Monthly Avg Limit
Final 6-month Avg Limit
Effluent
Concentration [mg/L]
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
01/08/2019
03/08/2019
05/08/2019
07/08/2019
09/08/2019
11/08/2019
01/08/2020
03/08/2020
05/08/2020
07/08/2020
09/08/2020
11/08/2020
01/08/2021
03/08/2021
05/08/2021
07/08/2021
09/08/2021
11/08/2021
01/08/2022
03/08/2022
05/08/2022
07/08/2022
09/08/2022
11/08/2022
01/08/2023


Effluent Bacteria January 2019 - February 2023
Fecal Coliform Weekly Geomean Limit
Fecal Coliform Monthly Geomean Limit
E. coli Monthly Geomean Limit
Fecal Coliform
E. Coli
Bacteria Counts [#/100 mL]
700
600
500
400
300
200
100
0
05/07/2019
06/07/2019
07/07/2019
08/07/2019
09/07/2019
10/07/2019
11/07/2019
12/07/2019
01/07/2020
02/07/2020
03/07/2020
04/07/2020
05/07/2020
06/07/2020
07/07/2020
08/07/2020
09/07/2020
10/07/2020
11/07/2020
12/07/2020
01/07/2021
02/07/2021
03/07/2021
04/07/2021
05/07/2021
06/07/2021
07/07/2021
08/07/2021
09/07/2021
10/07/2021
11/07/2021
12/07/2021
01/07/2022
02/07/2022
03/07/2022
04/07/2022
05/07/2022
06/07/2022
07/07/2022
08/07/2022
09/07/2022


Effluent Dissolved Oxygen January 2019 - February 2023
Daily Minimum
Effluent
Concentration [mg/L]
14
12
10
8
6
4
2
0
01/08/2019
03/08/2019
05/08/2019
07/08/2019
09/08/2019
11/08/2019
01/08/2020
03/08/2020
05/08/2020
07/08/2020
09/08/2020
11/08/2020
01/08/2021
03/08/2021
05/08/2021
07/08/2021
09/08/2021
11/08/2021
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03/08/2022
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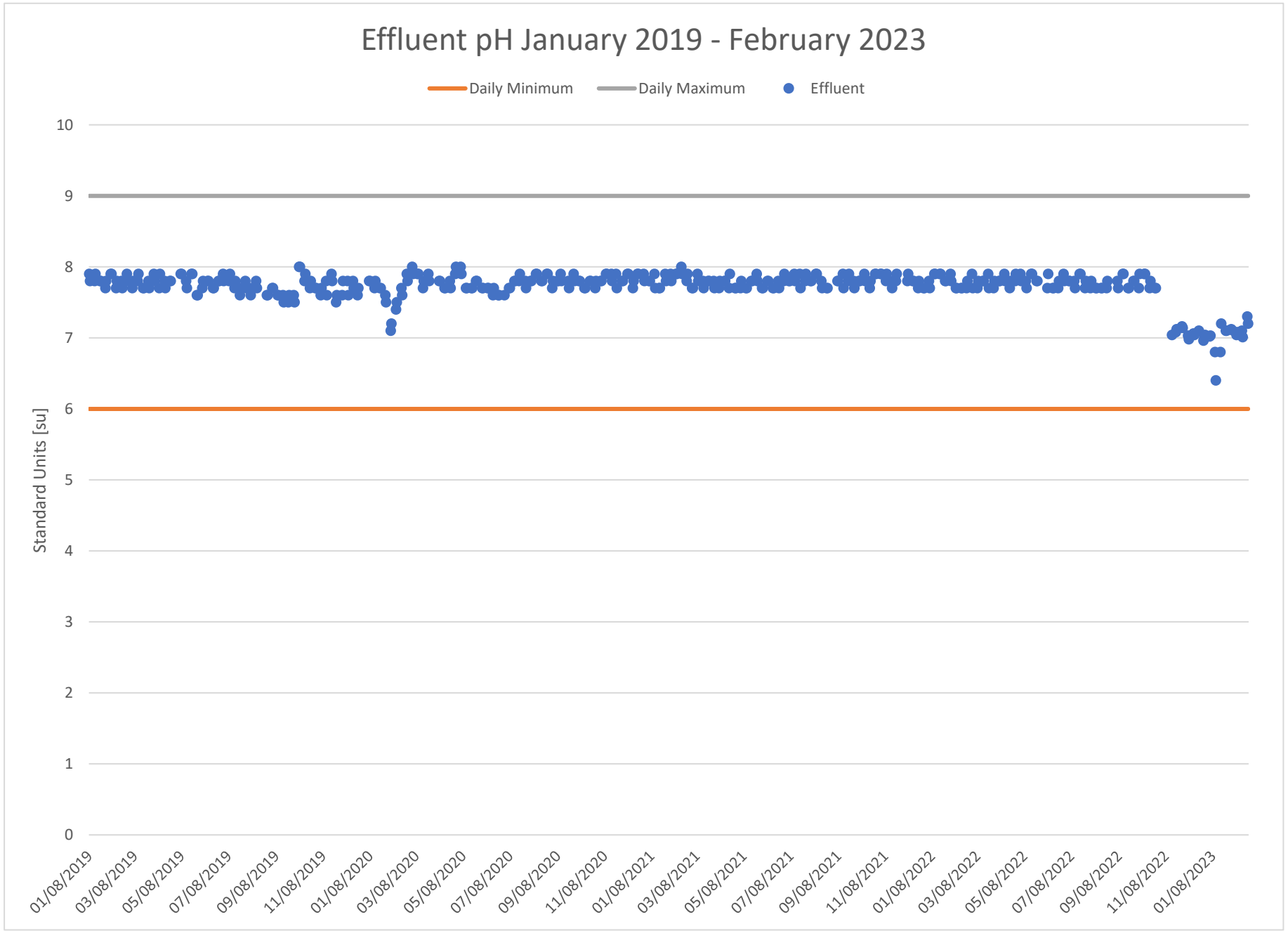
09/08/2022
11/08/2022
01/08/2023


Effluent pH January 2019 - February 2023
Daily Minimum
Daily Maximum
Effluent
Standard Units [su]
10
9
8
7
6
5
4
3
2
1
0
01/08/2019
03/08/2019
05/08/2019
07/08/2019
09/08/2019
11/08/2019
01/08/2020
03/08/2020
05/08/2020
07/08/2020
09/08/2020
11/08/2020
01/08/2021
03/08/2021
05/08/2021
07/08/2021
09/08/2021
11/08/2021
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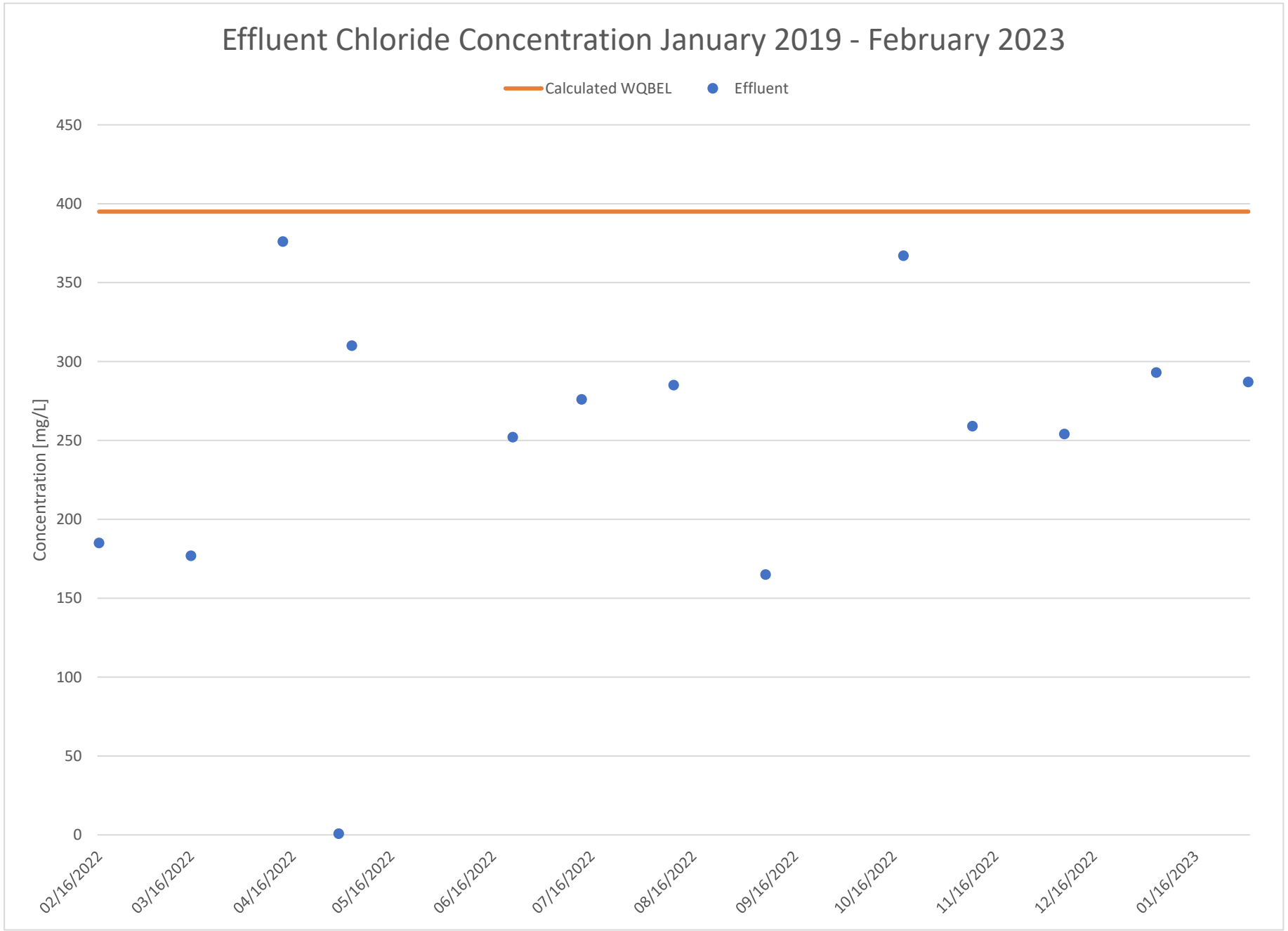
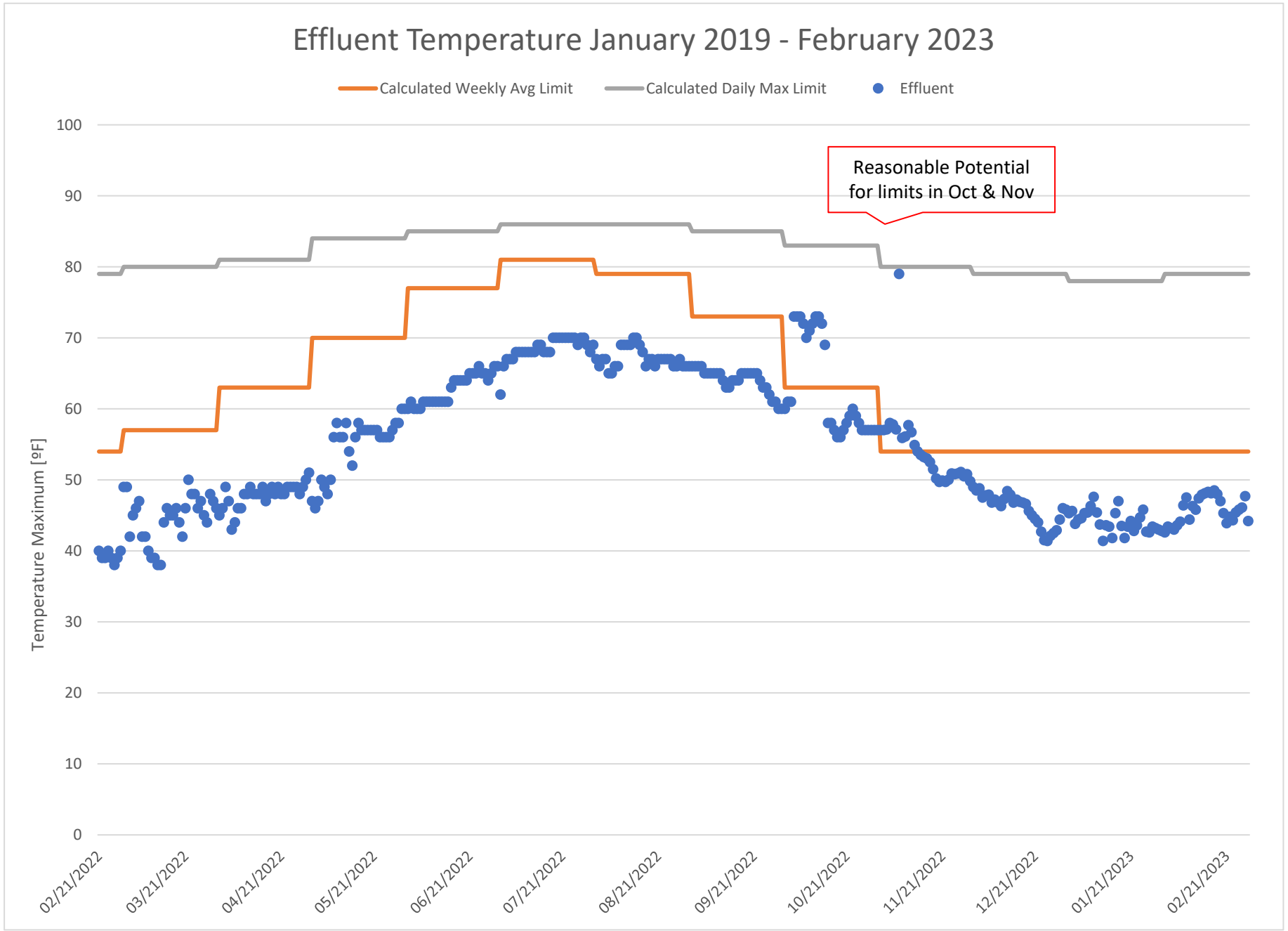
07/08/2022
09/08/2022
11/08/2022
01/08/2023


Effluent Chloride Concentration January 2019 - February 2023
Calculated WQBEL
Effluent
Concentration [mg/L]
450
400
350
300
250
200
150
100
50
0
02/16/2022
03/16/2022
04/16/2022
05/16/2022
06/16/2022
07/16/2022
08/16/2022
09/16/2022
10/16/2022
11/16/2022
12/16/2022
01/16/2023

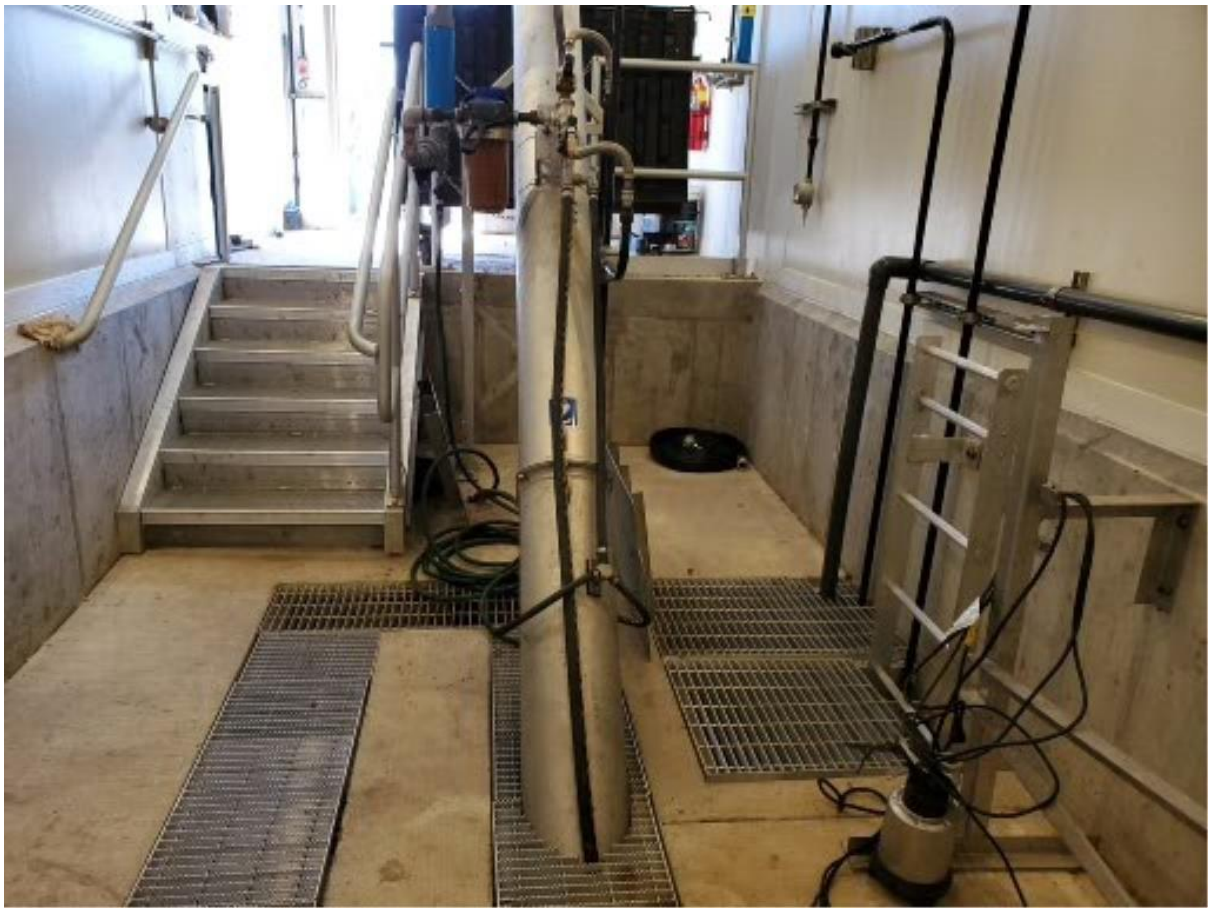

Effluent Temperature January 2019 - February 2023
Calculated Weekly Avg Limit
Calculated Daily Max Limit
Effluent
Reasonable Potential for limits in Oct & Nov
Temperature Maximum [ºF]
100
90
80
70
60
50
40
30
20
10
0
02/21/2022
03/21/2022
04/21/2022
05/21/2022
06/21/2022
07/21/2022
08/21/2022
09/21/2022
10/21/2022
11/21/2022
12/21/2022
01/21/2023
02/21/2023

CMAR Summary Report

Report Critieria : Permit No - 0031348, Report Year - 2021, 2020, 2019, 2018, 2017

Facility	DNR Contact	Design Flow	Year	GPA	Inf	BOD	TSS	NH3	P	N	GW	Ponds	BSlds	Staffing	OpCert	CollSys	FinMgt
RIDGEWAY WASTEWATER TREATMENT FACILITY	Ostien, Kenzie	.114	2021	4	A	A	A	A	A	-	-	-	A	A	A	A	A
0031348 SC Iowa	(608) 516-6487																
Receiving Water: Headwaters Smith-Conley Creek																	
Watershed: Upper East Branch Pecatonica River																	
River Basin: Pecatonica River																	
			2020	3.73	A	A	A	C	A	-	-	-	A	A	A	A	A
			2019	3.86	A	A	B	A	A	-	-	-	A	A	A	A	A
			2018	4	A	A	A	A	A	-	-	-	A	A	A	A	A
			2017	3.19	A	A	A	D	A	-	-	-	D	A	A	A	A

Inf - Influent; BOD,TSS, Nh3, P, N - Effluent Quality; GW - Groundwater Quality; Ponds - Leakage; Bslds - Biosolids; OpCert - Operator Certification; CollSys - Sanitary Sewers; FinMgt - Financial Management



Picture #1 - Rotary Fine Screen at Headworks

Picture #2 - Aeration Basin in Fill/Aeration Mode

Picture #3 - Clarifier

Picture #4 - Aeration Basin in Anoxic Zone

Picture #5 - Geotube Ready for Removal

Picture #6 - Aerated Sludge Storage

Picture #7 - Discharge into Receiving Water

Picture #8 - Receiving Water Upstream of Discharge

DO Calibrating Cheatsheet

Calibration.

- Verify accuracy of your DO meter-probe thermometer occasionally. Meter reads to ± 0.1 º C. If off by > 0.5 then get fixed.
- Verify accuracy of your DO meter barometer. Barometer reads to ± 1.0 % = ± 9 mmHg. If off by more then recalibrate.
- In order to determine an accurate Theoretical DO (TDO) value, an accurate temperature and pressure must be measured by the DO meter.
- Verify the accuracy of the calibration using an ICV. The ICV is always analyzed right after calibration. On day 0 the ICV is the method blank. On day 5 the ICV is a read-back of the calibration standard. The value of the ICV should be close (~ 0.2 – 0.4) to the TDO or there is a problem. If there is a problem, investigate and correct before measuring sample DO's. Look at saturation of std, temp, press, membrane, probe, meter as potential corrective action measures.
- The DO meter may not be able to display the one point calibration "tuning value". This value is based solely on DO meter readings for temperature and pressure using a saturated calibration standard as the basis. The results are based on the assumption that this "standard" is at 100% saturation. If the "standard" is anything less than 100% saturated then all results will be biased high by that percent. Conversely, if the "standard" is supersaturated, then all results will be biased low by that percent.
- The DO meter does not compensate for the actual percent saturation in the calibration standard when determining the DO value to tune the meter to during auto-calibration. The meter assumes that the standard is at 100% saturation (which is the TDO value for that temperature and pressure)

DO saturating

- It absolutely critical that the "standard" used by the meter during calibration (whether it is manual or auto) be 100% saturated with DO.
- Water Saturated Air (WSA) standards are recommended as the standard of choice.
- To saturate a WSA standard, place at least 1 inch of water in a 300 mL BOD bottle. Reagent water is fine. Shake it vigorously for at least 1 minute. Place probe in it after making sure there is no water on the probe tip (shake or gently touch with a tissue). Wait 15 - 30 minute and then calibration can occur – manual or auto.
- To saturate an Air Saturated Water (ASW) standard, place enough water in a 300 mL BOD bottle so that when the probe is placed in the bottle it will be submersed enough to measure properly. We do not want to fill this bottle entirely with water because then there is not enough air space to allow saturation from shaking the bottle. Cap and shake this bottle vigorously for 30 seconds, open cap for a few seconds. Repeat this cap/shake/uncap process for a total of 4 times. If asked for our recommendation we would opt for using dilution water as it more closely assimilates the ionic strength and temperature of the samples,
- To saturate your large container of dilution water, use the same procedure as for ASW (above). This is critical because the blank which uses all dilution water is used as an ICV to demonstrate that the DO in the blank is equal to the TDO. If they are too far off (more than ~ 0.2 – 0.4) then troubleshooting needs to be done to determine the cause. Most likely the standard used for calibration was not saturated completely, or temperature/pressure measurements are not accurate. Always analyze the blank (ICV) immediately after calibration.
- To saturate samples, first ensure that they are brought to room temperature before shaking. The best measurements will result when the samples are at the same temperature as the water used to calibrate the meter. Do not shake cold samples. Make sure there is plenty of headspace in the lab sample bottle before shaking (usually 50% is good). If there isn't much headspace then cap and shake this bottle vigorously for 30 seconds, open cap for a few seconds. Repeat this cap/shake/uncap process for a total of 4 times.

Notes

- Electrolyte solution should be fresh. Once hydrated has shelf life of one year.
- Membranes must be installed correctly. Bubbles, wrinkles, tears and holes can create problems.
- Gold cathode should be bright and have fine scratches covering the entire surface.
- Silver anode should be light in color and silver looking (only clean when necessary).
- Do not leave meter on overnight as it keeps sending out voltage. Turn on and let warm up for 30 minutes before calibration.
- If there is difficulty calibrating, or drifting/jumpy readings, try these corrective actions in order 1) change membrane (allow time to stabilize), 2) clean gold cathode (tip of probe), 3) clean silver anode (body of probe).
- New membranes need at least 30 minutes to stabilize (overnight is much better when possible).
- New probe needs at least overnight to stabilize.
- Make sure the temperature in ASW or WSA calibration std is at room temperature before calibration.
- Only one successful calibration per day is needed.
- Documentation needed during calibration
    - DO meter temperature
    - DO meter pressure (local)
    - TDO (just recommended – for ease of user evaluation to ICV value)
    - Analyst/Date
    - ICV = method blank IDO (to compare to TDO) on day 0
    - ICV = Calibration standard IDO (measured after calibration – to compare to TDO) on day 5