Corporation of the City of Quinte West

Youngs Cove Wastewater Treatment Plant

2021 Annual Performance Report

A Natural Attraction

Executive Summary

The Youngs Cove Wastewater Treatment Plant is currently privately owned by Prince Edward Estates Trustee, and operated by the City of Quinte West. The assumption of the facility by the Municipality will occur upon completion and acceptance of the Works. The facility currently does not have an MOE Registration number or a Classification, as the system is privately owned. The Wastewater Treatment Plant (WWTP) has been assigned Environmental Compliance Approval (ECA) number 6595-B5TPLW issued on December 19, 2018. The residential digesters (Clearford Clarifiers), associated Sanitary Laterals and Collection Mains, and the main Sewage Pumping Station (SPS) are assigned ECA number 6351-ARBM5Y, issued on September 22, 2017. The WWTP facility is described as a Membrane Bioreactor treatment type facility. The Works consist of a main Sewage Pumping Station located at 49 Wellers Way designed to collect wastewater flow from the entire Development Area (DA). A headworks screening building, equipped with two parallel 0.5 mm wedge wire rotary brush screens, gravity discharge to two (2) interconnected in-ground Equalization Tanks complete with three (3) feed pumps discharging to an in-ground aeration tank. The in-ground aeration tank is equipped with two (2) submersible pumps discharging to the MBR tanks. Each MBR tank is populated with one membrane module consistent with Phase 1A description in the ECA, capable of treating up to 105 cu.m/day. Each MBR tank is equipped with two (2) permeate extraction pumps, and a waste activated sludge pump. Effluent disinfection is accomplished through UV Disinfection with two (2) parallel UV units dedicated to each MBR tank, and one common spare. Phosphorus removal is achieved by dosing Aluminum Sulphate. Alkalinity adjustment is achieved through dosing sodium hydroxide. An in-ground Digester captures waste activated sludge. Sludge disposed of in this tank, is hauled by a certified waste hauler to the Trenton WWCS for further processing at the WWTP.

The annual reporting requirements as per the ECA, have been listed below:

a) *A summary and interpretation of all Influent and Imported Sewage monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;*

b) *A summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this Approval, including an overview of the success and adequacy of the Works;*

c) *A summary of any deviation from the monitoring schedule and reasons for the current reporting year and a schedule for the next reporting year;*

d) *A summary of all operating issues encountered and corrective actions taken;*

e) *A summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;*

f) *A summary of any effluent quality assurance or control measures undertaken;*

g) *A summary of the calibration and maintenance carried out on all Influent, and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;*

h) *A summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for proactive actions if any are required under the following situations:*

    a. *When any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality;*

    b. *When the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;*

i) A tabulation of the volume of sludge generated, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;

j) A summary of any complaints received and any steps taken to address the complaints;

k) A summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and sills within the meaning of Part X of EPA and abnormal discharge events;

l) A summary of all Notices of Modifications to Sewage Works completed under Paragraph 1.d. Of Condition 10, including a report on status of implementation of all modifications.

m) A summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the year following that for which the report is submitted; and

n) Any changes or updates to the schedule for the completion of construction and commissioning operation of major process(es)/equipment groups in the Proposed Works.

Summary and Interpretation of Monitoring Data

Final Effluent parameter monitoring - with Limits									
Month	**[CBOD5]** *(mg/L)*	**[TSS]** *(mg/L)*	**[TP]** *(mg/L)*	**[TAN]** *(mg/L)*	**GMD E.Coli** *(cfu/100mL)*	**Acute Lethality RBT** *(% Mortality)*	**Acute Lethality DM** *(% Mortality)*	**pH - MIN**	**pH - MAX**
	Limit: 5.0 mg/L; Objective: 2.0 mg/L	*Limit: 5.0 mg/L; Objective: 2.0 mg/L*	*Limit: 0.1 mg/L; Objective: 0.04 mg/L*	*See TAN section for limits*	*Limit: 200 cfu/100mL; Object.: 100 cfu/100mL*	Non-lethal	Non-lethal	*Limit: 6.0*	*Limit: 9.5*
January	2.3	2.0	0.03	0.78	2	0	0	6.62	7.07
February	2.0	2.0	0.04	0.55	2			6.64	7.09
March	2.2	2.0	**0.17**[1]	0.58	2			6.60	7.01
April	2.0	2.0	0.05	0.13	2	0	0	6.72	6.99
May	2.0	2.8	0.09	0.15	2			6.61	6.97
June	2.0	2.0	**0.12**[2]	0.16	1.7			6.68	7.02
July	2.3	3.0	0.09	0.13	2	0	0	6.13	7.12
August	2.0	4.0	0.04	0.13	2			6.49	6.95
September	2.0	2.2	0.03	0.10	2			6.48	6.94
October	2.0	1.5	0.03	0.10	2	0	0	6.40	6.89
November	2.0	1.3	0.03	0.10	2			6.13	7.28
December	2.0	1.0	0.03	0.10	2			6.77	7.29

[1] TP exceeded Effluent Limits due to equipment calibration errors and chemical dosage control. Equipment suppliers onsite in February to re-calibrate, however, it took some time to obtain proper dosages.
[2] TP exceeded Effluent Limits due to coagulant conservation as a result of a leaking discharge pipe. An alternate chemical supplier was required.

Final Effluent parameter monitoring - without Limits			
	Unionized Ammonia (mg/L)	**Dissolved Oxygen** (mg/L)	**Temperature** (deg.C)
January	0.002	9.09	17.88
February	0.002	9.41	16.80
March	0.001	9.85	16.39
April	0.001	10.09	16.65
May	0.001	8.68	19.21
June	0.001	8.57	22.30
July	0.001	8.17	25.25
August	0.001	7.92	26.09
September	0.001	8.54	24.92
October	0.001	9.16	22.35
November	0.001	9.17	19.91
December	0.001	9.88	17.42

Monthly Average Effluent Waste Loadings				
Month	**CBOD5** *(kg/d)*	**Total Suspended Solids** *(kg/d)*	**Total Phosphorus** *(kg/d)*	**Total Ammonia Nitrogen** *(kg/d)*
	Limit: 1.05 kg/d	*Limit: 1.05 kg/d*	*Limit: 0.021 kg/d*	*Limit: 0.42 kg/d (May 10 - November 30), 1.05 kg/d (December 1 - April 30)*
January	0.10	0.09	0.001	0.04
February	0.09	0.09	0.002	0.02
March	0.10	0.09	0.008	0.03
April	0.09	0.09	0.002	0.01
May	0.09	0.12	0.004	0.01
June	0.09	0.09	0.005	0.01
July	0.09	0.12	0.004	0.01
August	0.09	0.18	0.002	0.01
September	0.11	0.12	0.002	0.01
October	0.14	0.11	0.002	0.01
November	0.15	0.09	0.002	0.01
December	0.14	0.07	0.002	0.01

Raw Sewage Monthly Average Concentrations						
	Monthly Average BOD5 Concentration *(mg/L)*	**Monthly Average Total Suspended Solids Concentration** *(mg/L)*	**Monthly Average Total Phosphorus Concentration** *(mg/L)*	**Monthly Average Total Kjeldahl Nitrogen Concentration** *(mg/L)*	**Total Ammonia Nitrogen** *(mg/L)*	**Alkalinity** *(mg/L)*
January	228.3	49.8	6.9	64.0	58.1	153.3
February	226.8	55.3	6.7	64.0	57.2	145.0
March	256.0	69.2	7.3	65.7	59.1	113.3
April	246.3	56.3	7.8	72.1	66.6	188.0
May	227.5	88.8	8.3	73.7	68.6	180.0
June	220.4	85.6	8.6	80.8	67.6	180.0
July	230.3	91.0	9.1	74.0	67.2	180.0
August	346.3	227.0	8.7	73.1	66.1	180.0
September	267.8	87.4	8.9	64.4	60.4	170.0
October	123.0	63.3	4.7	42.3	37.4	180.0
November	38.0	21.0	1.9	16.0	15.1	240.0
December	53.4	32.8	2.3	21.6	19.6	

	Facility Influent Flow Monitoring			Facility Effluent Flow Monitoring		
Month	**Average Daily Influent Flow** *(cu.m/day)*	**Month Max Daily Influent Flow** *(cu.m/day)*	**Total Influent Flow** *(cu.m/month)*	**Average Daily Effluent Flow** *(cu.m/day)*	**Month Max Daily Effluent Flow** *(cu.m/day)*	**Total Effluent Flow** *(cu.m/ month)*
	Rated Capacity: 105 cu.m/day	*Peak Rated Capacity: 105 cu.m/day*				
January	46	59	1,436	47	74	1,442
February	47	59	1,322	45	56	1,268
March	46	65	1,432	44	59	1,379
April	46	57	1,390	45	57	1,365
May	46	56	1,423	45	59	1,397
June	44	73	1,321	44	58	1,321
July	45	56	1,391	42	54	1,290
August	45	58	1,393	46	53	1,420
September[3]	57	139	1,719	56	124	1,686
October	70	121	2,167	70	123	2,183
November	75	104	2,237	73	103	2,198
December	85	108	2,632	69	89	2,132
	Annual Avg Daily Influent Flow = 54 cu.m./day	**Max Daily Influent Flow = 139 cu.m./day**	**Total Annual Influent Flow = 19,863 cu.m.**	**Annual Avg Daily Effluent Flow = 52 cu.m./day**	**Max Daily Effluent Flow = 124 cu.m./day**	**Total Annual Effluent Flow = 17,640 cu.m.**

[3] Increase in flow due to a break in the underground infrastructure.

Summary of Bypass, Spill, or Abnormal Discharge Event(s)

There were no Bypasses, Spills, or Abnormal Discharge Events that occurred during the reporting period.

Summary of Operating Problems throughout Monitoring Period

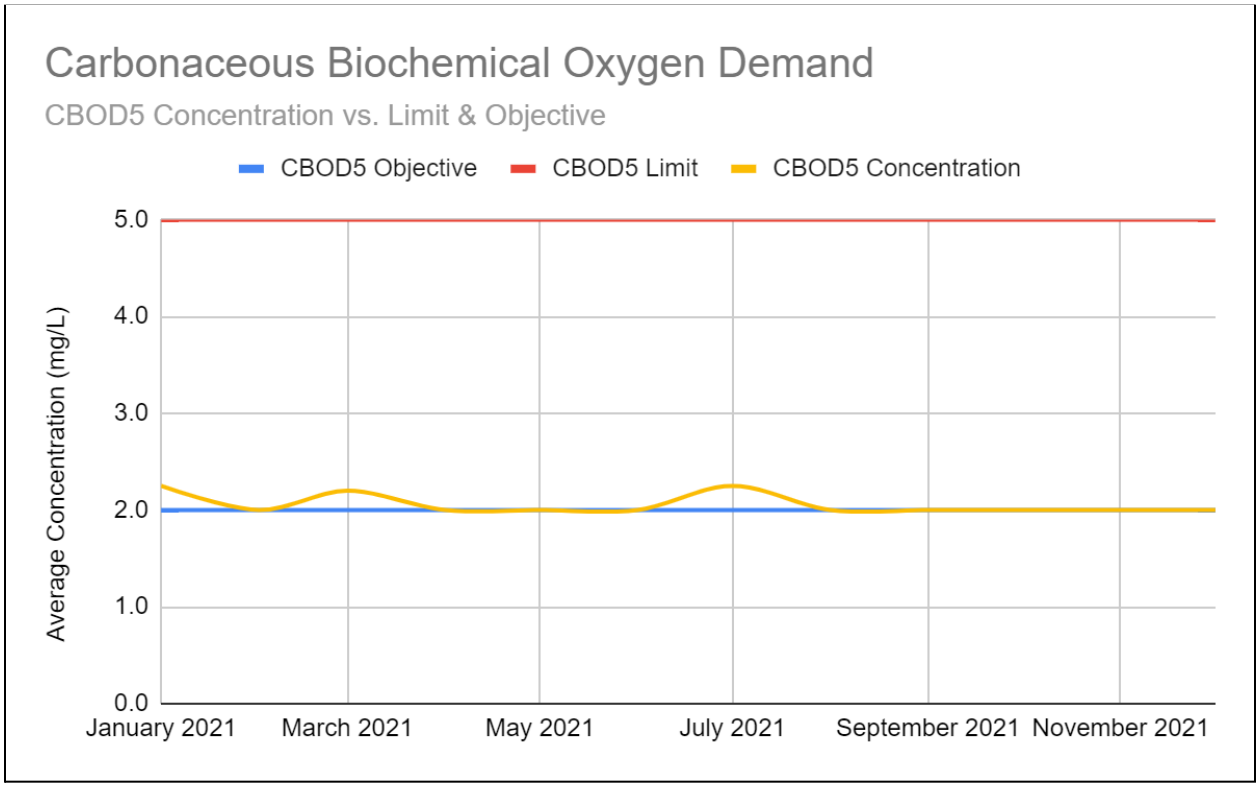
During the Reporting Period, the following operating problems occurred as listed below:

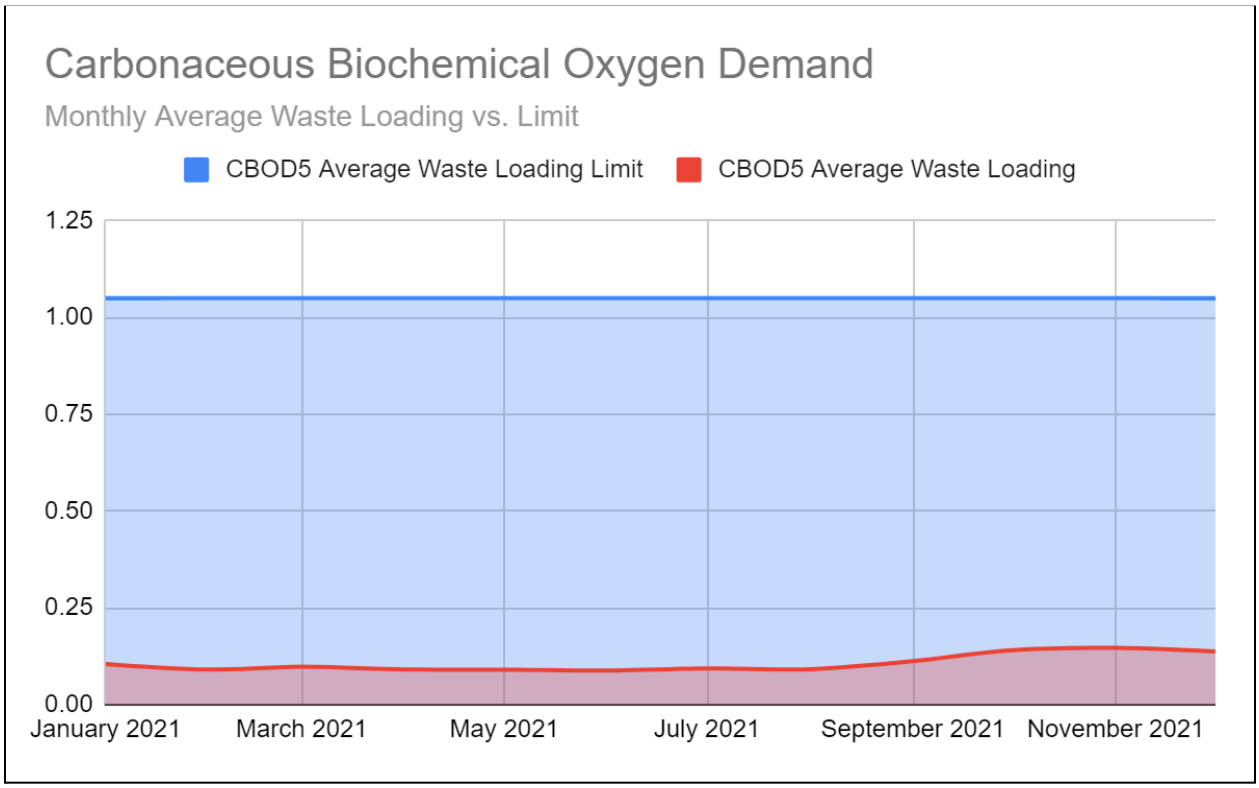
- Raw influent flows jumped significantly in September and remained high for the remainder of the year and into 2022. Due to the alkalinity and clarity of the influent it was suspected that significant infiltration was occurring. The developer, with help from their consultants, performed several investigations with no results until March 2022 when a crushed sewer lateral connection was found. This is assumed to be the source of the majority of excess influent flow to the facility from September 2021 to March 2022. This infiltration did cause membrane fouling issues by scaling and plugging membrane pores requiring more frequent cleaning and chemical clean in place backwashes.
- It was discovered that chemical tank level transmitters were not calibrated and set up correctly during commissioning. After a visit from the equipment supplier and SCADA integrator the transmitters were working correctly. However, the previous volume of chemical actually used was hard to determine and as a result, it took most of the month of March to get the plant back to the optimum alum dosing. This, as a result, caused higher average Total Phosphorus for the month of March.
- An alum leak formed on the main discharge header of the alum storage tank requiring operations staff to drain the tank and run on a temporary day tank while repairs were conducted by NewTerra. Different 48% alum was used during this period because Kemira's product was not readily available in a smaller quantity shipment and could not safely be set up in a temporary tank. Also coagulant dosage was reduced slightly to ensure the facility did not run out of chemical. These two factors contributed to the monthly average exceedance of Total Phosphorus.
- The influent fine screens were observed to blind frequently due to the small pore size and the composition of the wastewater. Physical cleaning of the screens was necessary one to two times per month.

Analysis of Final Effluent Monitoring Dataset

Carbonaceous Biochemical Oxygen Demand (CBOD5) / Biochemical Oxygen Demand (BOD5)

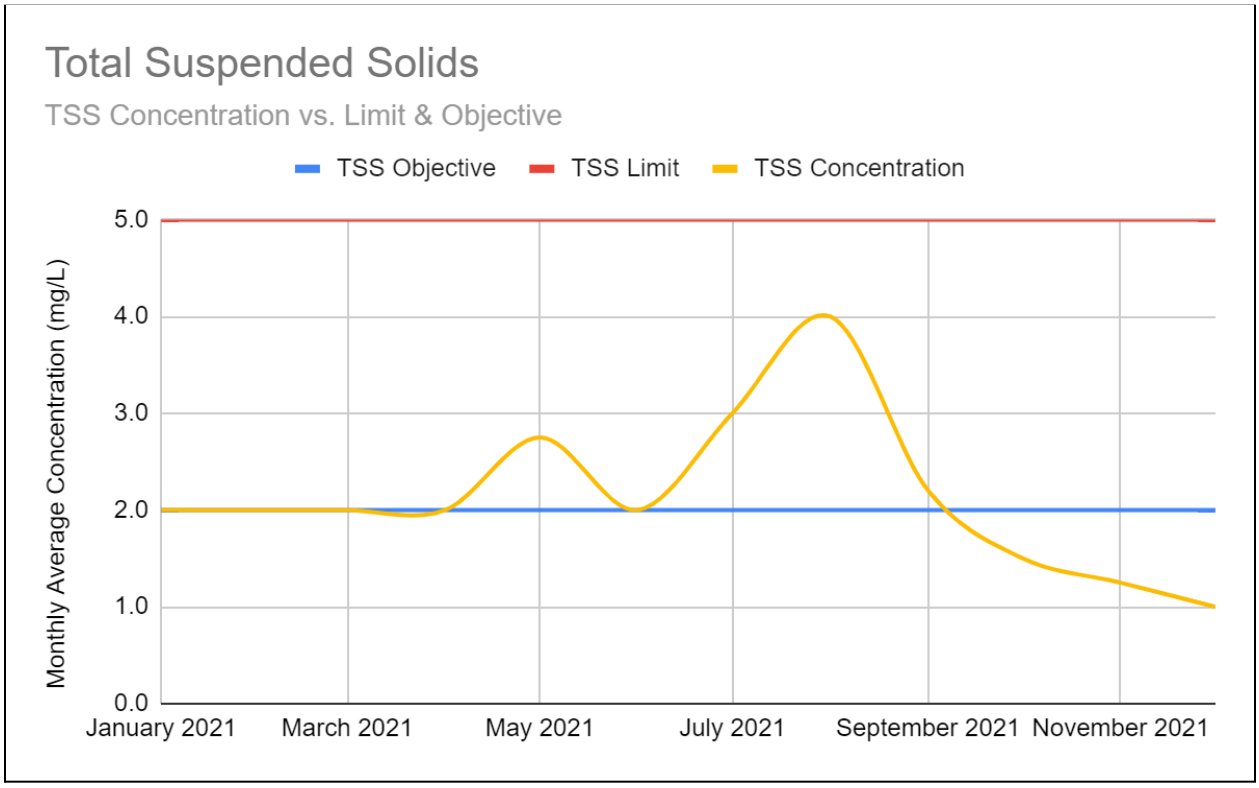
The following two Figures depict facility CBOD5 performance throughout the reporting period. The facility generally operates efficiently and maintains monthly average Effluent concentrations and waste loadings below the Effluent Objectives and Limits. The Method Detection Limit (MDL) for CBOD5 is 2.0 mg/L and reflects in the results. The Annual Average Concentration of CBOD5 was 2.1 mg/L.

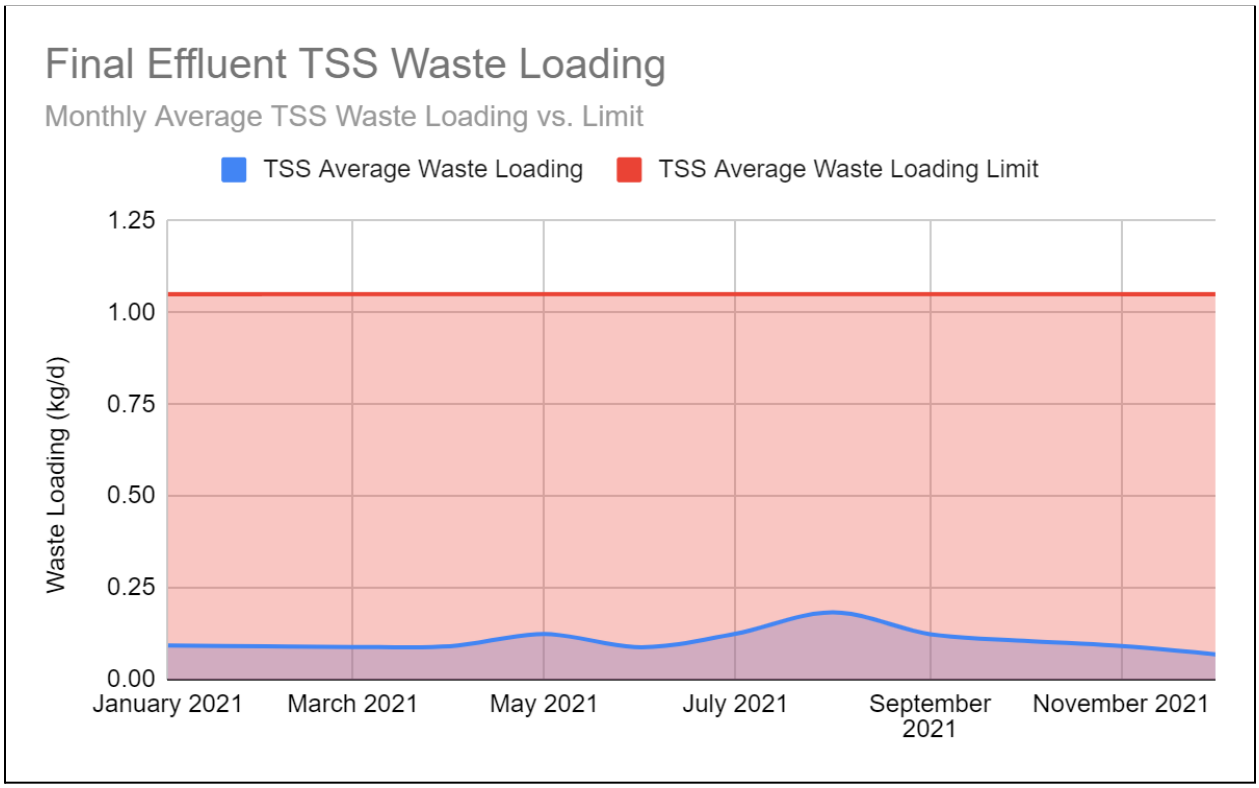



Carbonaceous Biochemical Oxygen Demand
Monthly Average Waste Loading vs. Limit
CBOD5 Average Waste Loading Limit
CBOD5 Average Waste Loading
1.25
1.00
0.75
0.50
0.25
0.00
January 2021
March 2021
May 2021
July 2021
September 2021
November 2021

Total Suspended Solids (TSS)

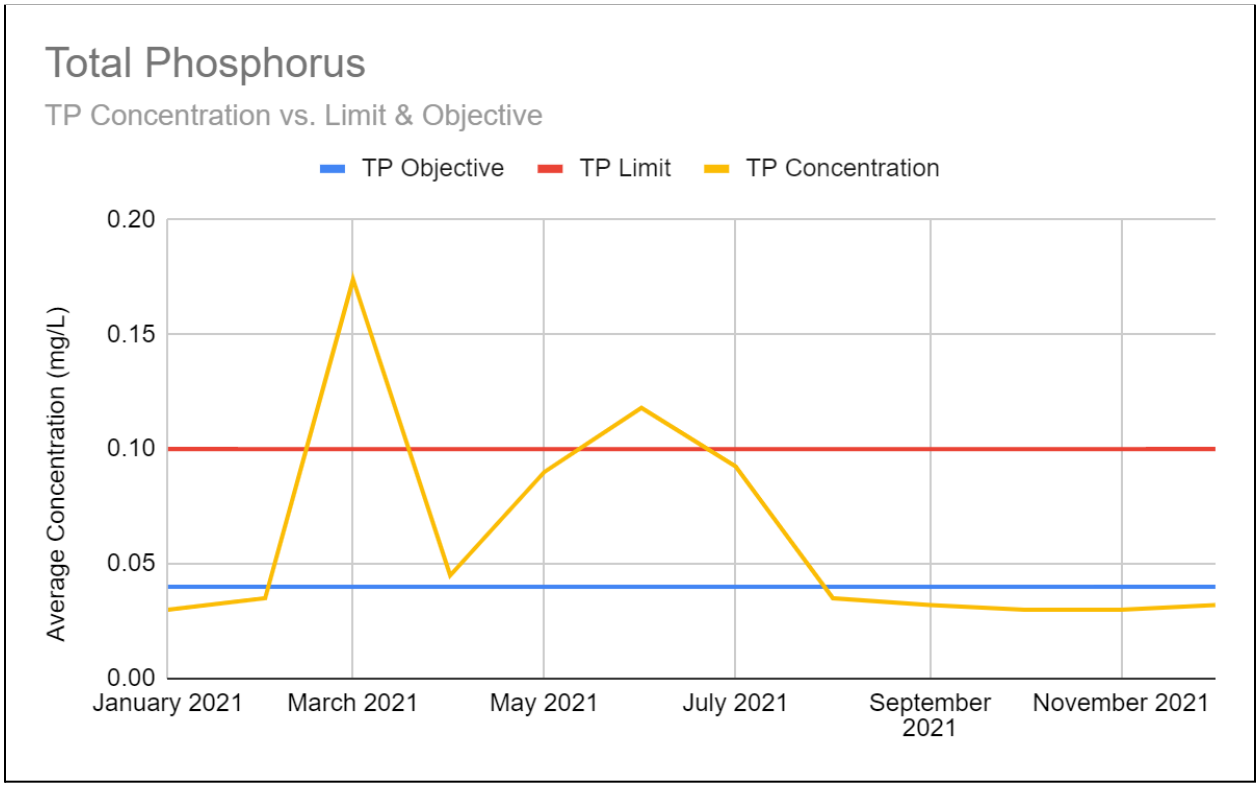
Apparent in the charts below, the facility was able to maintain compliance with the Effluent Limits established by the ECA, but operated above the Effluent Objectives consistently during May, July and August. This is strictly due to the MDL for TSS being set at 2.0 mg/L. There is nothing in the operation of the facility to suggest that the facility is not operating as designed and intended. The next chart in this section depicts the Monthly Average Waste Loading. As flows are quite low, there is a negligible monthly average waste loading calculated for each month of the monitoring period.

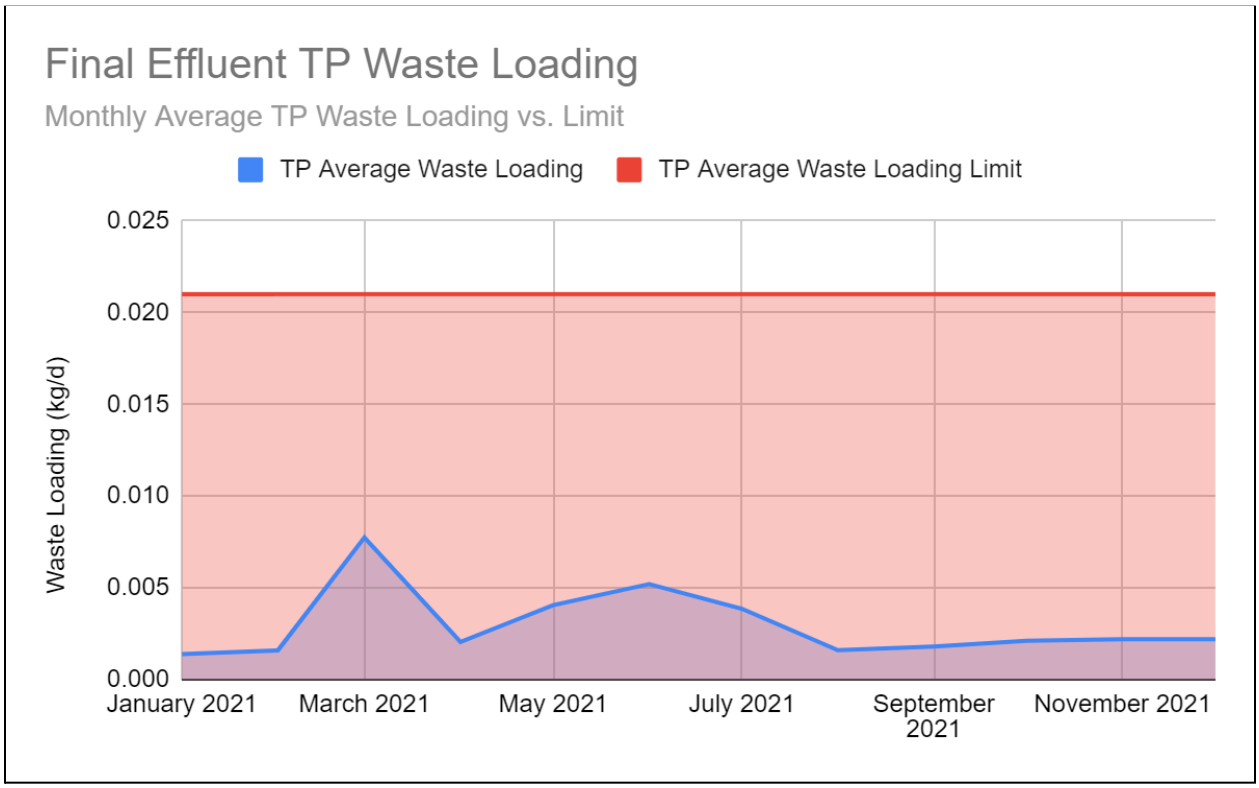



Final Effluent TSS Waste Loading
Monthly Average TSS Waste Loading vs. Limit
TSS Average Waste Loading
TSS Average Waste Loading Limit
Waste Loading (kg/d)
1.25
1.00
0.75
0.50
0.25
0.00
January 2021
March 2021
May 2021
July 2021
September 2021
November 2021

Total Phosphorus (TP)

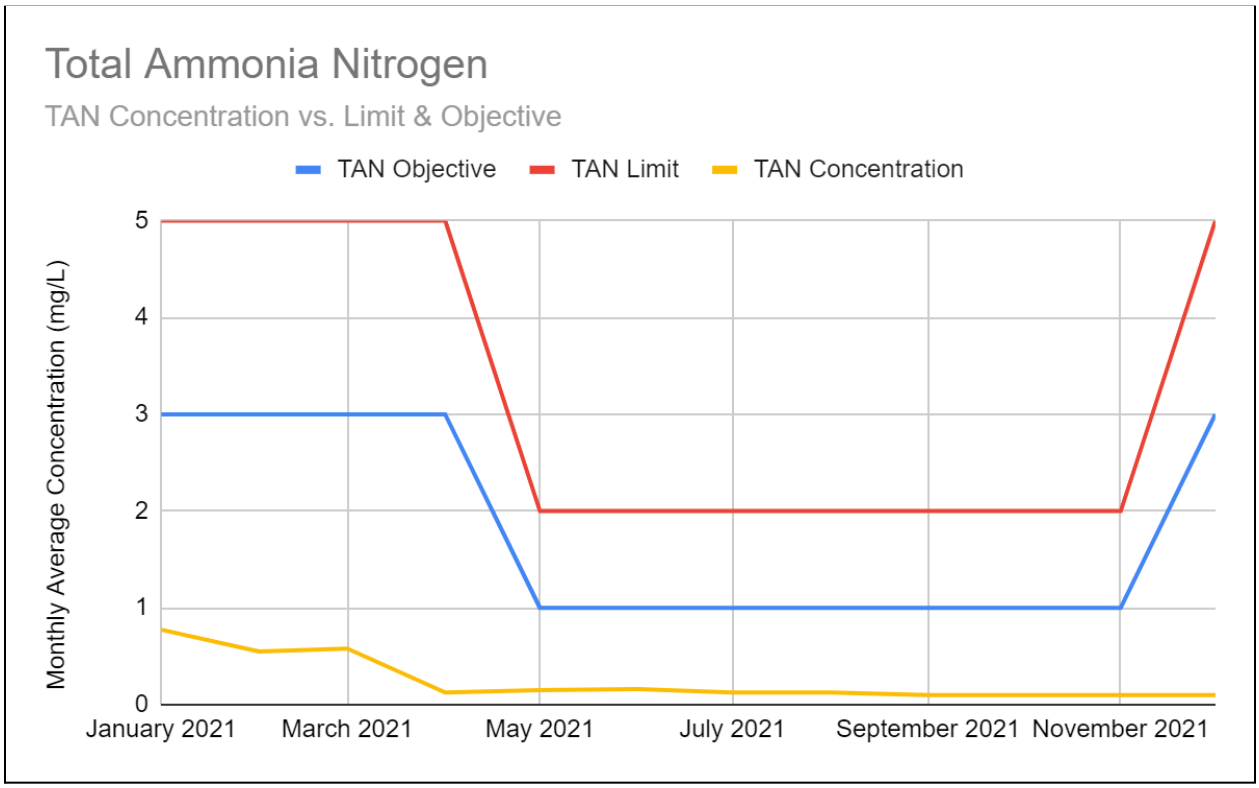
The following two figures depict monthly average TP concentrations and loadings in relation to their respective Effluent Limits and Objectives. Apparent in the following chart is that the facility was not able to operate below the Effluent Objective throughout March and July. This is, in large, due to an equipment calibration error resulting in issues with chemical dosage control. The equipment suppliers were onsite in February to re-calibrate, however, it took some time to obtain proper dosages. In June, the Operator had to make some minor chemical pump adjustments in order to conserve coagulant and source a different chemical supplier until repairs could be made to a leak on the chemical tank header. As depicted in the second chart, the monthly average waste loading is consistently measured below the Effluent Limit as monthly average daily flows are still quite low at this facility.

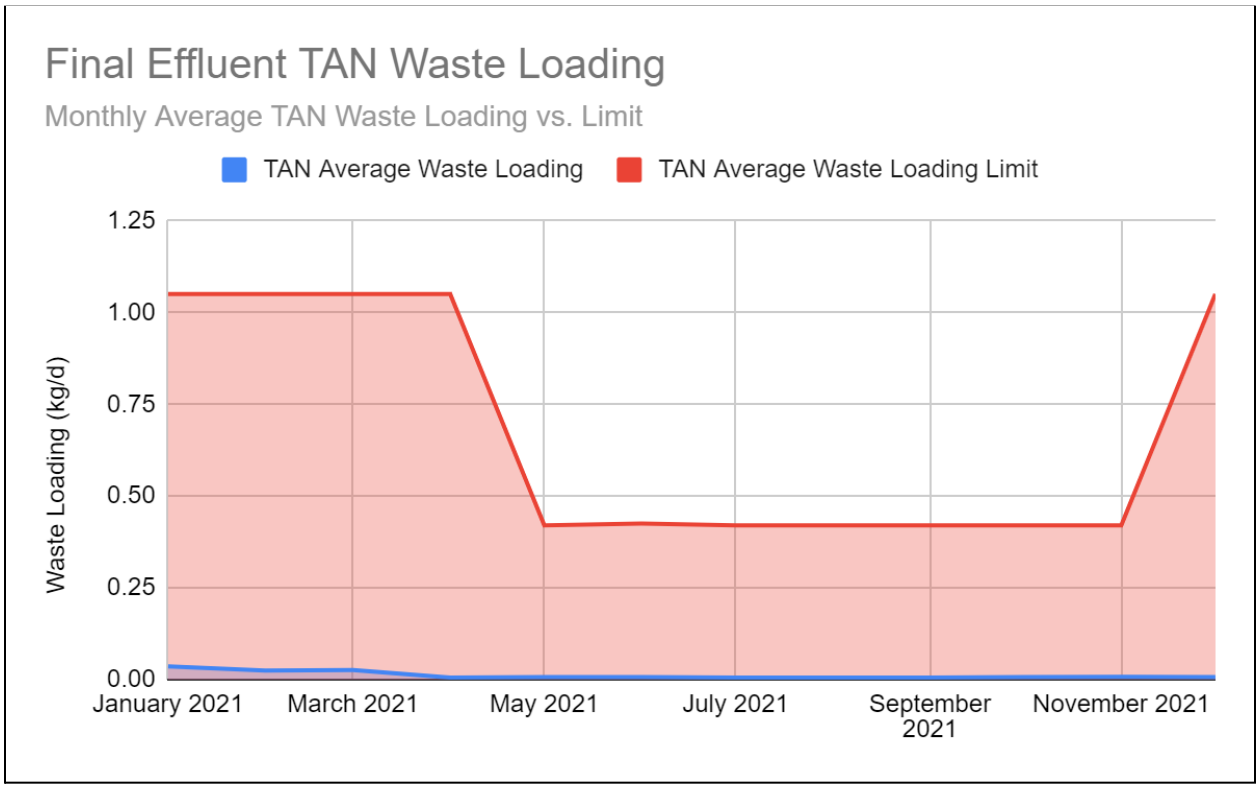



Final Effluent TP Waste Loading
Monthly Average TP Waste Loading vs. Limit
TP Average Waste Loading
TP Average Waste Loading Limit
Waste Loading (kg/d)
0.025
0.020
0.015
0.010
0.005
0.000
January 2021
March 2021
May 2021
July 2021
September 2021
November 2021

Total Ammonia Nitrogen (TAN) - Ammonia (NH_3) / Ammonium (NH_4^+)

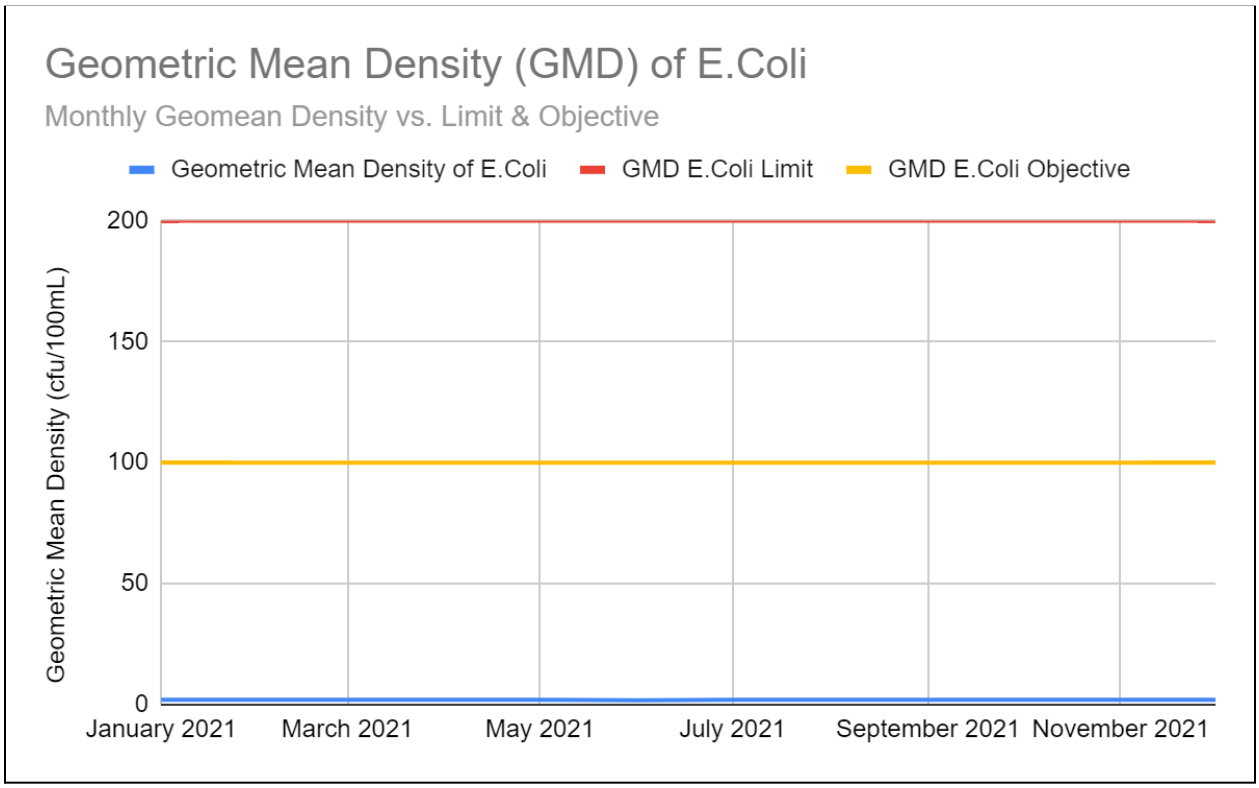
The following charts outline the monthly average TAN concentrations and respective waste loadings throughout the monitoring period. Apparent in both charts is that the facility operates very well in the nitrification process early on in the operation of the facility, even with the high strength raw sewage TKN concentrations. The raw sewage characteristics will be discussed further in the raw sewage section of this report.




Final Effluent TAN Waste Loading
Monthly Average TAN Waste Loading vs. Limit
TAN Average Waste Loading
TAN Average Waste Loading Limit
Waste Loading (kg/d)
1.25
1.00
0.75
0.50
0.25
0.00
January 2021
March 2021
May 2021
July 2021
September 2021
November 2021

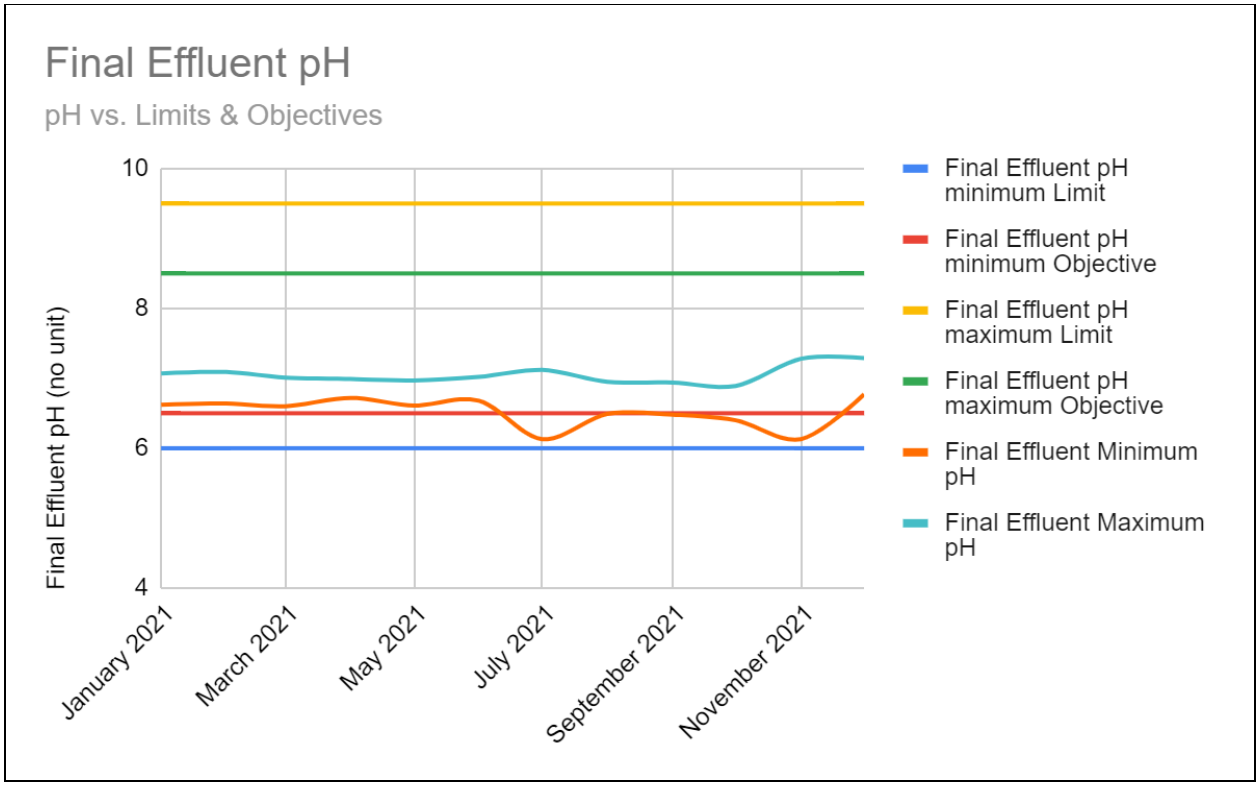
Geometric Mean Density of E. Coli

The UV disinfection system is sized for full build-out at 13.5 m^3/hr capacity consisting of two duty and one common standby UV system per membrane tank. It is apparent from the chart below that the UV system is functioning as designed to provide full disinfection. Further, it is important to note that the membranes themselves act as a natural barrier as the membrane pore size is smaller than E.Coli bacteria, therefore these organisms can not pass through the membrane.



Final Effluent pH

Approximately 226 samples were collected of the Final Effluent throughout the reporting period, and pH measurement taken. As illustrated in the following chart, the Final Effluent pH was consistently measured between the allowable Limits identified in Schedule B and C of the ECA. Effluent pH measurements are performed by the Operators generally on a daily basis, normally Monday to Friday. It is important to note that pH measurements used to determine compliance with the ECA have no QA/QC measures in place, other than routine calibration procedures of the pH probe.

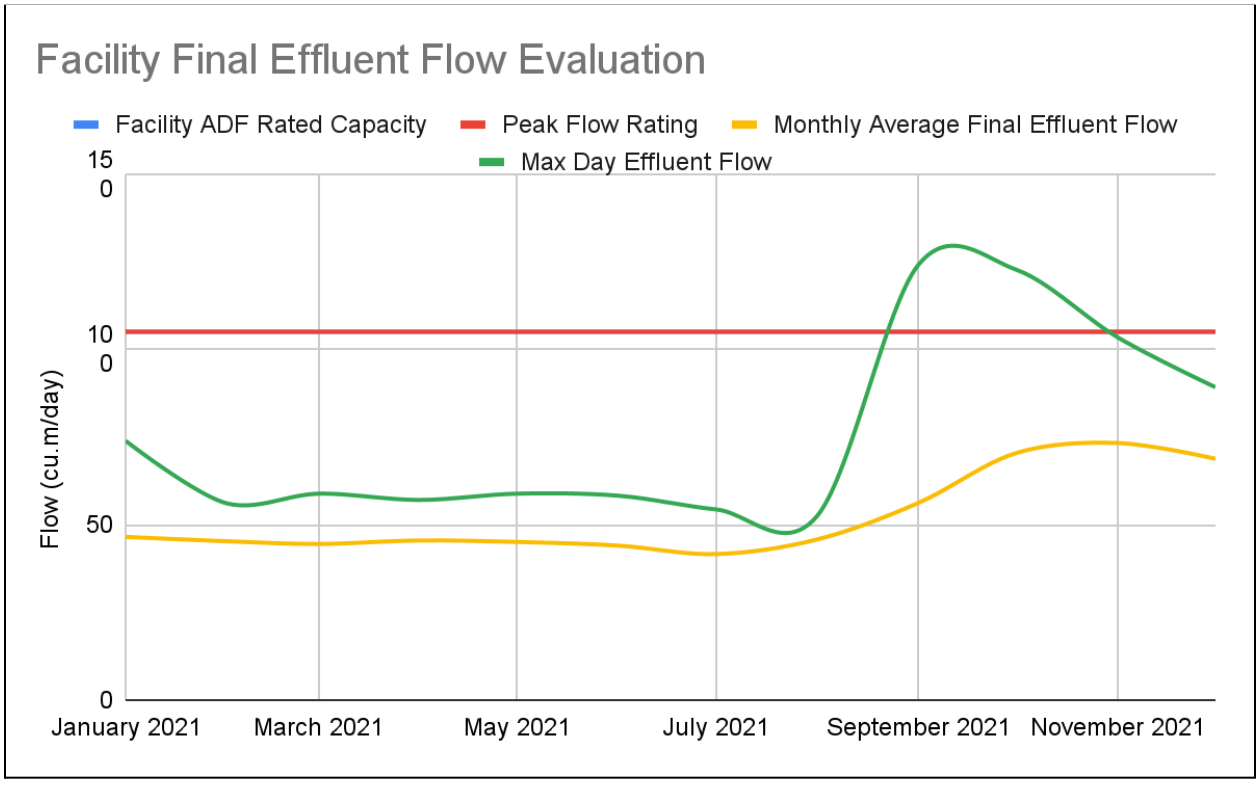


Acute Lethality to Rainbow Trout and Daphnia Magna

The City contracts all Acute Lethality testing to *Aquatox Testing and Consulting Inc*. The quarterly results from the samples collected yielded 0% mortality in Daphnia Magna at 100% Effluent Concentration and 0% mortality in Rainbow Trout at 100% Effluent Concentration.

Final Effluent Flows

As the Development area continues to expand, and more homes are occupied, Phase 1B and 2A upgrades will be required. These upgrades are tentatively scheduled for 2022. Effluent flows increased significantly as a result of a sudden increase in influent flow. After much investigation it was found that a sewer lateral connection had been damaged and was allowing ground water to infiltrate the system from September 2021 to March 2022.



Raw Sewage Characterization

The Young's Cove Wastewater Collection System (WWCS) consists of the following components:

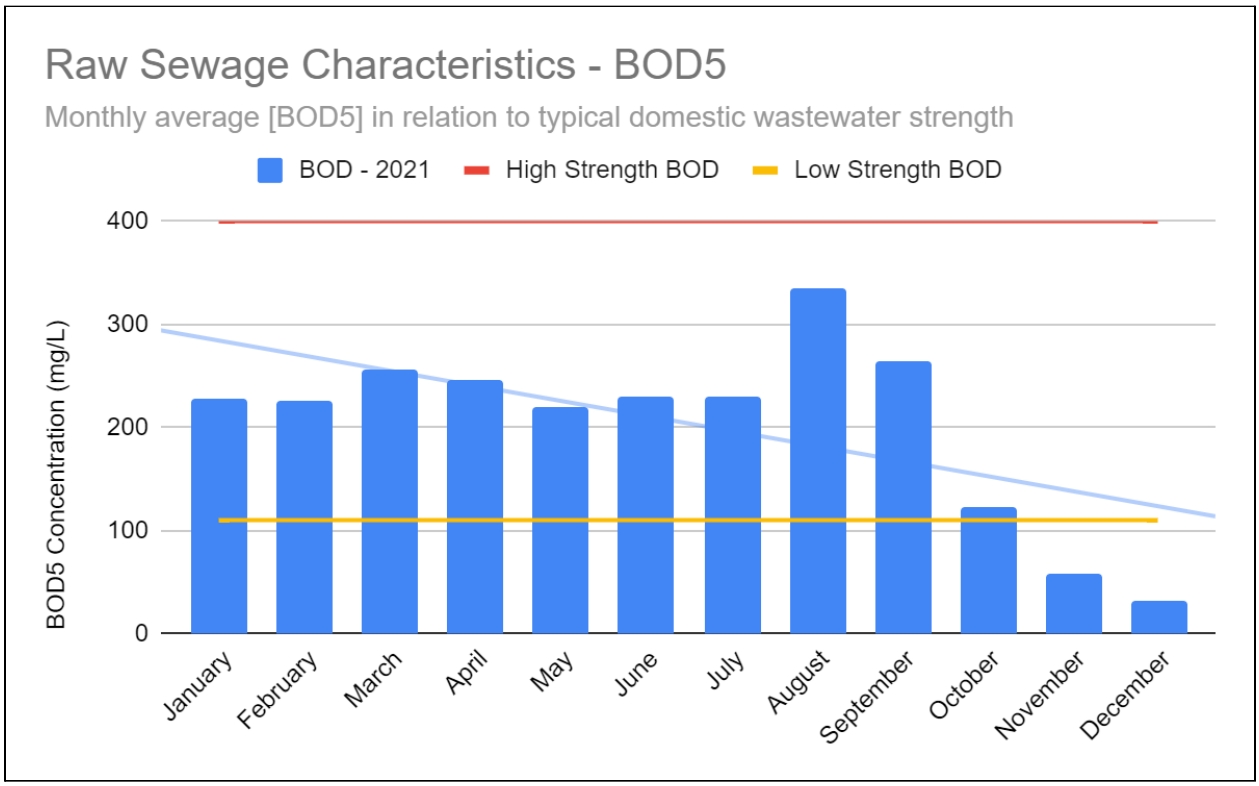
- Each residential lot has a proprietary Clearford Clarifier with minimum 48hr retention and an approximate 4.1 cubic metre capacity, to provide sufficient volume for sludge storage and digestion;
- Small bore technology sanitary sewer system, gravity feeding the Sewage Pumping Station located at 49 Wellers Way; and
- Sewage Pumping Station equipped with two submersible sewage pumps (duty/standby) each rated at 9.23 L/s at 11.01m TDH.

Raw Sewage characteristics for the facility differ from other typical domestic wastewater sources. The *Clearford Clarifiers* in place at each property are designed to remove solids at the source, and perform primary and partial secondary treatment before liquid effluent is discharged to the sanitary mains. Further, according to *Clearford Water Systems*, the Digesters should be capable of reducing TSS and BOD by 75% respectively.

Outlined in the charts below are monthly average concentrations measured in raw sewage over the last year, along with associated trendlines. Note, while the facility was not commissioned until June, 2020, the City was conducting regular sampling of the raw sewage, with sample collection occurring at the Sewage Pumping Station, in order to establish a baseline dataset of raw sewage quality. Also plotted on the charts are the typical 'high' and 'low' strengths for the associated contaminants in raw wastewater, as measured in a sample of untreated domestic wastewater. These figures were cited from an online publication that refers to the Metcalf and Eddy Inc. *Wastewater Engineering and Treatment Reuse*. (Metcalf and Eddy Inc. 20).

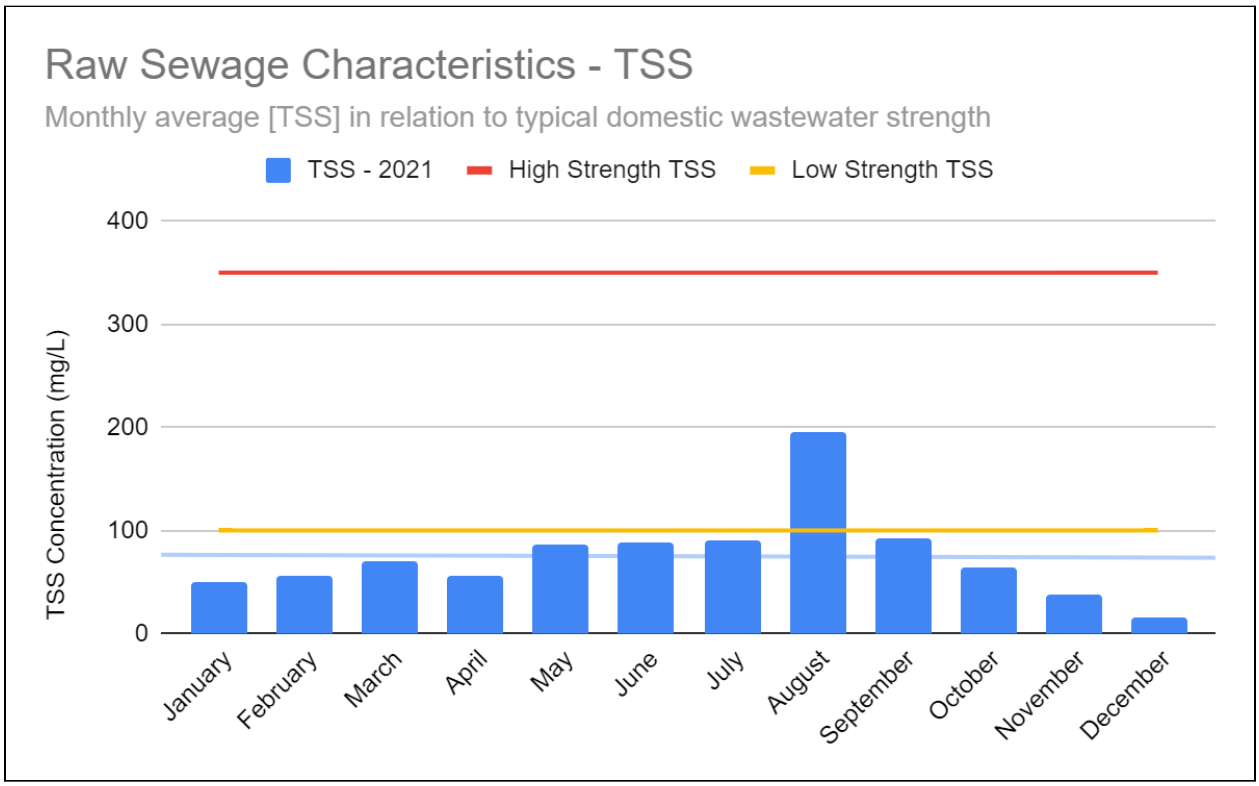
Raw Sewage Biological Oxygen Demand (BOD5)

Apparent in the chart below are the somewhat stable levels of raw sewage concentrations throughout the course of the year, with a decline in October through to December. This is attributed to the break in underground infrastructure as outlined in the Summary of Operating Problems throughout Monitoring Period section, which caused a dilution to the wastewater strength.



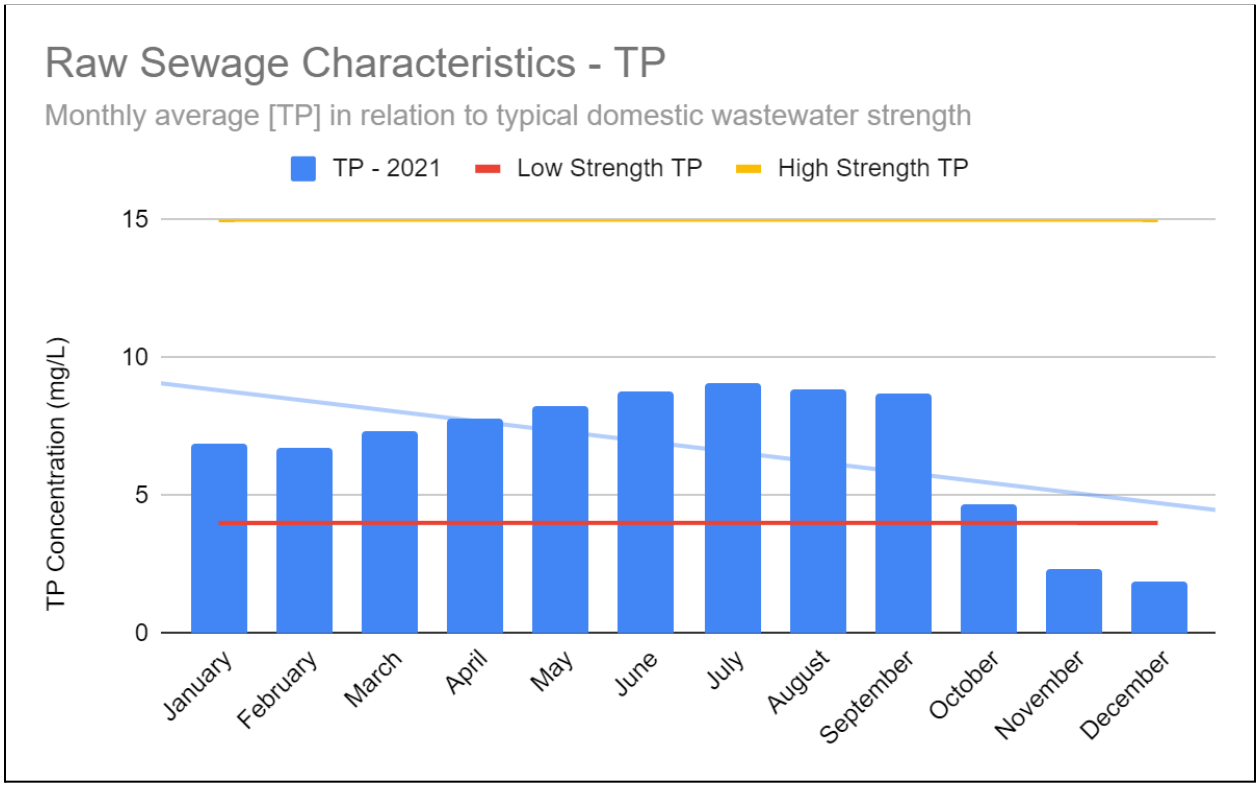
Raw Sewage Total Suspended Solids (TSS)

In review of the chart below, raw sewage concentrations of TSS are considered quite low, and relatively stable. Solids removal from *ClearDigest* tanks on each residential property will begin to take place in year three of the operation of the system. This process will involve the City engaging a certified waste hauler to pump out residential tanks, and haul material to the Trenton WWTP for further processing.



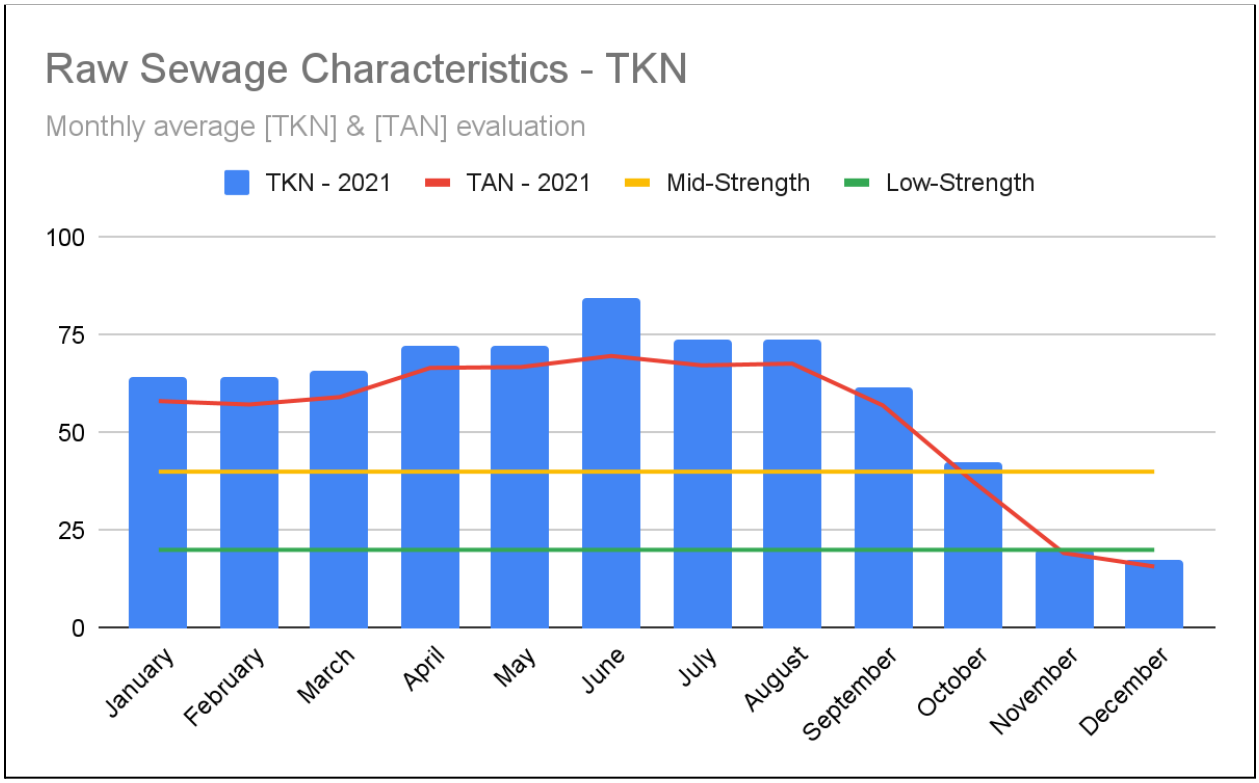
Raw Sewage Total Phosphorus (TP)

Total Phosphorus concentrations in raw sewage measured relatively stable between 5 and 9 mg/L for the bulk of the monitoring period. According to Metcalf and Eddy this indicates a relatively low to mid strength concentration of Phosphorus in a domestic wastewater supply.



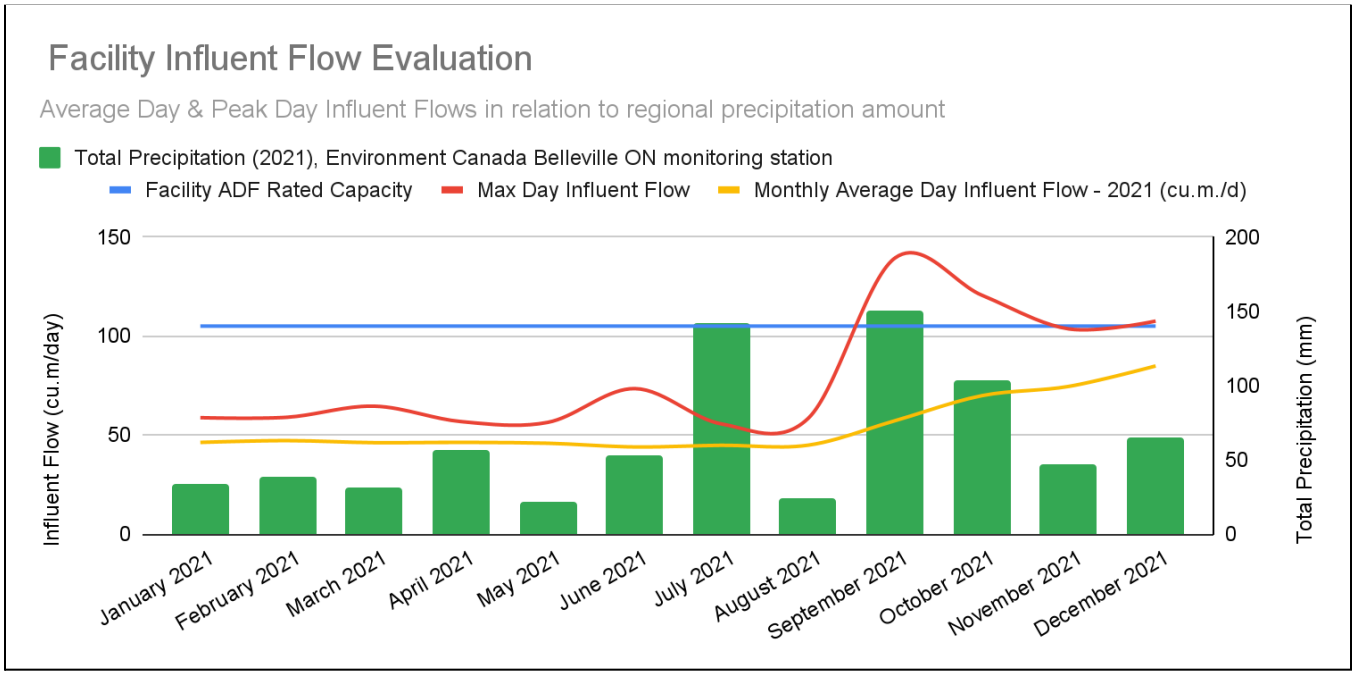
Raw Sewage Total Kjeldahl Nitrogen (TKN) / Total Ammonia Nitrogen (TAN)

Total Kjeldahl Nitrogen (TKN) is the sum of organic nitrogen, and Total Ammonia Nitrogen (TAN) - Total Ammonia Nitrogen is the sum of Ammonia and Ammonium. According to Metcalf and Eddy, the TKN is considered to be in the range of high strength concentration. Over the course of the monitoring period, TAN has accounted for an average 90% of the raw sewage TKN. This may indicate that the residential digesters are converting organic nitrogen to ammonium. The Young's Cove WWTP is designed to facilitate nitrification, and is proving effective in its ability by meeting the Effluent Objectives consistently.



Facility Influent Flow Evaluation

The facility operated at 52% of its Rated Capacity during the reporting period. Facility upgrades will likely take place in 2022 to increase the facility rated capacity to full build-out capacity of 266 cu.m/day. Outlined in the chart below are Influent flows measured throughout the monitoring period, in relation to seasonal precipitation amounts.



Summary of Maintenance performed throughout Reporting Period

The City supports an active Preventative Maintenance (PM) program to ensure the facility is maintained in a fit state of repair. A new digital operations and asset management platform was implemented in 2021 providing a more accessible and easier to use workflow for management and staff. Outside of Preventative Maintenance, the following Reactive Maintenance activities were completed by staff:

- Clean-in-Place chemical backwashing of membrane modules conducted in order to reduce membrane pressure.
- Monthly pressure washing of headworks fine screens.

Biosolids Management Summary

The onsite biosolids storage tank has a storage capacity of 77.4 cu. m. This tank was emptied periodically throughout the Reporting Period and disposed of in the Trenton Wastewater Collection System for further treatment at the Trenton Wastewater Treatment Plant. All material is hauled by a certified waste hauler on an as-needed basis.

It is expected that approximately 700 cu.m. of material may be hauled from the facility in 2022 and disposed of at the Trenton WWTP for further treatment.

Summary of Effluent Quality Assurance and Control Measures

The City collects samples from the Raw Sewage stream, Aeration Tanks, Membrane Tank and Final Effluent on a routine basis throughout the week. The City satisfies its regulatory compliance requirements by submitting a set of samples to an accredited laboratory, SGS Canada Inc. on a weekly basis, normally on Wednesday's throughout the Reporting Period. These sample results are manually entered into a spreadsheet and evaluated for compliance with the ECA. In addition to these samples, Operators perform in-house analysis for Total Suspended Solids, pH, temperature, alkalinity, dissolved reactive phosphorus, and Final Effluent Dissolved Oxygen. Sample results are entered into a spreadsheet for facility evaluation and process optimization. On an annual basis, the spectrophotometer is calibrated by a third party. Operators calibrate other instrumentation, such as the bench top pH meter, regularly.

Monitoring Schedule

The facility sampled in accordance with the ECA every Wednesday. In 2022, the facility will collect samples in accordance with the ECA, every Tuesday each week.

Flow Monitoring Equipment Calibration and Maintenance

Works Orders are generated on an annual basis to calibrate the facility Influent and Effluent Flow Meters. This calibration is completed by a third party contractor. The following figures are copies of the Calibration Certificates for the Sewage Pumping Station flow meters.

Tower Electronics Canada Inc.
Instrument Calibration Certificate

Customer:
The City of Quinte West
7 Creswell Drive
PO Box 490
Trenton, ON K8V 5R6

Calibration by:
Dan Matchett

Standards:
Endress and Hauser Field Check S/N:0000551303 Cal Due Mar 2022

Instrument Type
Magnetic Flow Meter

Meter Information

Date of Test:	2021-08-19
Location:	Youngs Cove SPS
Meter Under Test	
Client Tag:	FIT701
Manufacturer:	Endress & Hauser
Model:	Pro10
Serial Number:	P1066316000
Totalizer As Found:	11205.3m3
Totalizer As Left:	11206.4m3
Allowable Error%:	5

Programming Parameters:

DN Size:	80
Cal Factor:	1.2373
Zero:	0
Calibration Due:	Aug-22

Method of verification
EnH Field Check Verification/Calibration

Units:	LPS
Zero:	0.00
Span:	5.00
Totalizer:	M3

Flow Test

Sim Setting	Sim Flow LPS	Meter Display	Current Output	Disp Error%	mA Error %
0.000	0.000	0.000	4.019	0.000	0.475
1.250	1.250	1.272	8.068	0.440	0.850
2.500	2.500	2.483	11.973	0.340	0.225
3.750	3.750	3.800	16.146	1.000	0.913
5.000	5.000	5.012	19.943	0.240	0.285
			Average Error%	0.40	0.55
			Result:	PASS	PASS

Totalizer Test

Sim Flow Rate	5.000	LPS
Start Totalizer	11206.000	M3
End Totalizer	11206.400	M3
Volume Simulated	0.400	M3
Time(Seconds)	80.490	
Calculated Totalizer(MUT)	0.402	
Error%	-0.609	
Result:	PASS	

Comments:
Unit passes verification.

Tower Electronics Canada Inc.
2687 Hwy 40
K0K 3M0
Wooler On
Canada

Email: Dan@Tecanada.ca
Website: www.tecanada.ca

Calibrations Service Sales
Temporary and Permanent Meter Installations
Instrumentation For Flow Level Pressure.

Tower Electronics Canada Inc.
Instrument Calibration Certificate

Customer:
The City of Quinte West
7 Creswell Drive
PO Box 490
Trenton, ON K8V 5R6

Calibration by:
Dan Matchett

Standards:
Endress and Hauser Field Check S/N:0000551303 Cal Due Mar 2022

Instrument Type
Magnetic Flow Meter

Meter Information

Date of Test:	2021-08-19
Location:	Youngs Cove SPS
Meter Under Test	
Client Tag:	FIT702
Manufacturer:	Endress & Hauser
Model:	Pro10
Serial Number:	NC002616000
Totalizer As Found:	5307.34m3
Totalizer As Left:	5308.76m3
Allowable Error%:	5
Programming Parameters:	
DN Size:	80
Cal Factor:	1.2379
Zero:	0
Calibration Due:	Aug-22

Method of verification
EnH Field Check Verification/Calibration

Units: LPS
Zero: 0.00
Span: 5.00
Totalizer: M3

Flow Test

Sim Setting	Sim Flow LPS	Meter Display	Current Output	Disp Error%	mA Error %
0.000	0.000	0.000	3.998	0.000	0.050
1.250	1.250	1.330	8.132	1.598	1.650
2.500	2.500	2.501	11.969	0.020	0.258
3.750	3.750	3.800	16.183	1.000	1.144
5.000	5.000	4.990	20.012	0.200	0.060
			Average Error%	0.56	0.63
			Result:	PASS	PASS

Totalizer Test

Sim Flow Rate	5.000	LPS
Start Totalizer	5308.210	M3
End Totalizer	5308.640	M3
Volume Simulated	0.430	M3
Time(Seconds)	85.980	
Calculated Totalizer(MUT)	0.430	
Error%	0.023	
Result:	PASS	

Comments:
Unit passes verification.

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Website: www.tecanada.ca

Calibrations Service Sales
Temporary and Permanent Meter Installations
Instrumentation For Flow Level Pressure.

Tower Electronics Canada Inc.
Instrument Calibration Certificate

Customer:
The City of Quinte West
7 Creswell Drive
PO Box 490
Trenton, ON K8V 5R6

Calibration by:
Dan Matchett

Standards:
Endress and Hauser Field Check S/N:0000551303 Cal Due Mar 2022

Instrument Type
Magnetic Flow Meter

Meter Information

Date of Test:	2021-08-19
Location:	Youngs Cove SPS
Meter Under Test	Raw
Client Tag:	FIT201
Manufacturer:	Endress & Hauser
Model:	Pro10
Serial Number:	NC00A016000
Totalizer As Found:	16917.5m3
Totalizer As Left:	16921.4m3
Allowable Error%:	5
Programming Parameters:	
DN Size:	100
Cal Factor:	1.6261
Zero:	0
Calibration Due:	Aug-22

Method of verification
EnH Field Check Verification/Calibration

Units: LPS
Zero: 0.00
Span: 20.00
Totalizer: M3

Flow Test

Sim Setting	Sim Flow LPS	Meter Display	Current Output	Disp Error%	mA Error %
0.000	0.000	0.000	3.993	0.000	0.175
5.000	5.000	5.010	7.976	0.050	0.300
10.000	10.000	9.970	11.983	0.150	0.142
15.000	15.000	15.014	15.961	0.070	0.244
20.000	20.000	19.997	19.933	0.015	0.335
			Average Error%	0.06	0.24
			Result:	PASS	PASS

Totalizer Test

Sim Flow Rate	20.000	LPS
Start Totalizer	16919.500	M3
End Totalizer	16921.400	M3
Volume Simulated	1.900	M3
Time(Seconds)	95.430	
Calculated Totalizer(MUT)	1.909	
Error%	-0.451	
Result:	PASS	

Comments:
Unit passes verification.

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Trenton, ON K8V 5R6

Calibration by:
Dan Matchett

Standards:
Endress and Hauser Field Check S/N:0000551303 Cal Due Mar 2022

Instrument Type
Magnetic Flow Meter

Meter Information

Date of Test:	2021-08-19
Location:	Youngs Cove SPS
Meter Under Test	Sludge Tank Flow
Client Tag:	FIT901
Manufacturer:	Endress & Hauser
Model:	Pro10
Serial Number:	NC009F16000
Totalizer As Found:	480.8m3
Totalizer As Left:	482.603m3
Allowable Error%:	5

Programming Parameters:

DN Size:	50
Cal Factor:	1.3673
Zero:	0
Calibration Due:	Aug-22

Method of verification
EnH Field Check Verification/Calibration

Units: LPS
Zero: 0.00
Span: 5.00
Totalizer: M3

Flow Test

Sim Setting	Sim Flow LPS	Meter Display	Current Output	Disp Error%	mA Error %
0.000	0.000	0.000	3.997	0.000	0.075
1.250	1.250	1.290	8.129	0.790	1.612
2.500	2.500	2.501	11.998	0.020	0.017
3.750	3.750	3.799	16.166	0.976	1.038
5.000	5.000	5.010	20.001	0.200	0.005
			Average Error%	0.40	0.55
			Result:	PASS	PASS

Totalizer Test

Sim Flow Rate	5.000	LPS
Start Totalizer	481.600	M3
End Totalizer	482.500	M3
Volume Simulated	0.900	M3
Time(Seconds)	180.040	
Calculated Totalizer(MUT)	0.900	
Error%	-0.022	
Result:	PASS	

Comments:
Unit passes verification.

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Notice of Modifications

There were no 'Notice of Modifications' forms submitted to the Ministry during this Reporting Period.

Summary of complaints received throughout the reporting period

There were no complaints received by City staff regarding the Young's Cove WWTP throughout the reporting period.