Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Stephan Burt
District Manager
Hamilton District Office
Ministry of the Environment, Conservation and Parks

March 31, 2024

Re: 2023 Annual Performance Report for the Simcoe Wastewater Treatment Facility, Sewage Pumping Stations and the Simcoe Linear Infrastructure.

Attached is the 2022 Annual Performance Report for the Simcoe Wastewater Treatment Facility (WWTF) located at 16 Oakwood Avenue in Norfolk County and all associated sewage pumping stations (SPS's). This report has been completed in accordance with the following approvals:

- Section 11(4)(a) through (n) cited in Environmental Compliance Approval #5789-BDHNWH issued October 10, 2019 to the Corporation of Norfolk County.
- Schedule E, Section 4.6 cited in the Consolidated Linear Infrastructure – Environmental Compliance Approval #070-W601 issue number 1 issued on July 27, 2022 to the Corporation of Norfolk County

This report, as it pertains to the WWTF and the SPS's and forcemains was prepared by the Ontario Clean Water Agency on behalf of Norfolk County, based on the information contained in our records. The information included in the reports on the Simcoe gravity separate sewers was provided by Norfolk County.

The report covers the period from January 1, 2023 to December 31, 2023.

Sincerely,

Allison Billingsley
Process and Compliance Technician
Ontario Clean Water Agency
Southwest Region - Norfolk Cluster

Cc:
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Contents

Introduction:

The Simcoe Wastewater Treatment Facility (WWTF) is a conventional activated sludge facility with a rated capacity of 15,400 m^3/d. Simcoe also has three pumping stations. The overall facility comprises of the following key components:

- A headworks and preliminary treatment facility comprised of screening, raw sewage pumping and grit removal;
- A hauled waste receiving facility;
- A leachate receiving facility;
- Two liquid trains called plant 1 and plant 2 with individual capacities of 2,671 m^3/d and 12,729 m^3/d respectively;
- Common chlorination/dechlorination based disinfection system;
- Common tertiary filtration system; and,
- Anaerobic digestion based sludge stabilization and storage facility.

Recent Upgrades

- Plant 1 - Refurbished and recommissioned in 2008 with an individual rated capacity of 2,671 m^3/d.
- Plant 2 - Upgrades including aeration tank concrete repair, reconfiguration of the primary and secondary clarifier flow distribution and replacement of sludge removal mechanisms, completed in 2014.
- Aeration system with new blowers, fine bubble aeration system and DO control.
- Installation of screening and grit removal facilities.
- Addition of dechlorination process to the existing chlorination based disinfection system.

Sewage Pumping Stations

The Norfolk County Municipal Wastewater Collection System is made up of five separate wastewater collection systems. The Simcoe wastewater collection system (population 16,121) conveys sewage to the Simcoe Wastewater Treatment Facility through a total of 91 kilometres of gravity separate sewers, 2.7 kilometres of forcemains and three (3) sewage pumping stations (SPS) in the system. There are no overflow or bypass systems in the SPS's of Simcoe. For additional information on the individual SPS's listed below, please refer to CLI-ECA #070-W601 Issue #1.

- WW467 – 2nd Avenue SPS located at 205 Second Ave in Simcoe Ontario. 2nd Ave SPS is a duplex pumping station equipped with 2 pumps (1 duty, 1 standby), with a wet well of 58 m^3 capacity. The station is connected to a 300 mm diameter forcemain discharging to manhole at the intersection of Norfolk Street and Second Avenue. There is no overflow.
- WW492 – Decou Road SPS located at on the Southeast corner of Decou Road and Butternut Drive in Simcoe Ontario. Decou Rd. SPS is a duplex pumping station equipped with 2 pumps (1 duty, 1 standby), with a wet well of 57 m^3 capacity. The station is connected to a 100 mm diameter forcemain discharging to manhole at the intersection of Norfolk Street South and Decou Road.

- WW493 – Talbot Street SPS located at 302 Talbot Street North in Simcoe Ontario. Talbot St. SPS is a duplex pumping station equipped with 2 pumps (1 duty, 1 standby), with a wet well of 13 m^3 capacity. The station is connected to a 150 mm diameter forcemain discharging to manhole at the intersection of Talbot Street North and Maple Street. There is no overflow.

Raw Wastewater Collection
The east half of the pump house contains the dry well and the west half contains the wet well. A full height concrete wall running in the north-south direction divides the two wells. Above the wet well is an electrical equipment room, which houses the Motor Control Centers (MCCs) and Variable Frequency Drives (VFDs). The wet well is a reservoir situated below grade and includes a recessed section that extends underground to the west of the pump house building. Raw sewage enters the west side of the wet well through a 900mm pipe. A vertical steel bar screen in the wet well protects the raw sewage pump suction intakes from large debris. The bar screen is located across the width of the wet well on the east side of the pit. There are four raw sewage pumps located at the bottom of the pump house dry well. The suction intakes for the pumps extend through the common wall between the wet well and the dry well such that sewage is drawn from the east side of the wet well.

Inlet Works
Primary influent is pumped from the raw sewage pump house and sent through a 400mm forcemain to the influent works, located to the south of the pump house. These works consist of a grit vortex chamber (TEACUP). The grit collection bin is approximately 1m^3 and this bin is emptied twice a week.

Primary Clarification
The degritted wastewater from the influent works flow through a 500mm pipe to the distributing chamber that is situated in the center of the four primary clarifiers. The operator may control the flow from the distributing chamber to each clarifier using a manually operated sluice gate on each clarifier inlet pipe. The primary clarifiers reduce the suspended solids content of the sewage by sedimentation.

The degritted wastewater to each primary clarifier flows from the distributing chamber through a 400mm pipe. The suspended solids with a specific gravity, which is higher than that of the liquid tend to settle to the bottom of the clarifier. The bottom of each clarifier is conical as it slopes toward the center of the tank.

The sludge collection mechanism slowly rotates around the bottom of the tank pushing the settled sediment. The sediment settles to the sludge thickening zone and subsequently into the sludge pocket. The sludge is periodically drawn from the sludge pocket by the raw sludge pumps. The suspended solids with a specific gravity, which is lower than that of the liquid tend to rise to the surface. As the skimmer arm slowly rotates, it sweeps the floating solids toward the periphery of the clarifier around to the scum trough. The solids flow down through the scum trough into the scum pit where it is collected and pumped out by the raw sludge pumps.

Aeration Tanks
<u>Air Diffusion</u>

The primary effluent from the primary clarifiers is collected on the outlet side of the distributing chamber and sent to the aeration tanks through a 750mm pipe. An influent channel distributes the liquid to the four parallel aeration tanks. Influent enters the tanks on the north side and effluent exits the tanks on the south side. Each aeration basin is equipped with fine bubble diffuser and air is supplied by 1 of 3 multi-stage centrifugal blowers powered by 100 HP electric motors.

Secondary Clarification
Ferrous chloride is added to the distribution chamber upstream of the primary clarifiers as well as to the aeration discharge channel. There is one adjacent ferrous chloride storage tanks located east of Plant #2. The capacity of the tank is approximately 20,000 liters. The activated wastewater produced from the aeration process flows into the four secondary clarifiers where most sludge is settled. The solids that settle to the bottom of the secondary clarifier are either returned to the aeration tanks or sent to the primary clarifiers for co-thickening.

Disinfection Phase
Chlorine Contact Chamber
The secondary effluent from the aeration tanks flow through a 750mm pipe and enters the northwest corner of the chlorine contact chamber. The chlorine contact chamber is a square basin containing 5 baffles which is designed to slow flow and prevent short circuiting of the tank to allow for a minimum of 30 minutes of chlorine contact time. A chemical feed pipe in the chlorine room of the chlorination building delivers a dose of 12% hypochlorite solution to the incoming effluent stream at the chamber inlet. The turbulence at the chamber inlet causes the effluent and hypochlorite to mix. The mixture flows through the tank and finally passes through a 24 inch Montana flume flow measuring device.

Sodium Bisulphite
Sodium Bisulphite is stored in a 2,000L chemical storage tank with adequate spill containment. It is dosed at the outlet from the tertiary disk filters by means of a feed pipe along with two (2) 5.5L/h metering pumps (one standby).

Tertiary Treatment
Tertiary treatment is provided by two (2) automatic disk filters which run together starting up based on the level in the tank and rotating to introduce clean filter media to the effluent. A backwash pump and spray bar are used to clean the filters as they rotate to backwash any captured solids. Solids are then returned to the headworks of the facility.

Anaerobic Digestion Facility
Primary Digester
The raw sludge removed in the primary clarification process is sent through a 200mm raw sludge line from the primary clarifiers to the primary digester. The primary digester has a fixed steel dome and a holding capacity of 2,507m^3. The sludge entering the primary digester is heated to an internal temperature of 35ºC. This temperature must be maintained for the process to work. The primary digester uses a gas mixing system. The compressor supplying the compressed air to the lances is located in the compressor room on the second floor of the digester control building. The sludge mixer is operated continuously throughout the year. The gas pressure in the digester is controlled using pressure switches. These switches indicate if the

gas pressure is either too high or too low. The gas mixing system will shut down if either condition is detected.

Secondary Digesters
The content in the primary digester will gradually rise and flow into an overflow chamber. The sludge in the chamber will continue to flow by gravity into the secondary digesters for additional thickening of the digested sludge. Flow to each digester is equally distributed. The two secondary digesters each have a floating steel dome and a combined holding capacity of 2,437m3. There is no assisted mixing in the secondary digesters. Sludge is either emptied onto a tanker truck or transferred to the primary digester using the transfer pump. The digested sludge from the two secondary digesters are emptied and hauled to the Townsend Lagoons for interim storage or directly land applied to agricultural fields.

Standby Power
The emergency power for the entire plant is supplied from:
SDMO X700UC2 Supplied by GAL Power
4353 L Diesel fuel tank
700KW 1045HP

Simcoe WWTF Facts:

Environmental Compliance Approval	ECA 5789-BDHNWH (issued October 10, 2019)
Rated Capacity	15,400m^3/day
Receiving Water	Lynn River

For 2023, the Simcoe WWTF was operated in accordance with provincial regulations as required in ECA #5789-BDHNWH (ECA) issued October 10, 2019.The following report is presented such that it corresponds with ECA #5789-BDHNWH Section 11(4) (a) through (n) and satisfies the requirements for the sewage pumping stations and the Simcoe linear infrastructure in CLI-ECA #070-W601 Issue #1 dated July 27, 2022.

Section A: Influent Monitoring Data

As outlined in ECA#5789-BDHNWH Section 11(4)(a) the following is a summary and interpretation of all influent and imported sewage monitoring data and a review of the historical trend of the sewage characteristics.

(I) Sewage Pumping Stations

As per the CLI-ECA Schedule E Condition 4.6.3, there are no flow meters at the Simcoe SPS's. The following Tables 1 and 2, show the total pump run time hours for each station in 2023 compared to 2022. There is no additional monitoring data that required interpretation or conclusions for the Simcoe sewage pumping stations in 2023. There is no need for future modifications to the sewage pumping stations at this time.

Table 1. Pump Run Hours for the Simcoe SPS's in 2023 and 2022

Sewage Pumping Station (SPS)	Year	Pump #1 (hours)	Pump #2 (hours)
2nd Avenue	2022	145.58	136.80
	2023	172.50	165.90
Decou Road	2022	287.10	244.19
	2023	353.60	350.20
Talbot Street	2022	366.86	358.70
	2023	418.38	416.20

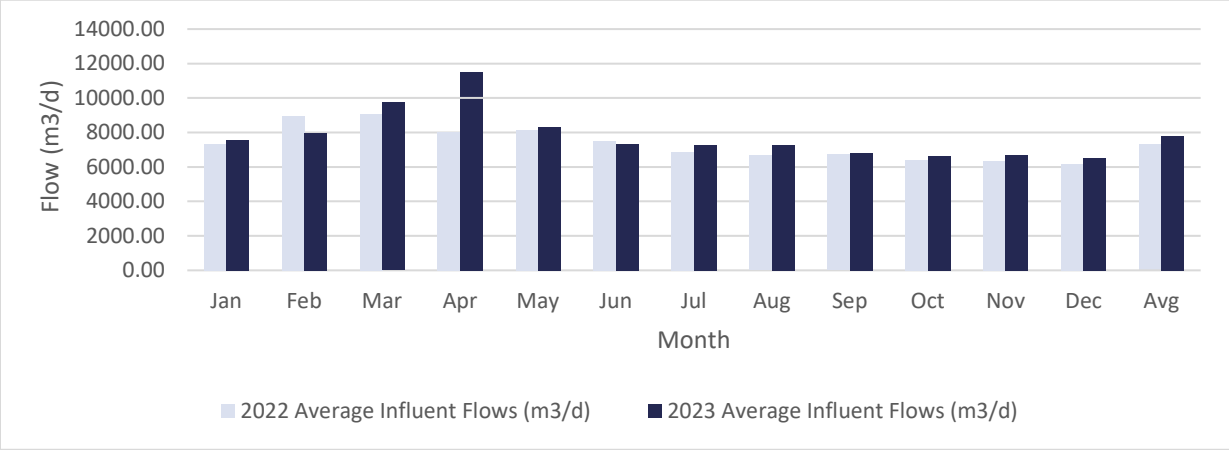
Table 2. Total Pump Run Hours for the Simcoe SPS's in 2023 compared to 2022

Sewage Pumping Station (SPS)	Total Hours 2022 (hours)	Total Hours 2023 (hours)	Percent Change (%)
2nd Avenue	282.38	338.40	16.55
Decou Road	531.29	703.80	24.51
Talbot Street	725.56	834.58	13.06

(II) Influent Flow Monitoring

The average daily flow of raw wastewater (influent) to the Simcoe WWTF was 7,798m^3/d in 2023. The following Graph 1 shows the average daily influent flows per month for 2023 compared to 2022.

Graph 1. Influent average daily flows for 2023 compared to 2022

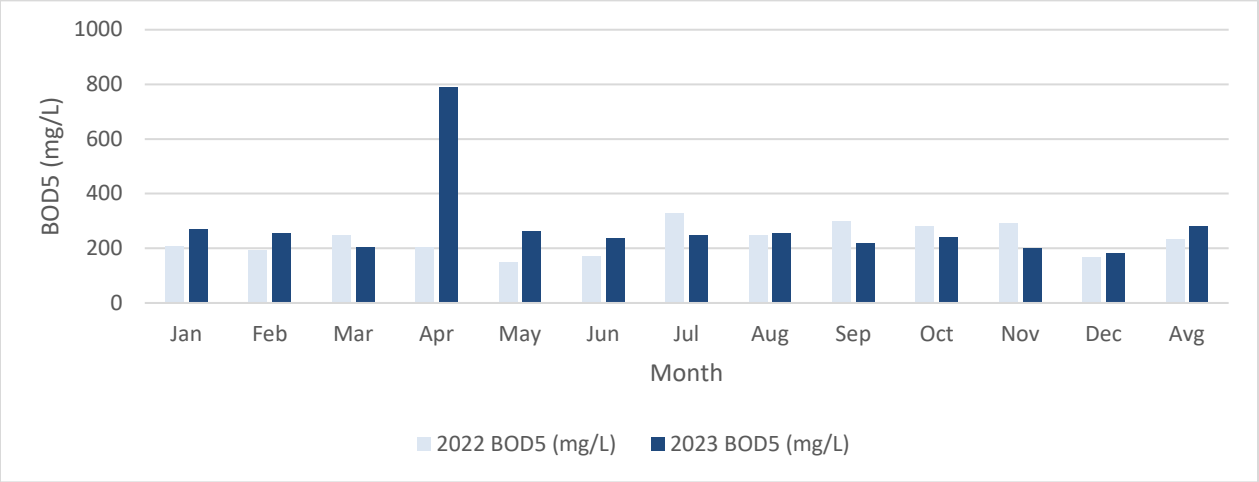


(III) Influent Data

The influent is monitored for BOD_5, total suspended solids, total phosphorus and total kjeldahl nitrogen, at a minimum on a weekly basis by means of a composite sample. Refer to Appendix A for more detailed monthly results.

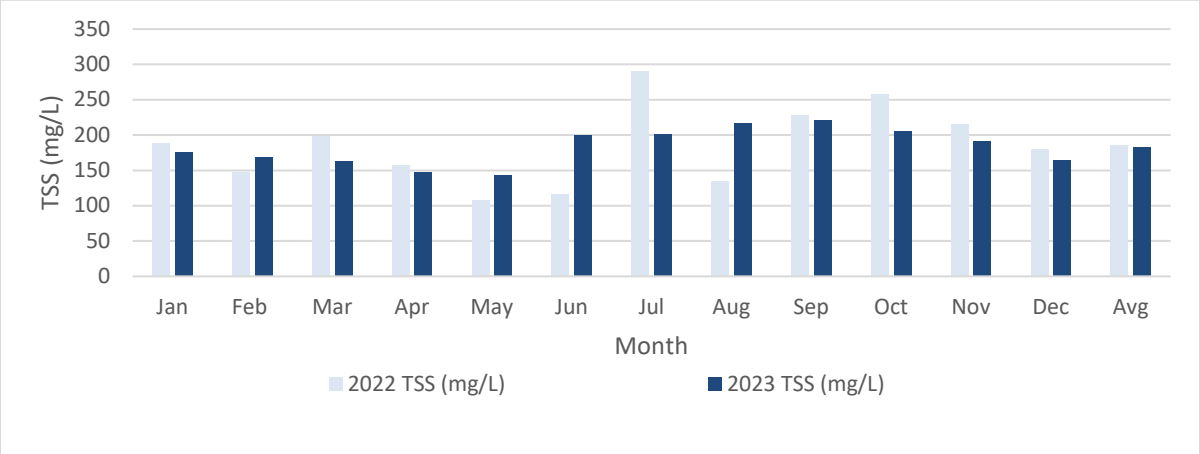
The annual average for influent BOD_5 concentration to the plant in 2023 was 279.2mg/L. This is an increase from 2022 by 17%. Refer to Graph 2 for a comparison of monthly concentrations in 2023 and 2022.

Graph 2. Influent monthly average concentration of BOD_5 for 2023 compared to 2022.



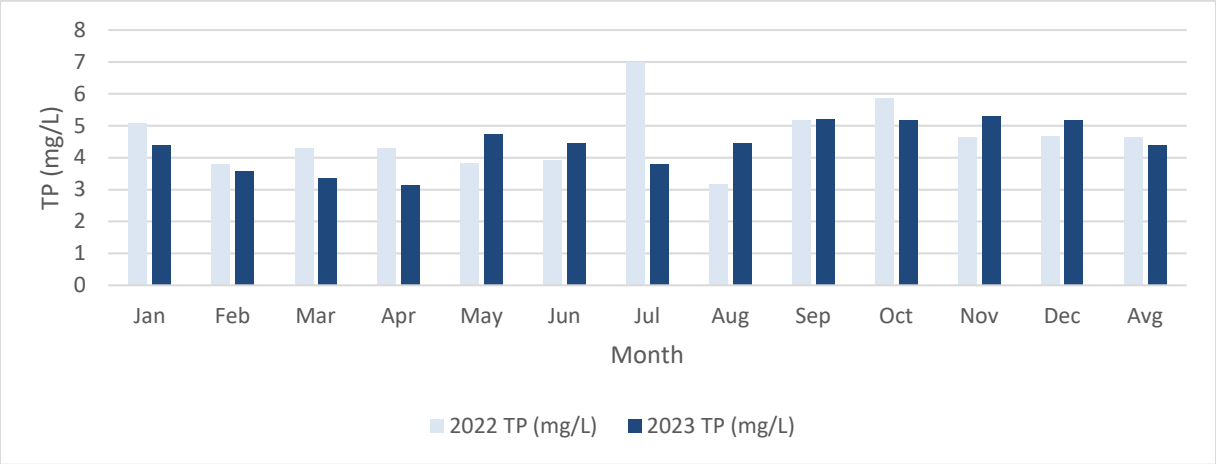
The annual average for influent total suspended solids (TSS) concentration to the plant was 183.1mg/L. This is a decrease from 2022 by 1.2%. Refer to Graph 3 for a comparison of monthly concentrations in 2023 to 2022.

Graph 3. Influent average monthly concentration of TSS for 2023 compared to 2022.



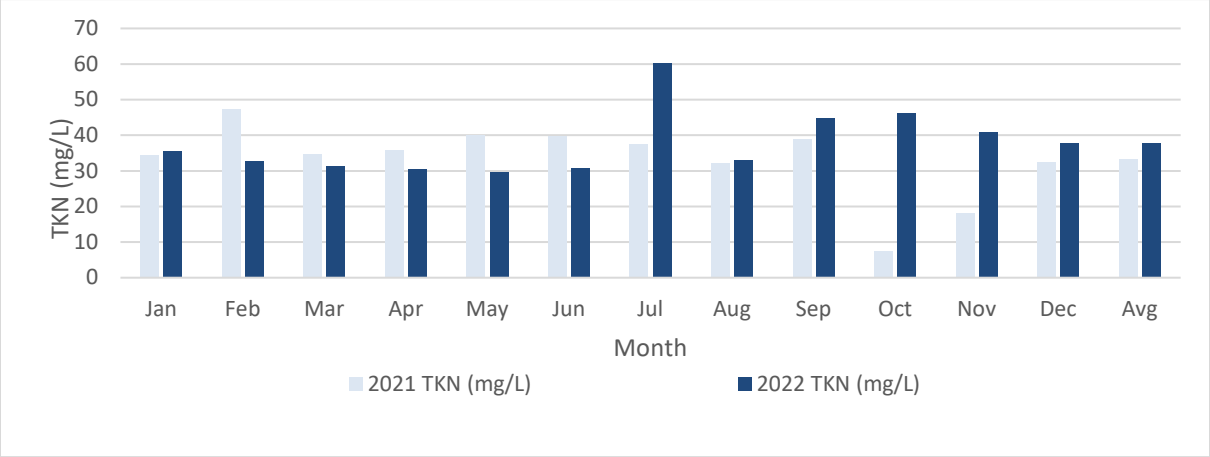
The annual average for influent total phosphorus (TP) concentration to the plant was 4.39mg/L. This is a decrease from 2022 by 5.7%. Refer to Graph 4 for a comparison of monthly concentrations in 2023 to 2022.

Graph 4. Influent average monthly concentration of TP for 2023 compared to 2022.



The annual average for influent total kjeldahl nitrogen (TKN) concentration to the plant was 32.7mg/L. This is an increase from 2022 by 15.4%. Refer to Graph 5 for a comparison of monthly concentrations in 2023 to 2022

Graph 5. Influent average monthly concentration of TKN for 2023 compared to 2022.



The influent characteristics have remained fairly consistent for all parameters with BOD_5 increasing and TSS, TP and TKN decreasing in 2023 compared to the 2022 data. Influent data is subject to fluctuation as expected with the flow variations that are experienced.

(IV) Imported sewage

As required by the ECA, imported sewage (septage) is to be sampled on a monthly basis and tested, at a minimum, for BOD_5, total suspended solids, total phosphorus, total kjeldahl nitrogen, pH and alkalinity. The addition of an imported sewage receiving station is part of the proposed upgrades for the Simcoe WWTF. The Simcoe WWTF received a total of 1,569.7m^3 in 2023 as broken down in Table 3 below.

Table 3. Total Volume of Imported Sewage to the Simcoe WWTF in 2023

Month	Holding Volume (m^3)	Septic Volume (m^3)	Portable Waste Volume (m^3)
January	57.91	-	0.38
February	54.03	3.03	0.38
March	119.23	-	-
April	94.06	-	-
May	70.70	-	-
June	93.11	14.38	-
July	262.68	29.52	-
August	289.55	1.51	7.68
September	122.63	5.68	11.26
October	143.83	18.83	-
November	87.06	9.16	-
December	69.83	-	3.27
Total	**1,464.62**	**82.11**	**22.97**

(V) Leachate Monitoring

As required by the ECA, Leachate is to be sampled on a quarterly basis. The addition of a leachate receiving station is part of the proposed upgrades for the Simcoe WWTF. The Simcoe WWTF received a total of 47,708.2m^3 in 2023 as shown in Table 4 below.

Table 4. Total Leachate received at the Simcoe WWTF in 2023

Month	Leachate Volume (m^3)
January	2,935.0
February	2,758.2
March	3,693.8
April	3,972.7
May	4,820.9
June	4,588.5
July	3,996.1
August	4,732.6
September	4,088.6
October	4,219.0
November	4,434.7
December	3,468.1
Total	**47,708.2**

Section B: Effluent Monitoring Data

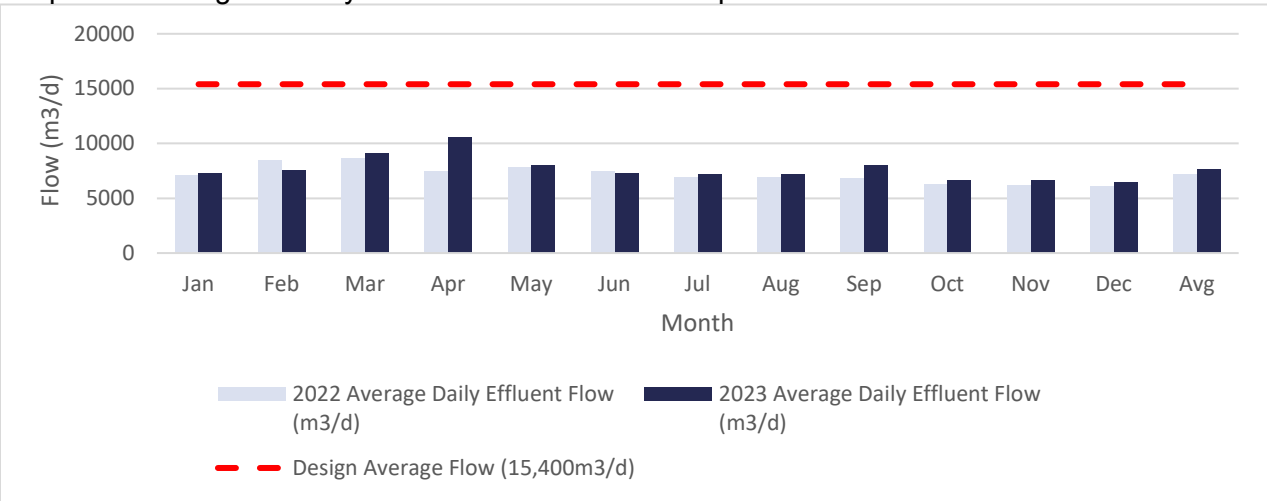
As outlined in the ECA #5789-BDHNWH Section 11(4)(b) the following is a summary and interpretation of all effluent monitoring data including concentrations and flow rates. Also

included is a comparison of effluent concentrations to the design objectives and compliance limits in the approval and an overview of the success and adequacy of the Works

(I) Effluent Flow Monitoring

The average daily flow of effluent wastewater discharging from the Simcoe WWTF was 7,630m^3/d in 2023 compared to 7,165m^3/d in 2022. The rated capacity identified in the ECA is 15,400m^3/d. As depicted in Graph 6, the WWTF is currently at 49.5% of the rated design capacity as identified in the ECA.

Graph 6. Average monthly effluent flows for 2023 compared to 2022



(II) Effluent Data

The final effluent is sampled on a weekly basis and tested for $cBOD_5$, total suspended solids, and total kjeldahl nitrogen, as a composite sample. With grab samples collected weekly and tested for E. coli. Three times a week composite samples are obtained for total phosphorus and total ammonia nitrogen, un-ionized ammonia as calculated, pH and temperature. Total residual chlorine is tested daily with the exception of weekends and statutory holidays when the plant is not staffed. Detailed results are found in Appendix A. Table 5 below shows the monthly average effluent results and loadings.

Table 5. Monthly average effluent results for 2023 obtained from composite sampling.

Month	cBOD5 (mg/L)	TSS (mg/L)	TP (mg/L)	TAN (mg/L)
January	2.4	2.5	0.13	0.86
February	2.2	1.8	0.13	1.15
March	2.0	1.4	0.08	0.08
April	2.0	2.3	0.12	0.09
May	2.0	2.3	0.26	0.11
June	2.5	2.4	0.21	0.13
July	2.4	5.5	0.24	0.15
August	2.0	5.0	0.16	0.09
September	2.0	3.3	0.22	0.14
October	2.0	3.5	0.15	0.14
November	2.0	2.0	0.12	0.17
December	2.2	1.5	0.21	0.14
Average	**2.1**	**2.8**	**0.17**	**0.27**
Objective	5.0	7.5	0.15	0.75 (3.0)*
Limit	10.0	15.0	0.45	1.0(5.0)*

*value in brackets is the limit from Nov 1 to Apr 31

Table 6. Monthly average effluent ranges for 2023 obtained from weekly grab samples.

Month	Unionized Ammonia (mg/L)***	Temp (°C)	E. coli (cfu/100mL)*	pH **	Total Residual Chlorine** (mg/L)
January	0.0056	11.6	4.9	7.18-7.84	0.00-0.02
February	0.0043	10.0	37.0	7.19-7.70	0.00-0.02
March	0.0004	9.9	1.0	7.29-7.53	0.00-0.02
April	0.0009	13.4	1.7	7.31-7.86	0.00-0.02
May	0.0007	15.1	2.7	7.07-7.66	0.00-0.02
June	0.0009	17.7	21.5	7.14-7.54	0.00-0.02
July	0.0010	19.8	32.7	7.10-7.64	0.00-0.02
August	0.0007	19.2	16.6	7.10-7.54	0.00-0.02
September	0.0013	18.6	9.8	7.06-7.65	0.00-0.02
October	0.0012	17.8	5.0	7.14-7.71	0.01-0.02
November	0.0011	15.2	10.1	7.04-7.71	0.00-0.02
December	0.0008	13.5	5.7	7.06-7.56	0.00-0.02
Average	**0.0016**	**15.2**	**7.4**	**7.04-7.86**	**0.00-0.02**
Objective	n/a	n/a	150	6.5-8.0	0.02****
Limit	n/a	n/a	200	6.5-8.5	0.02

*expressed as geometric mean
**minimum and maximum result range
***As calculated
**** non-detect = 0.02mg/l due to the limitations of in house colorimeters.

Table 7. Monthly average loadings for 2023.

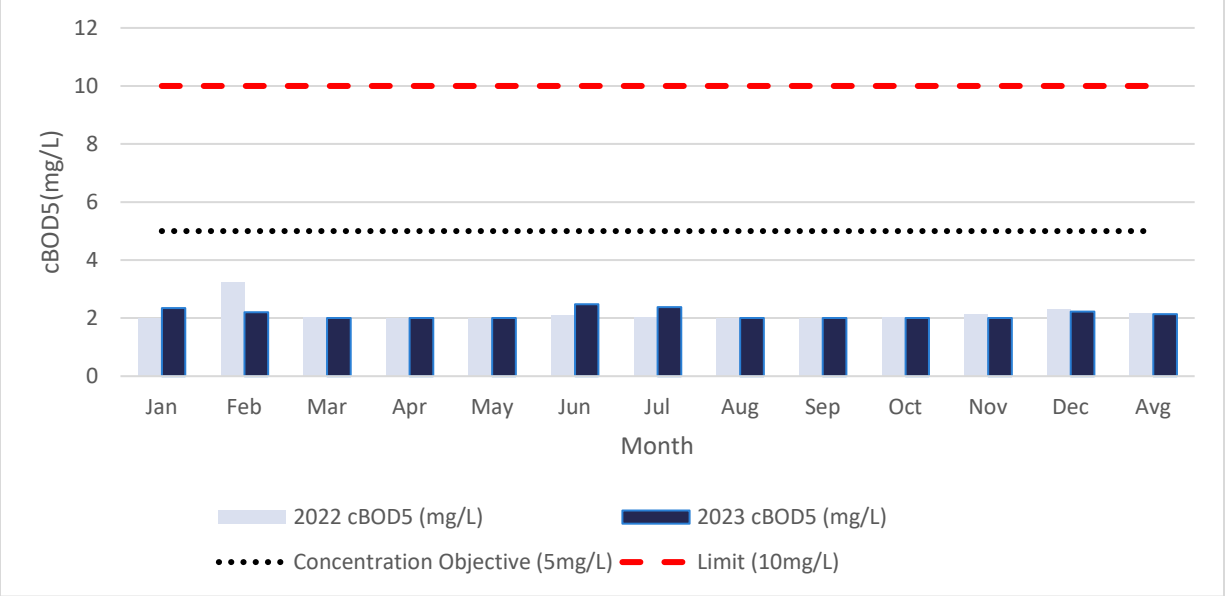
Month	$cBOD_5$ (kg/d)	TSS (kg/d)	TP (kg/d)	TAN (kg/d)
January	17.04	18.13	0.94	6.24
February	16.53	13.52	0.98	8.64
March	18.09	12.66	0.72	0.72
April	21.15	23.79	1.27	0.95
May	15.98	17.98	2.08	0.85
June	18.06	17.47	1.53	0.95
July	17.10	39.52	1.72	1.08
August	14.30	35.74	1.14	0.64
September	15.90	25.84	1.75	1.11
October	13.17	23.05	0.99	0.87
November	13.22	13.22	0.79	1.09
December	14.33	9.64	1.35	0.87
Average	**16.24**	**20.88**	**1.27**	**2.00**
Limit	154	231	6.93	15.4 (77.0)

*value in brackets is the limit from Nov 1 to Apr 31

Comparison to Compliance Limits and Objectives

The annual average for effluent $cBOD_5$ in 2023 was 2.1mg/L; this value has increased by 1% from the annual average in 2022. The annual loading of $cBOD_5$ was 16.24kg/d. The concentration objectives, limits and loading limit for $cBOD_5$ were not exceeded in 2023. Refer to Graph 7 for a comparison of effluent monthly average concentration of $CBOD_5$.

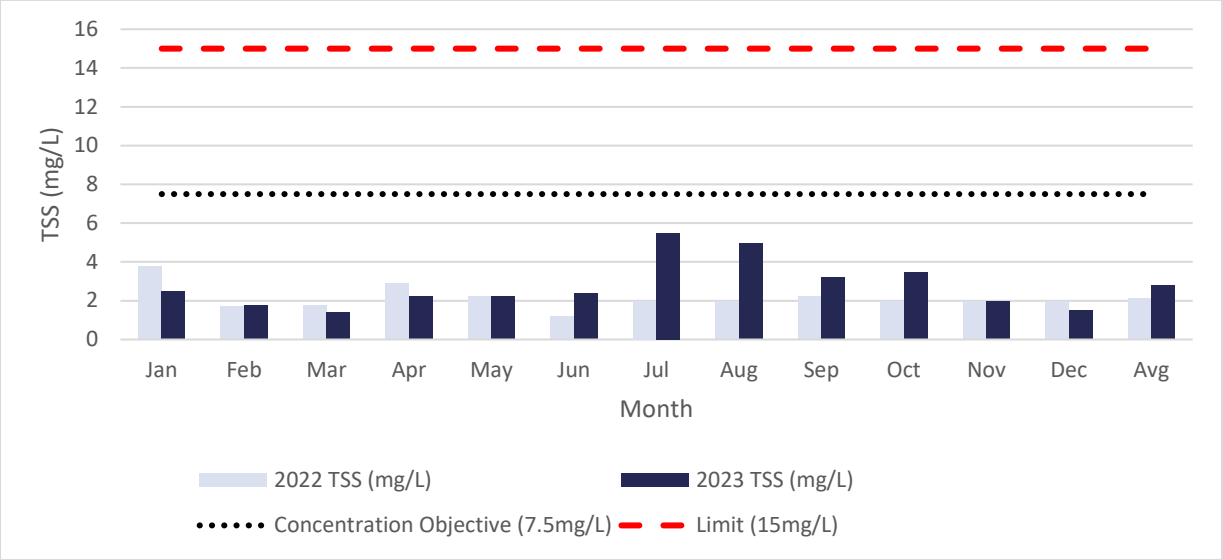
Graph 7. The effluent monthly average concentration of $cBOD_5$ in 2023 compared to 2022.



The annual average for effluent TSS in 2023 was 2.8mg/L; this value has increased by 22% from the annual average in 2022.The annual loading of TSS was 20.88kg/d. The concentration

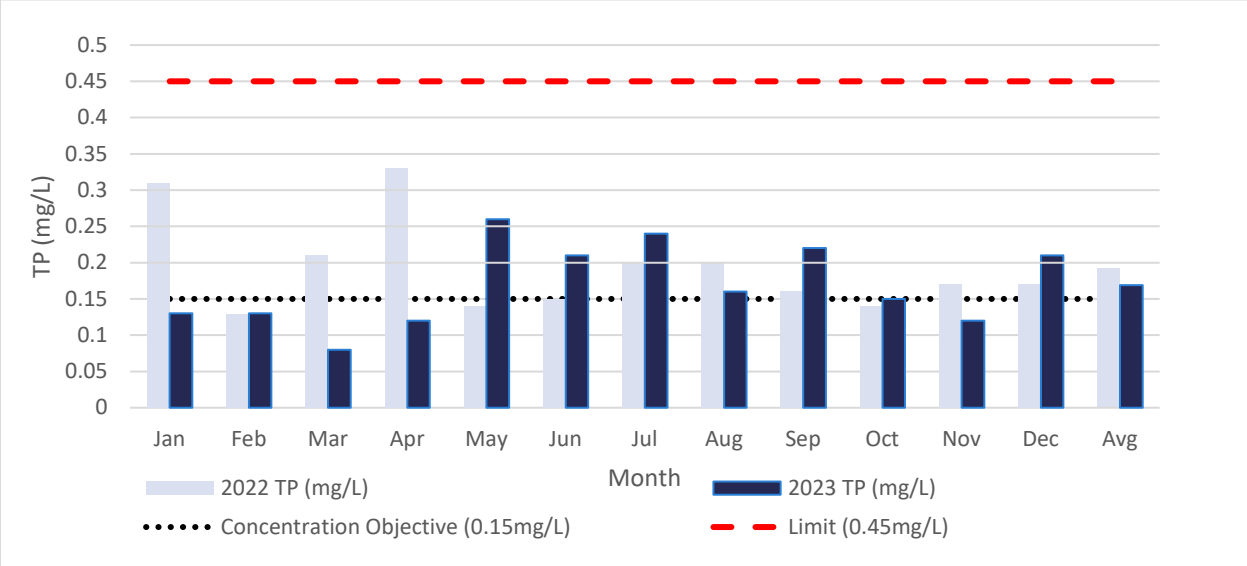
objectives, limits and loading limits were not exceeded in 2023. Refer to Graph 8 for the effluent monthly average concentration of TSS.

Graph 8. The effluent monthly average concentration of TSS in 2023 compared to 2022.



The annual average for effluent TP in 2023 was 0.17mg/L; this value has decreased by 13.7% from the annual average in 2022. The annual loading of TP was 1.27kg/d. The concentration limit and loading limit were not exceeded in 2023. There were six (6) objective exceedances in 2023 as discussed below in ***Section G: Summary of Efforts Made to Achieve Design Objectives.*** (Refer to Table 5). Refer to Graph 9 for a comparison of the effluent monthly average concentration of TP.

Graph 9. The effluent monthly average concentration of TP in 2023 compared to 2022.

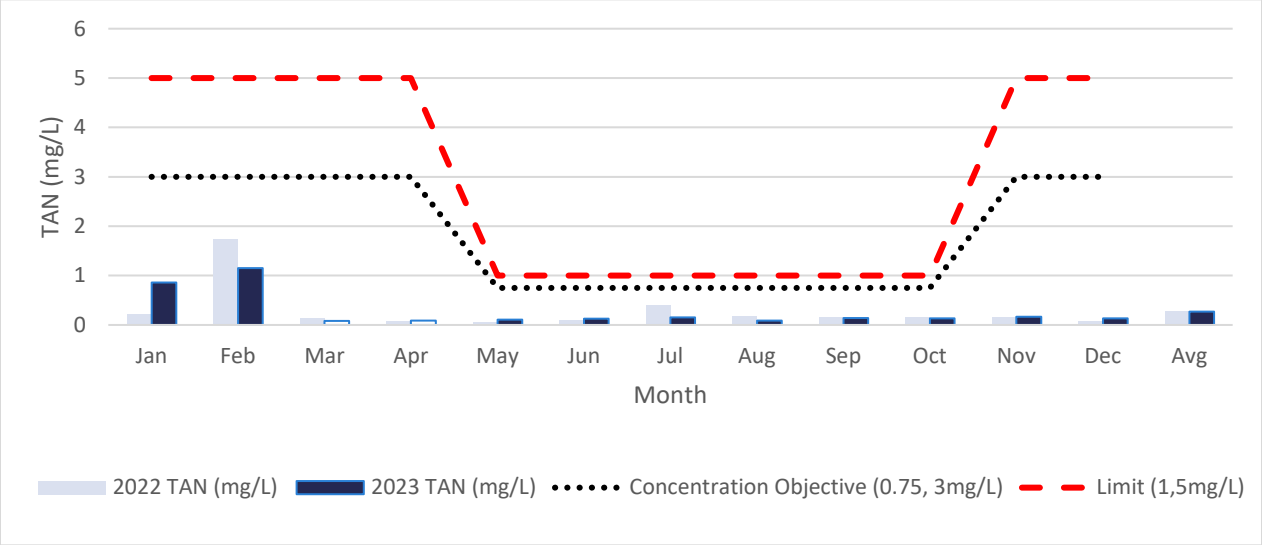


The annual average for effluent Total Ammonia Nitrogen (TAN) in 2023 was 0.27mg/L; this value has decreased by 5% from the annual average in 2022. The annual loading of TAN was 2.00kg/d. The limits and objectives for TAN vary based on the freezing period:

- November 1st to April 30th - the objective is 3.0mg/L and the limit is 5.0mg/L.
- May 1st to October 31st - the objective is 0.75mg/L and the limit is 1.0mg/L.

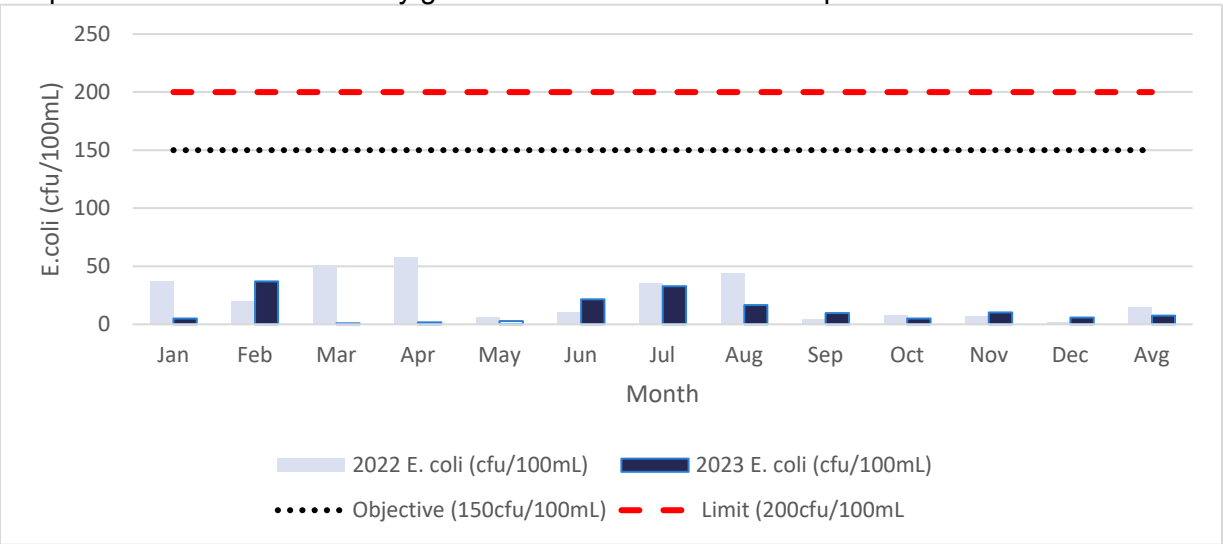
There were no objective or limit exceedances for TAN in 2023. Refer to Graph 10 for a comparison of the effluent monthly average concentrations.

Graph 10. The effluent monthly average concentration of TAN in 2023 compared to 2022.



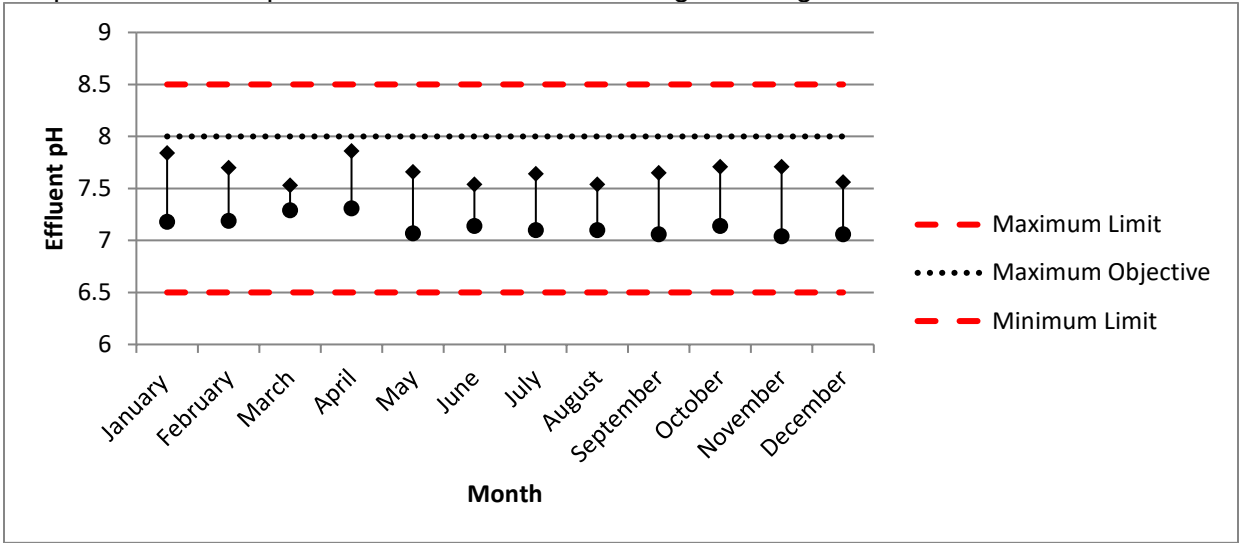
The annual geometric mean for effluent E.coli in 2023 was 7.4cfu/100mL; this value has decreased by 12% from the annual average in 2022. There were no objective or limit exceedances in 2023 for E. coli. Refer to Graph 11 for a comparison of the monthly effluent geometric mean concentration (geomean) of E.coli

Graph 11. The effluent monthly geomean of E.coli in 2022 compared to 2021.



The effluent pH is monitored three times/week at a minimum at the Simcoe WWTF. Overall the plant has provided effective treatment as there have been no results below or above the compliance limits of 6.5-8.5 in 2023. The pH is required to be maintained between 6.5-8.5 at all times. Refer to Graph 12 for the monthly minimum and maximum range for the pH readings.

Graph 12. Effluent pH minimum and maximum range readings for 2023.



The Simcoe Wastewater Treatment Facility performed well in 2023 producing quality effluent meeting all limits for all required parameters, with six (6) objective exceedance for TP as discussed below in ***Section G: Summary of Efforts Made to Achieve Design Objectives.***

Section C: Operating Problems and Corrective Actions

In 2023, there were challenges in meeting the Total Phosphorus objectives for 50% of the time. Operations staff continued to make adjustments to chemical feed rates strictly based on the ferrous chloride dosing calculator provided by Blue Sky as part of the phosphorous optimization study undertaken by the Corporation of Norfolk County. More information on these objective exceedances is included in ***Section G: Summary of Efforts Made to Achieve Design Objectives.***

As per the CLI-ECA Schedule E Condition 4.6.4, there were no operating problems at the sewage pumping stations that required corrective actions for 2023. In the collection system (gravity separate sewers) a plugged sewer main on College Street was remediated via flushing and debris removal.

Section D: Maintenance Activities

Regular scheduled monthly preventative maintenance are associated SPS's (as per the CLI-ECA Schedule E Condition 4.6.5) are assigned and monitored using the Workplace Management System (WMS) program. Refer to Appendix B for preventative maintenance schedule. Norfolk County's preventative maintenance of gravity separate sewers involves a sanitary flushing program (including manhole inspections), aiming to flush 20% of each system on an annual basis. Items that were repaired or replaced in 2023 were as follows:

Table 8. Simcoe WWTF Major Maintenance Completed in 2023

Date	Major Maintenance
January 3	Electrical contractor onsite to complete set up of the admin building heaters
January 10-19	Mechanical contractor onsite to complete south pump house pump install (completed on January 30)
January 27	Electrical contractor onsite to install motor on primary clarifier #2
February 6-7	Electrical contractor onsite to run new power supply cable to the flare stack
February 9	Mechanical contractor onsite to repair hydronic loop leak on boiler
February 9	Electrical contractor onsite to fix wiring on primary clarifier #2
March 8	Contractor onsite to replace solenoid on grit vortex teacup
March 30	Electrical contractor onsite to replace torque switches
April 12	Contractor onsite to complete AC install on blower #2
May 1	Flow Meter calibrations completed by third party
May 18	Mechanical contractor repaired leaking valve in boiler pit
June 8	Mechanical contractor onsite to replace seized hardware on sludge loading pumps
June 9	Contractor onsite installing new roof on the admin building and repair eaves trough
June 29	Contractor onsite to clean VFD's
July 5	Contractor onsite to install cameras around the facility (completed July 18)
August 1	Contractor onsite for maintenance and troubleshooting of small boiler
August 2	Contractor onsite to install air conditioning in blower building.

August 2	Gas meter calibrations completed by third party
August 4	Asbestos inspection completed by Norfolk County
August 18	Operations installed new float level tube on ferrous chloride tank
August 21	Contractor onsite to clear blockage in sludge line
August 29	Contractor onsite to clear blockage in sludge line
September 6	Contractor onsite to clear blockage in sludge line
September 8	Operations replaced UPS in North Pump house
September 29	Mechanical contractor onsite to anchor loose diffuser in aeration tank 7
October 23-24	Contractors onsite to install new flow meter on waste line
October 23-25	In house lab and new waste line flow meter calibrations completed by third party
October 25	Annual fire extinguisher calibrations completed by third party
November 6	Contractor onsite to install isolation valve on small boiler
November 6	Electrical contractor onsite to reset sludge loading pump 2 overload alarm
November 27	Backflow preventers inspections completed by third party
December 7	ESA inspection completed
December 19	Contractor onsite completed maintenance on small boiler

Table 9. 2nd Ave SPS Major Maintenance Completed in 2023

December 7	ESA inspection completed

Table 10. Decou Road SPS Major Maintenance Completed in 2023

April 11	Contractor onsite to dewater and clean out Decou Rd SPS
May 15	Electrical contractor onsite to replace fuse and troubleshoot transformer
June 6	Operations replaced water pump on the generator and topped up coolant
July 11	Electrical contractor onsite to replace overheated transformer
November 6	Contractor completed wet well clean out
December 7	ESA inspection completed

Table 11. Talbot Street SPS Major Maintenance Completed in 2023

Date	**Major Maintenance**
June 5	Board removed from fence – operations secured the facility
December 7	ESA inspection completed

Section E: Effluent Quality and Assurance

Effluent quality assurance is evaluated by monitoring parameters and changes throughout the plants processes. The operators monitor the basin by performing weekly tests on the mixed liquor. These tests include dissolved oxygen, pH, temperature, settling tests and Mixed Liquor Suspended Solids (MLSS). As well, monitoring of chemical dosages and wasting volumes are completed. Data collected from these tests provide valuable information to the operators to

make the appropriate adjustments in the treatment process and take corrective actions before the plant reaches its effluent limits.

Section F: Calibration Records

The influent and effluent flow meters were calibrated by JBF Controls Ltd. on May 1, 2023. In-house meters for pH and dissolved oxygen were calibrated by JBF Controls Ltd. on October 23, 2023 as per manufacturer's instructions.

As per the CLI-ECA Schedule E Condition 4.6.5 - There are no flow meters at the Simcoe sewage pumping stations that required calibration in 2023.

Section G: Summary of Efforts Made to Achieve Design Objectives

Table 12. Individual sample results compared against the effluent objectives and loading limits.

Parameter	Effluent Objective (mg/L)	Monthly Effluent Result Ranges (mg/L)	# of Objective Exceedances	Effluent Loading Limit (kg/d)	Monthly Loadings Result Ranges (kg/d)	# of Limit Loading Exceedances
$cBOD_5$	5.0	2.0-2.5	0	154	13.17-21.15	0
TSS	7.5	1.4-5.5	0	231	9.64-39.52	0
TP	0.15	0.08-0.26	6	6.93	0.72-2.08	0
TAN*	0.75 (3.0)	0.08-1.15	0	15.4 (77.0)	0.64-8.64	0
E. coli (cfu/100mL)**	150	1.0-37.0	0	n/a	n/a	n/a
TRC	0.02	0.00-0.02	0	n/a	n/a	n/a
pH***	6.5 – 8.5	7.04-7.86	0	n/a	n/a	n/a

*effluent objectives and limits are seasonal
**expressed as geometric mean
***minimum and maximum result (not monthly averages)

Table 13. Objective exceedances in 2023.

Date	Parameter	Concentration mg/L	Loadings kg/d	Issue and Proactive Actions Taken
05/2023	Total Phosphorus	0.26	2.08	Monitored/Adjusted Chemical Feed
06/2023	Total Phosphorus	0.21	1.53	Monitored/Adjusted Chemical Feed
07/2023	Total Phosphorus	0.24	1.72	Monitored/Adjusted Chemical Feed
08/2023	Total Phosphorus	0.16	1.14	Monitored/Adjusted Chemical Feed
09/2023	Total Phosphorus	0.22	1.75	Monitored/Adjusted Chemical Feed
12/2023	Total Phosphorus	0.21	1.35	Monitored/Adjusted Chemical Feed

Total Phosphorus did not meet design objectives 50% of the time, refer back to ***Section C: Operating Problems and Corrective Actions*** for more information.

Section H: Sludge Handling and Generation

Sludge sampling results can be found in Appendix C. Sludge is removed from the Simcoe WWTF and sent to the Townsend Lagoon for processing or taken to field for land application. The total volume generated in 2023 was 12,217m^3, refer to Table 14 below for a breakdown and Table 15 for the sludge disposal locations. It is expected that 2024 will be similar to 2023 with approximately 12,500m^3 of sludge being removed from the Simcoe WWTF.

Table 14. Volume Hauled from the Simcoe WWTF - Sludge Generation 2023.

Month	Townsend Lagoon (m^3)	Field (m^3)	Total (m^3)
January	806	0	806
February	1,455	0	1,455
March	1,079	0	1,079
April	578	765	1,343
May	945	220	1,165
June	812	0	812
July	764	0	764
August	1,147	0	1,147
September	706	385	1,091
October	360	540	900
November	590	180	770
December	885	0	885
Total	**10,127**	**2,090**	**12,217**

Table 15. Sludge Disposal Locations 2023.

Site	NASM#	Lot	Concession	Township	Simcoe WWTF (m^3)	Dates Spread
HN1412	60284	13	4	Woodhouse	450.0	April 13, 2023
HN1412	60284	13	4	Woodhouse	90.0	April 14, 2023
HN1334	60288	14	5	Woodhouse	225.0	April 14, 2023
HN1172	25130	22 & 23	4	Townsend	220.0	May 16, 2023
B1165	60695	17	1	Onondaga	130.0	September 27, 2023
B1165	60695	17	1	Onondaga	255.0	September 28, 2023
HN1084	25183	9 to12	7	Townsend	225.0	October 13, 2023
HN1084	25183	9 to 12	7	Townsend	90.0	October 17, 2023
HN1411	60829	23 &24	6	Woodhouse	225.0	October 24, 2023
HN1039	60789	13	5	Woodhouse	180.0	November 6, 2023
TOTAL					**2,090.0**	

Section I: Complaints

There were no complaints received for the Simcoe WWTF in 2023.

As per the CLI-ECA Schedule E Condition 4.6.6 - there were no community complaints received for the Simcoe sewage pumping stations or gravity separate sewers in 2023.

Section J: By-pass, Overflow, Spill or Abnormal Discharge Events

There were no bypass, overflow, spill or abnormal discharge events at the Simcoe WWTF in 2023.

As per CLI-ECA Schedule E Condition 4.6.3, 4.6.8 and 4.6.9 - There were no overflow events (raw sewage spills) at the Simcoe SPS's or gravity separate sewers in 2023.

Section K: Notice of Modification to the Works and Construction and Commissioning of Proposed Works

The Simcoe WWTF's construction scheduling time frame has not changed and there are no new updates at this time. The scope of the upgrade remains as stated in the most recent Simcoe ECA #5789-BDHNWH issued on October 10, 2019.

As per the CLI-ECA Schedule E Condition 4.6.7 – There were no alterations to the Simcoe SPS's in 2023. The following alterations were completed in the linear infrastructure in 2023:

Colborne Street North Reconstruction – Phase 1
Form SS1 New sanitary sewer servicing Colborne Street North from Union Street to Robinson Street, which will connect to existing sanitary on Union Street and Robinson Street.

Short Street Sanitary Sewer Addition
Form SS1 Addition of 18.3m to existing sanitary sewer to service two additional lots on Short Street.

Colborne Street North Reconstruction – Phase 2
Form SS1 New sanitary sewer servicing Colborne Street North from Windham Street to Union Street, which will connect to existing sanitary on Colborne Street North, Kent Street, and Union Street.

West Street Sanitary Sewer Replacement
Form SS1 Sanitary sewer on West Street, from Holden Street to Brook Street replaced with 200mm PVC, and final outlets are to be maintained.

Section L: Efforts made to achieve conformance with F-5-1

The Simcoe WWTF is a conventional activated sludge treatment facility and is comprised of two liquid trains both equipped with primary treatment, aeration basins, and secondary clarification with a combined chlorination/dechlorination based disinfection system and a tertiary filtration system. Supplementary phosphorus removal is also achieved with the addition of a ferrous chloride solution. The treatment components are capable of producing effluent quality that

exceeds the effluent design objectives specified in F-5-1. The Simcoe WWTF is required to achieve higher effluent quality standards than the Effluent guideline criteria as specified in the ECA.

The Corporation of Norfolk County completes the following:
CCTV flushing and camera inspections
Manhole inspections

Section M: Changes or Updates for Construction at Plant

There were no changes or updates to the schedule for the completion of construction and commissioning operations of major process(es) / equipment groups in the Proposed Works at the Simcoe WWTF in 2023.

Section N: Summary of Incidences of Shock Loading and Impacts on performance

There was one (1) incident of shock loading by an industrial establishment in June of 2023. An influent sample was collected at the time of the event and analyzed for BOD_5, TSS, TP, TKN pH and Ammonia. Effluent quality was maintained within the compliance limits and there were no incidents of non-compliance that resulted from this event. The Corporation of Norfolk County continues to monitor any potential events by means of the sewer use bylaw and any overuse agreements created between industrial establishments and the County.

APPENDIX A – Simcoe WWTF Monitoring Data

APPENDIX B – Maintenance Schedule

APPENDIX C – Sludge Monitoring Data