Ontario Clean Water Agency
Agence Ontarienne Des Eaux

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

March 28, 2025

Re: 2024 Annual Performance Report for the Port Dover Wastewater Treatment Plant and the Port Dover Linear Infrastructure

Attached is the 2024 Annual Performance Report for the Port Dover Wastewater Treatment Plant located at 137 Hamilton Plank Road, Port Dover in Norfolk County and all associated sewage pumping stations and linear infrastructure. This report has been completed in accordance with:

- Section 11(4)(a) through (n) cited in Environmental Compliance Approval #7884-C94HQT issued on January 14, 2022 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 WWTP, 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 Port Dover gravity separate sewers was provided by Norfolk County.

The report covers the period from January 1, 2024 to December 31, 2024.

Sincerely,

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

Cc:
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* Appendices available by request

Introduction:

The Port Dover WWTP is located at 137 Hamilton Plank Road, Ontario (Norfolk County). The plant is a conventional activated sludge plant with a rated capacity of 5,400 m^3/d, and is comprised of the following key components:

Headworks and preliminary treatment facility comprising screening, raw sewage pumping and grit removal; Liquid train comprising three primary clarifiers, two aeration tanks and two secondary clarifiers; Hauled waste receiving facility; Chlorination/dechlorination based disinfection system; Anaerobic digester; and Biosolids storage facility.

Raw Wastewater Collection
There are eight (8) sewage pumping stations (SPS) with seven (7) in the Port Dover collections system and one, SPS #6, Woodhouse, being at the WWTP. The Bridge St pumping station is the largest station in the collection system and receives flow from Nelson St SPS, Lynn St. SPS and Harbour St, SPS as well as the surrounding gravity sewer system. This typically makes up more than 50% of the flow received at the Port Dover WWTP. The WWTP and the pumping stations serve the Town of Port Dover, which has a population of approximately 5,527 people.

Sewage Pumping Stations
The Norfolk County Municipal Wastewater Collection System is made up of five separate wastewater collection systems. The Port Dover wastewater collection system conveys sewage to the Port Dover Wastewater Treatment Facility through a total of 57 kilometres of gravity separate sewers, 3.7 kilometres of forcemains and seven (7) sewage pumping stations in the authorized system and one (1) sewage pumping station located at the Wastewater Treatment Facility that is connected to the authorized system but not a part of the authorized system. For additional information on the individual SPS's listed below, please refer to CLI-ECA #070-W601 Issue #1.

- WW489 – Bridge Street SPS located at 4 Bridge Street in Port Dover, Ontario. Bridge Street SPS is a triplex pumping station equipped with 3 pumps (1 duty, 2 standby), with 19.6 m of total head and a wet well of 166 m^3 capacity. The station is connected to 350 mm diameter forcemain, discharging to a manhole at the intersection of Pansy Street & Erie Street. The station is also equipped with an equalization tank with an emergency storage volume of 2000m^3. There is an Overflow that is located in the man-hole immediately upstream of the wet well and discharges to the Lynn River. Lake Erie is the final receiver.
- WW485 – Donjon Boulevard SPS located at 80 Donjon Boulevard in Port Dover, Ontario. Donjon Boulevard SPS is a duplex pumping station equipped with 2 pumps (1 duty, 1 standby), and a wet well of 22 m^3 capacity. The station is connected to a 200 mm diameter forcemain, discharging to a manhole at the intersection of Hamilton Plank Road & Sommerset Drive. The Overflow is located in the pump station wet well and discharges to the Lynn River. Lake Erie is the final receiver.
- WW490 – Harbour Street SPS located at 40 Harbour Street in Port Dover, Ontario. Harbour Street SPS is a duplex pumping station equipped with 2 pumps (1 duty, 1 standby), and a wet well of 17 m^3 capacity. The station is connected to a 150 mm diameter forcemain, discharging to the Bridge Street Pumping Station at 4 Bridge Street, Port Dover. The Overflow is located in the pump station wet well and discharges to the

Lynn River. Lake Erie is the final receiver.

- WW486 – Lynn Street SPS located at 13 Lynn Street in Port Dover, Ontario. Lynn Street SPS is a duplex pumping station equipped with 2 dry well pumps (1 duty, 1 standby), and a wet well of 4 m^3 capacity. The station is connected to a 200 mm diameter forcemain, discharging to a manhole at the intersection of Lynn Street & Bridge Street.
- WW491 – Nelson Street SPS located at 328 Nelson Street in Port Dover, Ontario. Nelson Street SPS is a triplex pumping station equipped with 3 pumps (1 duty, 2 standby), and a wet well of 80 m^3 capacity. The station is connected to a 300 mm diameter forcemain, discharging to a manhole at the intersection of Main Street and Market Street West. The Overflow is located in the pump station wet well and discharges to the adjacent drainage ditch. Lake Erie is the final receiver.
- WW487 – River Drive SPS located at 8 River Drive in Port Dover, Ontario. River Drive SPS is a duplex pumping station equipped with 2 pumps (1 duty, 1 standby), and a wet well of 23 m^3 capacity. The station is connected to a 200 mm diameter forcemain, discharging to a manhole at the intersection of Pansy Street and Erie Street. The Overflow is located in the pump station wet well and discharges to Lynn River. Lake Erie is the final receiver.
- WW488 – Ryerse Crescent SPS located at 38 Ryerse Crescent in Port Dover, Ontario. Ryerse Crescent SPS is a triplex pumping station equipped with 3 dry well submersible pumps (1 duty, 2 standby), and a wet well of 94 m^3 capacity. The station is connected to a 250 mm diameter forcemain, discharging to a manhole at the end of Scott Drive. The Overflow is located in the pump station wet well and discharges to Lynn River. Lake Erie is the final receiver.

Inlet Works

Traveling Screens

There are two (2) screens controlled by a Milltronics unit in the inlet channels and work on lead and lag set points. The screens are rated for a total of 18,000 m^3/d with screening going to a compactor then to the grit box.

Raw Sewage Pumping

The raw sewage is then pumped from the wet wells via three (3) raw sewage pumps, 2 variable speeds and one fixed speed. The pumps are SCADA controlled with one variable speed pump operating as the duty pump. If the influent flows exceed the capabilities of the variable speed pumps, the fixed speed pump will turn on and take the place of one of the variable speed pumps. The variable speed pumps are rotated weekly however all pumps are exercised routinely to ensure operation. The above sequence can be changed by the SCADA system.

Grit Cyclone

The raw sewage is pumped into the Grit Cyclone, which removes grit from the raw sewage. Grit, which is normally sand, gravel etc., has no “nutritional” value for the activated sludge and harms pumps and other moving mechanisms within a wastewater treatment plant due to its abrasiveness. The cyclone uses a paddle in the tank to keep the velocity in the cyclone constant. Air and water scour are used to separate the grit and the water. Ferrous chloride is added immediately after the grit cyclone for Phosphorous control. The water flows by gravity to the primary clarifier splitter-box and the grit is dumped into a grit box and hauled off to a landfill site.

Primary Clarification

Flows enter the primaries via a splitter box, which has three (3) sluice gate valves to direct flow to the individual primary clarification tanks. Waste activated sludge is also received at the primary splitter box to maintain balanced loadings on all primary clarifiers.

The flow velocity through this tank is very slow allowing heavier solids to settle to the bottom of the tank and lighter material (scum) to float to the surface. The scum is removed by the use of chain drive surface skimmers. The skimmers work two fold, on the up movement the skimmers "push" the scum to the front end of the clarifier and on the down movement they "scrape" the sludge on the bottom of the tank into the sludge collector system. Once the skimmers reach the end of the tank the debris is deposited into a "scum trough" which periodically is manually discharged to the scum pit. The sludge from the primary clarifiers, which can also include waste activated sludge from the secondary (final) clarifiers, is gathered at the bottom of the tank and is pumped to the digester.

Aeration Tanks
The Primary effluent flows into the aeration tanks through a Parshall flume.

The aeration tanks provides air (oxygen) into the wastewater to promote biological activity. Microorganisms live and grow by using the dissolved oxygen and colloidal matter (small solid particles that didn't settle out in the primary clarifier). This in-turn either breaks the waste into simpler compounds or increases the microorganisms' own mass. The microorganisms will clump together to form large particles known as floc, which will settle out later on in the process. This mixture is referred to as "mixed liquor". Oxygen is added to the mixed liquor with the use of mechanical aerators.

There are two (2) mechanical aeration tanks each with two (2) cells for a total of four (4) mechanical mixers. At present the Dissolved Oxygen (DO) is measured manually and the motor speeds are adjusted on SCADA to maintain a dissolved oxygen concentration of 2.0 mg/L.

Secondary Clarification
From the Aeration Tanks the mixed liquor discharges into the secondary/final clarifiers. The clarifiers are circular tanks, 17 m (56') in diameter and 4.3 m (14.11') in depth. The purpose of secondary clarifiers is to settle out any remaining solids from the effluent by gravity. As in primary clarification, the settled sludge is collected at the bottom of the tank and pumped back to the aeration basins as Return Activated Sludge. A portion of the RAS is sent to the primary clarifiers as Waste Activated Sludge, which helps maintain the concentration of microorganisms at the desired level in the secondary treatment process. The clarifiers have a gear drive on the "flights" which act as both skimmers and sludge collectors. The effluent from both of these clarifiers is discharged into the common disinfection contact chamber channel.

Disinfection Phase
Chlorine Contact Chamber
The disinfection contact chamber is a baffled tank with chlorine (sodium hypochlorite) being used as the disinfectant. There is one (1) sodium hypochlorite chemical feed pump. Chlorine was injected at the head of the contact chamber but was changed in April 2022 as part of the interim works identified in the ECA to the outlet of the secondary clarifier to increase the contact time.

Dechlorination

Dechlorination utilizing Sodium Bisulphite was completed and operational on March 1, 2022 as part of the interim works identified in the ECA. A temporary building was constructed near the contact chamber to house the chemical and two (1 duty, 1 standby) sodium bisulphite chemical feed pumps. Sodium Bisulphite is injected at the outfall of the contact chamber prior to the discharge pipe.

Sludge Management System

Sludge Handling

The digester is an egg shaped tank approximately 18 m (59') high with a diameter of 8.5 m (28') with an approximate volume of 660 m^3 with two (2) recirculation pumps and a central draft tube to provide mixing. It also has a gas collection system, boiler, heat exchanger and gas flare. The raw sludge which is a mix of primary and waste activated sludge is pumped to the digester. The digester is anaerobic meaning that the microorganisms do not require air.

Anaerobic bacteria (those living in the absence of oxygen) break down the solids in the sludge to form simpler compounds and gases. One of these gases is methane, which is a valuable fuel. The methane gas, which is produced, is explosive when mixed with air, so special operating precautions have to be taken. The methane gas is collected and stored in a storage tank and used to heat the boiler. The digested sludge is spread on land during the summer months and stored on site during the winter.

Standby Power

The emergency power for the facility is supplied by 100kW generator powered by a 140HP diesel engine. The fuel storage tank is 900L, allowing for a 30-hour emergency power supply with a full tank of fuel. The generator is sized and connected to provide partial power to the plant. Operational staff determine what equipment needs to run during a power failure to maintain plant operation.

Port Dover WWTP Facts:

Environmental Compliance Approval:	ECA 7884-C94HQT (issued January 14, 2022)
Rated Capacity:	5,400m3/day
Receiving Water:	Lake Erie

For 2024, the Port Dover WWTP was operated in accordance with provincial regulations as required in ECA #7884-C94HQT. The following report is presented such that it corresponds with ECA #7884-C94HQT Section 11(4) (a) through (n) and satisfies the requirements for the sewage pumping stations and the Port Dover linear infrastructure in CLI-ECA #070-W601 Issue #1 dated July 27, 2022.

Section A: Influent Monitoring Data

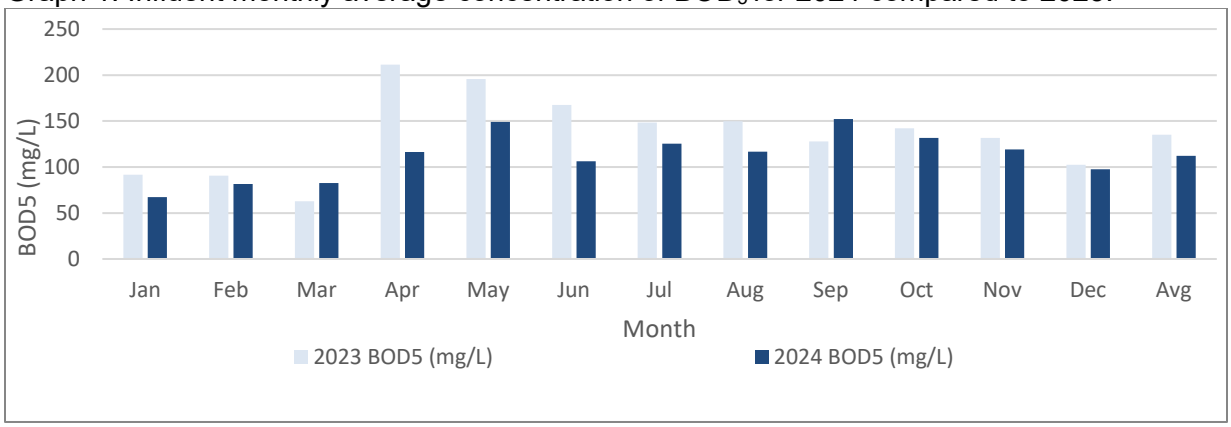
In accordance with ECA 7884-C94HQT issued January 14, 2022 Section 11(4)(a),the following is a summary and interpretation of all influent and imported sewage monitoring data and a review of the historical trend of the sewage characteristics.

(I) Influent Data

The raw wastewater (influent) is monitored for BOD_5, total suspended solids (TSS), total phosphorus (TP) and total kjeldahl nitrogen (TKN), pH and alkalinity at a minimum on a weekly basis by composite sample. Refer to Appendix A for more detailed monthly results.

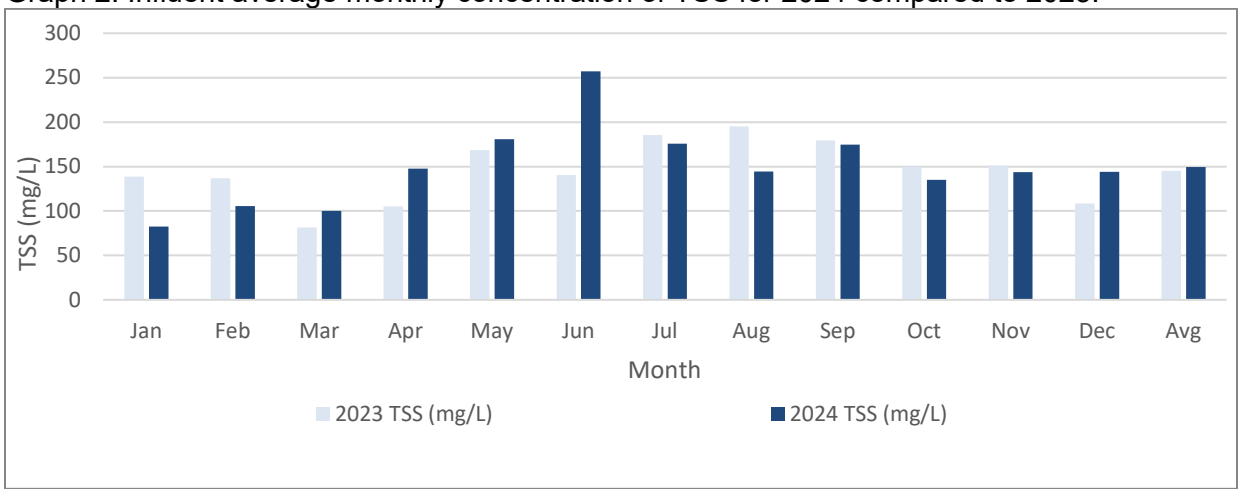
The annual average influent BOD_5 concentration to the plant in 2024 was 112.2mg/L. This is a decrease from 2023 by 20.5%. Refer to Graph 1 for a comparison of the monthly concentrations for 2024 to 2023.

Graph 1. Influent monthly average concentration of BOD_5 for 2024 compared to 2023.



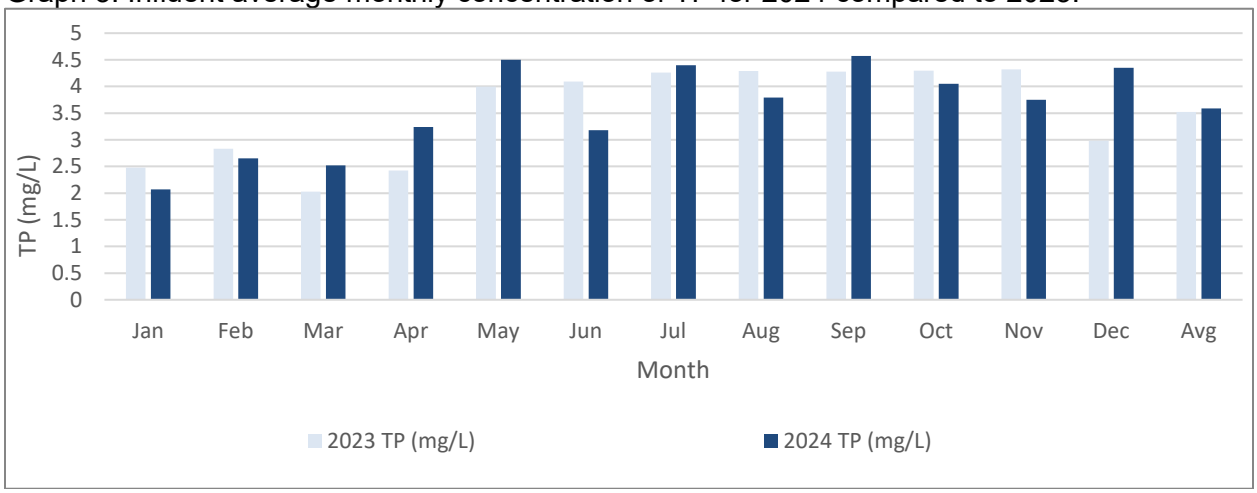
The annual average influent total suspended solids (TSS) concentration to the plant in 2024 was 149.3mg/L. This is an increase from 2023 by 2.8%. Refer to Graph 2 for a comparison of the monthly concentrations for 2024 to 2023.

Graph 2. Influent average monthly concentration of TSS for 2024 compared to 2023.



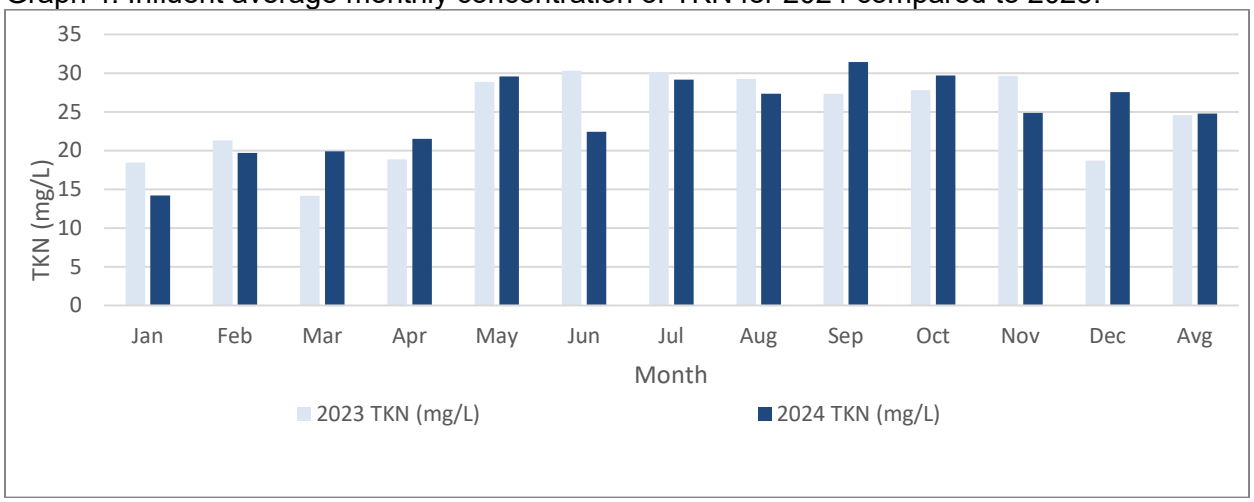
The annual average influent total phosphorus (TP) concentration to the plant in 2024 was 3.59mg/L. This is an increase from 2023 by 1.8%. Refer to Graph 3 for a comparison of monthly concentrations for 2024 to 2023.

Graph 3. Influent average monthly concentration of TP for 2024 compared to 2023.



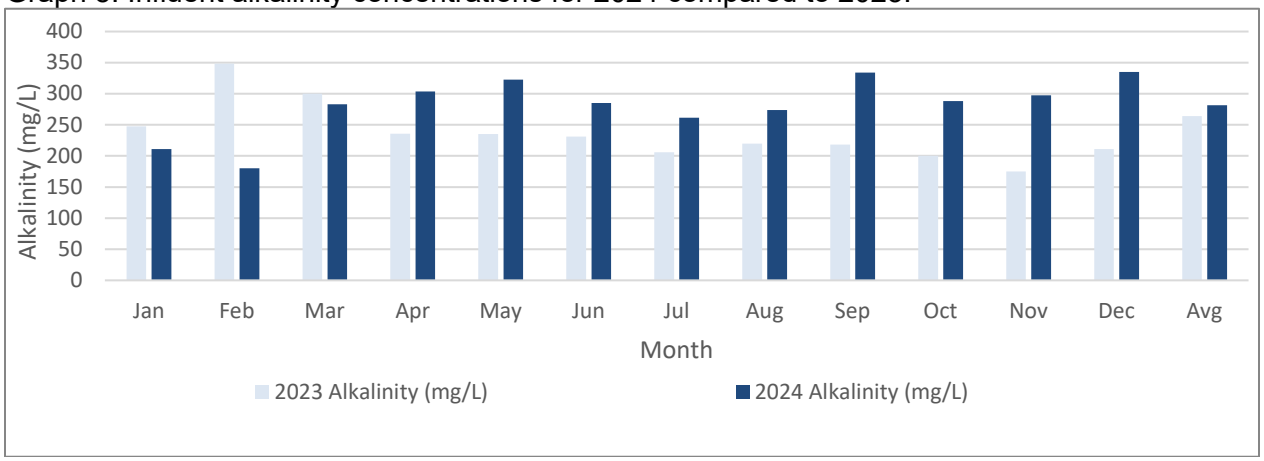
The annual average influent total kjeldahl nitrogen (TKN) concentration to the plant in 2024 was 24.8mg/L. This is an increase from 2023 by less than 1.0%. Refer to Graph 4 for a comparison of monthly concentrations for 2024 to 2023.

Graph 4. Influent average monthly concentration of TKN for 2024 compared to 2023.



The annual average influent alkalinity concentration to the plant in 2024 was 281mg/L. This is an increase from 2023 by 6.1%. Refer to Graph 5 for a comparison of monthly concentrations for 2024 to 2023.

Graph 5. Influent alkalinity concentrations for 2024 compared to 2023.



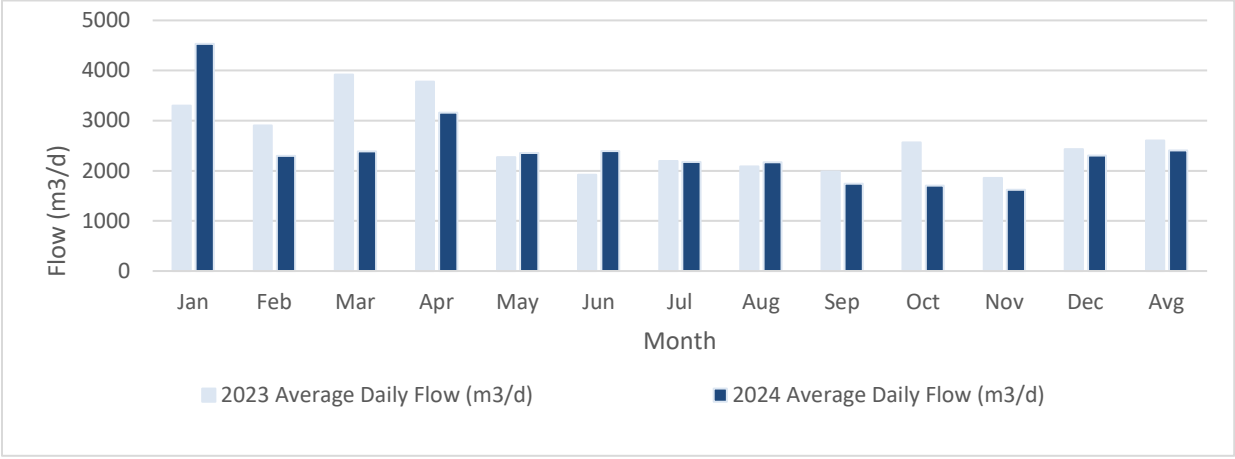
The influent characteristics have fluctuated marginally throughout the year. This is to be expected with the flow variations that are experienced at the Port Dover WWTP.

(II) Sewage Pumping Stations Monitoring Data

As per the CLI-ECA Schedule E Condition 4.6.3, a summary and interpretation of monitoring data for the SPS's is included below. There are flow meters located at the Bridge Street SPS and the Ryerse Cres. SPS. The following graphs show the flow trends from these stations for 2024 compared to 2023.

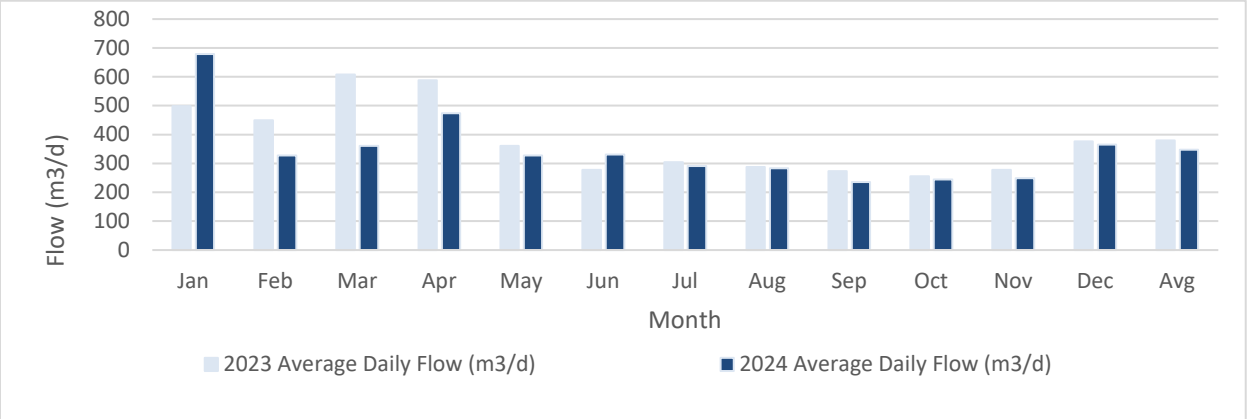
The average daily flow through the Bridge Street SPS in 2024 was 2,404m^3/d. The total flow for 2024 was 880,734m^3/d which is a decrease of 7.2% when compared to the total flow of 949,264m^3/d in 2023. The following Graph 6 shows a comparison of the average daily flows per month for 2024 and 2023.

Graph 6. Bridge Street SPS daily flows in 2024 compared to 2023.



The average daily flow through the Ryerse Cres. SPS in 2024 was 347m^3/d. The total flow for 2024 was 127,298m^3/d which is a decrease of 8.1% when compared to the total flow of 138,494m^3/d in 2023. The following Graph 7 shows a comparison of the average daily flows per month for 2024 and 2023.

Graph 7. Ryerse Cres. SPS daily flows in 2024 compared to 2023.



On May 30, 2024, four (4) additional flow meters were installed in the collection system. Flow meters are now installed at Donjon Blvd. SPS, Harbour St. SPS, Nelson Street SPS and River Drive SPS. . The average daily flow for 2024 has been tabulated below in Table 1. The following Table 2, shows the total pump run time hours for the Woodhouse and Lynn Street sewage pumping station in 2024 compared to 2023 as there are no flow meters at these stations, to date.

There is no additional monitoring data that required interpretation or conclusions for the Port Dover sewage pumping stations in 2024. There is no need for future modifications to the sewage pumping stations at this time.

Table 1. Average Daily Flow for the Port Dover SPS's in 2024

	Bridge Street (m^3/day)	**Ryerse Cres (m^3/day)**	**Donjon Blvd (m^3/day)**	**Harbour Street (m^3/day)**	**Nelson Street (m^3/day)**	**River Drive (m^3/day)**
January	4,535	679	-	-	-	-
February	2,299	328	-	-	-	-
March	2,385	361	-	-	-	-
April	3,161	474	-	-	-	-
May	2,356	327	-	-	-	-
June	2,396	331	225	46	952	185
July	2,175	291	212	66	898	167
August	2,172	283	212	66	915	161
September	1,745	236	176	53	750	116
October	1,703	244	178	43	690	120
November	1,618	249	215	36	620	147
December	2,303	365	233	34	800	218
Average	**2,404**	**347**	**207**	**49**	**804**	**159**

Table 2. Total Pump Run Hours for the Woodhouse and Lynn Street SPS's in 2024 compared to 2023.

Sewage Pumping Station (SPS)	Total Hours 2023 (hours)	Total Hours 2024 (hours)	Percent Change (%)
Lynn Street	84.40	12.8	-84.8%
Woodhouse	776.20	770.54	0.7%

(III) Imported Sewage (Septage) Monitoring

As required by the ECA, imported sewage (septage) is sampled on a weekly 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 Port Dover WWTP in which flow rates would be captured once completed. In 2024, it is estimated (based on?)that the Port Dover WWTP received a total of 6,425.05m^3 as broken down in Table 3 below.

Table 3. Total Volume of Imported Sewage to the Port Dover WWTP in 2024

Month	Holding Volume (m^3)	Septic Volume (m^3)	Portable Waste Volume (m^3)
January	584.00	3.8	-
February	604.10	-	-
March	621.90	-	-
April	853.90	-	0.2
May	568.13	-	-
June	457.61	-	2.27
July	478.42	5.68	2.74
August	531.79	-	5.58
September	255.87	3.03	0.76
October	382.66	0.57	-
November	476.91	0.57	-
December	609.76	-	-
Total	**6,425.05**	**13.64**	**11.58**

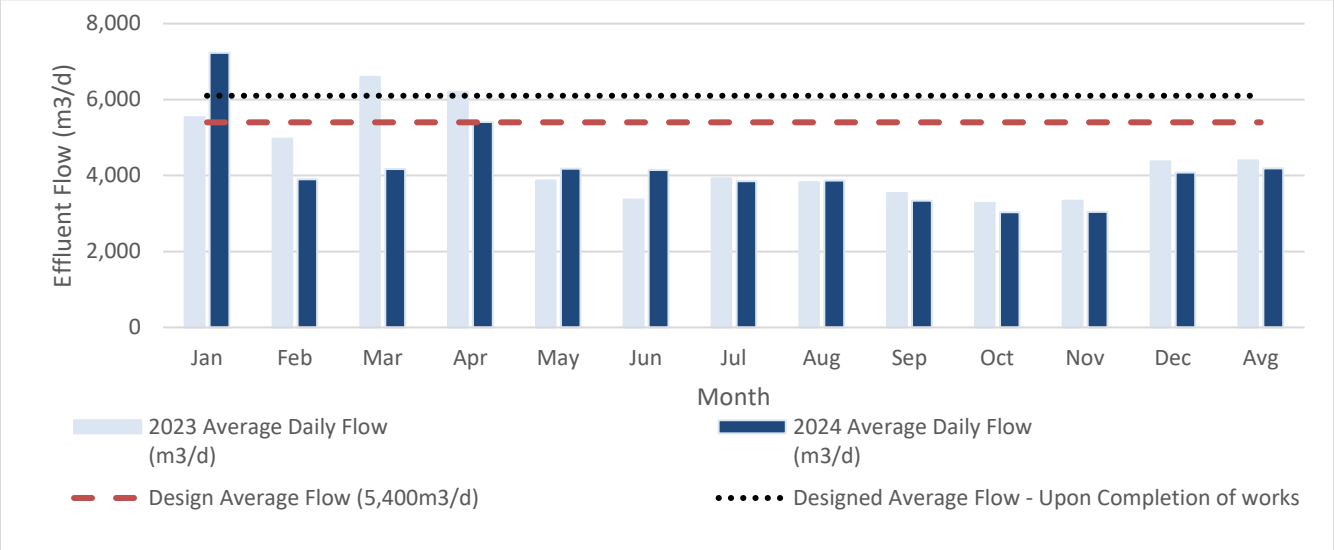
Section B: Effluent Monitoring Data

In accordance with ECA #7884-C94HQT 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. The completion of construction of the proposed works was not concluded in 2024 and therefore all monitoring data is compared against "prior to completion of construction" objectives and limits. Detailed monitoring data is supplied in Appendix A.

(I) Effluent Flow Monitoring

The average daily flow of the effluent wastewater discharging from the Port Dover WWTP was 4,186m^3/d in 2024 which is 77.5% of the rated capacity of 5,400m^3/d. The 2024 average daily flow has decreased when compared to the 2023 average daily flow of 4,401m^3/d. The following Graph 8 shows a comparison of the average daily flows per month for 2024 and 2023 compared to the rated capacity of the facility.

Graph 8. Average monthly effluent flows for 2024 compared to 2023



There were several instances where the daily flow exceeded the rated capacity. Refer to Table 4 for a summary of the rated capacity exceedances. Compliance with the Section 6. Design Objectives is assessed based on the annual average daily influent flow, which was within the rated capacity for the reporting period.

Table 4. Daily flow readings and ranges above the rated capacity of 5,400m^3/d in 2024.

Month	# of Exceedances	Flow Range (m^3/day)
January	16	5,476.15-17,174.87
February	2	5,664.96-6,437.48
March	1	5,765.23
April	9	5,902.04-13,345.65
May	2	5,651.86-8,618.86
June	3	5,858.31-6,502.66
July	-	-
August	1	5,413.28
September	1	9,785.19
October	-	-
November	-	-
December	3	6,758.28-9,694.50
TOTAL	**38**	**5,413.28-17,174.87**

(II) Effluent Data Monitoring

The final effluent is sampled on a weekly basis and tested for $cBOD_5$, total suspended solids

(TSS), total phosphorus (TP) and total ammonia (TAN), total kjeldahl nitrogen (TKN), nitrate as nitrogen, and nitrite as nitrogen as a composite sample. A grab sample is collected weekly and tested for E. coli. A grab sample is also collected daily (during normal operating hours) and tested for pH, temperature, dissolved oxygen (DO), total residual chlorine (TRC), and TRC post dechlorination. Unionized ammonia is calculated using the weekly laboratory TAN value with the corresponding in house pH and temperature results obtained at the time of sampling for TAN. Detailed results are found in Appendix A. Table 5, 6 and 7 below show the monthly average effluent results from the composite samples, the effluent results from the grab samples and a comparison to the loadings limits respectively.

Table 5. Monthly average effluent ranges for 2024 obtained from weekly composite sampling.

Month	$cBOD_5$ (mg/l)	TSS (mg/l)	TP (mg/l)	TAN (mg/l)	NO_2 (mg/l)	NO_3 (mg/l)	TKN (mg/l)
January	2.0	2.8	0.33	3.02	0.89	7.07	4.23
February	2.1	2.7	0.50	3.27	0.88	11.92	4.80
March	2.6	3.3	0.56	3.01	0.93	11.95	4.85
April	2.0	2.8	0.58	5.89	1.24	7.60	7.33
May	2.3	3.8	0.59	7.93	1.54	6.30	9.30
June	2.7	3.5	0.52	4.68	1.58	8.99	6.25
July	2.3	3.8	0.65	6.93	2.47	5.31	8.35
August	2.0	2.2	0.54	6.03	2.76	7.28	7.28
September	2.0	2.8	0.53	4.24	2.07	9.90	5.45
October	2.2	2.6	0.67	7.58	1.34	6.91	9.02
November	2.0	2.3	0.78	5.30	1.67	11.90	6.55
December	2.0	2.3	0.30	2.21	1.26	13.30	3.70
Average	**2.2**	**2.9**	**0.55**	**5.01**	**1.55**	**9.04**	**6.43**
Objective	15.0	15.0	0.80	n/a	n/a	n/a	n/a
Limit	25.0	25.0	1.0	n/a	n/a	n/a	n/a

Table 6. Effluent results for 2024 obtained from weekly grab samples.

Month	*E.coli (cfu/100mL)	pH (min-max)	Dissolved Oxygen (mg/l)	TRC post dechlor. (min-max) (mg/l)	Temperature (°C)	Unionized Ammonia (mg/l)**
January	102.0	7.06-7.62	3.03	0.00-0.02	9.8	0.0102
February	6.0	6.86-7.56	3.53	0.00-0.02	9.8	0.0086
March	30.9	6.91-7.43	2.89	0.00-0.02	10.6	0.0097
April	266.5	7.11-7.86	2.23	0.00-0.02	12.3	0.0291
May	155.1	7.16-7.72	2.63	0.00-0.02	16.0	0.0597
June	21.4	7.08-7.32	2.34	0.00-0.02	18.0	0.0332
July	35.1	7.28-7.84	2.13	0.00-0.02	20.1	0.0825
August	32.0	7.03-7.89	2.21	0.00-0.02	19.8	0.0641
September	11.1	7.16-7.84	2.30	0.00-0.02	18.8	0.0514
October	6.2	7.25-7.69	2.37	0.00-0.02	16.3	0.0700
November	25.6	7.13-7.67	2.74	0.00-0.02	14.1	0.0314
December	40.2	7.14-7.75	2.47	0.00-0.02	11.1	0.0115
Average	**32.4**	**6.86-7.89**	**2.57**	**0.00-0.02**	**14.7**	**0.0385**
Objective	100	6.5-8.5	n/a	Non-Detect	n/a	n/a
Limit	n/a	6.0-9.5	n/a	0.02	n/a	n/a

*Geometric Mean
**As calculated

Table 7. Monthly average effluent loading results for 2024

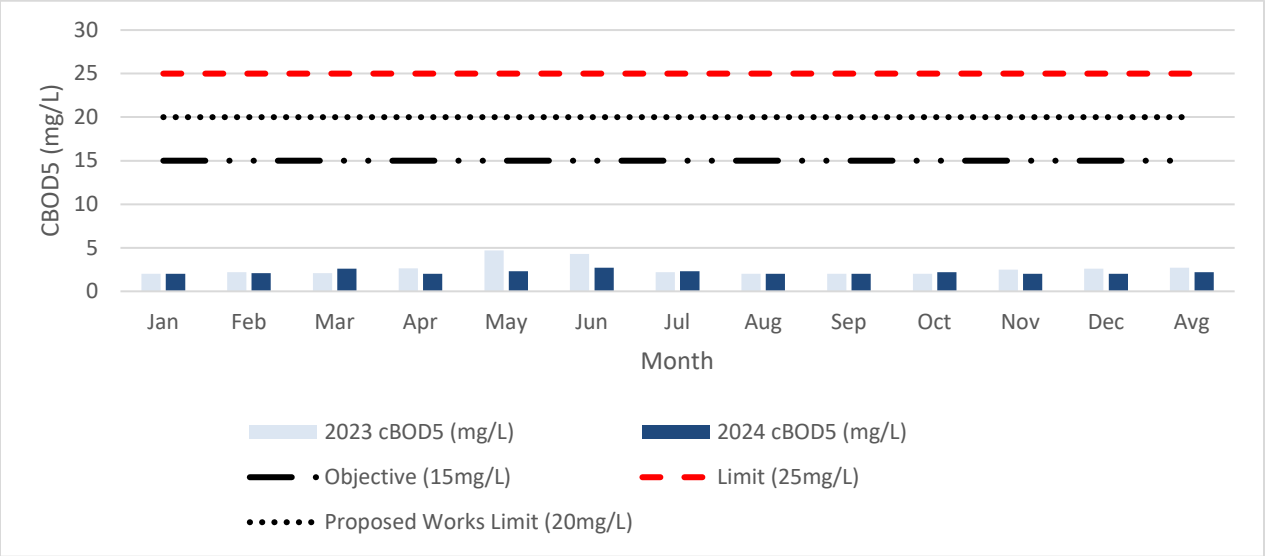
Month	cBOD5 (kg/d)	TSS (kg/d)	TP (kg/d)
January	14.45	20.23	2.38
February	8.20	10.15	1.95
March	10.85	13.77	2.34
April	10.82	14.88	3.14
May	9.61	15.88	2.47
June	11.19	14.51	2.16
July	8.85	14.43	2.50
August	7.73	8.50	2.09
September	6.68	9.19	1.77
October	6.67	7.88	2.03
November	6.08	6.84	2.37
December	8.15	9.37	1.22
Average	**9.11**	**12.14**	**2.20**
Limit	135.0	135.0	5.4

(III) Comparison to Compliance Limits and Objectives

The annual average concentration for effluent $cBOD_5$ in 2024 was 2.2mg/L; this value has decreased by 24.7% when compared to 2023. The annual average loading of $cBOD_5$ was 9.11kg/d. The effluent objective and the concentration and loading limits for $cBOD_5$ were not

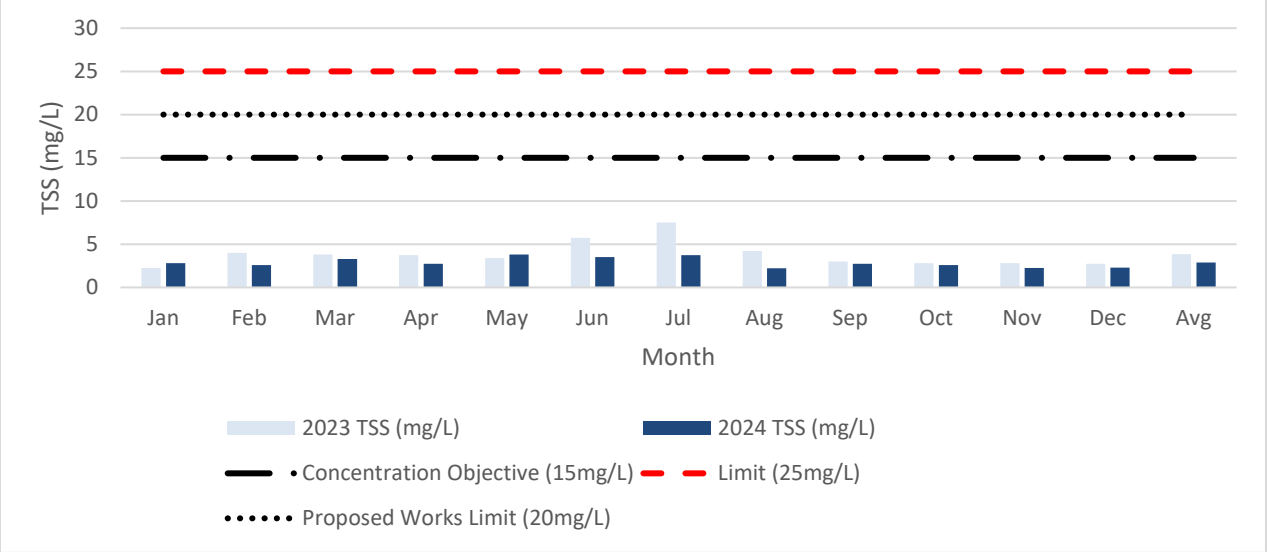
exceeded in 2024. Refer to Graph 9 for a comparison of effluent monthly average concentration of $cBOD_5$.

Graph 9. The effluent monthly average concentration of $cBOD_5$ in 2024 compared to 2023



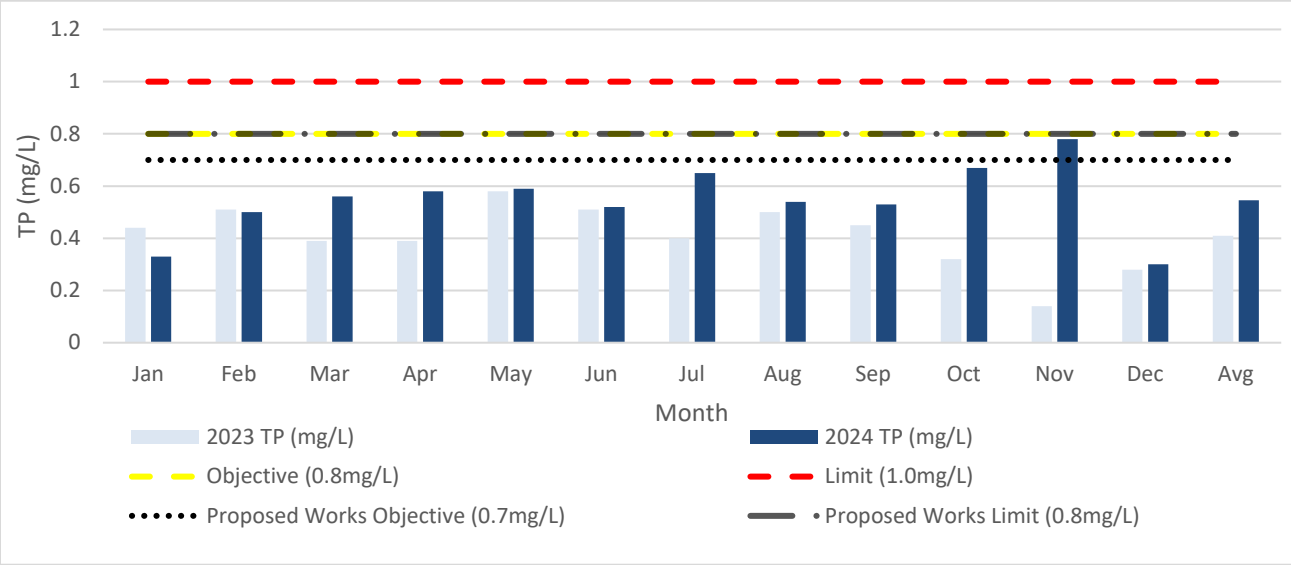
The annual average concentration for effluent TSS in 2024 was 2.9mg/L; this value has decreased by 32.9% from the annual average in 2023.The annual loading of TSS was 12.14kg/d. The effluent objective and the concentration and loading limits for TSS were not exceeded in 2024. Refer to Graph 10 for the effluent monthly average concentration of TSS.

Graph 10. The effluent monthly average concentration of TSS in 2024 compared to 2023.



The annual average concentration for effluent TP in 2024 was 0.55mg/L; this value has increased by 25.0% from the annual average in 2023. The annual loading of TP was 2.20kg/d. The effluent objective and concentration and loading limit for TP were not exceeded in 2024. Refer to Graph 11 for a comparison of the effluent monthly average concentration of TP.

Graph 11. The effluent monthly average concentration of TP in 2024 compared to 2023.

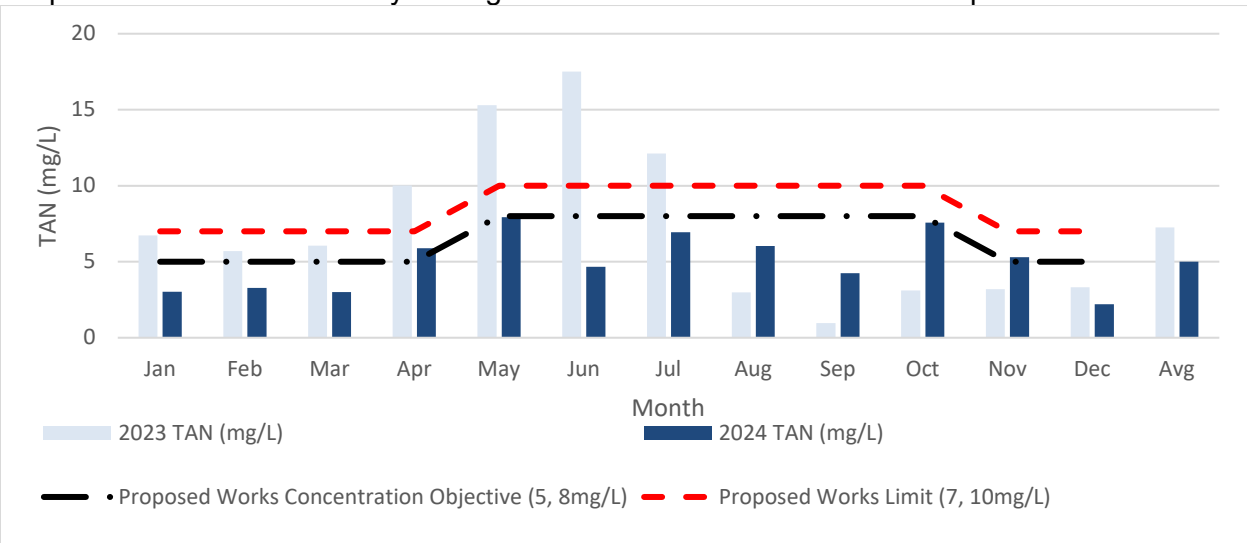


The annual average concentration for effluent Total Ammonia Nitrogen (TAN) in 2024 was 5.01mg/L. The annual loading of TAN was 20.3kg/d. There are currently no limits or objectives for TAN prior to construction of the proposed works. The proposed limits and objectives (upon completion of all proposed works) for TAN vary based on the freezing period:

- November 1st to April 30th - the objective is 5.0mg/L and the limit is 7.0mg/L.
- May 1st to October 31th - the objective is 8.0mg/L and the limit is 10.0mg/L.

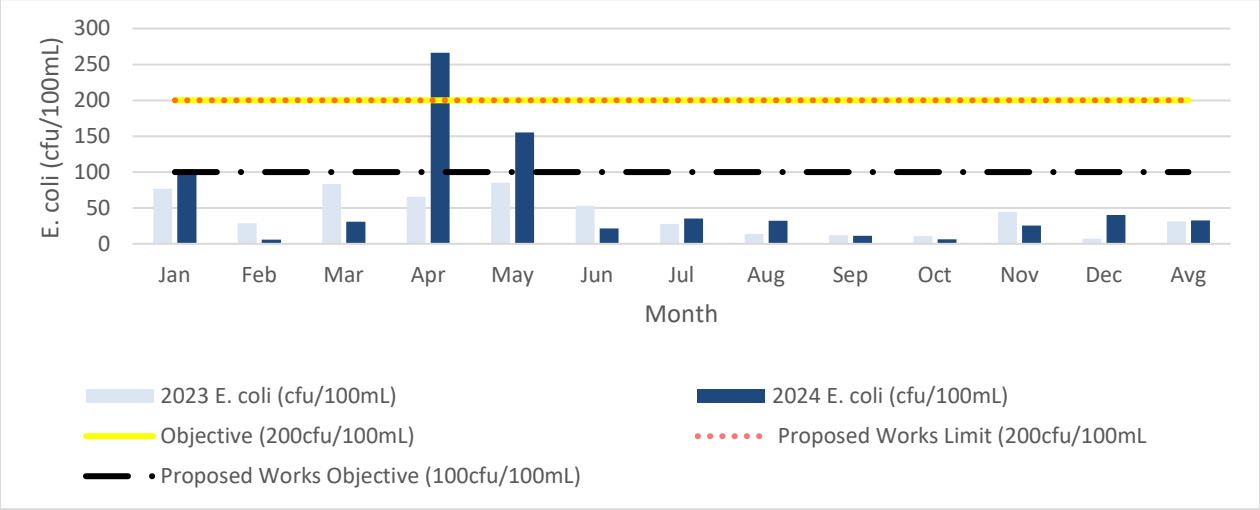
Once the proposed works are completed, the TAN concentrations will have to be monitored to ensure compliance of these limits and objectives. As shown in Graph 12 below, there were significant improvements in the TAN concentrations in 2024 compared to 2023 as a result of consistent operational control of dissolved oxygen and solids monitoring within the aeration basins. Refer to Graph 12 for the effluent monthly average concentrations of TAN for 2024 and 2023.

Graph 12. The effluent monthly average concentration of TAN in 2024 compared to 2023.



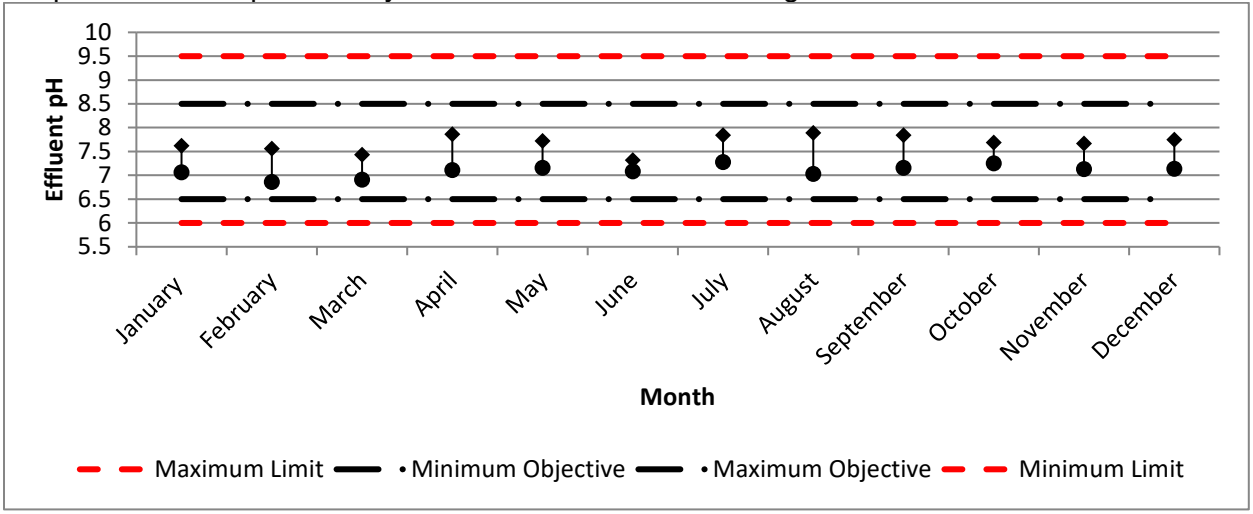
The annual geometric mean for effluent E.coli in 2024 was 32.4cfu/100mL; this value has decreased by 3.1% from the annual geometric mean in 2023. There is no limit for E.coli specified in the ECA. The objective is 200cfu/100mL.In 2024, there was one (1) objective exceedance as discussed below in in ***Section F: Objective Exceedances & Best Efforts***. Refer to Graph 13 for the effluent geometric mean (geomean) for effluent E.coli for 2024 and 2023.

Graph 13. The effluent monthly geomean concentration of E.coli in 2024 compared to 2023.



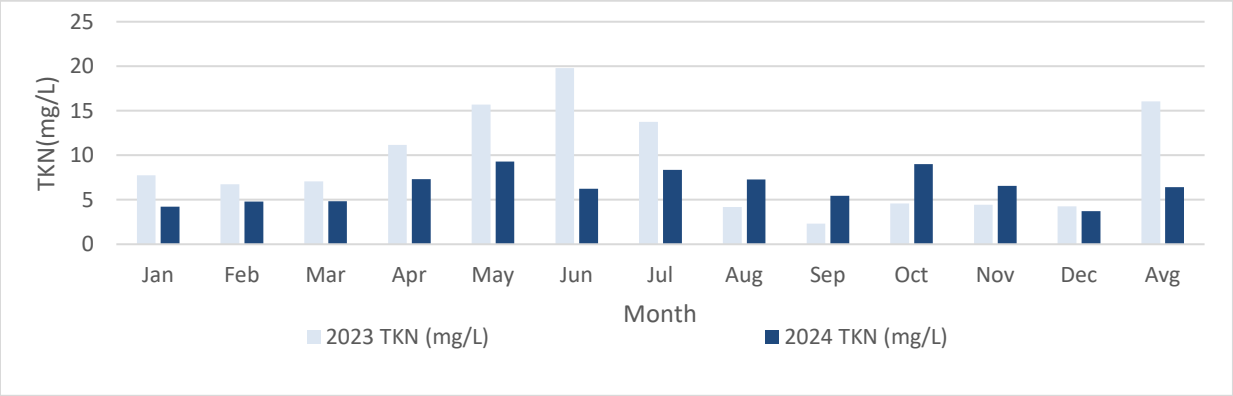
The effluent pH is monitored daily, during working hours, at a minimum at the Port Dover WWTP. Overall, the plant has provided effective treatment as there have been no results below or above the compliance objectives or limits of 6.5-9.0 and 6.0-9.5 respectively in 2024. The pH is required to be maintained between 6.0-9.5 at all times. Refer to Graph 14 for the monthly minimum and maximum pH readings.

Graph 14. Effluent pH monthly minimum to maximum readings for 2024.



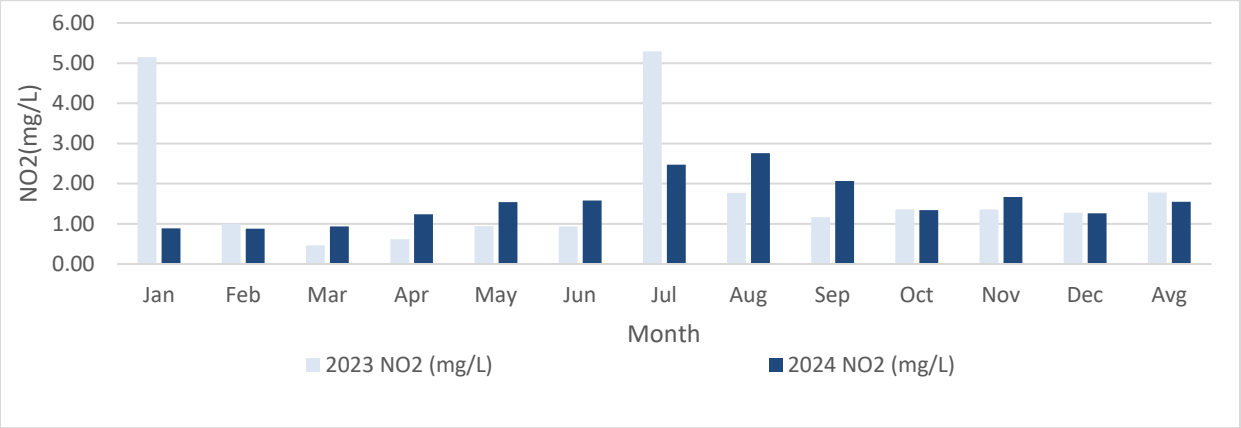
The annual average concentration for effluent TKN in 2024 was 6.42mg/L. There are no limits or objectives for TKN. Refer to Graph 15 for the monthly TKN concentrations for 2024 and 2023

Graph 15. The effluent monthly average concentration of TKN for 2024 and 2023.

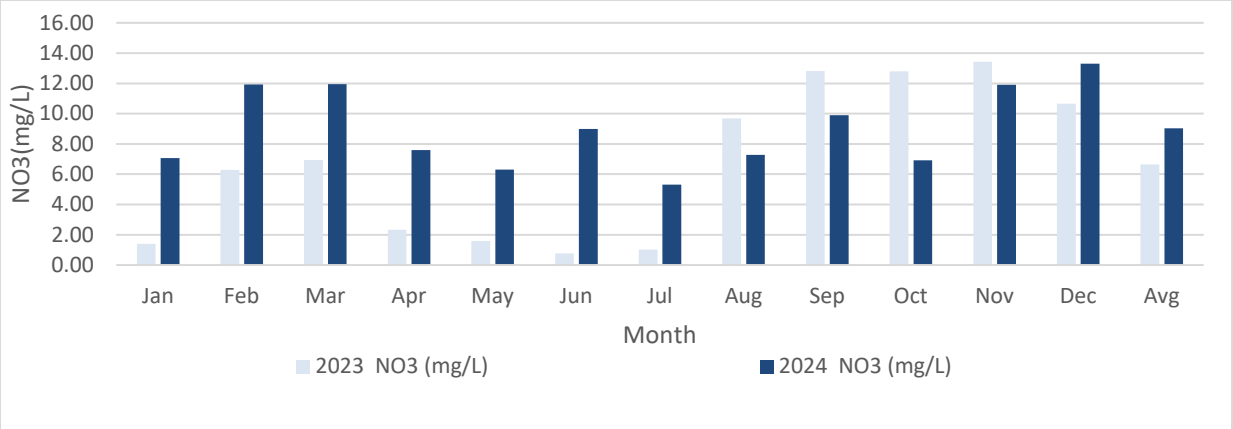


The annual average concentration for effluent NO_2 was 1.55mg/L and the annual average concentration for effluent NO_3 was 9.04mg/L in 2024. There are no limits or objectives for NO_2 and NO_3. Refer to Graphs 16 and 17 for the NO_2 and NO_3 comparison for 2024 and 2023.

Graph 16. The effluent monthly average concentration of NO_2 in 2024 compared to 2023.



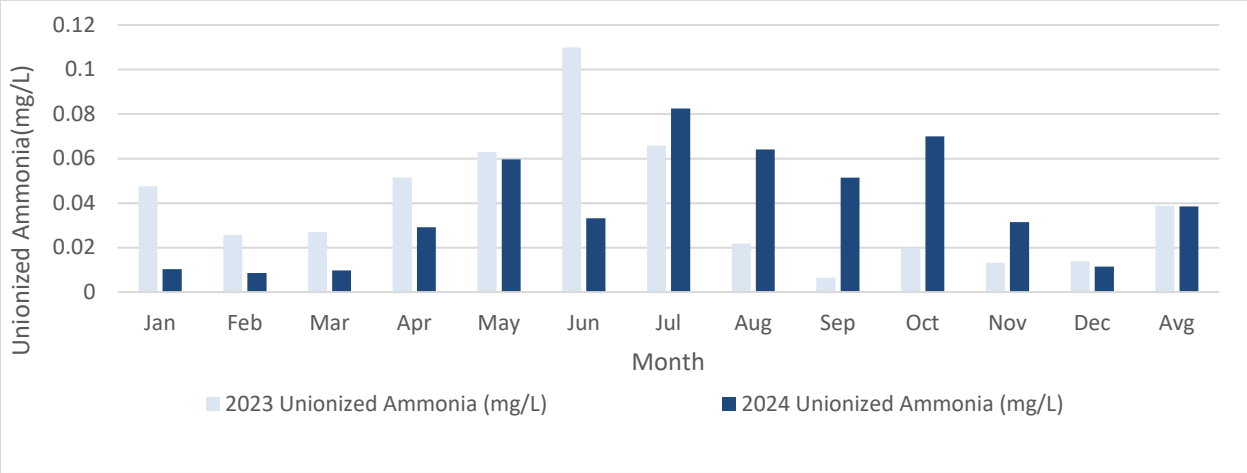
Graph 17. The effluent monthly average concentration of NO_3 in 2024 compared to 2023.



The annual average effluent concentration of unionized ammonia (as calculated) was 0.04mg/L

in 2024. There is no limit or objective specified for unionized ammonia in the ECA however, the Provincial Water Quality Objective is 0.02 mg/L

Graph 18. The effluent monthly average unionized ammonia in 2024 compared to 2023.



The Port Dover WWTP performed well in 2024 producing quality effluent meeting all compliance limits for all required parameters with only one (1) objective exceedance for Ecoli. As specified in the ECA, objectives are based on monthly average effluent concentrations. Refer below to Table 9 for a summary of objectives compared against the effluent results ranges.

Section C: Operating Problems and Corrective Actions

Operating problems experienced at the Port Dover WWTP coincide with problems within the Port Dover collection system. The collection system is experiencing inflow and infiltration issues during rain and snow melt events which results in rated capacity exceedances at the treatment plant. In 2024, there were thirty-eight (38) days where the daily flow rate exceeded the rated capacity of the plant, and two (2) overflow events at the Port Dover WWTP as well as at the Bridge Street SPS as discussed below in **Section J(a): By-pass, Spill or Abnormal Discharge Events.** Upon completion of construction of all proposed Works, the Port Dover WWTP's rated capacity will be increased. As part of the CLI-ECA issued for the collections system, Norfolk County has retained Civica Infrastructure Inc. to complete a County wide Inflow and Infiltration reduction study over a five (5) year period between 2024 and 2029 See Appendix B for the Civica Work Plan. (Additional details provided in **Section J(b): Summary of efforts to reduce CSOs, Spills, STP Overflows, STP Bypasses.)**

As required by the Environment Canada Wastewater System Effluent Regulations (WSER), acute lethality samples are required on a quarterly basis until four (4) consecutive samples pass (<50% mortality), then sampling can move to an annual basis. At the end of 2023 and into 2024, the Port Dover WWTP collected the required acute lethality samples achieving four (4) consecutive quarterly samples as specified in the WSER and moved to the annual sampling requirement. The quarterly sample dates were as follows: October 11, 2023, December 14, 2023, February 15, 2024 and April 5, 2024. The first annual sample was collected October 17, 2024.

As per the CLI-ECA Schedule E Condition 4.6.4, there were no plugged sewer events in the

collection system (gravity separate sewers) for 2024.

Section D: Maintenance Activities

Regular scheduled monthly preventative maintenance for the Port Dover WWTP and 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 C* for preventative maintenance schedule. Norfolk County's preventative maintenance of the 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 2024 are as follows:

Table 8. Major Maintenance Completed at the Port Dover WWTP in 2024

Date	Maintenance Activities
January 11	Contractors cleared drain, catch basin and raw sludge lines
January 12	Overflow flow meter re-calibrated by third party
January 25	Electrical Contractor repaired 3 explosion proof emergency lights
February 13	Contractor replaced leaking backflow preventer
February 15	Contractor onsite to clear digester lines
March 7	New sump pump installed by operations
March 21	Contractor completed a wet well clean out
April 29	Gas system calibrated by third party
May 6	Operations replaced sludge loading pump with spare
May 7	Flow meters calibrated by third party
May 14	Generator serviced by third party
May 16	Contractor installed new sludge loading pump in raw sewage dry well
May 30	Contractor replaced valve on methane boiler
June 10	Electrical contractor installed overloads for the spare sludge loading pump
July 15	Contractor installed new flame amplifier on waste gas flare
August 21	Contractor repaired a controlled fuel leak on plant generator
September 5	Contractor repaired grit dumpster
October 31	Contractor completed wet well clean out at Woodhouse SPS
December 4	Electrical contractor tested all heat tracing within the plant
December 6	Backflow preventers serviced and inspected by third party
December 10	ESA completed annual inspection

Table 9. Major Maintenance Completed at Donjon SPS

Date	Maintenance Activities
March 28	Generator serviced by third party
April 22	Contractor installed flow meter – commissioned in May
October 9	Water pump replaced with new

Table 10. Major Maintenance Completed at Harbour Street SPS

Date	Maintenance Activities
March 27	Contractor installed flow meter – commissioned in May
April 11	Low level float in wet well replaced with new
May 28	Generator serviced by third party
June 4	Generator serviced by third party

Table 11. Major Maintenance Completed at Lynn Street SPS

Date	Maintenance Activities
July 11	Operations replaced transducer head
October 31	Contractor completed wet well clean out

Table 11. Major Maintenance Completed at Bridge Street SPS

Date	Maintenance Activities
May 1	Generator serviced by third party
May 7	Flow meter calibrated by third party
May 13	Electrical Contractor repaired broken wire connection at reading device
June 4	Contractor replaced a capacitor in the VFD
October 31	Contractor completed wet well clean out

Table 12. Major Maintenance Completed at Nelson Street SPS

Date	Maintenance Activities
April 22	Contractor installed flow meter – commissioned in May
May 21	Generator serviced by third party

Table 13. Major Maintenance Completed at Ryerse Cres SPS

Date	Maintenance Activities
April 26	Backflow preventer inspected by third party
May 7	Flow meter calibrated by third party
December 20	Contractor completed wet well clean out

Table 14. Major Maintenance Completed at River Drive SPS

Date	Maintenance Activities
March 25	Contractor installed flow meter – commissioned in May
May 13	Generator serviced by third party

Section E: Effluent Quality 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 and Maintenance on Effluent Monitoring Equipment

The Port Dover WWTP does not have an influent meter installed and utilizes the effluent flow

meter for the purpose of estimating influent flows. The effluent flow meter was calibrated by JBF Controls Ltd. on May 7, 2024. In house meters for pH and dissolved oxygen were calibrated by JBF Controls Ltd on October 17, 2024 as per manufacturer's instructions.

As per the CLI-ECA Schedule E Condition 4.6.5 –Bridge Street SPS and Ryerse Cres. SPS have flow meters that require calibrations which were completed on May 7, 2024 by JBF Controls Ltd.. The following SPS's had flowmeters installed, with the accompanying factory calibration records, in May of 2024 and have been included on an annual workorder for all future calibrations; DonJon SPS, River Drive SPS, Harbour Street SPS and Nelson Street SPS.

Section G: Objective Exceedances & Best Efforts

As per Tables 15 & 16 below, the Port Dover WWTP produced quality effluent meeting all effluent objectives except one (1) in the reporting period. In April, 2024 the effluent objective for E.coli was not met. In order to ensure compliance, the operators continue to closely monitor the treatment process and utilize best operating practices.

Table 15. Effluent 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 Loading Exceedances
$cBOD_5$	15.0	2.0-2.7	0	135.0	6.08-14.45	0
TSS	15.0	2.2-3.8	0	135.0	6.84-20.23	0
TP	0.80	0.3-0.78	0	5.4	1.22-3.14	0
E. coli. (cfu/100mL)	200	6.03-226.5	1	n/a	n/a	n/a
pH*	6.5 – 9.0	6.86-7.89	0	n/a	n/a	n/a

Table 16. Objective exceedances in 2024.

Date	Parameter	Concentration 200cfu/100mL	Loadings kg/d	Issue and Proactive Actions Taken
04/2024	Ecoli	226.5	n/a	Cleaned contact chamber and increase sodium hypochlorite dose

Section H: Sludge Handling and Generated

Sludge sampling results can be found in Appendix D. Sludge is removed from the Port Dover WWTP and taken to field for land application. The total volume generated in 2024 was 3,384m^3, refer to Table 17 below for the sludge disposal locations in 2024.

It is expected that sludge generation and disposal in 2025 will be similar to 2024 with approximately 3,300m^3 being required to be removed from the Port Dover WWTP.

Table 17. Port Dover WWTP Sludge Disposal Locations 2024.

Site	NASM#	Volume (m3)	Date Spread
OX1110	24975	209.0	May 6, 2024
HN1207	60905	590.0	May 7, 2024
HN1207	60905	457.7	May 8, 2024
HN1373	61117	43.2	May 9, 2024
HN1420	25130	380.2	May 24, 2024
HN1340	60746	357.0	November 4, 2024
HN1340	60746	360.0	November 5, 2024
HN1340	60746	314.0	November 6, 2024
HN1340	60746	270.0	November 7, 2024
HN1340	60746	358.0	November 8, 2024
HN1340	60746	45.0	November 9, 2024
Total		**3,384.10**	

Section I: Complaints

There were no community complaints received for the Port Dover WWTP in 2024.

As per the CLI-ECA Schedule E Condition 4.6.6 - there were no community complaints received for the Port Dover sewage pumping stations or linear infrastructure in 2024.

Section J(a): By-pass, Spill or Abnormal Discharge Events

There were two (2) overflow events at the Port Dover WWTP in 2024. Details of the events are as follows:

January 9, 2024
Incident #4KPPJA
Volume: 340.5m^3
Duration: 3 hours, 47min
Disinfection: no
Verbal and written notification sent to SAC for the overflow event which was caused by heavy rainfall which overloaded the facility. There were no observed adverse impacts to the receiving stream.

January 26, 2024
Incident #4M78EJ
Volume: 988.9m^3
Duration: 5 hours, 34min
Disinfection: no
Verbal and written notification sent to SAC for the overflow event which was caused by heavy rainfall which overloaded the facility. There were no observed adverse impacts to the receiving stream.

As per CLI-ECA Schedule E Condition 4.6.3, 4.6.8 and 4.6.9 - There were two (2) overflow

events that occurred at the Port Dover SPS's in 2024. Details of the events are as follows:

January 9, 2024
Incident #1-4KKI6: Bridge Street Sewage Pumping Station
Volume: 1,728m^3
Duration: 12 hours, 6min
Disinfection: no
Verbal and written notification sent to SAC for the overflow event which was caused by heavy rainfall which overloaded the facility. There were no observed adverse impacts to the receiving stream.

January 26, 2024
Incident #1-4M78FO: Bridge Street Sewage Pumping Station
Volume: 1,296m^3
Duration: 12 hours, 0min
Disinfection: no
Verbal and written notification sent to SAC for the overflow event which was caused by heavy rainfall which overloaded the facility. There were no observed adverse impacts to the receiving stream.

As per CLI-ECA Schedule E Condition 4.6.3, 4.6.8 and 4.6.9 – There was no spill events in the collection system – gravity separate sewers in 2024.

Section J(b): Summary of efforts to reduce CSOs, Spills, STP Overflows, STP Bypasses

Norfolk County has retained Civica Infrastructure Inc. to complete a County wide Inflow and Infiltration reduction study over a five (5) year period between 2024 and 2029. An initial priority for the program was to collect flow and rainfall data to characterize the existing dry and wet weather flow conditions within the sanitary sewer networks in Port Dover. The study used nine (9) sanitary sewer flow monitors in conjunction with rainfall monitoring to assess levels of inflow and infiltration (I&I) within a previously identified priority I&I area in Port Dover. The Civica Work Plan has been provided in Appendix B

Section K: Copy of Notice of Modifications Submitted

There were no modifications to the process at the Port Dover WWTP that required a Notice of Modification to Sewage Works Form in 2024.

As per the CLI-ECA Schedule E Condition 4.6.7 – A Form SS2 Record of Future Alteration Authorized for Components on the Municipal Sewage Collection System, along with a Director's Notification form was submitted to the MECP for the following:

1. Asset ID and Name: WW485 - Don Jon Boulevard Pumping Station SPS 8
Site Location: 80 Donjon Blvd, Port Dover, Ontario
- one (1) insertion style flowmeter in forcemain

2. Asset ID and Name: WW487 - River Drive Pumping Station SPS 3

Site Location: 8 River Drive, Port Dover, Ontario

- one (1) insertion style flowmeter in forcemain

3. Asset ID and Name: WW490 - Harbour Street Pumping Station SPS 4
Site Location: 40 Harbour Street, Port Dover, Ontario

- two (2) insertion style flowmeters in forcemain

4. Asset ID and Name: WW491 - Nelson Street Pumping Station SPS 5
Site Location: 328 Nelson Street, Port Dover, Ontario

- one (1) insertion style flowmeter in forcemain

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

The Port Dover WWTP is a conventional activated sludge treatment plant providing treatment by preliminary screening, primary clarification, aeration basins and secondary clarification. The final disinfection is provided by common chlorination/dechlorination. 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 Port Dover WWTP is required to achieve higher effluent quality standards than the Effluent guideline criteria as specified in the ECA.

There were two (2) raw sewage spill (overflow) events in the collections system at Bridge Street Pumping Station, and two (2) overflow events at the Port Dover WWTP in 2024 as discussed above in **Section J: By-pass, Spill or Abnormal Discharge Events.**

The Corporation of Norfolk County completes the following in the sanitary sewer system to eliminate bypass and overflows:

- CCTV flushing and camera inspections
- Manhole inspections

Section M: Changes or Updates for Construction at Plant

Construction on the proposed works identified in the ECA commenced in Port Dover in October of 2024. A working draft/timeline of the construction events has been included in Appendix E

Section N: Summary of Deviations from Monitoring Schedule

Compliance samples were collected on Thursdays in 2024 and the current weekly sampling, as per the 2025 schedule, is now completed on Tuesdays. There was one (1) deviation made to the monitoring schedule in December of 2024 due to a change in the accredited lab's operating hours during the holidays. Refer to *Appendix F* for the monitoring schedule for 2025.