



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 Delhi Wastewater Treatment Facility, Sewage Pumping Stations and the Delhi Linear Infrastructure.

Attached is the 2023 Annual Performance Report for the Delhi Wastewater Treatment Facility (WWTF) located at 244 Western Avenue in Norfolk County and all associated sewage pumping stations (SPS's) and the Delhi Linear Infrastructure. This report has been completed in accordance with the following Approvals:

- Section 11(4)(a) through (k) cited in Environmental Compliance Approval #5168- AHCJ3G issued on March 17, 2017 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, 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 Delhi gravity separate sewers was provided by Norfolk County.

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

Sincerely,

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Introduction:

Delhi Wastewater Treatment Facility (WWTF) is located at 244 Western Avenue in Delhi, Ontario (Norfolk County). Construction of the facility was completed in the summer of 2015, with commissioning completed in fall 2015. The community of Delhi includes both permanent and seasonal residents along with a food processing industrial plant and a fertilizer plant which also discharges to the sanitary sewer system.

The Delhi WWTF uses a conventional activated sludge process for wastewater treatment. The facility has a rated capacity of 3,182 m³/d, and has unit processes including screening and grit removal, primary treatment, biological treatment, and UV for disinfection. Waste Activated Sludge (WAS) is co-thickened in the primary clarifiers and the combined sludge and scum are digested in an aerobic digester prior to disposal via land application. The treated effluent is discharged through an outfall pipe to the Big Creek which ultimately discharges into Lake Erie. The facility also has an odour control system which utilizes a bio filter to neutralize odourous gases emitted from the sludge digesters, headwork's and primary treatment.

Raw Wastewater Collection

The wastewater collected in the sanitary sewers in Delhi flows to the WWTF by pump and gravity flow. There are five (5) sewage pumping stations (SPS) in Delhi. St. Michael's Street SPS pumps sewage to the Main Street SPS and from there it is pumped to the WWTF. Hillside SPS's pump to the Western Ave SPS, Talbot SPS pumps to the intersection of King St and Main St and flows from gravity to the WWTF and the Western Ave SPS flows from gravity directly to the WWTF.

Sewage Pumping Stations

The Norfolk County Municipal Wastewater Collection System is made up of five separate wastewater collection systems. The Delhi wastewater collection system (population 5,344) conveys sewage to the Delhi Wastewater Treatment Facility through a total of 32 kilometres of gravity separate sewers, 1.5 kilometres of force mains and five (5) sewage pumping stations (SPS) in the system. There are no overflow or bypass systems in the SPS's of Delhi. For additional information on the individual SPS's listed below, please refer to CLI-ECA #070-W601 Issue #1

- WW484 – Hillside Avenue SPS located at 133 Hillside Avenue in Delhi Ontario. Hillside Ave SPS is a duplex pumping station equipped with 2 pumps (1 duty, 1 standby), with a wet well of 1.8 m³ capacity. The station is connected to a 100 mm diameter forcemain discharging to manhole located at 116 Hillside Avenue.
- WW452 – Main Street SPS located at 441 Main Street in Delhi Ontario. Main Street SPS is a triplex pumping station equipped with 3 pumps (1 duty, 2 standby), with 24.4 m total head, 1 – 3HP submersible mixer and a wet well of 130 m³ capacity. The station is connected to a 300 mm diameter forcemain, discharging to a manhole located at the intersection of Main Street & Western Avenue.
- WW482 – St. Michael's Street SPS located at 68 St. Michaels Street in Delhi Ontario. St. Michaels Street SPS is a duplex pumping station equipped with 2 pumps (1 duty, 1 standby), with a wet well of 10 m³ capacity. The station is connected to a 150 mm diameter forcemain, discharging to a manhole at the intersection of Smith Avenue & Gage Street.
- WW480 – Talbot Road SPS located at 200 Talbot Road in Delhi, Ontario. Talbot Road SPS is a duplex pumping station equipped with 2 pumps (1 duty, 1 standby), with 15.25 m of total head, and wet well with 9 m³ capacity. The station is connected to a 100 mm diameter forcemain, discharging to a manhole located at 130 King Street.

- WW481 – Western Avenue SPS located at 170 Western Avenue in Delhi, Ontario. Western Avenue SPS is a duplex pumping station equipped with 2 pumps (1 duty, 1 standby) with a wet well of 17 m³ capacity. The station is connected to a 150 mm diameter forcemain, discharging to 244 Western Avenue.

Inlet Works

The preliminary treatment unit includes coarse screening and grit removal equipment which are enclosed inside the main process area of the Headworks Building. Raw sewage flows via a 450 mm gravity sewer from the collection system to MH-1 located north of the Headworks Building. The sewage flows to the Headworks Building where it is screened through two (2) 6mm coarse screens, one (1) automatic screen, and one manual screen. There is a second automatic screen in storage as a spare. The automated screen continuously removes screenings and deposits them into the screenings conveyor. The screened sewage is then dosed with ferrous chloride as it passes through a Detritor Tank which removes grit prior to entering the main treatment process. The grit is pumped back into the Headworks Building to a grit classifier which washes and dewateres the grit slurry. The grit is deposited into a collection bin with the screenings for disposal; the wash-water is returned to the Detritus Tank inlet channel.

Primary Clarification

A double barrel inverted siphon conveys the screened sewage from the Detritor Tank to the Main Treatment Building. The sewage flows into the primary splitter box and is directed to one of the two (2) primary clarifiers by adjustable gates. The primary clarifiers remove a portion of the particulate load of TSS, cBOD₅, TKN and TP by settling of suspended solids. Ferrous chloride can be dosed immediately upstream of the primary clarifiers as a back up to remove a fraction of the soluble phosphorus and promote settling.

Biological Tanks (Aeration and Anoxic Tanks)

The treatment process consists of an activated sludge system with provision of an anoxic swing zone for denitrification. The main purpose of the biological tanks is to remove BOD and TKN from the primary effluent by use of microorganisms. This is to ensure compliance with effluent requirements for cBOD₅, unionized and total ammonia.

The biological treatment tanks consist of an anoxic/oxic configuration. The first and smallest of the two (2) cells is the swing zone which can be operated in both anoxic, as well as oxic mode. The second and the larger of the two (2) cells is a dedicated aeration tank with permanent oxic conditions. The swing zone is designed to be operated in anoxic mode for average loading conditions with a provision to switch it to oxic mode if required during peak loading conditions. Operating in anoxic mode, this tank effects denitrification (partial) of the nitrates recycled from the downstream aeration tank through the return activated sludge (RAS) system. Also, in doing so, it provides oxygen and alkalinity credit in the aeration zone which in turn helps maintain a steady state in the aeration zone under frequent loading fluctuations due to extraneous loads at the plant.

Secondary Clarification

The flow from the biological tanks enters the secondary splitter box where it is directed to the two (2) secondary clarifiers. The purpose of the secondary clarifiers is to remove the activated sludge by gravity settling and recycle it to maintain a sufficient quantity of microorganisms in the biological treatment process.

The secondary effluent enters the secondary clarifier outlet chamber, while sludge settles and gets collected into the secondary hoppers. The sludge is then pumped to the aeration tanks (return activated sludge) to recirculate the activated sludge back into the biological treatment system. A portion of the recirculated activated sludge is pumped to the primary clarifier as waste to maintain the concentration of mixed liquors in the secondary treatment process.

Tertiary Treatment

Two (2) 3.25m x 2.65m x 2.68m SWD filtration tanks (one standby) each equipped with a cloth media filter with a Peak Flow Rate of 92L/s.

Disinfection Phase

The effluent is directed by gravity to the disinfection channel ultra-violet (UV) disinfection system equipped with comprising two (2) banks (one standby) of UV lamps before being finally discharged to the effluent outfall manhole flowing to Big Creek.

Sludge Management System

The overall objective of the sludge handling system is to collect, thicken, stabilize, store and dispose of the sludge produced at the plant in a safe and sustainable manner. There are two (2) main sources of sludge production in the treatment system: settling of raw sewage suspended solids, and the waste activated sludge resulting from conversion of a portion of the organic matter and nutrients in the raw sewage to new biomass by microorganisms in the aeration tanks. Both of these sources of sludge are removed from the primary clarifiers and pumped to the aerobic digester where it is biologically stabilized. The stabilized biosolids are periodically loaded in trucks and hauled away for disposal.

Odour Control

An odour control system has been provided to abate emission of foul odours (hydrogen sulphide and other odourous compounds such as mercaptans). Two (2) odour control fans convey foul air from the Primary Clarifiers, Sludge Digesters and Headworks Building to the biofilter located west of the Administration Building. The foul air flows through a perforated pipe embedded within the biofilter and flows upwards through the biofilter media bed. The biofilter media is comprised of a proportioned mixture of limestone, compost and woodchips. The media is irrigated and kept moist by treated plant effluent to develop and sustain a biomass layer that removes odours from the foul air.

Standby Power

The emergency power for the entire plant is supplied from a 600 kW/750 kVA, 600V, 3 phase Diesel Generator Set. The generator is a Generac model SD600 supplied and installed by Total Power Ltd. The gen-set is comprised of an 18.1L diesel engine, 730kW alternator, 225 Amp- hour battery, engine control panel and accessories within a sound-attenuating enclosure. The fuel storage tank is 7578L, allowing for a 48-hour emergency power supply with a full tank of fuel. The generator is sized and connected to provide power for 100% of the facility's connected load.

Delhi WWTF Facts:

Environmental Compliance Approval:	ECA 5168-AHCJ3G (issued March 17, 2017)
Rated Capacity:	3,182m ³ /day
Receiving Water:	Big Creek

in ECA #5168-AHCJ3G (ECA) issued March 17, 2017. The following report is presented such that it corresponds with ECA #5168-AHCJ3G Section 11(4) (a) through (k) and satisfies the requirements for the sewage pumping stations and the Delhi linear infrastructure in CLI-ECA #070-W601 Issue #1 dated July 27, 2022.

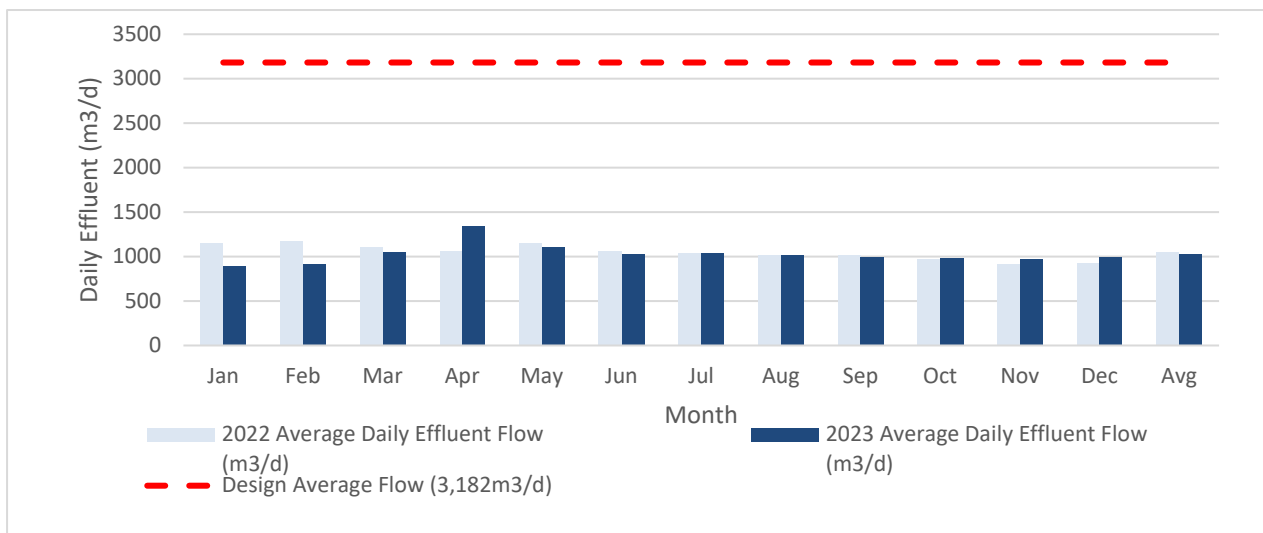
Section A: Summary of Monitoring Data

As outlined in ECA #5168-AHCJ3G, Section 11(4)(a) the following is a summary and interpretation of all monitoring data and a comparison to the compliance limits including an overview of the success and adequacy of the works. Detailed monitoring data is supplied in Appendix A.

(I) Effluent Flow Monitoring

The average daily effluent flow for 2023 was 1,028.0m³/d, which is 32.3% of the Delhi WWTF’s rated capacity of 3,182m³/d. The following Graph 1 shows a comparison of the average daily flows per month for 2023 and 2022 compared to the rated capacity of the facility.

Graph 1. Average daily flows in 2023 compared to 2022.



(II) Influent Sewage Monitoring

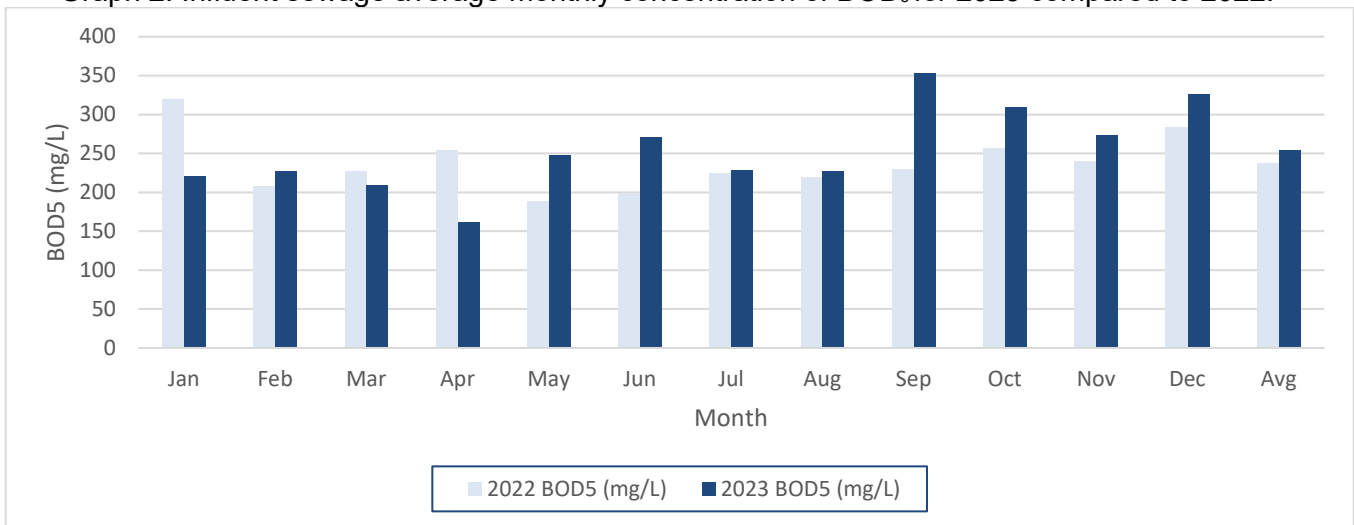
The influent sewage is monitored for BOD₅, total suspended solids, total phosphorus and total kjeldahl nitrogen on a monthly basis (minimum) by means of a composite sample. The treatment capabilities of the facility were designed based on the raw water characteristics identified in the Operations Manual from the design engineers. Refer to Appendix A for the detailed monthly results.

The influent at the Delhi WWTF is sampled on a weekly basis to be able to monitor the incoming parameters more efficiently and have greater control over the operations of the facility. The following Graphs 2-5 show the monthly average concentrations for the required influent parameters in 2023 compared to 2022.

The annual average for the influent sewage BOD₅ concentration to the plant in 2023 was 254mg/L

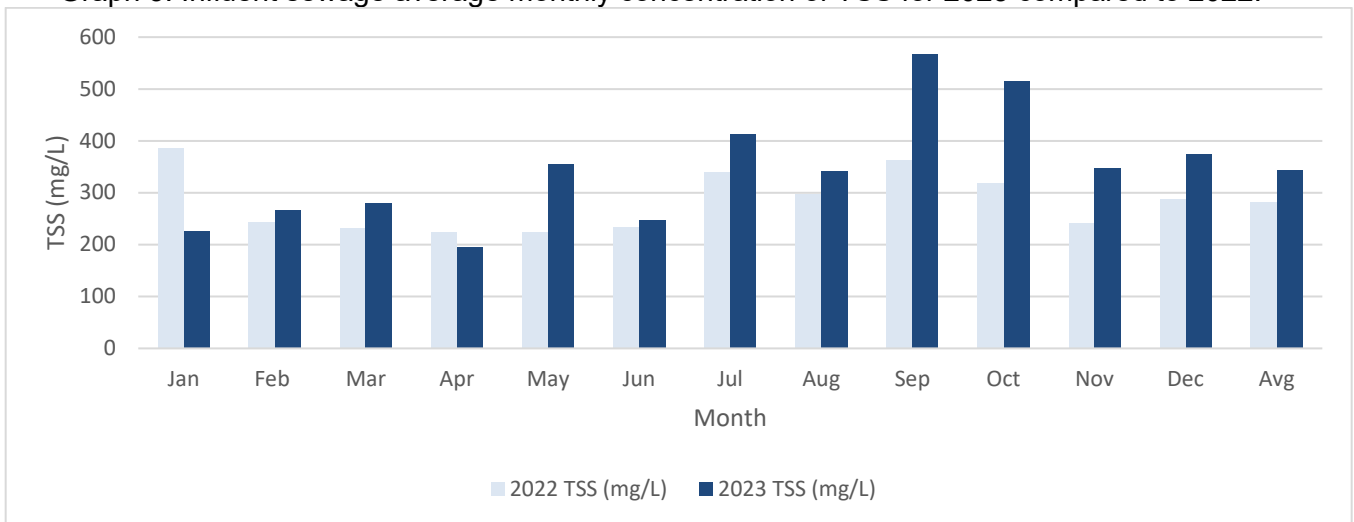
with an average loading of 259kg/d. This annual average loading is below the design criteria of 570kg/d

Graph 2. Influent sewage average monthly concentration of BOD₅ for 2023 compared to 2022.



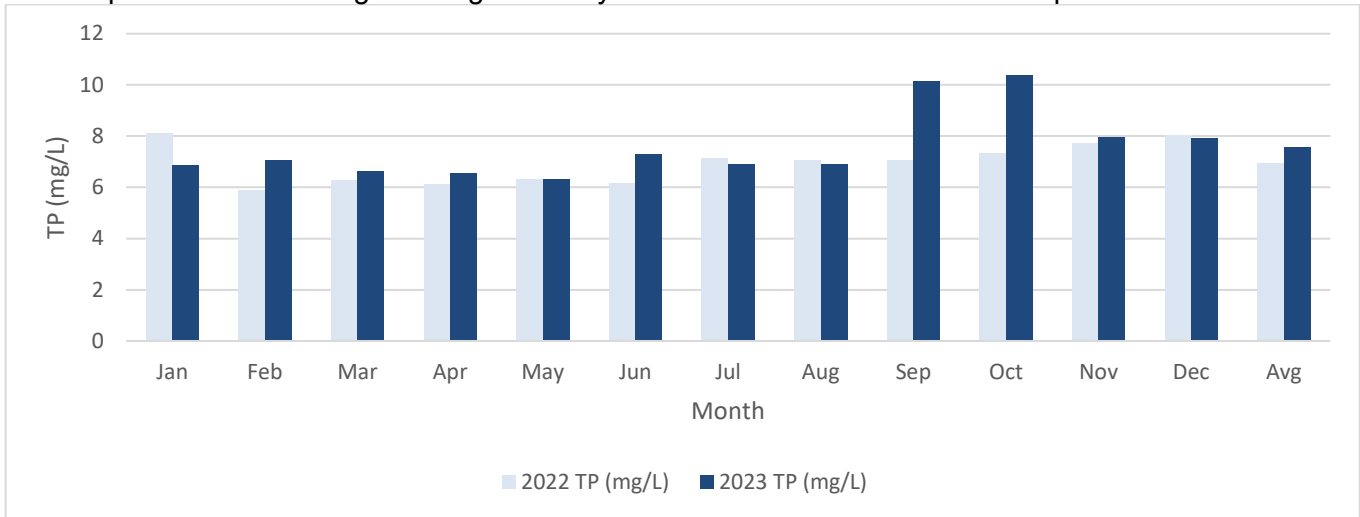
The annual average for the influent sewage total suspended solids (TSS) concentration to the plant in 2023 was 344mg/L with an average loading of 351kg/d. This annual average loading is below the design criteria of 627kg/d

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



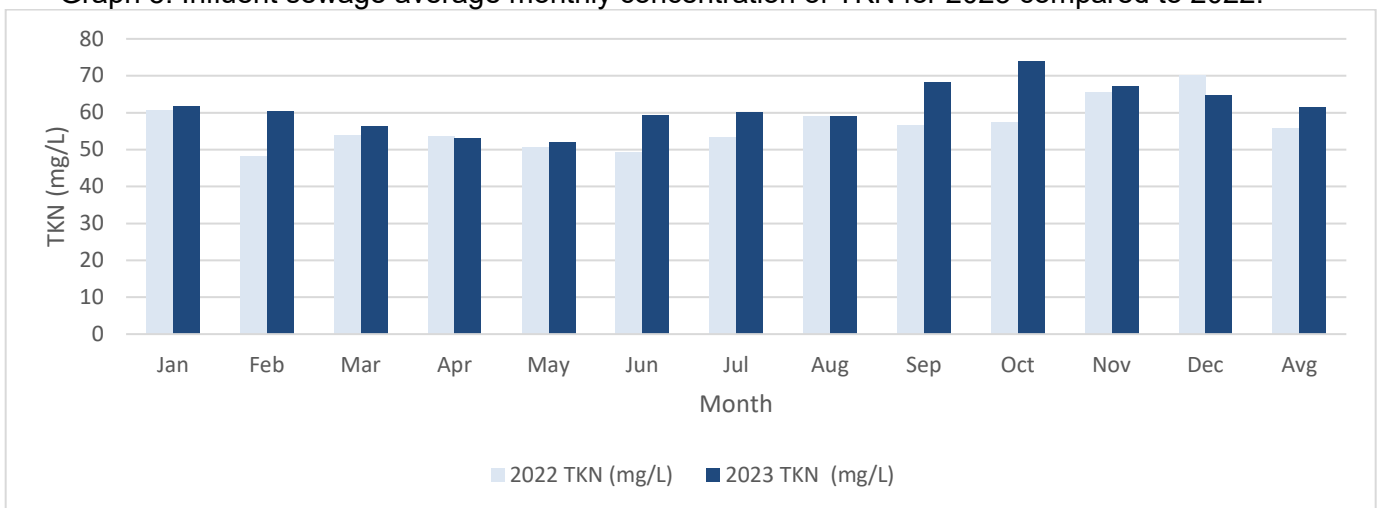
The annual average for the influent sewage total phosphorus (TP) concentration to the plant in 2023 was 7.57mg/L with an average loading of 7.74kg/d. This annual average loading is below the design criteria of 20kg/d.

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



The annual average for the influent sewage total kjeldahl nitrogen (TKN) concentration to the plant in 2023 was 61.3mg/L with an average loading of 62.7kg/d. This annual average loading is below the design criteria of 162kg/d.

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



The influent parameters all show an increase in the months of September and October but remained fairly consistent throughout the remainder of 2023. These variations are reflective of what is entering the facility at the time of sampling.

(III) Sewage Pumping Stations Monitoring Data

As per the CLI-ECA Schedule E Condition 4.6.3, there are no flow meters at the Delhi 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 Delhi 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 Delhi SPS's in 2023 and 2022

Sewage Pumping Station (SPS)	Year	Pump #1 (hours)	Pump #2 (hours)	Pump #3 (hours)
Hillside Avenue	2022	11.60	13.40	-
	2023	8.80	10.50	-
Main Street	2022	0.03	280.67	3.61
	2023	0.06	158.00	15.43
St. Michaels Street	2022	190.10	329.00	-
	2023	212.60	375.20	-
Talbot Road	2022	484.00	176.85	-
	2023	626.50	222.20	-
Western Avenue	2022	823.80	8.90	-

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

Sewage Pumping Station (SPS)	Total Hours 2022 (hours)	Total Hours 2023 (hours)	Percent Change (%)
Hillside Avenue	25.00	19.30	-29.5
Main Street	284.30	173.5	-63.9
St. Michaels Street	519.1	587.8	11.7
Talbot Road	660.9	848.7	22.1
Western Avenue	832.7	904.4	7.9

(IV) Final Effluent Monitoring

The Final Effluent is sampled on a weekly basis and tested for cBOD₅, total suspended solids, total phosphorus and total ammonia as a composite sample. A grab sample is taken weekly and tested for E. coli, pH and temperature. Total residual chlorine is required weekly when chlorination is in use. During the 2023 reporting period chlorination was not utilized. Detailed results are found in Appendix A. Table 3 below shows the monthly average effluent results and Table 4 shows the monthly average loadings.

Table 3. Monthly average effluent results for 2023.

Month	cBOD5 (mg/L)	TSS (mg/L)	TP (mg/L)	TAN (mg/L)	E. coli (cfu/100mL) Geomean	pH (min-max)	Temp (°C)
January	3.6	6.0	0.20	0.52	16.9	6.73-7.45	13.7
February	2.9	9.3	0.17	0.76	8.8	6.78-7.45	12.7
March	2.2	3.6	0.16	0.08	4.1	6.82-7.60	12.6
April	3.1	4.5	0.19	0.21	2.3	7.05-7.75	13.8
May	2.8	4.3	0.19	0.07	1.9	6.88-7.45	15.6
June	2.5	1.8	0.23	0.07	1.8	6.70-7.58	18.1
July	2.0	2.3	0.20	0.06	2.0	7.05-7.68	19.4
August	2.0	2.4	0.22	0.09	1.0	7.19-7.68	20.1
September	2.0	1.8	0.17	0.06	1.0	7.16-7.86	19.4
October	2.3	1.8	0.17	0.06	4.1	7.16-7.88	18.4
November	2.0	1.8	0.22	0.07	5.4	7.32-7.74	17.0
December	2.2	2.0	0.20	0.06	1.9	6.84-7.96	15.4
Average	2.5	3.4	0.19	0.18	2.9	6.70-7.96	16.4
ECA Objective	10.0	10.0	0.25	3.0(6.0)*	200	6.5-8.5	n/a
ECA Limit	15.0	15.0	0.3	4.0(8.0)*	150	6.5-8.5	n/a

Table 4. Monthly average loadings for 2023.

Month	cBOD5 (kg/d)	TSS (kg/d)	TP (kg/d)	TAN (kg/d)
January	3.21	5.35	0.18	0.46
February	2.65	8.45	0.16	0.69
March	2.34	3.76	0.17	0.09
April	4.10	6.05	0.26	0.28
May	3.04	4.70	0.21	0.07
June	2.54	1.84	0.24	0.07
July	2.07	2.33	0.21	0.06
August	2.03	2.44	0.22	0.09
September	2.00	1.75	0.17	0.06
October	2.23	1.73	0.17	0.06
November	1.99	1.76	0.21	0.07
December	2.16	1.99	0.19	0.06
Average	2.53	3.51	0.20	0.17
ECA Limit	63.6	63.6	0.95	12.7(25.5)*

*TAN Objective and Limit is based on Temperature. Values in brackets are from Dec 1 -Mar 1

(V) Big Creek Surface Water Monitoring Data

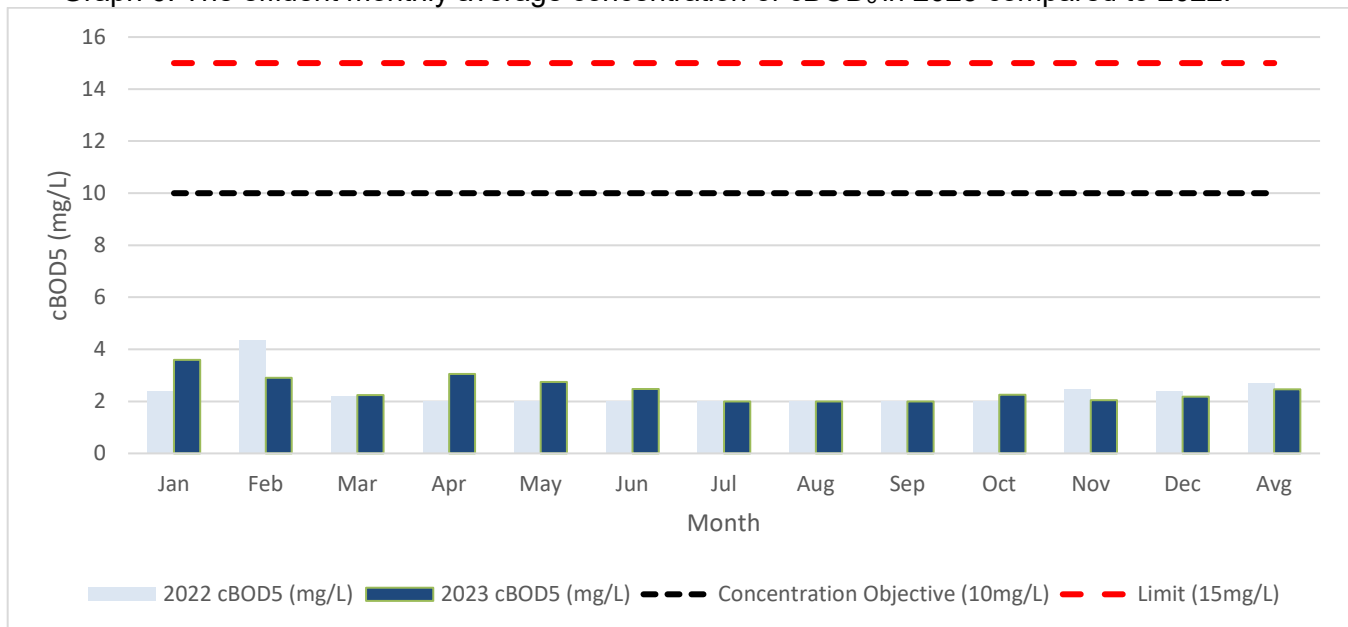
As per the ECA Section 9(7)(f), the annual monitoring data for the Big Creek Surface Water Sampling
Delhi Wastewater Treatment Facility Annual Report Page 10 of 24

Program for 2023 has been included in **Appendix B** as provided by Norfolk County. There is nothing that is significantly of issue to note. The completed report including the data review from 2012-2022, any conclusions that resulted from the program and any recommendations, was completed August 10, 2023 and has been submitted to the MECP for review.

(VI) Comparison to Compliance Limits and Objectives

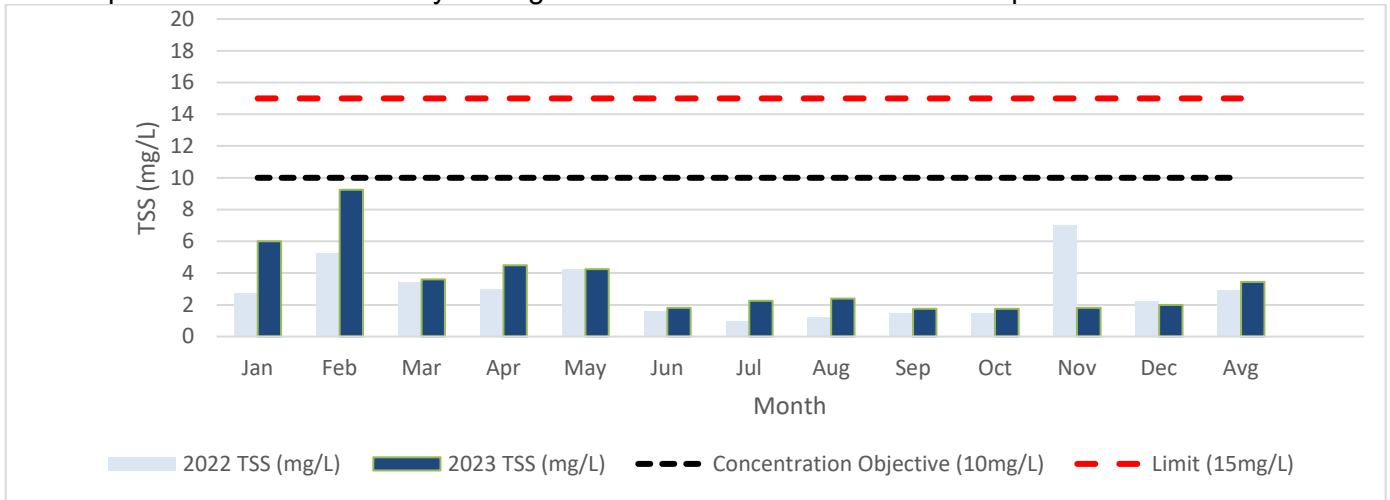
The annual average for the effluent cBOD₅ in 2023 was 2.5mg/L. The annual loading of cBOD₅ was 2.53kg/d. The monthly compliance limit and objective of 15mg/L and 10mg/l respectively were not exceeded in 2023. Refer to Graph 6 for the effluent monthly average concentration of CBOD₅ in 2023 compared to 2022.

Graph 6. The effluent monthly average concentration of cBOD₅ in 2023 compared to 2022.



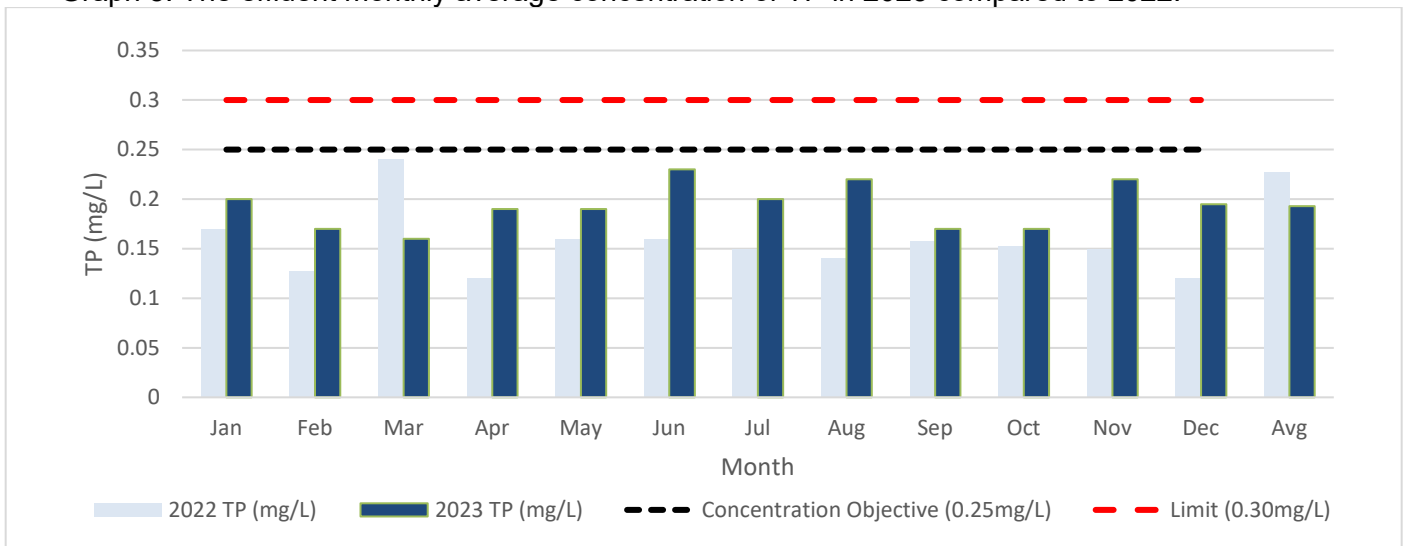
The annual average for effluent TSS in 2023 was 3.4mg/L. The annual loading of TSS was 3.51kg/d. The monthly compliance limit and objective of 15mg/L and 10mg/l respectively were not exceeded in 2023. Refer to Graph 7 for the effluent monthly average concentration of TSS in 2023 compared to 2022.

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



The annual average for effluent TP in 2023 was 0.19mg/L. The annual loading of TP was 0.20kg/d. The monthly compliance limit and objective of 0.3mg/L and 0.25mg/l respectively were not exceeded in 2022. Refer to Graph 8 for the effluent monthly average concentration of TP in 2023 compared to 2022.

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

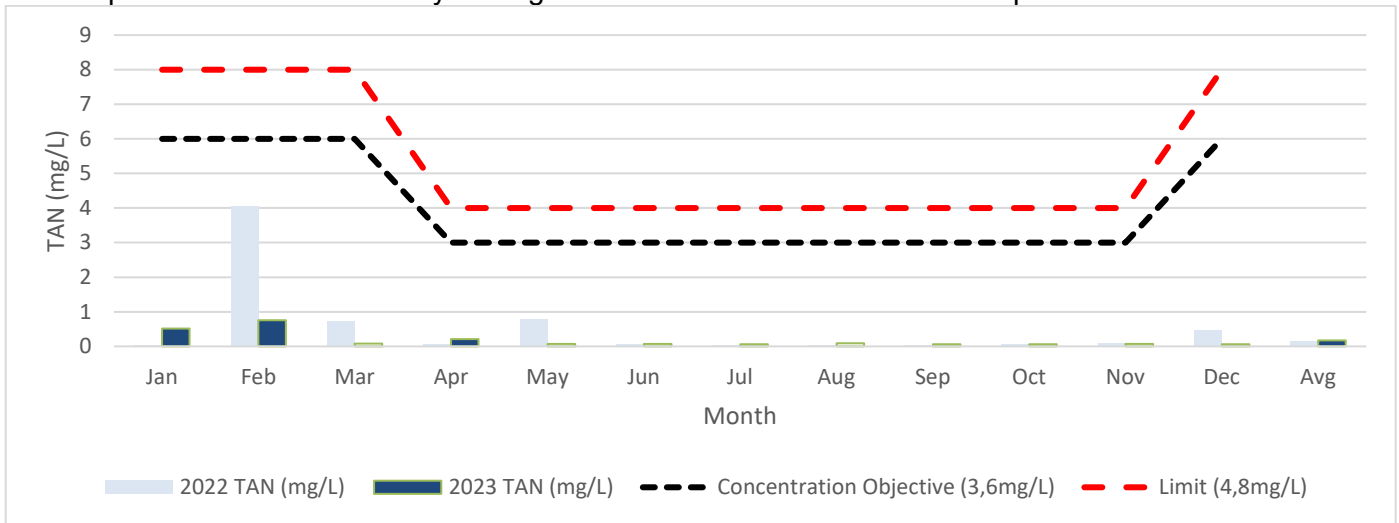


The annual average for effluent Total Ammonia Nitrogen (TAN) in 2023 was 0.0.18mg/L. The annual loading of TAN was 0.17kg/d. The limits and objectives for TAN are based on temperature (refer to table 2):

- December 1st to March 31st – limit is 8.0mg/L, objective is 6.0mg/L
- April 1st to November 30th - limit is 4.0mg/L, objective is 3.0mg/L.

There were no limit or objective exceedances for TAN in 2023. Refer to Graph 9 for the effluent monthly average concentrations of TAN in 2023 compared to 2022.

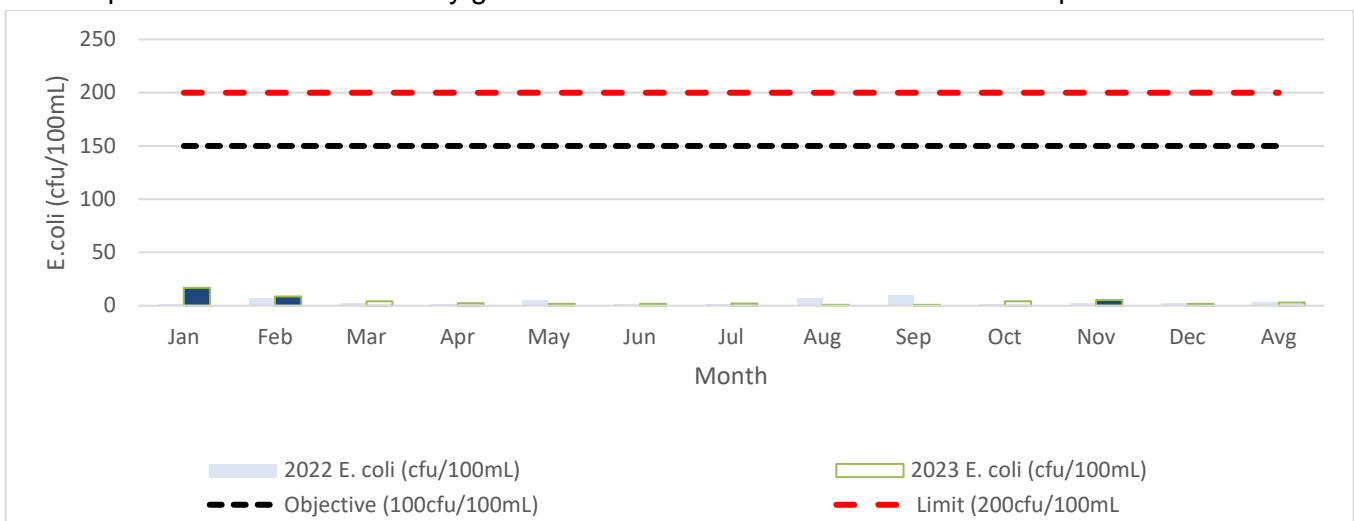
Graph 9. The effluent monthly average concentration of TAN in 2023 compared to 2022.



The annual geometric mean (Geomean) for effluent E.coli in 2023 was 2.9cfu/100mL. The monthly compliance limit and objective of 200cfu/100mL and 150cfu/100mL respectively were not exceeded in 2023. Refer to Graph 10 for the effluent monthly geometric mean concentrations in 2023 compared to 2022.

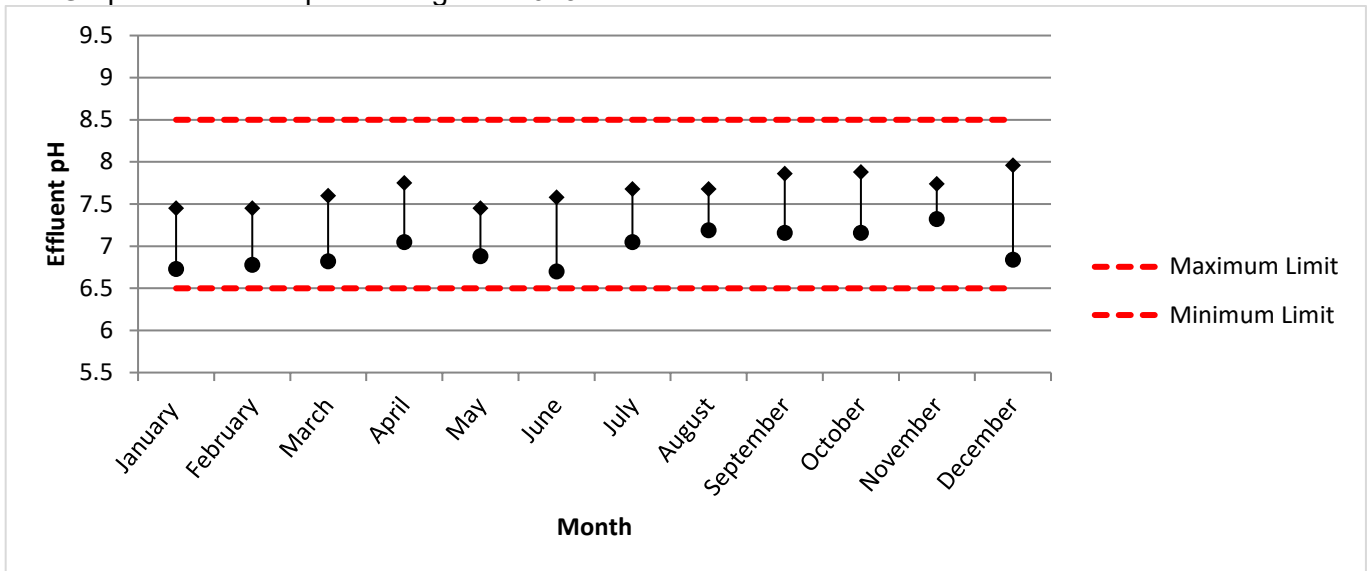
Note: ECA incorrectly identifies objective as 200cfu/100mL and limit as 150cfu/100mL.

Graph 10. The effluent monthly geomean concentration of E.coli in 2023 compared to 2022.



The effluent pH is monitored weekly at a minimum at the Delhi WWTF. There were no results below or above the compliance limits and objectives 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 11 for the monthly minimum and maximum pH range readings for 2023

Graph 11. Effluent pH readings for 2023.



Section B: Operating Problems and Corrective Actions

There were no non-compliance events at the Delhi WWTF in 2023.

There was one (1) overflow event on July 29, 2023 (Ref#1-30PAJA). This event is discussed in Section I: By-pass, Spill or Abnormal Discharge Events

As per the CLI-ECA Schedule E Condition 4.6.4, there were no operating problems at the sewage pumping stations or with the linear infrastructure that required corrective actions for 2023.

All major maintenance completed at the Delhi WWTF and at the SPS's is included below in **Section C: Maintenance Activities**.

Section C: Maintenance Activities

Regular scheduled monthly preventative maintenance for the Delhi WWTF 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 schedules. 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 2023 were as follows:

Table 5. Delhi WWTF Major Maintenance Completed in 2023

Date	Maintenance Activities
January 3	Mechanical Contractor removed secondary odour control fan motor and sent to Electrical Contractor for service. Re-installed on January 20.
February 1	Mechanical Contractor on site to look at WWTF Automatic Transfer Switch (ATS)
February 17	Mechanical Contractor replaced wires on secondary odour control.
March 28	Lifting Devices were inspected by third party
April 24	Contractor onsite installing new dissolved oxygen sensor
April 27	Contractor onsite to re-install parts of the filter building air handling unit (AHU) control panel
May 1	Contractor onsite to bring facility AHU's back online.
May 4	Flow meter calibrations completed by third party
May 29	Electrical Contractor onsite to install relay for filter building AHU
May 30	Contractor onsite for primary building AHU
June 5	Contractor onsite removing dissolved oxygen sensor for repair
June 15-20	Contractor onsite repairing front gate to the facility
June 29	Electrical Contractor onsite to clean VFD's
July 20	Contractor onsite to pump grit out of Detroit
August 4	Gas detector calibrations completed by third party
August 10-14	Contractor onsite to remove dead trees around property
August 14	Mechanical Contractor onsite to re-attach decant line to side of digester
September 7	Contractor onsite to replace air handling unit (AHU) motor
September 13	Contractor onsite to replace odour control bed media
September 22	Mechanical contractor on site for the headworks spill containment construction and disconnect existing electrical
September 25	Contractor on site to start ferrous containment
October 23	Received/Installed new explosion proof sump for primary pump house sump pit
October 26	Contractor on site to install motor fan on filter building AHU.
October 26	Electrical Contractor onsite to install aeration dissolved oxygen probe
November 23	Contractor onsite to completed spill containment. Epoxy coating applied.
November 28	Backflow preventers tested/inspected by third party
November 30	Contractor onsite to replace exhaust fan for chemical building ferrous room
December 15	Operations installed new feed line for headworks ferrous tank

Table 6. Talbot Rd. SPS Major Maintenance Completed in 2023

Date	Maintenance Activities
March 28	Lifting Devices were inspected by third party
April 11	Contractor completed wet well clean out
May 15	Contractor onsite to install fiber line to PLC panel
November 7	Contractor completed wet well clean out
December 22	Replaced Talbot PLC UPS

Table 7. Main St. SPS Major Maintenance Completed in 2023

Date	Maintenance Activities
March 28	Lifting Devices were inspected by third party
April 11	Contractor completed wet well clean out
May 8	Contractor onsite to install fiber line to PLC panel
June 7	Installed pump 3 in pump 2 location and installed new 10HP flight pump in pump 3 location. Contractor onsite to facilitate pump install and connections.
June 29	Contractors onsite to install new VFD for pump 3
September 1	Contractor onsite to fix automatic transfer switch and replace generator fuses.
November 9	Contractor completed wet well clean out
December 2	Contractor onsite to replace generator fuses
December 23	Contractor onsite to replace milltronics board

Table 8. St. Michaels St. SPS Major Maintenance Completed in 2023

Date	Maintenance Activities
March 28	Lifting Devices were inspected by third party
April 11	Contractor completed wet well clean out
May 10	Contractor onsite to install fiber line to PLC panel
June 21	Contractor onsite to tighten actuator arm inside ATS cabinet
September 1	Contractor onsite to repair generator automatic transfer switch. Contractor then replaced 2 fuses.

Table 9. Hillside St SPS Major Maintenance Completed in 2023

Date	Maintenance Activities
March 28	Lifting Devices were inspected by third party
September 14	Contractors on site to replace the 3HP submersible pumps #1&2 with 2 new 3HP submersible pumps
September 28	Mechanical Contractor onsite to replace guide rails

Table 10. Western Ave SPS Major Maintenance Completed in 2023

Date	Maintenance Activities
March 28	Lifting Devices were inspected by third party
April 11	Contractor completed wet well clean out
May 17	Contractor onsite to install fiber line to PLC panel
September 12	Electrical Contractor onsite to replace ATS display at station

Section D: Effluent Quality Assurance

Effluent quality assurance is evaluated by monitoring parameters and changes throughout the facility's processes. The operators monitor the aeration 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 E: Calibration and Maintenance on Effluent Monitoring Equipment

The Delhi WWTF effluent flow meter was calibrated by JBF Controls on May 4, 2023 and is operating as required. In house meters for pH and dissolved oxygen were calibrated by JBF Controls 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 Delhi sewage pumping stations that required calibration in 2023.

Section F: Objective Exceedances & Best Efforts

Table 11. 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
cBOD5	10.0	2.0-3.6	0	63.6	2.0-4.1	0
TSS	10.0	1.8-9.3	0	63.6	1.7-8.5	0
TP	0.25	0.16-0.23	0	1.9	0.16-0.26	0
TAN	3.0 (6.0)	0.06-0.76	0	12.7 (25.5)	0.06-0.69	0
E. coli (cfu/100mL)*	150	1.0-16.9	0	n/a	n/a	n/a
pH**	6.5 – 8.5	6.70-7.96	0	n/a	n/a	n/a

*expressed as geometric mean, ECA incorrectly identifies objective as 200cfu/100mL

**minimum and maximum result

The Delhi WWTF performed well in 2023 producing quality effluent. There were no objective exceedances in 2023.

Section G: Sludge Handling and Generation

Sludge sampling results can be found in **Appendix D**. Sludge is removed from the Delhi WWTF and sent to the Townsend Lagoon for processing or taken to field for land application. The total volume generated in 2023 was 2,173m³, refer to Table 12 below for a breakdown and Table 13 for the sludge disposal locations.

It is expected that 2024 will be similar to 2023 with approximately 2,500m³ of sludge being removed from the Delhi WWTF.

Table 12. Sludge Generation – Volume Hauled Delhi WWTF 2023.

Month	Townsend Lagoon (m ³)	Field (m ³)	Total (m ³)
January	168	0	168
February	0	0	0
March	180	0	180
April	0	583	583
May	0	0	0
June	0	0	0
July	180	0	180
August	340	0	340
September	162	130	292
October	45	385	430
November	0	0	0
December	0	0	0
Total	1,075	1,098	2,173

Table 13. Delhi Sludge Disposal Locations 2023.

Site	NASM#	Lot	Concession	Township	Volume (m3)	Date Spread
HN1412 F2	60284	13	4	Woodhouse	402.04	April 13, 2023
HN1412 F2	60284	13	4	Woodhouse	45.36	April 14, 2023
HN1334	60288	14	5	Woodhouse	135.53	April 14, 2023
B1165	60695	17	1	Onondaga	130.00	September 29, 2023
HN1084	25183	9-12	7	Townsend	358.00	October 13, 2023
Total					1,097.93	

Section H: Complaints

There were ten (10) community complaints received for the Delhi WWTF in 2023. All complaints were communicated between Norfolk County and OCWA and promptly investigated by reviewing the conditions at the facility, ensuring the odour control fans were operational and reviewing with weather conditions in the area.

As per the CLI-ECA Schedule E Condition 4.6.6 - there were no community complaints received for the Delhi sewage pumping stations in 2023. There were two (2) community odour complaints received for the gravity separate sewers in 2023. All complaints were investigated by Norfolk County staff by inspecting manholes for debris, odour, and flow.

Table 14. Community Complaints received

Date	Nature of Complaint	Investigating Response
July 17	Odours	Gravity Separate Sewers: Low flow area, sitting waste; flushed, confirmed no blockage.
September 26	Odour and red flashing light	No unusual conditions or modifications to the facility that would cause odours. Red flashing light was covered.
October 13	Odours	No unusual conditions or modifications to the facility that would cause odours.
October 18	Odour detected around Arena (Western Avenue)	Possible Dumpster at Arena. Not identified as coming from the Delhi WWTF or the SPS's.
October 24	Odours and yard lights on at night	No unusual conditions or modifications to the facility that would cause odours. Yard lights were put on timers
October 25	Two reports on past odour observations from neighbours	No response as no dates were specified. There were no unusual conditions or modifications to the facility that would cause odours at the time of the complaints
November 16	Odours	No unusual conditions or modifications to the facility that would cause odours.
November 30	Odours	No unusual conditions or modifications to the facility that would cause odours.
November 30	Odours	Gravity Separate Sewers: All manholes inspected showed good flow, and no debris on benching that would cause odours.
December 15	Two reports of a strong burning smell	Burning smell noticed in the area however it was not identified as coming from the Delhi WWTF or the Delhi SPS's.
December 22	Burning Smell	Wood burning smell by the Bridge on William Street. Not identified as coming from the Delhi WWTF or the Delhi SPS's.

Section I: By-pass, Spill or Abnormal Discharge Events

There was one (1) overflow event at the Delhi 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 Delhi SPS's, or linear infrastructure in 2023.

July 29, 2023 Incident #1-30PAJA

Volume: 2.8m³ to Big Creek

Verbal and written notification sent to SAC for overflow at Delhi WWTF due to an extreme amount of precipitation overloading the facility.

Section J: Copy of Notice of Modifications Submitted

There were no modifications to the process at the Delhi WWTF that required a Notice of Modification to Sewage Works in 2023.

As per the CLI-ECA Schedule E Condition 4.6.7 – The following alterations to the Delhi SPS's and linear infrastructure were made in 2023:

- Asset ID: WW452 - Main Street SPS – Director Notification as Pump #3 was upgraded,

requiring a change to the description of existing works in Schedule B of the ECA. Form SS2 detailing Pump #3 upgrades to a 10HP pump to keep up with flow preventing likelihood of bypass events at Main Street SPS 1 & Delhi WWTF during wet weather events.

- James Street – Form SS1 New 250mm sanitary sewer servicing James Street in Delhi from Imperial Street to Waverly Street. New 200mm sanitary sewer servicing James Street in Delhi from Waverly Street to Crosier Street. Proposed sanitary will connect to existing sanitary sewer at Imperial Street, Waverly Street, and Brock Avenue.
- Norfolk Avenue – Form SS1 300mm sanitary sewer on Norfolk Avenue replaced from Western Avenue to Eagle Street.
- Asset ID: WW484 – Hillside Avenue SPS
Form SS2 Replaced existing Pumps #1 & #2 (3HP Flygt Submersible Pumps), which were at the end of their life, with two new Sulzer, 3HP submersible pumps.

Section K: Report Summarizing Modifications as a result of Schedule B, Section 3

There were no modifications to the process at the Delhi WWTF as a result of Schedule B, Section 3 in 2023.

Appendix A - Monitoring Data

Appendix B – 2023 Big Creek Sampling Data

Appendix C - Maintenance Schedule

Appendix D - Sludge Sampling Results