Parkhill Lagoon Annual Performance Report

Prepared For:
The Municipality of North Middlesex

Operating Authority:

OCWA
ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

Reporting Period: January 1 – December 31, 2024

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Contents

Overview

The following report was prepared by Ontario Clean Water Agency on behalf of The Municipality of North Middlesex in accordance with:

- Condition 11(4) (a) through (m) cited in Environmental Compliance Approval #7549-CUJJ3V issued August 21, 2023, to The Corporation of the Municipality of North Middlesex.
- Schedule E (4) cited in Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) #002-W601 issued September 26, 2023, to The Corporation of the Municipality of North Middlesex.

System Process Description

The Parkhill Sewage Lagoon is located at 2034 Parkhill Drive, Ontario. The facility has a rated capacity of 1150 m^3/d and is comprised of the following components:

- Wastewater collection (WWC) system and pumping stations
- Lagoons

Raw Wastewater Collection

Raw sewage flows by gravity through the collection system. Where gravity flow is not possible due to elevation restrictions, there are two pumping stations. Station Street Pumping Station pumps raw sewage through a 4" forcemain to a gravity sewer that feeds into the main pumping station - Victoria Street. The Victoria Street Pumping Station has a 10" forcemain that pumps sewage to the Parkhill Sewage Lagoon. Both stations have two submersible centrifugal pumps (1 duty/1 standby). Pumps at Victoria Street and Station Street have a rated capacity of 44 L/s and 6.3 L/s, respectively. All pumps operate on a start/stop cycle based on wet well levels monitored by floats. Level monitoring via floats also activates high-level alarms. Victoria Street Pumping Station has an emergency back-up generator and an overflow that flows into the Cameron Gillies Drain.

Sewage Lagoons

Raw sewage flows from the collection system into the inlet chamber at the Parkhill Sewage Lagoon. Currently, flow enters the South Cell and then flows into the North Cell through a cross-over pipe. However, the lagoons can be operated in parallel whereby raw flow enters both cells at the same time.

The Parkhill Sewage Lagoon uses a facultative process where bacteria breaks down organic matter deposited in the lagoons. Prior to discharge, both cells are batch-dosed with a coagulant to provide further treatment. The lagoons discharge seasonally in the spring and fall. Effluent flows from both cells into a joint discharge pipe, entering Parkhill Creek and then the Ausable River.

System Facts:

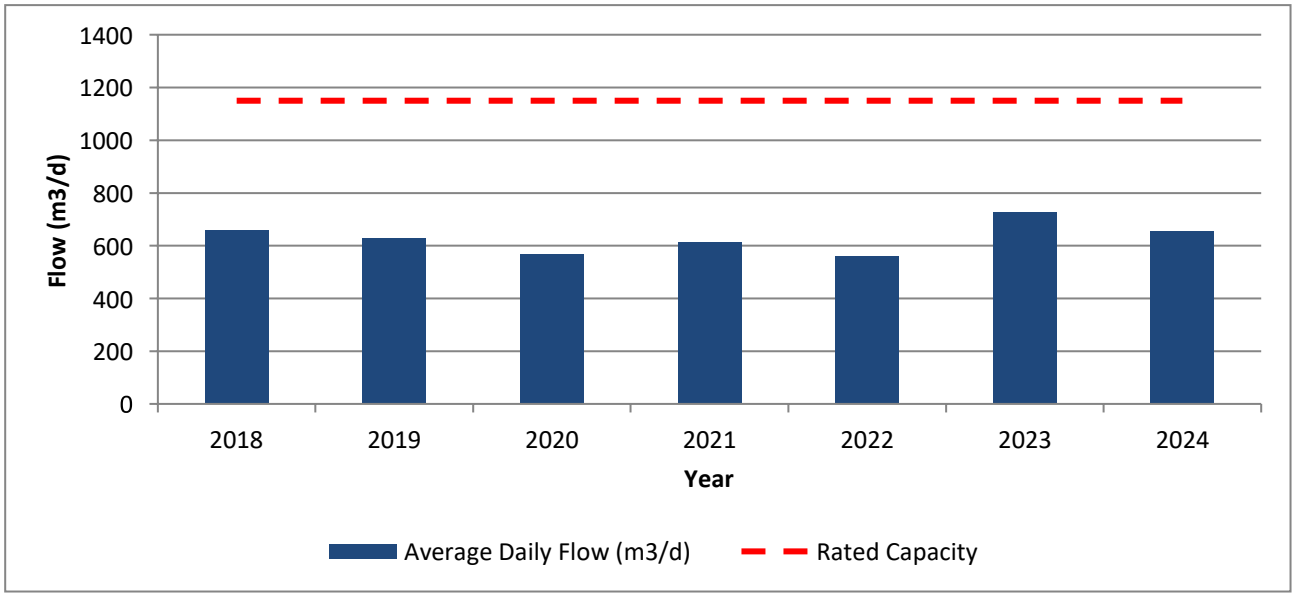
Environmental Compliance Approval (ECA)	#7549-CUJJ3V (issued August 21, 2023)
CLI Environmental Compliance Approval	#002-W601 (issued September 26, 2023)
Rated Capacity	1150m^3/d
Receiving Water	Parkhill Creek/Ausable River

The Parkhill Sewage Lagoon and WWC system was operated in accordance with the provincial regulations as required in ECA #7549-CUJJ3V and CLI-ECA #002-W601.

Influent and Effluent Flow Monitoring

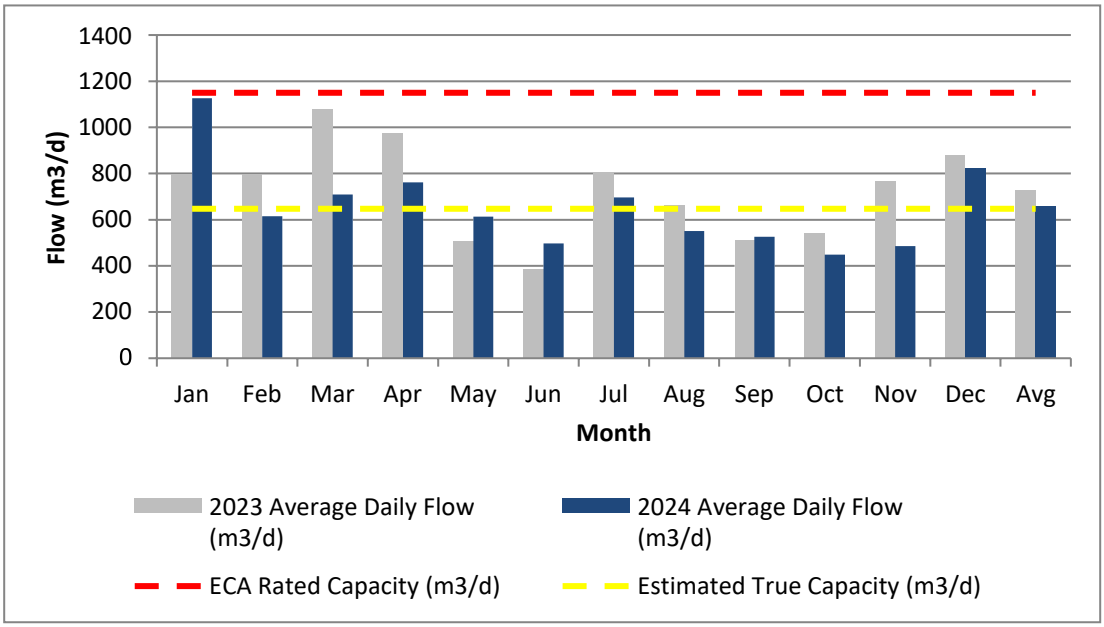
The Parkhill Sewage Lagoon is rated to treat an average daily flow of 1150 m^3. In 2024, the Parkhill Sewage Lagoon was at 57% of the ECA rated capacity. However, a 2023 capacity analysis estimated the true capacity of the lagoon to be 647 m^3/d. Using this measure, in 2024 the Parkhill Lagoon was at 101% of its capacity. In August 2024, 4815 dry tonnes of biosolids were removed from the south cell of the lagoon. A plan is in place to remove further biosolids from the north cell of the lagoon in 2025. After this time, OCWA recommends a reassessment of the capacity of the lagoons. Refer to Figure 1 for a comparison of the average daily flow for the last seven years against the ECA rated capacity.

Figure 1: *Influent Flows 2018-2024*



In 2024, the raw sewage average daily flow was 656 m^3/d versus 726 m^3/d in 2023. This 10% decrease is attributed to drier weather. Refer to Figure 2 for 2024 average daily flows by month and the corresponding annual average.

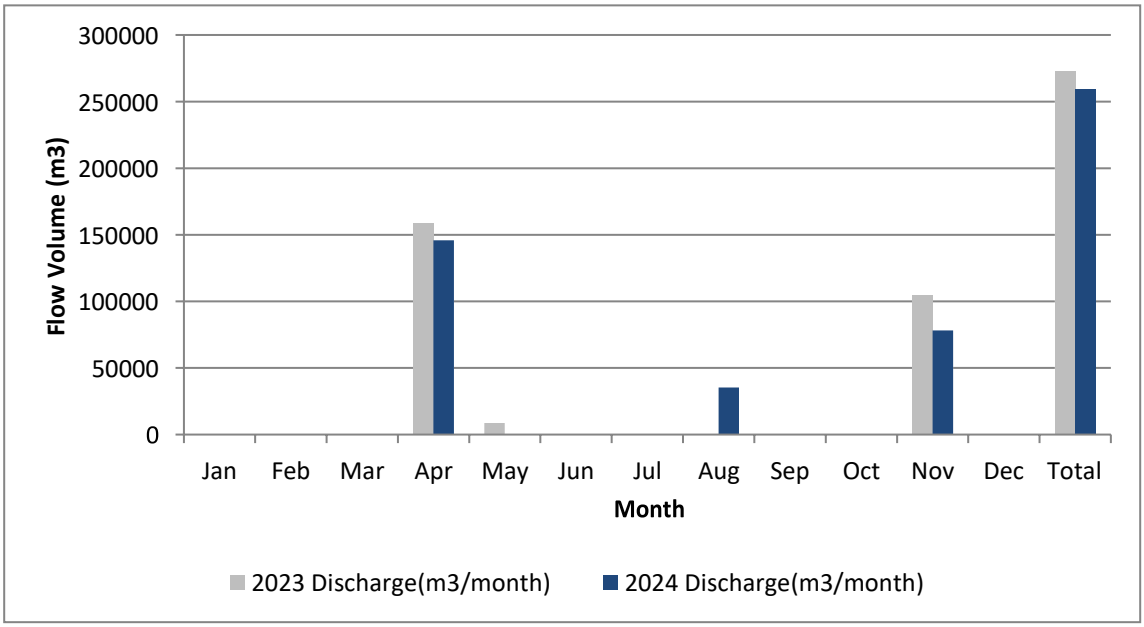
Figure 2: *Average Daily Flows by Month*



Typically, two seasonal discharges occur each year for the Parkhill Lagoon, one in the spring and one in the fall. In 2024, the seasonal discharges occurred April 10 to April 26 and November 6 to November 22. However, an additional planned discharge occurred August 21 to 28, 2024, to facilitate biosolids removal in the south cell. This discharge was pre-approved by the Ministry of Environment, Conservation and Parks (MECP).

The total volume discharged in 2024 was 259 653 m^3 versus 272 421 m^3 in 2023. The total volume is similar between 2024 and 2023 because the April discharge was both cells, the August discharge was only the south cell and the November discharge was the north cell only. Refer to Figure 3 below for effluent flow volumes in 2023 and 2024.

Figure 3: *Effluent Flow Volume*



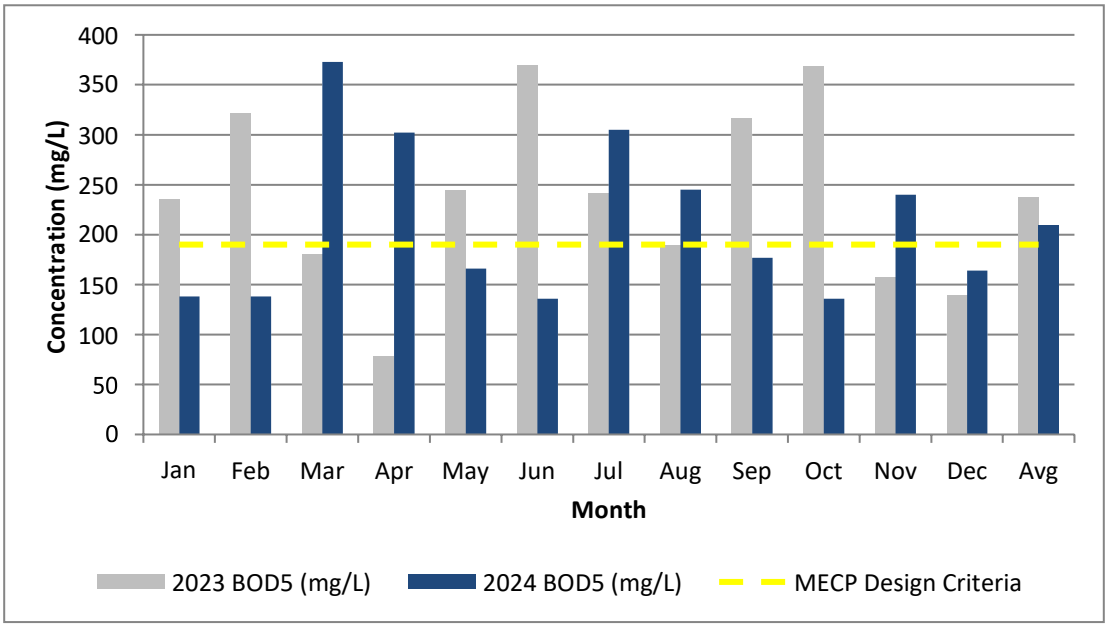
Influent Data

The influent is monitored for Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), Total Phosphorous (TP) and Total Kjeldahl Nitrogen (TKN) on a monthly basis with a grab sample. These parameters are measured against the design criteria of the Parkhill Sewage Lagoon. Values above design concentration can result in ineffective treatment of raw sewage and can lead to effluent limit exceedances.

In 2024, there were multiple exceedances of influent parameters. However, this did not affect effluent water quality, which continues to meet ECA limits.

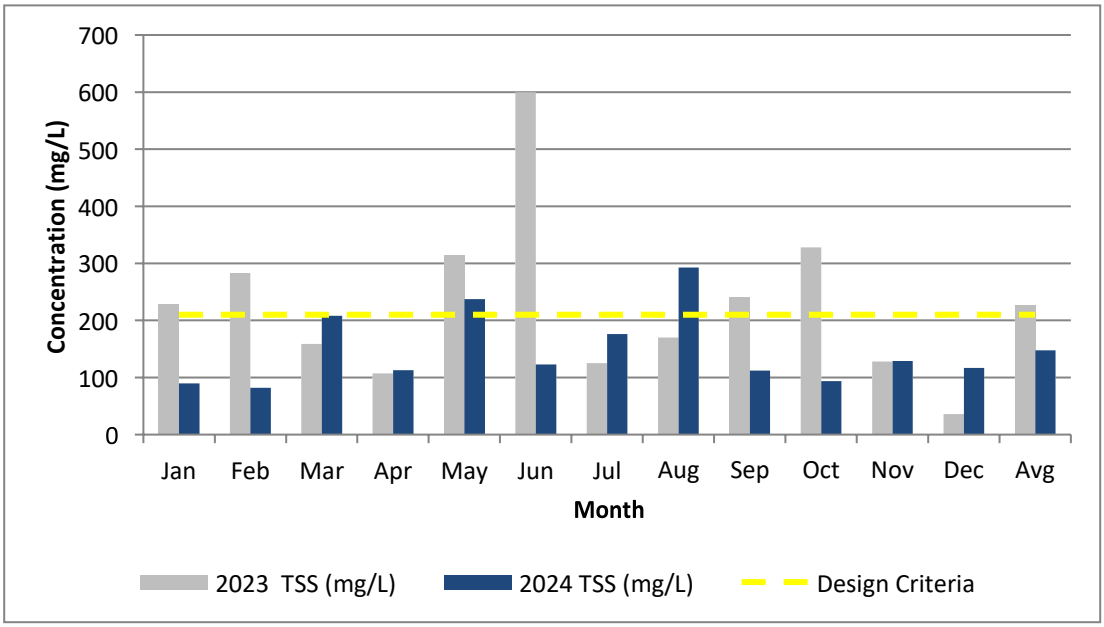
In 2024, the average raw BOD_5 concentration was 210 mg/L, a 12% decrease from 2023. Refer to Figure 4 for a comparison of 2024 monthly raw BOD_5 concentrations to 2023 concentrations.

Figure 4: *Raw BOD_5 Concentrations*



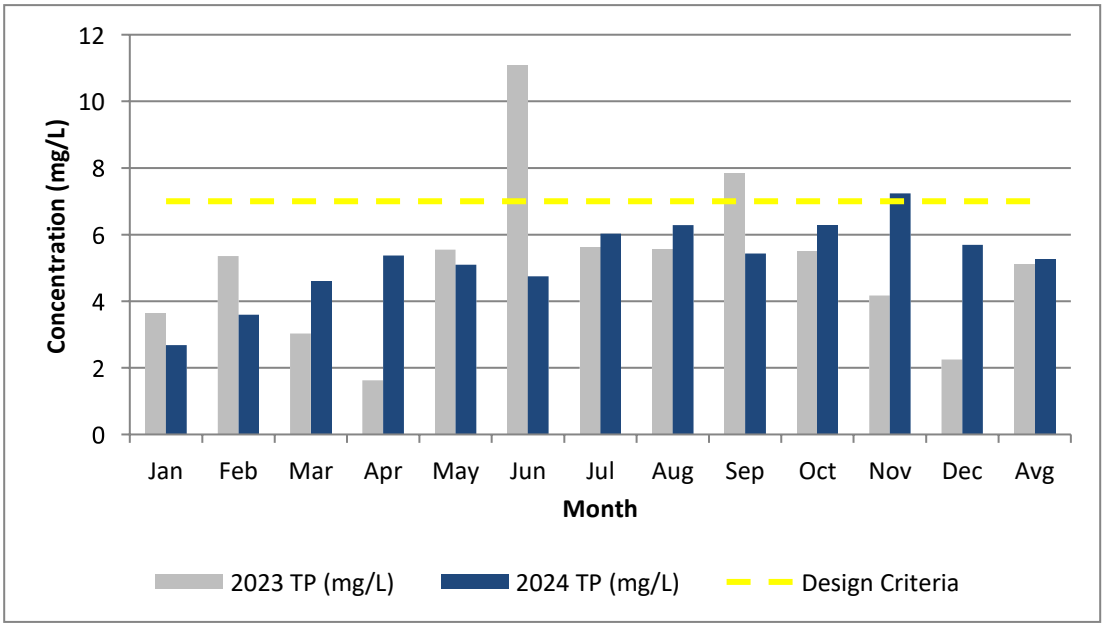
In 2024, the average raw Total Suspended Solids concentration was 148 mg/L, a 35% decrease from 2023. Refer to Figure 5 for a comparison of 2024 monthly raw Total Suspended Solids concentrations to 2023 concentrations.

Figure 5: *Raw TSS Concentrations*



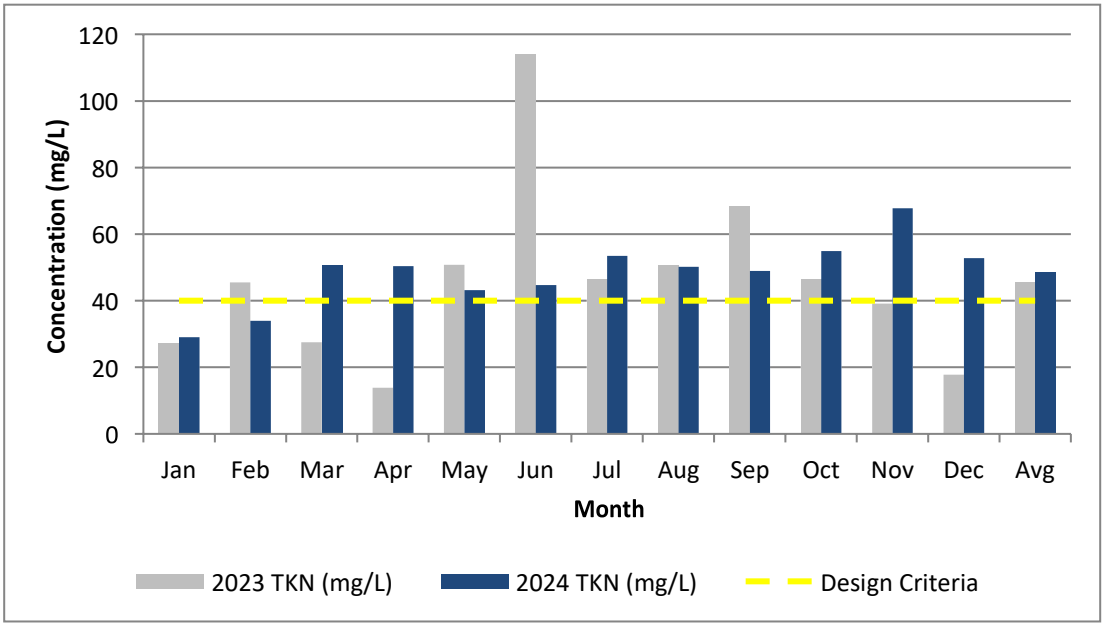
In 2024, the average raw Total Phosphorus concentration was 5.3 mg/L, a 3% increase from 2023. Refer to Figure 6 for a comparison of 2024 monthly raw Total Phosphorus concentrations to 2023 concentrations.

Figure 6*: Raw TP Concentrations*



In 2024, the average raw Total Kjeldahl Nitrogen concentration was 48 mg/L, a 6% increase from 2023. Refer to Figure 7 for a comparison of 2024 monthly raw Total Kjeldahl Nitrogen concentrations to 2023 concentrations.

Figure 7: *Raw TKN Concentrations*



Effluent Monitoring

Cell Content Sampling

Prior to discharge, the Parkhill Sewage Lagoon ECA requires that lagoon contents are sampled for Carbonaceous Oxygen Demand ($CBOD_5$), TSS, TP, TKN, and pH. Three grab samples are taken at the top, middle and bottom of each cell and combined into composite samples. Content samples assist in determining the amount of coagulation treatment to apply to the lagoons prior to discharge to achieve quality effluent.

In 2024, content samples were taken prior to the spring and fall discharge and the planned discharge in August. For the spring discharge, content samples were taken from both the north and south cell of the lagoon as contents of both cells were discharged at that time. For the fall and planned discharge content samples, cell contents were only taken on the cell being discharged. Refer to Table 1 below for the results of the 2024 lagoon content samples.

Table 1: *Lagoon Content Sample Results*

	Spring Sample March 11, 2025		**Planned Discharge July 24, 2025**	**Fall Sample October 21, 2025**
Parameter	**North Cell**	**South Cell**	**South Cell**	**North Cell**
$CBOD_5$ (mg/L)	14	16	24	17
Total Suspended Solids (mg/L)	21	28	56	18
Total Phosphorus (mg/L)	0.15	0.49	0.15	0.24
Total Kjeldahl Nitrogen (mg/L)	7.8	12.3	4.5	7.9
E. coli (cfu/100mL)	440	8800	1300	7200
pH	8.41	8.58	8.02	8.33

Additional content samples from the south cell lagoon were taken on July 10, 2024, for an acute lethality test. This test measures and assesses the biological effects of effluent on aquatic life. This test was taken prior to the planned discharge in August to ensure that effluent being deposited into the receiving stream would not harm aquatic life. The south cell final effluent passed this test with a 0% impairment and mortality rate on rainbow trout test species.

Effluent Sampling

During regular seasonal discharge, effluent is sampled twice weekly through grab samples. A minimum of five samples must be obtained during discharge—once at the beginning of discharge, once each at approximately 25%, 50% and 75% lagoon cell drawdown and once at discharge completion.

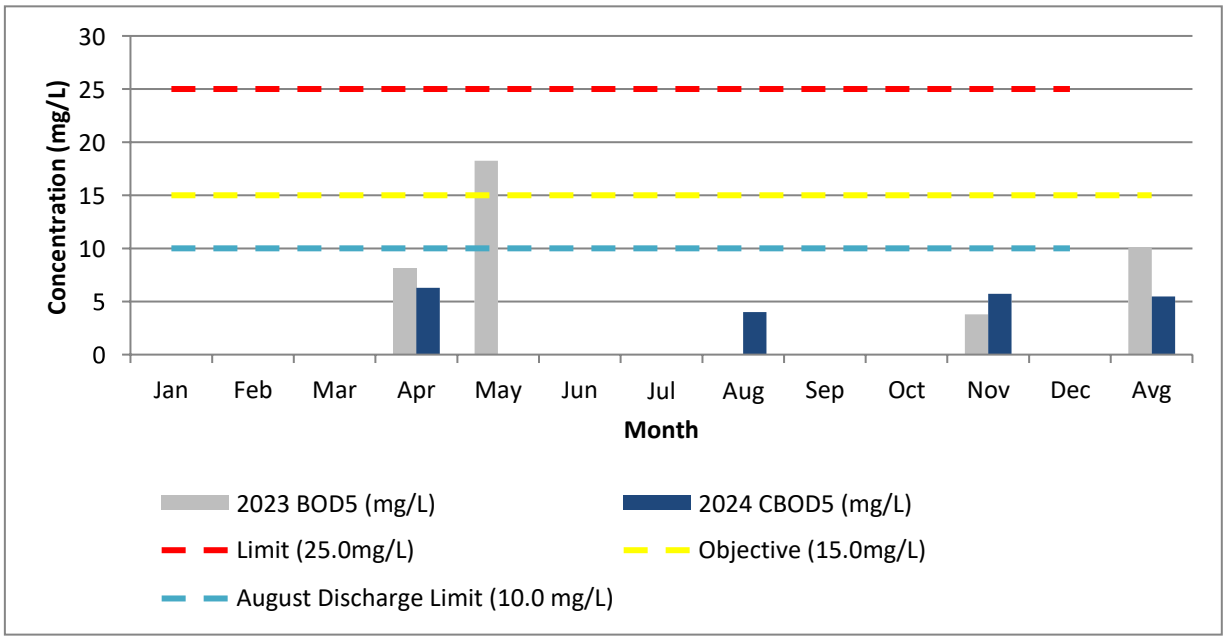
During the planned discharge in August, effluent samples were taken every three days and one sample was taken one week post-discharge. These sample results are included in the figures below along with regular effluent results. In addition, upstream and downstream river samples were taken throughout the planned discharge. River sample results showed no significant impact on the receiving stream.

Effluent is analyzed for $CBOD_5$, TSS, TP, Total Ammonia Nitrogen (TAN), TKN, Nitrite (NO_2), Nitrate (NO_3), E.coli, pH and temperature. The Parkhill Sewage Lagoon ECA specifies objectives for $CBOD_5$, TSS, and TP and limits for $CBOD_5$ and TSS. During the planned discharge, there were limits set for $CBOD_5$, TSS, TAN, E.coli and pH. For details on objective and limit exceedances, refer to 'Summary of Efforts Made to Achieve Design Objectives'.

Comparison to Compliance Limits and Objectives

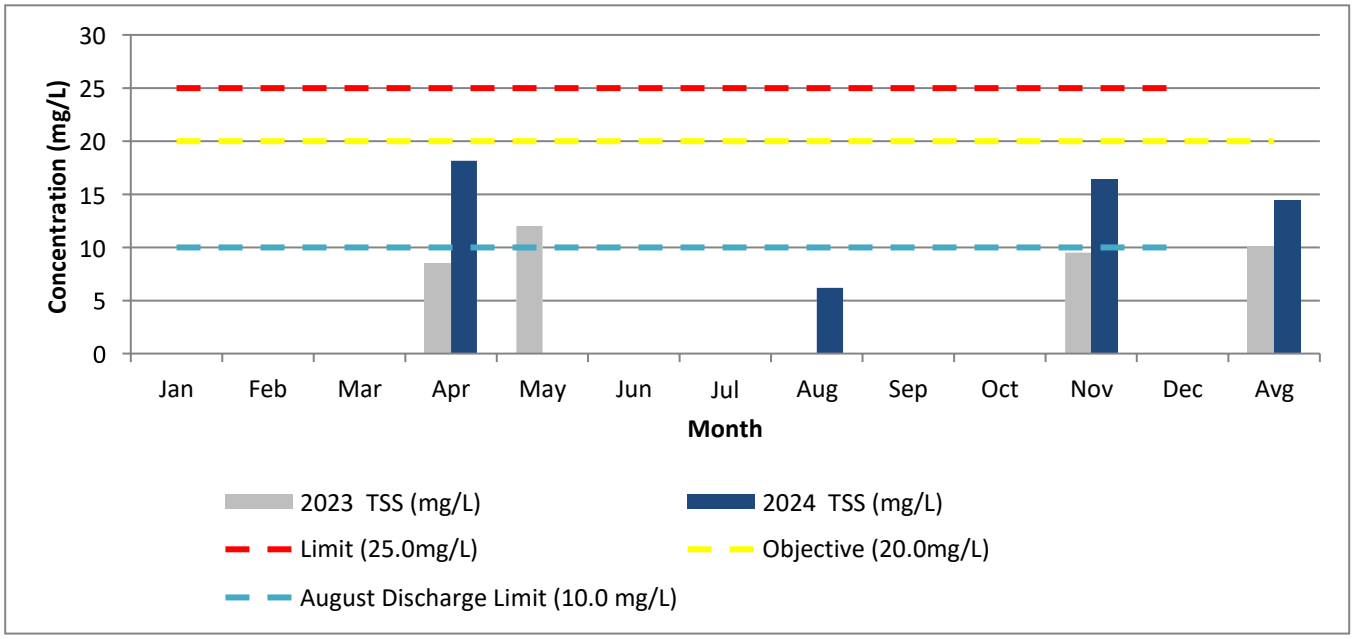
In 2024, the average effluent $CBOD_5$ concentration was 5.5 mg/L, a 46% decrease from 2023. Limits and objectives were met for both the planned and seasonal discharges. Refer to Figure 8 for a comparison of 2024 effluent CBOD5 concentrations to 2023 concentrations.

Figure 8: *Effluent $CBOD_5$ Concentrations*



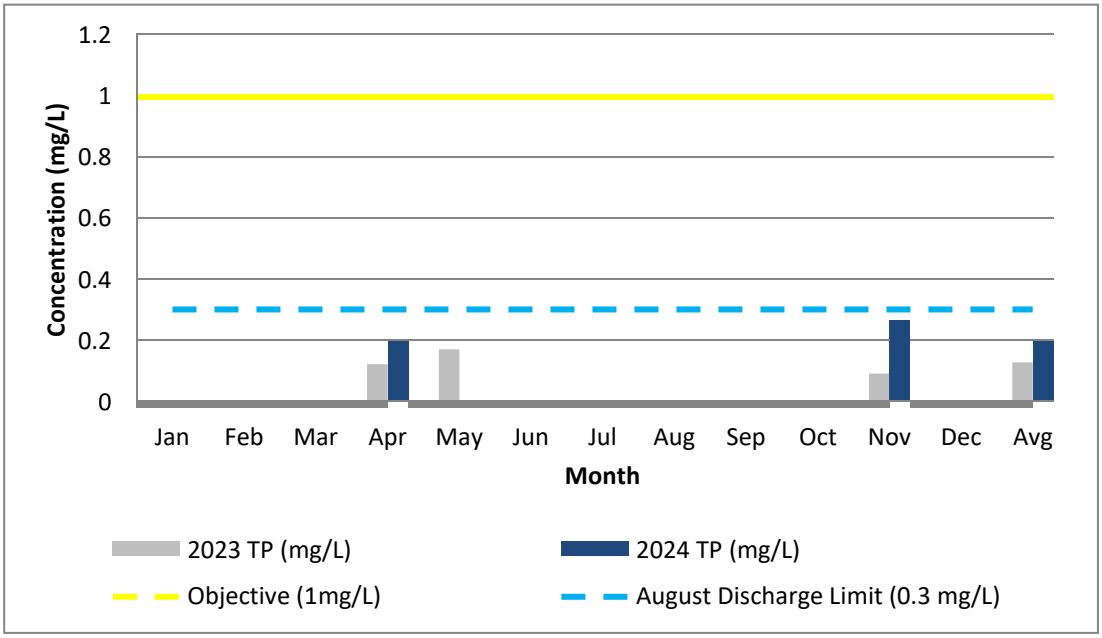
In 2024, the average effluent Total Suspended Solids concentration was 15 mg/L, a 45% increase from 2023. Limits and objectives were met for both the planned and seasonal discharges. Refer to Figure 9 for a comparison of 2024 effluent Total Suspended Solids concentrations to 2023 concentrations.

Figure 9*: Effluent TSS Concentrations*



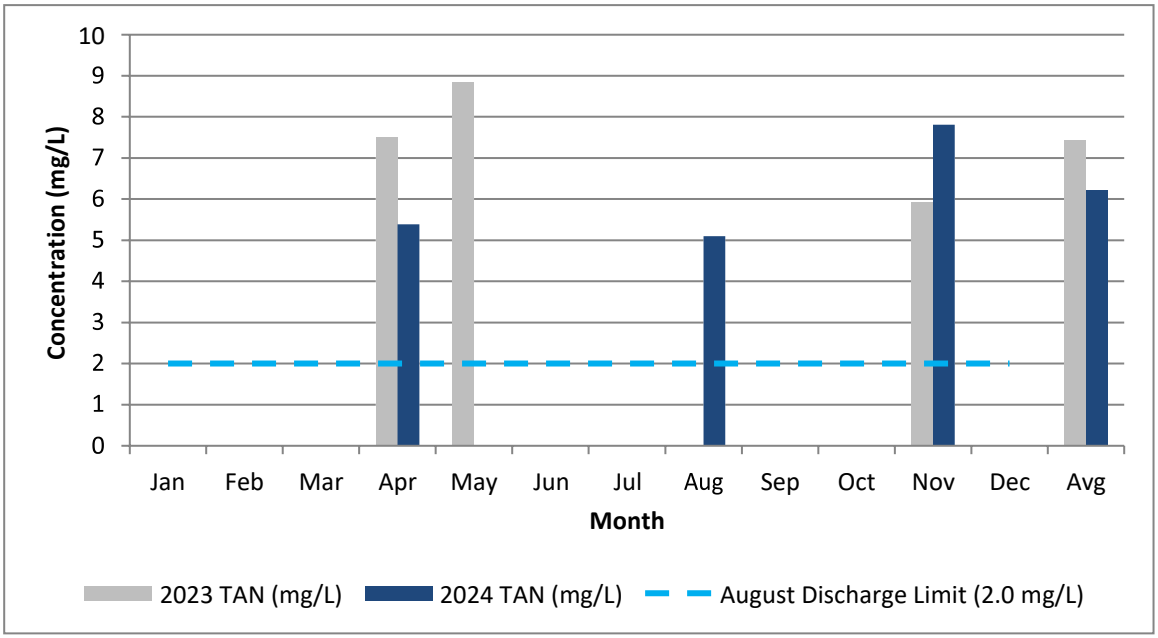
In 2024, the average effluent Total Phosphorus concentration was 0.18 mg/L, a 41% increase from 2023. The objective and planned discharge limit were met. Refer to Figure 10 for a comparison of 2024 effluent Total Phosphorus concentrations to 2023 concentrations.

Figure 10: *Effluent TP Concentrations*



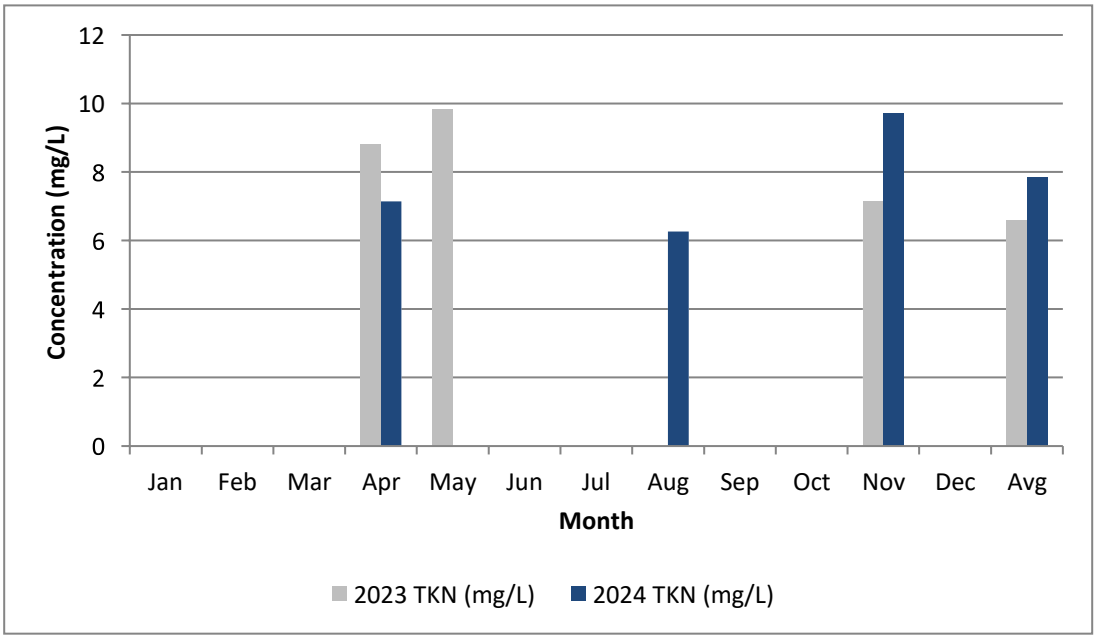
In 2024, the average effluent Total Ammonia Nitrogen was 6.21 mg/L, a 16% decrease from 2023. The August planned discharge limit was not met. To date this has not resulted in a non-compliance being issued by the MECP. Refer to Figure 11 for a comparison of 2024 effluent Total Ammonia Nitrogen concentrations to 2023 concentrations.

Figure 11: *Effluent TAN Concentrations*



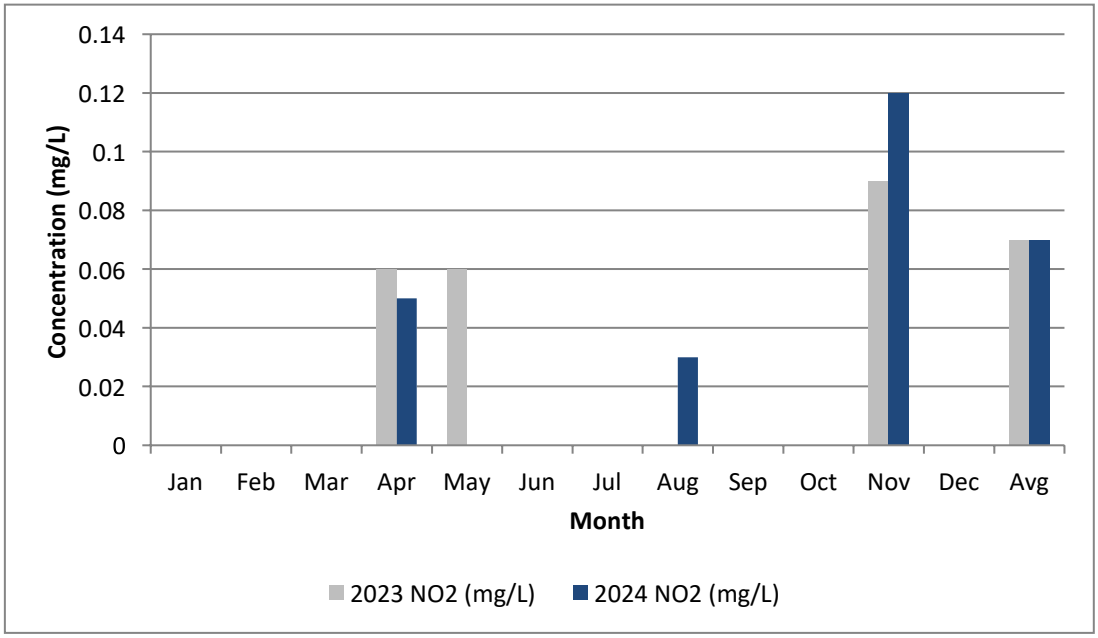
In 2024, the average effluent Total Kjeldahl Nitrogen was 7.85 mg/L, a 19% increase from 2023. Refer to Figure 12 for a comparison of 2024 effluent Total Kjeldahl Nitrogen concentrations to 2023 concentrations.

Figure 12: *Effluent TKN Concentrations*



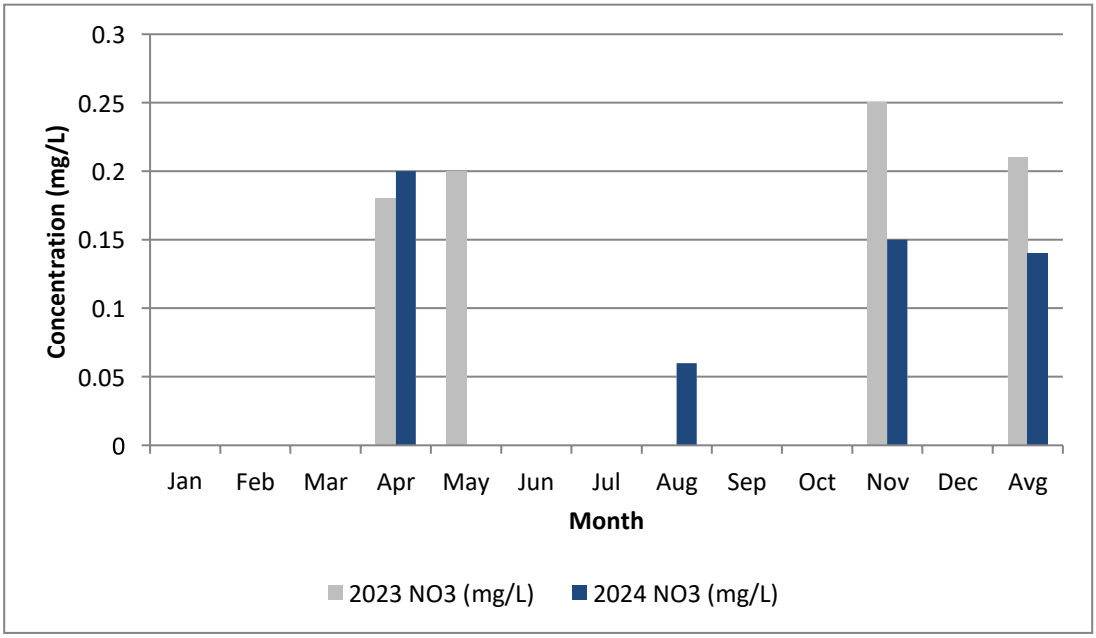
In 2024, the average effluent Nitrite was 0.07 mg/L, equal to the 2023 value. Refer to Figure 13 for a comparison of 2024 monthly effluent Nitrite concentrations to 2023 concentrations.

Figure 13: *Effluent NO_2 Concentrations*



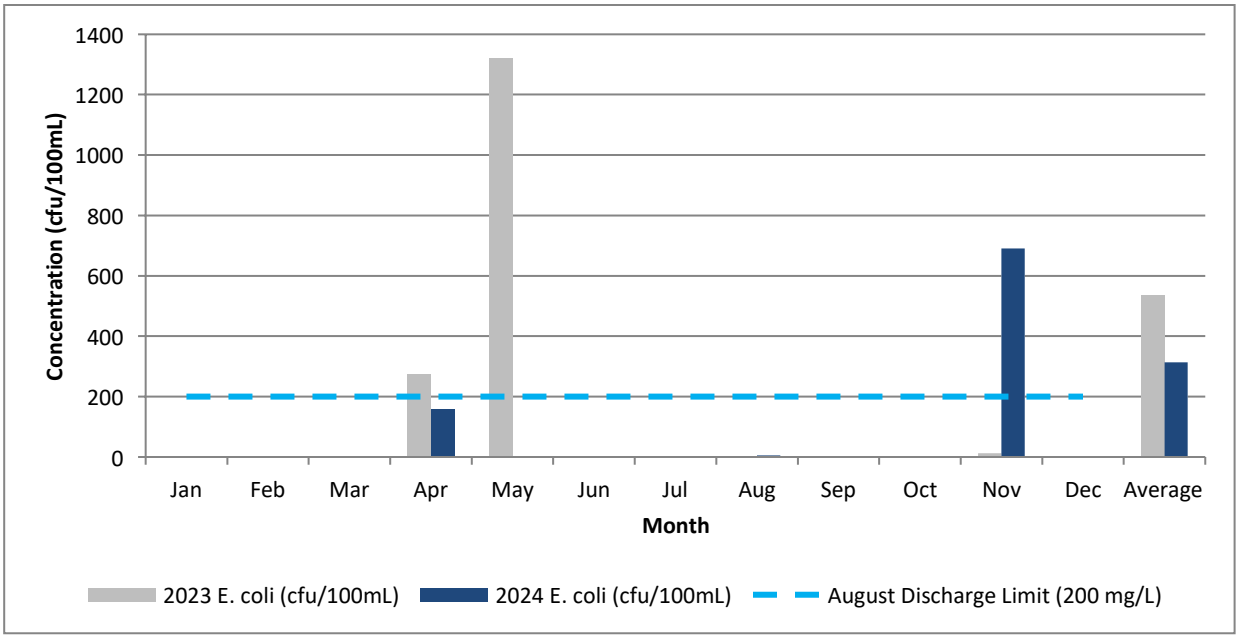
In 2024, the average effluent Nitrate was 0.14 mg/L, a 33% decrease from 2023. Refer to Figure 14 for a comparison of 2024 monthly effluent Nitrate concentrations to 2023 concentrations.

Figure 14: *Effluent NO_3 Concentrations*



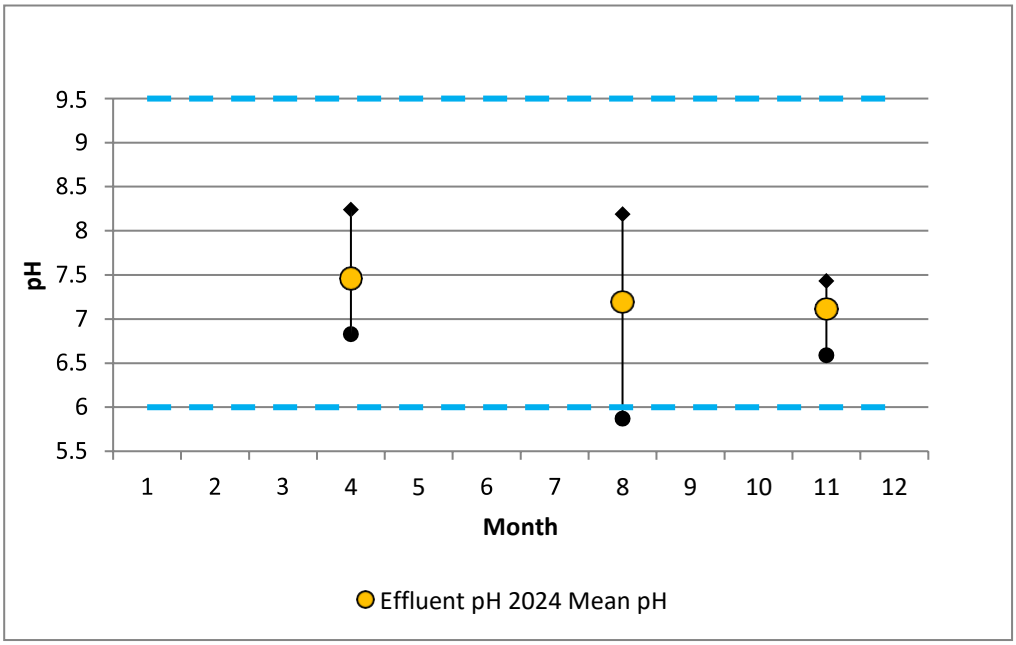
In 2024, the monthly geometric mean effluent E. coli concentration was 313 cfu/100mL, a 41% decrease from 2023. The limit for the planned discharge in August was met with the discharge average of 4.8 cfu/100 ml. Refer to Figure 15 for a comparison of 2024 monthly effluent E. coli concentrations to 2023 concentrations.

Figure 15: *Effluent E. coli Concentrations*



In 2024, pH in the Parkhill Sewage Lagoons final effluent ranged from 5.87 to 8.24. The minimum pH limit was not met during the planned discharge in August, however, no non-compliance has been issued by the MECP to date. Refer to Figure 16 for effluent pH values in 2024.

Figure 16: *Effluent pH Values*



Operating Problems and Corrective Actions

There was one non-compliance reported to the MECP on May 10, 2024. The spring discharge began five days too early as per the discharge period outlined in the ECA. Despite discharging early, there were no observed negative impacts on the receiving stream and ECA objectives and limits were met. To prevent this from reoccurring, the discharge periods were added to the sample calendar and discharge form.

The biggest challenge facing the Parkhill Sewage Lagoon and WWC system is capacity. Although the current facilities are performing well based on the current flows to the lagoon, the lagoon's capacity will be strained with new development. In August, 2024, biosolids were removed from the lagoon's south cell; biosolids from the north cell are planned to be removed in 2025. Biosolids removal will optimize capacity already present in the lagoon. As well, the ECA identifies proposed works for an upgraded sewage treatment plant in the future.

Another challenge is aging infrastructure, specifically within the collection system. Victoria Street Pumping Station has been identified as needing upgrades. Approval for funding for the design of this project is currently being sought by the Municipality of North Middlesex.

Capital and major maintenance recommendations were submitted by OCWA to the Municipality of North Middlesex. These recommendations address aging infrastructure and ongoing maintenance requirements for the Parkhill Sewage Lagoon and WWC system so that high quality effluent can continue to be produced. Items on the list for 2025 include:

- Lagoon dredging/biosolids removal of the north cell – Parkhill Lagoon

- Parkhill Lagoon upgrade design
- MCC panel upgrade – Victoria Street Sewage Pumping Station (SPS)
- HVAC upgrade - Victoria Street SPS
- Generator upgrade to relocate generator outside of Victoria Street SPS
- Roof condition assessment - Victoria Street SPS
- Pump replacement – Station Street SPS

Maintenance Activities

Preventative and corrective maintenance is assigned and monitored within the Workplace Management System (WMS) program. Refer to Appendix A for the 2024 maintenance summary. Refer to Table 2 for a list of major repairs and replacements that took place in 2024.

Table 2: *Major Maintenance*

Major Maintenance Wastewater
Pump Repair – Station Street Sewage Pumping Station
Semi-Annual Wet Well Cleaning
Biosolids Removal – South Cell of Parkhill Lagoon
South Cell Discharge Valve Replacement – Parkhill Lagoon

Effluent Quality Assurance

Effluent quality assurance is evaluated by monitoring parameters and changes throughout the facility's processes. Monthly raw samples are taken and submitted to an accredited lab for analysis and results are assessed by operational and compliance staff. Data from these tests provides valuable information as to the quality of raw influent. Lagoon cell content samples are also obtained prior to discharge. Information from both the raw monthly and lagoon content samples enables Operators to adjust the treatment process as needed prior to discharge to ensure effluent limits are met.

Lagoon cell contents are also submitted to Ontario Clean Water Agency's Essex Hub to perform a jar analysis to optimize coagulant dosage for batch dosing the lagoon prior to discharge. During discharge, operational and compliance staff assess lab reports from submitted effluent samples to ensure MECP limits and objectives are met.

In total there were 18 effluent monitoring samples collected in 2024. Refer to 'Comparison to Compliance Limits and Objectives' for details on effluent analysis.

Calibration Records

Pierce Services and Solutions Inc. calibrated the influent flow meter at the Victoria Street Pumping Station on June 13, 2024. The flow meter met the accuracy tolerance of being within 15% of the actual flow rate. Operational staff complete routine pH meter calibrations and verifications. Refer to Appendix B for 2024 Calibration Records.

Summary of Efforts Made to Achieve Design Objectives

The design objectives were met more 50% of the time for all parameters identified in the ECA. The facility is below 80% of its average daily flow rated capacity.

There were no objective or limit exceedances during seasonal discharge in 2024. For the planned discharge, the Total Ammonia Nitrogen (TAN) limit was not met throughout the discharge. The minimum limit for pH was not met on one occasion during the planned discharge. Difficulties in meeting these limits

were primarily due to reduced retention time, limited nitrification due to design and the warm summer temperatures. Refer to Table 3 for results. Discharging in the summer was an exception granted by the MECP due to the need for biosolids removal.

Table 3: *Summary of Objective Exceedances*

Date	Parameter	Concentration (mg/L) *except pH*	Limit (mg/L) *except pH*
August 21, 2024	TAN	3.7	2.0
August 23, 2024	TAN	4.3	2.0
August 26, 2024	TAN	5.3	2.0
August 27, 2024	TAN	5.8	2.0
August 28, 2024	TAN	6.4	2.0
August 21, 2024	pH	5.97	6.0

Sludge Generation

In 2024, there was an estimated 218 m^3 of sludge generated at the Parkhill Sewage Lagoon. Sludge generation in 2025 is approximated to be 250 m^3.

In August, 2024, 4815 dry tonnes (22 630 m^3 at 20% solids) of sludge was removed from the south cell for maintenance. This sludge was land applied to NASM Sites including: 61695, 61696, and 61712. Dredging of the north cell lagoon is scheduled for 2025.

Refer to Table 4 for sludge volumes for the Parkhill Lagoon from 2020 to 2024. Data for 2020 was obtained through a sludge survey. In the interim years, sludge volumes were estimated based on the initial volume, incoming raw sewage, and in the case of the south cell in 2024, biosolids removed.

Table 4*: Sludge Volumes in the Parkhill Lagoon*

Parkhill Lagoon	2020 Sludge Volume (m^3)	2021 Sludge Volume (m^3)	2022 Sludge Volume (m^3)	2023 Sludge Volume (m^3)	2024 Sludge Volume (m^3)
North Cell	20 802	21 017	21 232	21 447	21 665
South Cell	37 568	37 783	37 998	38 213	15 801 (post-biosolids removal)

Complaints

There were no complaints for the Parkhill Sewage Lagoon or the WWC system in 2024.

Bypass, Overflows, Spills & Abnormal Discharge Events

The ECA requires additional daily sampling when the lagoons are operated outside of normal operating conditions or a bypass or overflow event occurs. No overflows, bypasses, or spills occurred in 2024.

Notice of Modification to the Works

A Notice of Modification of Sewage Works was completed on August 2, 2024. This notification was for sludge removal from the Parkhill Lagoon to an approved site.

Summary of Efforts made to achieve conformance with F-5-1

Parkhill has a separated collection system, therefore a Pollution Prevention Control Program is not required to be established or maintained.

There is one designed overflow in the Parkhill collection system at the Victoria Street Pumping Station. To accommodate growth in the community, this pumping station has been identified as needing upgrades. The design of these upgrades is scheduled to occur in 2025. As well, the Municipality of North Middlesex plans to implement a sewer use bylaw in 2025 to control connections to the collection system. These maintenance activities contribute to the reduction and elimination of future overflow and bypass events.

Appendix A

Maintenance Summary

				Workorder Details			
WO #	Asset ID	Asset Description	Location Description	Work Order Description	Status	Schedule Start	Actual Finsh
3714296	0000068791	LAGOON CELL 02 NORTH PARKHILL	6001, Parkhill WWL & CS	Lagoon Cell North Inspection/ Service (1m/6m/1y) 6001	CLOSE	1/1/24 12:00 AM	1/24/24 07:39 AM
3714306	0000068790	LAGOON CELL 01 SOUTH PARKHILL	6001, Parkhill WWL & CS	Lagoon Cell South Inspection/ Service (1m/6m/1y) 6001	CLOSE	1/1/24 12:00 AM	1/24/24 07:40 AM
3714316	0000154310	PANEL ALARM/ DIALER VICTORIA ST	6001, Parkhill WWL & CS	Alarn Dialer Verbatim Testing (1m) 6001	CLOSE	1/1/24 12:00 AM	1/10/24 03:19 PM
3715050	0000068767	GENERATOR ELECTRIC VICTORIA	6001, Victoria St Pumping Station	Engine Diesel Victoria PS Insp/Test (1m) 6001	CLOSE	1/1/24 12:00 AM	1/10/24 03:18 PM
3715130			6001, Parkhill WWL & CS	WHMIS/MSDS/NSF Review and Update (1y) 6001	CLOSE	1/1/24 12:00 AM	3/1/24 08:34 AM
3736223			6001, Parkhill WWL & CS	Fire Protection Insp/Service (1m) - 6001	CLOSE	1/1/24 12:00 AM	1/9/24 02:28 PM
3748129			6001, Parkhill WWL & CS	RP03 Annual Report ECA (1y) 6001	CLOSE	1/1/24 12:00 AM	3/11/24 09:37 AM
3760165			6001, Parkhill WWL & CS	WSER Annual Reporting (1y) 6001	CLOSE	1/6/24 12:00 AM	2/9/24 01:46 PM
3763292			6001, Station St Pumping Station	Station St. SPS Control Panel Power Failure, 6001	CLOSE		2/1/24 12:54 PM
3769952	0000068791	LAGOON CELL 02 NORTH PARKHILL	6001, Parkhill WWL & CS	Lagoon Cell North Inspection/ Service (1m/6m/1y) 6001	CLOSE	2/1/24 12:00 AM	2/22/24 07:27 AM
3769962	0000068790	LAGOON CELL 01 SOUTH PARKHILL	6001, Parkhill WWL & CS	Lagoon Cell South Inspection/ Service (1m/6m/1y) 6001	CLOSE	2/1/24 12:00 AM	2/22/24 07:28 AM
3769972	0000154310	PANEL ALARM/ DIALER VICTORIA ST	6001, Parkhill WWL & CS	Alarn Dialer Verbatim Testing (1m) 6001	CLOSE	2/1/24 12:00 AM	2/13/24 11:38 AM
3770143			6001, Parkhill WWL & CS	Spill Kit Inspect Victoria St P.S. (6m) 6001	CLOSE	2/1/24 12:00 AM	2/9/24 12:48 PM
3770609	0000068767	GENERATOR ELECTRIC VICTORIA	6001, Victoria St Pumping Station	Engine Diesel Victoria PS Insp/Test (1m) 6001	CLOSE	2/1/24 12:00 AM	2/13/24 11:36 AM
3785694			6001, Parkhill WWL & CS	Fire Protection Insp/Service (1m) - 6001	CLOSE	2/1/24 12:00 AM	2/9/24 07:32 AM
3812205	0000068790	LAGOON CELL 01 SOUTH PARKHILL	6001, Parkhill WWL & CS	Lagoon Cell South Inspection/ Service (1m/6m/1y) 6001	CLOSE	3/1/24 12:00 AM	3/28/24 12:01 PM
3812215	0000068772	METER FLOW VICTORIA ST PS	6001, Victoria St Pumping Station	Meter Flow Victoria St Ps Insp/ Service (1y) 6001	CLOSE	3/1/24 12:00 AM	3/26/24 07:35 AM
3812221	0000068779	METER LEVEL VICTORIA ST PS	6001, Victoria St Pumping Station	Meter Level Victoria St Ps Insp/ Service (1y) 6001	CLOSE	3/1/24 12:00 AM	3/26/24 07:36 AM
3812226	0000154310	PANEL ALARM/ DIALER VICTORIA ST	6001, Parkhill WWL & CS	Alarn Dialer Verbatim Testing (1m) 6001	CLOSE	3/1/24 12:00 AM	3/15/24 08:47 AM
3812890	0000068767	GENERATOR ELECTRIC VICTORIA	6001, Victoria St Pumping Station	Engine Diesel Victoria PS Insp/Test (1m) 6001	CLOSE	3/1/24 12:00 AM	3/15/24 08:44 AM
3829294			6001, Parkhill WWL & CS	Fire Protection Insp/Service (1m) - 6001	CLOSE	3/1/24 12:00 AM	3/28/24 11:54 AM
3840221			6001, Victoria St Pumping Station	Health and Safety Inspections (1M) 6001	CLOSE	3/1/24 12:00 AM	3/26/24 07:37 AM
3857351	0000068790	LAGOON CELL 01 SOUTH PARKHILL	6001, Parkhill WWL & CS	Lagoon Cell South Inspection/ Service (1m/6m/1y) 6001	CLOSE	4/1/24 12:00 AM	4/4/24 07:41 AM
3857358	0000154310	PANEL ALARM/ DIALER VICTORIA ST	6001, Parkhill WWL & CS	Alarn Dialer Verbatim Testing (1m) 6001	CLOSE	4/1/24 12:00 AM	4/23/24 03:47 PM
3857545			6001, Parkhill WWL & CS	Lagoon Treatment(Batch Dosing) (6m) 6001	CLOSE	4/1/24 12:00 AM	4/12/24 07:57 AM
3857556			6001, Parkhill WWL & CS	Air Relief Chamber Inspection (6m) 6001	CLOSE	4/1/24 12:00 AM	4/26/24 07:41 AM
3858034	0000068767	GENERATOR ELECTRIC VICTORIA	6001, Victoria St Pumping Station	Engine Diesel Victoria PS Insp/Test (1m) 6001	CLOSE	4/1/24 12:00 AM	4/23/24 03:45 PM
3858060			6001, Parkhill WWL & CS	OG35 FEP Review (1y) 6001	CLOSE	4/1/24 12:00 AM	4/16/24 10:08 AM
3877206			6001, Parkhill WWL & CS	Fire Protection Insp/Service (1m) - 6001	CLOSE	4/1/24 12:00 AM	4/16/24 09:56 AM
3890664			6001, Parkhill WWL & CS	Lagoon Treatment (Contents Sampling) (6m) 6001	CLOSE	4/1/24 12:00 AM	4/12/24 07:55 AM
3890675			6001, Parkhill WWL & CS	Lagoon Biosolids Sampling (1y) 6001	CLOSE	4/1/24 12:00 AM	5/28/24 02:59 PM
3891880			6001, Parkhill WWL & CS	Parkhill Lagoon Inspection (6m) - 6001	CLOSE	4/1/24 12:00 AM	4/30/24 07:42 AM
3891892			6001, Victoria St Pumping Station	Health and Safety Inspections (1M) 6001	CLOSE	4/1/24 12:00 AM	4/16/24 02:31 PM
3909516	0000068790	LAGOON CELL 01 SOUTH PARKHILL	6001, Parkhill WWL & CS	Lagoon Cell South Inspection/ Service (1m/6m/1y) 6001	CLOSE	5/1/24 12:00 AM	5/2/24 12:40 PM

3909526	0000154310	PANEL ALARM/ DIALER VICTORIA ST	6001, Parkhill WWL & CS	Alarn Dialer Verbatim Testing (1m) 6001	CLOSE	5/1/24 12:00 AM	5/13/24 11:46 AM
3910191	0000068767	GENERATOR ELECTRIC VICTORIA	6001, Victoria St Pumping Station	Engine Diesel Victoria PS Insp/Test (1m) 6001	CLOSE	5/1/24 12:00 AM	5/15/24 12:07 PM
3925668			6001, Parkhill WWL & CS	Wet Well Inspection (6m) 6001	CLOSE	5/1/24 12:00 AM	5/7/24 11:18 AM
3939952			6001, Victoria St Pumping Station	Health and Safety Inspections (1M) 6001	CLOSE	5/1/24 12:00 AM	5/7/24 11:17 AM
3950211	0000068777	PANEL CONTROL RAW SEWAGE PUMPS	6001, Victoria St Pumping Station	Programmed Level Transducer / anchored float hanger 6001	CLOSE		5/15/24 02:16 PM
3958045	0000068790	LAGOON CELL 01 SOUTH PARKHILL	6001, Parkhill WWL & CS	Lagoon Cell South Inspection/ Service (1m/6m/1y) 6001	CLOSE	6/1/24 12:00 AM	6/21/24 02:00 PM
3958055	0000154310	PANEL ALARM/ DIALER VICTORIA ST	6001, Parkhill WWL & CS	Alarn Dialer Verbatim Testing (1m) 6001	CLOSE	6/1/24 12:00 AM	6/21/24 02:01 PM
3958883	0000068767	GENERATOR ELECTRIC VICTORIA	6001, Victoria St Pumping Station	Engine Diesel Victoria PS Insp/Test (1m) 6001	CLOSE	6/1/24 12:00 AM	6/21/24 02:02 PM
3989792			6001, Victoria St Pumping Station	Health and Safety Inspections (1M) 6001	CLOSE	6/1/24 12:00 AM	6/21/24 02:04 PM
4007730	0000068790	LAGOON CELL 01 SOUTH PARKHILL	6001, Parkhill WWL & CS	Lagoon Cell South Inspection/ Service (1m/6m/1y) 6001	CLOSE	7/1/24 12:00 AM	7/24/24 07:40 AM
4007740	0000154310	PANEL ALARM/ DIALER VICTORIA ST	6001, Parkhill WWL & CS	Alarn Dialer Verbatim Testing (1m) 6001	CLOSE	7/1/24 12:00 AM	7/15/24 02:27 PM
4008385	0000068767	GENERATOR ELECTRIC VICTORIA	6001, Victoria St Pumping Station	Engine Diesel Victoria PS Insp/Test (1m) 6001	CLOSE	7/1/24 12:00 AM	7/15/24 02:25 PM
4038519			6001, Victoria St Pumping Station	Health and Safety Inspections (1M) 6001	CLOSE	7/1/24 12:00 AM	7/12/24 07:42 AM
4056734	0000068790	LAGOON CELL 01 SOUTH PARKHILL	6001, Parkhill WWL & CS	Lagoon Cell South Inspection/ Service (1m/6m/1y) 6001	CLOSE	8/1/24 12:00 AM	8/30/24 12:25 PM
4056744	0000154310	PANEL ALARM/ DIALER VICTORIA ST	6001, Victoria St Pumping Station	Alarn Dialer Verbatim Testing (1m) 6001	CLOSE	8/1/24 12:00 AM	8/23/24 07:41 AM
4056922			6001, Parkhill WWL & CS	Spill Kit Inspect Victoria St P.S. (6m) 6001	CLOSE	8/1/24 12:00 AM	8/7/24 03:02 PM
4056924			6001, Parkhill WWL & CS	SDS Review - (1y) 6001	CLOSE	8/1/24 12:00 AM	8/26/24 02:28 PM
4084010			6001, Victoria St Pumping Station	Health and Safety Inspections (1M) 6001	CLOSE	8/1/24 12:00 AM	8/23/24 07:40 AM
4101431	0000068790	LAGOON CELL 01 SOUTH PARKHILL	6001, Parkhill WWL & CS	Lagoon Cell South Inspection/ Service (1m/6m/1y) 6001	CLOSE	9/1/24 12:00 AM	9/25/24 01:33 PM
4101441	0000154310	PANEL ALARM/ DIALER VICTORIA ST	6001, Victoria St Pumping Station	Alarn Dialer Verbatim Testing (1m) 6001	CLOSE	9/1/24 12:00 AM	9/20/24 12:26 PM
4101446	0000068765	PUMP SUBMERSIBLE RAW SEWAGE 01	6001, Station St Pumping Station	Pump Subm 01 Station St Ps Insp/ Service (1y) 6001	CLOSE	9/1/24 12:00 AM	9/20/24 12:15 PM
4101455	0000068775	PUMP SUBMERSIBLE RAW SEWAGE 01	6001, Victoria St Pumping Station	Pump Subm 01 Victoria St Ps Insp/ Service (1y) 6001	CLOSE	9/1/24 12:00 AM	9/20/24 12:18 PM
4101464	0000068766	PUMP SUBMERSIBLE RAW SEWAGE 02	6001, Station St Pumping Station	Pump Subm 02 Station St Ps Insp/ Service (1y) 6001	CLOSE	9/1/24 12:00 AM	9/20/24 12:20 PM
4101473	0000068776	PUMP SUBMERSIBLE RAW SEWAGE 02	6001, Victoria St Pumping Station	Pump Subm 02 Victoria St Ps Insp/ Service (1y) 6001	CLOSE	9/1/24 12:00 AM	9/20/24 12:22 PM
4132613			6001, Victoria St Pumping Station	Health and Safety Inspections (1M) 6001	CLOSE	9/1/24 12:00 AM	9/13/24 07:41 AM
4152308	0000068790	LAGOON CELL 01 SOUTH PARKHILL	6001, Parkhill WWL & CS	Lagoon Cell South Inspection/ Service (6m/1y) 6001	CLOSE	10/1/24 12:00 AM	
4152318	0000154310	PANEL ALARM/ DIALER VICTORIA ST	6001, Victoria St Pumping Station	Alarn Dialer Verbatim Testing (1m) 6001	CLOSE	10/1/24 12:00 AM	10/22/24 11:19 AM
4152483			6001, Parkhill WWL & CS	Sludge Depth Testing (1y) 6001	CLOSE	10/1/24 12:00 AM	11/29/24 08:44 AM
4152487			6001, Parkhill WWL & CS	Lagoon Treatment(Batch Dosing) (6m) 6001	CLOSE	10/1/24 12:00 AM	
4152498			6001, Parkhill WWL & CS	Air Relief Chamber Inspection (6m) 6001	CLOSE	10/1/24 12:00 AM	11/7/24 03:03 PM
4182481			6001, Parkhill WWL & CS	Lagoon Treatment (Contents Sampling) (6m) 6001	CLOSE	10/1/24 12:00 AM	
4183765			6001, Parkhill WWL & CS	Parkhill Lagoon Inspection (6m) - 6001	CLOSE	10/1/24 12:00 AM	11/7/24 03:06 PM
4183777			6001, Victoria St Pumping Station	Health and Safety Inspections (1M) 6001	CLOSE	10/1/24 12:00 AM	10/22/24 10:55 AM
4201748	0000154310	PANEL ALARM/ DIALER VICTORIA ST	6001, Victoria St Pumping Station	Alarn Dialer Verbatim Testing (1m) 6001	CLOSE	11/1/24 12:00 AM	11/1/24 11:47 AM
4202551			6001, Parkhill WWL & CS	Operation SOP Manual Review and Update (2y) 6001	CLOSE	11/1/24 12:00 AM	12/3/24 08:45 AM
4214453			6001, Parkhill WWL & CS	Wet Well Inspection (6m) 6001	CLOSE	11/1/24 12:00 AM	11/7/24 03:01 PM

4227462			6001, Victoria St Pumping Station	Health and Safety Inspections (1M) 6001	CLOSE	11/1/24 12:00 AM	11/14/24 07:40 AM
4243682	0000154310	PANEL ALARM/ DIALER VICTORIA ST	6001, Victoria St Pumping Station	Alarn Dialer Verbatim Testing (1m) 6001	COMP	12/1/24 12:00 AM	
4268895			6001, Victoria St Pumping Station	Health and Safety Inspections (1M) 6001	COMP	12/1/24 12:00 AM	

Appendix B
Calibration Records

Pierce Services
& S o l u t i o n s Inc.

519.820.4853 Fax 519.824.9402

Instrument Verification Sheet

Client Name: Ontario Clean Water Agency

Date: June 13, 2024

Equipment Description: Level Transmitter

Assigned Number: LIT 101

Area Located: Victoria Street SPS Parkhill

AMMS Number: N/A

Instrument Data

Manufacturer: Milltronics

Model Number: MultiRanger 200

Type:Ultrasonic

Serial Number; PBD/R5260002

Range: 0-5.610 m

Accuracy: +/- 5%

Method Of Calibration: Standard Verification

Application: Waste Water

Calibration Data

Input %	Input	As Found	As Left	Pass/Fail
	866mA	.79m	.75m	Pass

Confirmed Run Mode: ✓

Placed back in service: ✓

Comments :

Checked By: Greg Pierce CCST

Appendix C
Monitoring Data

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Performance Assessment Report

From 1/1/2024 to 12/31/2024 11:59:59 PM

6001 PARKHILL WASTEWATER TREATMENT LAGOON 110002461

	1 / 2024	2/ 2024	3/ 2024	4/ 2024	5/ 2024	6/ 2024	7/ 2024	8/ 2024	9/ 2024	10/ 2024	11/ 2024	12/ 2024	<--Total-->	<--Avg-->	<--Max-->	<-Criteria->
Flows																
Raw Flow: Total - Raw Sewage m³/d	34,917.00	17,820.00	21,981.00	22,830.00	19,034.00	14,915.00	21,612.00	17,098.00	15,766.00	13,892.00	14,578.00	25,519.00	239,962.00			0.00
Raw Flow: Avg - Raw Sewage m³/d	1,126.35	614.48	709.06	761.00	614.00	497.17	697.16	551.55	525.53	448.13	485.93	823.19		655.63		1,150.00
Raw Flow: Max - Raw Sewage m³/d	2,123.00	963.00	1,055.00	1,467.00	768.00	570.00	1,869.00	964.00	760.00	585.00	580.00	2,047.00			2,123.00	0.00
Raw Flow: Count - Raw Sewage m³/d	31.00	29.00	31.00	30.00	31.00	30.00	31.00	31.00	30.00	31.00	30.00	31.00	366.00			0.00
Eff. Flow: Total - North Cell Final Effluent m³/d	0.00	0.00	0.00	83,376.00	0.00	0.00	0.00	0.00	0.00	0.00	78,118.10	0.00	161,494.10			0.00
Eff. Flow: Total - South Cell Final Effluent m³/d	0.00	0.00	0.00	62,657.50	0.00	0.00	0.00	35,496.50	0.00	0.00	0.00	0.00	98,154.00			0.00
Eff. Flow: Total - Combined Cell Final Effluent m³/d	0.00	0.00	0.00	146,038.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	146,038.50			0.00
Eff. Flow: Avg - North Cell Final Effluent m³/d	0.00	0.00	0.00	5,211.00	0.00	0.00	0.00	0.00	0.00	0.00	4,595.18	0.00		4,893.76		
Eff. Flow: Avg - South Cell Final Effluent m³/d	0.00	0.00	0.00	4,177.17	0.00	0.00	0.00	4,437.06	0.00	0.00	0.00	0.00		4,267.57		
Eff. Flow: Avg - Combined Cell Final Effluent m³/d	0.00	0.00	0.00	9,127.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		9,127.41		
Eff. Flow: Max - North Cell Final Effluent m³/d	0.00	0.00	0.00	15,684.50	0.00	0.00	0.00	0.00	0.00	0.00	16,510.00	0.00			16,510.00	0.00
Eff. Flow: Max - South Cell Final Effluent m³/d	0.00	0.00	0.00	16,510.00	0.00	0.00	0.00	6,604.00	0.00	0.00	0.00	0.00			16,510.00	0.00
Eff. Flow: Max - Combined Cell Final Effluent m³/d	0.00	0.00	0.00	30,543.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			30,543.50	0.00
Eff Flow: Count - North Cell Final Effluent m³/d	0.00	0.00	0.00	16.00	0.00	0.00	0.00	0.00	0.00	0.00	17.00	0.00	33.00			0.00
Eff Flow: Count - South Cell Final Effluent m³/d	0.00	0.00	0.00	15.00	0.00	0.00	0.00	8.00	0.00	0.00	0.00	0.00	23.00			0.00
Eff Flow: Count - Combined Cell Final Effluent m³/d	0.00	0.00	0.00	16.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.00			0.00
Carbonaceous Biochemical Oxygen Demand: CBOD																
Eff: Avg cBOD5 - North Cell Final Effluent mg/L	0.00	0.00	0.00	< 4.00	0.00	0.00	0.00	0.00	0.00	0.00	< 5.71	0.00		< 4.92	< 5.71	
Eff: Avg cBOD5 - South Cell Final Effluent mg/L	0.00	0.00	0.00	< 9.33	0.00	0.00	0.00	< 4.00	0.00	0.00	0.00	0.00		< 6.91	< 9.33	
Eff: Avg cBOD5 - Combined Cell Final Effluent mg/L	0.00	0.00	0.00	< 6.29	0.00	0.00	0.00	< 4.00	0.00	0.00	< 5.71	0.00		< 5.47	< 6.29	25.00
Eff: # of samples of cBOD5 - North Cell Final Effluent	0.00	0.00	0.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.00	13.00			0.00
Eff: # of samples of cBOD5 - South Cell Final Effluent	0.00	0.00	0.00	6.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	11.00			0.00
Eff: # of samples of cBOD5 - Combined Cell Final Effluent	0.00	0.00	0.00	7.00	0.00	0.00	0.00	5.00	0.00	0.00	7.00	0.00	19.00			0.00
Biochemical Oxygen Demand: BOD5																
Raw: Avg BOD5 - Raw Sewage mg/L	138.00	138.00	373.00	302.00	166.00	136.00	305.00	245.00	177.00	136.00	240.00	164.00		210.00	373.00	0.00
Raw: # of samples of BOD5 - Raw Sewage	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	12.00			0.00
Total Suspended Solids: TSS																
Raw: Avg TSS - Raw Sewage mg/L	90.00	82.00	208.00	113.00	237.00	123.00	176.00	293.00	112.00	94.00	129.00	117.00		147.83	293.00	0.00
Raw: # of samples of TSS - Raw Sewage	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	12.00			0.00
Eff: Avg TSS - North Cell Final Effluent mg/L	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	16.43	0.00		13.46	16.43	
Eff: Avg TSS - South Cell Final Effluent mg/L	0.00	0.00	0.00	26.33	0.00	0.00	0.00	6.20	0.00	0.00	0.00	0.00		17.18	26.33	
Eff: Avg TSS - Combined Cell Final Effluent mg/L	0.00	0.00	0.00	18.17	0.00	0.00	0.00	6.20	0.00	0.00	16.43	0.00		14.47	18.17	25.00
Eff: # of samples of TSS - North Cell Final Effluent	0.00	0.00	0.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.00	13.00			0.00
Eff: # of samples of TSS - South Cell Final Effluent	0.00	0.00	0.00	6.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	11.00			0.00
Eff: # of samples of TSS - Combined Cell Final Effluent	0.00	0.00	0.00	12.00	0.00	0.00	0.00	5.00	0.00	0.00	7.00	0.00	24.00			0.00
Percent Removal: TSS - North Cell Final Effluent %	0.00	0.00	0.00	91.15	0.00	0.00	0.00	0.00	0.00	0.00	87.26	0.00			91.15	0.00
Percent Removal: TSS - South Cell Final Effluent %	0.00	0.00	0.00	76.70	0.00	0.00	0.00	97.88	0.00	0.00	0.00	0.00			97.88	0.00
Total Phosphorus: TP																
Raw: Avg TP - Raw Sewage mg/L	2.68	3.60	4.59	5.37	5.09	4.75	6.03	6.29	5.43	6.30	7.24	5.69		5.26	7.24	0.00
Raw: # of samples of TP - Raw Sewage	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	12.00			0.00
Eff: Avg TP - North Cell Final Effluent mg/L	0.00	0.00	0.00	< 0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00		< 0.20	< 0.26	
Eff: Avg TP - South Cell Final Effluent mg/L	0.00	0.00	0.00	0.23	0.00	0.00	0.00	< 0.04	0.00	0.00	0.00	0.00		0.14	0.23	
Eff: Avg TP - Combined Cell Final Effluent mg/L	0.00	0.00	0.00	< 0.18	0.00	0.00	0.00	< 0.04	0.00	0.00	0.26	0.00		< 0.18	< 0.26	1.00
Eff: # of samples of TP - North Cell Final Effluent	0.00	0.00	0.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.00	13.00			0.00
Eff: # of samples of TP - South Cell Final Effluent	0.00	0.00	0.00	6.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	11.00			0.00
Eff: # of samples of TP - Combined Cell Final Effluent	0.00	0.00	0.00	12.00	0.00	0.00	0.00	5.00	0.00	0.00	7.00	0.00	24.00			0.00
Percent Removal: TP - North Cell Final Effluent %	0.00	0.00	0.00	97.58	0.00	0.00	0.00	0.00	0.00	0.00	96.39	0.00			97.58	0.00
Percent Removal: TP - South Cell Final Effluent %	0.00	0.00	0.00	95.69	0.00	0.00	0.00	99.36	0.00	0.00	0.00	0.00			99.36	0.00
Nitrogen Series																
Raw: Avg TKN - Raw Sewage mg/L	29.00	33.90	50.70	50.40	43.20	44.70	53.40	50.20	48.90	54.90	67.80	52.80		48.33	67.80	0.00
Raw: # of samples of TKN - Raw Sewage	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	12.00			0.00
Eff: Avg TAN - North Cell Final Effluent mg/L	0.00	0.00	0.00	4.02	0.00	0.00	0.00	0.00	0.00	0.00	7.81	0.00		6.06	7.81	
Eff: Avg TAN - South Cell Final Effluent mg/L	0.00	0.00	0.00	6.73	0.00	0.00	0.00	5.10	0.00	0.00	0.00	0.00		5.99	6.73	
Eff: Avg TAN - Combined Cell Final Effluent mg/L	0.00	0.00	0.00	5.39	0.00	0.00	0.00	5.10	0.00	0.00	7.81	0.00		6.21	7.81	

Performance Assessment Report

Eff: # of samples of TAN - North Cell Final Effluent	0.00	0.00	0.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.00	13.00			0.00
Eff: # of samples of TAN - South Cell Final Effluent	0.00	0.00	0.00	6.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	11.00			0.00
Eff: # of samples of TAN - Combined Cell Final Effluent	0.00	0.00	0.00	12.00	0.00	0.00	0.00	5.00	0.00	0.00	7.00	0.00	24.00			0.00
Eff: Avg NO3-N - Combined Cell Final Effluent mg/L	0.00	0.00	0.00	< 0.21	0.00	0.00	0.00	< 0.06	0.00	0.00	< 0.15	0.00		< 0.14	< 0.21	0.00
Eff: # of samples of NO3-N - Combined Cell Final Effluent	0.00	0.00	0.00	7.00	0.00	0.00	0.00	5.00	0.00	0.00	7.00	0.00	19.00			0.00
Eff: Avg NO2-N - Combined Cell Final Effluent mg/L	0.00	0.00	0.00	< 0.05	0.00	0.00	0.00	< 0.03	0.00	0.00	0.12	0.00		< 0.07	< 0.12	0.00
Eff: # of samples of NO2-N - Combined Cell Final Effluent	0.00	0.00	0.00	7.00	0.00	0.00	0.00	5.00	0.00	0.00	7.00	0.00	19.00			0.00

Disinfection

Eff: GMD E. Coli - North Cell Final Effluent cfu/100mL	0.00	0.00	0.00	2.99	0.00	0.00	0.00	0.00	0.00	0.00	100.42	0.00				
Eff: GMD E. Coli - South Cell Final Effluent cfu/100mL	0.00	0.00	0.00	33.22	0.00	0.00	0.00	3.31	0.00	0.00	0.00	0.00				
Eff: GMD E. Coli - Combined Cell Final Effluent cfu/100mL	0.00	0.00	0.00	9.97	0.00	0.00	0.00	3.31	0.00	0.00	100.42	0.00				
Eff: # of samples of E. Coli - North Cell Final Effluent	0.00	0.00	0.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	0.00	13.00			0.00
Eff: # of samples of E. Coli - South Cell Final Effluent	0.00	0.00	0.00	6.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	11.00			0.00
Eff: # of samples of E. Coli - Combined Cell Final Effluent	0.00	0.00	0.00	12.00	0.00	0.00	0.00	5.00	0.00	0.00	7.00	0.00	24.00			0.00