Ontario Clean Water Agency
Agence Ontarienne Des Eaux

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

March 31, 2023

Re: 2022 Annual Performance Report for the Waterford Water Pollution Control Plant

Attached is the 2022 Annual Performance Report for the Waterford Water Pollution Control Plant located at 678 Deer Park Road in Norfolk County. This report has been completed in accordance with:

Section 11(4)(a) through (n) cited in Environmental Compliance Approval #7520-C7ZM73 issued on November 19, 2021 to the Corporation of Norfolk County.

This report was prepared by the Ontario Clean Water Agency on behalf of Norfolk County based on the information contained in our records. The report covers the period from January 1, 2022 to December 31, 2022.

Sincerely,

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

Cc:
Stephanie Davis – Director, Environmental Services, Norfolk County
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Karl VanHeyst - Water Inspector, MECP
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Introduction:

The Waterford Water Pollution Control Plant (WPCP) is a lagoon wastewater treatment system comprises of the following key components:

- Preliminary treatment - screening;
- Secondary Treatment System – two (2) parallel Aerated Lagoons, one (1) Facultative Lagoon, two (2) parallel operated Submerged Attached Growth Reactor (SAGR)
- Post-Secondary Treatment System - Sand Filters **-** two (2) stage filtration system, each stage comprised of three (3) parallel filters
- Supplementary Treatment Systems - Phosphorus Removal - injecting solution upstream of each filter stage;
- Disinfection System - UV disinfection system comprised of two (2) banks of UV lamps (one standby)

The Nexom optAER System is a lagoon-based biological wastewater treatment system. Biological wastewater treatment is achieved through bacterial breakdown of organic matter in the waste stream. Using oxygen provided by the aeration system, a range of bacteria consume and degrade the contaminants in the wastewater (BOD5, NH3, and TSS) into carbon dioxide, water, and nitrates. Aerobic treatment systems effectively control odor, and provide for internal sludge digestion.

The Nexom optAER wastewater treatment system at the Waterford, ON facility uses a Submerged Attached Growth Reactor (SAGR) Aeration System. The Submerged Attached Growth Reactor (SAGR) is primarily designed to provide nitrification (ammonia removal) in cold to moderate climates. The SAGR follows the aerated lagoons in the process flow. The SAGR is essentially a clean gravel bed with evenly distributed wastewater flow across the width of the cell, and a collection chamber at the end of the treatment zone. LINEAR aeration throughout the floor of the SAGR provides aerobic conditions that are required for nitrification. The gravel bed is covered with a layer of wood chips or mulch for insulation.

Raw Wastewater Collection

<u>Deer Park Road Sewage Pumping Station</u>

- one (1) non-rectangular wet well type pumping station with a well surface area of 21.2 meter square, with nominal dimensions of 6.1 m x 3.5 m, located at 28 Deer Park Road (formerly Mechanic Street East), Norfolk County, equipped with two (2) submersible pumps (1 duty 1 standby) with variable frequency drives, each rated at 98.5 L/s, at TDH of 14.2 m;
- one (1) 375 mm diameter emergency overflow pipe, discharging effluent to Nanticoke Creek in emergency;
- one (1) 350 mm diameter forcemain on easements from the Deer Park Road Pumping Station to

Inlet Works- Preliminary Treatment System

Screening

The plant influent chamber is equipped with one (1) screen channels, equipped with a coarse barscreen with a Peak Instantaneous Flow Rate of 110 L/s (to be decommissioned and replaced by the new Headworks as identified in the proposed works of the ECA);

Secondary Treatment

Aerated Lagoons

- two (2) aerated lagoons operating in parallel with a total volume of approximately 19,256m^3
- four (4) 7.5 kW (10 HP) surface mechanical aerators (to be decommissioned and removed, see Proposed Works);
- Facultative Lagoon one (1) facultative lagoon with a volume of approximately 91,053m^3
- a pump chamber (named "SAGR Influent Pump Chamber"), equipped with two (2) 8.9 kW (12HP) submersible pumps (1 duty, 1 standby) with variable frequency drives, each rated at 51 L/sat a TDH of 11.6m, discharging the Facultative Lagoon's effluent to an Influent Splitter Box of the Submerged Attached Growth Reactor process
- Submerged Attached Growth Reactor (SAGR)
- one (1) flow distribution chamber directing flow to different locations in the SAGR system as required, via an Influent Splitter Box arrangement complete with four (4) 250mm long flat plate overflow weirs for flow distribution and SAGR cell isolation as required;
- two (2) parallel operated SAGR cells, each 75 m long with a liquid depth of 2 m.

Post-Secondary Treatment

Sand Filters

- one (1) Filter Influent Pumping Chamber equipped with two (2) 14.9 kW (20 HP) submersible pumps (1 duty 1 standby) with variable frequency drives, each pump rated at 51 L/s at a TDH of16.5 m, pumping flow to a Sand Filtration System;
- a Blue PRO® deep-bed Sand Filtration System, consisting of 2 stages in series, each stage comprising three (3) parallel filters (2 duty 1 standby), each filter has a Peak Hourly Flow Rate of 91.7 m3/h and is a moving bed with a media depth of 1.5 m, configured with continuous airlift backwash control;
- one (1) Reject / Drain Pump Chamber, equipped with two (2) 8.2 kW (11 HP) submersible pumps (1 duty 1 standby) with variable frequency drives, each pump rated at 12.7 L/s at a TDH of 10.1 m, returning backwash water and process drain flows back to the front end of the Facultative Lagoon (the returning point to be relocated to upstream of the Aerated Lagoons, see Proposed Work);

Supplementary Treatment

Supplementary Treatment Systems

- Phosphorus Removal

- Two (2) chemical (ferric chloride solution, or equivalent) storage tanks, each with a working capacity of 13,200 L;
- Two (2) metering pumps (1 duty 1 standby), each rated at 0-120 L/h;
- Dual-point injection: the first injection point upstream of the first stage filters, the second injection point on the first stage filter effluent ahead of the second stage filters;
- Coagulation and Flocculation
- one (1) 25,000 L capacity chemical storage tank, equipped with one (1) metering pump rated at 0.62 Litres per hour (L/h) (to be decommissioned and removed, see Proposed Works);

Disinfection Phase

One (1) floor-mounted UV disinfection package system (model: Trojan UV3000PTP, or equivalent), with a Peak Hourly Flow Rate of 183 m3/h, consisting of two (2) banks of low pressure UV lamps (1 duty 1 standby) configured in series: each bank capable of disinfecting the maximum pumped flow of 4,400 m3/d; installed in a single channel measured 5,842 mm length x 872 mm width (outer dimension) x 586 mm SWD;

- one (1) 300 mm diameter UV bypass pipe, located immediately upstream of the UV system and discharges immediately downstream of the UV channel;

Sludge Management System

Biosolids Removal and Disposal

- sludge periodically removed from the lagoons by licensed hauler for offsite storage/disposal/land application;

Standby Power

The generator is for the proposed upgrades at the Headworks. Current generator is Cummins DSGAC-1864989:

- 2000L Diesel
- Approximately 75 Hours of run-time at 50% load
- 235 HP; 150 KW; 600 V, 3-phase

Plant Facts:

Environmental Compliance Approval:	ECA 7520-C7ZM73 (issued November 19, 2021)
Rated Capacity	2,200m^3/day
Receiving Water	Nanticoke Creek

For 2022, the Waterford WPCP was operated in accordance with provincial regulations as required in ECA #7520-C7ZM73 (ECA) issued November 19, 2021. The following report is presented such that it corresponds with ECA #7520-C7ZM73 Section 11(4) (a) through (n).

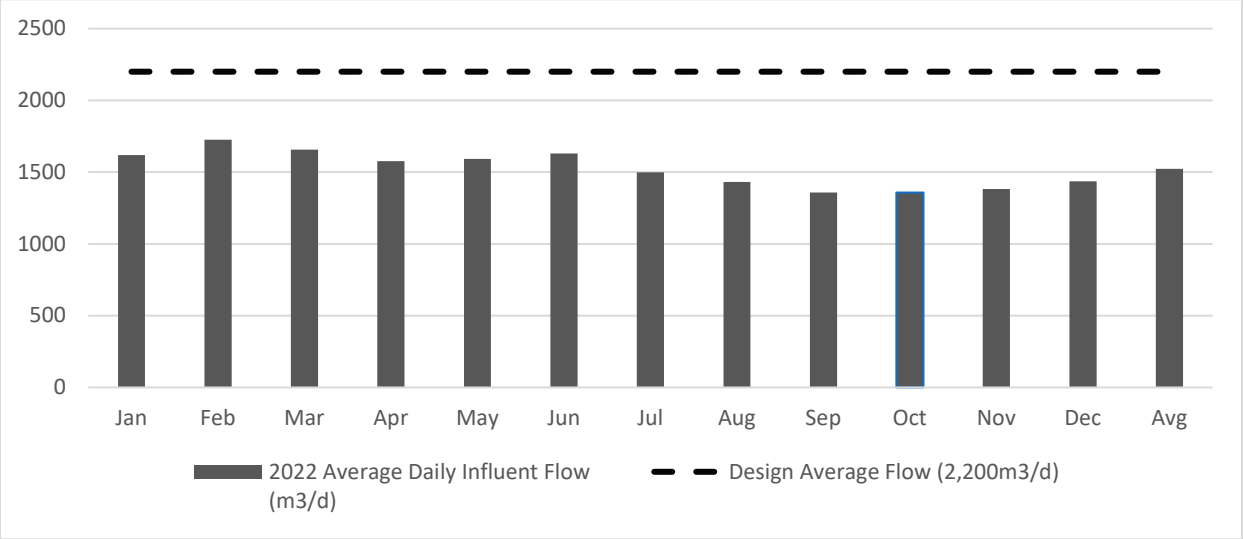
Section A: Influent Monitoring Data

As outlined in ECA#7520-C7ZM73 dated November 19, 2021 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 Flow Monitoring

The average daily flow of raw wastewater (influent) to the Waterford WPCP was 1,521m^3/d in 2022. The following Graph 1 shows the average daily influent flows per month for 2022.

Graph 1. Influent average daily flows for 2022

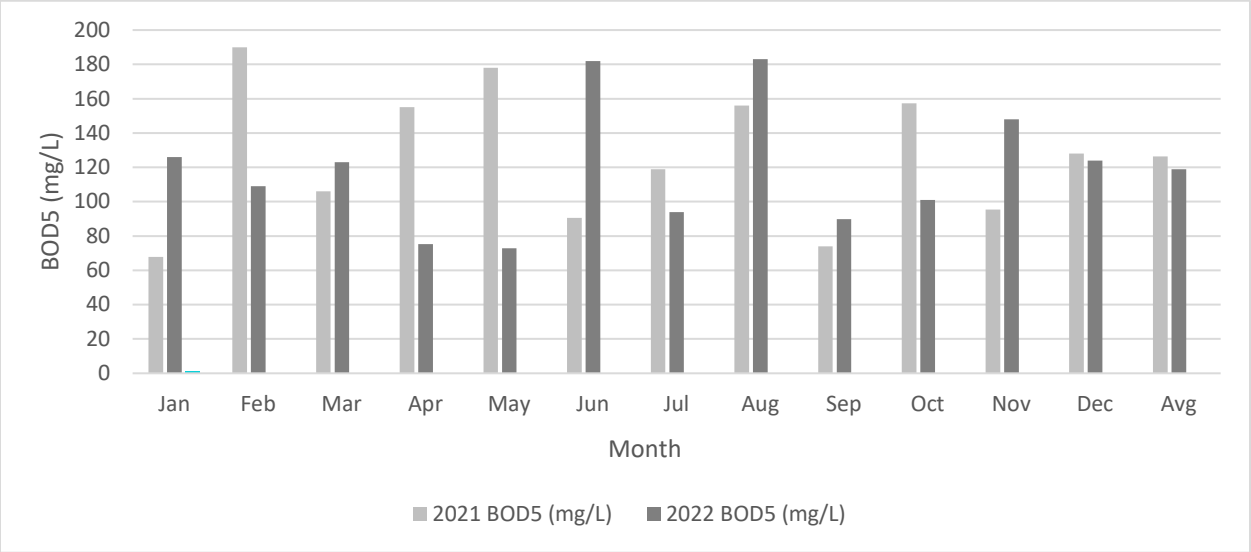


(II) Influent Data

The influent is monitored for BOD_5, total suspended solids, total phosphorus and total kjeldahl nitrogen on a monthly basis (minimum) by means of a composite sample. The plant was designed to treat based on influent characteristics identified in the Operations Manual from the design engineers. Refer to Appendix A for more detailed monthly results.

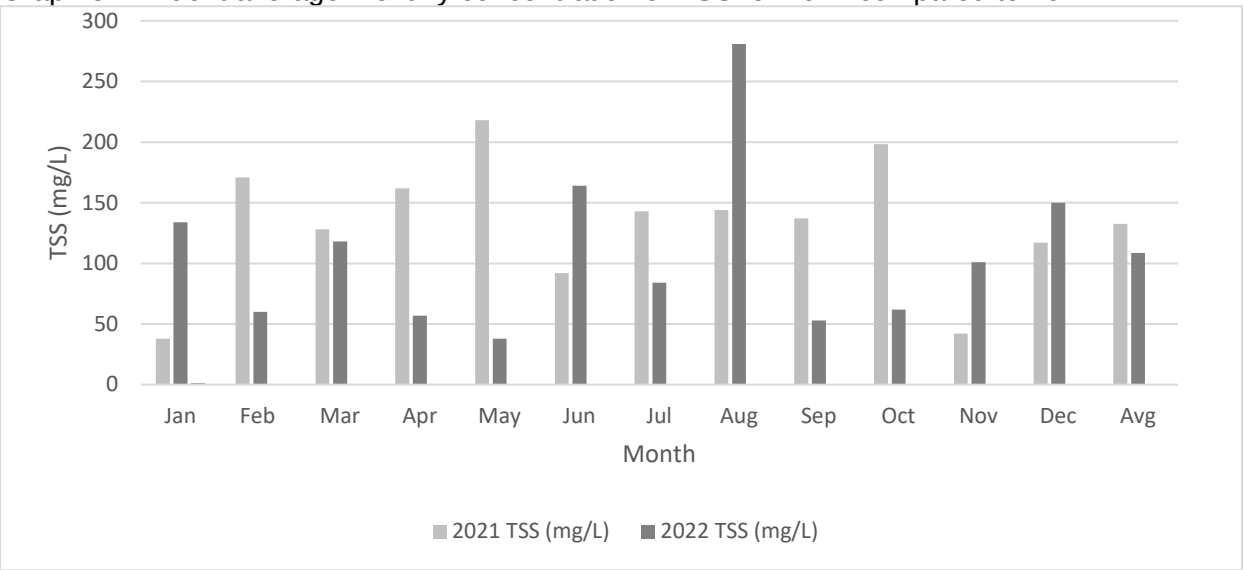
The annual average for influent BOD_5 concentration to the plant was 119.0mg/L. This is decrease from 2021 by 6.2%. Refer to Graph 2 for a comparison of monthly concentrations in 2022 and 2021.

Graph 2. Influent monthly average concentration of BOD_5 for 2022 compared to 2021.



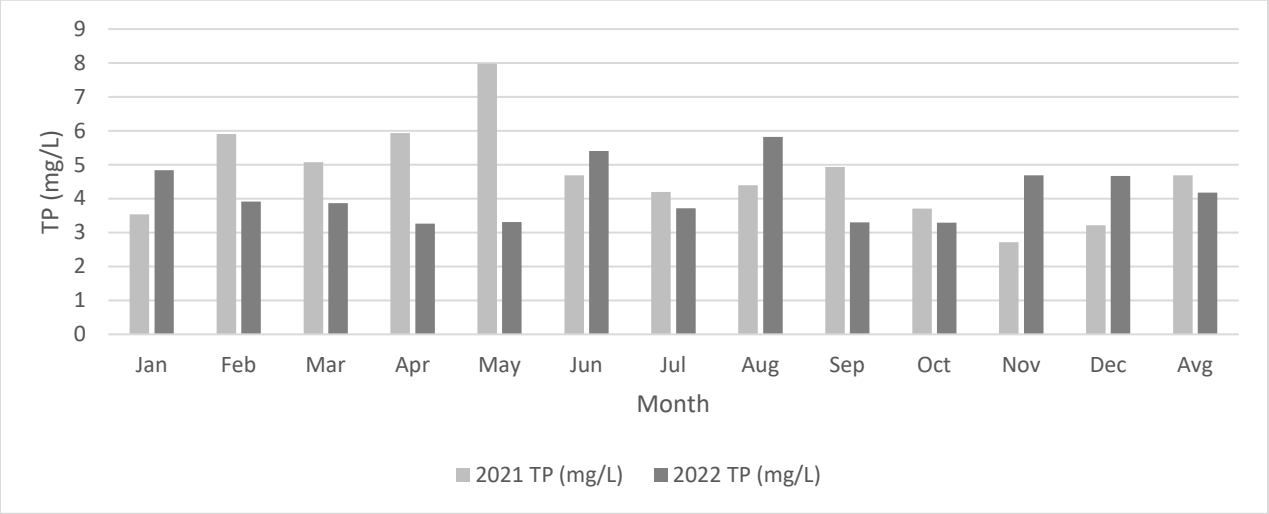
The annual average for influent total suspended solids (TSS) concentration to the plant was 108.5mg/L. This is a decrease from 2021 by 22.1%. Refer to Graph 3 for a comparison of monthly concentrations in 2022 to 2021.

Graph 3. Influent average monthly concentration of TSS for 2022 compared to 2021



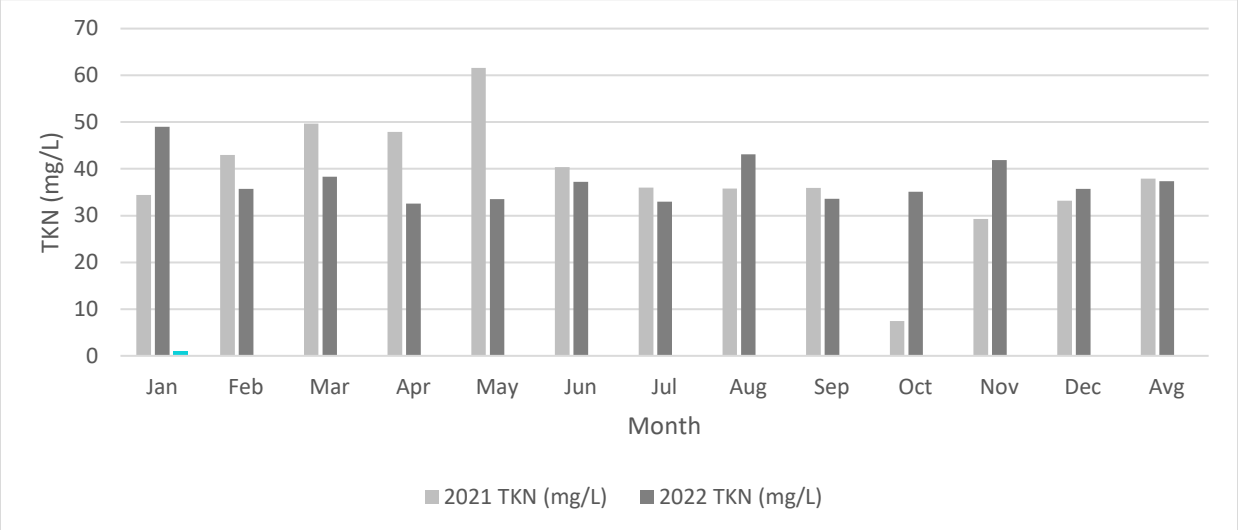
The annual average for influent total phosphorus (TP) concentration to the plant was 4.2mg/L. This is a decrease from 2021 by 12.4%. Refer to Graph 4 for a comparison of monthly concentrations in 2022 to 2021.

Graph 4. Influent average monthly concentration of TP for 2022 compared to 2021.



The annual average for influent total kjeldahl nitrogen (TKN) concentration to the plant was 37.4mg/L. This is a decrease from 2021 by 1.3%. Refer to Graph 5 for a comparison of monthly concentrations in 2022 compared to 2021.

Graph 5. Influent average monthly concentration of TKN for 2022 compared to 2021.



The influent characteristics have remained consistent throughout 2022. Overall, there is a decrease in all the parameters when comparing the 2022 data to the 2021 data.

(III) Imported sewage

There was no imported sewage received at the Waterford WPCP in 2022.

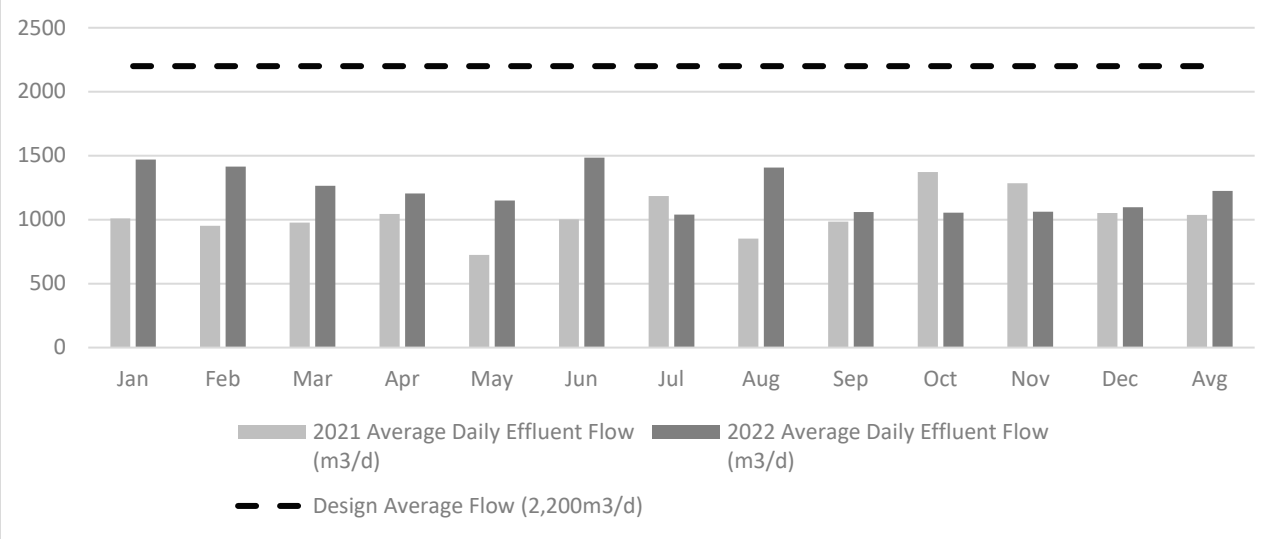
Section B: Effluent Monitoring Data

As outlined in the ECA #7520-C7ZM73 Section 11(4)(b) the following is a summary and interpretation of all effluent monitoring data including concentrations and flow rates. Also included is a comparison of effluent concentrations to the design objectives and compliance limits in the approval and an overview of the success and adequacy of the Works.

(I) Effluent Flow Monitoring

The average daily flow of effluent wastewater discharging from the Waterford WPCP was 1,226m^3/d in 2022 which is 55.7% of the rated capacity of 2,200m^3/d. This is a 15%increase in flow compared to the 2021 average daily flow of 1,037m^3/d. The following Graph 6 shows a comparison of the average daily flows per month for 2022 and 2021 compared to the rated capacity of the facility.

Graph 6. Average monthly flows in 2022 compared to 2021.



(II) Effluent Data

The final effluent at the Waterford WPCP is sampled on a weekly basis and tested for $cBOD_5$, total suspended solids, total phosphorus, total ammonia, total kjeldahl nitrogen, nitrate as nitrogen, and nitrite as nitrogen by means of a composite sample. A grab sample is collected weekly and tested for E.coli, pH, temperature and un-ionized ammonia.

Detailed results of the data can be found in Appendix A. The following Tables 1, 2 and 3 show the monthly average effluent results of the composite samples, the monthly averages of the grab samples, and a comparison to the loading limits respectively.

Acronyms: n/a = not applicable

Table 1. Monthly average effluent results for 2022 obtained from weekly composite sampling.

Month	cBOD5 (mg/L)	TSS (mg/L)	TP (mg/L)	TAN (mg/L)	NO2 (mg/L)	NO3 (mg/L)	TKN (mg/L)
January	2.0	2.3	0.02	0.06	0.011	15.4	0.88
February	2.0	1.8	0.05	0.15	0.014	18.9	1.05
March	2.2	1.6	0.06	0.08	0.004	18.5	0.72
April	2.0	2.5	0.06	0.03	0.005	15.5	0.70
May	2.0	1.6	0.08	0.03	0.013	13.6	0.86
June	2.0	1.5	0.04	0.18	0.057	15.5	1.05
July	2.0	2.0	0.05	0.03	0.010	14.9	0.88
August	2.0	1.6	0.06	0.03	0.023	9.6	0.92
September	1.8	1.3	0.05	0.03	0.006	3.3	0.78
October	2.0	1.3	0.05	1.05	0.072	4.2	1.85
November	2.0	2.0	0.05	0.03	0.005	13.6	0.86
December	3.0	2.3	0.07	0.04	0.005	19.6	1.03
Average	**2.1**	**1.8**	**0.05**	**0.14**	**0.018**	**13.6**	**0.95**
Objective	4.0	7.0	0.08	*0.6, 1.0, 3.0	n/a	n/a	n/a
Limit	6.0	10.0	0.1	*0.7, 2.0, 5.0	n/a	n/a	n/a

- *The TAN objectives and limits are based on temperature as per the ECA

Table 2. Monthly average effluent ranges for 2022 obtained from weekly grab samples.

Month	E. coli (cfu/100mL) Geometric Mean	pH Min – Max Range	Temp (°C)	Un-ionized Ammonia (mg/L) As calculated
January	1.0	6.55-7.23	8.0	0.0002
February	1.0	6.81-7.63	8.3	0.0011
March	1.0	7.16-7.54	8.4	0.0005
April	1.0	7.00-7.40	10.9	0.0001
May	1.0	6.97-7.45	15.6	0.0001
June	1.0	6.92-7.42	20.9	0.0009
July	1.0	6.61-7.89	23.5	0.0010
August	1.1	6.88-7.97	23.8	0.0004
September	1.0	7.24-7.81	21.3	0.0005
October	6.9	7.39-7.97	16.0	0.0148
November	1.0	7.14-7.68	12.9	0.0003
December	1.0	7.09-7.83	7.8	0.0003
Average	**1.18**	**6.55-7.97**	**14.8**	**0.0017**
Objective	100	6.0-8.5	n/a	n/a
Limit	200	6.0-9.5	n/a	n/a

Table 3. Monthly average loadings for 2022.

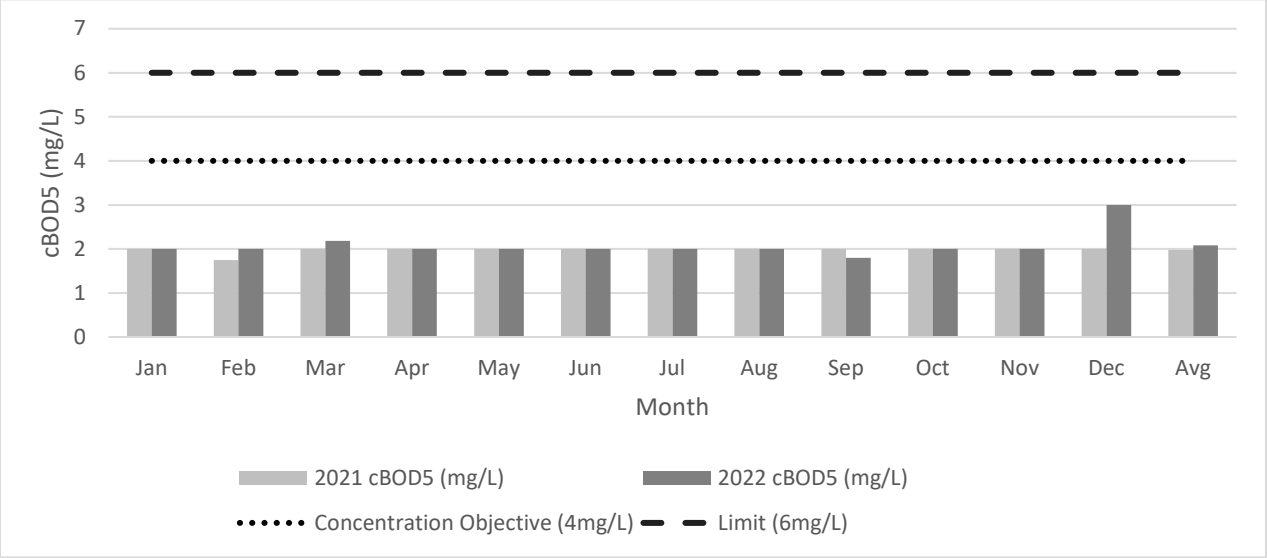
Month	cBOD5 (kg/d)	TSS (kg/d)	TP (kg/d)	TAN (kg/d)
January	2.94	3.31	0.03	0.09
February	2.83	2.48	0.07	0.22
March	2.76	2.02	0.08	0.10
April	2.41	3.01	0.07	0.04
May	2.30	1.84	0.09	0.03
June	2.97	2.23	0.06	0.27
July	2.08	2.08	0.05	0.03
August	2.82	2.25	0.08	0.04
September	1.91	1.38	0.05	0.03
October	2.11	1.32	0.05	1.10
November	2.12	2.12	0.05	0.03
December	3.29	2.47	0.08	0.04
Average	**2.54**	**2.21**	**0.06**	**0.17**
Limit	12.3	22.0	0.22	1.5, 4.4, 11.0

- *The TAN objectives and limits are based on temperature as per the ECA

(III) Comparison to Compliance Limits and Objectives

The annual average for effluent $cBOD_5$ in 2022 was 2.08mg/L; this value has increased by 4.9% compared to 2021. The annual loading of $cBOD_5$ was 2.54kg/d. The design objective, compliance limit and the loading limit for $cBOD_5$ were not exceeded in 2022. Refer to Graph 7 for a comparison of effluent monthly average concentration of $CBOD_5$.

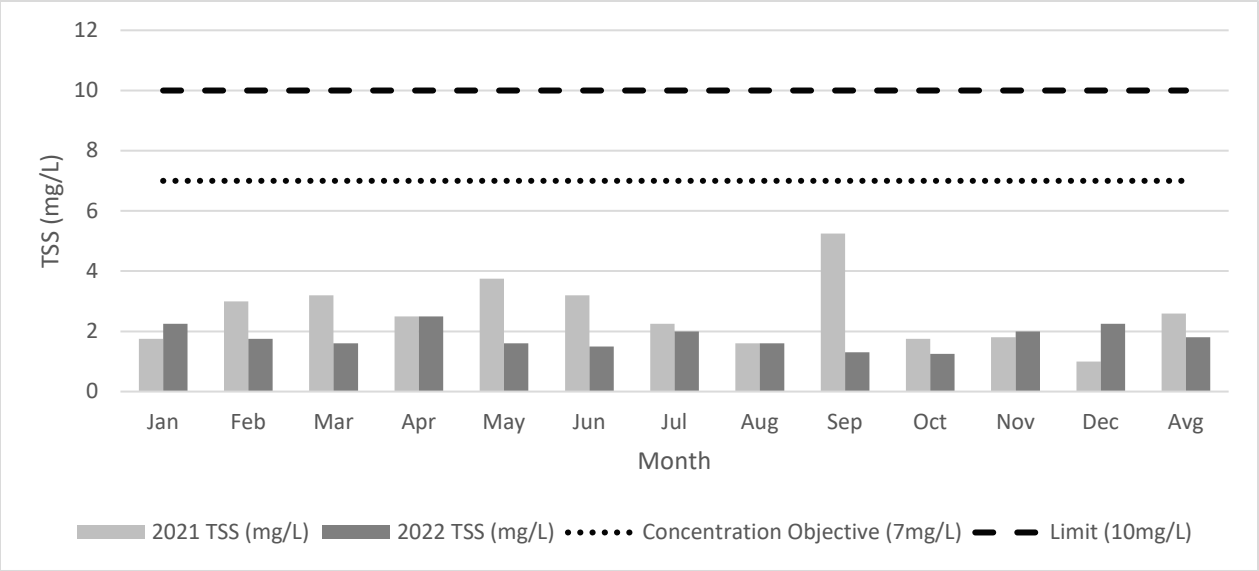
Graph 7. The effluent monthly average concentration of $cBOD_5$ in 2022 compared to 2021.



The annual average for effluent TSS in 2022 was 1.80mg/L; this value has decreased by 44% compared to 2021.The annual loading of TSS was 2.21kg/d. The design objective, compliance

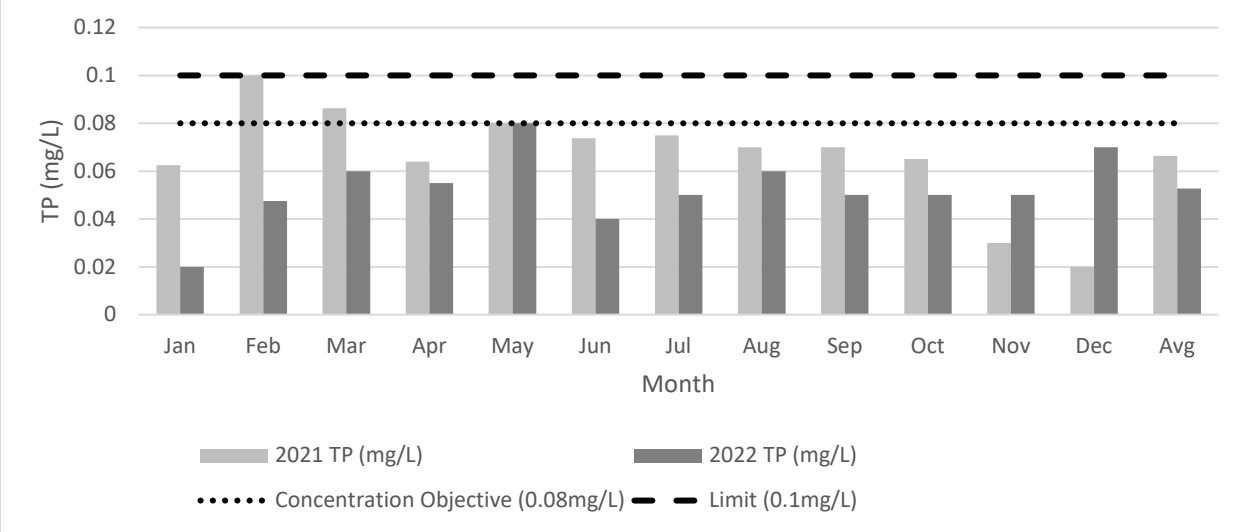
limit and the loading limit for TSS were not exceeded in 2022. Refer to Graph 8 for the effluent monthly average concentration of TSS.

Graph 8. The effluent monthly average concentration of TSS in 2022 compared to 2021.



The annual average for effluent TP in 2022 was 0.05mg/L.; this value has decreased by 26% compared to 2021. The annual loading of TP was 0.06kg/d. The design objective, compliance limit and the loading limit for TP were not exceeded in 2022. Refer to Graph 9 for a comparison of the effluent monthly average concentration of TP.

Graph 9. The effluent monthly average concentration of TP in 2022 compared to 2021.



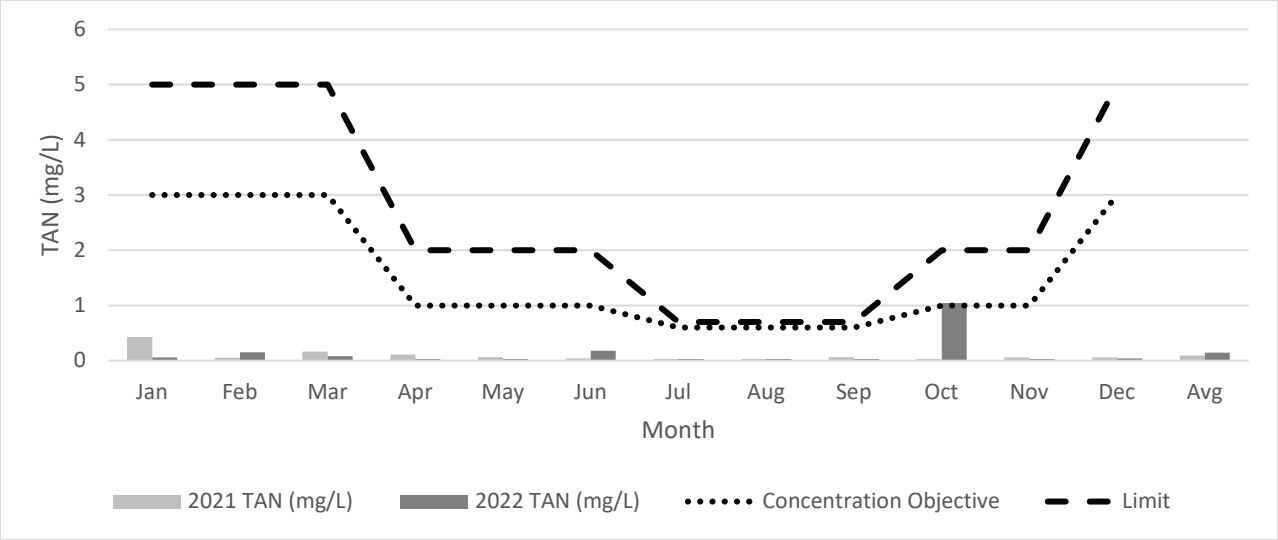
The annual average for effluent Total Ammonia Nitrogen (TAN) in 2022 was 0.14mg/L. The annual loading of TAN was 0.17kg/d. The limits and objectives for TAN are based on temperature:

- Dec 1st to March 31st – limit is 5.0mg/L, objective is 3.0mg/L

- April 1st to June 30th & Oct 1st to Nov 30th - limit is 2.0mg/L, objective is 1.0mg/L.
- July 1st to Sept 30th – limit is 0.7mg/L, objective is 0.6mg/L

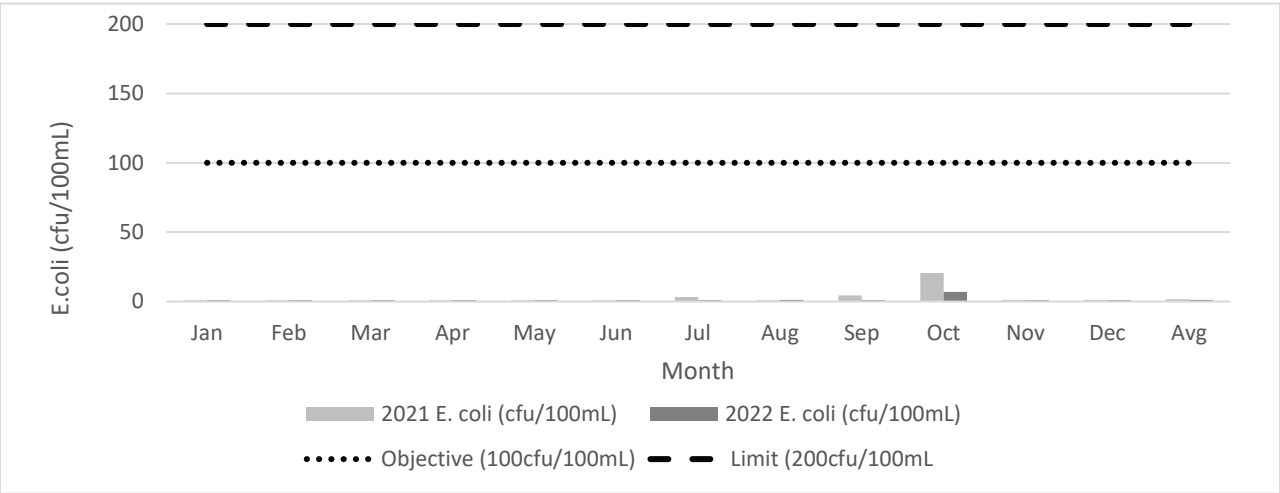
There were no limit exceedances for TAN in 2022. There was one (1) Objective exceedance in October 2022 as discussed below in **Section G: Summary of Efforts Made to Achieve Design Objectives.** Refer to Graph 10 for the effluent monthly average concentrations.

Graph 10. The effluent monthly average concentration of TAN in 2022 compared to 2021.



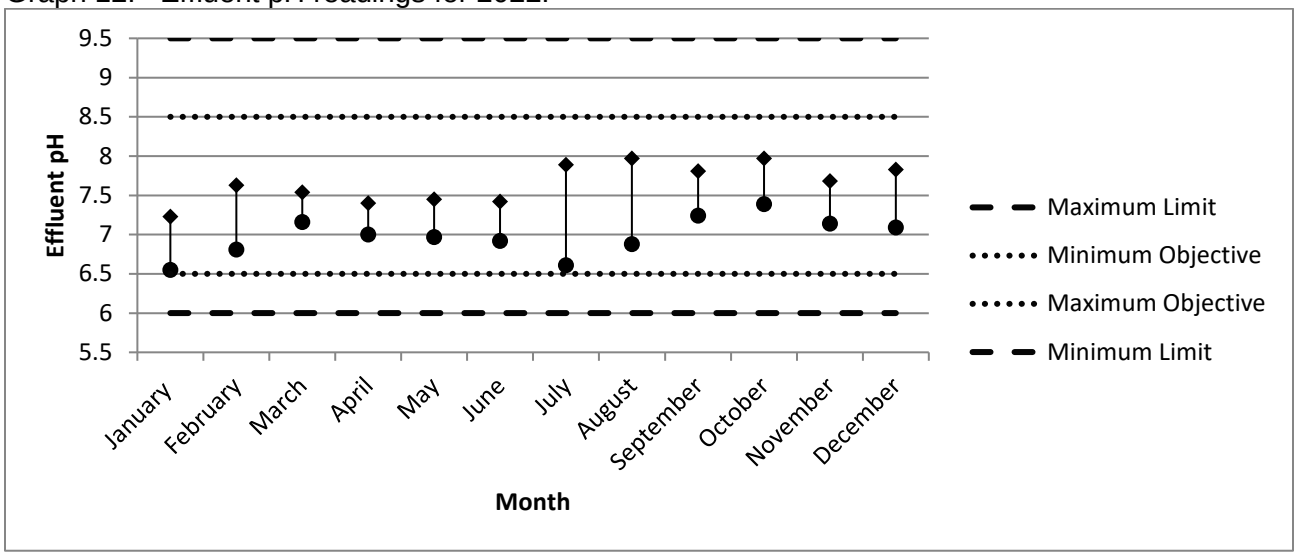
The annual geometric mean for effluent E. coli in 2022 was 1.18cfu/100mL; this value has decreased marginally since 2021. The design objective and compliance limit for E.Coli was not exceeded in 2022. The objective for E.coli is 100cfu/100mL and the limit is 200cfu/100mL.

Graph 11. The monthly geometric mean concentration of E. coli in 2022 compared to 2021.



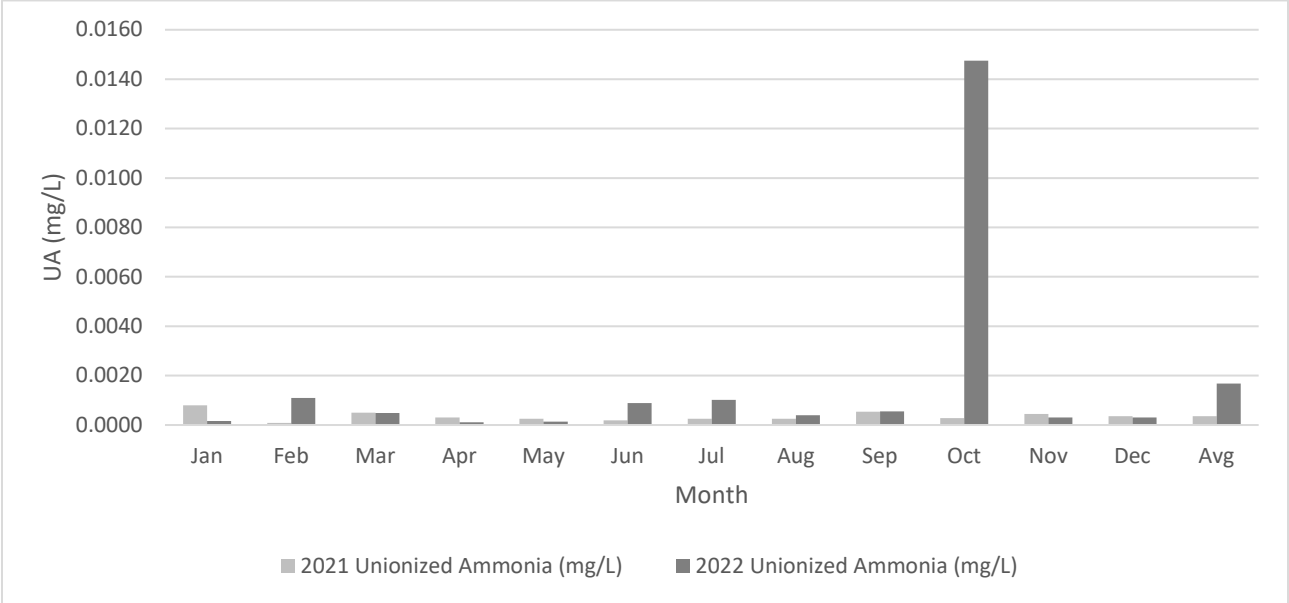
The effluent pH is monitored weekly at a minimum at the Waterford WWTP. Overall the plant has provided effective treatment as there have been no results below or above the design objectives of 6.5-8.5 or the compliance limits of 6.0-9.5 in 2022. Refer to Graph12 for the monthly minimum and maximum ranges for the 2022 pH readings.

Graph 12. Effluent pH readings for 2022.



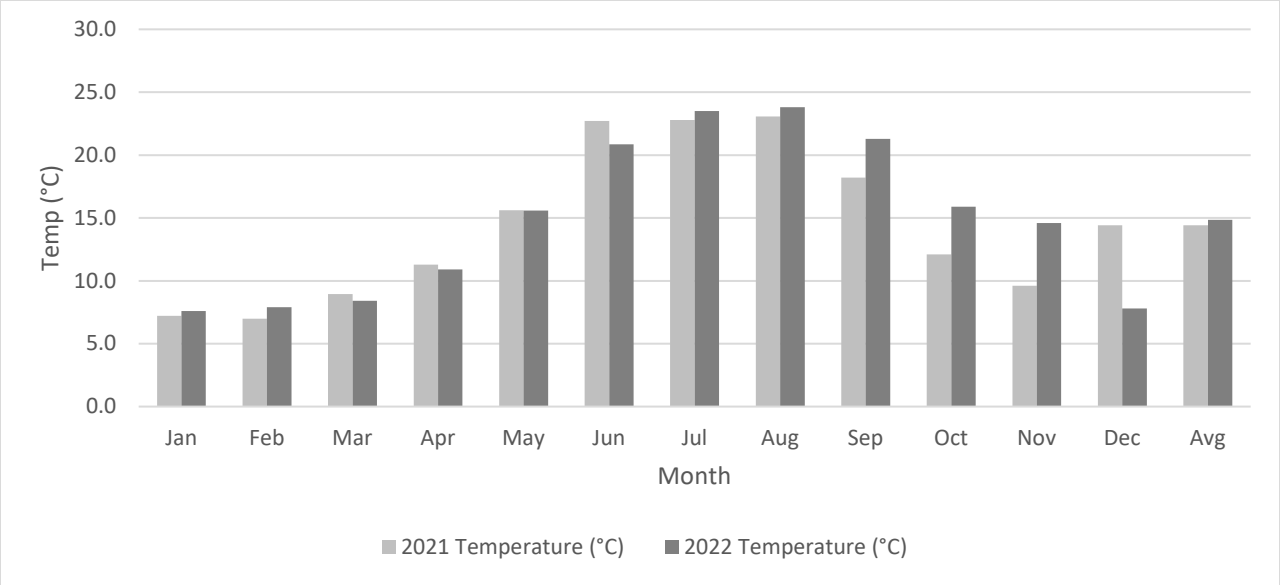
The annual average for effluent concentration of unionized ammonia (UA) was 0.0017mg/L in 2022. There is no limit or objective for unionized ammonia.

Graph13. The effluent monthly average unionized ammonia 2022 compared to 2021.



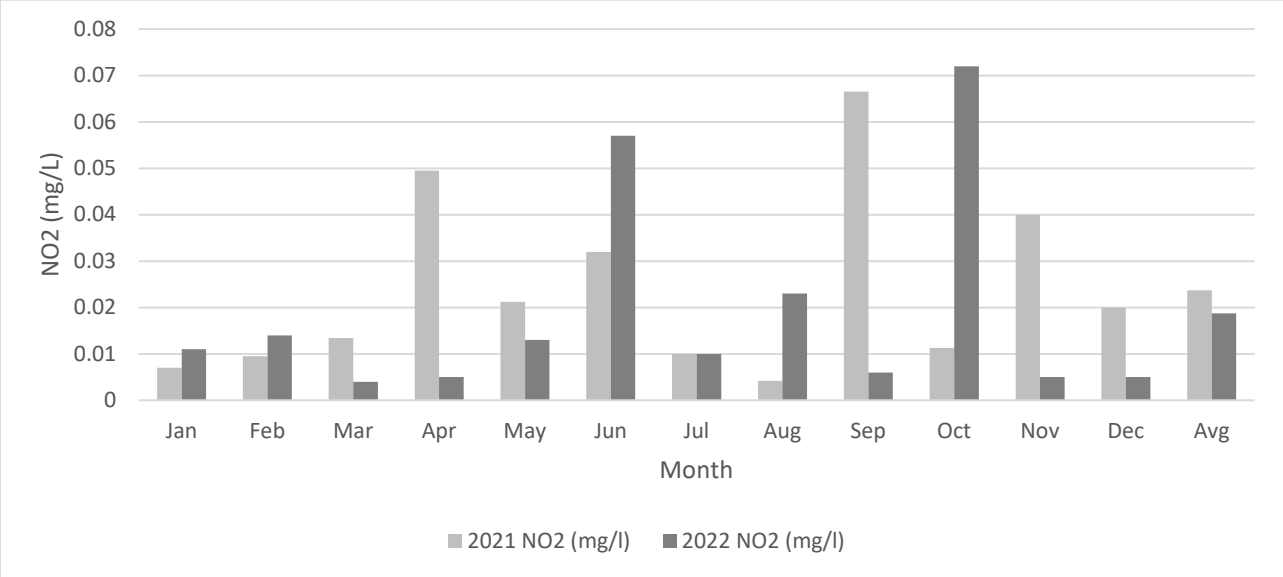
The annual average for effluent temperature was 14.8°C in 2022. There is no limit or objectives for temperature.

Graph 14. The effluent monthly average temperature in 2022 compared to 2021.



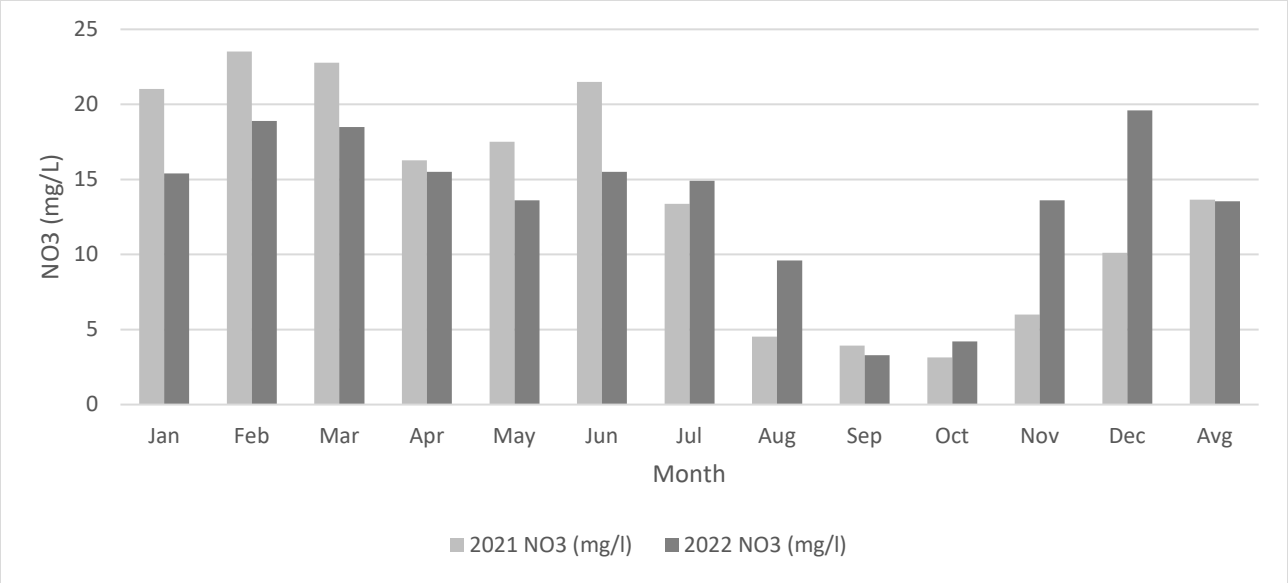
The annual average for effluent NO_2 in 2022 was 0.02mg/L. There are no limits or objectives for NO_2.

Graph 15. The effluent monthly average concentration of NO_2 in 2022 compared to 2021.



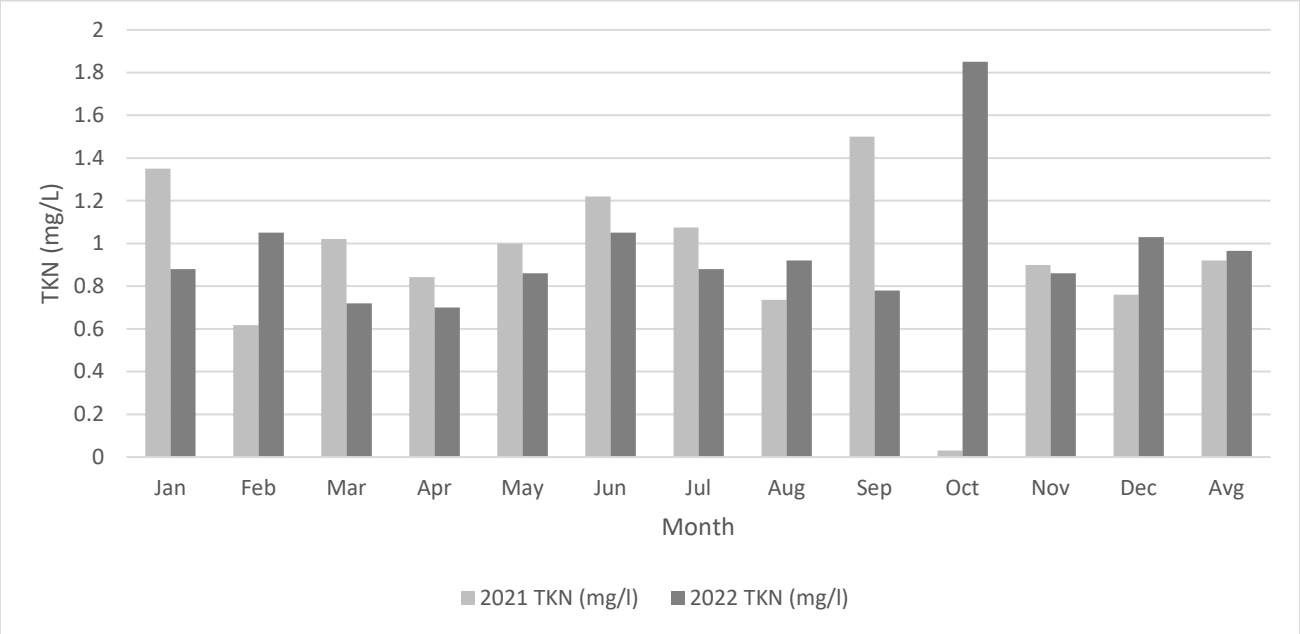
The annual average for effluent NO_3 in 2022 was 13.6mg/L. There are no limits or objectives for NO_3.

Graph 16. The effluent monthly average concentration of NO_3 in 2022 compared to 2021.



The annual average for effluent TKN in 2022 was 0.97mg/L; this value has increased by 5% from the annual average in 2021. Refer to Graph 17 for the effluent monthly average concentration of TKN.

Graph 17. The effluent monthly average concentration of TKN in 2022 compared to 2021.



The Waterford Water Pollution Control Plant performed well in 2022 producing quality effluent meeting all limits for all required parameters, with only one objective exceedance for TAN in October 2022 as discussed below in **Section G: Summary of Efforts Made to Achieve Design Objectives.**

Section C: Operating Problems and Corrective Actions

There was one (1) non-compliance reported for the Waterford WPCP in 2022. The effluent 24-hour composite sample was collected as per Schedule D, ECA #7520-C7ZM73 at the Waterford WPCP on June 7, 2022. E3 Laboratories Inc. (E3) picked up the samples with the accompanying chain of custody. The chain of custody identified $CBOD_5$ as the analyzing parameter however, E3 incorrectly analyzed for BOD_5. According to E3, this event was the result of human error during the initial logging of the samples. E3 has since modified their logging procedures to prevent a re-occurrence.

In October 2022, the secondary step feed was opened in order to build bio-mass for the winter months as required in the Operational & Maintenance Manual. This operational change caused the total ammonia nitrogen (TAN) to increase in the final effluent for a short time. With increased hydraulic retention time and adjusting what control there is over the dissolved oxygen, the ammonia was controlled efficiently and the Waterford WPCP remained in compliance.

Section D: Maintenance Activities

Regular scheduled monthly preventative maintenance is assigned and monitored using the Workplace Management System (WMS) program. Refer to Appendix B for preventative maintenance schedule. Items that were repaired or replaced in 2022 were:

Table 4. Major Maintenance Completed in 2022

Date	Maintenance Activities
January 6-7	Contractor on site Modifying MCC to allow PLC's to run on back-up generator
January 21	Contractor on site for propane tank inspection
February 2	Contractor on site to fix seals on bay doors in filter room
March 21	Replaced ferric chloride pump head
March 21	Contractor on site to install drain line in utility room
March 30	Contractor on site inspecting/calibrating gas detection system
April 1	Contractor on site inspecting the lifting device equipment
April 4-6	Contractor on site installing connections for backup generator to sand filter PLC
April 21	Contractor on site to complete calibration on the effluent flow meter
June 6	Contractor on site to flush SAGR bed lines
July 7	Mechanical Contractor on site to weld leaks in the stainless steel piping for filter 1, stage 1.
July 29	Mechanical contractor completed installing new relay in the crane hoist.
August 3	Wet Well clean out at Deer Park Station pumping station
August 23	Contractors on site running fiber lines to the Blue Line Rd pump station
August 24	Mechanical contractor on site to replace the faulty door lock on the main door.
September 6	Operations replaced vacuum pump on raw sampler
September 7	Installed chain across entrance to the plant after the gates were stolen
September 9	Operations re-installed ferrous chloride dosing line and injection point for stage 2
September 12	Contractor on site to rod the plugged SAGR lines
September 28	Wet well clean out –Blue line Rd pumping station

Date	Maintenance Activities
November 14	Environment Canada on site for Inspection – no report issued
November 16	Contractor completed backflow preventer inspections at plant and pump stations
December 6	ESA inspection completed

Section E: Effluent Quality and Assurance

Effluent quality assurance is evaluated by monitoring parameters and changes throughout the plants processes. The operators monitor the basin by performing weekly tests on the SAGR beds. These tests include pH, temperature, ammonia, total suspended solids and total phosphorus As well, monitoring of chemical dosages and wasting volumes are completed. Data collected from these tests provide valuable information to the operators to make the appropriate adjustments in the treatment process and take corrective actions before the plant reaches its effluent limits.

Section F: Calibration Records

The influent and effluent flow meters were calibrated by SCG Flowmetrix on April 21, 2022. In-house meters for pH and dissolved oxygen were calibrated by JBF Controls Ltd on September 16, 2022 as per manufacturer's instructions.

Section G: Summary of Efforts Made to Achieve Design Objectives

Table 5. Individual sample results compared against the effluent objectives and loading limits.

Parameter	Effluent Objective (mg/L)	Monthly Effluent Result Ranges (mg/L)	# of Objective Exceedances	Effluent Loading Limit (kg/d)	Monthly Loadings Result Ranges (kg/d)	# of Limit Loading Exceedances
$cBOD_5$	4.0	1.8-3.0	0	13.2	1.91-3.29	0
TSS	7.0	1.3-2.5	0	22.0	1.32-3.31	0
TP	0.08	0.02-0.08	0	0.22	0.03-0.09	0
TAN	0.6(1.0,3.0)	0.03-1.05	1	1.5(4.4,11.0)	0.03-1.10	0
E. coli (cfu/100mL)*	100	1.0-6.9	0	n/a	n/a	n/a
pH**	6.5 – 8.5	6.55-7.97	0	n/a	n/a	n/a

*effluent objectives and limits are seasonal first value Jul 1-Sept 30, second value Apr 1-Jun 30 and Oct 1-Nov 30, third value Dec 1-Mar 31

**expressed as geometric mean

Table 6. Objective exceedances in 2022.

Date	Parameter	Concentration mg/L	Loadings kg/d	Issue and Proactive Actions Taken
10/2022	TAN	1.05	1.10	The increased TAN was in preparation for the winter months Actions taken: Increased hydraulic retention time and dissolved oxygen. (more information above in Section C)

Section H: Sludge Handling and Generation

There was no sludge haulage during 2022. The estimated sludge volume generated in 2022 is not quantifiable as it is a lagoon system, therefore the sludge volume expected to be generated in 2023 in unknown. The sludge blankets in the facultative lagoon was measured in May of 2022 showing a range of 1-1.5ft of sludge depths compared to 5-7ft of water.

Section I: Complaints

There were no complaints received for the Waterford WPCP in 2022.

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

There were no bypasses, overflows, spills or abnormal discharge events at the Waterford WPCP in 2022.

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

There have been no Notices of Modifications to the Sewage Works completed in the 2022 reporting year. The commissioning of the upgraded Headworks facility to the Waterford WPCP is scheduled for later in 2023. The construction and commissioning schedule can be found in Appendix C.

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

The Waterford WPCP secondary and post-secondary treatment is provided by two aerated lagoons, two submerged activated growth reactor cells and a Blue PRO deep-bed sand filtration system with final disinfection provided by ultraviolet light. Supplementary phosphorus removal is also achieved with the addition of a ferric chloride solution. The treatment components are capable of producing effluent quality that exceeds the effluent design objectives specified in F-5-1. The Waterford WPCP is required to achieve higher effluent quality standards than the Effluent guideline criteria as specified in the ECA.

There were no bypasses or overflow events in the collections system for 2022.

The Corporation of Norfolk County completes the following:

- CCTV flushing and camera inspections
- Manhole inspections
- Flow monitoring and trending at pump stations.

Section M: Changes or Updates for Construction at Plant

There were no changes or updates to the schedule for the completion of construction and commissioning operation of major process(es) / equipment groups in the Proposed Works at the Waterford WPCP in 2022.

Section N: Summary of Deviations from Monitoring Schedule

There were no deviations to the monitoring schedule at the Waterford WPCP in 2022. The current 2023 sampling schedule is attached in Appendix D.

APPENDIX A – Waterford WPCP Monitoring Data

APPENDIX B – Maintenance Schedule

APPENDIX C – Construction and Commissioning Schedule

APPENDIX D – 2023 Sampling Schedule