THE CORPORATION OF THE TOWN OF

GANANOQUE

Canadian Gateway to the 1000 Islands

2024 Annual Wastewater Performance Report

Manager of Public Works, David Armstrong
Utilities Compliance Coordinator, Christine Brennan

February 18, 2024

EXECUTIVE SUMMARY

The Corporation of the Town of Gananoque's Public Utilities Division is pleased to provide the 2024 Annual Wastewater Performance Report. The purpose of this report is to keep the public and Council informed regarding the quality of the Town's Wastewater Treatment and Collection System.

The employees of the Town of Gananoque are committed to and share in the responsibilities for implementing, maintaining, and contributing to the continual improvement of the wastewater system.

This Annual Wastewater Performance Report is prepared in accordance with the Certificate of Approval # 0999-7X8QL3. Included with this report is the analytical data, plant flows, process flow schematic and the overall performance of parameter removals.

David Armstrong
Manager of Public Works

Christine Brennan
Utilities Compliance Coordinator

TABLE OF CONTENTS

LIST OF ACRONYMS & DEFINITIONS

Annual Average Concentration	The arithmetic mean of all daily or weekly concentrations, of a contaminant measured during a calendar year.
Annual Average Loading	The value obtained by multiplying the *Annual Average Concentration* of a contaminant by the *Average Daily Flow*.
Average Daily Flow	The cumulative total sewage flow to the sewage works during a calendar year, divided by the number of days during which sewage was flowing to the sewage works that year.
C of A	Certificate of Approval
CFU	Colony Forming Units
L/s	litres per second
m3/d	cubic meters per day
mg/L	milligrams per litre
mL	Milliliter
ML/d	Mega (million) litres per day
MECP	Ministry of the Environment, Conservation and Parks (Ontario)
MOH	Medical Officer of Health
Monthly Average Concentration	The arithmetic mean of all daily or weekly concentrations of a contaminant by the *Average Daily Flow* over the calendar month.
Monthly Average Loading	The value obtained by multiplying the *Monthly Average Concentration* of a contaminate by the *Average Daily Flow.*
O. Reg.	Ontario Regulation

1. Introduction

The following 2024 Annual Wastewater Performance Report is submitted in accordance with Condition 8(4) (a) through (i) of the Certificate of Approval (CofA) # 0999-7X8QL3 for the Gananoque Sewage Lagoons. This report has been prepared by the Town of Gananoque's Public Utilities.

2. Facility Description

The Gananoque Sewage Lagoons have been in operation for over 50 years. The facility is located north of Highway 401, occupying approximately a 1.5 sq. km (150 ha) parcel of land consisting of 3 Cells.

Raw sewage is received in Cell 1 from the East End Pumping Station (EEPS) through a 400mm diameter forcemain. At the EEPS, alum is added to assist in the reduction of Total Phosphorus and Total Suspended Solids. Once the sewage enters the first cell it flows from one cell to the next allowing the settling of solids and reduction of dissolved nutrients. The final effluent of the Lagoon then discharges to the St Lawrence River.

Refer to "**Appendix A"** to review the systematic drawing.

3. Monitoring Raw Influent and Treated Effluent Data

Refer to **"Appendix B"** to review the Summary Performance Report.

3.1 Influent and Effluent Lab Results, Limits and Objectives

Table 1: Raw Influent Results

Raw Influent Parameter	Annual Average Concentration in mg/l
$CBOD_5$	101.00
Total Suspended Solids	193.23
Total Phosphorous	4.93

Table 2: Effluent CBOD5 and Total Suspended Solids

The *Annual Average Concentrations* and *Annual Average Loading of* $CBOD_5$ and Total Suspended Solids shall not exceed the corresponding average and loading concentrations in the below table.

Effluent Parameter	Annual Average Concentration in mg/l	CofA Concentration Objective in mg/l	CofA Concentration Limit in mg/l	Annual Average Loading in kg/day	CofA Loading Objective in kg/day	CofA Loading Limit in kg/day
$CBOD_5$	5.89	25.0	30.0	19.78	133	159
Total Suspended Solids	59.24	25.0	30.0	149.43	133	159

On November 20th, 2024 the MECP was notified of the Total Suspended Solids exceedance. The letter stated "the Certificate of Approval requires Total Suspended Solids to have an annual average concentration below 30mg/L. Through our monitoring the Town of Gananoque will exceed the annual concentration for 2024."

Table 3: Effluent Total Phosphorous

The *Monthly Average Concentration* and *Monthly Average Loading* of Total Phosphorous shall not exceed the corresponding average and loading concentrations in the below table.

Effluent Parameter	Monthly Average Concentration in mg/l	CofA Concentration Objective in mg/l	CofA Concentration Limit in mg/l	Annual Average Loading in kg/day	CofA Loading Objective in kg/day	CofA Loading Limit in kg/day
Total Phosphorous	0.55	1.0	1.0	1.59	5.30	5.30

On November 20th, 2024 the MECP was notified of a Total Phosphorous exceedance for the month of October. The letter stated "The Certificate of Approval requires Total Phosphorus to have a monthly average below 1.0mg/L. In the month of October, the average Total Phosphorus concentration was 1.05mg/L, exceeding the required limit."

The alum dosage was increased on October 18th, 2024 to assist with the increased Total Phosphorus and Total Suspended Solids. The alum stoke adjustments were made (increasing stoke % on the EEPS alum pumps) with a goal to increase the original target of 60mg/L dosage to 70mg/L dosage.

Table 4: Effluent pH

The effluent pH must be maintained within the range of 5.5 to 9.5 at all times.

Effluent Parameter	Annual Minimum	CofA Minimum Objective	CofA Minimum Limit	Annual Maximum	CofA Maximum Objective	CofA Maximum Limit
pH	6.2	6.0	5.5	9.5	9.0	9.5

Table 5: Effluent E. Coli

The E.Coli *Annual Average Geometric Mean Density* shall stay below 200 organisms/100ml. Geometric Mean Density is the nth root of the product of multiplication of the results of n number of samples over the year.

Effluent Parameter	Annual Average (Geometric Mean Density) Count organisms/100ml	Annual Average Geometric Mean Density Objective Count organisms/100ml
E. Coli	33.58	200

3.2 Flow Data

The annual average daily treated effluent flow in 2024 was 3,498 m3 and the annual average daily raw influent flow was 3,128 m3. Weather conditions account for variations in flow differentials throughout the year. The table below provides the average monthly raw influent and treated effluent flow.

Table 6: Average Monthly Flows

Month	Raw Influent	Treated Effluent
January	129,042	198,565
February	102,548	134,530
March	114,163	122,889
April	125,715	140,390
May	84,699	95,294
June	83,571	70,124
July	100,909	100,849
August	124,875	126,711
September	74,599	94,611
October	58,285	54,699
November	46,372	44,393
December	49,943	46,930

3.3 Bypasses and Overflows

There were two overflow events during 2024 which occurred on August 8th and 9th due to heavy precipitation. All events were reported to the Spills Action Centre, the Ministry of Health and a letter was sent to the Ministry of the Environment, Conservation and Parks Inspector.

Table 7: 2024 Bypass and Overflow Events

Date	Location	Event	Volume	Duration	Cause
August 8, 2024	East End Pumping Station – Manhole #18	Overflow	143 m3	54 Minutes	Heavy Precipitation
August 9, 2024	East End Pumping Station – Manhole #18	Overflow	1 m3	16 Minutes	Heavy Precipitation

4.0 Operating Challenges and Corrective Action

Exceedances of the effluent limits for Total Suspended Solids and Total Phosphorus began to increase in July of 2024, with Total Suspended Solid concentrations continuing to climb throughout the remainder of 2024. Influent concentrations for Total Suspended Solids and Total Phosphorous appear to be increasing between July and November in 2024, directly

influencing the effluent concentrations. EVB Engineering was contacted to complete an assessment and has proposed for the Town to increase it's sampling within the lagoon cells. The increased sampling will begin in 2025.

4.1 Maintenance on Major Structures and Equipment

All works are subject to the annual budget process and approval by Council. A 10 Year Capital Equipment Replacement Plan has been developed which includes an extensive breakdown of all capital equipment that requires allocated funds for refurbishment or replacement.

Refer to **"Appendix C"** to review the 2024 capital projects.

4.2 Effluent Quality Assurances/ Control Measure

The Corporation of the Town of Gananoque is committed to comply with all applicable legislation and regulatory requirements as it pertains to wastewater effluent quality, environmental protection, and customer satisfaction.

The implementation of the Wastewater Quality Management System which consists of policies, procedures, and forms, helps maintain system compliance. These documents demonstrate risk-based treatment process evaluation, Operating Authority competency, open communications, appropriate contingency/incident response measures and response to consumers' concerns in a timely manner.

The employees involved within the Wastewater System share responsibilities of implementing, maintaining and contributing to the continual improvement of the Wastewater QMS.

5.0 Calibrations/Maintenance of Effluent Monitoring Equipment

The influent, effluent and pump station flow meters are calibrated annually for accuracy to within plus or minus 10 percent (+/- 10%) of actual flowrate. The last annual calibration was completed on September 23, 2024.

6.0 Key Contacts

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Christine Brennan
Utilities Compliance Coordinator
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Appendix A

CELL 2

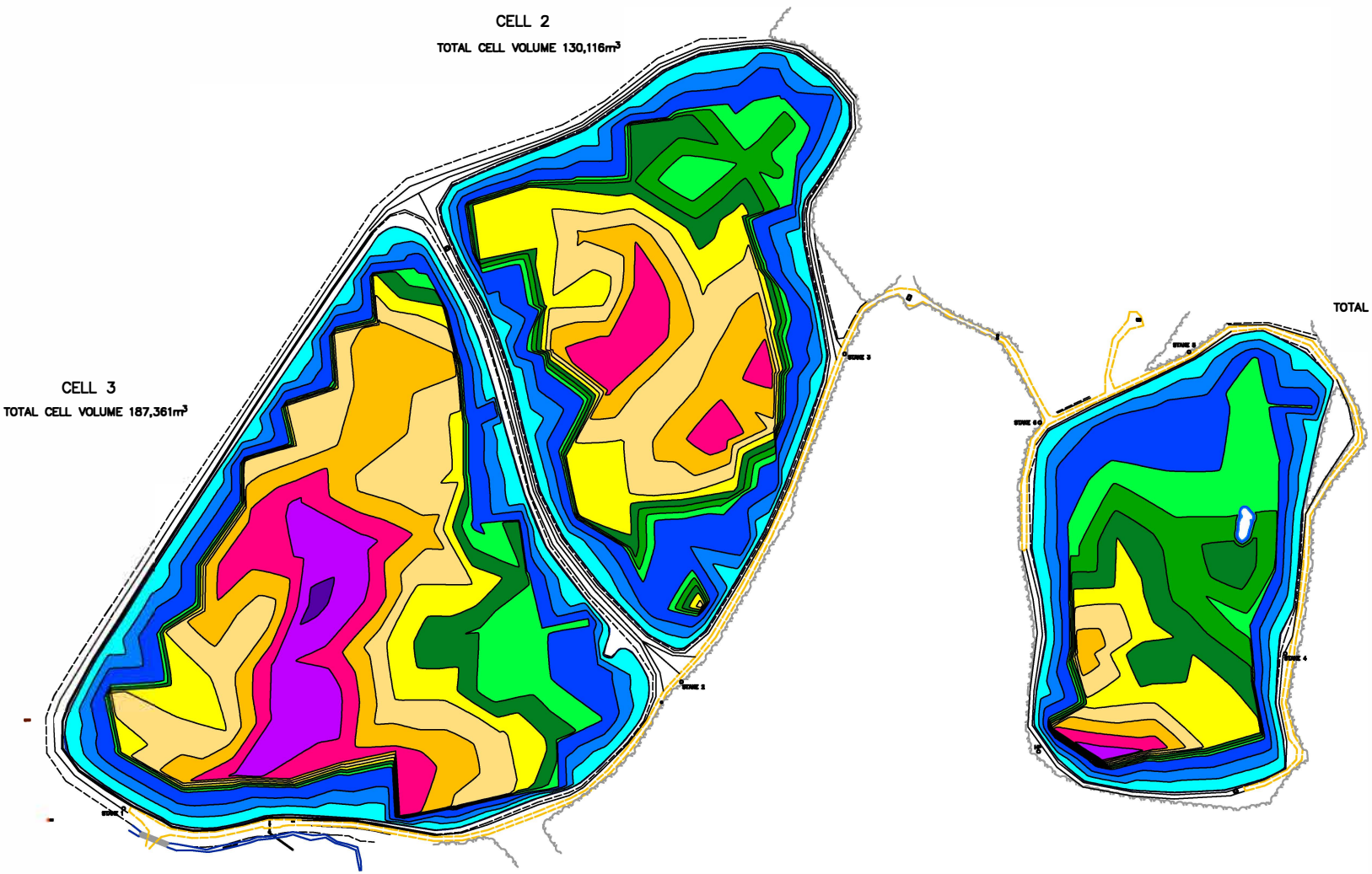
TOTAL CELL VOLUME 130,116m³

CELL 3

TOTAL CELL VOLUME 187,361m³

CELL 1

TOTAL CELL VOLUME 82,536m³



LEGEND
DEPTH OF CELL (METRES)

0.0 – 0.5	
0.5 – 1.0	
1.0 – 1.5	
1.5 – 1.6	
1.6 – 1.7	
1.7 – 1.8	
1.8 – 1.9	
1.9 – 2.0	
2.0 – 2.1	
2.1 – 2.2	
2.2 – 2.3	
>2.3	

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No.	DATE	BY	ISSUES / REVISIONS
1			

CLIENT: TOWN OF GANANOQUE

DRAWN BY:	CHECKED BY:
CTP	SAS
DESIGNED BY:	APPROVED BY:
SAS	GNL
SCALE: 1:1,000	DATE: SEPTEMBER 2007

PROJECT: GANANOQUE LAGOON SEWAGE TREATMENT SYSTEM

DRAWING: DEPTH OF CELL

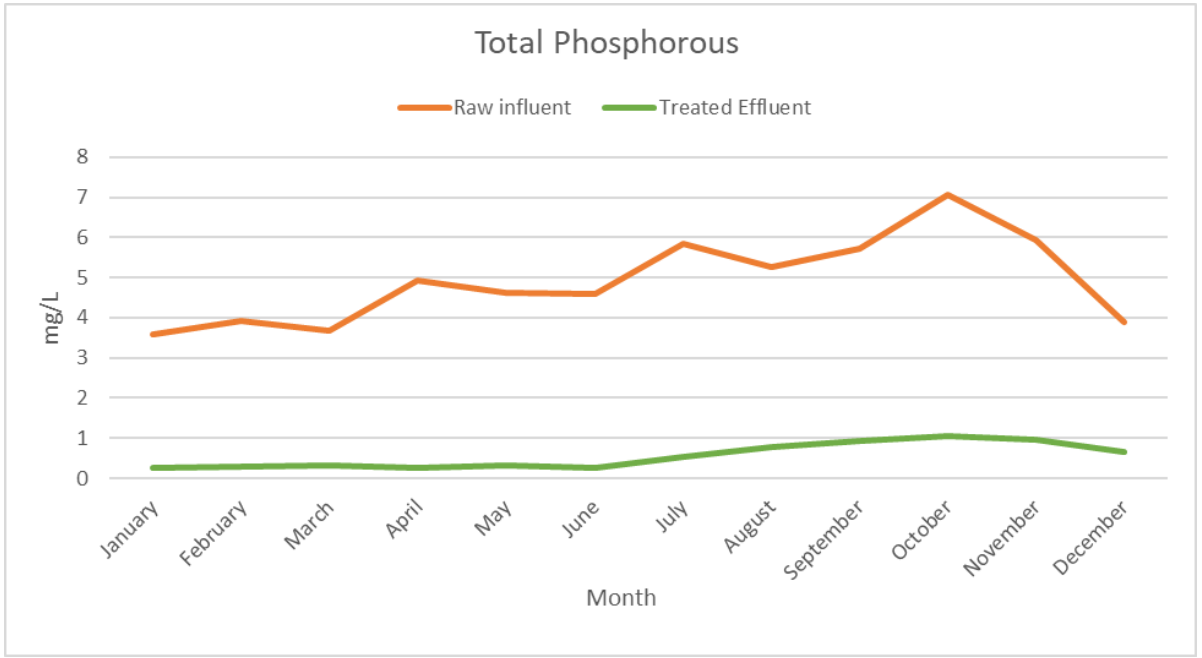
PROJECT No.: 52-27908

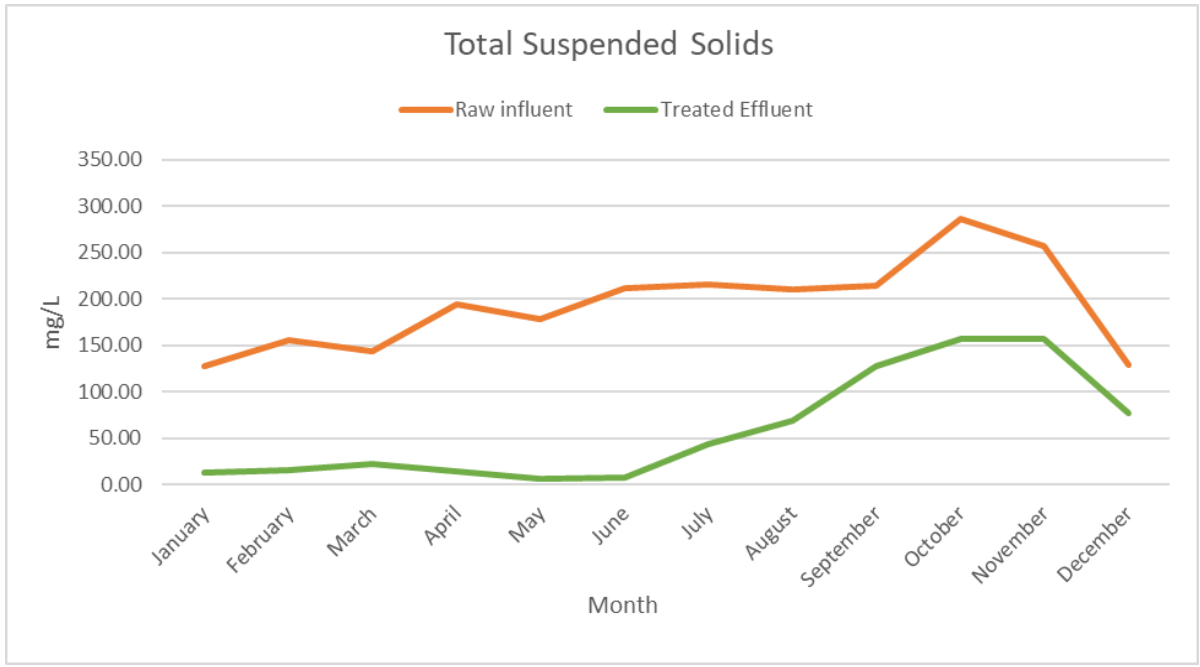
DRAWING No.: 1

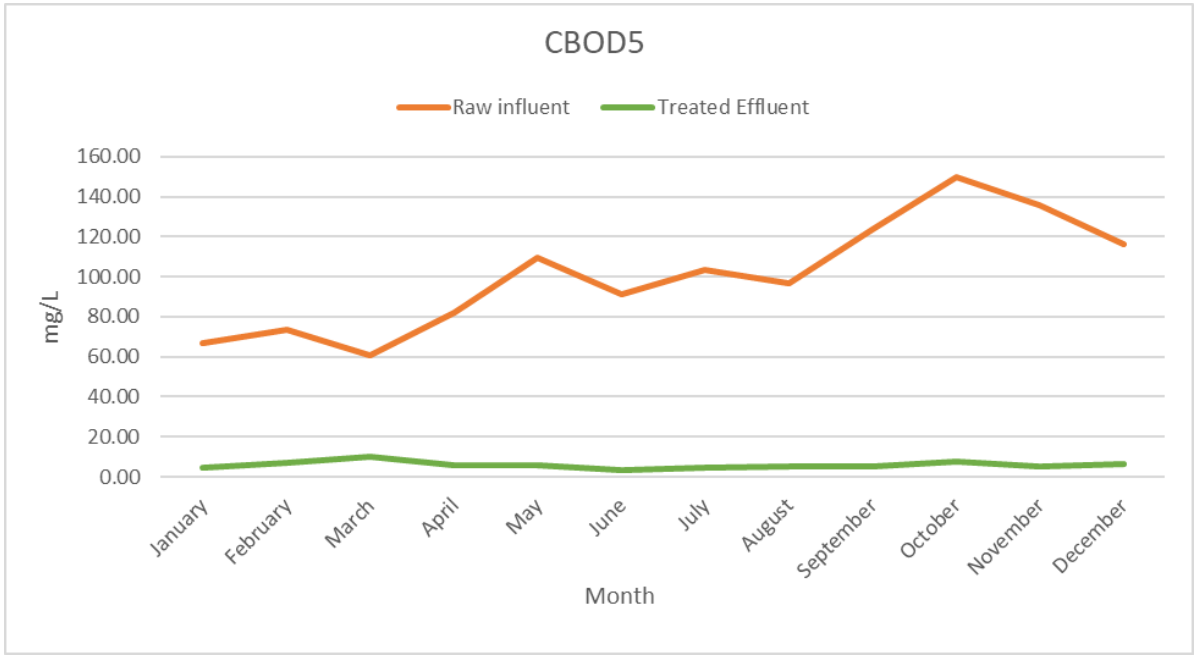
Appendix B

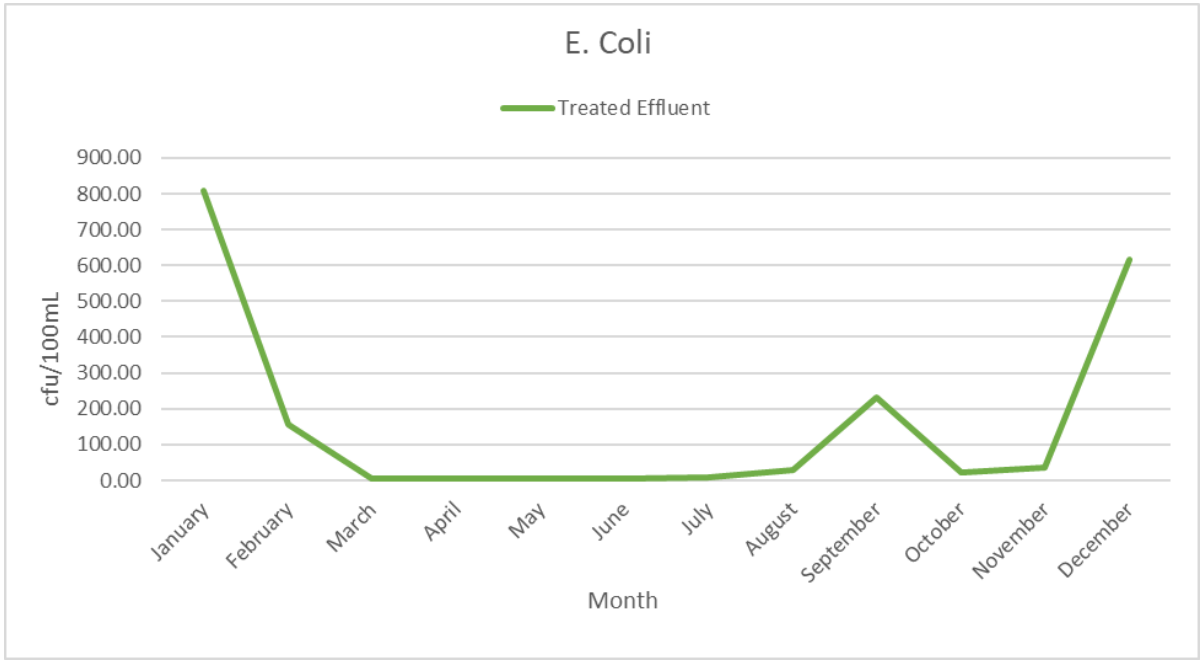
2024 Summary Performance Report

		Flows				Raw			Treated					Performance		
		Raw	Average Raw Day	Treated	Average Treated Day	Raw CBOD5	Raw TSS	Raw TP	Treated CBOD5	Treated TSS	Treated TP		E.Coli (Monthly Geometric Mean)	Removals		
Month	Days	m3	m3	m3	m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Loading	cfu/100mL	%CBOD5	%TSS	%TP
January	31	129,042	4,163	198,565	6,405	66.80	127.20	3.58	4.80	13.00	0.26	1.67	808.15	92.81	89.78	92.74
February	29	102,548	3,536	134,530	4,639	73.50	155.75	3.91	6.75	15.25	0.29	1.35	156.77	90.82	90.21	92.58
March	31	114,163	3,683	122,889	3,964	60.50	143.50	3.69	9.75	22.00	0.32	1.27	3.87	83.88	84.67	91.33
April	30	125,715	4,191	140,390	4,680	82.00	194.00	4.92	6.00	14.00	0.25	1.17	5.20	92.68	92.78	94.92
May	31	84,699	2,732	95,294	3,074	109.50	178.50	4.61	5.50	6.00	0.32	0.98	4.55	94.98	96.64	93.06
June	30	83,571	2,786	70,124	2,337	91.25	211.00	4.58	3.50	7.00	0.27	0.63	5.03	96.16	96.68	94.10
July	31	100,909	3,255	100,849	3,253	103.20	215.00	5.84	4.80	43.40	0.53	1.72	8.90	95.35	79.81	90.92
August	31	124,875	4,028	126,711	4,087	96.50	210.00	5.26	5.00	69.00	0.78	3.19	27.50	94.82	67.14	85.17
September	30	74,599	2,487	94,611	3,154	123.75	214.75	5.71	5.25	127.50	0.92	2.90	232.06	95.76	40.63	83.89
October	31	58,285	1,880	54,699	1,764	149.90	287.00	7.06	7.40	157.00	1.05	1.85	23.52	95.06	45.30	85.13
November	30	46,372	1,546	44,393	1,480	136.0	257.50	5.94	5.25	157.50	0.96	1.42	34.64	96.14	38.83	83.84
December	31	49,943	1,611	46,930	1,514	116.20	128.20	3.89	6.60	76.80	0.64	0.97	614.75	94.32	40.09	83.55


Total Phosphorous
Raw influent
Treated Effluent
8
7
6
5
4
3
2
1
0
mg/L
January
February
March
April
May
June
July
August
September
October
November
December
Month


Total Suspended Solids
Raw influent
Treated Effluent
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
mg/L
January
February
March
April
May
June
July
August
September
October
November
December
Month


CBOD5
Raw influent
Treated Effluent
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
mg/L
January
February
March
April
May
June
July
August
September
October
November
December
Month


E. Coli
Treated Effluent
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
cfu/100mL
January
February
March
April
May
June
July
August
September
October
November
December
Month

Appendix C

WASTEWATER TREATMENT CAPITAL PROJECTS

PROJECT NAME:	Wastewater Treatment/Construction
YEAR:	2024
COST CENTRE:	Capital reserve funded through wastewater revenues
LOCATION:	Gananoque Wastewater Treatment Lagoon System
LENGTH:	On-Going
YEAR FIRST INTRODUCED:	2020
PREPARED BY	D. Richards
DATE	September 14, 2023 FINAL
SCOPE:	Provides for the capital needs for the Gananoque Wastewater Treatment System
WHY REQUIRED:	Allows for coordinated planning for equipment upgrades and maintenance
BENEFITS:	Ensures that all costs are being captured and financed through the wastewater water rates

PROJECT DESCRIPTION:	NOTES	MGR:	BUDGET:
WASTEWATER TREATMENT EAST END PUMP STATION : BLDG. & PROPERTY MNTCE:			
Building/Structure	Assitional funds required for EEP Chemical Building and Wet Well - Geotech results and increase in construction costs	DR	1,200,000
Public Works Storage Facilities	New cover for coverall structure (Shared PW)	DA/BW	25,000
WASTEWATER TREATMENT EAST END PUMP STATION:			
Process Treatment Upgrades (Engineering)	Contract administration Chemical Building & Wet Well	DR	450,000
Wet Well	Contruction of EEPS Wet Well	DR	5,403,250
WASTEWATER TREATMENT LAGOON:			
Sludge Removal (Mechanical / Geotube)	Sludge Survey	DR	10,000
Sludge & H2S Removal (Acti-Zyme)	Acti-Zyme Pilot Project	DR	60,000
			7,148,250

WASTEWATER COLLECTION CAPITAL PROJECTS

PROJECT NAME:	Wastewater Collection/Construction
YEAR:	2024
COST CENTRE:	Capital reserve funded through wastewater revenues
LOCATION:	Gananoque Wastewater Collection System
LENGTH:	On-Going
YEAR FIRST INTRODUCED:	2020
PREPARED BY	D. Richards
DATE	September 14, 2023 FINAL
SCOPE:	Provides for the capital needs for the Gananoque Wastewater Collection System
WHY REQUIRED:	Allows for coordinated planning for equipment upgrades and maintenance requirements
BENEFITS:	Ensures that all costs are being captured and financed through the wastewater water rates

PROJECT DESCRIPTION:	NOTES	MGR:	BUDGET:
FULL RECONSTURCTION PROJECTS (SEWER MAINS & LATERALS)			
ARTHUR STREET (Charles to Deadend)	Engineering / Project Planning	DA	50,000
MAINS / SERVICE LATERALS / COLLECTION STRUCTUES :			
Service Lateral Replacements and Linning / Manhole Refurbishment	On-Going Collection / Structure Refurbishment Infiltration Control Program	DR	25,000
Engineering Services / CCTV Inspection / GIS Mapping	Update GIS Mapping	DA	25,000
WATER STREET PUMP STATION #2:			
MAIN STREET PUMP STATION #3:			
Grinder #1	Replace Ginder		75,000
STONE STREET PUMP STATION:			
			0
			175,000