

# Chesterville Wastewater System

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Sewage Works # 110000114

## Annual Report

Prepared for: Township of North Dundas

Reporting Period of January 1<sup>st</sup> – December 31<sup>st</sup> 2022

Issued: March 31, 2023

Revision: 0

Operating Authority:



This report has been prepared to meet the requirements of ECA #6657-BPYPVL

## Table of Contents

<b>Operations and Compliance Reliability Indices .....</b>	<b>1</b>
<b>System Process Description.....</b>	<b>1</b>
<b>Wastewater System Flows .....</b>	<b>2</b>
Raw Flows .....	2
Effluent Flow.....	3
<b>Effluent Quality Assurance or Control Measures .....</b>	<b>3</b>
<b>Effluent Quality .....</b>	<b>3</b>
Carbonaceous Biochemical Oxygen Demand (5-Day) .....	4
Total Suspended Solids.....	4
Total Phosphorus.....	5
Total Ammonia Nitrogen .....	6
Hydrogen Sulphide .....	7
pH.....	8
Acute Lethality.....	8
<b>Operating Issues .....</b>	<b>8</b>
<b>Maintenance .....</b>	<b>9</b>
Flow Meter Calibration and Maintenance .....	9
Maintenance Summary .....	9
Notice of Modifications .....	9
<b>Sludge Generation .....</b>	<b>9</b>
<b>Summary of Complaints.....</b>	<b>9</b>
<b>Summary of Abnormal Discharge Events .....</b>	<b>9</b>
Bypass/Overflow/Spills.....	9
<b>Appendix A – Performance Assessment Reports.....</b>	<b>A</b>
<b>Appendix B – Flow Meter Calibration Reports .....</b>	<b>B</b>
<b>Appendix C – Ministry Correspondence.....</b>	<b>C</b>

## Operations and Compliance Reliability Indices

Compliance Event	# of Events
Environment Canada Inspections	0
Ministry of Environment Inspections	0
Ministry of Labour Inspections	0
Non-Compliance	1
Spills/Overflows/Bypasses	0
Sewer Main Blockages	0

## System Process Description

Chesterville's wastewater system consists of a gravity fed sanitary sewage collection system with three pumping stations and a wastewater treatment lagoon. The main pumping station is located on Water Street and discharges directly to the lagoon. There is also a pumping station located on Lori Lane which was constructed in the early 1990's to service the Thompson subdivision. A third pumping station is located at the lagoon and services the industrial site located at 171 Main Street North. This pumping station is currently offline.

Chesterville's sewage treatment system was originally constructed in the 1970's and included only one lagoon cell until a second cell was added in 1981. Substantial upgrades to the system took place between 2014 and 2015. A second wet well was added at the main pumping station, increasing the pumping capacity to 145 l/s, and a continuous chemical feed system for phosphorus removal was added along a new forcemain from the pumping station to the lagoons. The lagoon system was expanded by incorporating the former Nestle lagoon cells, creating a five cell system, and the existing municipal lagoon cells were converted to polishing/effluent storage ponds with the addition of aeration to both cells.

The lagoon system's design capacity was increased from 1046 m<sup>3</sup>/d to 1660 m<sup>3</sup>/d following the upgrades. However, the Ministry required that testing be undertaken to confirm the lagoon would be able to perform to the required effluent criteria when the facility reached the new rated capacity. The testing took place and a report was submitted, but not deemed by the Ministry to provide enough evidence that the lagoon would be able to meet all necessary requirements when operating at full capacity. Rather than extend the timeline to continue the testing, the Ministry removed the performance testing requirement from the ECA and replaced it with a requirement in the annual report to review performance as flows increase. The amended ECA # 6657-BPYPVL was issued June 1, 2020.

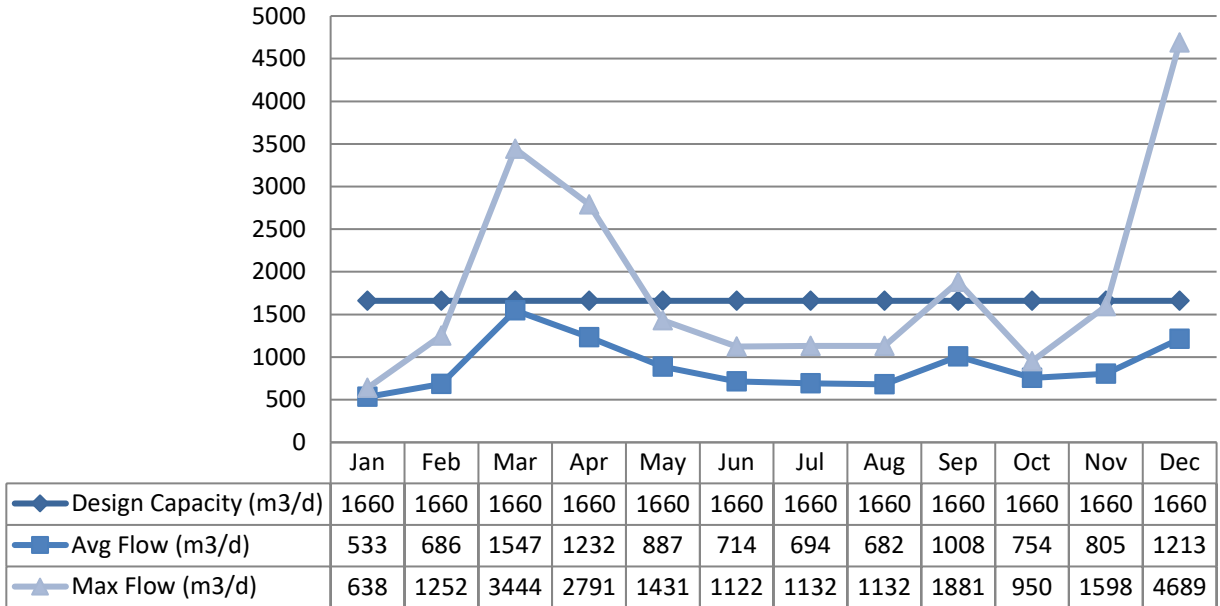
Effluent from the lagoons is discharged in the spring and in the fall via a 600 mm diameter pipe which extends from the treatment facility to an outlet in the South Nation River.

## Wastewater System Flows

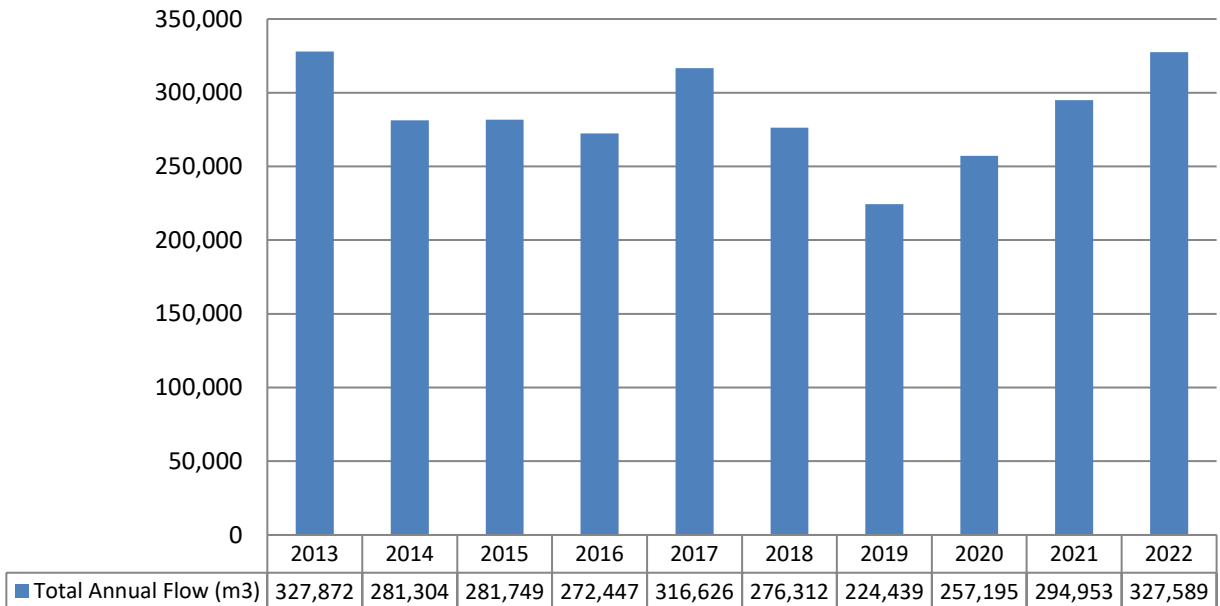
The hydraulic flows reaching the sewage lagoons in 2022 averaged 896 m<sup>3</sup>/day which represents 54% of the 1,660 m<sup>3</sup>/day design capacity.

### Raw Flows

#### 2022 Raw Flows:



#### Annual Raw Flow Comparison:



## **Effluent Flow**

A total of 339,153 m<sup>3</sup> of effluent was discharged from Chesterville’s sewage lagoons in 2022 with 247,489m<sup>3</sup> discharged in the spring and 91,664 m<sup>3</sup> discharged in the fall.

## **Effluent Quality Assurance or Control Measures**

Effluent control measures include pre-discharge sampling and testing of lagoon cell contents prior to seasonal discharges. The samples are collected by OCWA’s competent and licensed staff using approved methods and protocols for sampling including those specified in the Ministry’s Procedure F-10-1, “Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works”, the Ministry’s publication, “Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater” and the publication, “Standard Methods for the Examination of Water and Wastewater”.

All effluent samples collected during the reporting period were submitted to Caduceon in Ottawa for analysis, with the exception of pH, temperature and unionized ammonia. Caduceon is accredited by the Canadian Association for Laboratory Accreditation (CALA). Accredited labs must meet strict provincial guidelines including an extensive quality assurance/quality control program. By choosing these laboratories, OCWA is ensuring appropriate control measures are undertaken during sample analysis.

The pH and temperature parameters were analyzed in the field at the time of sample collection by certified operators to ensure accuracy and precision of the results obtained. Un-ionized ammonia was calculated using the total ammonia nitrogen concentration, pH and temperature as required by the facility’s ECA.

## **Effluent Quality**

The average concentrations of carbonaceous biochemical oxygen demand (CBOD<sub>5</sub>), total phosphorus (TP) and total ammonia nitrogen (TAN) remained below the effluent objectives and limits outlined in the facility’s ECA during both the spring and fall lagoon discharges. The average concentration of total suspended solids (TSS) exceeded the effluent objective during the spring discharge in 2022; however, during the fall discharge TSS remained below the objective and the limit specified in the ECA.

The Annual Average Daily Effluent Loading for Total Phosphorus exceeded the ECA Limit.

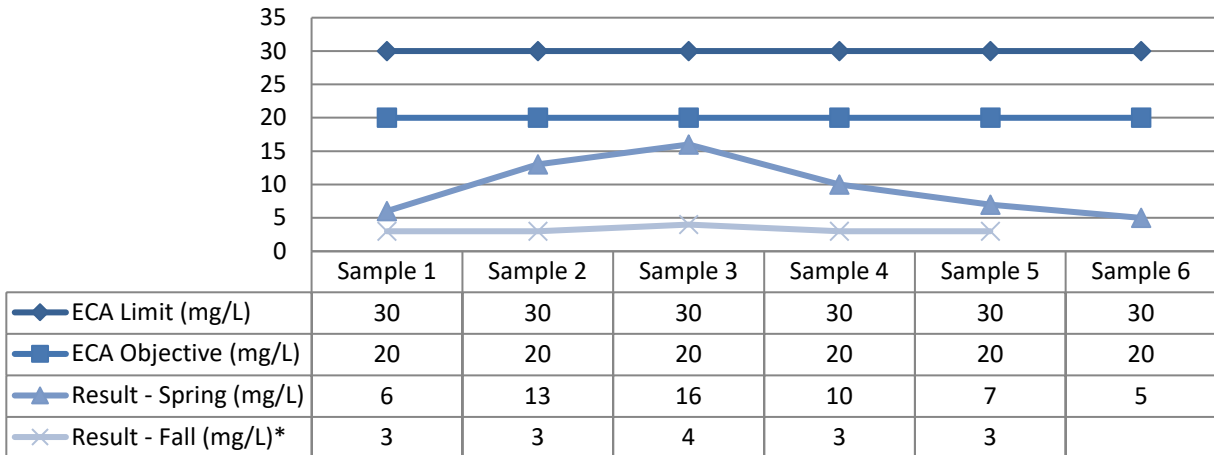
Effluent pH exceeded the objective specified in the ECA on five out of six of the effluent samples during the spring discharge in 2022. The pH remained below the objective and the limit during all effluent samples collected during the fall discharge. The objective level of non-detectable was exceeded for undissociated hydrogen sulphide (H<sub>2</sub>S) during both discharge periods, although the measured concentration remained quite low.

The results from the spring and fall discharge periods are tabulated below. Please refer to the Performance Assessment Reports in Appendix A for details.

**Carbonaceous Biochemical Oxygen Demand (5-Day)**

Discharge Period	Seasonal Average (mg/L)	Objective (mg/L)	Limit (mg/L)	Exceedance
Spring	9.5	20	30	No
Fall	3.2	20	30	No

**Effluent CBOD<sub>5</sub> Results:**



\* A total of five samples were collected during the fall discharge

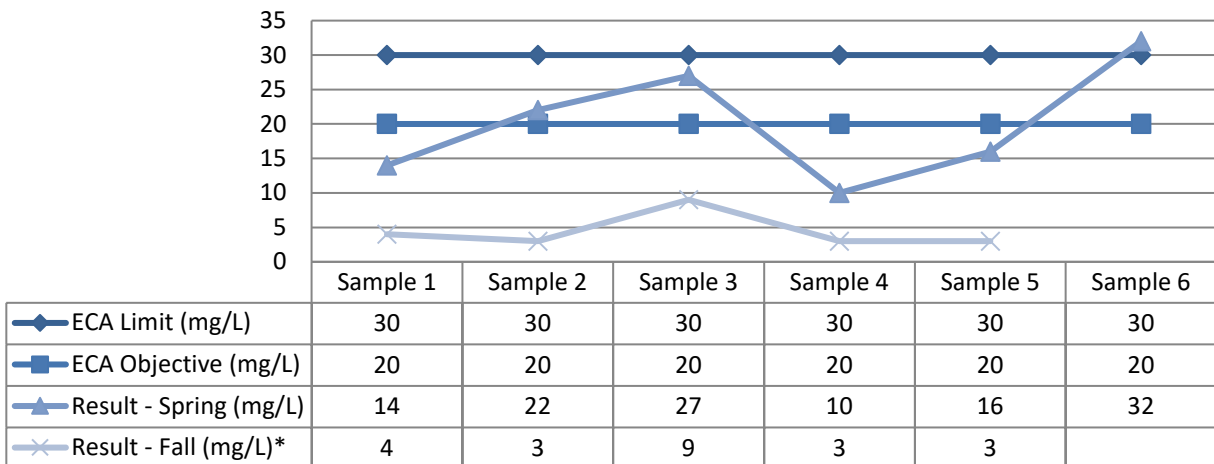
\* Fall discharge - three out of five results are < 3 mg/L

**Total Suspended Solids**

Discharge Period	Seasonal Average (mg/L)	Objective (mg/L)	Limit (mg/L)	Exceedance
Spring	20.2	20	30	Yes – Objective*
Fall	4.4	20	30	No

\*Please refer to the 'Operating Issues' section of this report for details.

**Effluent TSS Results:**



\* A total of five samples were collected during the fall discharge

\* Fall discharge - two out of five results are < 3 mg/L

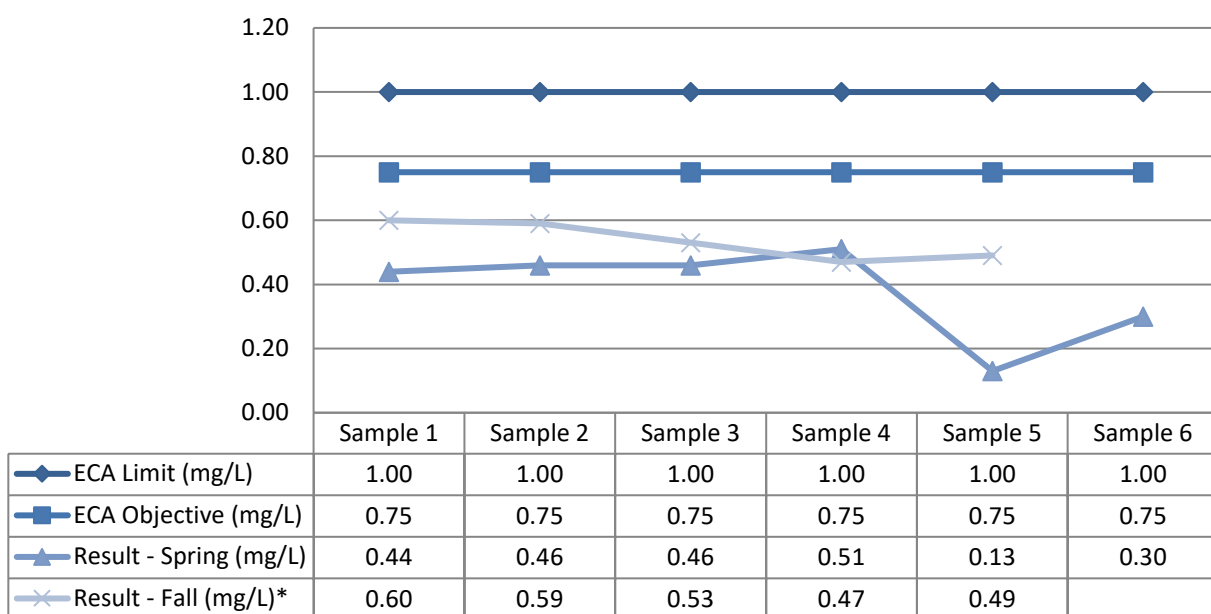
**Total Phosphorus**

Discharge Period	Seasonal Average (mg/L)	Objective (mg/L)	Limit (mg/L)	Exceedance
Spring	0.38	0.75	1.00	No
Fall	0.50	0.75	1.00	No

Discharge Period	Annual Average (mg/L)	Limit (kg/d)	Exceedance
2022	4.36	1.66	Yes*

\*Please see the non-compliance correspondence to the Ministry attached in Appendix C.

Effluent TP Results:



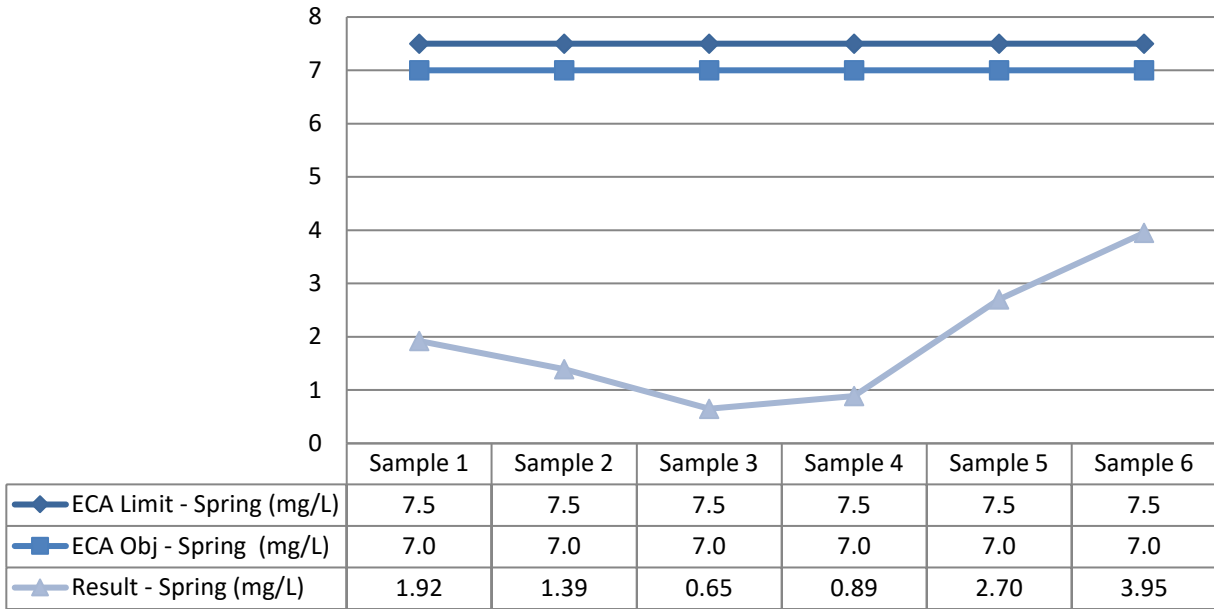
\* A total of five samples were collected during the fall discharge

**Total Ammonia Nitrogen**

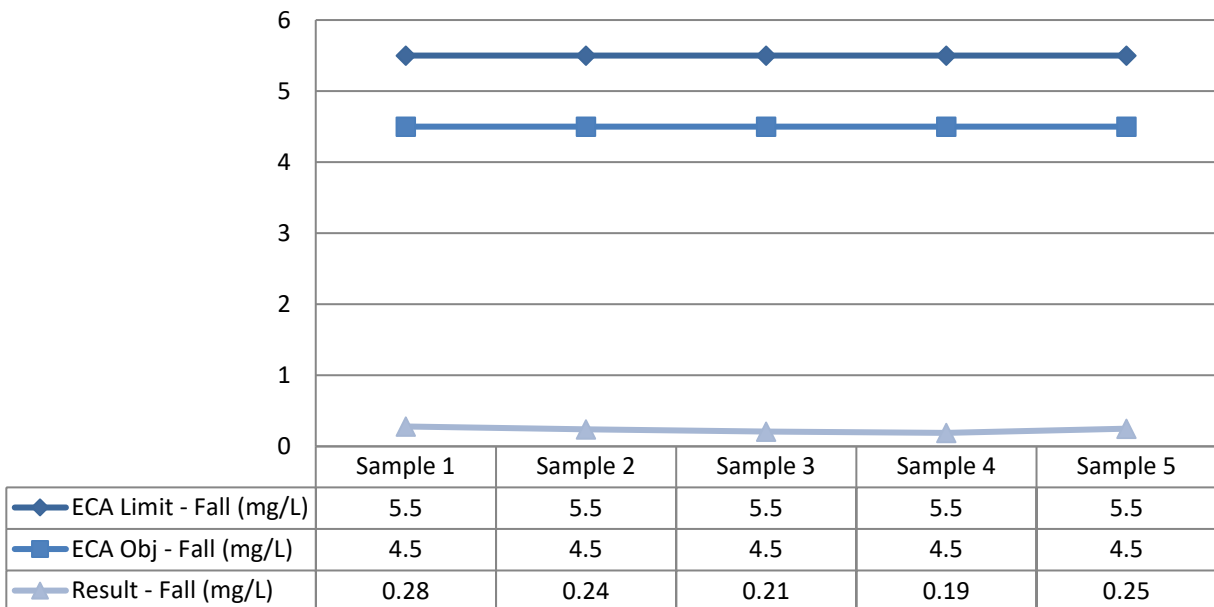
Discharge Period	Seasonal Average (mg/L)	Objective (mg/L)	Limit (mg/L)	Exceedance
Spring (Mar. 1 – Mar. 31)*	N/A	9.0	11.0	No
Spring (Apr. 1 – Apr. 30)*	1.9	7.0	7.5	No
Fall (Nov. 1 – Dec. 16)	0.2	4.5	5.5	No

\* The spring discharge began April 11, 2022

**Effluent TAN Results for Spring Discharge Period:**



**Effluent TAN Results for Fall Discharge Period:**





**Hydrogen Sulphide**

Discharge Period	Seasonal Average (mg/L)	Objective (mg/L)	Limit (mg/L)	Exceedance
Spring	0.0016	Non-Detectable	0.02	Yes – Objective
Fall	0.0019	Non-Detectable	0.02	Yes – Objective

***Effluent Undissociated H<sub>2</sub>S Results for Spring Discharge Period:***

	11-Apr	16-Apr	19-Apr	21-Apr	26-Apr	30-Apr	Average
S <sup>2-</sup> (mg/L)	0.02	< 0.1	0.05	< 0.1	0.05	< 0.1	0.04
pH	9.1	8.8	8.7	8.6	8.4	8.7	8.72
Temp	7.1	7.7	7.2	9.8	9.9	12.0	N/A
% Undissociated H <sub>2</sub> S (from table)	1.35	2.60	3.31	3.80	5.794	2.809	N/A
Undissociated H <sub>2</sub> S (mg/L)	0.0003	0.0013	0.0017	0.0019	0.0029	0.0014	0.0016

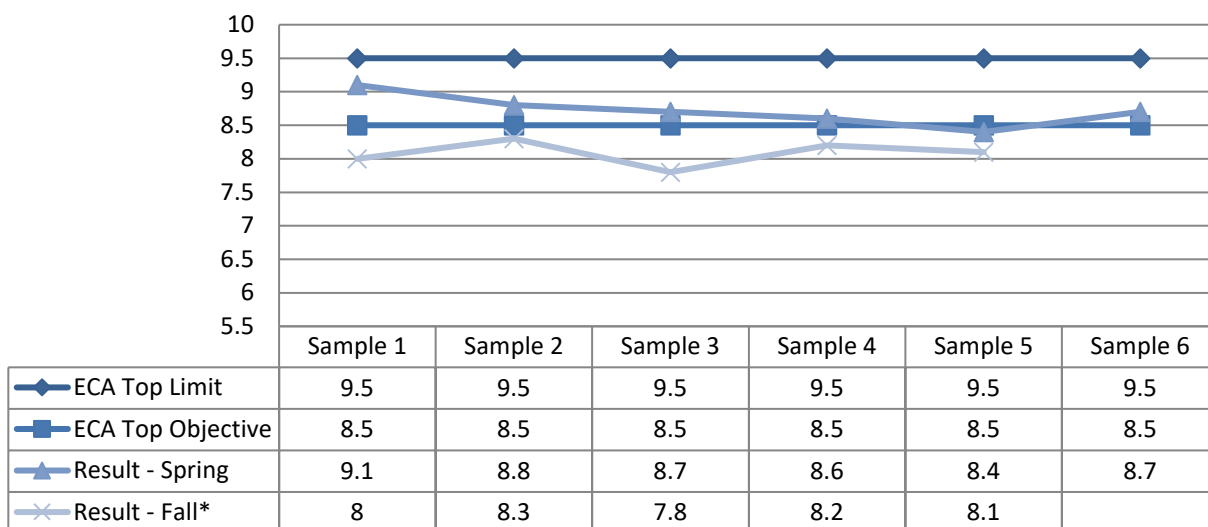
***Effluent Undissociated H<sub>2</sub>S Results for Fall Discharge Period:***

	01-Nov	03-Nov	08-Nov	10-Nov	15-Nov	Average
S <sup>2-</sup> (mg/L)	< 0.01	< 0.01	0.03	< 0.01	0.02	0.03
pH	8	8.3	7.8	8.2	8.1	8.08
Temp	15.0	16.1	10.5	9.3	9.3	N/A
% Undissociated H <sub>2</sub> S (from table)	11.69	6.06	19.41	9.16	11.27	N/A
Undissociated H <sub>2</sub> S (mg/L)	0.0006	0.0003	0.0058	0.0005	0.0023	0.0019

## pH

Discharge Period	Seasonal Average	Objective	Limit	Exceedance
Spring	8.72	6.5 – 8.5	6.0 – 9.5	Yes – Objective
Fall	8.08	6.5 – 8.5	6.0 – 9.5	No

### Effluent pH Results:



\* A total of five samples were collected during the fall discharge

## Acute Lethality

There were two samples collected in 2022 and tested for acute lethality to Rainbow Trout and Daphnia Magna. In accordance with the ECA, sampling has been reduced to once annually (alternating spring and fall) after four consecutive discharges indicated the effluent was not lethal. Results are displayed as % mortality. An adverse result is a >50% mortality rate.

Sample Period	Rainbow Trout	Daphnia Magna
Fall Discharge - Start	0 %	0 %
Fall Discharge - End	0 %	0 %

## Operating Issues

The annual average daily effluent loading calculated for Total Phosphorus exceeded the ECA limit of 1.66 kg/d in 2022 although the TP concentration of all samples remained below the limit and objective specified in the ECA throughout the spring and fall lagoon discharge periods. The annual average daily effluent loading is calculated with the annual average effluent concentration of TP and the annual average daily effluent flow which is based on the total number of days that effluent is discharged during the reporting period. Increasing the discharge duration will help stay below the annual average daily effluent loading for TP in 2023.

The ECA Objective for TSS was exceeded during the spring discharge of 2022. Lack of vegetation on the berms of the polishing cells contributed to berm erosion which mixed with the lagoon cell contents during the spring discharge.

## Maintenance

### Flow Meter Calibration and Maintenance

Copies of the flow meter calibration certificates for 2022 are attached in Appendix B.

### Maintenance Summary

Description
<ul style="list-style-type: none"> <li>- Performed routine sewer flushing</li> <li>- Performed routine wet well cleaning</li> <li>- New heater installed at Nestle SPS</li> <li>- Generator annual maintenance completed (Water St. SPS)</li> <li>- Serviced generator (new fuel cartridge and clamps)</li> <li>- New raw sewage flow meter display</li> </ul>

### Notice of Modifications

Date	Process	Modification	Status
None to report			

## Sludge Generation

Sludge depth is monitored periodically, and plans for sludge removal are made as required for optimal operation of the lagoon system. Sludge levels in all ponds were measured in 2020. The measurements were as follows:

Lagoon Cell	Sludge Depth
Primary Cell No. 1	1 – 2"
Primary Cell No. 2	1 – 3"
Secondary Cell	0 – 1"
Polishing Cell (East)	0 – 4"
Polishing Cell (West)	0"

Approximately 6500 m<sup>3</sup> of sludge was removed from the West polishing cell in 2019.

## Summary of Complaints

There were no complaints documented during the reporting period.

## Summary of Abnormal Discharge Events

### Bypass/Overflow/Spills

No bypasses, overflows, or spills occurred during the reporting period.

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## **Appendix A – Performance Assessment Reports**

## ONTARIO CLEAN WATER AGENCY PERFORMANCE ASSESSMENT REPORT

MUNICIPALITY: TOWNSHIP OF NORTH DUNDAS  
 PROJECT: CHESTERVILLE WASTEWATER TREATMENT SYSTEM  
 PROJECT NUM.: 5677  
 WORKS NUM.: 110000114  
 DESCRIPTION: THREE SEWAGE PUMPING STATIONS AND A FIVE CELL LAGOON SYSTEM  
 INCLUDING TWO PRIMARY CELLS, ONE SECONDARY CELL, AND TWO POLISHING CELLS

YEAR: 2022  
 WATER COURSE: SOUTH NATION RIVER  
 DESIGN CAPACITY: 1660 m<sup>3</sup>/day

MONTH	FLOWS			EFFLUENT		BIOCHEMICAL O <sub>2</sub> DEMAND				SUSPENDED SOLIDS			PHOSPHORUS			TKN
	Total Flow (m <sup>3</sup> )	Avg Day Flow (m <sup>3</sup> )	Max Day Flow (m <sup>3</sup> )	Effluent Flow (m <sup>3</sup> )	Discharge Duration (days)	Avg. Alum Dosage* (mg/L)	Avg Raw BOD (mg/L)	Avg Eff CBOD (mg/L)	Percent Removal (%)	Avg Raw SS (mg/L)	Avg Eff SS (mg/L)	Percent Removal (%)	Avg Raw PHOS. (mg/L)	Avg Eff PHOS. (mg/L)	Percent Removal (%)	Avg Raw TKN (mg/L)
JAN	16,531	533	638			87.4	167			252			5.48			45.6
FEB	19,220	686	1,252			78.9	111			205			3.41			33.0
MAR	47,955	1,547	3,444			70.1	41			43			1.89			21.5
APR	36,961	1,232	2,791	247,489	20	88.4	39	9.5		45	20.2		1.89	0.38		20.3
MAY	27,511	887	1,431			88.7	15			23			1.18			13.7
JUN	21,413	714	1,122			81.2	21			30			3.56			40.5
JUL	21,511	694	1,132			80.4	13			26			2.78			29.0
AUG	21,131	682	1,132			63.1	26			38			3.64			44.3
SEPT	30,226	1,008	1,881			57.3	101			54			3.58			44.3
OCT	23,387	754	950			67.9	148			205			4.55			39.2
NOV	24,140	805	1,598	91,664	15	26.7	152	3.2		195	4.4		6.02	0.54		48.1
DEC	37,603	1,213	4,689			53.3	107			520			3.39			38.2
TOTAL	327,589			339,153	35											
AVG		896					78	6.6	91.5	136	13.0	90.5	3.4	0.45	86.9	34.8
MAX			4,689				70.3	167		520			6.0			
CRITERIA		<b>1,660</b>						<b>30</b>			<b>30</b>			<b>1.0</b>		

**COMMENTS:** Percent removal based on 12 months of raw composite samples

\*No alum dosage from February 24th - March 17th 2022

\*No alum dosage from April 5th - April 19th 2022

\*No alum dosage from October 1st - October 26th 2022

**ONTARIO CLEAN WATER AGENCY  
LAGOON PERFORMANCE ASSESSMENT REPORT**

MUNICIPALITY: **TOWNSHIP OF NORTH DUNDAS**  
 PROJECT: **CHESTERVILLE WASTEWATER TREATMENT LAGOONS**  
 PROJECT NUM.: **5677**  
 WORKS NUM.: **110000114**  
 DESCRIPTION: **A FIVE CELL LAGOON SYSTEM INCLUDING TWO PRIMARY CELLS, ONE SECONDARY CELL, AND TWO POLISHING CELLS**

YEAR: **2022**  
 WATER COURSE: **SOUTH NATION RIVER**  
 DESIGN CAPACITY: **1660 m<sup>3</sup>/day**

SAMPLE RESULTS	SPRING							247,489 m <sup>3</sup>		
	DATE	11-Apr	16-Apr	19-Apr	21-Apr	26-Apr	30-Apr	Average	ECA Objective	ECA Limit*
CBOD5 (mg/L)	6	13	16	10	7	5	9.5	20	30	
TSS (mg/L)	14	22	27	10	16	32	20.2	20	30	
TP (mg/L)	0.44	0.46	0.46	0.51	0.13	0.3	0.38	0.75	1.0	
**NH <sub>3</sub> (mg/L)	1.92	1.39	0.65	0.89	2.70	3.95	1.9	7.0	7.5	
S <sup>2</sup> (mg/L)	0.02	< 0.1	0.05	< 0.1	0.05	< 0.1				
TKN (mg/L)	5.1	5.7	5.6	6	1.8	7.9				
NO <sub>2</sub> (mg/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
NO <sub>3</sub> (mg/L)	< 0.1	0.30	0.5	1.1	0.9	1.2				
<i>E. coli</i> (cfu/100mL)	10	240	600	140	390	240				

\* ECA limit. Monthly average concentration shall not exceed the corresponding maximum concentration  
 \*\* NH3 Objectives: March - 9.0 mg/L; April - 7.0 mg/L; NH3 Limits: March - 11.0 mg/L, Apr - 7.5 mg/L

SAMPLE RESULTS	FALL					91,664 m <sup>3</sup>		
	DATE	01-Nov	03-Nov	08-Nov	10-Nov	15-Nov	Average	ECA Objective
CBOD5 (mg/L)	3	<3	4	<3	<3	3.2	20	30
TSS (mg/L)	4	3	9	<3	<3	4.4	20	30
TP (mg/L)	0.6	0.59	0.53	0.47	0.49	0.5	0.75	1.0
**NH <sub>3</sub> (mg/L)	0.28	0.24	0.21	0.19	0.25	0.2	4.5	5.5
S <sup>2</sup> (mg/L)	<0.01	<0.01	0.03	<0.01	0.02			
TKN (mg/L)	1.6	1.5	1.6	1.4	2.1			
NO <sub>2</sub> (mg/L)	<0.1	0.7	<0.1	<0.1	<0.1			
NO <sub>3</sub> (mg/L)	<0.1	<0.1	<0.1	<0.1	<0.1			
<i>E. coli</i> (cfu/100mL)	20	20	150	30	<10			

\* ECA limit. Seasonal average concentration shall not exceed the corresponding maximum concentration  
 \*\* NH3 Objective Nov 1 - Dec 16: 4.5 mg/L; NH3 Limit Nov 1 - Dec 16: 5.5 mg/L

Unionized NH3 calculations	On Site Temperature	7.1	7.7	7.2	9.8	9.9	12.0
	On Site pH	9.1	8.8	8.7	8.6	8.4	8.7
	NH3-N (lab)	1.92	1.39	0.65	0.89	2.7	3.95
	unionized NH3-N (calc)	0.301	0.124	0.045	0.060	0.119	0.387

Unionized NH3 calculations	On Site Temperature	15.0	16.1	10.5	9.3	9.3
	On Site pH	8	8.3	7.8	8.2	8.1
	NH3-N (lab)	0.28	0.24	0.21	0.19	0.25
	unionized NH3-N (calc)	0.007	0.013	0.003	0.005	0.005

Undissociated H2S Calculations	S <sup>2</sup> (mg/L)	0.02	< 0.1	0.05	< 0.1	0.05	< 0.1	Average	Objective	Limit
	pH	9.1	8.8	8.7	8.6	8.4	8.7	8.72	N/A	N/A
	Temp	7.1	7.7	7.2	9.8	9.9	12.0	N/A	N/A	N/A
	% Undissociated H2S	1.35	2.60	3.31	3.80	5.794	2.809	N/A	N/A	N/A
	Undissociated H <sub>2</sub> S	0.0003	0.0013	0.0017	0.0019	0.0029	0.0014	0.0016	ND	0.02

Undissociated H2S Calculations	S <sup>2</sup> (mg/L)	<0.01	<0.01	0.03	<0.01	0.02	Average	Objective	Limit
	pH	8	8.3	7.8	8.2	8.1	8.08	N/A	N/A
	Temp @	15.0	16.1	10.5	9.3	9.3	N/A	N/A	N/A
	% Undissociated H2S	11.69	6.06	19.41	9.16	11.27	N/A	N/A	N/A
	Undissociated H <sub>2</sub> S	0.0006	0.0003	0.0058	0.0005	0.0023	0.0019	ND	0.02

TOTAL LOADING	
CBOD5 (kg)	2,351
TSS (kg)	4,991
TP (kg)	95
NH <sub>3</sub> (kg)	474

Acute Lethality	Start	End
Rainbow Trout	N/A	N/A
Daphnia Magna	N/A	N/A

\* After 4 consecutive discharge seasons not indicating acute lethality testing can be reduced to once annually at end of discharge alternating spring and fall.

TOTAL LOADING	
CBOD5 (kg)	293
SS (kg)	403
TP (kg)	49
NH <sub>3</sub> (kg)	21

Acute Lethality	Start	End
Rainbow Trout	0%	0%
Daphnia Magna	0%	0%

\* After 4 consecutive discharge seasons not indicating acute lethality testing can be reduced to once annually at end of discharge alternating spring and fall.

PRE-DISCHARGE RESULTS	East (5)	West (4)	East (5)*	West (4)*	Cell 3	Cell 2	
	CBOD5 (mg/L)	9	5				
	TSS (mg/L)	28	548	11	22	12	26
	TP (mg/L)	0.36	0.43	0.50	0.72	0.52	0.47
	NH3	0.20	0.92				
	H2S	0.03	0.05				
<i>E. Coli</i>	< 2	4					

\*Resample

PRE-DISCHARGE RESULTS	East (5)	West (4)	Cell 3	
	CBOD5 (mg/L)	4	4	< 3
	SS (mg/L)	9	6	11
	TP (mg/L)	0.68	0.75	0.74
	NH3	0.12	0.07	0.06
	H2S	0.010	0.02	0.02
<i>E. Coli</i>	142	66	32	

ANNUAL LOADING TP (KG/D)	kg/day
	4.36
<b>ECA LIMIT</b>	<b>1.66</b>

**ONTARIO CLEAN WATER AGENCY  
CHESTERVILLE SEWAGE LAGOON 2022**

**DETERMINATION OF UN-IONIZED AMMONIA (NH<sub>3</sub>) IN WASTEWATER EFFLUENT**

Sample Date	Sample Temperature (°C)	Degrees Kelvin	Dissociation Constant pKa	Sample pH on-site	Fraction of Un-ionized Ammonia	Total Ammonia (mg/L) (NH <sub>3</sub> +NH <sub>4</sub> +as N)	Un-ionized Ammonia (mg/L)
11-Apr	7.1	280.25	9.83	9.10	0.1566	1.92	0.301
16-Apr	7.7	280.85	9.81	8.80	0.0890	1.39	0.124
19-Apr	7.2	280.35	9.83	8.70	0.0694	0.65	0.045
21-Apr	9.8	282.95	9.74	8.60	0.0678	0.89	0.060
26-Apr	9.9	283.05	9.73	8.40	0.0442	2.70	0.119
30-Apr	12.0	285.15	9.66	8.70	0.0980	3.95	0.387

Sample Date	Sample Temperature (°C)	Degrees Kelvin	Dissociation Constant pKa	Sample pH on-site	Fraction of Un-ionized Ammonia	Total Ammonia (mg/L) (NH <sub>3</sub> +NH <sub>4</sub> +as N)	Un-ionized Ammonia (mg/L)
01-Nov	15.0	288.15	9.56	8	0.0266	0.28	0.007
03-Nov	16.1	289.25	9.53	8.3	0.0558	0.24	0.013
08-Nov	10.5	283.65	9.71	7.8	0.0120	0.21	0.003
10-Nov	9.3	282.45	9.76	8.2	0.0271	0.19	0.005
15-Nov	9.3	282.45	9.76	8.1	0.0216	0.25	0.005

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## **Appendix B – Flow Meter Calibration Reports**



<b>Work Order #</b>	2721318	Meter Flow Verification (1y) 5677	<b>Status</b> COMP
<b>Job Plan #</b>	METFLO01-A	METER FLOW ANNUAL GENERIC	
<b>Project</b>	NORDUY5677-M100		
<b>Type</b>	PM		<b>Scheduled Start Date</b> 03-Mar-22
<b>Criticality</b>	3		
<b>Class</b>	Calibration		

<b>Location</b>	5677, Chesterville WWT Lagoon & CS, Process, Headworks, Pumping
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<b>Asset</b>	0000168525	METER FLOW RAW SEWAGE Water St SPS	<b>Status</b> OPERATING
<b>Building</b>	PUMPING STATION BUILDING		
<b>Level</b>	G		
<b>Qualifier</b>	CHESTERVILLE WWTP. SPS DIESEL ROOM RAW SEWAG		
<b>Manufacturer</b>	TOSHIBA		
<b>Model</b>	LF654NM1BNCAAF		
<b>Serial Number</b>	1865030004		
<b>Warranty Expiration</b>			
<b>Install Date</b>	01-Oct-19		<b>Purchase Price</b> \$ 13,000.00
<b>Asset Comments</b>	PIPE SIZE: 12" WELL DIAMETER: 2.743M PIPE MATERIAL: DUCTILE IRON WALL THICKNESS: 0.34" O.D.: 13.2" I.D: 12.52 WELL RADIUS: 137.16 PLANT METER MAKE: DANFOSS TYPE: MAGNETIC MODEL: 3100173F3001IP67 SERIAL: 3100-122905T433 CALIBRATED RANGE: 0-100% OUTPUT: 4-20 mAdc PERCENT OF ACCURACY - RANGE - CLASS - CALIBRATION RANGE - DATE CODE - OUTPUT AMPERAGE - 4-20MAOUTPUT TYPE (PULSE/MILLIAMPS) - MILLAMPDESIGN PRESSURE - SCADA TAG # - CAPACITY/RATING - M3TYPE/ FORM - MAGLAYING LENGTH - CATALOG NUMBER -		

<b>Reported By</b>	MAXADMIN
<b>Lead</b>	
<b>Crew Work Group</b>	1555 Nation Valley Operations

Sequence	Asset	Location	Inspected
1	0000261009	METER FLOW EFFLUENT GREYLINE 5677-WLCH-P-PC	5677, Chesterville WWT Lagoon & CS, Process, Process Control & Monitoring <input type="checkbox"/>
2	0000261276	METER FLOW RAW SEWAGE Emma St 5677-WLNE-P	5677, Chesterville - Nestle SPS, Process <input type="checkbox"/>

Asset #	Meter	Last Reading	Date	Current Reading	Date
0000168525					
0000261276	AS LEFT	AS LEFT ASSET		CONDITION	
0000261009	AS LEFT	AS LEFT ASSET		CONDITION	

**Safety Message**

This Work Order (and accompanying Maintenance Procedure) have been developed to aid field personnel in the care and maintenance of the specified equipment. However, maintenance personnel are expected to look for and correct any defects which are not anticipated in the procedure. This document may not provide all the technical information that may be required, and it may be necessary to refer to the manufacturer's manual for further details.

The "As Found" and "As Left" readings, as well as any abnormalities found and any repairs carried out, are to be recorded in the Maximo WMS System.

Isolate and de-energize equipment in accordance with the lock-out procedure.

Take time to identify hazards and plan how each hazard will be eliminated or controlled. Work practices must be in accordance with the Occupational Health & Safety Act and the Ontario Clean Water Agency safety manual.

Ensure direct supervisor or their designate have been notified of entry into the site. This notification should provide approximate time and duration. On completion of duties notification is to be given that site has been vacated and secured.

Task	Description
10	<p><b>RUNNING CHECKS</b></p> <ol style="list-style-type: none"> <li>1) Verify calibration parameters and programming parameters where applicable.</li> <li>2) Ensure proper connections and grounding.</li> <li>3) Check display for any alarm or error codes.</li> </ol>
20	<p><b>HAVE QUALIFIED TECHNICIAN CALIBRATE UNIT</b></p> <ol style="list-style-type: none"> <li>1. Have a qualified technician calibrate the unit, using actual flow method or flow simulator.</li> <li>2. Calibration records must be kept for a period of five years.</li> <li>3. Records shall include the level of accuracy of the equipment as found and as left.</li> <li>4. Calibration test equipment shall be certified annually and certification dates recorded on the calibration record. Some test equipment may not require calibration</li> </ol>
30	<p><b>RECORD ADJUSTMENTS AND VERIFY OUTPUTS</b></p> <ol style="list-style-type: none"> <li>1. Record any adjustments, modifications or replacements made to the equipment during the calibration.</li> <li>2. Verify accuracy of electronic outputs to the end device as required based on theoretical versus actual values .{Chart recorders, SCADA, Outpost 5}.</li> <li>3. Ensure all nameplate data is recorded and entered in WMS.</li> </ol>
40	<p><b>COMPLETE A VERIFICATION SHEET FOR EACH FLOW METER, POST IT AND ATTACH TO WORK ORDER</b></p> <p>Note: Calibration sheet must be signed and original kept on site in the SOP binder.</p>

**For Field-Use Only - Completion Elements:**

**Work Log:**

Annual Inspection and Calibration of flow meter completed

Labour			
Date	Reg/Prem.	Hours	Memo

Completed By

Please Print Name

Stephane Barbarie

Signature

*Stephane Barbarie*

Date

April 13, 2022

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## **Appendix C – Ministry Correspondence**

March 27, 2023

Ms. Tracy Hart  
District Manager, Ministry of the Environment, Conservation and Parks  
Ottawa District Office  
[tracy.hart@ontario.ca](mailto:tracy.hart@ontario.ca)

**Subject: Chesterville Sewage Lagoon - Notification of Non-Compliance of TP Loading**

This letter provides written notification of non-compliance with the total phosphorus (TP) loading specified in Schedule C of ECA #6657-BPYPVL during the 2022 annual reporting period for Chesterville's Sewage Lagoon. This letter confirms the verbal notification of non-compliance provided by OCWA to the Ontario Ministry of the Environment, Conservation and Parks' Spills Action Centre on March 27, 2023 (Reference #1-33Q7Y2).

The following effluent limit was exceeded:

Type of Limit	Result	ECA Limit
Total Phosphorus Annual Loading	4.36 kg/d	1.66 kg/d

The annual average daily effluent loading calculated for Total Phosphorus exceeded the ECA limit of 1.66 kg/d in 2022 although the TP concentration of all samples remained below both the limit and objective specified in the ECA throughout the spring and fall lagoon discharge periods. The annual average daily effluent loading is calculated with the annual average effluent concentration of TP and the annual average daily effluent flow which is based on the total number of days that effluent is discharged during the reporting period. Increasing the discharge duration will help stay below the annual average daily effluent loading for TP in 2023.

A complete listing of all sample results obtained during the 2022 discharge can be found in the Lagoon Discharge PAR, attached.

If you have any questions or concerns, please contact me at (613) 448-3098.

Sincerely,



Caroline Lamarche  
Process & Compliance Technician  
OCWA, Nation Valley Cluster

Cc: Angela Rutley, CAO, Township of North Dundas  
Danielle Ward, Interim Director of Environmental Services, Township of North Dundas  
Dawn Crump, Senior Operations Manager, OCWA  
Vanessa Greatrix, Safety, Process & Compliance Manager, OCWA  
Michelle Gordon, Provincial Officer, MECP

**ONTARIO CLEAN WATER AGENCY  
LAGOON PERFORMANCE ASSESSMENT REPORT**

MUNICIPALITY: **TOWNSHIP OF NORTH DUNDAS**  
 PROJECT: **CHESTERVILLE WASTEWATER TREATMENT LAGOONS**  
 PROJECT NUM.: **5677**  
 WORKS NUM.: **110000114**  
 DESCRIPTION: **A FIVE CELL LAGOON SYSTEM INCLUDING TWO PRIMARY CELLS, ONE SECONDARY CELL, AND TWO POLISHING CELLS**

YEAR: **2022**  
 WATER COURSE: **SOUTH NATION RIVER**  
 DESIGN CAPACITY: **1660 m<sup>3</sup>/day**

SAMPLE RESULTS	SPRING							247,489 m <sup>3</sup>		
	DATE	11-Apr	16-Apr	19-Apr	21-Apr	26-Apr	30-Apr	Average	ECA Objective	ECA Limit*
CBOD5 (mg/L)	6	13	16	10	7	5	9.5	20	30	
TSS (mg/L)	14	22	27	10	16	32	20.2	20	30	
TP (mg/L)	0.44	0.46	0.46	0.51	0.13	0.3	0.38	0.75	1.0	
**NH <sub>3</sub> (mg/L)	1.92	1.39	0.65	0.89	2.70	3.95	1.9	7.0	7.5	
S <sup>2</sup> (mg/L)	0.02	< 0.1	0.05	< 0.1	0.05	< 0.1				
TKN (mg/L)	5.1	5.7	5.6	6	1.8	7.9				
NO <sub>2</sub> (mg/L)	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
NO <sub>3</sub> (mg/L)	< 0.1	0.30	0.5	1.1	0.9	1.2				
<i>E. coli</i> (cfu/100mL)	10	240	600	140	390	240				

\* ECA limit. Monthly average concentration shall not exceed the corresponding maximum concentration  
 \*\* NH3 Objectives: March - 9.0 mg/L; April - 7.0 mg/L; NH3 Limits: March - 11.0 mg/L, Apr - 7.5 mg/L

SAMPLE RESULTS	FALL						91,664 m <sup>3</sup>		
	DATE	01-Nov	03-Nov	08-Nov	10-Nov	15-Nov	Average	ECA Objective	ECA Limit
CBOD5 (mg/L)	3	<3	4	<3	<3	3.2	20	30	
TSS (mg/L)	4	3	9	<3	<3	4.4	20	30	
TP (mg/L)	0.6	0.59	0.53	0.47	0.49	0.5	0.75	1.0	
**NH <sub>3</sub> (mg/L)	0.28	0.24	0.21	0.19	0.25	0.2	4.5	5.5	
S <sup>2</sup> (mg/L)	<0.01	<0.01	0.03	<0.01	0.02				
TKN (mg/L)	1.6	1.5	1.6	1.4	2.1				
NO <sub>2</sub> (mg/L)	<0.1	0.7	<0.1	<0.1	<0.1				
NO <sub>3</sub> (mg/L)	<0.1	<0.1	<0.1	<0.1	<0.1				
<i>E. coli</i> (cfu/100mL)	20	20	150	30	<10				

\* ECA limit. Seasonal average concentration shall not exceed the corresponding maximum concentration  
 \*\* NH3 Objective Nov 1 - Dec 16: 4.5 mg/L; NH3 Limit Nov 1 - Dec 16: 5.5 mg/L

Unionized NH3 calculations	On Site Temperature	7.1	7.7	7.2	9.8	9.9	12.0
	On Site pH	9.1	8.8	8.7	8.6	8.4	8.7
	NH3-N (lab)	1.92	1.39	0.65	0.89	2.7	3.95
	unionized NH3-N (calc)	0.301	0.124	0.045	0.060	0.119	0.387

Unionized NH3 calculations	On Site Temperature	15.0	16.1	10.5	9.3	9.3
	On Site pH	8	8.3	7.8	8.2	8.1
	NH3-N (lab)	0.28	0.24	0.21	0.19	0.25
	unionized NH3-N (calc)	0.007	0.013	0.003	0.005	0.005

Undissociated H2S Calculations	S <sup>2</sup> (mg/L)	0.02	< 0.1	0.05	< 0.1	0.05	< 0.1	Average	Objective	Limit
	pH	9.1	8.8	8.7	8.6	8.4	8.7	8.72	N/A	N/A
	Temp	7.1	7.7	7.2	9.8	9.9	12.0	N/A	N/A	N/A
	% Undissociated H2S	1.35	2.60	3.31	3.80	5.794	2.809	N/A	N/A	N/A
	Undissociated H <sub>2</sub> S	0.0003	0.0013	0.0017	0.0019	0.0029	0.0014	0.0016	ND	0.02

Undissociated H2S Calculations	S <sup>2</sup> (mg/L)	<0.01	<0.01	0.03	<0.01	0.02	Average	Objective	Limit
	pH	8	8.3	7.8	8.2	8.1	8.08	N/A	N/A
	Temp @	15.0	16.1	10.5	9.3	9.3	N/A	N/A	N/A
	% Undissociated H2S	11.69	6.06	19.41	9.16	11.27	N/A	N/A	N/A
	Undissociated H <sub>2</sub> S	0.0006	0.0003	0.0058	0.0005	0.0023	0.0019	ND	0.02

TOTAL LOADING	
CBOD5 (kg)	2,351
TSS (kg)	4,991
TP (kg)	95
NH <sub>3</sub> (kg)	474

Acute Lethality	Start	End
Rainbow Trout	N/A	N/A
Daphnia Magna	N/A	N/A

\* After 4 consecutive discharge seasons not indicating acute lethality testing can be reduced to once annually at end of discharge alternating spring and fall.

TOTAL LOADING	
CBOD5 (kg)	293
SS (kg)	403
TP (kg)	49
NH <sub>3</sub> (kg)	21

Acute Lethality	Start	End
Rainbow Trout	0%	0%
Daphnia Magna	0%	0%

\* After 4 consecutive discharge seasons not indicating acute lethality testing can be reduced to once annually at end of discharge alternating spring and fall.

PRE-DISCHARGE RESULTS	East (5)	West (4)	East (5)*	West (4)*	Cell 3	Cell 2	
	CBOD5 (mg/L)	9	5				
	TSS (mg/L)	28	548	11	22	12	26
	TP (mg/L)	0.36	0.43	0.50	0.72	0.52	0.47
	NH3	0.20	0.92				
	H2S	0.03	0.05				
<i>E. Coli</i>	< 2	4					

\*Resample

PRE-DISCHARGE RESULTS	East (5)	West (4)	Cell 3	
	CBOD5 (mg/L)	4	4	< 3
	SS (mg/L)	9	6	11
	TP (mg/L)	0.68	0.75	0.74
	NH3	0.12	0.07	0.06
	H2S	0.010	0.02	0.02
<i>E. Coli</i>	142	66	32	

ANNUAL LOADING TP (KG/D)	kg/day
	4.36
<b>ECA LIMIT</b>	<b>1.66</b>