



**Cannington Water Pollution Control Plant
2023 Annual Performance Report**





The Regional Municipality of Durham

Cannington Water Pollution Control Plant 2023 Annual Performance Report

Environmental Compliance Approval (ECA): 8730-8CYU2X

Dated June 28, 2012

The Cannington Water Pollution Control Plant (WPCP) 2023 Annual Performance Report provides staff, stakeholders and customers an overview of the performance of the Cannington WPCP. Further, this report fulfills the annual reporting requirements of the Ontario Ministry of the Environment, Conservation and Parks (MECP). This report demonstrates the commitment of ensuring that the WPCP continues to deliver wastewater services to our customers in an environmentally responsible manner.

Water Pollution Control Plant Process Description

General

The Cannington WPCP located in the Community of Cannington in the Township of Brock is owned and operated by the Regional Municipality of Durham (Region). The plant is operated according to the terms and conditions of the ECA. This MECP Class 1 wastewater treatment plant is designed to treat wastewater at a rated capacity of 1,068 cubic metres per day (m³/d) and utilizes a seasonal retention wastewater stabilization lagoon system. The Cannington WPCP services a population of approximately 2,238 residents. The treated effluent is discharged to the Beaver River in accordance with the conditions listed in the ECA.

Raw Influent Pumping

Wastewater is collected in approximately 12.6 kilometres of sanitary sewers in the Cannington service area and is conveyed to the treatment facility by a sanitary sewage pumping station (SSPS) located on Laidlaw Street. Aluminum sulphate is added at Laidlaw Street SSPS to enhance the settling of solids and phosphorus removal.

Lagoon Treatment

The Cannington WPCP is a seasonal wastewater stabilization lagoon facility consisting of a two cell lagoon system that is operated as a seasonal retention facultative waste stabilization pond providing a retention time of approximately 190 days. Flow to the Cannington WPCP is distributed to each cell through an influent distribution chamber. Each cell is equipped with an outlet chamber and one outfall pipe leading to the Beaver River. The ECA permits two seasonal discharge periods per year. Spring discharge is from March 1 to May 31 and fall discharge is from October 1 to December 31. Prior to and during discharge to the Beaver River, samples are collected to verify the effluent meets the limits established in the ECA.



Environmental Compliance Approval (ECA)

Under Condition 9.(4) of ECA #8730-8CYU2X the Region of Durham must produce an annual performance report that must contain the following information:

a) Summary and interpretation of all monitoring data and a comparison to the effluent limits;

The raw wastewater flowing into the Cannington WPCP is analyzed for its chemical and physical composition. Monitoring of the raw wastewater is performed in accordance with the conditions in the ECA. Table 2 Raw Influent Analyses summarizes the raw wastewater characteristics during the reporting period.

The Cannington WPCP effluent was determined to be compliant with the approval limits during the reporting period. The plant operated at 95.0% of its rated capacity and received a maximum daily flow of 2,541 cubic metres per day (m³/d) March 31 to April 2, 2023. The total treated effluent discharged to the Beaver River in 2023 was calculated to be 400,120 cubic metres (m³).

b) Description of any operating problems encountered and corrective actions taken;

No operating problems were encountered in 2023.

c) Summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;

Solids were removed from the south lagoon and were land applied in the fall.

d) Summary of any effluent quality assurance or control measures undertaken in the reporting period;

In-house lab test results are compared to the results of the Regional Environmental Laboratory on comparable samples to determine the in-house accuracy. Temperature and pH are monitored in the field, all other routine process control tests are performed at the Lake Simcoe WPCP laboratory in Beaverton.

e) Summary of the calibration and maintenance carried out on all effluent monitoring equipment;

Calibration of the flow meter located at Laidlaw Street SSPS was conducted on June 29 and November 30, 2023.

f) Estimate of the sludge settling capacity of the lagoons and its annual depletion;

Approximately 535.5 tons of sludge was removed from the lagoon and land applied from October 31 to November 3, 2023. This removal increased the sludge settling capacity by 1.36%.

g) Description of efforts made and results achieved in meeting the effluent objectives;

The Region continually strives to achieve the best effluent quality at all times and remain below the objectives specified in the ECA:



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- The carbonaceous biological oxygen demand (cBOD₅) objective of 15.0 mg/L was exceeded in 2 of 9 samples (22.2%)
- The pH objective range of 6.5 to 8.0 was exceeded in 4 of 27 samples (14.8%). Coagulant is manually added to reduce total suspended solids (TSS) and total phosphorous (TP). TSS, TP, and pH is monitored three times per week to ensure values are within compliance.

h) Summary of any complaints received during the reporting period and any steps taken to address the complaints;

All complaints received are administered, investigated and documented using a central database. No complaints were received in 2023.

i) Summary of all By-pass, spill or abnormal discharge events;

No by-passes, spills or abnormal discharges occurred during the reporting period.

j) Status update of the initial effluent characterization;

The initial effluent characterization report was submitted to MECP in April 2016.

k) Information required by Ministry of the Environment, Conservation and Parks (MECP) District Manager;

No additional information was requested.

MECP Inspection

The plant was inspected by the MECP on October 24, 2023.



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Table 1 Raw Influent Flows

Month	Total Flow to Plant* cubic metre (m ³)	Average Daily Flow cubic metre per day (m ³ /d)	Maximum Daily Flow m ³ /d
January	44,158	1,424	2,524
February	36,248	1,295	1,720
March	43,495	1,403	2,541
April	47,118	1,571	2,541
May	33,682	1,087	1,397
June	27,784	926	1,795
July	23,028	743	857
August	22,204	716	867
September	17,479	583	658
October	21,908	707	918
November	22,360	745	837
December	30,760	992	2,176
Total	370,224		
Annual Average	30,852	1,014	
Minimum	17,479		
Maximum	47,118		2,524
ECA Limit		1,068**	
Compliance Met		Yes	

*Metered at Laidlaw Street Pumping Station

**Annual Average



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Table 2 Raw Influent Analyses

Month	Carbonaceous Biochemical Oxygen Demand average (avg.) concentration (conc.) milligrams per litre (mg/L)	Biochemical Oxygen Demand avg. conc. mg/L	Total Suspended Solids avg. conc. mg/L	Total Phosphorus (TP) avg. conc. mg/L	Total Ammonia Nitrogen avg. conc. mg/L	pH minimum	pH maximum	Temperature Degree Celsius avg.
January	59	76	121	3.9	20.30	7.9	8.2	10.4
February	76	88	151	4.2	23.20	7.9	8.4	10.1
March	70	109	123	3.9	21.80	7.9	8.1	8.9
April	59	75	122	3.3	15.90	7.9	8.0	9.5
May	75	85	132	4.2	24.90	8.0	8.5	11.8
June	100	114	189	5.2	32.40	8.4	8.5	13.4
July	103	119	190	5.5	36.90	8.0	8.4	15.4
August	131	172	173	5.6	36.70	7.9	8.1	16.0
September	126	184	244	7.1	48.80	8.1	8.3	16.8
October	119	138	190	6.3	43.10	7.9	8.2	15.3
November	119	157	216	6.2	35.70	8.0	8.2	13.8
December	117	175	162	5.5	33.10	8.0	8.2	12.7
Average	96	124	168	5.1	31.07			
Minimum	59	75	121	3.3	15.90	7.9		8.9
Maximum	131	184	244	7.1	48.80		8.5	16.8
Sampling Frequency Requirement Met	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes



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Table 3 Calculated Effluent Flows

Month	Effluent Flow cubic metre
January	
February	
March	93,947
April	89,763
May	83,890
June	
July	
August	
September	
October	132,519
November	
December	
Total	400,120
Annual Average	100,030
Minimum	83,890
Maximum	132,519



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Table 4 Final Effluent Analyses

Month	Carbonaceous Biochemical Oxygen Demand average (avg.) concentration (conc.) milligrams per litre (mg/L)	Biochemical Oxygen Demand avg. conc. mg/L	Total Suspended Solids avg. conc. mg/L	Total Phosphorus (TP) avg. conc. mg/L	TP loading kilograms per month
January					
February					
March	21.7	24.0	11.8	0.24	23
April	6.2	7.0	9.0	0.16	14
May	3.0	2.7	7.7	0.11	9
June					
July					
August					
September					
October	1.0	1.4	3.9	0.07	9
November					
December					
Annual Loading					55
Average	8.0	8.8	8.1	0.15	15
Minimum	1.0	1.4	3.9	0.07	9
Maximum	21.7	24.0	11.8	0.24	23
ECA Limit	25*		30*		117**
ECA Objective	15		20	0.5	
Lake Simcoe Phosphorus Reduction Strategy				0.25*	97**
Within Compliance	Yes		Yes	Yes	Yes
Sampling Frequency Requirement Met	Yes	Yes	Yes	Yes	

*Annual Average Concentration

**Total Annual Loading, kg/year



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Table 4 Final Effluent Analyses continued

Month	Total Ammonia Nitrogen average (avg.) concentration (conc.) milligrams per litre (mg/L)	pH minimum	pH maximum	Temperature Degree Celsius avg.
January				
February				
March	13.59	7.0	7.6	3.0
April	13.38	7.8	8.0	11.6
May	5.00	7.5	8.3	15.6
June				
July				
August				
September				
October	4.63	7.6	7.9	13.8
November				
December				
Average	9.15			
Minimum	4.63	7.0		3.0
Maximum	13.59		8.3	15.6
ECA Limit		6.0	9.5	
ECA Objective		6.5	8.0	
Within Compliance		Yes	Yes	
Sampling Frequency Requirement Met	Yes	Yes	Yes	Yes



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Table 5 Chemical Usage

Month	Aluminum Sulphate litres
January	5,168
February	4,467
March	10,379
April	10,148
May	5,240
June	3,441
July	4,156
August	5,775
September	4,106
October	2,776
November	9,996
December	7,770
Total	73,422