



**Cannington Water Pollution Control Plant
2021 Annual Performance Report**





The Regional Municipality of Durham

Cannington Water Pollution Control Plant 2021 Annual Performance Report

Environmental Compliance Approval (ECA): 8730-8CYU2X Dated June 28, 2012

The Cannington Water Pollution Control Plant (WPCP) 2021 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 two seasonal wastewater stabilization lagoons. The Cannington WPCP services a population of approximately 2,133 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 89.5% of its rated capacity and received a maximum daily flow of 2,124 cubic metres per day (m³/d) on December 11, 2021. The total treated effluent discharged to the Beaver River in 2021 was calculated to be 266,754 cubic metres (m³).

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

CBOD and BOD analysis on lagoon effluent discharge sample from October 18, 2021 was conducted the past sample holding time after initial results yielded complete oxygen depletion at the Regional Environmental Laboratory. ECA sampling frequency had been satisfied.

Laidlaw Street Sanitary Sewage Pumping Station (SSPS) flows decreased in August and November due to alum and sludge build up in the stainless steel discharge pipe (forcemain) located in the dry well. Jet force high pressure water was used to clean the forcemain.

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

Major maintenance items in 2021 included:

- Jet force high pressure water was used to clean the Laidlaw SSPS forcemain located in the dry well.

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. Results were found to be in an acceptable range. 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 May 18 and November 10, 2021.



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- Temperature and pH are monitored in the field, all other routine process control tests are performed at the Lake Simcoe WPCP laboratory in Beaverton.
- All monitoring and laboratory equipment is calibrated and maintained according to manufacturer's specifications at Lake Simcoe WPCP.

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

The annual depletion of the sludge settling capacity is negligible. Approximately 500 dry tonnes of sludge was removed from the North Lagoon.

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.

- The total suspended solids objective of 20 milligrams per litre (mg/L) was exceeded in 3 of 30 samples (10.0%)
- The total phosphorus objective of 0.5 mg/L was exceeded in 1 of 30 samples (3.3%)
- The CBOD₅ objective of 15.0 mg/L was exceeded in 2 of 8 samples (25.0%)

Best efforts will continue to be applied to maintain results below objectives.

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

All complaints received from the public are administered and tracked through a central database. No complaints were received in 2021.

i) Summary of all By-pass, Spill or Abnormal Discharge;

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 last inspected by the MECP on June 12, 2018.



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Table 1 Raw Influent Flows

Month	Total Flow to Plant - metered at the Laidlaw Street Pumping Station cubic metres	Average Daily Flow cubic metres per day (m ³ /d)	Maximum Daily Flow m ³ /d
January	28,739	927	1,126
February	20,378	728	824
March	36,833	1,188	2,010
April	33,498	1,117	1,327
May	30,982	999	1,444
June	20,660	689	773
July	37,691	1,216	1,916
August	20,695	668	877
September	23,713	790	1,773
October	25,668	828	1,072
November	28,605	954	1,270
December	41,462	1,337	2,124
Total	348,924		
Annual Average	29,077	956	
Minimum	20,378		
Maximum	41,462		2,124
ECA Limit		1,068*	
Compliance Met		Yes	

*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	95	130	153	4.9	31.05	7.9	8.1	9.3
February	145	352	231	7.1	44.09	8.0	8.1	8.8
March	98	228	145	5.3	28.05	7.8	8.1	7.3
April	100	124	148	4.7	26.89	7.6	7.9	9.9
May	98	130	179	5.4	31.80	7.8	8.1	11.0
June	122	177	241	6.5	41.00	7.9	8.0	12.7
July	63	76	158	5.0	25.25	7.5	7.8	14.6
August	100	145	209	6.1	39.26	7.8	7.9	15.9
September	107	166	196	6.1	41.23	7.7	8.2	15.7
October	106	124	158	5.3	33.54	7.8	8.0	15.0
November	102	134	165	4.9	31.63	7.6	7.8	12.6
December	71	71	142	3.5	18.91	7.4	7.6	8.9
Average	101	155	177	5.4	32.72			11.8
Minimum	63	71	142	3.5	18.91	7.4		7.3
Maximum	145	352	241	7.1	44.09		8.2	15.9
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 metres
January	
February	
March	93,607
April	
May	84,485
June	
July	
August	
September	
October	88,661
November	
December	
Total	266,754
Annual Average	88,918
Minimum	84,485
Maximum	93,607



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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	19.9	20.6	12.6	0.22	20
April					
May	4.0	6.5	11.2	0.11	10
June					
July					
August					
September					
October	3.5	8.0	6.5	0.08	7
November					
December					
Total					37**
Average	9.1	11.7	10.1	0.14	12
Minimum	3.5	6.5	6.5	0.08	7
Maximum	19.9	20.6	12.6	0.22	20
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)	Un-ionized Ammonia avg. conc. mg/L	pH minimum	pH maximum	Temperature Degree Celsius avg.
January					
February					
March	18.09	0.04	6.8	7.6	6.2
April					
May	9.52	0.08	7.4	7.7	12.7
June					
July					
August					
September					
October	6.85	0.05	7.3	7.5	16.3
November					
December					
Average	11.48	0.06			11.7
Minimum	6.85	0.04	6.8		6.2
Maximum	18.09	0.08		7.7	16.3
ECA Limit			6.0	9.5	
ECA Objective			6.5	8.0	
Within Compliance			Yes	Yes	
Sampling Frequency Requirement Met	Yes	Yes	Yes	Yes	Yes



Table 5 Chemical Usage

Month	Aluminum Sulphate litres
January	14,637
February	9,584
March	16,285
April	19,398
May	16,595
June	10,300
July	17,640
August	12,288
September	12,590
October	13,733
November	16,545
December	14,839
Total	174,434