



Cannington Water Pollution Control Plant 2020 Annual Performance Report





The Regional Municipality of Durham

Cannington Water Pollution Control Plant 2020 Annual Performance Report

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

The Cannington Water Pollution Control Plant (WPCP) 2020 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 2,082 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 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 90.5% of its rated capacity and received a maximum daily flow of 3,095 m³/d on January 11, 2020. The total treated effluent discharged to the Beaver River in 2020 was calculated to be 332,254 m³.

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

A Request for Pandemic Related Temporary Relief (Alternative Arrangement) for Municipal Wastewater Systems was submitted to the MECF on March 31, 2020. The request was made for relief of influent sampling to assist in managing workload and for the health and safety of staff.

The Director granted relief on April 29, 2020. Cannington WPCP returned to normal sampling practices on June 1, 2020.

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 2020 included:

- Performed wet well cleanouts at Laidlaw Street Sanitary Sewage Pumping Station (SSPS),
- Replaced UPS at Laidlaw Street SSPS.

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 a comparable 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 6 and October 7, 2020.
 - All monitoring and laboratory equipment is calibrated and maintained according to manufacturer's specifications at Lake Simcoe WPCP.
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f) Estimate of the sludge settling capacity of the lagoons and its annual depletion;

The annual depletion of the sludge settling capacity is negligible. There was no removal of sludge during the reporting period.

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 mg/L was exceeded in 3 of 38 samples (7.9%)
- The total phosphorus objective of 0.5 mg/L was exceeded in 2 of 38 samples (5.3%)
- The CBOD₅ objective of 15.0 mg/L was exceeded in 1 of 11 samples (9.1%)
- The maximum effluent pH objective of 8.0 was exceeded in 2 of 27 samples (7.4%)

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;

A summary of complaints received from the public is administered through a central database. No complaints were received in 2020.

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 metre	Average Daily Flow cubic metre per day (m ³ /d)	Maximum Daily Flow m ³ /d
January	45,389	1,464	3,095
February	26,419	911	1,173
March	51,935	1,675	2,760
April	38,904	1,297	1,835
May	26,853	866	1,008
June	20,581	686	802
July	16,657	537	596
August	20,066	647	1,080
September	22,446	748	975
October	25,553	824	1,210
November	25,984	866	1,091
December	32,863	1,060	1,367
Total	353,650		
Annual Average	29,471	966	
Minimum	16,657		
Maximum	51,935		3,095
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.) milligram per litre (mg/L)	Biochemical Oxygen Demand	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	52	67	79	2.9	13.86	7.8	8.0	9.1
February	94	130	176	5.2	27.33	8.0	8.2	9.0
March	67	104	84	3.3	18.82	7.6	8.1	8.5
April	56	65	99	3.7	20.60	7.8	8.0	10.5
May	76	117	151	4.9	30.72	8.2	8.3	10.1
June	148	157	174	6.6	39.95	7.7	8.1	13.8
July	128	145	140	6.4	45.09	8.0	8.5	15.3
August	149	175	195	5.9	37.77	7.8	8.1	16.9
September	141	161	162	5.0	35.00	7.7	8.1	16.4
October	109	139	159	4.8	31.21	7.8	8.3	15.6
November	126	135	163	5.0	32.88	7.6	8.2	12.8
December	125	152	157	4.2	23.55	7.9	8.0	10.3
Average	106	129	145	4.8	29.73			12.4
Minimum	52	65	79	2.9	13.86	7.6		8.5
Maximum	149	175	195	6.6	45.09		8.5	16.9
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 metre
January	
February	
March	93,060
April	92,182
May	54,831
June	
July	
August	
September	
October	
November	92,182
December	
Total	332,254
Annual Average	83,064
Minimum	54,831
Maximum	93,060



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Table 4 Final Effluent Analyses

Month	Carbonaceous Biochemical Oxygen Demand average (avg.) concentration (conc.) milligram 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 kilogram per month
January					
February					
March	15.5	16.4	5.4	0.08	7
April	6.1	7.1	12.6	0.22	21
May	3.1	4.1	3.8	0.09	5
June					
July					
August					
September					
October					
November	3.5	4.8	11.2	0.12	11.4
December					
Total					44**
Average	7.1	8.1	8.2	0.13	11
Minimum	3.1	4.1	3.8	0.08	5
Maximum	15.5	16.4	12.6	0.22	21
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	14.29	0.03	7.0	7.6	3.9
April	10.21	0.04	7.1	7.5	7.2
May	11.07	0.19	7.5	8.0	19.9
June					
July					
August					
September					
October					
November	13.11	0.12	7.4	8.2	6.7
December					
Average	12.17	0.09			9.4
Minimum	10.21	0.03	7.0		3.9
Maximum	14.29	0.19		8.2	19.9
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 litre
January	18,206
February	11,807
March	23,484
April	17,127
May	12,129
June	8,724
July	7,644
August	9,505
September	10,047
October	10,849
November	12,859
December	15,342
Total	157,721