



Cannington Water Pollution Control Plant
2017 Annual Performance Report





The Regional Municipality of Durham

Cannington Water Pollution Control Plant 2017 Annual Performance Report

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

The Cannington Water Pollution Control Plant (WPCP) 2017 Annual Performance Report provides staff, stakeholders and customers an overview of the performance of the Cannington WPCP in 2017. Further, this report fulfills the annual reporting requirements of the Ontario Ministry of the Environment and Climate Change (MOECC). 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 MOECC Class One 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 2,095 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 12.7 km of sanitary sewers in the Cannington service area and is conveyed to the treatment facility by a sanitary sewage pumping station located on Laidlaw Street. Aluminum sulphate is added at Laidlaw Street Sanitary Sewage Pumping Station 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. The ECA permits two seasonal discharge periods per year. Spring discharge is from March 1st to May 31st and fall discharge is from October 1st to December 31st. 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

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

a) Summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 5, including an overview of the success and adequacy of the works

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 105.1% of its rated capacity and received a maximum daily flow of 3,483 m³/d on May 6, 2017. Increased flow is contributed to heavy rainfall during the spring months. An Inflow and Infiltration Study is in progress and is expected to be completed in 2019. The total treated effluent discharged to the Beaver River in 2017 was calculated to be 454,987 m³.

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

No operating problems were encountered in 2017.

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

No maintenance was performed on major equipment during the reporting period.

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.

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

- Calibration of the flow meter located at Laidlaw Street Pumping Station was conducted in May and November, 2017.
 - 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.
- 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 biosolids during the reporting period.

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

- The Regional Municipality of Durham strives to achieve the best effluent quality at all times consistently remaining well below ECA limits.



- Due to heavy rainfall during the spring months the annual average daily flow of 1,122 m³/day exceeded the rated capacity of 1,068 m³/day. An Inflow and Infiltration study is currently underway and is expected to be completed in 2019.
- The five day carbonaceous biological oxygen demand objective of 15 mg/L was exceeded twice in March during the spring discharge.
- The Total Suspended Solids objective was exceeded on March 17th during the spring discharge. Continuous monitoring of the effluent criteria demonstrated that other results during discharge were below the objective.
- The pH objective of 8.0 was exceeded six times during the May discharge period ranging between 8.1 and 8.3. Due to the nature of wastewater treatment in the lagoon system pH is a difficult parameter to control.
- 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 complaint

A summary of complaints received from the public is administered through a central database. No complaints were received in 2017.

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 in April of 2016.

k) Information required by MOECC District Manager

No additional information was requested.

MOECC Inspection

This plant was last inspected by the MOECC in November 2013.



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Table 1 Raw Influent Flows

Month	Total Flow to Plant -metered at the Laidlaw Street Pumping Station m³	Average Daily Flow m³/d	Maximum Daily Flow m³/d
January	37,766	1,218	1,815
February	36,677	1,310	2,671
March	44,204	1,426	2,725
April	54,062	1,802	3,005
May	52,247	1,685	3,483
June	40,020	1,334	2,517
July	33,299	1,074	1,634
August	20,630	665	764
September	18,681	623	762
October	21,328	688	821
November	26,946	898	1,195
December	23,716	765	845
Total	409,577		
Annual Average	34,131	1,122	
Minimum	18,681		
Maximum	54,062		3,483
ECA Limit		1,068*	
Met Compliance		No	

*Annual Average



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Table 2 Raw Influent Analyses

Month	CBOD ₅ avg. conc. mg/L	BOD ₅ avg. conc. mg/L	TSS avg. conc. mg/L	TP avg. conc. mg/L	TP loading kg/d	TAN avg. conc. mg/L	pH min.	pH max.	Temp. Degrees Celsius avg.
January	87	114	129	4.1	5.0	21.5	7.0	7.6	10.0
February	75	116	114	3.6	4.7	20.7	7.1	7.3	9.7
March	61	80	87	3.0	4.3	16.7	7.1	7.6	8.4
April	60	69	90	2.8	5.0	15.5	7.9	8.1	9.9
May	57	90	83	3.3	5.6	16.2	7.7	8.1	11.6
June	61	78	127	3.0	4.0	13.8	7.1	8.2	14.0
July	80	98	81	4.1	4.5	24.8	7.0	7.4	15.5
August	106	120	103	5.6	3.7	32.5	7.2	7.5	16.7
September	136	146	127	6.2	3.9	39.7	7.1	7.7	16.8
October	114	153	141	5.5	3.8	38.9	7.4	7.8	14.7
November	90	113	110	3.9	3.5	25.7	7.5	7.8	13.0
December	85	100	98	4.7	3.6	30.0	7.6	8.0	10.7
Average	84	106	108	4.2	4.7	24.7			12.6
Minimum	57	69	81	2.8	3.5	13.8	7.0		8.4
Maximum	136	153	141	6.2	5.6	39.7		8.2	16.8
Sampling Frequency Requirement Met	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes



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Table 3 Calculated Effluent Flows

Month	Effluent Flow m³
January	
February	
March	157,254
April	
May	140,288
June	
July	
August	
September	
October	74,747
November	
December	82,698
Total	454,987
Annual Average	113,747
Minimum	74,747
Maximum	157,254



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Table 4 Final Effluent Analyses

Month	CBOD ₅ avg. conc. mg/L	BOD ₅ avg. conc. mg/L	TSS avg. conc. mg/L	TP avg. conc. mg/L	TP loading kg/d	TP loading kg/month
January						
February						
March	12.3	16.8	14.8	0.22	1.8	34.3
April						
May	4.3	4.8	5.0	0.07	0.4	9.5
June						
July						
August						
September						
October	1.0	1.0	4.0	0.05	0.2	3.7
November						
December	3.5	4.3	5.2	0.10	0.7	8.3
Total						55.7**
Average	5.3	6.7	7.2	0.11	0.7	4.8
Minimum	1.0	1.0	4.0	0.05	0.2	3.7
Maximum	12.3	16.8	14.8	0.22	1.8	34.3
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		Yes

*Annual Average Concentration

**Total Annual Loading, kg/year



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Table 4 Final Effluent Analyses continued

Month	TAN avg. conc. mg/L	Un-ionized Ammonia avg. conc. mg/L	pH min.	pH max.	Temperature °C avg.
January					
February					
March	13.2	0.0	7.1	7.9	3.8
April					
May	6.2	0.2	7.4	8.3	15.0
June					
July					
August					
September					
October	3.0	0.0	6.7	6.9	14.4
November					
December	14.9	0.0	7.1	7.4	1.7
Average	9.3	0.1			8.7
Minimum	3.0	0.0	6.7		1.7
Maximum	14.9	0.2		8.3	15.0
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	9,270
February	16,299
March	17,712
April	22,363
May	21,774
June	13,498
July	11,507
August	9,758
September	6,946
October	7,582
November	12,857
December	9,028
Total	158,595