Cannington Water Pollution Control Plant

2024 Annual Performance Report

The Regional Municipality of Durham
Cannington Water Pollution Control Plant 2024 Annual Performance Report

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

The Cannington Water Pollution Control Plant (WPCP) 2024 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 (m^3/d) and utilizes a seasonal retention wastewater stabilization lagoon system. The Cannington WPCP services a population of approximately 2,235 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 94.0% of its rated capacity and received a maximum daily flow of 2,507 cubic metres per day (m^3/d) April 14, 2024. The total treated effluent discharged to the Beaver River in 2024 was calculated to be 541,334 cubic metres (m^3).

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

No operating problems were encountered in 2024.

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 2024 included:

- Replaced discharge valves on the south and north lagoons.
- Repaired cement in distribution chambers for the south and north lagoons

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 12, 2024.

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 carbonaceous biological oxygen demand ($cBOD_5$) objective of 15.0 mg/L was exceeded in 1 of 12 samples (8.3%).
- The total suspended solids (TSS) objective of 20.0 mg/L was exceeded in 4 of 40 samples (10.0%).
- The total phosphorus (TP) objective of 0.5 mg/L was exceeded in 1 of 40 samples (2.5%).
- The pH objective range of 6.5 to 8.0 was exceeded in 3 of 28 samples (10.7%). Coagulant is manually added to reduce total suspended solids (TSS) and total phosphorous (TP). TSS, TP, and pH are 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 2024.

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.

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	36,616	1,181	1,601
February	31,407	1,083	1,242
March	35,278	1,138	1,443
April	51,017	1,701	2,507
May	38,880	1,254	2,057
June	33,753	1,125	1,574
July	34,034	1,098	2,165
August	22,645	730	848
September	20,104	670	782
October	18,680	603	678
November	19,230	641	738
December	25,889	835	1,382
Total	367,533		
Annual Average	30,628	1,004	
Minimum	18,680		N/A
Maximum	51,017		2,507
ECA Limit		1,068**	
Compliance Met		Yes	

*Metered at Laidlaw Street Pumping Station

**Annual Average

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	71	114	142	4.0	37.40	7.8	8.0	10.5
February	91	133	131	4.4	42.73	7.9	8.2	9.9
March	107	120	122	3.8	34.58	7.5	8.0	9.1
April	80	99	111	2.9	26.08	7.8	8.0	10.7
May	101	140	152	4.2	39.10	7.9	8.0	12.3
June	91	117	130	3.8	36.38	7.8	8.1	13.9
July	96	138	162	4.3	39.20	7.8	8.1	16.2
August	108	133	149	5.3	47.40	7.9	8.1	16.2
September	114	176	212	5.9	56.98	8.0	8.2	16.7
October	133	175	206	7.2	70.56	8.2	8.4	16.0
November	141	178	267	7.3	69.23	8.2	8.4	14.3
December	124	157	183	5.6	51.98	7.8	8.3	12.2
Average	105	140	164	4.9	30.16			13.2
Minimum	71	99	111	2.9	15.80	7.5		9.1
Maximum	141	178	267	7.3	48.80		8.4	16.7
Sampling Frequency Requirement Met	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 3 Calculated Effluent Flows

Month	Effluent Flow cubic metre
January	
February	
March	109,656
April	167,862
May	119,083
June	
July	
August	
September	
October	68,864
November	
December	75,869
Total	541,334
Annual Average	108,267
Minimum	68,864
Maximum	167,862

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	9.7	14.4	24.8	0.27	30
April	4.3	5.6	10.0	0.14	24
May	4.0	7.7	6.0	0.11	13
June					
July					
August					
September					
October	4.3	7.1	8.2	0.14	10
November					
December	5.7	8.5	17.6	0.12	9
Annual Loading					85
Average	5.6	8.6	13.3	0.16	17
Minimum	4.0	5.6	6.0	0.11	9
Maximum	9.7	14.4	24.8	0.27	30
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

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	11.82	7.5	7.6	3.9
April	9.50	7.6	8.0	9.8
May	9.81	7.5	7.9	17.6
June				
July				
August				
September				
October	5.18	7.5	7.7	12.2
November				
December	11.01	7.4	8.1	2.7
Average	9.46			9.2
Minimum	5.18	7.4		2.7
Maximum	11.82		8.1	17.6
ECA Limit		6.0	9.5	
ECA Objective		6.5	8.0	
Within Compliance		Yes	Yes	
Sampling Frequency Requirement Met	Yes	Yes	Yes	Yes

Table 5 Chemical Usage

Month	Aluminum Sulphate litres
January	5,775
February	7,626
March	9,765
April	13,032
May	6,577
June	5,060
July	7,192
August	3,903
September	5,862
October	5,363
November	5,305
December	6,418
Total	81,879