



**2013 WASTEWATER POLLUTION CONTROL
PLANT ANNUAL REPORT**

Certificate of Approval No 3560-8A8LEY
Sewage Works No. 110000953

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1.0 INTRODUCTION

The Municipality of Brighton is pleased to present its Annual Performance Report for wastewater treatment for the operating period of January 1 to December 31, 2013. Brighton's Water Pollution Control Plant (WPCP) services a population of approximately 6,462 people, as well as Presqu'île Provincial Park. The WPCP is classified as a Class 1 treatment facility that operates under Certificate of Approval (CofA) Number 3560-8A8LEY, issued by the Ontario Ministry of the Environment (MOE). This report is presented in accordance with Section 10.6 of the CofA.

The WPCP is located at 100 County Road 64. Wastewater collected from the serviced area of the Municipality passes through four treatment components at the WPCP, in the order listed below:

- 1) A 0.7 hectare aerated lagoon (Lagoon #1) with two mechanical surface aerators,
- 2) A chemical mixing chamber where alum is added,
- 3) A 5.44 hectare waste stabilization pond (Lagoon #2) with three baffles,
- 4) A two celled constructed wetland having a total surface area of 6.2 hectares.

The effluent from the constructed wetland is discharged continuously into a natural wetland that borders Presqu'île Bay, which is located off the northeast shore of Lake Ontario.

2.0 WASTEWATER FLOWS

The C of A stipulates that the rated flow capacity of the WPCP is an average of 4,600 m³/day. The average flow for 2013 was 3,207 m³/day, which represents 70% of the rated flow capacity. The highest average flows occurred in April. The lowest average flows occurred in September. The maximum daily flow for the year was 12,000 m³ on April 13th. The lowest daily flow was 1,629 m³ on December 23rd. There were no exceedances of the rated flow capacity of the WPCP in 2013.

Table I – Monthly Wastewater Flows to WPCP

Month	Total Flow (m³)	Avg. Flow (m³/day)	Percent of the rated capacity (%)
January	111,158	3,586	78%
February	79,803	2,850	62%
March	122,773	3,960	86%
April	141,484	4,716	103%
May	103,272	3,331	72%
June	117,854	3,928	85%
July	82,224	2,652	58%
August	77,127	2,488	54%
September	67,495	2,250	49%
October	73,959	2,386	52%
November	107,075	3,569	78%
December	85,864	2,770	60%
Annual	1,170,088	3,207	70%

2.1 Flow Interpretation

The variations in the flow of wastewater received at the WPCP are caused by infiltration and inflow to the collection system, as a result of local precipitation events, fluctuations in ground water elevations and snow melt.

3.0 WASTEWATER EFFLUENT QUALITY

Section 7 of the CofA lists monthly average limits for the levels of six parameters in the effluent from the waste stabilization pond. The parameters are: five day carbonaceous biochemical oxygen demand (CBOD5), total suspended solids (TSS), total phosphorus (TP), ammonia plus ammonium nitrogen (ammonia), Escherichia coliform bacteria (E. Coli), and pH. Section 9 of the CofA outlines the frequency that the parameters must be tested and lists an additional three parameters that must be tested: nitrate nitrogen, nitrite nitrogen and temperature. In 2013, the effluent quality met the limits for the parameters tested, with the exception of E. Coli in January, February, March and April, June, October and November. Ammonia from June to December inclusive (Table II).

Table II – Monthly Average Waste Stabilization Pond Effluent Quality

Parameter	CBOD5 (mg/L)	TSS (mg/L)	TP (mg/L)	Ammonia (mg/L)	E. Coli (cfu/100 mL)	pH
Effluent Limit (mg/L)	30	40	1.0	(May-Oct 14 Nov-Apr 17)	200	6.0- 9.5
January	14.0	26.8	0.59	15.1	<400	7.8
February	17.0	21.5	0.50	15.2	<400	7.4
March	22.0	38.0	0.69	12.6	<400	7.4
April	12.4	21.6	0.49	8.8	322	8.2
May	5.0	5.0	0.15	9.8	10	8.0
June	7.8	14.0	0.43	17.6	<400	7.9
July	7.2	13.2	0.53	21.5	4	8.1
August	7.8	30.5	0.83	19.3	40	8.2
September	8.3	24.0	0.75	21.7	52	7.7
October	5.3	16.0	0.60	26.2	400	7.9
November	3.5	5.5	0.38	19.1	940	7.8
December	4.0	2.7	0.43	19.8	7	7.9

Section 7 of the CofA also lists effluent loading limits for CBOD5, TSS, TP and Ammonia. The effluent from the waste stabilization pond met the effluent loading limits for all required parameters except for ammonia in June (Table III).

Table III – Monthly Average Waste Stabilization Pond Effluent Load

	CBOD5 (kg/d)	TSS (kg/d)	TP (kg/d)	Ammonia (kg/d)
CofA Limit	138	184	4.6	May-Oct 64.4 Nov-Apr 78.2 Averaged
January	50.2	96.1	2.1	57.2
February	48.5	61.3	1.4	57.2
March	87.1	150.5	2.7	47.6
April	58.5	101.9	2.3	33.1
May	16.7	16.7	0.5	27.8
June	30.4	55.0	1.7	49.9
July	19.1	35.0	1.4	60.9
August	19.3	75.9	2.1	54.6
September	18.6	54.0	1.7	61.6
October	12.5	38.2	1.4	71.9
November	12.5	19.6	1.3	84.5
December	11.1	7.4	1.2	71.8

4.0 CONSTRUCTED WETLAND EFFLUENT QUALITY

Section 6 of the CofA lists monthly average objectives for the levels of six parameters in the constructed wetland effluent. It is the same six parameters that are listed for the waste stabilization pond. Section 9 of the CofA outlines the frequency that the parameters must be tested and lists an additional three parameters that must be tested: nitrate nitrogen, nitrite nitrogen and temperature. In 2013, the effluent quality met the limits for the parameters tested, with the exceptions of ammonia from May to November, and E-coli in January, March, and July to October (Table III).

Table IV – Monthly Average Constructed Wetland Effluent Quality

Parameter	CBOD5 (mg/L)	TSS (mg/L)	TP (mg/L)	Ammonia (mg/L)	E. Coli (cfu/100 mL)	pH
Effluent Objective (mg/L)	15	15	0.8	(May-Oct 10 Nov-Apr 15)	200	6.0- 9.5
January	6.8	11.0	0.29	13.6	>400	7.5
February	13.5	14.5	0.46	15.1	130	7.4
March	13.3	22.0	0.41	12.7	1280	7.7
April	4.4	7.6	0.41	8.3	6	7.8
May	2.5	6.0	0.15	4.5	62	7.8
June	5.0	3.5	0.16	13.4	134	7.7
July	6.8	5.2	0.24	16.4	>400	8.1
August	4.3	8.0	0.31	15.4	240	7.8
September	4.0	2.7	0.32	18.4	204	7.5
October	2.0	4.0	0.34	21.0	218	7.8
November	3.5	5.5	0.31	20.5	130	7.7
December	3.0	5.3	0.36	19.9	100	7.8

5.0 OVERVIEW OF SUCCESS AND ADEQUACY OF WORKS

The WPCP is successfully treating the effluent for five of the six required parameters (Table V). The WPCP is not successfully treating ammonia. Analysis of the data shows that the waste stabilization pond is producing ammonia during June through to December, adding to the level of ammonia that passes into the waste pond from the aeration pond. The most likely source of ammonia is the decomposition of organic matter within the waste stabilization pond.

Table V – Overall Efficiency of WPCP Sewage Works System

Date	CBOD5 (%)	TSS (%)	TP (%)	Ammonia (%)
January	90.6%	85.9%	84.1%	44.1%
February	91.5%	94.9%	89.4%	31.7%
March	83.6%	81.4%	84.7%	56.5%
April	90.8%	89.4%	83.3%	66.5%
May	95.0%	93.7%	93.5%	77.7%
June	94.6%	97.0%	96.1%	74.6%
July	88.2%	97.5%	95.8%	71.8%
August	94.0%	90.7%	88.1%	41.6%
September	89.7%	97.8%	88.1%	56.0%
October	97.6%	98.0%	93.9%	52.1%
November	92.7%	92.1%	87.4%	12.9%
December	94.7%	96.7%	92.0%	52.5%
Average	91.9%	92.9%	90%	53.2%

6.0 OPERATING PROBLEMS AND CORRECTIVE ACTIONS

Table VI – Summary of Operating Problems and Corrective Actions

DATE	PROBLEM	CORRECTIVE ACTION
September 2013	Impeller pumping issue	Trimmed impeller
2013	Pump clogging Liftstation	Unclog pump
2013	Liftstation debris	Quinte Sewer called in

7.0 SUMMARY OF MAINTENANCE

Table VII – Summary of Maintenance

DATE	NAME OF EQUIPMENT MAINTAINED	ACTION
Monthly	pH meter	Calibration
Monthly	Flash mixer/ Aerators/Pumps	Grease/check oil
February	Alum Pump 1&2/ flush quarterly	Flushed and clean
March	OCMIII	Blown motherboard, fixed March 8, 2012
Spring	Constructed wetland	Water levels lowered
September	Aerators	Removed debris
May	Alum Pump 1	Replaced diaphragm
June 4- Oct. 10	Alum Pump 1	Sent for repairs
Summer	Constructed wetland	Water levels raised
Sept./Oct./Nov.	Facultative lagoon Lagoon 1	Biosolids removed from lagoon 1 & 2
October	Alum system	Installed pressure gauge
December	Facultative lagoon berm	Berm reconstruction
December	Baffle	Baffle removal
November & December	Constructed wetland	Trapping of muskrats
December	OCMIII	Mother board, new OCM

8.0 EFFLUENT QUALITY ASSURANCE AND CONTROL

Wastewater exiting the aeration pond passes through an alum dosing chamber. Alum is a flocculent used to precipitate soluble phosphorus. It also aids in the settling of other substances. The dosing system operates twenty-four hours a day, seven days a week. The system is checked and logged daily by a wastewater operator.

Samples are collected by a trained wastewater operator, following the applicable MOE guidelines. All collected wastewater samples are sent weekly to an accredited laboratory for analysis. The results of the water samples are analyzed weekly by Brighton staff. A result showing non-compliance with the required wastewater quality stated in the CofA is reported to the MOE, as required by the CofA.

9.0 SUMMARY OF CALIBRATION AND MAINTENANCE ON MONITORING EQUIPMENT

Table VIII – Dates of Equipment Calibration

DATE OF CALIBRATION Or Maintenance	EQUIPMENT CALIBRATED/Maint.	COMPANY PERFORMING CALIBRRATION/Maint.
May 02	Flow monitors/ Mag Meters	MeasureMax
May 15	SenSion 6/ DR2800	Hach
Monthly	pH meters	In-house

10.0 EFFORTS AND RESULTS TO MEET EFFLUENT OBJECTIVES

See Section 8.0 regarding total phosphorus control.

The Municipal council approved an action plan, presented by AECOM, to assist in the management of ammonia in the effluent from the WPCP. The first part of the action plan was to remove a portion of biosolids from the waste stabilization pond (2012). In phase 2 2013 biosolids were also removed from both waste stabilization ponds. Ammonia levels in the waste stabilization pond effluent remained similar to the previous year in the months following the biosolids removal. However, the ammonia levels are still higher than the level permitted in the CofA.

11.0 BIOSOLIDS MANAGEMENT

In September, October and November 19,000 m³ of biosolids were removed from the Lagoons 1&2 waste pond. Some of the biosolids were placed into the drying bed (CofA A710120) on the WPCP property, but most of the biosolids were removed from our site and land applied or transported to suitable sites for disposal, as per applicable legislation.

12.0 SUMMARY OF COMPLAINTS

No complaints were received by municipal staff during this reporting period.

13.0 SUMMARY OF BY-PASSES, SPILLS AND ABNORMAL DISCHARGES

There were no by-passes, spills or abnormal discharges during this reporting period.