



2018 WASTEWATER POLLUTION CONTROL PLANT ANNUAL REPORT

Environmental Compliance Approval
6166-AJTTGW

TABLE OF CONTENTS

1.0	INTRODUCTION
2.0	WASTEWATER FLOWS
2.1	Flow Interpretation
2.2	Raw sewage quality
3.0	WASTEWATER EFFLUENT QUALITY
4.0	CONSTRUCTED WETLAND EFFLUENT QUALITY
5.0	OVERVIEW OF SUCCESS AND ADEQUACY OF WORKS
6.0	OPERATING PROBLEMS AND CORRECTIVE ACTIONS
7.0	SUMMARY OF MAINTENANCE
8.0	EFFLUENT QUALITY ASSURANCE AND CONTROL
9.0	SUMMARY OF CALIBRATION AND MAINTENANCE ON MONITORING EQUIPMENT
9.1	Calibration reports
10.0	EFFORTS AND RESULTS TO MEET EFFLUENT OBJECTIVES
11.0	AMMONIUM NITROGEN
11.1	Total Phosphorus
11.2	CBOD and Suspended Solids
12.0	BIOSOLIDS MANAGEMENT
13.0	SUMMARY OF COMPLAINTS
14.0	SUMMARY OF BY-PASSES, SPILLS AND ABNORMAL DISCHARGES
15.0	SUMMARY OF SEWER WORK COMPLETED
16.0	RAINBOW TROUT TOXICITY TESTING

List of Tables

Table I –	Monthly Wastewater Flows to WPCP
Table II –	Monthly Raw Influent to WPCP
Table III –	Monthly Average Waste Stabilization Pond Effluent Quality
Table IV –	Monthly Average Waste Stabilization Pond Effluent Load
Table V –	Monthly Average Constructed Wetland Effluent Quality
Table VI –	Overall Efficiency of WPCP Sewage Works System
Table VII –	Summary of Operating Problems and Corrective Actions
Table VIII –	Summary of Maintenance

Table IX – Dates of Equipment Calibration

Table X – Summary of VSS Levels and Ammonia Removal Rates in Aerated Cell

List of Appendices

Appendix A – Notice of Modifications – Submitted to MOECC Under LOF Process – 2018

Appendix B – Metal Analysis of Sludge Samples from Stabilization Pond (Lagoon)

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, 2018.

Brighton's Water Pollution Control Plant (WPCP) services a population of approximately 7,000, as well as Presqu'île Provincial Park. The WPCP is classified as a Class 1 treatment facility that operates under amended Environmental Compliance Approval (ECA) Number 6166-AJGTGW, issued by the Ontario Ministry of the Environment Conservation Parks (MECP) March 20, 2017.

This report has been prepared in accordance with Section 10.5 of the ECA. This ECA includes Limited Operational Flexibility (LOF) provisions to allow expedited changes to the treatment operation, subject to final MECP approvals and conditions.

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 cell (Lagoon #1) with two mechanical surface aerators, and two aspirating aerators.
- 2) A chemical mixing chamber where ferric chloride 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 AND RAW SEWAGE QUALITY

The ECA stipulates that the rated flow capacity of the WPCP is a yearly average of 4,600 m³/day. The average flow for 2018 was 3,129 m³/day, which represents 68% of the rated flow capacity. The highest daily flow occurred in April at a flow of 13,178 m³/day. The lowest daily flow occurred in September at 1,549 m³/day.

It should be noted that 2018 was an average year for precipitation. Sewage flows returned to normal average flows of (3,129 m³/day or less). It is unlikely that water levels will return to record levels in Lake Ontario and thus average sewage flows are also expected to remain around 3,000 m³/day, especially when combined with ongoing leak repairs in the sewer system.

There was no exceedance of the rated flow capacity of the WPCP in 2018.

Table I
Monthly Wastewater Flows to WPCP in 2018

Month	Total Flow (m ³)	Avg. Flow (m ³ /day)	Percent of the rated capacity (%)
January	103,358	3,334	72%
February	115,344	4,119	90%
March	115,579	3,728	81%
April	175,505	5,850	127%
May	108,811	3,510	76%
June	81,363	2,712	59%
July	61,444	1,982	43%
August	56,863	1,834	40%
September	55,327	1,844	40%
October	61,463	1,983	43%
November	93,079	3,103	67%
December	106,390	3,546	77%
Annual	1,134,526	3,129	68%

2.1 Flow Interpretation

The variations in the flow of wastewater received at the WPCP are caused by infiltration and inflow (possible sump pump) to the collection system, as a result of local precipitation events, fluctuations in groundwater elevations and snow melt.

From 2014 to 2018 sewer repair work was completed by Sewer Technologies which has reduced infiltration. Due to normal conditions in 2018, it is likely average sewage flows would have been significantly higher if sewer repairs had not been completed.

2.2 Raw Sewage Quality

As per the ECA, raw sewage samples are to be collected and analyzed for select parameters normally once per month. However, for 2018, raw sewage samples were collected weekly as part of an intensive study of the WPCP to better assess ammonia.

Table II as follows summarizes raw wastewater quality for 2018. For all months, results for all samples collected within a month were averaged to determine raw sewage quality values provided in **Table II**.

Raw sewage samples are collected just upstream of the WPCP in the sanitary sewer collection system. Samples of the pumped sewage from the Harbour Street sewage pumping station are collected at the outlet manhole of the SPS forcemain. Separate samples of the gravity drainage portion of the sanitary sewer system are collected at the same manhole between pumps cycles of the SPS. The pumped sewage sample and the

gravity sewage samples are analyzed separately and then the results averaged to provide weekly raw sewage quality values.

**TABLE II
MONTHLY RAW INFLUENT TO WPCP IN 2018**

YEAR	CBOD5	TSS	TOTAL PHOSPHOROUS	TKN	AMMONIA NITROGEN
2018	Raw Sewage (mg/L)	Raw Sewage (mg/L)	Raw Sewage (mg/L)	Raw Sewage (mg/L)	Raw Sewage (mg/L)
January	57.4	104.4	3.40	30.2	32.1
February	44.6	100.9	3.32	28.0	24.2
March	57.4	119.4	3.64	30.8	21.3
April	55.5	99.4	3.37	31.2	22.7
May	84.4	149.2	4.22	36.3	29.8
June	90.8	158.8	4.68	40.9	28.1
July	92.7	199.0	6.23	53.9	43.4
August	123.8	93.8	6.80	57.9	47.6
September	140.5	95.0	6.76	60.0	46.7
October	195.0	96.0	6.41	60.5	48.5
November	195.0	200.0	4.84	42.8	34.3
December	89.8	175.3	3.90	35.8	28.0
Yearly Average	102.2	167.2	4.8	42.3	33.9

3.0 WASTEWATER EFFLUENT QUALITY

Section 7 of the ECA lists monthly average limits for the levels of four 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), and ammonia plus ammonium nitrogen (ammonia).

Section 9 of the ECA outlines the frequency that the parameters must be tested for and lists an additional six parameters that must be tested: total Kjeldahl nitrogen, nitrate nitrogen, nitrite nitrogen, temperature and E-coli.

In 2018, the effluent quality met the limits for the parameters tested, except for ammonia nitrogen for January and then from June to August. Due to the natural environment E-coli cannot be controlled. (**Table III**).

**Table III
Monthly Average Waste Stabilization Pond Effluent Quality - 2018**

Parameter	CBOD5 (mg/L)	TSS (mg/L)	TP (mg/L)	Ammonia Nitrogen (mg/L)	pH
Effluent Limit (mg/L)	30	40	1.0	(May-Oct 14 mg/l) Nov-Apr 17 mg/l)	6.0- 9.5
January	3.4	10.2	0.31	17.4	7.5
February	4.3	13.0	0.34	12.2	7.3
March	3.8	10.5	0.33	9.3	7.5
April	4.5	10.3	0.24	12.1	7.7
May	2.2	10.4	0.20	13.6	7.8
June	1.5	7.8	0.25	24.3	7.7
July	1.0	3.0	0.14	25.7	7.6
August	1.0	4.5	0.19	22.2	7.6
September	2.8	2.3	0.13	9.0	7.4
October	2.2	3.4	0.12	7.3	7.6
November	3.6	3.8	0.15	12.6	7.6
December	3.8	7.0	0.28	14.3	7.6

Section 7 of the ECA also lists effluent loading limits for CBOD5, TSS, TP and Ammonia Nitrogen. The effluent from the waste stabilization pond met the effluent loading limits for all required parameters.

Table IV
Monthly Average Waste Stabilization Pond Effluent Load - 2018

	CBOD5 (kg/d)	TSS (kg/d)	TP (kg/d)	Ammonia Nitrogen (kg/d)	Sludge Generated Approximately** (m ³ /month) Based on Sludge Yield of 2.8 l/ m ³
ECA Limit	138 kg/d	184 kg/d	4.6 kg/d	May-Oct 64.4 kg/d Nov-Apr 78.2 kg/d	
January	11.3	34.0	1.0	67.7	289.4 m ³
February	17.5	53.6	1.4	47.3	323.0 m ³
March	14.0	39.1	1.2	36.3	323.6 m ³
April	26.3	60.0	1.4	46.9	491.4 m ³
May	7.7	36.5	0.7	31.5	304.7 m ³
June	4.1	21.0	0.7	56.0	227.8 m ³
July	2.0	5.9	0.3	59.5	172.0 m ³
August	1.8	8.3	0.4	51.3	159.2 m ³
September	5.1	4.1	0.2	20.9	154.9 m ³
October	4.4	6.7	0.2	16.9	172.1 m ³
November (2017)*	11.2	11.4	0.5	65.9*	260.6 m ³
December (2017)*	13.3	24.8	1.0	72.7*	297.9 m ³

*The last two months of the previous year are used for this calculation (seasonal Ammonia only) as per MECP.

**Sludge generated is based on an estimated sludge yield of 2.8 l of sludge per cubic meter of wastewater treated. Sludge yield at 2.8 l/m³ based on 5% total solids in sludge blanket on bottom of stabilization lagoon. The ECA does not limit sludge production rates.

4.0 CONSTRUCTED WETLAND EFFLUENT QUALITY

Section 6 of the ECA lists monthly average objectives for the levels of six parameters in the constructed wetland effluent (CBOD, TSS, TP, Ammonia Nitrogen, E. Coli and pH).

Section 9 of the ECA 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 2018, the effluent quality met the objectives for the parameters tested, with the exception of ammonia nitrogen (TAN) for January and from May to August and then for December. E-coli did not meet the objectives for numerous months in 2018. Due to the natural environment conditions E-coli cannot be controlled.

Table V
Monthly Average Constructed Wetland Effluent Quality Objectives - 2018

Parameter	CBOD5 (mg/L)	TSS (mg/L)	TP (mg/L)	Ammonia Nitrogen (mg/L)	E. Coli (cfu/20 0 mL)	pH
Effluent Objective (mg/L)	15	15	0.8	(May-Oct 10 mg/l) Nov-Apr 15 mg/l)	200	6.0-9.5
January	2.4	6.2	0.26	18.9	100	7.5
February	2.5	7.0	0.26	13.6	300	7.4
March	1.3	3.4	0.15	11.5	280	7.6
April	2.0	9.2	0.16	11.2	200	7.8
May	1.6	6.2	0.30	10.8	200	7.9
June	2.3	5.8	0.54	21.6	300	7.9
July	1.0	3.8	0.61	19.8	280	7.9
August	1.3	5.8	0.49	20.4	20	7.8
September	2.5	5.0	0.34	8.9	400	7.9
October	2.2	5.0	0.12	6.6	300	7.6
November	4.3	4.8	0.11	10.0	20	7.6
December	2.1	4.1	0.18	13.2	1000	7.7

5.0 OVERVIEW OF SUCCESS AND ADEQUACY OF WORKS

For the most part, the WPCP is successfully treating the effluent for the key effluent parameters with the exception of ammonia nitrogen. As per **Table III**, there were exceedances of ammonia nitrogen for four of the twelve months in 2018.

For E-coli, there is no active disinfection in the treatment process and the influence of wildlife contributes to higher E-coli values.

Table VI summarizes overall treatment efficiency of the lagoon system, based on effluent quality from the wetland portion of the treatment works compared to the raw sewage quality.

Table VI
Overall Efficiency of WPCP Sewage Works System - 2018

Date	CBOD5 (%)	TSS (%)	TP (%)	Ammonia Nitrogen (%)
January	95.8%	94.1%	92.4%	41.0%
February	94.4%	93.1%	92.2%	43.8%
March	97.8%	97.2%	96.0%	46.2%
April	96.4%	90.7%	95.4%	50.7%
May	98.1%	95.8%	92.8%	63.9%
June	97.5%	96.4%	88.6%	23.1%
July	98.9%	98.1%	90.1%	54.5%
August	99.0%	97.6%	92.9%	57.2%
September	98.2%	97.9%	95.0%	81.1%
October	98.9%	97.7%	98.1%	86.4%
November	98.1%	98.0%	97.7%	71.0%
December	97.4%	97.6%	95.4%	52.8%
Average	97.5%	96.2%	93.9%	55.9%

6.0 OPERATING PROBLEMS AND CORRECTIVE ACTIONS

The following table summarizes main mechanical problems experienced in 2018 and the corrective actions taken.

Table VII
Summary of Operating Problems and Corrective Actions

LOCATION	PROBLEM	CORRECTIVE ACTION
Lagoon	Ammonia	Lagoon Dredging
Lagoon	Ammonia	Decanting/timers
Lagoon	Radar unit for Chemical Tank	replaced March 2018
Lagoon	New Chemical pumps	completed by June 2018
Liftstation	Liftstation debris (twice yearly maintenance)	Quinte Sewer clean wetwell
Lagoon	Pumps (1) at liftstation rebuild	pumps repairs
Lagoon and Liftstation	electrical panels	clean contacts on switches
Lagoon	Material build up around aeration pond	Cleaned by contractor.
Aerated cell	Debris on aerators	cleaned aerators twice
Loyalist Drive	Lateral cleaning twice a year	3 homes on one service
Lagoon	Brushing	Berms
Liftstation	debris in pumps	open and remove debris
Lagoon	chemical valves	replace pump heads (2)
Lagoon	Sludge removal	Terratec
WPCP	Inspection (May)	Viktoria Light MECP
Lagoon	Upgrade to 200amp service	Rowley Electric
Lagoon	Bury Electrical wire	Rowley Elec.
Lagoon	Install new Heat/AC Pump	Davidson Plumbing and Heating
Lagoon	New Chemical Tank	replace old
Lagoon	chemical line	From new tank Davidson
Lagoon	Valves for Chemical Tank	Davidson Plumbing/Heating
Liftstation	Wetwell Lights	replace with LED
Lagoon	Outside light	Replace with LED
Lagoon	New Dissolved Air Monitor	Hach
Lagoon	New In House Testing Equip.	Hach (replace old)
Lagoon	Outside tap	Replaced Jim Bryant
Liftstation	Fix Toilet	Replace
WPCP	Hoist Inspection	3 at Liftstation (one for Park)

7.0 SUMMARY OF MAINTENANCE

The following is an abbreviated summary of normal maintenance completed at the lagoon system and sewage pumping stations.

Table VIII
Summary of Maintenance

DATE	NAME OF EQUIPMENT MAINTAINED	ACTION
Weekly	pH meter / DO	Calibration (in-house)
Yearly	Jar Testing for Ferric Dosing	Josh Arnet/FenChem
Quarterly	Flash mixer/ Aerators/Pumps	Grease/check oil
Yearly	Sludge Depth Measured	Check buildup
February yearly maint. or when required	Chemical Pump 1&2/ flush	Flushed and clean, replace Diaphragms
April Yearly	Constructed wetland	Trapping of muskrats
March 28, 2018 (yearly)	OCMIII, MultiRanger, Siemens Magmeter, LUT400	Calibration
Spring	wetland levels	Water levels lowered
Spring, summer and fall	Aerators	Removed debris
Summer	Constructed wetland	Water levels raised
Spring	ferric system cleaned	Flushed lines, clean pumps
Weekly	Berm	Repair/Maintenance
November	wetland levels	Water levels raised
Spring and Fall	Constructed wetland	Trapping of muskrats

8.0 EFFLUENT QUALITY ASSURANCE AND CONTROL

Wastewater exiting the aeration pond passes through a chemical dosing chamber. Ferric Chloride is the coagulant used to precipitate soluble phosphorus. It also aids in the settling of other substances and odour control. 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 MECP 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 ECA is reported to the MECP, as required by the ECA.

9.0 SUMMARY OF CALIBRATION AND MAINTENANCE ON MONITORING EQUIPMENT

Table IX – Dates of Equipment Calibration

DATE OF CALIBRATION Or Maintenance	EQUIPMENT CALIBRATED/Maint.	COMPANY PERFORMING CALIBRRATION/Maint.
March 28, 2018 Yearly	Flow monitors/ Mag Meters	Franklin/MeasureMax
November 17 2018 Yearly	DO meter/ DR3900/	Hach Technician
Weekly	Do/pH meters	In-house

9.1 Calibration reports for flow metering equipment as follows.



FIELD SERVICES REPORT

REPORT OF: Mike Humphries
CUSTOMER / ADDRESS:
Town of Brighton
67 Sharpe Road
Brighton, Ontario K0K 1H0

DATE OF SERVICE: March 28, 2018

CONTACT: Keith Lee

EMAIL: klee@brighton.ca

PURPOSE FOR SERVICE:

Check operation and calibration of Lagoon LUT reading effluent flow from the main settling ponds.

SYSTEM CONFIGURATION:

Siemens Sitrans LUT440
Siemens Milltronics XRS-5C transducer
Siemens Milltronics TS3 temperature sensor

APPLICATION:

Primary element – 18 inch Parshall flume
Maximum Flow – 14000 m³ /day
Maximum head – 29.55 cm

OBSERVATIONS / CHANGES MADE:

Totalizer As Found	1297.04	m ³			
Totalizer As Left	1336.11	m ³			
Zero As Found	76.42	cm			
Zero As Left	76.42	cm	Zero Offset	0.11	cm
Change in Zero	0.00	cm			

OCM Flow Table

Head Applied (m)	Head Displayed (m)	Error (%)	Calculated Flow (m ³ /Day)	Flow Displayed (m ³ /hr)	Error (%)	Calculated MA Output	Measured mA Output	Error (%)
0.00	0.00	0.00	0.00	0.00	0.00	4.00	4.00	0.00
7.50	7.47	-0.40	1695	1686	-0.51	5.94	5.91	-0.45
15.00	15.03	0.20	4928	4933	0.11	9.63	9.65	0.19
22.50	22.42	-0.36	9201	9164	-0.40	14.52	14.47	-0.31
30.00	29.92	-0.27	14330	14280	-0.35	20.38	20.33	-0.23

CONCLUSIONS / RECOMMENDATIONS:

LUT440 is functioning as expected with good accurate results.



FIELD SERVICES REPORT

REPORT OF: Mike Humphries
CUSTOMER / ADDRESS:
Town of Brighton
67 Sharpe Road
Brighton, Ontario K0K 1H0

DATE OF SERVICE: April 10, 2017

CONTACT: Keith Lee

EMAIL: klee@brighton.ca

PURPOSE FOR SERVICE:

Check operation and calibration of Marsh OCM III on final effluent to the filter ponds.

SYSTEM CONFIGURATION:

OCM III, REV 3.3, SN PBD/C2230927
ST-25C transducer
TS2 temperature sensor

APPLICATION:

Primary element: 2 X 90° V-notch weirs
Maximum Flow: 6730 m³ / day. (3365 m³ X2)
Maximum head: 24 cm
Totalizer: 1 count = 1 cubic meter
Remote totalizer: 1count = 1 cubic meter

OBSERVATIONS / CHANGES MADE:

The flow meter is installed outdoors in a steel enclosure. The water flows into a baffled well, and then again over two 90° V-notch weirs.

Zero As Found	77.18399	cm
Zero As Left	77.18399	cm
Change in Zero	0.00	cm

Head Applied (m)	Head Displayed (m)	Error (%)	Calculated Flow (m ³ /Day)	Flow Displayed (m ³ /hr)	Error (%)	Calculated MA Output	Measured mA Output	Error (%)
0.00	0.00	0.00	0.00	0.00	0.00	4.00	4.00	0.00
6.00	6.05	0.83	210	212	0.79	4.50	4.54	0.88
12.00	11.96	-0.33	1190	1181	-0.74	6.83	6.80	-0.42
18.00	18.02	0.11	3279	3279	0.01	11.79	11.80	0.05
24.00	24.06	0.25	6730	6749	0.28	20.00	20.04	0.20

CONCLUSIONS / RECOMMENDATIONS:

OCM III is functioning as expected with good accurate results.



FIELD SERVICES REPORT

REPORT OF: Mike Humphries
CUSTOMER / ADDRESS:
Town of Brighton
67 Sharpe Road
Brighton, Ontario K0K 1H0

DATE OF SERVICE: April 10, 2017

CONTACT: Keith Lee

EMAIL: klee@brighton.ca

PURPOSE FOR SERVICE:

Return to operation and calibration of North Marsh OCM III on effluent from the North Filter pond.

SYSTEM CONFIGURATION:

OCM III, Rev 3.30
ST-25C transducer
TS2 temperature sensor

APPLICATION:

Primary element – Rectangular Weir
Maximum Flow – 20894.4 m³/day
Maximum head – 40.0 cm
Totalizer – 1 count = 1 cubic meter
Remote totalizer – 1count = 1 cubic meter

OBSERVATIONS / CHANGES MADE:

Zero As Found	155.85090	cm
Zero As Left	155.85090	cm
Change in Zero	0.00	cm

Head Applied (m)	Head Displayed (m)	Error (%)	Calculated Flow (m ³ /Day)	Flow Displayed (m ³ /hr)	Error (%)	Calculated MA Output	Measured mA Output	Error (%)
0.00	0.00	0.00	0.00	0.00	0.00	4.00	4.00	0.00
10.00	10.02	0.20	2612	2620	0.31	6.00	6.03	0.50
20.00	20.05	0.25	7387	7397	0.13	9.66	9.69	0.34
30.00	29.96	-0.13	13571	13553	-0.14	14.39	14.36	-0.22
40.00	40.03	0.07	20894	20914	0.09	20.00	20.04	0.20

CONCLUSIONS / RECOMMENDATIONS:

OCM III is functioning as expected with good accurate results.



FIELD SERVICES REPORT

REPORT OF: Mike Humphries
CUSTOMER / ADDRESS:
Town of Brighton
67 Sharpe Road
Brighton, Ontario K0K 1H0

DATE OF SERVICE: April 10, 2017

CONTACT: Keith Lee

EMAIL: klee@brighton.ca

PURPOSE FOR SERVICE:

Return to operation and calibration of South Marsh OCM III on effluent from the South Filter pond.

SYSTEM CONFIGURATION:

OCM III, Rev 3.30
ST-25C transducer
TS2 temperature sensor

APPLICATION:

Primary element – Rectangular Weir
Maximum Flow – 20894.4 m³ /day
Maximum head – 40.00 cm
Totalizer – 1 count = 1 cubic meter
Remote totalizer – 1count = 1 cubic meter

OBSERVATIONS / CHANGES MADE:

Zero As Found	156.80990	cm
Zero As Left	156.80990	cm
Change in Zero	0.00	cm

Head Applied (m)	Head Displayed (m)	Error (%)	Calculated Flow (m ³ /Day)	Flow Displayed (m ³ /hr)	Error (%)	Calculated MA Output	Measured mA Output	Error (%)
0.00	0.00	0.00	0.00	0.00	0.00	4.00	4.00	0.00
10.00	10.04	0.40	2612	2626	0.54	6.00	6.03	0.50
20.00	19.99	-0.05	7387	7373	-0.19	9.66	9.65	-0.07
30.00	30.03	0.10	13571	13581	0.07	14.39	14.41	0.12
40.00	40.08	0.20	20894	20954	0.28	20.00	20.04	0.20

CONCLUSIONS / RECOMMENDATIONS:

OCM III is functioning as expected with good accurate results.



FIELD SERVICES REPORT

REPORT OF: Mike Humphries
CUSTOMER / ADDRESS:
Town of Brighton
67 Sharpe Road
Brighton, Ontario K0K 1H0

DATE OF SERVICE: April 10, 2017

CONTACT: Keith Lee

EMAIL: klee@brighton.ca

PURPOSE FOR SERVICE:
Check operation of Multiranger Plus in lift / pumping station.

SYSTEM CONFIGURATION:
Milltronics Multiranger Plus
Milltronics Transducer

APPLICATION:
Ultra Sonics monitoring level of wet well.
Level readings are used for pump control.

OBSERVATIONS / CHANGES MADE:
Echo confidence is high (42db) and readings appear to be correct.

CONCLUSIONS / RECOMMENDATIONS:
Multiranger Plus is functioning as expected.

SIEMENS MAGFLO® Verification Certificate

Customer:		MAGFLO® Identification:	
Name	Brighton, Town of	TAG No./Name	0
Address	35 Alice Street	Sensor Code No.	7ME652
	Brighton, ON	Sensor Serial No.	122202H091
	K0K 1H0	Transmitter Code No.	7ME691
Phone	613-475-3453	Transmitter Serial No.	401730N041
Email		Location	Presqu'île Provincial Park

Results:		Verification file name or No.	Presqu'île
	Transmitter		Passed
	Sensor Insulation		Passed
	Magnetic Circuit		Passed

Velocity	Current Output			Frequency Output		
Theoretical	Theoretical	Actual	Deviation	Theoretical	Actual	Deviation
0.5m/s	4.800mA	4.805mA	0.68%	0.500kHz	0.502kHz	0.33%
1.0m/s	5.600mA	5.605mA	0.33%	1.000kHz	1.002kHz	0.18%
3.0m/s	8.800mA	8.807mA	0.14%	3.000kHz	3.004kHz	0.13%

Current Output 4-20mA Frequency Output 0-10kHz

Transmitter Settings:			Sensor Details:	
Basic	Qmax.	2000.00 l/min	Size	DN 150 6 IN
	Flow Direction	Positive	Cal. Factor	15.6641264
	Low flow Cut-off	3.00%	Correction Factor	1.0
	Empty Pipe	ON	Excitation Freq.	7.5Hz
Output	Current Output	OFF		
	Time Constant	N/A		
	Relay Output	Error Level		
	Digital Output	Pulse		
	Frequency Range	N/A		
	Time Constant	N/A		
	Volume/pulse	0.99999953 US G/p		
	Pulse width	0.066 sec.		
	Pulse polarity	Positiv		
Totalizer 1 value before test		70647.9453125 m³	Verificator Details (083F5061)	
Totalizer 1 value after test		70647.9765625 m³	Serial No.	000115N060
Totalizer 2 value before test		2.0099771 m³	Device No.	90529
Totalizer 2 value after test		2.00997782 m³	Software Version	1.40
Operating time in days		1779	PC-Software Version	5.01
			Cal. date	2015.10.29
			ReCal. date	2016.10.29

Comments

These tests verify that the flowmeter is functioning within 2% deviation of the original test parameters.
Verification is traceable to National and International Standards.

Date and signature

2016.04.25

Mike Humphries



Certificate of Instrument Performance
Certificat de Conformité

Company Name / Nom de la Compagnie : MUNICIPALITY OF BRIGHTON

Account Number / No. de compte : 40170999

Certification Number / Numéro du Certificat : WO-00244727

Part Number / No. de pièce : LPV440.99.00012	Model / Modèle : DR3900 SPECTROPHOTOMETER WITH RFID
Serial Number / No. de série : 1834843	
External Reference / Référence externe :	

Hach Sales & Service Canada Ltd. certifies that your instrument has been serviced, calibrated, verified with standards and now meets new product specifications.

Hach Sales & Service Canada Ltd. atteste que votre instrument a été entretenu, calibré et vérifié selon les normes en vigueur. Ses spécifications actuelles sont équivalentes à celles d'un produit neuf.

Certified by / Certifié par :

SK

SureshKurup

Certification Date / Date de certification :

11/14/2018

10.0 EFFORTS AND RESULTS TO MEET EFFLUENT OBJECTIVES

In May of 2015, Brighton retained the engineering and wastewater operations firm of GSS Engineering Consultants Ltd. (GSS) to assist with operation of the lagoon system.

With the assistance of GSS, the Municipality of Brighton has implemented a number of interim efforts under the LOF process of the ECA to potentially improve performance of the lagoon treatment system.

Four aerators are provided in the aerated cell. Total aerator power is approximately 60 kW. While total energy available in the aerated cell is relatively low (3.3 W/m³ based on total volume of 18,000 m³), all four (4) aerators, when running together, will suspend a significant amount of solids in the aerated cell. MECP design guidelines recommends mixing energy of 15-25 W/m³ to fully suspend mixed liquor, suspended solids.

In the early spring of 2016, the aerators were equipped with simple timers to allow all the aerators to operate at the same time and then turn off. The intent was to allow periods of settling during the aerator "off" period, to slowly build volatile suspended solids (VSS) in the aerated cell to achieve nitrification.

However, simple on/off operation of the aerators was not successful in increasing VSS levels in the aerated cell. It was then proposed to combine the on/off aerator operation with manual "decanting" of the top layer of effluent from the aerated cell when the aerators were off. This would assumedly retain solids within the aerated cell and allow VSS to build to levels that would support nitrification.

A Notice of Modification (Notification Number 7) for trial decanting, combined with on/off aeration, was submitted to MECP in August, 2017. A renewal of the decanting process was again requested in 2018 (Notification Number 8). Notification Number 9 (restart of Aqua-N nitrification solution) was requested in 2018 but was not processed by MECP or further discussed by Brighton. Notification Number 8 and 9 are included in **Appendix A**.

Notification Number 8 was subsequently approved by the MECP under the LOF conditions of the current ECA. Decanting was completed in 2017 (and then again in 2018) by the following manual decanting method:

Method

Based on preliminary evaluations, the simplest method to achieve manual decanting was to:

- Manually turn off all aerators at approximately 7 am
- Wait one half to one hour to allow settling of solids in the aerated cell
- Manually lift the first 6 inch stop log to release the first "batch" of clear decant

- After approximately 1 additional hour, manually remove the 2nd stop log to release a second batch of clear decant
- Overall, such draining of decant lowered water levels in the aeration cell by approximately 12 inches (300 mm).
- At approximately 2 pm, reinstall both stop logs and then turn on all aerators. The aerated cell would slowly refill
- Allow aerators to run from 2 pm to approximately 7 am. Then repeat the decant process. The operators completed regular measurement of dissolved oxygen in the aerated cell. Generally, the 6 hour decant period (8 am to 2 pm) resulted in falling dissolved oxygen levels in the aerated cell, but oxygen levels normally did not fall below 1 mg/l. Once the aerators were restarted, there was sometimes a temporary, further sag in oxygen levels before oxygen levels rebounded to 4 to 6 mg/l.

The area of the aerated cell is approximately 6,000 m². Therefore, the volume contained in the top 0.3 m of the cell is approximately 1,800 m³. Therefore, given a fill time of 17 hours (2 pm to 7 am), the stop logs would not normally start overflowing before 7 am as long as incoming sewage flows were less than 106 m³/hour (or 2,500 m³/day).

Normally, once the aerated cell was decanted for 6 hours, the remaining storage depth of approximately 12 inches (300 mm) was sufficient to store the incoming sewage flow until the next morning, without overtopping the stop logs.

Results – Retention of VSS and Removal of Ammonia

Decanting was completed on a sporadic basis during the early summer of 2018 but generally full time aeration (and normal overflow of the aeration cell to the lagoon) was practiced during the summer of 2018. **Table X** summarizes raw sewage flows, volatile suspended solids levels, raw sewage ammonia levels and ammonia effluent levels for the aerated cell during 2018:

Table X
Summary of VSS Levels and Ammonia Removal Rates in Aerated Cell – 2018

Month	Avg. Flow (m ³ /day)	Raw Ammonia (mg/l)	VSS Levels in Aerated cell (mg/L)	Ammonia in Cell Effluent (mg/l)	Ammonia Removal	Treatment Dose (Days x mg/l)	Total NO ₂ and NO ₃ (mg/)
January	3,334	32.1	Not calc.	15.9	Not calc.		
February	4,119	24.2	Not calc.	12.2	Not calc.		
March	3,728	21.3	Not calc.	12.6	Not calc.		
April	5,850	22.7	Not calc.	9.7	Not calc.		
May	3,510	29.8	Not calc.	15.6	Not calc.		
June	2,712	28.1	267	20.8	26%	1,770	0.8
July	1,982	43.4	292	28.1	35%	2,650	1.1
August	1,834	47.6	195	5.6	88%	1,910	6.0
September	1,844	46.7	235	0.5	99%	2,290	5.9
October	1,983	48.5	220	11.6	76%	2,000	5.5
November	3,103	34.3	178	15.6	55%	1,030	2.8
December	3,546	28.0	303	14.0	50%	1,540	1.4
Annual Average	3,129	33.9	N/A	13.5	N/A	N/A	N/A

Table X above also shows percent ammonia removal for each month, beginning in June, 2018 when more active sludge management was performed. Overall, a target concentration of 400 mg/l VSS was targeted as being desirable, with even higher levels (600 mg/l of VSS) being preferred.

Such higher levels of VSS were not achieved on a consistent basis. While the average values of VSS are shown above as being typically less than 300 mg/l, periodically, higher values of VSS (above 400 mg/l) were achieved during some weeks.

As per **Table X**, very good ammonia removal started to occur in early August of 2018. This unexpected, but very desirable result, began slowly in early August but the ammonia removal rate greatly increased between August 7 and August 14, 2018. During this period, sewage flows were low, and VSS levels were generally high, but such low flows and higher VSS had been in place since early July. Therefore, the reasons why the marked increase in ammonia removal occurred during this time is not known.

As well, during July and August, all aerators were running continuously, and no active decanting was being practiced.

Table X also provides a column showing “treatment dose” being the retention (or treatment) time in the aerated cell (in days) multiplied by the average VSS levels for the month (in mg/l). Generally, a longer treatment time in the aerated cell (coinciding with lower sewage flows) combined with high levels of VSS in the aerated cell, would have the best chance of providing an aged, high sludge mass that would promote a significant population of nitrifying bacteria.

Given the volume of the aerated cell being approximately 18,000 cubic meters, a flow of 3,000 m³/day would provide a treatment time of 6 days.

As per **Table X**, good ammonia removal rates (greater than 75%) coincided with a “treatment dose” greater than 2,000 days x mg/l.

Decanting began in earnest in late September, 2018, once it appeared that slowly increasing sewage flow rates were resulting in lower levels of VSS. However, such decanting was not successful in maintaining high levels of VSS in the aeration cell, and the very high rate of nitrification seen in the latter half of August (and September), slowly reduced to “normal” levels of ammonia removal in the cell in the latter part of October as well as in November and December.

Nonetheless, lower levels of ammonia in the aerated cell effluent in August, September and the first half of October resulted in lower levels of ammonia in the lagoon effluent beginning in September and continuing until late November.

For 2019, decanting combined with various aeration strategies will be continued, to try and provide significant treatment time each day when incoming raw sewage flows are combined with fully mixed, high VSS cell contents to achieve at least partial nitrification of raw sewage in the aerated cell.

Other Results

Other than ammonia, decanting beginning in September, 2018 appeared to improve the or at least maintain the quality of effluent being discharged from the downstream stabilization lagoon. Values of CBOD, TSS and TP were often below levels consistent with tertiary treatment.

For instance, for all months in the year, CBOD concentrations in the lagoon effluent were less than 5 mg/l. TSS concentrations in the lagoon effluent were less than 5 mg/l for all months between July and November. TP concentrations in the lagoon effluent were less than 0.3 for all months between April and December, 2018.

As well, there was no measurable, detrimental effect on lagoon effluent caused by desludging of the lagoon between August and October of 2018. The cutting/suction head of the desludging barge was not observed to create any turbidity except right around the barge. Such turbidity appeared to resettle within a short distance of the operating barge in a relatively short amount of time.

Summary

The decanting process, combined with on/off operation of the aerators, appears capable of building relatively high levels of VSS in the aeration cell. However, it has not been demonstrated that high levels of VSS can be sustained, in a fully mixed and suspended state in the aeration cell, on an ongoing basis.

However, it is recommended that continued experimentation with various combinations of on/off aerator operation (either manually or by timers) coupled with decanting, be continued during 2019.

11.0 Ammonium Nitrogen

Removal of ammonia nitrogen has been a long-standing issue for the Brighton WPCP. LOF provisions under previously issued Notices were undertaken largely to improve removal of ammonia nitrogen in the lagoon system.

In 2018, efforts to improve ammonia removal focused on operation of the aerators on timers in conjunction with manual decanting of the aerated cell. These measures were intended to build levels of VSS and increase sludge age in the aerated cell to promote development of nitrifying bacteria.

In August of 2018 sludge removal was undertaken (Terratec) to help with the removal of uptake of ammonia from the sludge buildup of the last 4 years, Terratec removed and land applied 532.4 dry metric tonnes, 288 tanker truck loads with an average of 4.63% solids, at a cost of over \$300K. Total volume of sludge removed was approximately 11,848 cubic meters.

Efforts to reduce ammonia have continued at the same time a Class EA was being completed to determine the best long term treatment alternative. Previous testing by Enviro Sim (2016) indicated that the raw sewage is treatable (for significant ammonia removal) if proper treatment, with an established mass of nitrifying bacteria, is available.

The Class EA process was completed in 2018. The identified preferred alternative is a dedicated, ammonia treatment system using attached growth biomass, at the end of the stabilization lagoon and upstream of the wetlands, with the preferred process being a Moving Bed Biological Reactor (MBBR). GHD Engineering Consultants has now been retained to provide final design services for the new MBBR system. Submission of final

design documents along with an ECA submission for the new MBBR is scheduled for spring/early summer of 2019.

11.1 Total Phosphorus

As per **Table III**, there was no exceedance of the TP limit of 1.0 mg/l in 2018.

Jar testing of the coagulant dosage was completed January 25th, 2018 to optimize dosing levels of ferric chloride under cold water conditions.

Levels of TP in wetland effluent remained below the Objective level of 0.8 mg/l for all months.

11.2 CBOD and Suspended Solids

Levels of CBOD and Suspended solids remained below the compliance limits and objective limits for all months in 2017.

12.0 BIOSOLIDS MANAGEMENT

As follows is an estimate of sludge generated in the lagoon system in 2018, and the volume of sludge removed from the treatment works.

As per previous sections, a significant volume of sludge (11,848 cubic meters) was removed from the stabilization lagoon between August and October of 2018 and land applied. The majority of the accumulated sludge in the stabilization lagoon was removed during the sludge removal contract. Heavy metal analysis of sludge samples collected from the stabilization lagoon, before the sludge removal contract began, are provided in Appendix B.

In spite of significant volumes of sludge being removed in 2018, sludge will continue to build up in the stabilization lagoon over time. Based on total sewage flows, the following section provides an estimate of the total amount of sludge generated and deposited in the stabilization lagoon in 2018.

The volume of sludge generated, and stored in the lagoon (stabilization pond) is estimated as follows:

- Total sewage flow in 2018 – 1,134,526 m³
- Assume starting sludge yield of 3.5 l/m³ (as per Table 16-1 of Design Guidelines for Sewage Works – MOE, 2008)

- Above sludge yield is for conventional activated sludge plants with anaerobic treatment and with phosphorus removal. Sludge yield in Table 16-1 is based on average solids content of 4%.
- Some consolidation of sludge will occur over time in stabilization lagoon. Assume sludge thickening from 4% to 5% will occur. Therefore, sludge yield will be slightly less, or $0.8 \times 3.5 \text{ l/m}^3 = 2.8 \text{ l/m}^3$.
- Therefore, total sludge production in 2018 is estimated to be 3,177 cubic meters.

Net sludge generated in 2018 is summarized as follows:

Total Sewage Flow in 2018	Sludge Yield	Total Sludge Generated	Average Sludge Depth in Lagoon	Sludge Removed	Net Sludge Added to Lagoon in 2018
1,134,526 m ³	2.8 l/m ³	3,177 m ³	0.058 m	11,848 m ³	0 m ³ *

Note – average sludge depth in lagoon above is extra sludge depth produced in lagoon in current year and based on approximate lagoon area of 54,400 m².

As above (*), no new sludge deposited in lagoon in 2018 as sludge removal contract was completed in latter part of 2018. The sludge removed in 2018 included significant volumes of sludge deposited in the lagoon in the years preceding 2018.

13.0 SUMMARY OF COMPLAINTS

The Municipality received no complaints in 2018

14.0 SUMMARY OF BY-PASSES, SPILLS AND ABNORMAL DISCHARGES

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

15.0 SUMMARY OF SEWER WORK COMPLETED

Between 2010 and 2018, the Municipality completed significant maintenance of the sanitary sewer system. This work included flushing and TV inspection and progressed to major repairs of sewers and manholes to reduce infiltration.

At the end of 2014, Sewer Technologies completed a priority sewer repair list with the most important problems rated at 5, and the least important problems rated at 1. The repair work has been carried out in 2015, 2016, 2017, 2018, and will continue into 2019.

In seven years, the Municipality has spent approximately \$700,000 on the collection system infrastructure. As noted, average flows have been reduced by approximately 900 cubic meter per day.

This lower flow has increased the remaining treatment capacity to that of the year 2000, potential reduced pollutant loadings on the environment, reduced run time of pumping equipment and reduced energy usage for pumping raw sewage.

In 2018, smoke testing was completed to find direct inflow sources such as sump pumps and down spouts. The Municipality plans to invest \$150,000 on further sewer repairs, and door to door inspections of the sump pumps, in attempts to remove more inflow and infiltration to the sanitary system.

16.0 RAINBOW TROUT TOXICITY TESTING

Brighton has submitted quarterly samples of final effluent from the constructed wetlands to a toxicity laboratory in Guelph, Ontario (Aquatox Testing and Consulting Ltd.) for LC 50 testing using young rainbow trout.

All tests completed in 2018 had zero mortalities. Sampling and testing have been done in accordance with Environment Canada requirements.

Prepared by:

Keith Lee, Wastewater ORO
Municipality of Brighton

Jeff Graham, P. Eng.
GSS Engineering Consultants Ltd

APPENDIX A

NOTICE OF MODIFICATIONS SUBMITTED TO MECP UNDER LOF PROCESS – 2018



Ministry of
the Environment

Notice of Modification to Sewage Works

RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA AND SEND A COPY TO THE WATER SUPERVISOR (FOR MUNICIPAL SYSTEMS) OR DISTRICT MANAGER (FOR INDUSTRIAL SYSTEMS)

Part 1 – Environmental Compliance Approval (ECA) with Limited Operational Flexibility

(Insert the ECA's owner, number and issuance date and notice number, which should start with "01" and consecutive numbers thereafter)

ECA Owner	ECA number	Issuance Date (mm/dd/yy)	Notice number
Municipality of Brighton	3081-9XQNZK	07/07/15	8

Part 2 – Description of the modifications as part of the Limited Operational Flexibility

(Attach a detailed description of the sewage works)

Previously, Brighton installed timers on the existing four aerators in the aerated cell of the sewage treatment works. On/off cycling of the aerators was attempted to retain biological solids in the aerated cell, to increase sludge age and promote formation and retention of nitrifying bacteria. This notice seeks to augment aeration timers by allowing removal of existing stop logs (two, 6" tall stop logs) in the morning to "decant" clarified water from the aerated cell when the aerators are off. Once the boards are reinstalled later in the same day, all aerators would be returned to operation.

Description shall include:

1. A detail description above of the modifications and/or operations to the sewage works (e.g. sewage work component, location, size, equipment type/model, material, process name, etc.)
2. An assessment of the anticipated environmental effects
3. Updated versions of, or amendments to, all relevant technical documents required by this ECA that are affected by the modifications as applicable, e.g. site plan, design brief, drawings, emergency and spill prevention plan, etc.

Part 3 – Declaration by Professional Engineer

I hereby declare that I have verified the scope and technical aspects of this modification and confirm that the design:

1. Has been prepared or reviewed by a Professional Engineer who is licensed to practice in the Province of Ontario;
2. Has been designed in accordance with the Limited Operational Flexibility as described in the ECA;
3. Has been designed consistent with Ministry's Design Guidelines, adhering to engineering standards, industry's best management practices, and demonstrating ongoing compliance with s.53 of the Ontario Water Resources Act; and other appropriate regulations.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name (Print)	PEO License Number
Jeff Graham, P. Eng.	90222860
Signature	Date (mm/dd/yy)
	06/21/2018
Name of Employer	
GSS Engineering Consultants Ltd.	

Part 4 – Declaration by Owner

I hereby declare that:

1. I am authorized by the Owner to complete this Declaration;
2. The Owner consents to the modification; and
3. This modifications to the sewage works are proposed in accordance with the Limited Operational Flexibility as described in the ECA.
4. The Owner has fulfilled all applicable requirements of the *Environmental Assessment Act*.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name of Owner Representative (Print)	Owner representative's title (Print)
Mr. Keith Lee	Wastewater Supervisor
Owner Representative's Signature	Date (mm/dd/yy)
	06/21/2018



Notice of Modification to Sewage Works

Ministry of
the Environment

RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA AND SEND A COPY TO THE WATER SUPERVISOR (FOR MUNICIPAL SYSTEMS) OR DISTRICT MANAGER (FOR INDUSTRIAL SYSTEMS)

Part 1 – Environmental Compliance Approval (ECA) with Limited Operational Flexibility

(Insert the ECA's owner, number and issuance date and notice number, which should start with "01" and consecutive numbers thereafter)

ECA Owner	ECA number	Issuance Date (mm/dd/yy)	Notice number
Municipality of Brighton	C of A No. 3560-8A8LEY	11/17/10	9

Part 2 – Description of the modifications as part of the Limited Operational Flexibility

(Attach a detailed description of the sewage works)

Do additional trial addition of Aqua N (600) solution and alternate nitrification enhancement products to lagoon system to determine if stable, nitrifying process can be established. Solution consists of a blend of selectively adapted bacteria that promote ammonia removal. A copy of the Material Safety Data Sheets can be provided upon request. Solution will be added to raw sewage upstream of aerated cell (lagoon), and at chemical mixing point upstream of stabilization lagoon. Dosage rates as per manufacturer's recommendations. It is proposed to operate trial dosage from 30 to 60 days. Currently, operating staff collect weekly raw sewage samples, and separate effluent samples from the aerated lagoon, the stabilization lagoon and the combined wetland effluent. TKN, ammonia and nitrate are all analyzed for at all locations (in addition to other required parameters). Therefore, no additional effluent sampling and analysis is felt to be required.

Description shall include:

1. A detail description above of the modifications and/or operations to the sewage works (e.g. sewage work component, location, size, equipment type/model, material, process name, etc.)
2. An assessment of the anticipated environmental effects
3. Updated versions of, or amendments to, all relevant technical documents required by this ECA that are affected by the modifications as applicable, e.g. site plan, design brief, drawings, emergency and spill prevention plan, etc.

Part 3 – Declaration by Professional Engineer

I hereby declare that I have verified the scope and technical aspects of this modification and confirm that the design:

1. Has been prepared or reviewed by a Professional Engineer who is licensed to practice in the Province of Ontario;
2. Has been designed in accordance with the Limited Operational Flexibility as described in the ECA;
3. Has been designed consistent with Ministry's Design Guidelines, adhering to engineering standards, industry's best management practices, and demonstrating ongoing compliance with s.53 of the Ontario Water Resources Act; and other appropriate regulations.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name (Print)	PEO License Number
Jeff Graham, P. Eng.	90222860
Signature	Date (mm/dd/yy)
	06/21/18
Name of Employer	
GSS Engineering Consultants Ltd.	

Part 4 – Declaration by Owner

I hereby declare that:

1. I am authorized by the Owner to complete this Declaration;
2. The Owner consents to the modification; and
3. This modifications to the sewage works are proposed in accordance with the Limited Operational Flexibility as described in the ECA.
4. The Owner has fulfilled all applicable requirements of the *Environmental Assessment Act*.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name of Owner Representative (Print)	Owner representative's title (Print)
Mr. Keith Lee	Wastewater Supervisor
Owner Representative's Signature	Date (mm/dd/yy)
	06/21/18

APPENDIX B

METAL ANALYSIS OF SLUDGE SAMPLES TAKEN IN 2018



CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G-2018-05-08

REPORT No. B18-12147

Report To:

Municipality of Brighton
67 Sharp Rd., PO Box 189
Brighton ON K0K 1H0 Canada
Attention: Keith Lee

Caduceon Environmental Laboratories
285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 08-May-18

JOB/PROJECT NO.: Brighton WPCP

DATE REPORTED: 18-May-18

P.O. NUMBER:

SAMPLE MATRIX: Liquid Sludge

WATERWORKS NO.

Parameter	Units	R.L.	Client I.D.		Liquide Sludge	Liquide Sludge		
			Sample I.D.	Date Collected	B18-12147-1	B18-12147-2		
			Reference Method	Date/Site Analyzed				
E coli	cfu/g	1	MOE E3371	08-May-18/O	140000	70000		
Phosphorus-Total	mg/L	0.01	E3199A.1	10-May-18/K	93.0	1850		
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	10-May-18/K	284	2170		
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	10-May-18/K	111	159		
Nitrite (N)	mg/L	0.1	SM4110C	16-May-18/O	< 1 ¹	< 0.5 ¹		
Nitrate (N)	mg/L	0.1	SM4110C	16-May-18/O	2.0	< 0.5 ¹		
Total Suspended Solids	mg/L	3	SM2540D	09-May-18/K	21000	48000		
Volatile Suspended Solids	mg/L	10	SM2540D	09-May-18/K	13000	27000		
Total Solids	mg/L	30	SM 2540	09-May-18/K	18700	59700		
Aluminum	mg/L	0.03	SM 3120	15-May-18/O	458	750		
Arsenic	mg/L	0.1	EPA 200.8	15-May-18/O	0.2	< 0.1		
Cadmium	mg/L	0.03	SM 3120	15-May-18/O	0.09	0.09		
Chromium	mg/L	0.01	SM 3120	15-May-18/O	13.5	7.70		
Cobalt	mg/L	0.03	SM 3120	15-May-18/O	0.55	0.28		
Copper	mg/L	0.01	SM 3120	15-May-18/O	41.3	29.1		
Lead	mg/L	0.1	SM 3120	15-May-18/O	3.7	4.7		
Mercury	mg/L	0.002	EPA 7471A	15-May-18/O	0.069	0.074		
Molybdenum	mg/L	0.05	SM 3120	15-May-18/O	0.53	0.22		
Nickel	mg/L	0.05	SM 3120	15-May-18/O	2.37	1.63		
Selenium	mg/L	0.1	EPA 200.8	15-May-18/O	0.3	0.2		
Zinc	mg/L	0.03	SM 3120	15-May-18/O	52.0	36.0		

¹ Elevated detection limit due to Suspended solids

R.L. = Reporting Limit

Michelle Dubien



CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G-2018-05-15

REPORT No. B18-13063

Report To:

Municipality of Brighton
67 Sharp Rd., PO Box 189
Brighton ON K0K 1H0 Canada

Attention: Keith Lee

Caduceon Environmental Laboratories

285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 15-May-18

DATE REPORTED: 24-May-18

SAMPLE MATRIX: Liquid Sludge

JOB/PROJECT NO.: Brighton WPCP

P.O. NUMBER:

WATERWORKS NO.

Parameter	Units	R.L.	Client I.D.		Liquide Sludge	Liquide Sludge		
			Reference Method	Date/Site Analyzed	B18-13063-1	B18-13063-2		
E coli	cfu/100mL	1	SM9222B	15-May-18/K	190000	1070000		
Phosphorus-Total	mg/L	0.01	E3199A.1	17-May-18/K	2570	2910		
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	17-May-18/K	2970	3710		
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	16-May-18/K	373	497		
Nitrite (N)	mg/L	0.1	SM4110C	16-May-18/O	< 0.5 ¹	< 0.5 ¹		
Nitrate (N)	mg/L	0.1	SM4110C	16-May-18/O	0.7	0.8		
Total Suspended Solids	mg/L	3	SM2540D	16-May-18/K	66000	142000		
Volatile Suspended Solids	mg/L	10	SM2540D	16-May-18/K	36000	74000		
Total Solids	mg/L	30	SM 2540	18-May-18/K	70700	67400		
Aluminum	mg/L	0.03	SM 3120	24-May-18/O	535	550		
Arsenic	mg/L	0.1	EPA 200.8	22-May-18/O	0.3	0.4		
Cadmium	mg/L	0.03	SM 3120	22-May-18/O	0.09	0.14		
Chromium	mg/L	0.01	SM 3120	22-May-18/O	12.4	15.1		
Cobalt	mg/L	0.03	SM 3120	22-May-18/O	0.63	0.57		
Copper	mg/L	0.01	SM 3120	22-May-18/O	39.8	53.5		
Lead	mg/L	0.1	SM 3120	22-May-18/O	3.5	6.3		
Mercury	mg/L	0.002	EPA 7471A	22-May-18/O	0.075	0.089		
Molybdenum	mg/L	0.05	SM 3120	22-May-18/O	0.41	0.47		
Nickel	mg/L	0.05	SM 3120	22-May-18/O	2.21	2.70		
Selenium	mg/L	0.1	EPA 200.8	22-May-18/O	0.3	0.3		
Zinc	mg/L	0.03	SM 3120	22-May-18/O	45.1	59.0		

1. Elevated detection limit due to Suspended solids

Michelle Dubien
Lab Manager

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.



CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G-2018-06-26

REPORT No. B18-18288

Report To:

Municipality of Brighton
67 Sharp Rd., PO Box 189
Brighton ON K0K 1H0 Canada

Attention: Keith Lee

Caduceon Environmental Laboratories

285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 26-Jun-18

JOB/PROJECT NO.: Brighton WPCP

DATE REPORTED: 05-Jul-18

P.O. NUMBER:

SAMPLE MATRIX: Liquid Sludge

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.		Date Collected	
					Liquid Sludge	Liquid Sludge	26-Jun-18	26-Jun-18
E coli	cfu/g	1	MOE E3371	26-Jun-18/O	4200	>243000		
Phosphorus-Total	mg/L	0.01	E3199A.1	27-Jun-18/K	1150	337		
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	27-Jun-18/K	1230	656		
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	27-Jun-18/K	224	41.4		
Nitrite (N)	mg/L	0.1	SM4110C	28-Jun-18/O	< 0.1	< 0.1		
Nitrate (N)	mg/L	0.1	SM4110C	28-Jun-18/O	< 0.1	< 0.1		
Volatile Suspended Solids	mg/L	10	SM2540D	27-Jun-18/K	27000	11000		
Total Solids	mg/L	30	SM 2540	28-Jun-18/K	54400	16500		
Aluminum	mg/L	0.03	SM 3120	03-Jul-18/O	51.0	46.3		
Arsenic	mg/L	0.1	EPA 200.8	03-Jul-18/O	< 0.1	< 0.1		
Cadmium	mg/L	0.03	SM 3120	03-Jul-18/O	< 0.03	< 0.03		
Chromium	mg/L	0.01	SM 3120	03-Jul-18/O	1.62	1.54		
Cobalt	mg/L	0.03	SM 3120	03-Jul-18/O	0.04	0.05		
Copper	mg/L	0.01	SM 3120	03-Jul-18/O	4.36	4.59		
Lead	mg/L	0.1	SM 3120	03-Jul-18/O	0.4	0.3		
Mercury	mg/L	0.002	EPA 7471A	04-Jul-18/O	0.012	0.007		
Molybdenum	mg/L	0.05	SM 3120	03-Jul-18/O	0.07	0.05		
Nickel	mg/L	0.05	SM 3120	03-Jul-18/O	0.28	0.31		
Selenium	mg/L	0.1	EPA 200.8	03-Jul-18/O	< 0.1	< 0.1		
Zinc	mg/L	0.03	SM 3120	03-Jul-18/O	5.15	5.55		

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Michelle Dubien
Lab Manager

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.



CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: G-2018-08-07

REPORT No. B18-23103

Report To:

Municipality of Brighton
67 Sharp Rd., PO Box 189
Brighton ON K0K 1H0 Canada

Attention: Keith Lee

Caduceon Environmental Laboratories

285 Dalton Ave
Kingston Ontario K7K 6Z1
Tel: 613-544-2001
Fax: 613-544-2770

DATE RECEIVED: 07-Aug-18

JOB/PROJECT NO.: Brighton WPCP

DATE REPORTED: 14-Aug-18

P.O. NUMBER:

SAMPLE MATRIX: Liquid Sludge

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.		Liquid Sludge	
					Sample I.D.			
E coli	cfu/g	1	MOE E3371	07-Aug-18/O	B18-23103-1	B18-23103-2	400000	622000
Phosphorus-Total	mg/L	0.01	E3199A.1	08-Aug-18/K	07-Aug-18	07-Aug-18	2460	1230
Total Kjeldahl Nitrogen	mg/L	0.1	E3199A.1	08-Aug-18/K			2260	1750
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	09-Aug-18/K			96.7	396
Nitrite (N)	mg/L	0.1	SM4110C	10-Aug-18/O			< 0.1	< 0.1
Nitrate (N)	mg/L	0.1	SM4110C	10-Aug-18/O			< 0.1	< 0.1
Total Suspended Solids	mg/L	3	SM2540D	08-Aug-18/K			88000	85000
Volatile Suspended Solids	mg/L	10	SM2540D	08-Aug-18/K			39000	40000
Total Solids	mg/L	30	SM 2540	10-Aug-18/K			56400	48300
Aluminum	mg/L	0.03	SM 3120	13-Aug-18/O			1430	118
Arsenic	mg/L	0.1	EPA 200.8	13-Aug-18/O			0.2	0.1
Cadmium	mg/L	0.03	SM 3120	13-Aug-18/O			0.12	0.04
Chromium	mg/L	0.01	SM 3120	13-Aug-18/O			9.75	4.56
Cobalt	mg/L	0.03	SM 3120	13-Aug-18/O			0.38	0.20
Copper	mg/L	0.01	SM 3120	13-Aug-18/O			39.6	13.3
Lead	mg/L	0.1	SM 3120	13-Aug-18/O			4.6	0.9
Mercury	mg/L	0.002	EPA 7471A	13-Aug-18/O			0.093	0.018
Molybdenum	mg/L	0.05	SM 3120	13-Aug-18/O			0.40	0.23
Nickel	mg/L	0.05	SM 3120	13-Aug-18/O			1.93	0.82
Selenium	mg/L	0.1	EPA 200.8	13-Aug-18/O			0.2	< 0.1
Zinc	mg/L	0.03	SM 3120	13-Aug-18/O			44.1	15.7

Michelle Dubien
Lab Manager

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.