

# Municipality of



# Brighton

## **WASTEWATER POLLUTION CONTROL PLANT**

**ANNUAL REPORT**

# 2006

MINISTRY OF ENVIRONMENT - CERTIFICATE OF APPROVAL NUMBER 3-0521-00-006  
SEWAGE WORKS NUMBER 110000953

## TABLE OF CONTENTS

- 1.0 INTRODUCTION
  - Classification and Control Document Information.
- 2.0 CONTACT INFORMATION
  - Owner/Operator contact information
- 3.0 WASTEWATER TREATMENT PLANT & TREATMENT PROCESS
- 4.0 COMPLIANCE WITH TERMS AND CONDITIONS OF CERTIFICATE OF APPROVAL
  - 4.1 PERFORMANCE
    - 4.1.1 Wastewater flows to the WPCP
    - 4.1.2 Waste Stabilization Pond Effluent Quality
    - 4.1.3 Wetland Effluent Quality
  - 4.2 MONITORING AND RECORDING
    - Table VII – Compliance to sampling frequency
    - Table VIII– Waste Stabilization Pond – weekly lab results
    - Table IX – Wetland Final Effluent – weekly lab results
    - Table X- Waste Stabilization Pond Loading
    - Table XI- Performance
  - 4.3 OPERATION AND MAINTENANCE
    - Summary of Operations
    - Summary of Maintenance
    - Summary of Environmental or Operating Problems
  - 4.4 REPORTING
- 5.0 CONCLUSION

## 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, 2006.

Brighton's Water Pollution Control Plant services a population of approximately 5,750 consisting of 2,400 residential and 170 commercial accounts. The Ontario Environmental Training Consortium Certification Office (OETC) classifies the Water Pollution Control Plant as Wastewater Treatment Class 1 facility and Wastewater Collection Class 2 collection system.

The Brighton Wastewater Pollution Control Plant operates under Certificate of Approval number 3-0521-99-006 issued by the Ministry of Environment.

-----

### CONTROL DOCUMENT INFORMATION

Type of Control Document	Number	Issue Date	Effluent Monitoring Requirements (Yes/No)	Effluent Reporting Requirements (Yes/No)
C of A Sewage Works	3-0521-99-006	7/09/99	YES	YES
C of A Sludge Drying Beds	3-0381-96-006	8/01/96	N/A	N/A
C of A Composting Site	A710120	2/05/97	N/A	N/A

There were no biosolids pumped to the drying beds during this reporting period and no material was utilized or removed from the composting site.

## 2.0 CONTACT INFORMATION

For information or questions regarding this report please contact:

The Corporation of the Municipality of Brighton  
35 Alice Street, P.O. Box 189  
Brighton, ON K0K 1H0  
Telephone: (613) 475-0670  
Fax: (613) 475-3453

Jim Phillips, P.Eng., Director  
Public Works & Environmental Services  
67 Sharp Road  
Municipality of Brighton  
Telephone: (613) 475-1162  
Fax: (613) 475-2599

Brighton WPCP Operators: Wayne Pearson, WWT I/WWC II, Operator-in-Charge  
Brighton WPCP & Public Works Urban Road Foreman  
Telephone: (613) 475-0666  
Fax: (613) 475-2599

Keith Lee, WDSI/ WWTI/WWC II Operator  
Public Works & Environmental Services  
Telephone: (613) 475-1162

Consultant: John Pries, C.E.T.  
CH2M HILL Canada Ltd.  
180 King St. S., Suite 600  
Waterloo, ON., N2J 1P8  
Telephone: (519) 579-3500

Accredited Laboratory: Caduceon Environmental Laboratories  
285 Dalton Ave., Kingston, ON K7M 6Z1  
Phone: (613) 544-2001  
Fax: (613) 544-2770

### 3.0 WASTEWATER TREATMENT PLANT DESCRIPTION & TREATMENT PROCESS

The sewage works in Brighton consists of:

- a 0.7 hectare aerated lagoon (lagoon #1) with two mechanical surface aerators. The effluent from the aeration lagoon passes through a chemical mixing chamber where alum is added before entering the waste stabilization pond;
- a 5.44 hectare waste stabilization pond (lagoon #2) is a facultative lagoon where wastewater stabilization is carried out by a combination of aerobic, anaerobic and facultative bacteria.
- a constructed wetland having a surface area of 6.2 hectare, located south of the existing waste stabilization pond consisting of Wetland Cell #1 (north cell) and Wetland Cell #2 (south cell) with alternating deep zones and vegetative terraces. The effluent from the constructed wetlands is continuous and discharges to a natural wetland that borders Presqu'ile Bay located off the northeast shore of Lake Ontario;
- a 2-cell drying bed to service the existing sewage treatment lagoons; sludge that accumulates in the lagoons may be periodically pumped to drying beds.

The hydraulic capacity of the sewage works has been re-rated at 4,600 m<sup>3</sup>/day since the constructed wetlands were incorporated to the treatment system in the summer of 2000. Approximately 44% of the sanitary sewage from the Brighton collection system flows by gravity to the aerated lagoon; the remainder of the flow (56%) was collected at the Harbour Street Sewage Pumping Station where it is pumped through a force main to the WPCP. The pumping station is equipped with three dry well centrifugal pumps that pump wastewater through a force main to the aerated lagoon. A standby diesel generator is on-site (replaced in September of 2005) at the pumping station to provide electricity to the pumps during power outage events.

Brighton's wastewater treatment system is a simple low-tech approach based on the wastewater going through a biological activity in a lagoon-based system. Raw wastewater enters the aerated lagoon (lagoon #1) where it is mixed and oxygenated. The added oxygen from aeration allows aerobic microorganisms to reduce organic matter and nutrients, and reduces odour potential in the wastewater. The effluent from the aerated lagoon then passes through a mixing chamber where Alum (Aluminum Sulfate) is added. Alum is a flocculent used in wastewater ponds to precipitate soluble phosphorus and aids in the settling of many other substances. The effluent then flows to the waste stabilization pond (lagoon #2) where the bound solids settle to the bottom and the organic portions are decomposed through microbial action. Dissolved materials such as nitrogen and phosphorus are used by green algae in the pond for cell growth. The effluent from the waste stabilization pond then enters the constructed wetland for final polishing where the water is further filtered and cleansed. The natural processes occurring in the lagoons and wetland system produce a good quality effluent that is monitored regularly by licensed operators. Treatment performance from lagoon-based systems is susceptible to low temperature conditions and associated negative effects on biological treatment performance. Ammonia removal rates and microbial growth typically decrease with lower temperatures. The Certificate of Approval provides changes in concentration limits for Ammonia in the waste stabilization pond and constructed wetlands from October to April to provide allowances for cold temperatures that result in lower nitrification rates.

Analyses are taken in both the influent (raw sewage) and the effluent at the lagoon and wetlands to determine the amount of treatment achieved. The results must comply with MOE guidelines and Certificate of Approval effluent concentration limits and objectives.

## 4.0 COMPLIANCE WITH TERMS AND CONDITIONS OF CERTIFICATE OF APPROVAL

### 4.1 Performance

#### 4.1.1 *Wastewater Flow to the WPCP*

*Certificate of Approval 2.(a)* The Owner shall ensure that the flow of sewage into the sewage treatment works does not exceed the average daily flow of 4,600 m<sup>3</sup>/day for a period of any twelve (12) consecutive calendar months.

The average daily flow for 2006 was 3,813 m<sup>3</sup>/day, which represents 82% of the average day design capacity of 4,600m<sup>3</sup>/day. The maximum annual daily flow for 2006 occurred on November 17, 2006 where heavy precipitation contributed to a peak flow of 10,135m<sup>3</sup>/day. Peak monthly flow of 153,616 m<sup>3</sup> occurred in December due to precipitation that month. Annual flow of sewage to the WPCP was 1,388,797 in 2006 with approximately 56% of the wastewater entered via the pumping station and 44% flowing by gravity from the remainder of the sanitary collection system.

**Table I – Monthly Sewage In-flow to Treatment Plant**

Date	Total Flow m <sup>3</sup>	Avg. Flow m <sup>3</sup> /Day	Max. Day Flow m <sup>3</sup>	% (Avg.Day/Design Capacity)
JAN	135,919	4384	6690	95%
FEB	116,375	4156	7692	90%
MAR	108,727	3507	5638	76%
APR	123,600	4120	5681	89%
MAY	107,899	3481	4000	75%
JUN	92,457	3082	3779	67%
JUL	96,755	3121	4368	67%
AUG	78,674	2615	3237	56%
SEP	85,449	2848	3465	62%
OCT	145,412	4691	9322	102%
NOV	143,914	4797	10135	104%
DEC	153,616	4955	5,343	108%
ANNUAL	1,388,797	3813	4179	82%

Volume of influent of wastewater to lagoon #2 measured 1,388,797 m<sup>3</sup> See Table II.

Average per capita daily wastewater flow from Brighton WWTP was approximately 0.66 m<sup>3</sup>/capita in 2006, which includes domestic, industrial and commercial contributions as well as infiltration and inflow. (Based on a population of 5,850 and an average daily flow of 3,813 m<sup>3</sup>/day.)

The total flow of wastewater to the treatment plant in 2005 was 1,103,019 m<sup>3</sup>, flows in 2006 were approximately 8% higher due to increased precipitation throughout the year and possibly due to infiltration and illegal sump pump hook ups.

**Table II- Annual Flows to the WPCP**

Date	2006	2005	2004	2003	2002
JAN	135,919	120,016	99,348	72,557	94,250
FEB	116,375	91,820	72,900	68,753	98,823
MAR	108,727	93,266	139,521	121,860	122,051
APR	123,600	137,108	137,429	120,487	124,897
MAY	107,899	90,800	107,407	125,924	141,812
JUN	92,457	70,223	91,458	100,143	100,415
JUL	96,755	68,654	99,697	74,838	87,723
AUG	78,674	60,800	113,708	71,274	73,113
SEP	85,449	76,665	110,785	68,544	64,857
OCT	145,412	89,040	80,535	81,242	62,360
NOV	143,914	102,228	90,949	109,618	76,973
DEC	153,616	103,019	149,474	123,796	75,444
ANNUAL	1,388,797	1,103,699	1,293,211	1,139,036	1,122,718

#### 4.1.2 Waste Stabilization Pond Effluent Quality

*Certificate of Approval 2.(b)* The owner shall design, construct and/or operate the sewage treatment works such that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the waste stabilization pond:

**Table III – C of A Waste Stabilization Pond Effluent Parameters**

Effluent Parameters	Concentration in Effluent	Loading in Effluent
CBOD <sub>5</sub>	30.0 mg/L	138.0 kg./day
Suspended Solids	40.0 mg/L	184.0 kg./day
Ammonia & Ammonium Nitrogen (May 1 to Oct. 30) <sup>1</sup>	<b>14.0 mg/L<sup>1</sup></b>	<b>64.4 kg./day<sup>1</sup></b>
(Nov. 1 to Apr. 30) <sup>2</sup>	17.0 mg/L <sup>2</sup>	78.2 kg./day <sup>2</sup>
Total Phosphorus	1.0 mg/L	4.6 kg./day

**Waste Stabilization Pond Effluent Summary:**

- The Biological Oxygen Demand is the amount of oxygen used by micro-organisms as they decompose organic matter in the effluent sample for five days. High BOD in effluent means a large quantity of oxygen was needed to break down the organic matter and identifies a large amount of organic matter in the effluent indicating inadequate treatment. The CBOD<sub>5</sub> average concentration from the waste stabilization pond effluent in 2006 was 4.11 mg/L; the CofA limit is 30.0 mg/L CBOD<sub>5</sub> based on the average concentration of all samples taken.
- Total Suspended Solids in effluent are composed of settleable solids and nonsettleable solids depending on the size, shape and weight of the solid particles; large sized particles tend to settle more rapidly and are largely removed in the waste stabilization pond. Suspended Solids concentration limit from the waste stabilization pond effluent is 40.0 mg/L. The annual average of Total Suspended Solids was 9.61 from the waste stabilization pond.
- Total Phosphorus (TP) refers to the amount of phosphorus in a sample. Excess TP stimulates algae and weed growth that may cause fluctuations in dissolved oxygen in the receiving waters. Total Phosphorus limits for the waste stabilization pond is based on the monthly average concentration of the parameter; the CofA limit is 1.0 mg/L TP. Monthly average concentration of Total Phosphorus in 2006 ranged from 0.01-0.80 mg/L.
- C of A limits for Ammonia change from May to October at 14.0 mg/L and Nov.-Apr. at 17.0 mg/L. Non-compliance with respect to concentrations of (Ammonia + Ammonium) Nitrogen in the effluent is deemed to have occurred when the '*monthly average*' concentration of the parameter listed in Table III is exceeded in any calendar month. Ammonia concentrations from May to October ranged from 9.40-13.95 mg/L; and from 6.40-13.0 mg/L in November to April.
- There were no exceedances as defined by the Certificate of Approval of any of the parameters with respect to the concentration or total loading of the Waste Stabilization Pond (Lagoon #2) refer to Tables VIII and X.

**4.1.3 Wetland Effluent Quality**

**Certificate of Approval 5.(a)** the Owner shall use best effort to operate the sewage treatment works with the objective that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from constructed wetland:

**Table IV – C of A Constructed Wetland Effluent Objectives**

<b>Constructed Wetland Effluent Parameter</b>	<b>Concentration</b>
CBOD <sub>5</sub>	15.0 mg/L
Suspended Solids	15.0 mg/L
Ammonia + Ammonium Nitrogen (May 1 to October 30) <sup>1</sup>	<b>10.0 mg/L</b> <sup>1</sup>
(November 1 to April 30) <sup>2</sup>	15.0 mg/L <sup>2</sup>
Total Phosphorus	0.80 mg/L



**Wetland Effluent Summary:**

- The average concentration of CBOD<sub>5</sub> from the constructed wetland effluent in 2006 was 3.19mg/L; the C of A objective is 15.0 mg/L CBOD<sub>5</sub> based on the average concentration of all samples taken.
- Suspended Solids concentration limit from the constructed wetland effluent is 15.0 mg/L. The annual average concentration of Total Suspended Solids was 6.64mg/L from the constructed wetland based on the average concentration of all samples taken.
- Total Phosphorus limits for the constructed wetland is based on the monthly average concentration of the parameter; the C of A limit is 0.80 mg/L. Monthly average concentrations of Total Phosphorus in 2006 ranged from 0.09-0.60 mg/L.
- Limits for Ammonia change from May to October at 10.0 mg/L and Nov.-Apr. at 15.0 mg.L. Monthly average Ammonia objectives were not met for the months of May, September and October.
- Lack of sunlight, plant production, decreased temperatures and ice cover in winter months directly affects treatment capability of a natural treatment process by limiting dissolved oxygen concentrations which may contribute to elevated food to microorganism ratio (F:M) conditions. Algae and plants consume nitrogen and phosphorus in the wastewater; lack of this activity in winter months limits the reduction of Ammonia and Phosphorus in the final effluent.

**Certificate of Approval (5.)(b)** states that the geometric mean density of E. Coli should not exceed 200 organisms per 100 ml. for any calendar month. E. Coli are sampled once a month from the waste stabilization pond basis as per C of A. See Tables VIII and IX representing the weekly lab results of the Waste Stabilization Pond and Wetland Effluent including monthly E. Coli results. E. Coli levels were above 200 organisms per 100 ml on two occasions in the lagoon and one occasions in the wetland. See Tables VIII & IX

#### 4.2 **Monitoring and Recording Table VII**

Certificate of Analysis 4.(b) Samples of raw sewage shall be collected at locations acceptable to the District Manager and analyzed for at least parameters 1 to 4 at the indicated minimum frequencies; parameters 5 to 8 are taken in order to analyze system performance.				
	<b>Raw Sewage Parameter</b>	<b>Type of Sample</b>	<b>Minimum Frequency</b>	<b>Total # of Samples</b>
1	CBOD <sup>5</sup>	grab	monthly	12
2	Suspended Solids	grab	monthly	12
3	Total Phosphorus	grab	monthly	12
4	Total Kjeldahl Nitrogen	grab	monthly	12
5	Ammonia (N)	grab	monthly	12
6	Nitrite (N)	grab	monthly	12
7	Nitrate (N)	grab	monthly	12
Certificate of Analysis 4.(c) Samples of effluent from the waste stabilization pond shall be collected at locations acceptable to the District Manager and analysed for at least the following parameters(1-10) at the indicated minimum frequencies.				
	<b>Waste Stabilization Pond Effluent Parameter</b>	<b>Type of Sample</b>	<b>Minimum Frequency</b>	<b>Total # of Samples</b>
1	CBOD5	grab	weekly	52
2	Suspended Solids	grab	weekly	52
3	Total Phosphorus	grab	weekly	52
4	Total Kjeldahl Nitrogen	grab	weekly	52
5	Ammonia (N)	grab	weekly	52
6	Nitrite (N)	grab	weekly	52
7	Nitrate (N)	grab	weekly	52
8	pH	grab	weekly	52
9	Temperature	grab	weekly	52
10	E. Coli	grab	monthly	12
Certificate of Analysis 4.(d) Samples of effluent from the constructed wetland shall be collected at locations acceptable to the District Manager and analysed for at least the following parameters (1-9) at the indicated minimum frequencies. E. Coli is sampled to comply with C. of A. objective 5.(b).				
	<b>Constructed Wetland Effluent Parameter</b>	<b>Type of Sample</b>	<b>Minimum Frequency</b>	<b>Total # of Samples</b>
1	CBOD5	grab	weekly	52
2	Suspended Solids	grab	weekly	52
3	Total Phosphorus	grab	weekly	52
4	Total Kjeldahl Nitrogen	grab	weekly	52
5	Ammonia (N)	grab	weekly	52
6	Nitrite (N)	grab	weekly	52
7	Nitrate (N)	grab	weekly	52
8	pH	grab	weekly	52
9	Temperature	grab	weekly	52
10	E. Coli	grab	monthly	12

## Waste Stabilization Pond Weekly Results Table VIII

WASTE POND EFFLUENT-2005										
DATE	CBOD <sub>5</sub>	TSS	T.P.	T.P.	Ammonia	Ammonia	TKN	Nitrite (N)	Nitrate (N)	E. Coli
C of A	30 mg/L	40 mg/L		1.0 mg/L	(May-Oct)14	Monthly	mg/L	mg/L	mg/L	200/100ml/mo
CBOD results <2 recorded as 1.0			weekly	Monthly Avg.	(Nov-Apr) 17	Average				
04-Jan	5.00	11.00	0.68		12.10		12.00	0.10	0.40	2800
10-Jan	5.00	13.00	0.52		12.70		14.00	0.10	0.50	
17-Jan	5.00	15.00	0.40		11.10		14.00	0.10	0.60	
24-Jan	5.00	8.00	0.31		9.40		10.00	0.10	1.60	
31-Jan	4.00	7.00	0.27		0.76		10.00	0.10	<0.1	
	4.80	10.80		0.44		11.33	12.00	0.10	0.78	2800
07-Feb	2.00	9.00	0.35		5.30		8.00	0.10	1.00	800
14-Feb	<2	15.00	0.26		6.80		8.00	0.10	1.50	
21-Feb	5.00	11.00	0.12		5.10		7.90	0.10	1.70	
28-Feb	8.00	20.00	0.32		8.40		10.00	0.10	1.30	
	5.00	13.75		0.26		6.40	8.48		1.38	
07-Mar	9.00	16.00	0.37		8.90		13.00	0.10	0.90	<100
14-Mar	8.00	19.00	0.71		9.40		14.00	0.10	0.70	
21-Mar	3.00	11.00	0.57		9.70		12.00	0.10	0.90	
28-Mar	8.00	17.00	0.63		10.60		13.00	0.10	0.90	
	7.00	15.75		0.57		9.65	13.00		0.85	
04-Apr	5.00	11.00	0.44		11.60		12.00	0.10	0.30	<100
11-Apr	5.00	4.00	0.76				15.00	0.10	0.10	
18-Apr	4.00	9.00	0.69				14.00	0.10	<0.1	
25-Apr	<2	7.00	0.80		14.40		17.00	0.10	<0.1	
	4.67	7.75		0.67		13.00	14.50		0.20	
02-May	2.00	2.00	0.74		13.30		14.00	0.10	<0.1	<100
09-May	2.00	10.00	0.55				15.00	0.10	<0.1	
16-May	2.00	2.00	0.40		14.70		15.00	0.10	0.10	
23-May	2.00	2.00	0.49		11.50		16.00	0.10	0.10	
30-May	2.00	10.00	0.40		13.70		15.00	<0.1	<0.1	
	2.00	5.20		0.52		13.30	15.00		0.10	
06-Jun	2.00	4.00	0.41		15.60		17.00	0.10	0.10	8
13-Jun	2.00	7.00	0.35		16.10		16.10	0.10	0.10	
20-Jun	4.00	2.00	0.29		12.00		16.00	0.40	0.10	
27-Jun	2.00	8.00	0.33		12.10		16.00	0.10	0.10	
	2.50	5.25		0.35		13.95	16.28		0.10	
04-Jul	7.00	15.00	0.42		12.20		16.00	0.10	0.10	200
11-Jul	2.00	6.00	0.35		15.10		15.00	0.10	0.10	
18-Jul	2.00	3.00	0.23		8.40		14.00	0.10	0.10	
25-Jul	4.00	11.00	0.22		7.10		10.00	0.50	0.10	
	3.75	8.75		0.31		10.70	13.75		0.10	
01-Aug	3.00	4.00	0.29		6.30		11.00	0.10	0.10	100
08-Aug	5.00	13.00	0.21		9.20		14.00	0.10	0.10	
15-Aug	6	12.00	0.41		10.10		15.00	0.10	0.10	
22-Aug	5.00	11.00	0.26		12.00		21.00	0.10	0.10	
29-Aug	2	22.00	0.11		10.00		14.00	0.10	0.10	
	4.20	12.40		0.29		9.40	15.00		0.10	
05-Sep	2.00	10.00	0.37		15.00		18.00	0.10	0.10	20
12-Sep	3	21.00	0.52		14.80		17.00	0.10	0.10	
19-Sep	2.00	7.00	0.47		11.80		15.00	0.60	0.10	
26-Sep	3.00	2.00	0.41		12.90		15.00	0.10	0.10	
	2.50	10.00		0.44		13.63	16.25		0.10	
03-Oct	2.00	4.00	0.36		12.40		16.00	0.1	0.1	2
10-Oct	4.00	2	0.31		13.80		15.00	0.10	0.10	
17-Oct	2.00	12.00	0.22		12.70		15.00	0.10	0.10	
24-Oct	3.00	4.00	0.32		6.00		8.00	0.10	0.40	
31-Oct	2	2.00	0.22		10.30		9.30	0.70	0.10	
	2.60	4.80		0.29		11.04	12.66		0.16	
07-Nov	11.00	14.00	0.21		11.10		10.10	0.10	0.40	100
14-Nov	3.00	14.00	0.17		11.50		11.00	0.10	0.40	
21-Nov	2	9.00	0.01		7.30		9.00	0.10	0.70	
28-Nov	2.00	10.00	0.01		8.40		9.00	0.10	0.80	
	4.50	11.75		0.10		11.04	9.78		0.58	
05-Dec	23.00	12.00	0.15		7.10		9.00	0.10	0.30	100
12-Dec	2.00	8.00	0.09		4.30		8.00	0.10	1.50	
19-Dec	2.00	5.00	0.09		8.70		9.00	0.10	1.10	
27-Dec	2.00	16.00	0.15	0.12	10.00	7.53	10.00	0.10	1.00	
	7.25	10.25					9.00		0.98	
Average	4.11	9.61	0.36	0.36	10.48		13.08	0.13	0.45	

## Wetland Final Effluent Weekly Results Table IX

WETLAND FINAL EFFLUENT										
DATE	CBOD <sub>5</sub>	TSS	TP	TP Month	Ammonia(N)	NH <sub>3</sub> Month	TKN	Nitrite	Nitrate	E. Coli
BOD <2mg/L recorded as 1.0				weekly	Average	Average		(N)	(N)	
03-Jan	2.00	6.00	0.55		12.20		12.00	<0.1	0.20	200
10-Jan	<2	6.00	0.44		13.40		14.00	<0.1	0.30	
17-Jan	2.00	7.00	0.23		12.40		14.00	<0.1	0.80	
24-Jan	<2	2.00	0.12		0.82		9.00	<0.1	1.40	
31-Jan	<2	3.00	0.08		0.52		8.00	<0.1	1.20	
	2.00	4.80		0.28		7.87	11.40	<0.1	0.78	
07-Feb	2.00	3.00	0.16		4.20		7.00	<0.1	1.50	<100
14-Feb	2.00	4.00	0.20		5.80		8.00	<0.1	1.90	
21-Feb	2.00	4.00	0.11		4.00		6.00	<0.1	2.50	
28-Feb	4.00	10.00	0.09		3.20		5.00	<0.1	2.70	
	2.50	5.25		0.14		4.30	6.50		2.15	
07-Mar	2.00	5.00	0.19		5.90		9.00	<0.1	1.80	<100
14-Mar	3.00	5.00	0.16		6.10		9.00	<0.1	0.60	
21-Mar	2.00	5.00	0.26		8.20		10.00	<0.1	1.00	
28-Mar	3.00	7.00	0.11		7.50		8.00	<0.1	0.70	
	2.50	5.50		0.18		6.93	9.00			
04-Apr	2.00	12.00	0.20		8.40		9.00	<0.1	0.20	<100
11-Apr	2.00	13.00	0.31				13.00	<0.1	0.10	
18-Apr	17.00	15.00	1.19				13.00	<0.1	0.10	
25-Apr	2.00	16.00	0.54		12.90		16.00	<0.1	0.10	
	5.75	14.00		0.56		10.65	12.75			
02-May	2.00	3.00	0.68		11.30		12.00	<0.1	0.10	<100
09-May	2.00	11.00	0.59				12.00	<0.1	0.10	
16-May	2.00	8.00	0.69		14.30		13.00	0.10	0.10	
23-May	8.00	2.00	0.46		13.00		16.00	0.10	0.10	
30-May	<2	6.00	0.57		11.60		14.00	0.10	0.10	
	3.50	6.00		0.60		12.55	13.40			
06-Jun	2.00	3.00	0.44		12.60		14.00	0.10	0.10	52
13-Jun	2.00	8.00	0.27		12.30		13.20	0.10	0.10	
20-Jun	3.00	6.00	0.35		7.50		11.00	0.10	0.10	
27-Jun	4.00	2.00	0.19		7.30		11.00	0.10	0.10	
		4.75		0.31		9.93	12.30			
04-Jul	3.00	9.00	0.19		7.00		10.00	0.10	0.10	100
11-Jul	2.00	3.00	0.17		8.50		10.00	0.20	0.10	
18-Jul	2.00	4.00	0.16		6.20		11.00	0.10	0.10	
25-Jul	2.00	6.00	0.17		6.00		11.00	0.10	0.10	
	2.25	5.50		0.17		6.93	10.50			
01-Aug	3.00	4.00	0.19		2.70		8.00	0.10	0.10	100
08-Aug	3.00	12.00	0.23		3.80		8.00	0.10	0.10	
15-Aug	3.00	7.00	0.23		4.20		8.00	0.10	0.10	
22-Aug	2.00	7.00	0.38		14.00		16.00	0.10	0.10	
29-Aug	4.00	14.00	0.10		10.70		13.00	0.10	0.10	
		8.80		0.23		7.08	10.60			
05-Sep	3.00	8.00	0.45		14.60		15.00	0.10	0.10	600
12-Sep	3.00	8.00	0.50		14.20		16.00	0.10	0.10	
19-Sep	2.00	6.00	0.51		12.40		13.00	0.10	0.10	
26-Sep	2.00	3.00	0.61		12.70		16.00	0.10	0.10	
				0.52		13.48	15.00			
03-Oct	2.00	2.00	0.49		15.10		15.00	0.10	0.10	82
10-Oct	2.00	5.00	0.40		13.30		14.00	0.10	0.10	
17-Oct	2.00	7.00	0.23		15.50		16.00	0.10	0.10	
24-Oct	2.00	5.00	0.17		6.20		8.00	0.10	0.10	
31-Oct	2.00	2.00	0.12		10.4		9.40	0.30	0.10	
		4.20		0.32		12.53	12.48			
07-Nov	2.00	11.00	0.11		10.20		10.00	0.10	0.20	100
14-Nov	4.00	10.00	0.13		7.90		9.00	0.10	0.20	
21-Nov	2.00	4.00	0.02		7.10		8.00	0.10	0.50	
28-Nov	2.00	6.00	0.10		6.80		7.00	0.10	0.70	
		7.75		0.09		8.00	8.50			
05-Dec	22.00	11.00	0.08		6.20		8.00	0.10	1.40	100
12-Dec	2.00	6.00	0.12		4.90		9.00	0.10	1.30	
19-Dec	2.00	2.00	0.09		6.50		6.00	0.10	1.50	
27-Dec	2.00	11.00	0.12		5.90		7.00	0.10	1.90	
		7.50		0.10		5.88	7.50			
Average	3.19	6.64	0.29	0.29						
CofA obj.	15.00	15.00	0.8		(May-Oct)14mg/l					200/100ml/mo
					(Nov-Apr)17mg/l					

## Waste Stabilization Pond Loading Table X

	Total	Average	Average	Loading	Average	Loading	Average	Loading	Average	Loading	Average	Loading
	Flow (m <sup>3</sup> )	Flow m <sup>3</sup> /day	CBOD mg/L	BOD kg/day	S.S. mg/L	S.S. kg/day	NH <sub>3</sub> mg/L	NH <sub>3</sub> kg/day	TKN mg/L	TKN kg/day	T.Phos mg/L	T.Phos kg/day
JAN	135,919	4,384	4.80	21.05	10.80	47.35	11.33	49.65	12.00	52.61	0.44	1.91
FEB	116,375	4,156	5.00	20.78	13.75	57.15	6.40	26.60	8.48	35.22	0.26	1.09
MAR	108,727	3,507	7.00	24.55	15.75	55.24	9.65	33.85	13.00	45.60	0.57	2.00
APR	123,600	4,120	4.67	19.23	7.75	31.93	13.00	53.56	14.50	59.74	0.67	2.77
MAY	107,899	3,481	2.00	6.96	5.20	18.10	13.30	46.29	15.00	52.21	0.52	1.80
JUN	92,457	2,982	2.50	7.46	5.25	15.66	13.95	41.61	16.28	48.54	0.35	1.03
JUL	96,755	3,121	3.75	11.70	8.75	27.31	10.70	33.40	13.75	42.92	0.31	0.95
AUG	78,674	2,538	4.20	10.66	12.40	31.47	9.40	23.86	15.00	38.07	0.29	0.74
SEP	85,449	2,756	2.50	6.89	10.00	27.56	13.63	37.56	16.25	44.79	0.44	1.22
OCT	145,412	4,691	2.60	12.20	4.80	22.52	11.04	51.79	12.66	59.38	0.29	1.34
NOV	143,914	4,642	4.50	20.89	11.75	54.55	11.04	51.25	9.78	45.38	0.10	0.46
DEC	153,616	4,955	7.25	35.93	10.25	50.79	0.00	0.00	9.00	44.60	0.00	0.00
Total Annual	1,388,797											
Avg. Annual	115,733	3,778	4.23	16.52	9.70	36.64	12.00	39.08	12.97	47.42	0.35	1.28
Min	78,674						8.57	35.82				
Max	153,616											
CofA Limit		4,600	30.00	138.00	40.00	184.00	May-Oct. 14.0 <sup>1</sup> Nov.-Apr. 17.0 <sup>2</sup>	May-Oct. 64.4 <sup>1</sup> Nov.-Apr. 78.2 <sup>2</sup>			1.00	4.60

### Preformance Table XI

Month	Flows			CBOD5				lag2	Suspended Solids			
	Total Flow m <sup>3</sup>	Average Day m <sup>3</sup> /D	Maximum Day m <sup>3</sup> /D	Raw Sewage (mg/L)	Lagoon #1 (mg/L)	Lagoon #2 (mg/L)	Wetland Effluent (mg/L)	C of A Limits	Raw Sewage (mg/L)	Lagoon #1 (mg/L)	Lagoon #2 (mg/L)	Wetland Effluent (mg/L)
Jan.	135,919	4,384	6,890	42.00	19.00	4.80	2.00	30.0	150.00	36.00	10.80	4.80
Feb.	116,375	4,156	7,692	63.00	12.00	5.00	2.50	30.0	56.00	32.00	13.75	5.25
Mar.	108,727	3,507	5,638	96.00	18.00	7.00	2.50	30.0	208.00	42.00	15.75	5.50
Apr.	123,600	4,120	5,681	36.00	21.00	4.67	5.75	30.0	86.00	52.00	7.75	14.00
May	107,899	3,481	3,481	24.00	14.00	2.00	3.50	30.0	74.00	30.00	5.20	6.00
June	92,457	2,982	3,779	48.00	30.00	2.50	0.00	30.0	36.00	84.00	5.25	4.75
July	96,755	3,121	4,368	84.00	4.00	3.75	2.25	30.0	60.00	486.00	8.75	5.50
Aug.	78,674	2,538	3,237	78.00	8.00	4.20	0.00	30.0	109.00	29.00	12.40	8.80
Sept.	85,449	2,756	2,756	75.00	20.00	2.50	0.00	30.0	150.00	152.00	10.00	0.00
Oct.	145,412	4,691	4,691	48.00	8.00	2.60	0.00	30.0	135.00	92.00	4.80	4.20
Nov.	143,914	4,642	4,642	42.00	2.00	4.50	0.00	30.0	160.00	9.00	11.75	7.75
Dec.	153,616	4,955	4,955	36.00	6.00	7.25	0.00	30.0	80.00	40.00	10.25	7.50
Total	1,388,797	45,335					3.19					6.64
Average	115,733	3,778		56.00	13.50	4.23	1.67		108.67	90.33	9.70	6.21
C. of A. Limit/Obj. % Efficient		4,600				30.0	15.0				40.0	15.0
					75.9%	92.4%	97.0%			16.9%	91.1%	94.3%
			*Lag2 =lagoon 2			*Wet=Wetland						

Month	lag2	Total Phosphorous				lag2	Nitrogen (TKN)				lag2	Ammonia				Temp
	C of A Limits	Raw Sewage (mg/L)	Lagoon #1 (mg/L)	Lagoon #2 (mg/L)	Wetland Effluent (mg/L)	C of A Limits	Raw Sewage (mg/L)	Lagoon #1 (mg/L)	Lagoon #2 (mg/L)	Wetland Effluent (mg/L)	C of A Limits	Raw Sewage (mg/L)	Lagoon #1 (mg/L)	Lagoon #2 (mg/L)	Wetland Effluent (mg/L)	
Jan.	40.0	2.80	1.86	0.44	0.28	1.0	20.00	12.00	12.00	11.40	17.0	14.00	9.40	11.33	7.87	4.06
Feb.	40.0	2.40	1.22	0.26	0.14	1.0	20.00	9.00	8.48	5.25	17.0	19.90	7.60	6.40	4.30	3.73
Mar.	40.0	5.40	1.98	0.57	0.18	1.0	50.00	17.00	13.00	9.00	17.0	43.00	16.60	9.65	6.93	5.68
Apr.	40.0	2.10	1.80	0.67	14.00	1.0	19.00	14.00	14.50	14.00	17.0	15.10	13.00	13.00	10.65	12.93
May	40.0	2.40	1.79	0.52	6.00	1.0	21.00	14.00	15.00	13.40	14.0	22.00	12.70	13.30	12.55	16.60
June	40.0	3.87	3.10	0.35	4.75	1.0	30.00	20.00	16.28	12.30	14.0	24.00	19.60	13.95	9.93	22.05
July	40.0	2.90	3.60	0.31	5.50	1.0	30.00	20.00	13.75	9.00	14.0	20.40	18.20	10.70	6.93	24.60
Aug.	40.0	5.69	2.50	0.29	8.80	1.0	51.00	20.00	15.00	10.50	14.0	38.00	13.20	9.40	7.08	23.76
Sept.	40.0	2.00	1.61	0.44	0.00	1.0	30.00	19.00	16.25	15.00	14.0	11.00	15.40	13.63	13.48	18.00
Oct.	40.0	4.00	2.50	0.29	4.20	1.0	30.00	18.00	12.66	12.48	14.0	24.40	12.90	11.04	12.53	11.62
Nov.	40.0	4.30	0.08	0.10	7.75	1.0	30.00	9.20	9.78	8.50	17.0	25.90	9.80	11.04	8.00	7.85
Dec.	40.0	2.70	1.19	0.00	7.50	1.0	20.00	8.00	9.00	7.50	17.0	19.10	6.40	0.00	5.88	0.00
		3.38	1.94	0.35	4.93		29.25	15.02	12.97	10.69		23.07	12.90	10.29	8.84	
				1.00	0.80								14.0 (S) 17.0 (W)	10.0 (S) 15.0 (W)		
			42.7%	89.6%	-45.7%			48.7%	55.6%	63.4%			44.1%			61.7%
														13.96	13.48 max	
														0.00	4.30 min	

**Certificate of Approval 4.(a)** Annual calibration of flow measuring devices was performed on October 18<sup>th</sup>, 2006.

**Certificate of Approval 4.(b)(c)(d)** – Table VII demonstrates compliance with frequency of sampling of raw sewage, waste stabilization pond effluent and wetland effluent.

#### 4.3 **Operation and Maintenance**

**Certificate of Approval (5).(c)** stipulates that the Owner shall endeavour to operate the sewage treatment works such that the effluent will not contain any oil or other substance in amounts sufficient to create a visible film or sheen on the surface of the receiving waters and shall be essentially free of any floating material.

Occasional foaming was present where wastewater cascades over weirs or from outfalls; this appears to occur on a seasonal basis.

**Certificate of Approval 6.(a)** refers to proper maintenance of related equipment and appurtenances to operate sewage works, including funding for operator training.

In September of this year we replaced the stand-by Generator at the Harbour Street Pumping Station.

An Operations and Maintenance Manual is in place at the Sewage Works. Continuing education for operators is promoted by the municipality for wastewater treatment and collection as well as health, safety, and technical related courses.

**Certificate of Approval 7.(c)** Flows through the Brighton Wastewater Treatment lagoons and wetlands are continuous.

**Certificate of Approval 7.(d)(i) Summary of all monitoring data including an overview of the sewage treatment program.**

*See Table XI* for – Sewage Treatment Plant Performance - demonstrates efficiency of each stage of the Brighton WPCP treatment system.

**Certificate of Approval 7.(d)(ii) Interpretation of all monitoring and analytical data and comparison to the final effluent quality and quantity.**

*Table XI* Brighton WPCP Performance Summary detail results and efficiency of the sewage treatment performance demonstrating pollutant removal rates from raw sewage concentrations through to final effluent for CBOD<sub>5</sub>, Suspended Solids, Total Phosphorus, TKN and Ammonia.

**Table XI** demonstrates the success of Brighton's WPCP natural treatment process, which includes:

- 97.0% CBOD<sub>5</sub> removal
- 94.3% removal of Suspended Solids
- 90.9% removal of Phosphorus
- 63.4% removal of Nitrogen
- 61.7% removal of Ammonia.

**Certificate of Approval 7.(d)(iii) Summary of any final effluent quality assurance or control measures undertaken during the reporting period.**

**Certificate of Approval 7.(d)(iv) Summary of maintenance carried out on major structure, equipment, apparatus, mechanism forming part of the works.**

- In the spring there was a new pump installed for the Chemical feed to control the amount of Alum supplied. This is a coagulating chemical used in the process of lagoons.
- New plumbing was also carried out at the same time, as well an inline filter was installed.
- This year for the first time we did our own Hydra-seeding in the wetland to help with the reseedling of cattails and bulrushes.

**Certificate of Approval 7.(d)(v) Summary of any environmental or operating problems encountered and mitigative measures taken.**

- Although there are no combined sanitary and storm sewers in Brighton, the collection system is susceptible to higher flows with heavy precipitation events. Investigation of potential incorrect sump pump connections in the community was commenced in 2006 to ensure that the discharge from sump pumps are not connected to the sanitary sewer system.
- Muskrat damage to the constructed wetlands have reduced plant growth in the vegetated zones. Seasonal trapping is being conducted to control muskrat population. This will become a yearly on going situation due to the natural conditions for muskrats.

**Certificate of Approval 7.(d)(vi) Summary of alterations, extensions or replacements in the process or operation of the works which are considered for implementation over the next reporting period.**

**Certificate of Approval 7.(d)(iv) Summary of calibration and maintenance procedures conducted on all monitoring equipment.**

Milltronics performed annual calibration of flow meters at the Brighton WPCP on October 18<sup>th</sup>, 2006

#### 4.4 **Reporting – Non-Compliance**

**Certificate of Approval 7.(b)** There was no non-compliance issues in this reporting period.



## **5.0 CONCLUSION**

The Brighton WasteWater Pollution Control Plant has been successful in treating the wastewater utilizing the lagoons and wetlands through natural treatment processes. The final quality of the effluent may be influenced by a majority of environmental factors such as climate or wildlife. Enhanced performance is exhibited during warmer months when nutrients are absorbed from the growth of vegetation and bacteria are most active. Wastewater effluent from the wastewater pollution control plant (WPCP) is tested at Caduceon Environmental Labs, a certified lab, on a weekly basis as per Certificate of Approval. In 2006 the contaminant concentration in the effluent from the lagoon system was consistently below the compliance limits stipulated under the terms and conditions of the Certificate of Approval, in addition the majority of the effluent quality objectives for the wetland were achieved. Brighton is dedicated to achieving continuous improvement of its wastewater treatment system and being environmentally responsible to the quality of its receiving waters.