2024 Year End Report: Bracebridge Lagoon Lane WWTP



Environmental Compliance Approval: # 3237-BDGQDG

Engineering and Public Works Department

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Introduction

The Bracebridge Lagoon Lane Wastewater Treatment Plant (WWTP), which services the Town of Bracebridge, is owned and operated by the District Municipality of Muskoka. The plant is located at 1000 Lagoon Lane and was commissioned in 2011. It services a population of approximately 8,600 people.

The treatment facility consists of 60 acres of facultative lagoons and a membrane bioreactor (MBR) treatment plant. The first two lagoons were constructed in 1959.They were 23 acres in size. By 1976, additional capacity was required to meet the needs of the town. At that time, an additional 37 acres of lagoon were constructed, bringing the total to 60 acres.

In 1983, an extended aeration treatment plant was commissioned to provide additional capacity for the growing population and in 2011, that plant was decommissioned, and a new membrane bioreactor (MBR) plant was constructed within the same 60 acres.

In February of 2022, the construction and commissioning of a new wastewater receiving facility, referred to as the 'Headworks' was completed. All sanitary wastewater from the Town's collection system is received at this facility, where it is screened via 3mm step screens. The material removed with the step screens is washed to remove many organics and compressed to remove excess water which is then discharged into the endless bag system. The mostly dried, bagged material is disposed of into an onsite refuse bin. The screened wastewater flows through the grit vortex separating heavier inorganic material to settle out, be collected and pumped as a slurry to the grith classifiers and hydro-cyclones. The mostly dried grits are discharged to the endless bag system and disposed of in the onsite refuse bin. The refuse bin is emptied, and material is hauled off site weekly by local solid waste contractor. The raw sewage with larger solids removed, is then pumped to the membrane bioreactor (MBR) plant for secondary treatment. Aluminum is used as a precipitant to aid in the removal of phosphorous and disinfection is by ultra-violet lights. The only other chemical added to the wastewater treatment process is soda ash, for alkalinity. The final effluent is discharged into the Muskoka River by way of a diffused outfall.

The MBR plant operates under the MECP Environmental Compliance Approval (ECA Sewage) # 3237-BDGQDG, issued July 2019. Under the terms of the ECA, the plant is permitted to treat an average daily flow of 8,000m^3/day, with a peak flow rating of 18,000m^3/day. Effluent limit criteria are as follows:

Table 1 Effluent Limit Criteria

Effluent Parameter	Concentration
CBOD	10 mg/L
Total Suspended Solids	10 mg/L
Total Phosphorous	0.4 mg/L
Total Ammonia Nitrogen Summer (May 15 to September 30)	5.0 mg/L
Total Ammonia Nitrogen Winter (October 01 to May 14)	10.0 mg/L
E. coli	80 counts/100 ml (Monthly geometric Mean Density)
pH	6.0 – 9.5 inclusive

MBRs rely upon membrane equipment for liquids/solids separation prior to discharge of the effluent. The membrane equipment installed at the Lagoon Lane WWTP is an immersed system, i.e. a system that is designed for installation within membrane tanks, which utilizes hollow fiber membranes.
Waste sludge from the MBR process is sent to one of the three primary facultative lagoons.

General Information

A review of the District of Muskoka's infrastructure needs is conducted annually by the Director of Water and Sewer Services, Area Manager and Chief Operator, and recommendations for maintenance, rehabilitation and renewal programs are considered.
Efforts to eliminate the discharge of untreated or partially treated wastewater to receiving waters are being accomplished by a long-term financial commitment to correct excessive infiltration into the wastewater collection system by means of sewer main rehabilitation / replacement, manhole rehabilitation and pumping station rehabilitation programs.
The treatment facility is capable of effective operation during emergencies, maintenance shutdowns, and power failures. This is achieved through such measures as preventive maintenance of duty / standby units, the duplication of major treatment components, the provision of standby power sources and extensive use of the SCADA systems. All pumping stations and treatment control systems use SCADA (Supervisor Control and Data Acquisition), in combination with Data Highway Plus, and programmable logic controllers.
All operators are qualified to operate the systems efficiently and effectively to achieve the highest level of treatment at all times. A commitment to provide Operator training and certification is being sustained.
Regulatory sampling is carried out to meet the requirements outlined in the ECA, and additional in-house operational sampling beyond these regulatory requirements is being performed on a routine basis. These efforts have resulted in an effective treatment process which ensures that effluent discharges consistently meet effluent objectives and are environmentally safe. All final effluent sample results for the MBR facilities met their effluent limits.
All data in this report is a compilation of test results received from SGS Canada and their accredited laboratory, Lakefield Research. All in-plant sampling, analysis and recording of results conforms, in order of precedence, to the following 3 standards: Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works", Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" and the American Water Works Association/Water Environment Federation (AWWA/WEF) publication "Standard Methods for the Examination of Water and Wastewater".

Executive Summary

In all respects, test results of the treated effluent for the parameters of CBOD5, suspended solids, ammonia, total phosphorous, and E. Coli are in compliance with the limits outlined in the Certificate of Approval regarding monthly allowable concentrations and total effluent loading throughout the entire year.
Overall, the plant treatment processes performed satisfactorily and are deemed to be adequate. All sample test results of the final effluent were within levels outlined in the plant ECA (#3237-BDGQDG).

Quantity of Flow Summary

In 2024, the Bracebridge (Lagoon Lane) CWP was operated to treat a combined annual average daily flow of 4163m3/day, equating to 52% of the plant rated capacity (8000m3/d). A peak day flow of 9797m3 occurred in December 2024, equating to 54% of the peak design flow capacity (18000m3).

In 2024, the CWP reportedly received a total of 6408 m3 of hauled septage. In 2024 no Landfill Leachate was hauled to the CWP Septage Lagoons from Rosewarne Landfill. An annual total volume of 17457.82 m3 of septage supernatant was reportedly transferred from the Septage Lagoons to the CWP, with the highest maximum day rate of that septage supernatant transfer noted as being 177.69m3/day in July 2024 - within the 180m3/d capacity specified by the ECA. None of the individual system components exceeded the design flow rating.

Plant Operational Upsets or Process Failures:

Exceedance Notification# 1-949UZC was issued 07-19-2024 regarding a final effluent pH level objective of 6.50 not being met. The final effluent pH level dropped when permeate valve (MV531) failed to fully close during a routine citric acid membrane cleaning procedure causing the system to siphon low pH water into the final effluent (permeate) tank. Ministry of the Environment Conservation and Parks (MECP) determined this incident to be an objective exceedance only. The valve, actuator, and limit switch were replaced on this train following the occurrence.

Summary of Maintenance

PEAK Engineering Rebuilt both grit classifiers in the Headworks building January 16-18, 2024.
Operations removed Membrane Train 2/cassette 3 with KRS Crane and repaired damaged portion of module June 26,2024.
Operations installed new valve, actuator and limit switch for Train 3 permeate valve MV531 July 25, 2024.
Bishop Water Technologies was reported to have transferred 14,631.308 m3 of sludge from Facultative Cell 3 to Facultative Cells 1 & 2 between May 21 and June 1, 2024.
Aquasurvey was onsite August 14, 2024, to conduct a sludge survey for Facultative Lagoon Cells 2 and 3.
Bartels Environmental Services was onsite at Bracebridge Septage Lagoon Cell #1 from August 26 through September 5 for (NASM) sludge removal for land application and was reported to have removed 616 m3 of sludge from Septage Cell #1 offsite for this purpose.
PEAK Engineering and Huber Technology was onsite October 8 & 9 for attempted Rehab of Fine Screens 1 & 2. It was determined that a complete rehabilitation of the screens is required.
All equipment information at this plant is entered into a computer database. From this information, a scheduled preventive maintenance program has been established. The maintenance program includes (and not limited to):

- Monthly testing (under load) of the standby generators.
- Annual servicing of emergency standby generators.
- Annual replacement of U.V. bulbs.
- Annual calibration of flow metering devices.
- Annual cleaning of all sewage pumping stations.

- Marine inspection of effluent outfall and diffuser completed in 2022. (5-year cycle)

Evaluation of the Need for Improvement Works

The treatment facility is operating at a plant capacity of 52.0% and is in compliance with specified effluent parameter criteria.

Interpretation of Analytical Results

All sample results for Raw Sewage and Final Effluent are reported in this section. Other tables in this report include Chemical Usage, Biosolids Quality, and Biosolids Quantity.

Raw Sewage

The information reported in the Raw Sewage sample results summary table consists of test results of analysis conducted on composite samples of the plant influent flow as required by the plant ECA. Samples are sent for analysis to Lakefield Research, as well as analysis conducted on site using Standard Methods or equivalent. Weekly analysis has been performed and reported as specified under the terms outline in the ECA.

Influent Analysis

Table 2 Influent Analysis

Influent Parameter	Minimum	4 Week Average Maximum	Annual Average	Average loading kg/day
BOD5 (mg/L)	78	729.3	30.9	406.8
Suspended Solids (mg/L)	68	859.3	443.1	602.2
Total Phosphorus (mg/L)	1.4	8.1	4.9	6.4
TKN (mg/L)	11.6	62.6	39.1	52.4
pH	6.47	7.25	7.12	N/A

Effluent Analysis

The information reported in the Final Effluent sample results summary tables 14-19 consist of test results of analysis conducted on final effluent composite samples. Bacteriological samples, however, consisted of grab samples. Weekly analysis has been performed and reported as specified under the terms outlined in the ECA.

Effluent Objective Analysis

The effluent objectives were met during all sample periods aside from the short-lived low pH exceedance described above.

Final Effluent Analysis Summary

All final effluent samples tested for CBOD5, suspended solids, ammonia, E. Coli, and total phosphorous were below non-compliance limits outlined in the ECA.

Table 3 Final Effluent Analysis Summary

Parameter	Minimum	4 Week Average Maximum	Annual Average	Average Loading kg/day
CBOD5 (mg/L)	2.00	2.50	2.04	3.92
Suspended Solids (mg/L)	2.00	2.50	2.08	4.09
Total Phosphorus (mg/L)	0.03	0.07	0.03	0.07
Ammonia (mg/L)	0.10	4.68	1.02	2.38
E. Coli (#/100 mL)	0	0.50	0.06	N/A
pH	6.84	7.79	7.57	N/A

Final Effluent Sampling Summary

Average daily flow comparisons by day of week ensure ECA requirements for scheduled sampling are taken at a time, and in a location characteristic of the quality and quantity of the sewage stream over the time period being monitored. Average daily flow rates by day of the week compare the flow to the average daily flow for the entire year. This data is used to determine if a particular day of the week is best to ensure samples are taken to meet the requirements of scheduled monitoring sections of the ECA's. Sampling plans are reviewed and updated yearly based on the previous yearly flow data.

Biosolids Generation

The quality and volume of biosolids both generated and hauled from the facility for disposal is outlined in the table provided. Waste activated sludge is pumped from the Bracebridge CWP to the Lagoon Cell #3. The lagoon provides storage and stabilization for the waste activated sludge.

For the reporting period, stabilized biosolids in Lagoon Cell #3 were equalized between Cell #1 and Cell #2, work was performed by Bishop Water Technologies.

Co-Treatment Flow Summary

The treatment plant has the capability to co-treat additional wastes through the Septage Receiving Facility, which located on site at the Septage Lagoons. Septage and holding tank waste are hauled in by vacuum trucks, and dumped into the receiving cell, which is then blended into the plant influent flow. In addition, leachate from the district owned Rosewarne Landfill is transported to a site within the collection system, blended with wastewater within the system, and then received at the headworks of the MBR facility.
The plant ECA (Sewage) # 3237-BDGQDG, states that the average quantity of partially treated septage lagoon effluent shall not exceed an annual daily average of 180 m^3. The highest monthly average for partially treated septage lagoon effluent was 78.3 m^3 in the month of June with no issue observed by this volume.

During the reporting period 7319 m^3 of hauled septage was received at Lagoon Lane septage lagoon and an additional 38,082 m^3 of Rosewarne Landfill leachate was hauled directly to site

for treatment. In addition, wastewater from the treatment lagoons 1 through 4 was transferred to the MBR plant. All septage, leachate and wastewater disposed of into the Lagoon Lane receival site, was processed through the lagoon system and the supernatant from septage lagoon cel l#3 was pumped to the MBR plant. Septage cell #3 transfers are summarized in the following table:

Table 4 Septage Cell 3 Transfer Summary

Month	Minimum Daily Flow (m3)	Maximum Daily Flow (m3)	Total Monthly Flow (m3)
January	33.13	69.13	1235.74
February	11.52	46.09	973.03
March	11.05	23.05	399.51
April	11.52	118.59	1798.35
May	23.04	115.23	1862.92
June	43.12	155.17	2348.12
July	0.00	177.69	2067.74
August	23.04	161.28	2098.15
September	2.88	115.22	810.52
October	2.88	115.23	899.11
November	0.00	115.23	1636.09
December	0.00	115.23	1328.54

Summary of Complaints received throughout the reporting period.

There are no noted complaints for 2024

Bracebridge Wastewater Collection Summary 2024

New Sewer Services:
A total of 19 customers connected to existing sewer laterals in 2024.

New Sewer Mains:
No new sewer mains were installed in Bracebridge in 2024.

Sewer Main Replacements:
Approx 120 meters of sewer main was replaced in 2024.

Low Pressure Sewer Breaks:
There were no low-pressure sewer breaks in 2024.

Sewer Force Main Breaks:
There were no sewer force main breaks in 2024.

Sewer Force Main Replacement:
There were no Sewer Force Main replacements in 2024.

Main Line Sewer Blockage:
There was one main line sewer blockages in 2024 at a cost of approx. $10,000.00 to repair.

Sewer Lateral Blockage:
There were 5 sewer lateral blockages on the municipal side in 2024. The approximate cost was $13,000.00 to repair.

Low Pressure Sewer Blockages:
There were no low-pressure sewer blockages in 2024.

Frozen Sewer Force Mains:
There were no frozen sewers Mains in 2024.

Frozen Sewer Service Laterals:
No sewer service laterals froze in 2024.

Frozen Low Pressure Sewer Services:
No low-pressure sewer services froze in 2024.

Sewer Flushing/Video:
There was no sewer flushing program or video inspections done in Bracebridge in 2024. We did have the high maintenance areas flushed by Braywood 4 times in 2024 at an approx. cost of $12000.00.

Sewer Locates:
District staff assisted by sub-contractors addressed 1283 1080 locate requests in 2024.

Air Release Valves:

All fifteen air/vacuum release valves connected to the sewage force mains in our collection system had a maintenance inspection 2024.

Sewer Rehabilitation:

There was no maintenance hole rehab in Bracebridge in 2024.

Table 5 Effluent Flow Summary

Month	Plant Total Monthly (m^3)	Average Day Flow (m^3/d)	Maximum Day Flow (m^3/d)	Minimum Day Flow (m^3/d)	Lagoons Monthly Flow (m^3)	Facility Total Monthly Flow (m^3)
January	124,279	4,009	5,288	2,679	13303	137,582
February	115,343	3,977	5,489	2,767	12196	127,539
March	167,443	5,401	7,716	4,148	23404	190,847
April	185,481	6,183	8,033	4,316	19596	205,078
May	168,797	5,445	7,462	3,936	19452	188,249
June	115,686	3,856	6,783	2,817	1230	116,916
July	107,151	3,456	4,334	2,971	0	107,151
August	125,317	4,042	5,401	2,940	28072	153,389
September	101,681	3,389	5,081	2,589	15994	117,675
October	83,242	2,685	2,933	2,476	0	83,242
November	81,695	2,723	3,281	2,439	0	81,695
December	143,256	4,621	9,797	2,810	42563	185,819

Total Flow: 1,519,372m^3
Average Day: 4,163m^3
Maximum Day: 9,797m^3
Minimum Day: 2,439m3

Table 6 Influent Quarterly Analysis Summary – Weekly 24-Hour Composite Sample Part 1

Sample Date	Sample Identification Number	BOD5 mg/L	Alkalinity (Total as CaCO3) mg/L	pH	Total Phosphorus mg/L	Suspended Solids mg/L
Feb 06/24	CA13267	173	300	7.65	4.8	267
May 07/24	CA13487	112	235	7.33	1.77	213
Aug 13/24	CA13700	212	213	6.97	3.5	238
Nov 19/24	CA13834	185	347	7.46	3.34	71
Yearly Average		170.5	273.8	7.4	3.4	197.3
Maximum		212.0	347.0	7.7	4.8	267.0
Minimum		112.0	213.0	7.0	1.8	71.0

Table 7 Influent Quarterly Analysis Summary – Weekly 24-Hour Composite Sample Part 2

Sample Date	Sample Identification Number	Total Kjeldahl Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Total Ammonia Nitrogen mg/L
Feb 06/24	CA13267	47.8	<0.06	<0.03	35.2
May 07/24	CA13487	23.4	<0.06	<0.03	17.9
Aug 13/24	CA13700	36	<0.06	<0.03	27.5
Nov 19/24	CA13834	52.0	<0.06	<0.03	46.1
Yearly Average		39.8	273.8	0.04	31.7
Maximum		52.0	0.0	0.05	46.1
Minimum		23.4	0.0	0.03	17.9

Table 8 Chemical Usage Summary: Alum

Month	Average Dosage mg/L	Total Liters
January	49.8	9,826.9
February	51.2	9,602.7
March	49.3	13,404.7
April	43.7	12,961.4
May	32.1	8,761.8
June	35.3	6,771.9
July	36.9	6,614.7
August	36.7	7,385.4
September	34.6	5,706.9
October	32.9	4,535.4
November	33.0	4,446.5
December	29.9	6,857.8

Total Yearly Volume: 96,876 L

Table 9 Chemical Usage Summary: Soda Ash

Month	Average Dosage mg/L	Total kg (dry)
January	4.4	583.3
February	4.4	583.3
March	4.4	583.3
April	4.4	583.3
May	4.4	583.3
June	4.4	583.3
July	4.4	583.3
August	4.4	583.3
September	4.4	583.3
October	4.4	583.3
November	4.4	583.3
December	4.4	583.3

Total Yearly Kilograms: 44,436 kg

Table 10 Effluent Quarterly Analysis Summary – Weekly 24-Hour Composite Sample Part 1

Sample Date	Sample Identification Number	CBOD5 mg/L	pH	Total Phosphorus mg/L	Suspended Solids mg/L
Feb 06/24	CA13267	2	7.55	0.05	2
May 07/24	CA13487	2	7.79	<0.03	2
Aug 13/24	CA13700	2	7.53	<0.03	2
Nov 19/24	CA13267	2	7.56	<0.03	2
Yearly Average		2	7.61	0.1	2
Maximum		2	7.79	0.1	2
Minimum		2	7.53	0.1	2

Table 11 Effluent Quarterly Analysis Summary – Weekly 24-Hour Composite Sample Part 2

Sample Date	Sample Identification Number	Total Kjeldahl Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Total Ammonia Nitrogen mg/L
Feb 06/24	CA13267	3.9	1.84	0.03	1.9
May 07/24	CA13487	1.1	6.69	<0.03	0.4
Aug 13/24	CA13700	0.6	1.92	<0.03	<0.1
Nov 19/24	CA13267	1.7	2.5	<0.03	0.8
Yearly Average		1.8	3.2	0.06	1
Maximum		3.9	6.7	0.06	1.9
Minimum		0.6	1.8	0.06	0.1

Table 12 Effluent Loading and Concentration Summary: COBD5

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
January	2.00	8.02	7.55
February	2.00	7.95	8.54
March	2.00	10.80	10.88
April	2.00	12.37	11.18
May	2.00	10.89	11.58
June	2.00	7.71	9.18
July	2.00	6.91	10.84
August	2.00	8.08	8.16
September	2.00	6.78	6.17
October	2.00	5.37	6.05
November	2.00	5.45	5.30
December	2.00	9.24	13.57
Average Monthly	2.10	8.30	11.93
Effluent Objective	5.00	N/A	
Non-Compliance	10.00	N/A	

Table 13 Effluent Loading and Concentration Summary: Suspended Solids

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
January	2.20	6.47	11.63
February	2.00	6.24	10.98
March	2.25	7.50	17.36
April	2.40	8.42	19.28
May	2.00	10.96	14.92
June	2.00	14.10	13.57
July	2.00	11.94	8.67
August	2.00	8.33	10.80
September	2.00	8.19	10.16
October	2.00	5.15	5.87
November	2.00	4.98	6.56
December	2.00	6.53	19.59
Average Monthly	2.07	8.68	12.45
Effluent Objective	5.00	N/A	
Non-Compliance	10.00	N/A	

Table 14 Effluent Loading and Concentration Summary: Total Ammonia Nitrogen Summer

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
May	0.28	1.50	2.05
June	0.45	1.74	3.05
July	0.22	0.76	0.95
August	0.18	0.71	0.95
September	0.10	0.34	0.51
October	0.14	0.38	0.41
Average Monthly	0.23		
Effluent Objective	2.0	N/A	N/A
Non-Compliance	5.0	N/A	N/A

Table 15 Effluent Loading and Concentration Summary: Total Ammonia Nitrogen Winter

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
January	2.04	8.18	10.79
February	0.70	2.78	3.84
March	2.03	10.96	15.66
April	0.84	5.19	6.75
November	0.75	2.04	2.46
December	4.10	18.95	40.17
Average Monthly	1.74	8.02	13.28
Effluent Objective	2.0	N/A	N/A
Non-Compliance	10.0	N/A	N/A

Table 16 Effluent Loading and Concentration Summary: Fecal Coliform

Month	Geomean (#/100mL)	Maximum Daily (#/100mL)
January	0.00	0.00
February	0.00	0.00
March	0.00	0.00
April	0.00	0.00
May	0.25	1.87
June	0.25	1.70
July	0.00	0.00
August	0.00	0.00
September	0.00	0.00
October	0.00	0.00
November	0.00	0.00
December	0.20	1.96
Average Monthly	0.06	0.5
Effluent Objective	<2.0	
Non-Compliance	80.00	

Table 17 Effluent Loading and Concentration Summary: Total Phosphorus

Month	Average mg/L	Average kg/day	Maximum Daily kg/day
January	0.03	0.12	0.16
February	0.04	0.16	0.22
March	0.03	0.16	0.23
April	0.03	0.19	0.24
May	0.06	0.33	0.45
June	0.04	0.15	0.27
July	0.03	0.10	0.13
August	0.03	0.12	0.16
September	0.03	0.10	0.15
October	0.03	0.08	0.09
November	0.03	0.08	0.10
December	0.03	0.14	0.29
Average Monthly	0.03	0.14	0.21
Effluent Objective	0.30	N/A	N/A
Non-Compliance	0.40	N/A	N/A

Table 18 Liquid Sludge Production Summary

Month	Hauler	Shipped to: Location	Volume m^3
January	Pumped	Lagoon Cell #3	3835.6
February	Pumped	Lagoon Cell #3	4102.4
March	Pumped	Lagoon Cell #3	4667.3
April	Pumped	Lagoon Cell #3	2840.9
May	Pumped	Lagoon Cell #3	4359.1
June	Pumped	Lagoon Cell #3	4318.2
July	Pumped	Lagoon Cell #3	4078.9
August	Pumped	Lagoon Cell #3	3639.7
September	Pumped	Lagoon Cell #3	3226.3
October	Pumped	Lagoon Cell #3	4332.4
November	Pumped	Lagoon Cell #3	3808.8
December	Pumped	Lagoon Cell #3	2912.5

Yearly Total Volume m^3: 46,122 m^3

Table 19 Sludge Quality Analysis

Parameter Sampled (mg/L)	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Date	Feb 06/24 09:20	May 07/24	Aug 13/24 09:00	Nov 19/24 08:30
Nitrate	<3	<3	<3	<3
Mercury	0.003	0.002	0.001	0.001
Chromium	0.12	0.12	0.08	0.07
Cobalt	0.02	0.02	0.01	<0.01
Copper	2.7	1.9	1.8	1.8
Lead	0.7	1.6	0.7	0.2
Molybdenum	<0.05	<0.05	<0.05	<0.05
Nickel	0.1	0.18	0.07	0.06
Selenium	<0.1	<0.1	<0.1	<0.1
Arsenic	<0.1	<0.1	<0.1	<0.1
Zinc	2	2	2	1
Cadmium	<0.005	<0.005	<0.005	<0.005
Ammonia+ Ammonium	4.7	9.8	5.4	4.4
Total Kjeldahl Nitrogen	363	512	360	344
Total Phosphorus	200	160	140	140
Total Solids	7360	8370	6610	5460
Volatile Solids	6330	8330	5220	4530
Nitrite	<3	<3	<3	<3
Potassium	57	41	40	47
Total Suspended Solids	6610	7670	5580	5090

Bracebridge Certification of Reports

I certify that the information in this document and all attachments are correct, accurate, and complete to the best of my knowledge.

Michael Curie
Director, Water and Wastewater Services

Jamey Adams
Manager, Water and Wastewater Operations

Glenn Gardiner
Manager, Water and Wastewater Operations