

Indian Road (Bala) Water Pollution Control Plant



2018

Wastewater, Year End Report

Environmental Compliance Approval: #5049-B55KXT

Introduction

The Indian Road (WPCP), which services the Town of Bala, is owned and operated by the District Municipality of Muskoka. The plant is located at 1007 Tower Road, and was commissioned in 1996. It currently services 358 customer accounts.

The Plant operates under the MOE Environmental Compliance Approval (Sewage) # 5049-B55KXT, issued October 31 2018. Under the terms of the Certificate of Approval, the plant is permitted to treat an average daily flow of 550m³/day, and a peak flow of 2,036m³/day. Additionally, effluent limit criteria are as follows:

Effluent Parameter	Concentration	Total Effluent Loading
CBOD5	15 mg/l	8.25 kg/day
Suspended Solids	15 mg/l	8.25 kg/day
Ammonia/Ammonia Nitrogen	5.0 mg/l (May-October)	2.75 kg/day
	10.0 mg/l (November-April)	5.50 kg/day
Total Phosphorous	0.30 mg/l	0.165 kg/day
pH	6.0 – 9.5 inclusive at all times	

The plant is an extended aeration activated sludge treatment process, consisting of grit removal, tertiary filtration and Ultra-Violet disinfection. The facility is also equipped with aerobic digesters for bio-solids stabilization prior to final disposal.

Waste sludge from the plant process is digested aerobically at the plant and periodically hauled off site for disposal.

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 shut downs, 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 in order 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 samples were taken as required by the ECA.

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 (#5049-B55KXT).

Quantity of Flow Summary

The plant has a daily average flow design capacity of 550 m³/day. The actual average daily flow for the year was 321 m³/day, however, the 3-year average is 322 m³/day, which represents 59% of the plant capacity.

Plant Operational Upsets or Process Failures

There were no plant operational problems in 2018.

Summary of Maintenance

There were no significant plant upgrades on major infrastructure in 2018.

All equipment information at this plant is entered into a computer database. From this information, a scheduled preventive maintenance program has been established for all major components of the system. The maintenance program includes (and not limited to):

- Monthly testing of emergency testing (under load) of the standby generators.

- Monthly calibration verification of analytical equipment
- Annual servicing of emergency standby generators.
- Annual replacement of U.V. bulbs.
- Annual calibration of flow metering devices.
- Annual calibration verification of analytical equipment by third party.
- Annual cleaning of all sewage pumping stations.
- Marine inspection of effluent outfall and diffuser completed in 2017. (5 year cycle)

All flow meter and analytical calibration verifications indicated all equipment was within calibration tolerances as required the ECA.

Evaluation of the Need for Improvement Works

The treatment facility is operating at a plant capacity of 59% and is in compliance with specified effluent parameter criteria. In addition, there has been no significant treatment process upsets and plant bypasses. As a result, there is no need for improvements to the existing works.

Summary of Proposed Work Requiring Approval under OWRA

Although the treatment facility is operating satisfactorily there are anticipated upgrades to various components of the plant, possible requiring an ECA amendment in 2019. These upgrades are to existing equipment as part as normal lifecycle replacement.

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.

Effluent analysis

The information reported in the Final Effluent sample results summary table #7 consists 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.

Final Effluent Analysis Summary

	Minimum	4 Week Average Maximum	Annual Average	Average Loading kg/day
CBOD5 (mg/l)	2.0	2.75	2.31	0.73
Suspended Solids (mg/l)	2.0	3.25	2.54	0.81
Ammonia (mg/l)	0.10	0.26	0.12	0.04
E. Coli (#/100 ml)	0	0	0	Not Applicable
Total Phosphorous (mg/l)	0.03	0.09	0.05	0.02
pH	Min – 6.42	Max – 7.21	6.89	<i>Not Applicable</i>

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

Biosolids Generation

The quality and volume of biosolids hauled from the facility for disposal is outlined in the table provided. biosolids from the plant was hauled to an approved site. Private contractors were used by the District of Muskoka to transfer all material for disposal in 2018, and will continue to do so in 2019. It is not anticipated that there will be a significant increase in the total volume of bio solids produced in 2019.

Complaints

No complaints were received in 2018.

Wastewater Collection Summary

New Sewer Services

Two new 38mm LPS services were installed in 2018, although neither has yet been connected to a customer. Cost for both was carried by the developers.

New Sewer Mains

A total of approximately 55 meters of 38mm LPS main was installed. This was paid for by the developer.

Sewer Main Replacements

There were no sewer mains replaced in 2018.

Low Pressure Sewer Breaks

There were no low pressure sewer breaks in 2018.

Sewer Force Main Breaks

There were no sewer force main breaks in 2018.

Sewer Force Main Valve Replacement

There were no sewer force main valve replacements in 2018.

Main Line Sewer Blockage

There were no main line sewer blockages in 2018.

Sewer Lateral Blockage

There were no sewer lateral blockages in 2018.

Low Pressure Sewer Blockages

No low pressure sewer blockages in 2018.

Frozen Sewer Force Mains

No sewer force mains froze in 2018.

Frozen Sewer Service Laterals

No sewer service laterals froze in 2018.

Frozen Low Pressure Sewer Services

No low pressure sewer services froze in 2018.

Air Release Valves

All sewer Air-Vacuum Release Valves were inspected once in 2018.

Sewer Flushing/Video

A total of 747 meters of sewer main was flushed in 2018.

A total of 1125 meters of sewer main was video inspected in 2018.

Sewer Rehabilitation

There was no sewer rehabilitation in 2018.

Sewer locates

District staff addressed 51 locate requests in 2018.

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.

Marcus Firman, C.E.T.
Director of Water and Wastewater Operations

Mike Mitchell
Manager of Water and Wastewater Operations

TABLE 1: EFFLUENT FLOW SUMMARY - 2018

District of Muskoka - Indian Rd. WPCP - Bala

Month	Total Monthly (m ³)	Average Day Flow (m ³ /d)	Maximum Day Flow (m ³ /d)	Minimum Day Flow (m ³ /d)	Comments
January	10,285	332	523	205	
February	9,922	354	706	225	
March	10,616	342	511	260	
April	13,819	461	741	327	
May	9,811	316	472	188	
June	6,504	217	292	172	
July	7,125	230	337	179	
August	8,194	264	357	204	
September	7,497	250	352	206	
October	9,473	306	424	237	
November	11,332	378	485	288	
December	12,411	400	597	307	

Total

Average Day

Maximum Day

Minimum Day

TABLE 3: INFLUENT QUARTERLY ANALYSIS SUMMARY - 2018

District of Muskoka - Indian Rd. WPCP - Bala

Sample Date	Sample Identification Number	Weekly 24 Hour Composite Sample					
		BOD5 mg/L	Alkalinity (Total as CaCO3) mg/L	pH	Phosphate mg/L	Total Phosphorus mg/L	Suspended Solids mg/L
12-Feb-18	CA13412	115	116		0.10	2.84	153
14-May-18	CA13330	111	159		0.34	1.53	114
13-Aug-18	CA13287	81	214		1.09	3.18	117
12-Nov-18	CA12470	61	189		0.18	0.77	52
Yearly Average		92	170		0.43	2.08	109
Maximum		115	214		1.09	3.18	153
Minimum		61	116		0.10	0.77	52

Sample Date	Weekly 24 Hour Composite Sample					
	Conductivity mg/L	Total Kjeldahl Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Total Ammonia Nitrogen mg/L	Chloride mg/L
12-Feb-18	597	3.60	3.9	1.42	2.00	96
14-May-18	656	13.20	0.06	0.03	9.30	94
13-Aug-18	759	22.60	0.11	0.06	19.50	53
12-Nov-18	582	7.10	0.54	0.25	6.20	57
Yearly Average	649	11.63	1.15	0.44	9.25	75
Maximum	759	22.60	3.90	1.42	19.50	96
Minimum	582	3.60	0.06	0.03	2.00	53

TABLE 4: CHEMICAL USAGE SUMMARY - 2018

District of Muskoka - Indian Rd. WPCP - Bala

Month	ALUM			SODA ASH			SODIUM HYPOCHLORITE			POLYMER		
	Average Dosage	Total kg	Estimated Monthly Cost	Average Dosage	Total kg	Estimated Monthly	Average Dosage	Total kg	Estimated Monthly	Average Dosage	Total kg	Estimated Monthly
January	42.0	436.6	\$148	0.0	0.0	\$0						
February	40.8	349.5	\$118	0.0	0.0	\$0						
March	38.6	339.3	\$115	0.0	0.0	\$0						
April	36.9	537.8	\$182	0.0	0.0	\$0						
May	427.3	388.6	\$132	0.0	0.0	\$0						
June	47.2	286.8	\$97	14.4	1.7	\$2						
July	48.8	366.2	\$124	6.5	83.3	\$110						
August	83.6	431.5	\$146	7.4	94.1	\$125						
September	56.7	419.3	\$142	3.1	45.9	\$61						
October	55.0	544.2	\$184	3.8	65.0	\$86						
November	58.4	647.2	\$219	5.4	61.8	\$82						
December	63.7	726.6	\$246	5.6	64.3	\$85						
Average Monthly	83.2	456.1	\$155	3.8	34.7	\$46	0	0.0	\$0	0.0	0	\$0
Unit Cost (see note 1)	\$339.00 per MT			\$1.33 per kg			per MT			per MT		
Total Yearly		5,474	\$1,856		416	\$551		0	\$0		0	\$0

TOTAL YEARLY COST OF CHEMICALS =	\$2,407
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TABLE 6: EFFLUENT QUARTERLY ANALYSIS SUMMARY - 2018**District of Muskoka - Indian Rd. WPCP - Bala**

Sample Date	Sample Identification Number	CBOD5 mg/L	Alkalinity (Total as CaCO3) mg/L	pH	Phosphate mg/L	Total Phosphorus mg/L	Suspended Solids mg/L
12-Feb-18	CA13387	2	58	7.39	0.03	0.03	2
14-May-18	CA13330	2	67	7.36	0.03	0.04	4
13-Aug-18	CA13287	2	44	6.93	0.05	0.06	2
12-Nov-18	CA12470	2	77	7.81	0.03	0.07	2
Yearly Average		2.0	61.5	7.37	0.04	0.05	2.5
Maximum		2.0	77.0	7.81	0.05	0.07	4
Minimum		2.0	44.0	6.93	0.03	0.03	2

Sample Date	Conductivity mg/L	Total Kjeldahl Nitrogen mg/L	Nitrate Nitrogen mg/L	Nitrite Nitrogen mg/L	Total Ammonia Nitrogen mg/L	Chloride mg/L
12-Feb-18	460	0.50	8.76	0.03	0.10	67
14-May-18	570	0.70	11.40	0.03	0.10	87
13-Aug-18	362	0.50	11.40	0.03	0.10	39
12-Nov-18	480	0.50	9.36	0.03	0.10	52
Yearly Average	468	0.55	10.23	0.03	0.10	61
Maximum	570	0.70	11.40	0.03	0.10	87
Minimum	362	0.50	8.76	0.03	0.10	39

TABLE 7: EFFLUENT LOADING and CONCENTRATION SUMMARY - 2018

District of Muskoka - Indian Rd. WPCP - Bala

MONTH	BOD ₅			SUSPENDED SOLIDS			TOTAL AMMONIA NITROGEN						TKN			FECAL COLIFORM		TOTAL PHOSPHOROUS						
	Average		Maximum Daily	Average		Maximum Daily	Summer (May to Oct)			Winter (Nov to Apr)			Average		Maximum Daily	Average	Maximum Daily	Average		Maximum Daily				
	mg/L	kg/d	kg/d	mg/L	kg/d	kg/d	mg/L	kg/d	kg/d	mg/L	kg/d	kg/d	mg/L	kg/d	kg/d	mg/L	kg/d	kg/d	#/100 mL	#/100 mL	mg/L	kg/d	kg/d	
January	2.20	0.73	1.15	2.80	0.93	1.46				0.10	0.03	0.05	0.60	0.20	0.31	0.00	0.00	0.09	0.03	0.05				
February	2.75	0.97	1.94	2.00	0.71	1.41				0.10	0.04	0.07	0.50	0.18	0.35	0.00	0.00	0.06	0.02	0.04				
March	2.25	0.77	1.15	2.00	0.68	1.02				0.13	0.04	0.06	0.58	0.20	0.29	0.00	0.00	0.04	0.01	0.02				
April	2.20	1.01	1.63	3.20	1.47	2.37				0.12	0.06	0.09	0.82	0.38	0.61	0.00	0.00	0.06	0.03	0.04				
May	2.00	0.63	0.94	2.75	0.87	1.30	0.10	0.03	0.05				0.78	0.25	0.37	0.00	0.00	0.03	0.01	0.02				
June	2.25	0.49	0.66	2.75	0.60	0.80	0.10	0.02	0.03				0.60	0.13	0.18	0.00	0.00	0.04	0.01	0.01				
July	2.60	0.60	0.88	2.20	0.51	0.74	0.26	0.06	0.09				0.58	0.13	0.20	0.00	0.00	0.04	0.01	0.01				
August	2.25	0.59	0.80	3.25	0.86	1.16	0.10	0.03	0.04				0.75	0.20	0.27	0.00	0.00	0.07	0.02	0.02				
September	2.00	0.50	0.70	3.25	0.81	1.15	0.10	0.02	0.04				0.60	0.15	0.21	0.00	0.00	0.08	0.02	0.03				
October	3.00	0.92	1.27	2.00	0.61	0.85	0.10	0.03	0.04				0.45	0.14	0.19	0.00	0.00	0.05	0.02	0.02				
November	2.00	0.76	0.97	2.25	0.85	1.09				0.10	0.04	0.05	0.73	0.27	0.35	0.00	0.00	0.05	0.02	0.02				
December	2.00	0.80	1.19	2.00	0.80	1.19				0.10	0.04	0.06	0.50	0.20	0.30	0.00	0.00	0.05	0.02	0.03				
Average Monthly																								
Average Yearly	2.29	0.73	1.11	2.54	0.81	1.21	0.13	0.03	0.05	0.11	0.04	0.06	0.62	0.20	0.30	0.00	0.00	0.05	0.02	0.03				
Effluent Objective	5.00	5.50		10.00	5.50		0.50	0.28		2.00	1.10					80.00		0.30	1.65					
Non-Compliance	10.00	8.25		15.00	8.25		5.00	2.75		10.00	5.50					80.00		0.30	1.65					

Note: Bracketed and Bolded Values indicate non-compliance ()

TABLE 9: LIQUID BIOSOLIDS PRODUCTION SUMMARY - 2018

District of Muskoka - Indian Rd. WPCP - Bala

No.	Date	Hauler	Shipped To		Received From		Comments
			Location	Volume	Location	Volume	
1	JAN			0.00			
2	FEB			0.00			
3	MAR	ROHES	ROHES LAGOONS	109.20			
4	APRIL			0.00			
5	MAY	ROHES	ROHES LAGOONS	72.80			
6	JUNE	ROHES	ROHES LAGOONS	72.80			
7	JULY	ROHES	ROHES LAGOONS	145.60			
8	AUG	ROHES	ROHES LAGOONS	72.80			
9	SEPT	ROHES	ROHES LAGOONS	182.00			
10	OCT	ROHES	ROHES LAGOONS	72.80			
11	NOV	ROHES	ROHES LAGOONS	72.80			
12	DEC			0.00			
Yearly Total			801				
Yearly Cost @ \$28/m3			22,422.40				

TABLE 10: BIOSOLIDS QUALITY ANALYSIS - 2018

District of Muskoka - Indian Rd. WPCP - Bala

Parameter Sampled	Quarterly Analysis				Average	Comments
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter		
Date	12-Feb-18	14/May/18	13/Aug/18	12/Nov/18		
Sample ID	CA13387	CA12692	CA13280	CA12467		
Nitrate mg/L	29	52	85	43	52	
Mercury mg/L	0.017	0.053	0.035	0.026	0.033	
Chromium mg/L	0.10	0.18	0.14	0.15	0.14	
Cobalt mg/L	0.01	0.02	0.01	0.02	0.02	
Copper mg/L	2.5	3.9	4.3	4.5	3.8	
Lead mg/L	0.1	0.2	0.2	0.2	0.2	
Molybdenum mg/L	0.05	0.05	0.05	0.05	0.05	
Nickel mg/L	0.08	0.14	0.12	0.13	0.12	
Selenium mg/L	0.1	0.1	0.1	0.1	0.1	
Arsenic mg/L	0.1	0.1	0.1	0.1	0.1	
Zinc mg/L	2.6	3.5	3.6	3.8	3.4	
Cadmium mg/L	0.005	0.006	0.006	0.008	0.006	
Ammonia mg/L	1.3	3	26.0	1.0	7.8	
Total Kjeldahl Nitrogen mg/L	436	863	512	640	613	
Total Phosphorus mg/L	180	320	310	280	273	
Total Solids mg/L	8040	16600	10900	11600	11785	
NO2 mg/L	0.4	0.4	9.3	2.0	3.0	
Chloride mg/L	28	72	41	42	46	
PO4(sol)(Dissolved Rea mg/L as P	0.75	0.75	0.75	0.75	0.75	
TSS mg/L	7000	15600	9680	11000	10820	
COD mg/L	6700	12300	9700	10000	9675	
BOD mg/L	318	1980	316	423	759	
Potassium mg/L	26	49	59	46	45	

