



BARRIE DISTRICT OFFICE
MAR 20 2020

Wastewater Treatment Facility
249 Bradford Street

2019 Annual Monitoring Report
Environmental Compliance Approval 0284-B2ML52

March 20, 2020

The City of Barrie
Wastewater Operations Branch
P.O. Box 400 Barrie, Ontario L4M 4T5
Telephone 705-739-4220 ▪ Fax 705-739-4251 ▪ www.barrie.ca

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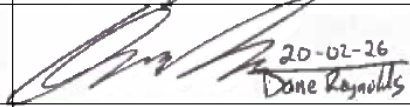


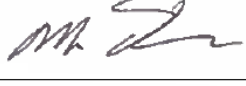


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Review and Sign-Off

WwTF 2019 Annual Report Reviewed by:	Signature	Date
G. Jorden, Supervisor, Wastewater Operations and Maintenance		FEB 26/20
D. Reynolds, Senior Engineer, Wastewater Optimization	 20-02-26 Done Reynolds	Feb 26/20
D. O'Neill, Supervisor of Wastewater Capital Works		FEB 26/2020
K. Quigley, Supervisor Operational Technology		FEB 26/2020
M. Shaw, Supervisor of Technical Services		Feb 26/20
S. Coulter, Manager of Wastewater Operations		FEB 26/20
B. Araniyasundaran, Director of Infrastructure		March 20/2020

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Overview and Summary

The City of Barrie's Wastewater Treatment Facility (WwTF) is located at 249 Bradford Street and in 2019 operated under Amended Environmental Compliance Approval No. 0284-B2ML52 ("the ECA") dated August 24th, 2018 issued by the Ministry of the Environment, Conservation and Parks (MECP). Compliance for 2019 will be evaluated against section 11 reporting requirements of the ECA; a copy of which is attached in Appendix "A".

Amended Environmental Compliance Approval (ECA) No. 0284-B2ML52 granted approval to add three more mixers to the selector and two more heat exchangers to Primary Digester #3. The status of this project as of December 31, 2019 was that the new equipment was under construction and that construction had been extended beyond the anticipated September completion date.

On December 19, 2019 the City applied for an amendment to Amended Certificate of Approval (Air) 1316-5MKTGU dated October 23, 2006 ("the Air ECA") to update operations of air pollution control equipment, noise levels and dispersion modelling.

On July 4, 2019 the City submitted a Notice of Modification of Sewage Works No. 2019-01 for a new sludge transfer pipe. As of December 31, 2019 the new piping is in service but the contract is not substantially performed.

In 2019 sewage treatment processes included:

- Mechanical Bar Screens;
- Grit removal;
- Primary settling;
- Biological selector;
- High purity oxygen activated sludge treatment (UNOX process);
- Chemical addition for removal of phosphorus and suspended solids
- Secondary settling;
- Nitrification by rotating biological contactors (RBC);
- Sand filtration;
- Ultraviolet disinfection;
- Treated effluent is discharged to Kempenfelt Bay through a staged diffuser;
- Biosolids are separated from the liquid sewage and are processed via dual digestion of sludge (aerobic & anaerobic); and
- Methane gas generated from this process is 'scrubbed' and used for co-generation of heat and electricity to offset plant energy demands.

In 2019, the effluent average daily flow of 49.9 mega litres per day (MLD) of sewage was treated representing approximately 65.7% of the plant's rated capacity of 76 MLD. The maximum daily effluent flow was 75.4 MLD on March 16, 2019 due to heavy rains, warm weather and spring runoff accessing the sanitary collection system.

The WwTF was in full compliance with all effluent concentration limits and loading limits. In addition, the plant met all ECA Objectives with few exceptions.

Over the reporting period the Wastewater Treatment Facility functioned exceptionally well, producing high quality treated effluent as indicated by minimal effluent nutrient levels. The effluent phosphorous monthly average concentrations all met the 0.18 mg/L monthly average compliance limit and the effluent annual average phosphorous concentration of 0.03 mg/L (second lowest on record) met the Lake Simcoe Phosphorus Reduction Strategy limit of 0.1 mg/L. The 2019 final effluent phosphorous annual loading was 546 kg/year which is 20% of the annual compliance loading of 2,774 kg. The average ammonia-N effluent concentration was 0.61 mg/L (fourth lowest on record) and all ammonia-N limits, objectives and loadings were consistently met.

In 2019, some effluent pollutants such as total phosphorus, dissolved phosphorus, cBOD₅ and e.coli were often below analytical detection limits.

The WwTF had no overflows or bypasses of sewage in 2019.

The reporting sections in this report follow the specific reporting requirements of section 11(4) of the ECA. Copies of relevant ECAs and Notices of Modifications are contained in Appendix "A".

Annual statistics such as average loading, flow and removal efficiency etc. in this report are calculated as per Schedule F of the ECA (i.e. arithmetic mean of all single sample results obtained during a calendar year).

Reporting Section 11(4) (a): Summary/Interpretation of Influent & Imported Sewage Quality and Flows and Historical Trends

WwTF influent sampling for 2019 was conducted as per the requirements of the ECA and results are presented in Table 1:

Table 1 WwTF 2019 Monthly Average Influent Concentrations and Total Flows

Month (2019)	Total Effluent Flow (m ³)	BOD ₅ (mg/L)	Total Susp. Solids (TSS) (mg/L)	Total Kjeldahl Nitrogen (TKN) (mg/L)	Total Phos. (TP) (mg/L)	Diss. Reactive Phos. (DRP) (mg/L)	cBOD ₅ (mg/L)	NH ₃ -N (mg/L)
January	1518589	242.55	306.20	41.76	5.52	1.25	152	24.31
February	1366620	208.35	300.27	43.21	5.57	1.24	145	27.23
March	1581122	180.63	245.38	41.60	5.05	1.19	132	26.67
April	1681578	185.64	271.14	37.62	4.63	0.85	116	22.75
May	1717477	156.40	223.08	38.25	4.63	0.91	106	24.21
June	1549888	168.00	250.08	39.64	5.06	0.96	99	24.20
July	1473787	180.36	256.86	39.64	5.06	0.99	104	23.10
August	1416405	202.69	267.85	38.76	5.13	1.04	119	21.48
September	1397643	195.57	284.71	37.36	4.93	1.04	99	22.20
October	1462092	220.04	291.41	38.72	5.27	1.15	116	22.87
November	1483554	198.40	271.52	40.55	5.33	1.24	117	24.66
December	1548315	222.46	275.04	42.11	5.35	1.27	134	25.76
Average	1516423	196.76	270.29	39.94	5.13	1.09	120	24.12
Sum	18197069							

Table 1 sampling and flow monitoring data was previously sent to MECP in monthly R1 and R2 Municipal Utility Monitoring Program (MUMP) reports. Influent concentrations appear to be typical of domestic sewage.

In 2019 77.2 cubic meters of imported sewage originating from the Bear Creek Development was received in December at the WwTF. Samples were taken from the discharge of sewage from the bottom of the truck which hauls the sewage. The results of sampling and analyses are shown in Table 2.

Table 2 Results of Sampling and Analysis of Imported Sewage

Date	Vol. Received (m ³)	BOD ₅ (mg/L)	TSS (mg/L)	TKN (mg/L)	TP (mg/L)	Ammonia-N (mg/L)
Dec. 17	6.8	-	-	-	-	-
Dec. 19	6.8	-	-	-	-	-
Dec. 27	34.1	650	2950	47.1	15.3	22.0
Dec. 31	29.5	-	-	-	-	-

The imported sewage sampling data indicate that TSS, BOD₅ and total phosphorus were higher than expected but this probably indicates that the sample taken was more indicative of concentrated material which settled to the bottom of the truck. The City will attempt to get more representative samples in future.

Four years of historical trending of influent concentrations and flow data is shown in Figures 1-4 below.

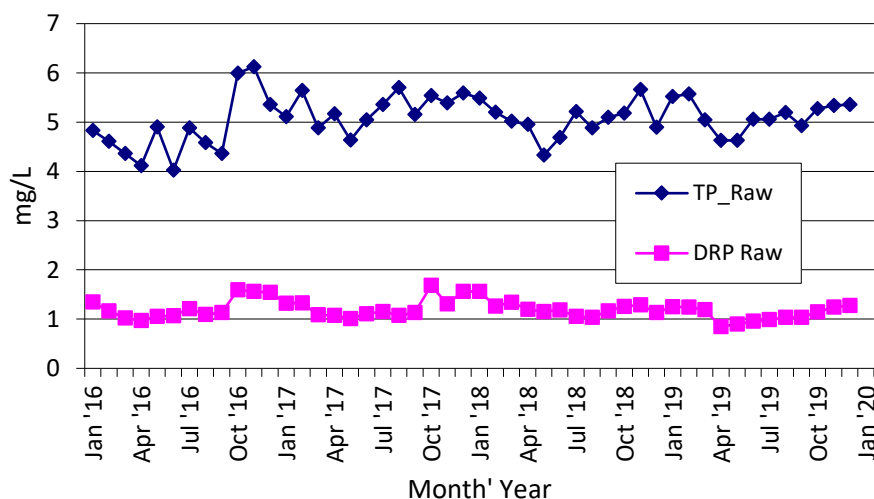


Figure 1 WwTF Average Monthly Influent Total Phosphorus and Dissolved Reactive Phosphorus Concentrations (mg/L)

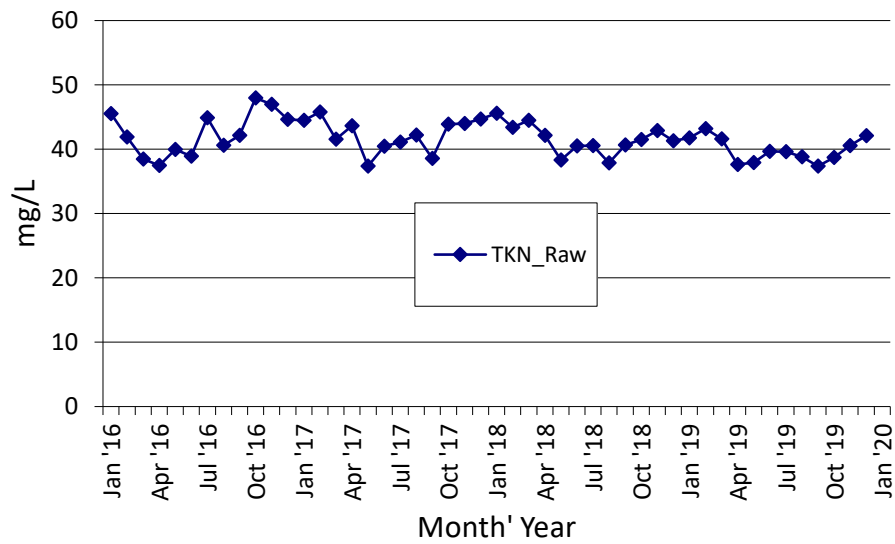


Figure 2 WwTF Average Monthly Influent Total Kjeldahl Nitrogen (mg/L)

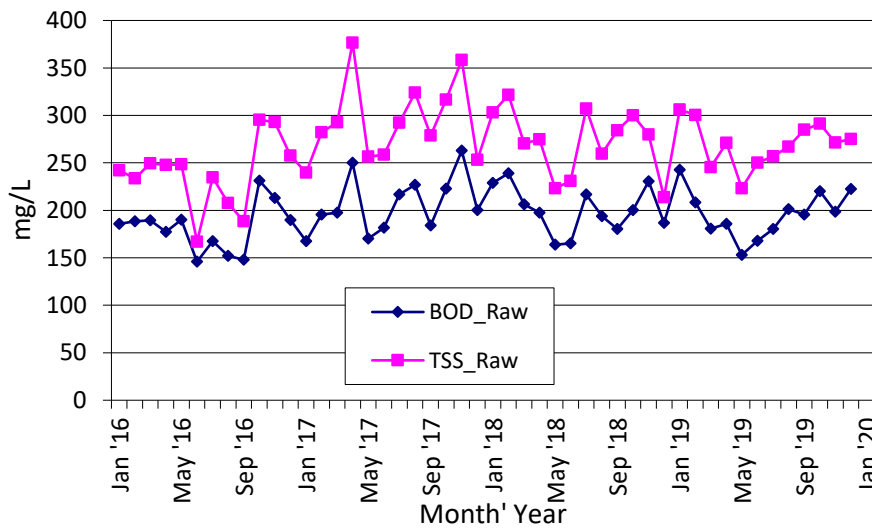


Figure 3 WwTF Average Monthly Influent Five-Day Biochemical Oxygen Demand and Total Suspended Solids (mg/L)

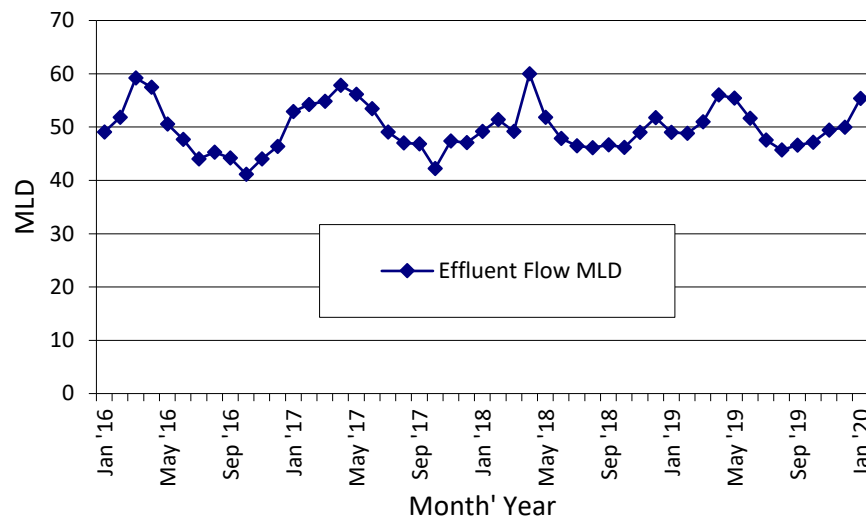


Figure 4 WwTF Average Monthly Effluent Flow (MLD)

No trends are discernible over the past four years except that flows are usually highest in spring which reflects spring thaw and inflow and infiltration contributions to flow.

Influent flow rates and effluent flow rates are considered identical as there is no flow retention capability within the plant over 24 hours.

Table 3 compares average monthly flow with maximum daily flow for that month. A maximum daily effluent flow of 75.4 MLD occurred on March 16, 2019 due to heavy rains, warm weather and spring melt accessing the sanitary collection system. The month of March was very wet with precipitation falling on 23 of 31 days.

Table 3 WwTF 2019 Monthly Average and Monthly Maximum Daily Flows (MLD)

Month (2019)	Average Daily Flow (MLD)	Maximum Daily Flow (MLD)
January	48.99	57.27
February	48.81	61.20
March	51.00	75.45
April	56.05	66.24
May	55.40	61.95
June	51.66	55.10
July	47.54	49.68
August	45.69	47.74
September	46.59	49.44
October	47.16	60.51
November	49.45	57.47
December	49.95	56.77
	Average 49.9	Maximum 75.5

Reporting Section 11(4) (b): Summary and Interpretation of All Final Effluent Monitoring Data and Comparison to Design Objectives and Limits

In computing averages on final effluent parameters, results are often below the analytical detection limits of laboratory methods. Detection limits for target parameters are as follows: total phosphorus (TP), 0.02 mg/L; dissolved reactive phosphorus (DRP), 0.01 mg/L; carbonaceous biochemical oxygen demand (cBOD), 2.0 mg/L and ammonia-N, 0.03 mg/L. E.coli counts of zero are recorded as 1.0 to allow calculation of the geometric mean. E. coli is monitored in two locations; the North UV effluent channel and the South UV effluent channel. The higher monthly average e. coli result is used for comparison with regulatory requirements.

The City of Barrie assumes that non-detect results are at the limit of detection for averaging purposes. Hence, the average effluent concentrations stated for cBOD₅, TP, dissolved reactive P and E.coli are usually an over-estimation of the actual effluent concentration. Effluent ammonia-N concentrations are usually above detection limits.

Recognizing that effluent target parameters are frequently below detection it is clear that the City of Barrie demonstrates a commitment to continuous improvement and is producing effluent quality far beyond the expectation for standards of a secondary treatment facility. The WwTF design objectives were based on achieving 0.15 mg/L effluent total phosphorus and 3 - 8 mg/L ammonia-N depending on season. These design values are almost an order of magnitude higher than actual results achieved.

Tables 4, 5 and 6 summarize all effluent monitoring results, flow rates and loadings and evaluate compliance with all effluent limits, objectives and loadings stipulated in the ECA. As noted above, where concentrations of pollutants are below detection limits the concentration is assumed to be at the limit of detection.

Table 4 shows that no monthly average effluent concentration limits were exceeded in 2019. In terms of meeting monthly average effluent objectives one sample (20 mg/L on February 5) exceeded the TSS objective of 10 mg/L, two samples (0.47 mg/L on February 5 and 0.13 mg/L on Mar. 20) exceeded the TP objective of 0.12 mg/L, one sample (3.94 mg/L on October 18) exceeded the ammonia-N objective of 3 mg/L, 1 sample on July 26 (pH = 9.04) exceeded the objective of 8.5 which is attributed to operator or instrument error and one sample (pH = 6.46 on April 26) did not meet the minimum pH objective of 6.5 which is attributed to normal process variation.

Table 4 WwTF 2019 Monthly Effluent Concentrations

Month (2019)	Average cBOD ₅ (mg/L)	Average TSS (mg/L)	Average NH ₃ - N (mg/L)	Average NH ₃ - N (mg/L)	Average TP (mg/L)	Geomean E. Coli CFU per 100 ml	Min. pH	Max. pH
January	2	2.1		0.3	0.03	1.05	6.73	7.27
February	2.09	2.92		0.76	0.06	1.12	6.77	7.11
March	2	2.69		2.1	0.04	1.0	6.64	7.2
April	2	2.07		2.2	0.03	1.0	6.46	7.18
May	2.08	2.08		0.33	0.03	1.0	6.7	7.12
June	2	1.17	0.11		0.03	1.0	6.72	7.16
July	2	1.07	0.1		0.02	1.0	6.67	9.04
August	2	1.43	0.28		0.03	1.0	6.66	7.07
September	2.08	1.15	0.31		0.02	1.0	6.5	6.9
October	2	1.6	0.58		0.02	1.51	6.6	7
November	2	1.46		0.2	0.03	1.06	6.7	7.9
December	2.11	2.58		0.2	0.03	1.0	6.59	7.03
ECA Sch. "C" Limit	15	15	4	10	0.18	200	6.0	9.5
Number of ECA Limit exceedences	0	0	0	0	0	0	0	0
ECA Sch. "B" Objective	10	10	3	8	0.12	100	6.5	8.5
Number of ECA Objective exceedences*	0	1	1	0	2	0	1/365	1/365

*Concentration objectives apply to any single sample except e. coli which is based on monthly geometric mean

In Table 5 the Monthly Average Daily Effluent Loadings = Monthly Average Effluent Concentrations (from Table 4) x the corresponding Average Daily Flow for that month (from Table 5). ECA Schedule C Loading Limits are shown and the number of exceedences summarized at the bottom of the table. Hence there were no exceedences of monthly loading limits. Also none of the monthly average flows exceeded the plant rated capacity of 76 MLD.

Table 5 WwTF 2019 Monthly Average Daily Effluent Loadings

Month (2019)	Avg. Daily Flow (MLD)	cBOD (kg/d)	TSS (kg/d)	NH ₃ - N (kg/d)	NH ₃ -N (kg/d)	Total Phosphorus (kg/d)
January	48.99	98	103		15	1.5
February	48.81	102	143		37	2.9
March	51	102	137		107	2.0
April	56.05	112	116		123	1.7
May	55.4	115	115		18	1.7
June	51.66	103	60	6		1.5
July	47.54	95	51	5		1.0
August	45.69	91	65	13		1.4
September	46.59	97	54	14		0.9
October	47.16	94	75	27		0.9
November	49.45	99	72		10	1.5
December	49.95	105	129		10	1.5
ECA Schedule "C" Limit	76*	1140	1140	304	760	13.7
Number exceeding Schedule "C" Limit	0	0	0	0	0	0

*Rated Capacity

Table 6 summarizes compliance with the Lake Simcoe Phosphorus Reduction Strategy (LSPRS) Compliance Limits set forth in Schedule C of the ECA. The average annual effluent concentration of total phosphorus is the arithmetic mean of all single sample results. The total flow is the sum of monthly total flow volumes. The annual loading is the product of these two quantities. The result is that the WwTF met effluent phosphorus concentration and loading compliance limits set by the ECA and the LSPRS.

Table 6 WwTF 2019 Final Effluent Quality Comparison with Lake Simcoe Phosphorus Reduction Strategy (LSPRS) Total Phosphorus (TP) Loading Limits

Effluent Parameter	Annual Average TP Concentration (mg/L)	Annual Total TP Loading (kg/yr)
WwTF (2019)	0.03	546
ECA Schedule "C" Limit	0.1	2,774
Number exceeding Schedule "C" Limit	0	0

Quarterly sampling of leachate-related parameters in final effluent began in the third quarter of 2018 when the requirement was imposed in the new ECA. The results of 2019 sampling and analysis are shown in Table 7:

Table 7 WwTF 2019 Sampling and Analytical Results for Leachate Parameters in Final Effluent

Effluent Parameter	Detection Limit (mg/L)	Result (Mar. 28, 2019)	Result (June 27, 2019)	Result (Sept. 4, 2019)	Result (Dec. 4, 2019)
Bis (2-ethyhexyl) phthalate	0.002 / 0.005	0.005 mg/L	0.005 mg/L	0.005 mg/L	0.002 mg/L
Boron	0.05	0.124 mg/L	0.139 mg/L	0.05 mg/L	0.153 mg/L
Cobalt	0.007	0.007 mg/L	0.007 mg/L	0.007 mg/L	0.007 mg/L
Magnesium	0.2	17.3 mg/L	17.3 mg/L	16.9 mg/L	17.7 mg/L
Manganese	0.02	0.057 mg/L	0.051 mg/L	0.036 mg/L	0.039 mg/L
Potassium	0.5	16.7 mg/L	15.3 mg/L	16.0 mg/L	17.9 mg/L
Strontium	0.02	0.369 mg/L	0.382 mg/L	0.313 mg/L	0.346 mg/L

With the exception of strontium the leachate parameter values appear to be consistent with expected contributions from domestic water use and consistent with 2018 sample results. The typical value of strontium in domestic sewage is unknown however it is a common element in the earth's crust and has wide spread commercial uses.

Effluent acute lethality monitoring was conducted quarterly in 2019 in accordance with the federal Wastewater Systems Effluent Regulations (WSER). All four quarterly effluent samples were determined to be not acutely lethal according to methods EPS 1/RM/14 and EPS 1/RM/13.

Laboratory data sheets have been omitted for brevity but are available upon request.

Figures 5 and 6 offer an 11-year overview of WwTF final effluent nutrient level trends which demonstrate the ongoing success and adequacy of the sewage works in protecting the Lake Simcoe aquatic habitat.

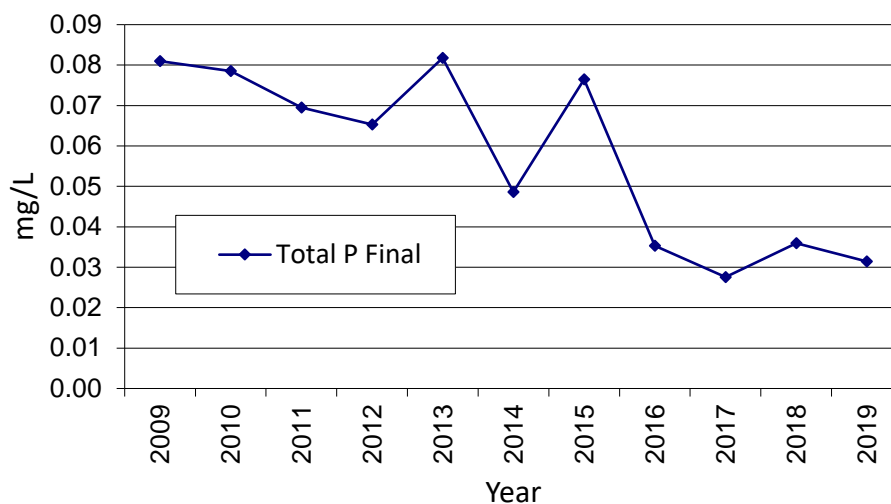


Figure 5 WwTF Average Annual Effluent Total Phosphorus Concentration (mg/L)

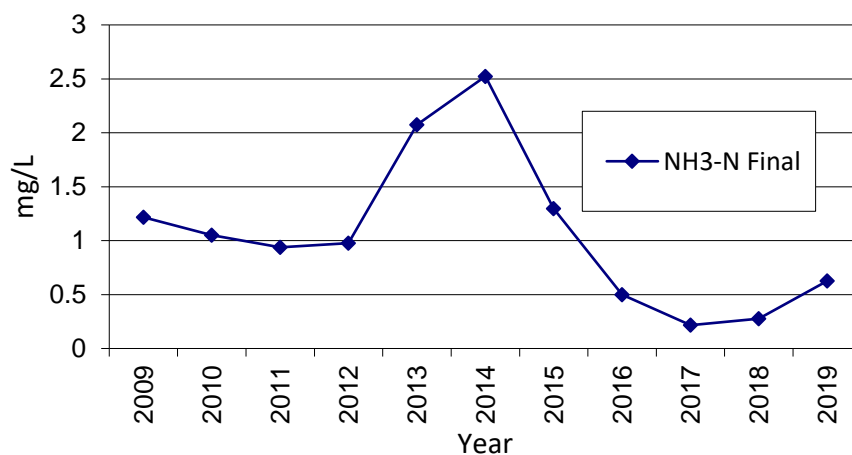


Figure 6 WwTF Average Annual Effluent Ammonia-N Concentration (mg/L)

It is evident from the figures and tables above that in 2019 the Barrie WwTF achieved aggressive removal of two nutrients – total phosphorus and ammonia-N. These target parameters have the potential to cause toxicity and eutrophication in the aquatic environment of Lake Simcoe.

In summary, final effluent from the Barrie WwTF in 2019 was of very high quality and posed minimal risk to the health of Lake Simcoe and surrounding communities.

Reporting Section 11(4) (c): Summary of Deviations from Monitoring Schedule

It should be noted that the City of Barrie exceeds the minimum sampling requirements stipulated by Schedule “D” of the ECA. For example, the City of Barrie monitors effluent phosphorus daily including weekends and

holidays. Although this ensures that the City meets its sampling requirements, it raises the number of potential exceedances of effluent objectives which are applied daily for purposes of compliance. However, it also provides a more accurate estimate of pollutant concentrations and loadings.

Section 9 of the ECA requires that a sampling schedule for Schedule D parameters be created except where sampling is conducted 3 or more times per week. In 2018, the City of Barrie began sampling and analysis of all Schedule “D” parameters at least 3 times per week except for the leachate parameters. This program continued into 2019 and leachate parameters continued to be sampled the last Thursday of the last month of each quarter. This schedule was adjusted after one year (in September 2019) to sample leachate parameters the first Wednesday of the last month of each quarter. This program will continue into 2020.

Sampling of imported sewage cannot be routinely scheduled as deliveries are infrequent and randomly received.

The only other deviation from the 3x week sampling of Schedule “D” parameters in 2019 was that effluent e.coli was only sampled 2x week in the last week of December due to lab holiday schedules and due to the maximum sample storage time of 48 hours.

Reporting Section 11(4) (d): Summary of All Operating Issues and Corrective Actions

There were no significant sewage treatment operating challenges in 2019 as is evidenced by the performance data in Reporting Section 11(4) (b). Some less significant issues that arose in 2019 included

1. Reduced nitrification in March and April: likely due to higher flows and/or operational changes to support capital works upgrades to the selector.
2. Re-development of the work order management system (CMMS) and partial temporary loss of functionality. Revised version to be rolled out in 2020 with added functionality.
3. Controlling fugitive odours. Repairs and adjustments were made in 2019 to the sludge truck loading hood but further improvements are being investigated.
4. Land application of biosolids was delayed until May due to wet weather.
5. Some structures require extensive and costly replacement of brick veneers.
6. Sludge thickening basement flooded when sludge pipe air valve broke. No release to the environment. Pipe was repaired.

There were no overflows or bypasses of sewage at the WwTF in 2019.

Reporting Section 11(4) (e): Normal and Emergency Repair Summary on Major Equipment Items

In 2019 major repairs or upgrades included:

1. Rebuild secondary clarifier #1 (new chains and flights).
2. Install new isolation valve on secondary clarifier #1 inlet line.
3. Re-design of CMMS
4. Re-route sludge transfer pipe from secondary digester to sludge holding tank (see Notice of LOF).
5. Repair PD3 digester overflow box.
6. Cogen #1 wiring upgrade.
7. Cogen #1 top and bottom overhaul.
8. Install new heat exchanger for PD3 digester (see the ECA).
9. Install 3 new mixers in the selector (see the ECA).
10. Replace primary sludge outlet valve on primary clarifier #1

11. Inspect all 4 grit tanks.

Reporting section 11(4) (f): Summary of Effluent QA/QC Program

The City of Barrie currently uses a member of the Canadian Association for Laboratory Accreditation (CALA), E3 Labs Inc. laboratories, for analysis of all samples taken for regulatory reporting purposes. The following chapter is excerpted from E3 Labs Quality Manual dated September 1st, 2015 and describes QA/QC procedures that were in place for 2019.

7.0 QUALITY CONTROL

Quality Control Samples are used, as appropriate, to ensure that the analytical process is in control. The various types of quality control samples and the characteristics they monitor are summarized as follows:

<u>Type of Quality Control Samples</u>	<u>Characteristic Monitored</u>
Standards/Lab QC	verify
Reference	calibration/stability
Material*	method accuracy
Duplicate	method precision
Samples Analyte	method recovery
Spike Reagent	contamination
Blank	(chemical)
Matrix Spike	sample recovery

* Reference materials may be either certified reference materials or can be prepared by the laboratory using the same compound as the calibration standards but using a different lot# or manufacturer of the chemical.

These Quality Control samples are defined as follows:

Standards/ Lab QC: A solution prepared by the use of a primary standard or purchased pre-made from a supplier who certifies its concentration. The analyst performing the applicable tests for which that standard will be used usually prepares standards. Standard preparation is documented in the Standard Logbook.

Certified Reference Material: A sample that contains the analytes of interest in concentrations that are known from a previous in-house analysis or provided by an outside source. In-house reference material preparation is documented in the Standard Logbook.

Analyte Spike: A sample prepared by adding a measured amount of a reference standard to reagent water or sample.

Reagent Blank: A sample containing laboratory high quality water which is analyzed as though it were a sample.

The quality control results for each run are monitored and verified by the analyst against the established control limits, which have been determined for the tests and/or specific parameters analyzed. The Laboratory Manager reviews quality control results on a regular basis. The values outside the established limits are automatically flagged by LTMS to warn the analysts of the outlier results. The Laboratory Manager will review all flagged data. The analyst in consultation with the Laboratory Manager reviews raw data and the steps followed in the test procedure and take the appropriate action(s) to identify and resolve the situation.

If any quality control sample results fall outside the control limits, the acceptance or rejection of the results is at the discretion of the analyst in consultation with the Laboratory Manager. The Laboratory Manager has the final authority to accept or reject results.

If necessary, the analysis will be repeated, if sufficient sample remains. The Laboratory Manager will review the repeated test results.

7.1 Proficiency Testing and Inter-/Intra-laboratory Studies

An important part of our Quality Assurance program is the participation in proficiency testing and inter- and intra-laboratory studies. The Laboratory Manager ensures that the lab participates in external proficiency testing.

These include proficiency samples for CALA and other PT sample suppliers.

If a proficiency test study provides results that cause doubt concerning test method performance, the Laboratory Manager may initiate a Quality Audit. Based on the audit findings, corrective action is initiated.

The results of this audit and any actions taken shall be documented and maintained on file by the Laboratory Manager.

7.2 Control Charts and Control Limits

7.2.1 Control Charts

Control charts are used, as appropriate, to monitor and evaluate the quality of the QC data generated. Such charts relate on-going test method performance to either statistically defined (± 3 STD) or protocol defined control limits. The values that are outside these limits are automatically or manually flagged to notify the analyst of the deviation. The supervisor or senior analyst designated to the co-ordination/supervision of the respective test is responsible to ensure the continual monitoring of the method's performance. Prescribed control charting practices are contained in the method SOP. All control charts are maintained by the LIMS.

7.2.2 Control Limits

Control limits, or other specified limits, when exceeded, are automatically or manually flagged. The analyst responsible for the test or reviewing the data is then expected to intervene and document the reason for the non-conformity or outlier result. This is realized through the LIMS or recorded in the appropriate logbook. Action limits may be assigned by the Laboratory Manager for results that impact the customer or regulatory limits.

Reporting Section 11(4) (g): Calibration and Maintenance on Influent, Imported Sewage and Effluent Monitoring Equipment

Influent/effluent monitoring consists of using automatic samplers and handheld pH/temp meters. These are checked or calibrated daily by operators. In addition, effluent monitoring equipment consists of using an in-line pH/temp meter as a check and various flow meters used to record flow volumes from which final effluent flow is calculated. A summary of these calibration activities in 2019 is shown in Table 8.

Table 8 Calibration Summary of Monitoring Equipment

Activity	Date	By
Calibrate hand-held temp/pH meter & check autosampler volumes	daily	operator
Clean and disinfect final autosampler and tubing	weekly	operator
Calibrate in-line final temp/pH meter AIT_2156	monthly	Lacey Inst.
Calibrate Biosolids flow meter FIT_1969	Oct. 17/19	Induscontrol Inc.
Calibrate Raw Sewage flow meters FIT0812_01/02/03/04/05/06	Oct. 15/19	Induscontrol Inc.
Calibrate HPEW flow meter FIT_2157	Oct. 17/19	Induscontrol Inc.
Calibrate WAS flow meter FIT_6145_01/02/03	Oct. 21/19	Induscontrol Inc.
Calibrate TWAS flow meter FIT 6162_01	Oct. 17/19	Induscontrol Inc.
Calibrate Bioaugmentation tank flow meter FIT_1491	Nov. 5/19	Induscontrol Inc.
Calibrate Grit tank flow meters FIT_2420_01/02/03/04	Oct. 23/19	Induscontrol Inc.
Calibrate Septage tank flow meter FIT_1293	Nov. 5/19	Induscontrol Inc.

Imported sewage was sampled and quantified manually; not automatically.

Calibration certificates and/or proof of calibration are available upon request.

Reporting Section 11(4) (h): Efforts Made in Meeting Effluent Objectives

The WwTF normally meets and surpasses all design objectives and the average annual daily flow has not reached 80% of design flow (=60.8 MLD). Efforts made in 2019 to maintain this high level of service included:

1. A major capital project is underway to implement membrane bioreactor (MBR) technology. This will enhance a continued ability to produce final effluent that will meet the effluent limit of 0.10 mg/L total phosphorus imposed by the Lake Simcoe Phosphorus Reduction Strategy. The consultant Stantec is currently finalizing pre-design studies with City staff.
2. In 2015 under a Notice of Modification #2 to MECP the main alum addition point was moved from pre-aeration to post-aeration resulting in much better nutrient removal. This innovation resulted in a dramatic improvement in treatment and effluent quality. A design for permanent facilities including dedicated pumps for each secondary clarifier will further improve the ability to balance and monitor chemical addition. The design was expected to be finalized and construction was intended to take place in 2019 but has been deferred to 2020.
3. A dedicated process optimization engineer and analyst is kept on permanent staff.
4. Upgrades for improved selector mixing (i.e. more mixers) were completed in 2019.
5. A sludge transfer pipe that has caused spills in the past was replaced in 2019.
6. Annual voluntary participation in national benchmarking (NWWBI) initiatives took place in 2019.

Reporting Section 11(4) (i): Biosolids Volumes and Disposal Locations

In 2019 biosolids generated at the Wastewater Treatment Facility (WwTF) were transported to the Oro-Medonte Biosolids Storage Facility (BSF) or directly to appropriate agricultural land in accordance with the Nutrient Management Act. Supernatant from the BSF is returned on empty trucks to the WwTF for treatment. WESSUC Inc., the City's Biosolids contractor, conducted all biosolids land application activities and transported biosolids and supernatant between the WwTF, BSF and Non-Agricultural Source Material (NASM) application sites. Biosolids laboratory analysis and land application was completed in accordance with the Nutrient Management Act and O. Reg. 267/03.

Table 9 summarizes the volumes of biosolids produced, hauled and land applied by month over the 2019 reporting period. Over the 2019 reporting period, the WwTF produced a total of 133,933 cubic meters (m³) of biosolids of which 51,331 m³ were applied directly to land and 82,602 m³ were sent to storage at the BSF. From the BSF 44,056 m³ biosolids were applied to land while 49,799 m³ supernatant was returned to the WwTF.

Weather in the third week of March was warm reaching temperature highs of about 11 degrees C while overall the month of March received precipitation on 23 of 31 days. This unfortunately delayed the land application season resulting in no spreading of biosolids in April.

Table 9 2019 Biosolids Haulage Volume Summary

Month (2019)	Plant to Field (m ³)	Plant to Storage (m ³)	Storage to Field (m ³)	Total from Plant (m ³)	Total to Field (m ³)	Supernatant Returned to WwTF (m ³)
January	0	10890.63	0	10890.63	0	1330.22
February	0	11263.07	0	11263.07	0	5026.88
March	0	11309.7	0	11309.7	0	7527.44
April	0	11517.11	0	11517.11	0	8852.5
May	6988.86	5776.96	9670.45	12765.82	16659.31	4718.71
June	5,156.09	5,235.32	6579.03	10391.41	11735.12	6266.62
July	11,365.89	311.78	6049.39	11677.67	17415.28	1909.05
August	8541	2316	5344	10856.82	13884.14	2171.94
September	7194	2582	6646	9775.72	13839.22	2222.21
October	7368	3070	6153	10438.52	13521.3	3112.37
November	4718	6414	3615	11132	8332.58	4344.11
December	0	11915	0	11915	0	2317.17
Total	51331	82602	44056	133933	95387	49799

Table 10 below outlines the 2019 biosolids land application summary and identifies associated NASM Plan application sites, biosolids sources, total volume of biosolids applied and application dates.

Table 10 2019 Biosolids Land Application Program

Site	NASM #	Expiry	Township	Area Spread (ha)	From WwTF (m³)	From BSF (m³)	Total (m³)	Dates Spread
S12070	23707	2023	Oro-Medonte	26.7	1647.14	2782.05	4429.19	May 7-11
S12069	23703	2023	Oro-Medonte	28.1	1513.44	2612.30	4125.74	May 15-18
S11070	22505	2020	Springwater	25.2	2003.14	1599.50	3602.64	May 21-23
S12081	23762	2023	Oro-Medonte	48.3	3071.72	3957.70	7029.42	May 24-June 4
S12085	23762	2023	Oro-Medonte	12.4	712.3	1161.00	1873.30	June 7
S12002	22955	2021	Oro-Medonte	7.9	400.75	624.10	1024.85	June 19
S12010	22939	2021	Oro-Medonte	10.3	623.9	711.30	1335.20	June 20
S11082	22907	2021	Springwater	22.2	1330.87	1557.61	2888.48	June 24-26
S11071	22504	2020	Springwater	7.2	445.13	489.89	935.02	June 27
S11069	22504	2020	Springwater	13.1	708.27	798.53	1506.80	June 27, 28, July 2
S11038	23453	2022	Springwater	19.3	1024.06	840.76	1864.82	July 2, 12
S11070	22505	2020	Springwater	16.4	1113.03	748.7	1861.73	July 2, 10
S12083	23897	2023	Oro-Medonte	12.6	667.71	888.15	1555.86	July 4
S11034	23602	2022	Springwater	7.9	935	0.00	935.00	July 5
S11035	23454	2022	Springwater	8.2	890.72	179	1069.72	July 8
S5048	23827	2023	Essa	2.2	267.28	0	267.28	July 11
S11093	23710	2023	Springwater	9.2	757.08	445	1202.08	July 15
S11036	22660	2020	Springwater	14.0	1023.84	674.5	1698.34	July 17, 19
S4018	23912	2023	New Tecumseth	1.5	178.09	0	178.09	July 18
S11083	23098	2021	Springwater	9.5	801.26	312.05	1113.31	July 22
S12047	22734	2020	Oro-Medonte	25.1	1927.24	1384.23	3311.47	July 24-26
S12067	23379	2022	Oro Station	9.2	712.49	488	1200.49	July 29
S12089	23938	2023	Oro-Medonte	13.2	1499.44	216.59	1716.03	July 31-Aug 1
S2004	22508	2020	Innisfil	22.9	2620.6	0	2620.6	Aug 7-9, 12
S5018	22313	2019	Essa	15.2	1664.11	0	1664.11	Aug 19, 21
S12056	23212		Oro-Medonte	30.3	0	3541.5	3541.5	Aug 22, 27
S11056	24001	2023	Springwater	6.5	801.26	178	979.26	Aug 23, 26
S11078	22752	2020	Springwater	44.0	4073.86	2736.5	6810.36	Aug 23, 26, 28, 30, Sept 3, 5, 6
S11063	22439	2020	Springwater	34.4	3249.04	1917	5166.04	Sept 9, 13, 16, 18
S12094	24030	2023	Oro-Medonte	23.7	890.29	2083.50	2973.79	Sept 25-26
S12092	24028	2023	Oro-Medonte	37.0	2760.18	1757.10	4517.28	Sept 25, 30, Oct 4, 7
S11085	23197	2021	Springwater	24.7	2047.96	1190.68	3238.64	Oct 9-11

Site	NASM #	Expiry	Township	Area Spread (ha)	From WwTF (m ³)	From BSF (m ³)	Total (m ³)	Dates Spread
S11097	24046	2023	Springwater	9.5	1202.07	266.50	1468.57	Oct 15, 18
S12078	23713	2023	Oro-Medonte	37.1	1513.71	3231.48	4745.19	Oct 19, 21, 23
S11075	24084	2023	Springwater	18.2	1536.17	1068.00	2604.17	Oct 25, 30
S11074	22615	2020	Springwater	6.9	823.39	487.50	1310.89	Nov 5
S3017	22299	2019	Bradford W. Gwillimbury	3.8	850.44	0.00	850.44	Nov 7, 8
S5041	22872	2021	Essa	3.7	667.79	0.00	667.79	Nov 21
S11071	22504	2020	Springwater	18.9	801.20	914.05	1715.25	Nov 25
S11084	23075	2021	Springwater	31.5	1574.71	2213.50	3788.21	Nov 26-28
Total				718.0	51330.7	44056.3	95387.0	

During 2020, it is estimated that a total of approximately 135,000 m³ to 140,000 m³ of biosolids will be generated at the WwTF.

Reporting Section 11(4) (j): Complaint Summary and Resolution

No public complaints were received in 2019.

Reporting Section 11(4) (k): Bypass/Spill/Abnormal Events

There were no overflows or bypasses of sewage or situations outside Normal Operating Conditions in 2019 at the WwTF.

Reporting Section 11(4) (l): Status of Notices of Modification

On July 4, 2019 LOF 2019-01 was issued to replace a sludge transfer line between the digesters and sludge holding tank. As of December 31, 2019 the new piping was in service but the contract was not substantially performed. A certificate of substantial performance was issued on February 3, 2020 in regard to the new sludge transfer pipe (see copy in Appendix A)

A copy of the Notification is contained in Appendix "A".

Reporting Section 11(4) (m): Summary of Efforts Re: Procedure F-5-1

The objective of Guideline F-5 appears to be in promoting secondary treatment of sewage as a minimum level of treatment. This involves meeting certain effluent criteria stipulated in the Procedure, preventing upsets and breakdowns and avoiding overflows and bypasses. The WwTF did not have any bypasses or overflows in 2019 due to proactive efforts to foresee where problems might occur and from experience where bypasses have occurred. The WwTF also far exceeded the secondary effluent criteria in Procedure F-5-1. Although the WwTF was designed to meet secondary treatment standards it easily meets and

consistently exceeds the Advanced Treatment standards set by Procedure F-5-1 (BOD=10 mg/L, TSS = 5 mg/L and TP=0.3 mg/L) as demonstrated in Table 4.

This section summarizes various strategies the City of Barrie currently uses to avoid overflows, bypasses, upsets and breakdowns:

- Routine bi-weekly cleaning of all sand filters using sodium hypochlorite.
- Routine weekly cleaning of WwTF raw wet well and pump station wet wells
- Check of all pump stations at least 3 times per week for pump run hours, alarms, float conditions etc.
- Routine daily inspections of all WwTF critical equipment.
- Routine quarterly cleaning of pump station wet wells and float alarms
- Balancing flows and sludge levels between tanks on a daily basis
- Using good engineering practice to design and operate the WwTF and pump stations
- Using the wet well and sewer system to equalize flows and prevent bypasses and overflows
- Using ultrasonic level detectors in tanks to automatically control pump rates
- 24/7 automated tank level monitoring with redundant level detection systems
- Using SCADA systems and controls on all critical wastewater infrastructure
- Maintaining redundant backup generators at WwTF in case of power failure
- Maintaining backup generators in larger pump stations.
- Weekly testing of WwTF standby generators, transfer switches and switchgear
- Annual cleaning and inspection of high voltage equipment, transformers etc.
- Using a remote dialing system connected to SCADA to alarm a standby operator on call 24/7
- Using electronic security measures at pump stations and entry doors at WwTF
- Permanent staffing of an in-house Optimization Section two optimization engineers
- Maintaining a computerized work management system which tracks and prioritizes maintenance and repairs
- Maintaining and enforcing a sewer use by-law
- Providing ample funding for repairs and upgrades
- Twinning all force mains at pump stations for redundancy
- Maintaining a nominally separated sewer system
- Undertaking infiltration and inflow studies
- Maintaining sufficient staffing and training
- Sampling at multiple process locations in the WwTF to have a good understanding of plant process and pinpoint potential problems
- Maintaining an in-house laboratory and two lab technicians for redundancy and responsiveness
- Ongoing study to evaluate new wastewater equalization facilities
- Supplying all operators with cell phones to facilitate communications
- Conducting routine condition assessments of infrastructure
- Minimizing solids carryover in secondary effluent to keep filters clean
- Maximizing nitrification in aeration basins to minimize RBC solids going to sand filters

For more innovations that the City of Barrie is undertaking to ensure the highest quality of effluent please refer to Reporting Section 11(4) (h).

It is difficult to attach a discrete cost to each bullet above due to overlap, the generality of some costs and the frequency that the costs are incurred. Most items fall within the annual operating budget of the WwTF which remains at approximately \$16 million per year. Some items fall within capital works projects while others comprise engineering or planning projects.

Reporting Section 11(4) (n): Changes or Updates to Schedules for Proposed Works

The status of the proposed works as of December 31, 2019 was that new equipment was still under construction and that construction had been extended beyond the anticipated September 2019 completion date. On February 6, 2020 MECP was notified that the proposed works had been commissioned (see copy of communication in Appendix A).

A certificate of substantial performance was issued on February 3, 2020 in regard to the new sludge transfer pipe (see copy of communication in Appendix A).

Appendix “A”: Environmental Compliance Approvals and Correspondence



Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 0284-B2ML52
Issue Date: August 24, 2018

The Corporation of the City of Barrie
70 Collier St
Post Office Box, No. 400
Barrie, Ontario
L4M 4T5

Site Location: City of Barrie Wastewater Treatment Facility
249 Bradford St Reference Plan 51R-11568
City of Barrie, County of Simcoe

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

usage and operation of existing municipal sewage works, for the treatment of sanitary sewage and disposal of effluent to Lake Simcoe via a Sewage Treatment Plant (City of Barrie Wastewater Treatment Facility) and Final Effluent disposal facilities as follows:

Classification of Collection System: Nominally Separate Sewer System

Classification of Sewage Treatment Plant: Secondary

Design Capacity of Sewage Treatment Plant

Design Capacity with All Treatment Trains in Operation	Prior to Completion of Construction of All Proposed Works	Upon Completion of Construction of All Proposed Works
Rated Capacity	76,000 m ³ /d	76,000 m ³ /d



Influent, Imported Sewage and Processed Organic Waste

Receiving Location	Types
In Collection System	Sanitary Sewage/Septage/Holding Tank Waste/Portable Toilet Waste/Leachate/Pretreated Leachate/Pretreated Industrial Wastewater
At Sewage Treatment Plant	Septage/Holding Tank Waste/Portable Toilet Waste/Leachate

Proposed Works:

Secondary Treatment Systems

- Biological Treatment
 - relocate existing three (3) mixers within the selector tank at different location within the tank.
 - installation of three (3) new mixers within the selector to increase the number of mixers to six (6) in within the selector.

Sludge Management System

- Sludge Digestion
 - Primary Digesters
 - combine the two existing 100 kW circuits of the 200 kW existing heat exchanger to serve primary digester No.3 into one.
 - installation of two (2) new heat exchangers to serve primary digester No.3, each having a capacity of approximately 300 kW.

Existing Works:

Sanitary Sewage Pumping Stations

Raw Sewage Pumping Station

- three (3) inlet overflow channels into the wet well with manually raked bar screens.
- five (5) raw sewage pumps and one (1) standby pump rated at a nominal capacity of 34,560 m³/d with a discharge flow measurement device.

Secondary Pumping Station

- six (6) pumps, each rated at a nominal capacity of approximately 35,000 m³/d.

City of Barrie Wastewater Treatment Facility

Influent Sewers

- two (2) 1050 mm diameter inlet sewers to the Preliminary Treatment System;

Imported Sewage Receiving Facilities

- one (1) 300 m³ capacity (active volume) equalization/pretreatment hauled sewage holding compartment equipped with coarse bubble diffused aeration system, two (2) 7.5 kW positive displacement air blowers and two (2) submersible pumps, each rated at approximately 7 L/s against 4.2 m TDH discharging to the WTF influent sewer.
- one (1) in-line grinder capable of handling hauled sewage flowrate of approximately 28 L/s.

Biosolids Supernatant Compartment and Bioaugmentation Compartment

- one (1) approximately 500 m³ capacity (active volume) biosolids supernatant holding compartment equipped with one (1) rail mounted submersible propeller type mixer and three (3) submersible pumps, each rated at approximately 3 L/s against 5.0 TDH discharging to the WTF influent sewer.
- one (1) 132 m³ capacity (active volume) bioaugmentation holding compartment equipped with two (2) submersible pumps, each rated at approximately 76 L/s against 11 m TDH discharging to the WTF primary clarifier effluent. Also included are piping for enhanced nitrification.

Preliminary Treatment System

- Screening
 - 2 multi-rake bar screens (12.7 mm stainless steel mechanically cleaned bar screens), each coupled with a screenings washer compactor to reduce the quantity of organics captured in the screened material, designed to handle up to a peak instantaneous flow of 250,100 m³/d combined.
- Grit Removal
 - four (4) covered aerated grit tanks, each capable of handling approximately 130 m³ nominal liquid capacity.
 - four (4) horizontal screw conveyors to transport settled grit collected in aerated grit tanks for grit tanks (Nos. 1, 2, 3 and 4) conveyors, each having a rated capacity of approximately 0.5 m³/hr at

10% loading.

- four (4) horizontal, centrifugal screw impeller grit pumps, each having a normal operating rated capacity of approximately 13 L/s at 7.0 m Total Dynamic Head (TDH).
- three (3) grit blowers (2 duty, one standby), each rated at approximately 430 m³/hr.
- two (2) grit classifiers, each with two (2) hydrocyclones designed for a grit quantity of 10 to 100 mL grit/m³ wastewater and feed flow rate to each cyclone of approximately 13 L/s at 8.5m TDH.

Influent Flow Measurement and Sampling Point

- flow measurement devices to measure flow from the discharge of each raw sewage pump, then add the measured flows to get the total influent flow.
- automatic composite sampler at the Headworks Building;

Primary Treatment System

- three (3) covered primary clarifiers: Primary Clarifier 1 and 2 each measuring approximately 45.7 m x 16.5 m x 3.65 m in Side Water Depth (SWD), Primary Clarifier 3 measures approximately 46.1 m x 16.5 m x 3.65 m in SWD. Each is equipped with three (3) longitudinal collectors and one (1) cross collector, non-metallic chain and flight style sludge collectors.
- five (5) primary raw sludge pumps to the aerobic reactor / sludge blending tank and/or digester, each having a normal operating rated capacity of approximately 13 L/s at 12 m TDH.
- one (1) primary scum pump rated at approximately 13 L/s.
- nine (9) scum skimmers and nine (9) scum collection troughs.

Secondary Treatment Systems

- Biological Treatment
 - one (1) selector tank with nominal operating capacity of approximately 2,000 m³.
 - primary effluent flow splitter box.
 - the selector or the splitter or both may be used at any given time.
 - three (3) mixers for selector tank (approx. 3 kW per mixer) - (to be replaced as per Proposed

Works)

- five (5) high purity oxygen covered Reactors (UNOX): Reactors 1 and 2 each having a normal operating capacity of approximately 2,400 m³, Reactor 3 having a capacity of approximately 2,400 m³ and reactors 4 and 5 each having a normal operating capacity of approximately 2,400 m³.
- one (1) 30 kW and two (2) 20 kW mixers per each UNOX Reactors 1 to 5 inclusive.
- one (1) centrifugal blower to purge off gases from the aerobic reactors to the UNOX reactors, and having a rated capacity of 31 L/s at a discharge pressure of 695 mm water column with a direct drive of approximately 5.6 kW.
- one (1) centrifugal purge air blower for UNOX reactor no. 4 and 5, with a rated capacity of approximately 900 L/s at a discharge pressure of 4.5 kPa with a direct drive of approximately 12 kW.
- two (2) Thermax SG1700 HF ambient vaporizers with a combined capacity of 21.6 metric tonnes of liquid oxygen per day at a minimum ambient temperature of -30 °C. Liquid oxygen will be stored in a 48.5 m³ liquid oxygen storage tank.
- one (1) 75 kW electric oxygen vaporizer plus trim heater.
- Secondary Sedimentation
 - two (2) Return Activated Sludge (RAS) Chambers.
 - six (6) covered Secondary Clarifiers (2 cells each): Secondary Clarifiers 1, 2 and 3 each measuring approximately 63.6 m x 12.2 m x 3.3 in SWD and Secondary Clarifiers 4, 5, and 6 each measuring approximately 64.6 m x 12.2 m x 3.3 in SWD, each equipped with four (4) longitudinal collectors; one (1) cross collector; and two (2) scum skimmers, non-metallic chain and flight style sludge collectors.
 - six (6) Return Activated Sludge pumps, (three (3) for each RAS Chamber), each pump with a rated capacity of approximately 22,000 m³/d at 7.9 m TDH.
 - one (1) Secondary Scum Pump with a rated capacity of approximately 13 L/s (1,090 m³/d) at 15 m TDH.
 - twelve (12) geotextile inlet membrane baffles; two (2) in each of the six (6) secondary clarifiers.

Post-Secondary Treatment System

- Rotating biological contactors
 - thirty-six (36) rotating biological contactors (RBCs) for tertiary nitrification. Each RBC has a

contacting surface area of approximately 15,500m² for a total of approximately 558,000m². The RBC system has been designed to treat secondary effluent at an ammonia loading rate of 1.5 to 2 g/m²/day, and therefore has an approximate ammonia treatment capacity of 1,116 kg/day.

- **Filtration**
 - six (6) shallow bed, single media tertiary filters; each having dimensions of approximately 34.4 m long x 4.8 m wide; with six (6) filters having a combined peak design flow capacity of 156,000 m³/d (all in service).
 - filters 1 & 2 have an automatic backwash system consisting of a travelling bridge equipped with one (1) submersible pump for backwash rated at approximately 13 L/s and one (1) washwater pump rated at approximately 13 L/s.
 - filters 3 & 4 have an automatic backwash system consisting of a travelling bridge equipped with one (1) submersible pump for backwash rated at approximately 17 L/s and one (1) washwater pump rated at approximately 17 L/s.
 - filters 5 & 6 have an automatic backwash system consisting of a travelling bridge equipped with one (1) washwater pump rated at approximately 14 L/s.
 - air scour system: Tertiary filters 5 and 6 are equipped with an air scour system with a shared positive displacement blower having a rated capacity of approximately 78 m³/min for cleaning the filter media as part of routine maintenance.

Supplementary Treatment Systems

- **Phosphorus Removal**
 - two (2) below grade storage tanks PVC lined, for storage of Alum, each with approximately 38,000 L capacity located in the Chemical Building.
 - two (2) double-head positive displacement metering pumps installed in the existing chemical building to dose alum at the inlet works, the aeration tank influent channel and the mixed liquor channel; each metering pump having a rated capacity of approximately 680 L/hr for total capacity of 1360 L/hr.
 - two (2) peristaltic hose pumps rated at 371 L/hr each for total capacity of 742 L/hr.
 - one (1) positive displacement transfer pump with a rated capacity of approximately 640 L/hr installed in the existing chemical building for alum transfer to day tank storage of alum for use in the flash mixing tanks.
 - one (1) day tank for storage of alum, with approximately 3,200 L capacity, located in existing

concrete chemical storage tank between Ultra Violet (UV) disinfection channels.

- four (4) positive displacement metering pumps installed in the existing high pressure effluent pump room for alum feed for phosphorus removal, each metering pump having a rated capacity of approximately 53 L/hr, to dose alum from the day tank to the flash mixing tanks.
- three (3) flash mixing tanks having dimensions of approximately 8.5 m long x 4.0 m wide x 4.5 m SWD, to provide flash mixing of alum in the RBC effluent for phosphorus removal, equipped with approximately 12kW motor driven, propeller type mixers, respectively.
- six (6) flocculation tanks, two (2) downstream of each flash mixing tank for phosphorus removal at an average daily flow of 76,000 m³/day, each tank having dimensions of approximately 8.5 m x 8.5 m x 4.5 m SWD, equipped with a 2.2 kW and 1.1 kW motor driven, propeller type mixers, respectively.

Disinfection System

- Effluent Disinfection – UV Disinfection
 - two (2) approximately 14 m long x 2.5 m wide x 2 m SWD parallel, ultraviolet disinfection open channels, each ultraviolet disinfection channel equipped with a system control centre and a power distribution centre.
 - 18 modules per flow channel, (6 rows with 3 columns), total of 36 modules combined for the two channels, installed vertically with associated appurtenances with a total capacity of approximately 195,000m³/day.
 - two (2) positive displacement blowers installed to supply air for scouring during UV lamp cleaning, each blower having a rated capacity of approximately 120 L/s at a discharge pressure of approximately 48 kPa with an electric drive of approximately 11 kW.
 - one (1) approximately 2 m long x 1m wide x 2 m deep UV cleaning tank installed for UV lamp cleaning (acid) solution complete with scouring blower.
- Sodium Hypochlorite Disinfection
 - sodium hypochlorite storage and feed system consisting of two (2) storage tanks of approximately 6,000 L (combined);
 - two (2) peristaltic hose pumps rated at 550 L/hr each.
 - piping for addition of sodium hypochlorite to the tertiary filters for filter cleaning.

Final Effluent Flow Measurement and Sampling Point

- automatic composite sampler at outlet of the UV disinfection system;

Sludge Management System

- **Sludge Thickening**
 - three (3) positive displacement waste activated sludge pumps, each pump rated at approximately 25.0 L/s at 21 m TDH with approximately 19 kW variable frequency drive.
 - one (1) polymer feed system having a rated capacity of approximately 30 L/hr, adjusted per demand, consisting of a volumetric feeder, a polymer hopper wetting assembly, three (3) positive displacement rated capacity of approximately 20 kg/hr, post dilution feed pumps with polymer solution to be dosed after the waste activated sludge pumps.
 - three (3) approximately 1.3 m diameter x 4.8 m long rotary drum thickeners.
 - two (2) positive displacement thickened activated sludge pumps, each pump rated at approximately 13 L/s at 42 m TDH with approximately 22 kW variable frequency drive.
- **Sludge Pre-Treatment**
 - two (2) cells within one tank to be used in either anaerobic sludge blending process mode or aerobic dual-digestion process mode, with an approximate volume of 620 m³ each.
 - one (1) external propeller type draft tube mixer per cell to provide sludge mixing, each mixer having a rated capacity of approximately 19 m³/min and 11 kW.
 - capability for addition of atmospheric air or high purity oxygen to holding cells of approximately 4 m³/min (150 scfm).
 - two (2) centrifugal pumps to provide sludge transfer to the primary anaerobic sludge digesters, each pump having an approximate capacity of 22 L/s at a TDH of approximately 14 m with a variable frequency drive of approximately 8 kW.
 - one (1) centrifugal blower to purge off gases from the cells to the UNOX reactors, and having an approximate capacity of 31 L/s at a discharge pressure of 0.7 m. water column with a direct drive of approximately 6kW.
- **Sludge Digestion**
 - **Primary Digesters**

- two (2) primary anaerobic digesters (No. 1 and No. 2) with a volume of approximately 1,580 m³ each.
- four (4) internal draft tube mixers on Primary Digesters No. 1 and No. 2 (two per tank) to provide sludge mixing, each mixer having an approximate capacity of 27 m³/min with a reversible, variable frequency drive of approximately 8 kW.
- digesters No. 1 and No. 2 sludge heating system consists of two (2) sludge recirculation heaters rated at approximately 300 kW each, which are installed in the control room of these digesters; and hot water jacket type heaters affixed to the mechanical mixers of approximately 60 kW for each mixer.
- two (2) sludge re-circulating pumps, each pump having an approximate capacity of 22 L/s at a TDH of approximately 14 m with a variable frequency drive of approximately 8 kW, also having in-line grinders with by-pass for maintenance.
- two (2) transfer/recirculation pumps, transferring to the secondary digester or Primary Digester No. 3, each pump having an approximate capacity of 22 L/s at a TDH of approximately 14 m with a variable frequency drive of approximately 8 kW.
- one (1) primary anaerobic digester (No. 3) with volume of approximately 3,800 m³ which may be used as secondary digester.
- primary Digester No.3 sludge heating system consisting of two (2) sludge recirculation heaters rated at approximately 100 kW (**each to be upgraded as per Proposed Works**)
- primary digester No.3 sludge heating system consisting of two (2) sludge recirculation heaters rated at approximately 100 kW each. Primary Digester No.3 may be used as a secondary digester as required.
- total combined primary digester volume of approximately 7,000 m³ with minimum HRT of approximately 15 days at 76 MLD. Primary Digesters 1, 2 and 3 may be operated in series or parallel.
- Secondary Digesters
 - one (1) secondary digester, at approximately 3,800 m³ capacity, which may be used temporarily as a primary digester".
 - two (2) transfer pumps, each pump having a rated capacity of approximately 1700 L/hr and a TDH of 24 m, transferring to the on-site Biosolids Holding Tank #1; or Sludge Loading Station No. 2 adjacent to the chemical storage building.
- Biosolids Storage and Disposal

- one (1) on-site sludge storage tank of approximately 772 m³ capacity (Biosolids Holding Tank #1)
- two (2) transfer pumps for loading sludge haulage trucks each pump having a rated capacity of approximately 16 L/s at 8.4 m TDH.
- one (1) propeller mixing pump equipped with an approximate 15 kW motor driven.

Final Effluent Disposal Facilities

- Approximately 316 m of 1200 mm diameter sewer outfall with seventeen (17) open diffuser ports discharging to Kempenfelt Bay of Lake Simcoe.

including all other mechanical system, electrical system, instrumentation and control system, standby power system, piping, pumps, valves and appurtenances essential for the proper, safe and reliable operation of the Works in accordance with this Approval, in the context of process performance and general principles of wastewater engineering only;

all in accordance with the submitted supporting documents listed in Schedule A.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "Annual Average Effluent Concentration" is the mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar year, calculated and reported as per the methodology specified in Schedule F;
2. "Annual Average Daily Effluent Flow" means the cumulative total Final Effluent discharged during a calendar year divided by the number of days during which Final Effluent was discharged that year;
3. "Annual Total Effluent Loading" means the value obtained by multiplying the Annual Average Effluent Concentration of a contaminant by the cumulative total Final Effluent discharged during the same calendar year;
4. "Annual Average Daily Influent Flow" means the cumulative total sewage flow of Influent to the Sewage Treatment Plant during a calendar year divided by the number of days during which sewage was flowing to the Sewage Treatment Plant that year;
5. "Approval" means this environmental compliance approval and any schedules attached to it, and the application;
6. "BOD5" (also known as TBOD5) means five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demands;

7. "Bypass" means diversion of sewage around one or more treatment processes, excluding Preliminary Treatment System, within the Sewage Treatment Plant with the diverted sewage flows being returned to the Sewage Treatment Plant treatment train upstream of the Final Effluent sampling point(s) and discharged via the approved effluent disposal facilities;
8. "CBOD5" means five day carbonaceous (nitrification inhibited) biochemical oxygen demand measured in an unfiltered sample;
9. "Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;
10. "District Manager" means the District Manager of the appropriate local district office of the Ministry where the Works is geographically located;
11. "*E. coli* " refers to the thermally tolerant forms of *Escherichia* that can survive at 44.5 degrees Celsius;
12. "EPA" means the *Environmental Protection Act* , R.S.O. 1990, c.E.19, as amended;
13. "Equivalent Equipment" means alternate piece(s) of equipment that meets the design requirements and performance specifications of the piece(s) of equipment to be substituted;
14. "Event" means an action or occurrence, at a given location within the Works that causes a Bypass or Overflow. An Event ends when there is no recurrence of Bypass or Overflow in the 12-hour period following the last Bypass or Overflow. Overflows and Bypasses are separate Events even when they occur concurrently;
15. "Existing Works" means those portions of the Works included in the Approval that have been constructed previously;
16. "Final Effluent" means effluent that is discharged to the environment through the approved effluent disposal facilities, including all Bypasses, that are required to meet the compliance limits stipulated in the Approval for the Sewage Treatment Plant at the Final Effluent sampling point(s);
17. "Imported Sewage" means sewage hauled to the Sewage Treatment Plant by licensed waste management system operators of the types and quantities approved for co-treatment in the Sewage Treatment Plant, including hauled sewage and leachate within the meaning of R.R.O. 1990, Regulation 347: General – Waste Management, as amended;
18. "Influent" means flows to the Sewage Treatment Plant from the collection system and Imported Sewage;
19. "Limited Operational Flexibility" (LOF) means the conditions that the Owner shall follow in order to undertake any modification that is pre-authorized as part of this Approval;
20. "Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and

includes all officials, employees or other persons acting on its behalf;

21. "Monthly Average Effluent Concentration" is the mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar month, calculated and reported as per the methodology specified in Schedule F;
22. "Monthly Average Daily Effluent Flow" means the cumulative total Final Effluent discharged during a calendar month divided by the number of days during which Final Effluent was discharged that month;
23. "Monthly Average Daily Effluent Loading" means the value obtained by multiplying the Monthly Average Effluent Concentration of a contaminant by the Monthly Average Daily Effluent Flow over the same calendar month;
24. "Monthly Geometric Mean Density" is the mean of all Single Sample Results of *E.coli* measurement in the samples taken during a calendar month, calculated and reported as per the methodology specified in Schedule F;
25. "Nominally Separate Sewer Systems" means wastewater collection systems that comprised of Sanitary Sewers and Nominally Separate Sewers while runoff from precipitation and snowmelt are separately collected in Storm Sewers;
26. "Nominally Separate Sewers" means Sanitary Sewers that also have connections from roof leaders and foundation drains, and are not considered to be Combined Sewers;
27. "Normal Operating Condition" means the condition when all unit process(es), excluding Preliminary Treatment System, in a treatment train is operating within its design capacity;
28. "Operating Agency" means the Owner or the entity that is authorized by the Owner for the management, operation, maintenance, or alteration of the Works in accordance with this Approval;
29. "Overflow" means a discharge to the environment from the Works at designed location(s) other than the approved effluent disposal facilities or via the effluent disposal facilities downstream of the Final Effluent sampling point;
30. "Owner" means The Corporation of the City of Barrie and its successors and assignees;
31. "OWRA" means the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, as amended;
32. "Peak Daily Flow Rate" (also referred to as maximum daily flow or maximum day flow) means the largest volume of flow to be received during a one-day period for which the sewage treatment process unit or equipment is designed to handle;
33. "Peak Instantaneous Flow Rate" means the instantaneous maximum flow rate as measured by a metering device for which the sewage treatment process unit or equipment is designed to handle;

34. "Preliminary Treatment System" means all facilities in the Sewage Treatment Plant associated with screening and grit removal;
35. "Primary Treatment System" means all facilities in the Sewage Treatment Plant associated with the primary sedimentation unit process and includes chemically enhanced primary treatment;
36. "Processed Organic Waste" means organic waste within the meaning of R.R.O. 1990, Regulation 347: General – Waste Management, as amended, that is hauled to the Sewage Treatment Plant of the types and quantities approved for co-processing in the sludge management system;
37. "Proposed Works" means those portions of the Works included in the Approval that are under construction or to be constructed;
38. "Rated Capacity" means the Annual Average Daily Influent Flow for which the Sewage Treatment Plant is designed to handle;
39. "Secondary Treatment System" means all facilities in the Sewage Treatment Plant associated with biological treatment, secondary sedimentation and phosphorus removal unit processes;
40. "Sewage Treatment Plant" means all the facilities related to sewage treatment within the sewage treatment plant site excluding the Final Effluent disposal facilities;
41. "Single Sample Result" means the test result of a parameter in the effluent discharged on any day, as measured by a probe, analyzer or in a composite or grab sample, as required;
42. "Source Protection Plan" means a drinking water source protection plan prepared under the Clean Water Act, 2006;
43. "Storm Sewers" means pipes that collect and convey runoff resulting from precipitation and snowmelt (including infiltration and inflow);
44. "Works" means the approved sewage works, and includes Proposed Works, Existing Works and modifications made under Limited Operational Flexibility.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

1. The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the terms and conditions herein and shall take all reasonable measures to ensure any such person complies with the same.
2. The Owner shall design, construct, operate and maintain the Works in accordance with the conditions of this Approval.
3. Where there is a conflict between a provision of any document referred to in this Approval and the conditions of this Approval, the conditions in this Approval shall take precedence.

2. CHANGE OF OWNER AND OPERATING AGENCY

1. The Owner shall, within thirty (30) calendar days of issuance of this Approval, prepare/update and submit to the District Manager the Municipal and Local Services Board Wastewater System Profile Information Form, as amended (Schedule G) under any of the following situations:
 - a. the form has not been previously submitted for the Works;
 - b. this Approval is issued for extension, re-rating or process treatment upgrade of the Works;
 - c. when a notification is provided to the District Manager in compliance with requirements of change of Owner or Operating Agency under this condition.
2. The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:
 - a. change of address of Owner;
 - b. change of Owner, including address of new owner;
 - c. change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act, R.S.O. 1990, c. B.17*, as amended, shall be included in the notification;
 - d. change of name of the corporation where the Owner is or at any time becomes a corporation, and a

copy of the most current information filed under the *Corporations Information Act, R.S.O. 1990, c. C.39*, as amended, shall be included in the notification.

3. The Owner shall notify the District Manager, in writing, of any of the following changes within thirty (30) days of the change occurring:
 - a. change of address of Operating Agency;
 - b. change of Operating Agency, including address of new Operating Agency.
4. In the event of any change in ownership of the Works, the Owner shall notify the succeeding owner in writing, of the existence of this Approval, and forward a copy of the notice to the District Manager.
5. The Owner shall ensure that all communications made pursuant to this condition refer to the environmental compliance approval number.

3. CONSTRUCTION OF PROPOSED WORKS / RECORD DRAWINGS

1. All Proposed Works in this Approval shall be constructed and installed and must commence operation within five (5) years of issuance of this Approval, after which time the Approval ceases to apply in respect of any portions of the Works not in operation. In the event that the construction, installation and/or operation of any portion of the Proposed Works is anticipated to be delayed beyond the time period stipulated, the Owner shall submit to the Director an application to amend the Approval to extend this time period, at least six (6) months prior to the end of the period. The amendment application shall include the reason(s) for the delay and whether there is any design change(s).
2. Within thirty (30) days of commencement of construction, the Owner shall prepare and submit to the District Manager a schedule for the completion of construction and commissioning operation of the Proposed Works. The Owner shall notify the District Manager within thirty (30) days of the commissioning operation of any Proposed Works. Upon completion of construction of the Proposed Works, the Owner shall prepare and submit a statement to the District Manager, certified by a Professional Engineer, that the Proposed Works is constructed in accordance with this Approval.
3. Within one (1) year of completion of construction of the Proposed Works, a set of record drawings of the Works shall be prepared or updated. These drawings shall be kept up to date through revisions undertaken from time to time and a copy shall be readily accessible for reference at the Works.

4. BYPASSES

1. Any Bypass is prohibited, except:
 - a. an emergency Bypass when a structural, mechanical or electrical failure causes a temporary reduction in the capacity of a treatment process or when an unforeseen flow condition exceeds the design capacity of a treatment process that is likely to result in personal injury, loss of life, health hazard, basement flooding, severe property damage, equipment damage or treatment process upset, if a

portion of the flow is not bypassed;

- b. a planned Bypass that is a direct and unavoidable result of a planned repair and maintenance procedure or other circumstance(s), the Owner having notified the District Manager in writing at least fifteen (15) days prior to the occurrence of Bypass, including an estimated quantity and duration of the Bypass, an assessment of the impact on the quality of the Final Effluent and the mitigation measures if necessary, and the District Manager has given written consent of the Bypass;
2. Notwithstanding the exceptions given in Paragraph 1, the Operating Agency shall undertake everything practicable to maximize the flow through the downstream treatment process(es) prior to bypassing.
3. At the beginning of a Bypass Event, the Owner shall immediately notify the Spills Action Centre (SAC) and the local Medical Officer of Health. This notice shall include, at a minimum, the following information:
 - a. the type of the Bypass as indicated in Paragraph 1 and the reason(s) for the Bypass;
 - b. the date and time of the beginning of the Bypass;
 - c. the treatment process(es) gone through prior to the Bypass and the treatment process(es) bypassed;
 - d. the effort(s) done to maximize the flow through the downstream treatment process(es) and the reason(s) why the Bypass was not avoided.
4. Upon confirmation of the end of a Bypass Event, the Owner shall immediately notify the Spills Action Centre (SAC) and the local Medical Officer of Health. This notice shall include, at a minimum, the following information:
 - a. the date and time of the end of the Bypass;
 - b. the estimated or measured volume of Bypass.
5. For any Bypass Event, the Owner shall collect daily sample(s) of the Final Effluent, inclusive of the Event and analyze for all effluent parameters outlined in Compliance Limits condition, except for *E. coli*, toxicity to Rainbow Trout and *Daphnia magna*, total residual chlorine / bisulphite residual, dissolved oxygen, pH, temperature and unionized ammonia, following the same protocol specified in the Monitoring and Recording condition as for the regular samples. The sample(s) shall be in addition to the regular Final Effluent samples required under the monitoring and recording condition, except when the Event occurs on a scheduled monitoring day.
6. The Owner shall submit a summary report of the Bypass Event(s) to the District Manager on a quarterly basis, no later than each of the following dates for each calendar year: February 15, May 15, August 15, and November 15. The summary reports shall contain, at a minimum, the types of information set out in Paragraphs (3), (4) and (5) and either a statement of compliance or a summary of the non-compliance notifications submitted as required under Paragraph 1 of Condition 11. If there is no Bypass Event

during a quarter, a statement of no occurrence of Bypass is deemed sufficient.

7. The Owner shall develop a notification procedure in consultation with the District Manager and SAC and notify the public and downstream water users that may be adversely impacted by any Bypass Event.

5. OVERFLOWS

1. Any Overflow is prohibited, except:
 - a. an emergency Overflow in an emergency situation when a structural, mechanical or electrical failure causes a temporary reduction in the capacity of the Works or when an unforeseen flow condition exceeds the design capacity of the Works that is likely to result in personal injury, loss of life, health hazard, basement flooding, severe property damage, equipment damage or treatment process upset, if a portion of the flow is not overflowed;
 - b. a planned Overflow that is a direct and unavoidable result of a planned repair and maintenance procedure or other circumstance(s), the Owner having notified the District Manager in writing at least fifteen (15) days prior to the occurrence of Overflow, including an estimated quantity and duration of the Overflow, an assessment of the impact on the environment and the mitigation measures if necessary, and the District Manager has given written consent of the Overflow;
2. Notwithstanding the exceptions given in Paragraph 1, the Operating Agency shall undertake everything practicable to maximize the flow through the downstream treatment process(es) and Bypass(es) prior to overflowing.
3. At the beginning of an Overflow Event, the Owner shall immediately notify the Spills Action Centre (SAC) and the local Medical Officer of Health. This notice shall include, at a minimum, the following information:
 - a. the type of the Overflow as indicated in Paragraph 1 and the reason(s) for the Overflow;
 - b. the date and time of the beginning of the Overflow;
 - c. the point of the Overflow from the Works, the treatment process(es) gone through prior to the Overflow, the disinfection status of the Overflow and whether the Overflow is discharged through the effluent disposal facilities or an alternate location;
 - d. the effort(s) done to maximize the flow through the downstream treatment process(es) and Bypass(es) and the reason(s) why the Overflow was not avoided.
4. Upon confirmation of the end of an Overflow Event, the Owner shall immediately notify the Spills Action Centre (SAC) and the local Medical Officer of Health. This notice shall include, at a minimum, the following information:

- a. the date and time of the end of the Overflow;
- b. the estimated or measured volume of the Overflow.

5. For any Overflow Event

- a. in the Sewage Treatment Plant, the Owner shall collect grab sample(s) of the Overflow, one near the beginning of the Event and one every eight (8) hours for the duration of the Event, and have them analyzed at least for CBOD₅, total suspended solids, total phosphorus, total ammonia nitrogen, nitrate as N, nitrite as N, total Kjeldahl nitrogen, *E. coli* , except that raw sewage and primary treated effluent Overflow shall be analyzed for BOD₅, total suspended solids, total phosphorus and total Kjeldahl nitrogen only.
- 6. The Owner shall submit a summary report of the Overflow Event(s) to the District Manager on a quarterly basis, no later than each of the following dates for each calendar year: February 15, May 15, August 15, and November 15. The summary report shall contain, at a minimum, the types of information set out in Paragraphs (3), (4) and (5). If there is no Overflow Event during a quarter, a statement of no occurrence of Overflow is deemed sufficient.
- 7. The Owner shall develop a notification procedure in consultation with the District Manager and SAC and notify the public and downstream water users that may be adversely impacted by any Overflow Event.
- 8. The Owner shall develop a response plan for any unplanned Overflows, consisting of measures to mitigate and prevent the contamination of drinking water.

6. DESIGN OBJECTIVES

- 1. The Owner shall design and undertake everything practicable to operate the Sewage Treatment Plant in accordance with the following objectives:
 - a. Final Effluent parameters design objectives listed in the table(s) included in Schedule B.
 - b. Final Effluent is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film or sheen or foam or discolouration on the receiving waters.
 - c. Annual Average Daily Influent Flow is within the Rated Capacity of the Sewage Treatment Plant.

7. COMPLIANCE LIMITS

- 1. The Owner shall operate and maintain the Sewage Treatment Plant such that compliance limits for the Final Effluent parameters listed in the table(s) included in Schedule C are met.
- 2. The Owner shall operate and maintain the Sewage Treatment Plant such that the Final Effluent is

disinfected continuously year-round / during the disinfection period between January 01 and December 31 inclusive.

8. OPERATION AND MAINTENANCE

1. The Owner shall ensure that, at all times, the Works and the related equipment and appurtenances used to achieve compliance with this Approval are properly operated and maintained. Proper operation and maintenance shall include effective performance, adequate funding, adequate staffing and training, including training in all procedures and other requirements of this Approval and the OWRA and regulations, adequate laboratory facilities, process controls and alarms and the use of process chemicals and other substances used in the Works.
2. The Owner shall update and maintain the operations manual for the Works within six (6) months of completion of construction of the Proposed Works, that includes, but not necessarily limited to, the following information:
 - a. operating procedures for the Works under Normal Operating Conditions;
 - b. inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary;
 - c. repair and maintenance programs, including the frequency of repair and maintenance for the Works;
 - d. procedures for the inspection and calibration of monitoring equipment;
 - e. operating procedures for the Works to handle situations outside Normal Operating Conditions and emergency situations such as a structural, mechanical or electrical failure, or an unforeseen flow condition, including procedures to minimize Bypasses and Overflows;
 - f. a spill prevention and contingency plan, consisting of procedures and contingency plans, including notification to the District Manager, to reduce the risk of spills of pollutants and prevent, eliminate or ameliorate any adverse effects that result or may result from spills of pollutants;
 - g. procedures for receiving, responding and recording public complaints, including recording any followup actions taken.
3. The Owner shall maintain the operations manual up-to-date and make the manual readily accessible for reference at the Works.
4. The Owner shall ensure that the Operating Agency fulfils the requirements under O. Reg. 129/04, as amended for the Works, including the classification of facilities, licensing of operators and operating standards.

9. MONITORING AND RECORDING

1. The Owner shall, upon commencement of operation of the Works, carry out a scheduled monitoring program of collecting samples at the required sampling points, at the frequency specified or higher, by means of the specified sample type and analyzed for each parameter listed in the tables under the monitoring program included in Schedule D and record all results, as follows:
 - a. all samples and measurements are to be taken at a time and in a location characteristic of the quality and quantity of the sewage stream over the time period being monitored.
 - b. a schedule of the day of the week/month for the scheduled sampling shall be created. The sampling schedule shall be revised and updated every year through rotation of the day of the week/month for the scheduled sampling program, except when the actual scheduled monitoring frequency is three (3) or more times per week.
 - c. definitions and preparation requirements for each sample type are included in document referenced in Paragraph 3.b.
 - d. definitions for frequency:
 - i. Daily means once every day;
 - ii. Weekly means once every week;
 - iii. Thrice per week means three times per week.
 - iv. Monthly means once every month;
 - v. Quarterly means once every three months;
 - vi. Annually means once every year;
2. In addition to the scheduled monitoring program required in Paragraph 1, the Owner shall collect daily sample(s) of the Final Effluent, on any day when there is any situation outside Normal Operating Conditions, by means of the specified sample type and analyzed for each parameter listed in the tables under the monitoring program included in Schedule D, except for *E. coli*, toxicity to Rainbow Trout and *Daphnia magna*, total residual chlorine / bisulphite residual, dissolved oxygen, pH, temperature and unionized ammonia.
3. The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following documents and all analysis shall be conducted by a laboratory accredited to the ISO/IEC:17025 standard or as directed by the District Manager:
 - a. the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only), as amended;

- b. the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater Version 2.0" (January 2016), PIBS 2724e02, as amended;
- c. the publication "Standard Methods for the Examination of Water and Wastewater", as amended.
- d. the Environment Canada publications "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout" (EPS 1/RM/13 Second Edition - December 2000) and "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* " (EPS 1/RM/14 Second Edition - December 2000), as amended, subject to the following:
 - i. the use of pH stabilization in the determination of acute lethality of Final Effluent to Rainbow Trout in accordance with the Environment Canada publication "Procedure for pH Stabilization during the Testing of Acute Lethality of Wastewater Effluent to Rainbow Trout (EPS 1/RM/50)" (2008), as amended, is permitted only if:
 - a. all the three criteria stipulated in the Environment Canada EPS 1/RM/50 are met; and
 - b. the Final Effluent is not discharged to a receiver in which the Final Effluent contributes more than 50% of the total flow in the receiving water, unless the District Manager, having reviewed additional information submitted regarding the Final Effluent and the receiving water approves on the use of RM50 on a site-specific basis.
- 4. If the Owner monitors Bisulphite Residual as a surrogate to Total Residual Chlorine, then detected levels of Bisulphite Residual in the sample shall be deemed to confirm absence of Total Residual Chlorine.
- 5. The minimum monitoring frequency with respect to acute lethality to Rainbow Trout and *Daphnia magna* shall, after eight (8) consecutive quarters of monitoring results not indicating acute lethality, be reduced to annually. If any Final Effluent sample indicates acute lethality to Rainbow Trout or *Daphnia magna*, the monitoring frequency shall revert back to quarterly and the Owner shall carry out the following immediately:
 - a. Review the following:
 - i. Final Effluent quality and confirm that concentrations of ammonia are within the limits;
 - ii. plant operations around the time of the toxicity event; and
 - iii. all data available regarding plant operations and Final Effluent quality.
 - b. If the observed effluent toxicity is not associated with ammonia, an investigation shall be undertaken to determine the cause or source of the toxicity.
 - c. Upon determination of cause or source of acute lethality to Rainbow Trout and *Daphnia magna*, the Owner shall determine appropriate control measures to achieve non-acutely lethal effluent and time lines for the implementation of identified control measures. The Owner shall submit the proposed

control measures and implementation time lines for approval to the District Manager.

6. The Owner shall monitor and record the flow rate and daily quantity using flow measuring devices or other methods of measurement as approved below calibrated to an accuracy within plus or minus 15 per cent (+/- 15%) of the actual flowrate of the following:
 - a. Influent flow to the Sewage Treatment Plant by continuous flow measuring devices and instrumentations/pumping rates/details of other methods (e.g. top water elevation of lagoons), or in lieu of an actual installation of equipment, adopt the flow measurements of the Final Effluent for the purpose of estimating Influent flows if the Influent and Final Effluent streams are considered not significantly different in flow rates and quantities;
 - b. Final Effluent discharged from the Sewage Treatment Plant by continuous flow measuring devices and instrumentations/pumping rates/details of other methods (e.g. level of lagoons), or in lieu of an actual installation of equipment, adopt the flow measurements of the Influent for the purpose of estimating Final Effluent flows if the Influent and Final Effluent streams are considered not significantly different in flow rates and quantities;
 - c. each type of Imported Sewage received for co-treatment at the Sewage Treatment Plant by flow measuring devices/pumping rates/haul truck manifests;
7. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the monitoring activities required by this Approval.

10. LIMITED OPERATIONAL FLEXIBILITY

1. The Owner may make pre-authorized modifications to the sewage pumping stations and Sewage Treatment Plant in Works in accordance with the document "Limited Operational Flexibility - Protocol for Pre-Authorized Modifications to Municipal Sewage Works" (Schedule E), as amended, subject to the following:
 - a. the modifications will not involve the addition of any new treatment process or the removal of an existing treatment process, including chemical systems, from the liquid or solids treatment trains as originally designed and approved.
 - b. the scope and technical aspects of the modifications are in line with those delineated in Schedule E and conform with the Ministry's publication "Design Guidelines for Sewage Works 2008", as amended, Ministry's regulations, policies, guidelines, and industry engineering standards;
 - c. the modifications shall not negatively impact on the performance of any process or equipment in the Works or result in deterioration in the Final Effluent quality;
 - d. where the pre-authorized modification requires notification, a "Notice of Modifications to Sewage Works" (Schedule E), as amended shall be completed with declarations from a Professional Engineer and the Owner and retained on-site prior to the scheduled implementation date. All supporting

information including technical memorandum, engineering plans and specifications, as applicable and appropriate to support the declarations that the modifications conform with LOF shall remain on-site for future inspection.

2. The following modifications are not pre-authorized under Limited Operational Flexibility:
 - a. Modifications that involve addition or extension of process structures, tankages or channels;
 - b. Modifications that involves relocation of the Final Effluent outfall or any other discharge location or that may require reassessment of the impact to the receiver or environment;
 - c. Modifications that involves addition of or change in technology of a treatment process or that may involve reassessment of the treatment train process design;
 - d. Modifications that requires changes to be made to the emergency response, spill prevention and contingency plan; or
 - e. Modifications that are required pursuant to an order issued by the Ministry.

11. REPORTING

1. The Owner shall report to the District Manager orally as soon as possible any non-compliance with the compliance limits, and in writing within seven (7) days of non-compliance.
2. The Owner shall, within fifteen (15) days of occurrence of a spill within the meaning of Part X of the EPA, submit a full written report of the occurrence to the District Manager describing the cause and discovery of the spill, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation, in addition to fulfilling the requirements under the EPA and O. Reg. 675/98 "Classification and Exemption of Spills and Reporting of Discharges".
3. The Owner shall, upon request, make all manuals, plans, records, data, procedures and supporting documentation available to Ministry staff, Source Protection Authority and any other parties identified in the Source Protection Plans.
4. The Owner shall prepare performance reports on a calendar year basis and submit to the District Manager by March 31 of the calendar year following the period being reported upon. The reports shall contain, but shall not be limited to, the following information pertaining to the reporting period:
 - a. a summary and interpretation of all Influent and Imported Sewage monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;
 - b. a summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this Approval, including an overview of the success and adequacy of the Works;

- c. a summary of any deviation from the monitoring schedule and reasons for the current reporting year and a schedule for the next reporting year;
- d. a summary of all operating issues encountered and corrective actions taken;
- e. a summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;
- f. a summary of any effluent quality assurance or control measures undertaken;
- g. a summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;
- h. a summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations:
 - i. when any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality;
 - ii. when the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;
- i. a tabulation of the volume of sludge generated, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;
- j. a summary of any complaints received and any steps taken to address the complaints;
- k. a summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events;
- l. a summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d. of Condition 10, including a report on status of implementation of all modification.
- m. a summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the year following that for which the report is submitted.
- n. any changes or updates to the schedule for the completion of construction and commissioning operation of major process(es) / equipment groups in the Proposed Works.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 regarding general provisions is imposed to ensure that the Works are constructed and operated in the manner in which they were described and upon which approval was granted.
2. Condition 2 regarding change of Owner and Operating Agency is included to ensure that the Ministry records are kept accurate and current with respect to ownership and Operating Agency of the Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.
3. Condition 3 regarding construction of Proposed Works/record drawings is included to ensure that the Works are constructed in a timely manner so that standards applicable at the time of Approval of the Works are still applicable at the time of construction to ensure the ongoing protection of the environment, and that prior to the commencement of construction of the portion of the Works that are approved in principle only, the Director will have the opportunity to review detailed design drawings, specifications and an engineer's report containing detailed design calculations for that portion of the Works, to determine capability to comply with the Ministry's requirements stipulated in the terms and conditions of the Approval, and also ensure that the Works are constructed in accordance with the Approval and that record drawings of the Works "as constructed" are updated and maintained for future references.
4. Condition 4 regarding Bypasses is included to indicate that Bypass is prohibited, except in circumstances where the failure to Bypass could result in greater damage to the environment than the Bypass itself. The notification and documentation requirements allow the Ministry to take action in an informed manner and will ensure the Owner is aware of the extent and frequency of Bypass Events.
5. Condition 5 regarding Overflows is included to indicate that Overflow of untreated or partially treated sewage to the receiver is prohibited, except in circumstances where the failure to Overflow could result in greater damage to the environment than the Overflow itself. The notification and documentation requirements allow the Ministry to take action in an informed manner and will ensure the Owner is aware of the extent and frequency of Overflow Events.
6. Condition 6 regarding design objectives is imposed to establish non-enforceable design objectives to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs.
7. Condition 7 regarding compliance limits is imposed to ensure that the Final Effluent discharged from the Works to the environment meets the Ministry's effluent quality requirements.
8. Condition 8 regarding operation and maintenance is included to require that the Works be properly operated, maintained, funded, staffed and equipped such that the environment is protected and deterioration, loss, injury or damage to any person or property is prevented. As well, the inclusion of a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the Owner. Such a manual is an integral part of the operation of the Works. Its compilation and use should assist the Owner in staff training, in proper plant operation and in

identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for Ministry staff when reviewing the Owner's operation of the Works.

9. Condition 9 regarding monitoring and recording is included to enable the Owner to evaluate and demonstrate the performance of the Works, on a continual basis, so that the Works are properly operated and maintained at a level which is consistent with the design objectives and compliance limits.
10. Condition 10 regarding Limited Operational Flexibility is included to ensure that the Works are constructed, maintained and operated in accordance with the Approval, and that any pre-approved modification will not negatively impact on the performance of the Works.
11. Condition 11 regarding reporting is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for this Approval.

Schedule A

1. Application for Environmental Compliance Approval submitted by Robert Sutton, Director of Engineering of The City of Barrie received on September 11, 2017, including design report, final plans and specifications.

Schedule B

Final Effluent Design Objectives

Concentration Objectives

Final Effluent Parameter	Averaging Calculator	Objective (milligrams per litre unless otherwise indicated)
CBOD5	Single Sample Result	10.0 mg/L
Total Suspended Solids	Single Sample Result	10.0 mg/L
Total Phosphorus	Single Sample Result	0.12 mg/L
Total Ammonia Nitrogen	Single Sample Result	3.0 mg/L (June 01 - October 31) 8.0 mg/L (November 01 - May 31)
<i>E. coli</i>	Monthly Geometric Mean Density	*100 CFU per 100 mL (January 01 to December 31)
pH	Single Sample Result	6.5 - 8.5 inclusive

* If the MPN method is utilized for *E. coli* analysis the objective shall be 100 MPN/100 mL

Schedule C

Final Effluent Compliance Limits

Concentration Limits

Final Effluent Parameter	Averaging Calculator	Limit (maximum unless otherwise indicated)
CBOD5	Monthly Average Effluent Concentration	15.0 mg/L
Total Suspended Solids	Monthly Average Effluent Concentration	15.0 mg/L
Total Phosphorus	Monthly Average Effluent Concentration	0.18 mg/L
Total Ammonia Nitrogen	Monthly Average Effluent Concentration	4.0 mg/L (June 01 - October 31) 10.0 mg/L (November 01 - May 31)
<i>E. coli</i>	Monthly Geometric Mean Density	*200 CFU per 100 mL (January 01 to December 31)
pH	Single Sample Result	between 6.0 - 9.5 inclusive

* If the MPN method is utilized for *E. coli* analysis the limit shall be 200 MPN/100 mL

Loading Limits

Final Effluent Parameter	Averaging Calculator	Limit (maximum unless otherwise indicated)
CBOD5	Monthly Average Daily Effluent Loading	1,140 kg/d
Total Suspended Solids	Monthly Average Daily Effluent Loading	1,140 kg/d
Total Phosphorus	Monthly Average Daily Effluent Loading	13.7 kg/d
Total Ammonia Nitrogen	Monthly Average Daily Effluent Loading	304 kg/d (June 01 - October 31) 760 kg/d (November 01 - May 31)

Lake Simcoe Phosphorus Reduction Strategy (LSRPS) Compliance Limits

Final Effluent Parameter	Annual Average Concentration (maximum unless otherwise indicated)	Annual Total Loading (maximum unless otherwise indicated)
Total Phosphorus Baseline Concentration	0.1 mg/L	-
Total Phosphorus Baseline Load	-	2,774 kg/year

Schedule D

Monitoring Program

Influent - Influent sampling point

Parameters	Sample Type	Minimum Frequency
BOD5	24 hour composite	Weekly
Total Suspended Solids	24 hour composite	Weekly
Total Phosphorus	24 hour composite	Weekly
Total Kjeldahl Nitrogen	24 hour composite	Weekly
Dissolved Reactive Phosphorus	24 hour composite	Weekly

Imported Sewage - Imported Sewage Receiving Station

Parameters	Sample Type	Minimum Frequency
BOD5	Grab	Monthly
Total Suspended Solids	Grab	Monthly
Total Phosphorus	Grab	Monthly
Total Kjeldahl Nitrogen	Grab	Monthly

Final Effluent - Final Effluent sampling point

Parameters	Sample Type	Minimum Frequency
CBOD5	24 hour composite	Weekly
Total Suspended Solids	24 hour composite	Weekly
Total Phosphorus	24 hour composite	Thrice per week
Dissolved Reactive Phosphorus	24 hour composite	Thrice per week
Total Ammonia Nitrogen	24 hour composite	Thrice per week
Total Kjeldahl Nitrogen	24 hour composite	Weekly
Nitrate as Nitrogen	24 hour composite	Weekly
<i>E. coli</i>	Grab	Weekly (January 01 to December 31)
pH*	Grab/Probe/Analyzer	Thrice per week
Temperature*	Grab/Probe/Analyzer	Thrice per week
Un-ionized Ammonia**	As Calculated	Thrice per week

*pH and temperature of the Final Effluent shall be determined in the field at the time of sampling for Total Ammonia Nitrogen.

**The concentration of un-ionized ammonia shall be calculated using the total ammonia concentration, pH and temperature using the methodology stipulated in "Ontario's Provincial Water Quality Objectives" dated July 1994, as amended.

Leachate Related - Final Effluent sampling point

Parameters	Sample Type	Minimum Frequency
Boron	Grab	Quarterly
Cobalt	Grab	Quarterly
Magnesium	Grab	Quarterly
Manganese	Grab	Quarterly
Potassium	Grab	Quarterly
Strontium	Grab	Quarterly
Bis (2-ethylhexyl) Phthalate	Grab	Quarterly

Schedule E

Limited Operational Flexibility

Protocol for Pre-Authorized Modifications to Municipal Sewage Works

1. General

1. Pre-authorized modifications are permitted only where Limited Operational Flexibility has already been granted in the Approval and only permitted to be made at the pumping stations and sewage treatment plant in the Works, subject to the conditions of the Approval.
2. Where there is a conflict between the types and scope of pre-authorized modifications listed in this document, and the Approval where Limited Operational Flexibility has been granted, the Approval shall take precedence.
3. The Owner shall consult the District Manager on any proposed modifications that may fall within the scope and intention of the Limited Operational Flexibility but is not listed explicitly or included as an example in this document.
4. The Owner shall ensure that any pre-authorized modifications will not:
 - a. adversely affect the hydraulic profile of the Sewage Treatment Plant or the performance of any upstream or downstream processes, both in terms of hydraulics and treatment performance;
 - b. result in new Overflow or Bypass locations, or any potential increase in frequency or quantity of Overflow(s) or Bypass(es).
 - c. result in a reduction in the required Peak Flow Rate of the treatment process or equipment as originally designed.

2. Modifications that do not require pre-authorization:

1. Sewage works that are exempt from Ministry approval requirements;
 2. Modifications to the electrical system, instrumentation and control system.
- 3. Pre-authorized modifications that do not require preparation of "Notice of Modification to Sewage Works"**
1. Normal or emergency maintenance activities, such as repairs, renovations, refurbishments and replacements with Equivalent Equipment, or other improvements to an existing approved piece of equipment of a treatment process do not require pre-authorization. Examples of these activities are:
 - a. Repairing a piece of equipment and putting it back into operation, including replacement of minor

components such as belts, gear boxes, seals, bearings;

- b. Repairing a piece of equipment by replacing a major component of the equipment such as motor, with the same make and model or another with the same or very close power rating but the capacity of the pump or blower will still be essentially the same as originally designed and approved;
 - c. Replacing the entire piece of equipment with Equivalent Equipment.
- 2. Improvements to equipment efficiency or treatment process control do not require pre-authorization. Examples of these activities are:
 - a. Adding variable frequency drive to pumps;
 - b. Adding on-line analyzer, dissolved oxygen probe, ORP probe, flow measurement or other process control device.
- 4. Pre-Authorized Modifications that require preparation of "Notice of Modification to Sewage Works"
 - 1. Pumping Stations
 - a. Replacement, realignment of existing sewers including manholes, valves, gates, weirs and associated appurtenances provided that the modifications will not add new influent source(s) or result in an increase in flow from existing sources as originally approved.
 - b. Extension or partition of wetwell to increase retention time for emergency response and improve station maintenance and pump operation;
 - c. Replacement or installation of inlet screens to the wetwell;
 - d. Replacement or installation of flowmeters, construction of station bypass;
 - e. Replacement, reconfiguration or addition of pumps and modifications to pump suctions and discharge pipings including valve, gates, motors, variable frequency drives and associated appurtenances to maintain firm pumping capacity or modulate the pump rate provided that the modifications will not result in a reduction in the firm pumping capacity or discharge head or an increase in the peak pumping rate of the pumping station as originally designed;
 - f. Replacement, realignment of existing forcemain(s) valves, gates, and associated appurtenances provided that the modifications will not reduce the flow capacity or increase the total dynamic head and transient in the forcemain.
 - 2. Sewage Treatment Plant
 - 1. Sewers and appurtenances

- a. Replacement, realignment of existing sewers (including pipes and channels) or construction of new sewers, including manholes, valves, gates, weirs and associated appurtenances within the a sewage treatment plant, provided that the modifications will not add new influent source(s) or result in an increase in flow from existing sources as originally approved and that the modifications will remove hydraulic bottlenecks or improve the conveyance of sewage into and through the Works.
2. Flow Distribution Chambers/Splitters
 - a. Replacement or modification of existing flow distribution chamber/splitters or construction of new flow distribution chamber/splitters, including replacements or installation of sluice gates, weirs, valves for distribution of flows to the downstream process trains, provided that the modifications will not result in a change in flow distribution ratio to the downstream process trains as originally designed.
3. Imported Sewage Receiving Facility
 1. Replacement, relocation or installation of loading bays, connect/disconnect hook-up systems and unloading/transferring systems;
 2. Replacement, relocation or installation of screens, grit removal units and compactors;
 3. Replacement, relocation or installation of pumps, such as dosing pumps and transfer pumps, valves, piping and appurtenances;
 4. Replacement, relocation or installation of storage tanks/chambers and spill containment systems;
 5. Replacement, relocation or installation of flow measurement and sampling equipment;
 6. Changes to the source(s) or quantity from each source, provided that changes will not result in an increase in the total quantity and waste loading of each type of Imported Sewage already approved for co-treatment.
4. Preliminary Treatment System
 - a. Replacement of existing screens and grit removal units with equipment of the same or higher process performance technology, including where necessary replacement or upgrading of existing screenings dewatering washing compactors, hydrocyclones, grit classifiers, grit pumps, air blowers conveyor system, disposal bins and other ancillary equipment to the screening and grit removal processes.
 - b. Replacement or installation of channel aeration systems, including air blowers, air supply main, air headers, air laterals, air distribution grids and diffusers.

5. Primary Treatment System

- a. Replacement of existing sludge removal mechanism, including sludge chamber;
- b. Replacement or installation of scum removal mechanism, including scum chamber;
- c. Replacement or installation of primary sludge pumps, scum pumps, provided that the modifications will not result in a reduction in the firm pumping capacity or discharge head that the primary sludge pump(s) and scum pump(s) are originally designed to handle.

6. Secondary Treatment System

1. Biological Treatment

- a. Conversion of complete mix aeration tank to plug-flow multi-pass aeration tank, including modifications to internal structural configuration;
- b. Addition of inlet gates in multi-pass aeration tank for step-feed operation mode;
- c. Partitioning of an anoxic/flip zone in the inlet of the aeration tank, including installation of submersible mixer(s);
- d. Replacement of aeration system including air blowers, air supply main, air headers, air laterals, air distribution grids and diffusers, provided that the modifications will not result in a reduction in the firm capacity or discharge pressure that the blowers are originally designed to supply or in the net oxygen transferred to the wastewater required for biological treatment as originally required.

2. Secondary Sedimentation

- a. Replacement of sludge removal mechanism, including sludge chamber;
- b. Replacement or installation of scum removal mechanism, including scum chamber;
- c. Replacement or installation of return activated sludge pump(s), waste activated sludge pump(s), scum pump(s), provided that the modifications will not result in a reduction in the firm pumping capacity or discharge head that the activated sludge pump(s) and scum pump(s) are originally designed to handle.

7. Post-Secondary Treatment System

- a. Replacement of filtration system with equipment of the same filtration technology, including feed pumps, backwash pumps, filter reject pumps, filtrate extract pumps, holding tanks associated with the pumping system, provided that the modifications will not result in a reduction in the capacity of

the filtration system as originally designed.

8. Disinfection System

1. UV Irradiation

- a. Replacement of UV irradiation system, provided that the modifications will not result in a reduction in the design capacity of the disinfection system or the radiation level as originally designed.

2. Chlorination/Dechlorination and Ozonation Systems

- a. Extension and reconfiguration of contact tank to increase retention time for effective disinfection and reduce dead zones and minimize short-circuiting;
- b. Replacement or installation of chemical storage tanks, provided that the tanks are provided with effective spill containment.

9. Supplementary Treatment Systems

1. Chemical systems

- a. Replacement, relocation or installation of chemical storage tanks for existing chemical systems only, provided that the tanks are sited with effective spill containment;
- b. Replacement or installation of chemical dosing pumps provided that the modifications will not result in a reduction in the firm capacity that the dosing pumps are originally designed to handle.
- c. Relocation and addition of chemical dosing point(s) including chemical feed pipes and valves and controls, to improve phosphorus removal efficiency;
- d. Use of an alternate chemical provided that it is a non-proprietary product and is a commonly used alternative to the chemical approved in the Works, provided that the chemical storage tanks, chemical dosing pumps, feed pipes and controls are also upgraded, as necessary..

10. Sludge Management System

1. Sludge Holding and Thickening

- a. Replacement or installation of sludge holding tanks, sludge handling pumps, such as transfer pumps, feed pumps, recirculation pumps, provided that modifications will not result in reduction in the solids storage or handling capacities;

2. Sludge Digestion

- a. Replacement or installation of digesters, sludge handling pumps, such as transfer pumps, feed pumps, recirculation pumps, provided that modifications will not result in reduction in the solids storage or handling capacities;
- b. replacement of sludge digester covers.

3. Sludge Dewatering and Disposal

- a. Replacement of sludge dewatering equipment, sludge handling pumps, such as transfer pumps, feed pumps, cake pumps, loading pumps, provided that modifications will not result in reduction in solids storage or handling capacities.

4. Processed Organic Waste

- a. Changes to the source(s) or quantity from each source, provided that changes will not result in an increase in the total quantity already approved for co-processing.

11. Standby Power System

- 1. Replacement or installation of standby power system, including feed from alternate power grid, emergency power generator, fuel supply and storage systems, provided that the existing standby power generation capacity is not reduced.

12. Pilot Study

- 1. Small side-stream pilot study for existing or new technologies, alternative treatment process or chemical, provided:
 - i. all effluent from the pilot system is hauled off-site for proper disposal or returned back to the sewage treatment plant for at a point no further than immediately downstream of the location from where the side-stream is drawn;
 - ii. no proprietary treatment process or propriety chemical is involved in the pilot study;
 - iii. the effluent from the pilot system returned to the sewage treatment plant does not significantly alter the composition/concentration of or add any new contaminant/inhibiting substances to the sewage to be treated in the downstream process;
 - iv. the pilot study will not have any negative impacts on the operation of the sewage treatment plant or cause a deterioration of effluent quality;
 - v. the pilot study does not exceed a maximum of two years and a notification of completion shall be

submitted to the District Manager within one month of completion of the pilot project.


13. Lagoons

- a. installing baffles in lagoon provided that the operating capacity of the lagoon system is not reduced;
- b. raise top elevation of lagoon berms to increase free-board;
- c. replace or install interconnecting pipes and chambers between cells, provided that the process design operating sequence is not changed;
- d. replace or install mechanical aerators, or replace mechanical aerators with diffused aeration system provided that the mixing and aeration capacity are not reduced;
- e. removal of accumulated sludge and disposal to an approved location offsite.

3. Final Effluent Disposal Facilities

- 1. Replacement or realignment of the Final Effluent channel, sewer or forcemain, including manholes, valves and appurtenances from the end of the treatment train to the discharge outfall section, provided that the sewer conveys only effluent discharged from the Sewage Treatment Plant and that the replacement or re-aligned sewer has similar dimensions and performance criteria and is in the same or approximately the same location and that the hydraulic capacity will not be reduced.

This page contains an image of the form entitled "Notice of Modification to Sewage Works". A digital copy can be obtained from the District Manager.

	Ministry of the Environment, Conservation and Parks	Notice of Modification to Sewage Works
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RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA ON-SITE PRIOR TO THE SCHEDULED IMPLEMENTATION DATE.

Part 1 – Environmental Compliance Approval (ECA) with Limited Operational Flexibility <small>(insert the ECA's owner, number and issuance date and notice number, which should start with "D1" and consecutive numbers thereafter)</small>		
ECA Number	Issuance Date (mm/dd/yyyy)	Notice number (if applicable)
ECA Owner	Municipality	

Part 2: Description of the modifications as part of the Limited Operational Flexibility <small>(Attach a detailed description of the sewage works)</small>
<p>Description shall include:</p> <ol style="list-style-type: none"> 1. A detail description 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. Confirmation that the anticipated environmental effects are negligible 3. List of updated versions of, or amendments to, all relevant technical documents that are affected by the modifications as applicable, i.e. submission of documentation is not required, but the listing of updated documents is (design brief, drawings, emergency plan, etc.)

Part 3 – Declaration by Professional Engineer	
<p>I hereby declare that I have verified the scope and technical aspects of this modification and confirm that the design:</p> <ol style="list-style-type: none"> 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. <p>I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate.</p>	
Name (Print)	PEO License Number
Signature	Date (mm/dd/yyyy)
Name of Employer	

Part 4 – Declaration by Owner	
<p>I hereby declare that:</p> <ol style="list-style-type: none"> 1. I am authorized by the Owner to complete this Declaration; 2. The Owner consents to this modification; and 3. This modification to the sewage works are proposed in accordance with the Limited Operational Flexibility as described in the ECA. <p>4. The Owner has fulfilled all applicable requirements of the Environmental Assessment Act.</p> <p>I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate.</p>	
Name of Owner Representative (Print)	Owner representative's title (Print)
Owner Representative's Signature	Date (mm/dd/yyyy)

EAPB Form July 20, 2018

Schedule F

Methodology for Calculating and Reporting Monthly Average Effluent Concentration, Annual Average Effluent Concentration and Monthly Geometric Mean Density

1. Monthly Average Effluent Concentration

- Step 1: Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar month and proceed as follows depending on the result of the calculation:
- a. If the arithmetic mean does not exceed the compliance limit for the contaminant, then report and use this arithmetic mean as the Monthly Average Effluent Concentration for this parameter where applicable in this Approval;
 - b. If the arithmetic mean exceeds the compliance limit for the contaminant and there was no Bypass Event during the calendar month, then report and use this arithmetic mean as the Monthly Average Effluent Concentration for this parameter where applicable in this Approval;
 - c. If the arithmetic mean exceeds the compliance limit for the contaminant and there was Bypass Event(s) during the calendar month, then proceed to Step 2;
 - d. If the arithmetic mean does not exceed the compliance limit for the contaminant and there was Bypass Event(s) during the calendar month, the Owner may still elect to proceed to Step 2 calculation of the flow-weighted arithmetic mean.
- Step 2: Calculate the flow-weighted arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar month and proceed depending on the result of the calculation:
- a. Group No Bypass Days (NBPD) data and Bypass Days (BPD) data during a calendar month separately;
 - b. Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured on all NBPD during a calendar month and record it as **Monthly Average NBPD Effluent Concentration**;
 - c. Obtain the “**Total Monthly NBPD Flow**” which is the total amount of Final Effluent discharged on all NBPD during the calendar month;
 - d. Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured on all BPD during a calendar month

and record it as **Monthly Average BPD Effluent Concentration**;

- e. Obtain the “**Total Monthly BPD Flow**” which is the total amount of Final Effluent discharged on all BPD during the calendar month;
- f. Calculate the flow-weighted arithmetic mean using the following formula:

$$\frac{[(\text{Monthly Average NBPD Effluent Concentration} \times \text{Total Monthly NBPD Flow}) + (\text{Monthly Average BPD Effluent Concentration} \times \text{Total Monthly BPD Flow})]}{(\text{Total Monthly NBPD Flow} + \text{Total Monthly BPD Flow})}$$

It should be noted that in this method, if there are no Bypass Event for the month, the calculated result would be the same as the non-flow-weighted arithmetic mean method;

- g. Report and use the lesser of the flow-weighted arithmetic mean obtained in Step 2 and the arithmetic mean obtained in Step 1 as the Monthly Average Effluent Concentration for this parameter where applicable in this Approval.

2. Annual Average Effluent Concentration

Step 1: Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar year and proceed as follows depending on the result of the calculation:

- a. If the arithmetic mean does not exceed the compliance limit for the contaminant, then report and use this arithmetic mean as the Annual Average Effluent Concentration for this parameter where applicable in this Approval;
- b. If the arithmetic mean exceeds the compliance limit for the contaminant and there was no Bypass Event during the calendar year, then report and use this arithmetic mean as the Annual Average Effluent Concentration for this parameter where applicable in this Approval;
- c. If the arithmetic mean exceeds the compliance limit for the contaminant and there was Bypass Event(s) during the calendar year, then proceed to Step 2;
- d. If the arithmetic mean does not exceed the compliance limit for the contaminant and there was Bypass Event(s) during the calendar year, the Owner may still elect to proceed to Step 2 calculation of the flow-weighted arithmetic mean.

Step 2: Calculate the flow-weighted arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar year and proceed depending on the result of the calculation:

- a. Group No Bypass Days (NBPD) data and Bypass Days (BPD) data during a calendar year

separately;

- b. Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured on all NBPD during a calendar year and record it as **Annual Average NBPD Effluent Concentration**;
- c. Obtain the “**Total Annual NBPD Flow**” which is the total amount of Final Effluent discharged on all NBPD during the calendar year;
- d. Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured on all BPD during a calendar year and record it as **Annual Average BPD Effluent Concentration**;
- e. Obtain the “**Total Annual BPD Flow**” which is the total amount of Final Effluent discharged on all BPD during the calendar year;
- f. Calculate the flow-weighted arithmetic mean using the following formula:

$$\frac{[(\text{Annual Average NBPD Effluent Concentration} \times \text{Total Annual NBPD Flow}) + (\text{Annual Average BPD Effluent Concentration} \times \text{Total Annual BPD Flow})]}{(\text{Total Annual NBPD Flow} + \text{Total Annual BPD Flow})}$$

It should be noted that in this method, if there are no Bypass Event for the calendar year, the calculated result would be the same as the non-flow-weighted arithmetic mean method;

- g. Report and use the lesser of the flow-weighted arithmetic mean obtained in Step 2 and the arithmetic mean obtained in Step 1 as the Annual Average Effluent Concentration for this parameter where applicable in this Approval.

3. Monthly Geometric Mean Density

Geometric mean is defined as the n^{th} root of the product of n numbers. In the context of calculating Monthly Geometric Mean Density for *E.coli*, the following formula shall be used:

$$\sqrt[n]{x_1 x_2 x_3 \cdots x_n}$$

in which,

“ n ” is the number of samples collected during the calendar month; and

“ x ” is the value of each Single Sample Result.

For example, four weekly grab samples were collected and tested for *E.coli* during the calendar month. The *E.coli* densities in the Final Effluent were found below:

Sample Number	<i>E.coli</i> Densities* (CFU /100 mL)
1	10
2	100
3	300
4	50

The Geometric Mean Density for these data:

$$\sqrt[4]{10 \times 100 \times 300 \times 50} = 62$$

*If a particular result is zero (0), then a value of one (1) will be substituted into the calculation of the Monthly Geometric Mean Density. If the MPN method is utilized for *E. coli* analysis, values in the table shall be in MPN/100 mL.

Schedule G

Municipal and Local Services Board Wastewater System Profile Information Form

(For reference only, images of the form are attached on the next four pages. A digital copy can be obtained from the District Manager.)



Ministry of the
Environment,
Conservation and Parks

**Municipal and Local Services Board Wastewater
System Profile Information Form**

The information in this form is necessary to administer the Ministry's approvals, compliance and enforcement programs with respect to wastewater treatment and collection systems owned by municipalities and local services boards. These programs are authorized under the Ontario Water Resources Act, the Environmental Protection Act, the Nutrient Management Act and their respective regulations.

Email the completed form to: waterforms@ontario.ca
For any questions call 1-888-793-2588.

[A] SYSTEM PROFILE INFORMATION					
Wastewater System Number (if assigned)		<input type="checkbox"/> New Profile <input type="checkbox"/> Update Existing Profile			
Name of System		Level of Treatment (select one) <input type="checkbox"/> Primary <input type="checkbox"/> Secondary <input type="checkbox"/> Tertiary <input type="checkbox"/> Secondary Equivalent <input type="checkbox"/> Other (specify): _____ <small>*See Terms and Concepts on page 4</small>			
Name of Municipality or Local Services Board					
Population Served	Population (Design)	Type of System <input type="checkbox"/> Treatment & Collection System <input type="checkbox"/> Collection System Only			
Design Rated Capacity (m ³ /day)	Peak Flow Rate (m ³ /day)	Current Environmental Compliance Approval (ECA) Number	Current ECA Issue Date (yyyy/mm/dd):		
The treatment plant receives sewage from: (Check all that applies. * If you have checked more than one option below, indicate the approximate %)					
<input type="checkbox"/> Sanitary Sewer		<input type="checkbox"/> Combined Sewer			
<input type="checkbox"/> Noninally Separated Sewer		<input type="checkbox"/> Partially Separated Sewer		<small>*See Terms and Concepts on page 4</small>	
[B] OWNER INFORMATION					
Legal Name of Municipality or Local Services Board					
Unit No	Street No.	Street Name	Street Type (St, Rd, etc)	Street Direction (N,S,E,W)	
PO Box	City/Town			Postal Code	
<input type="checkbox"/> Dr <input type="checkbox"/> Miss <input type="checkbox"/> Mr <input type="checkbox"/> Mrs <input type="checkbox"/> Ms	Owner Contact First Name		Owner Contact Last Name		Owner Contact Job Title
Tel. No. () - ext.		Fax Number () -		Email address	
[C] OPERATING AUTHORITY <input type="checkbox"/> Check if same as owner					
Legal Name of Operator					
Unit No	Street No.	Street Name	Street Type (St, Rd, etc)	Street Direction (N,S,E,W)	
PO Box	City/Town			Postal Code	
<input type="checkbox"/> Dr <input type="checkbox"/> Miss <input type="checkbox"/> Mr <input type="checkbox"/> Mrs <input type="checkbox"/> Ms	Operator Contact First Name		Operator Contact Last Name		Operator Contact Job Title
Tel. No. () - ext.		Fax Number () -		Email address	

Oct 2014

Page 1 of 4

[D] 24/7 CONTACT					
<input type="checkbox"/> Dr <input type="checkbox"/> Miss First Name <input checked="" type="checkbox"/> Mr <input type="checkbox"/> Mrs Last Name <input type="checkbox"/> Ms Job Title		Tel. No. () - ext.		Fax Number () - Email address	
[E] SYSTEM CIVIC LOCATION ADDRESS (I.E. ADDRESS OF TREATMENT PLANT)					
Unit No.	Street No.	Street Name.		Street Type (St, Rd, etc)	Street Direction (N,S,E,W)
PO Box	City/Town		Postal Code		
If the Wastewater System has no street address					
Geographical Township		Lot		Concession	
Geographical Referencing (if known, enter the Geographical Reference Information for this Wastewater System)					
Map Datum	Geo-Referencing Method		Accuracy Estimate	Location Reference	
Latitude	Longitude	Zone	Easting	Northing	
[F] TREATMENT PROCESS					
Preliminary	Primary	Secondary	Secondary Equivalent	Post-Secondary	Additional Treatment
<input type="checkbox"/> Screening <input type="checkbox"/> Shredding/ grinding <input type="checkbox"/> Grit Removal <input type="checkbox"/> Other(specify):	<input type="checkbox"/> Settling/sedimentation/ clarification <input type="checkbox"/> Scum Removal <input type="checkbox"/> Polymer Addition <input type="checkbox"/> Other(specify):	<input type="checkbox"/> Conventional Activated Sludge (CAS) <input type="checkbox"/> Extended Aeration <input type="checkbox"/> Membrane Bioreactor (MBR) <input type="checkbox"/> Sequencing Batch Reactor (SBR) <input type="checkbox"/> Rotating Biological Contactor (RBC) <input type="checkbox"/> Trickling Filter (TF) <input type="checkbox"/> Biological Aerated Filter (BAF) <input type="checkbox"/> Other(specify):	<input type="checkbox"/> Aerated Lagoon <input type="checkbox"/> Facultative Lagoon <input type="checkbox"/> Anaerobic Lagoon <input type="checkbox"/> Aerobic Lagoon <input type="checkbox"/> Other(specify):	<input type="checkbox"/> Filtration <input type="checkbox"/> Clarification <input type="checkbox"/> Intermittent Sand Filter (after lagoons) <input type="checkbox"/> Polishing Wetlands <input type="checkbox"/> Polishing Lagoons <input type="checkbox"/> Other(specify):	<input type="checkbox"/> Phosphorous Removal <input type="checkbox"/> Biological <input type="checkbox"/> Chemical If chemical is used, specify: <input type="checkbox"/> Nitrification <input type="checkbox"/> Denitrification <input type="checkbox"/> Other(specify):
[G] DISINFECTION					
Method of Disinfection			Disinfection Period		
<input type="checkbox"/> Chlorination If you chlorinate, do you practice de-chlorination? <input type="checkbox"/> Yes <input type="checkbox"/> No			<input type="checkbox"/> Continuous <input type="checkbox"/> Seasonal		
<input type="checkbox"/> Ultraviolet Irradiation			<input type="checkbox"/> Continuous <input type="checkbox"/> Seasonal		
<input type="checkbox"/> Other (specdy):			<input type="checkbox"/> Continuous <input type="checkbox"/> Seasonal		

[H] SLUDGE	
Sludge Stabilization Process	Method of Sludge Disposal/Utilization
<input type="checkbox"/> Aerobic Digestion	<input type="checkbox"/> Agricultural
<input type="checkbox"/> Anaerobic Digestion	<input type="checkbox"/> Landfill
<input type="checkbox"/> Drying & Pelletization	<input type="checkbox"/> Incineration
<input type="checkbox"/> Lime Treatment	<input type="checkbox"/> Other (specify):
<input type="checkbox"/> Composting	
<input type="checkbox"/> Other (specify):	
Available Sludge Storage Capacity (m ³):	
[I] EFFLUENT	
Effluent Disposal Method	Effluent Discharge Frequency
<input type="checkbox"/> Surface Water Receiving Water Body Name:	<input type="checkbox"/> Continuous <input type="checkbox"/> Seasonal
<input type="checkbox"/> Subsurface	<input type="checkbox"/> Continuous <input type="checkbox"/> Seasonal
<input type="checkbox"/> Other (specify):	<input type="checkbox"/> Continuous <input type="checkbox"/> Seasonal
Is the effluent discharged in a vulnerable area identified in the local source protection assessment report approved under the Clean Water Act, 2008?	
<input type="checkbox"/> Yes <input type="checkbox"/> No	
[J] INFLUENT	
Does the plant receive sewage from another municipality or local services board either through an interconnected collection system or hauled sewage?	
<input type="checkbox"/> Yes <input type="checkbox"/> No	
(if yes, name(s) of other municipality or local services board):	
Plant receives:	
<input type="checkbox"/> Leachate (approximate annual volume in m ³):	
<input type="checkbox"/> Septage (approximate annual volume in m ³):	
<input type="checkbox"/> Industrial Input (approximate annual volume in m ³):	
or (approximate volume in %):	

Terms and Concepts

The following Terms and Concepts are provided to assist you when completing Wastewater System Profile Information Form.

In order to determine the level of treatment that applies to the wastewater system, the effluent quality objectives that the wastewater treatment plant was designed to meet must be considered. The process based approach often used in the past has led to confusion and is open to interpretation due to recent developments and practices in the wastewater treatment industry. For example, a plant with a high rate filter (often referred to as a tertiary filter) after its secondary treatment was considered a tertiary treatment in the past since the filter was designed and operated to produce a tertiary quality effluent. However, secondary plants are now being constructed with these filters as a safeguard against any potential secondary clarifier performance degradation and not for the purpose of ensuring tertiary treatment performance. Also, new technologies have evolved that can produce tertiary quality effluent without having these high rate filters (e.g., membrane bioreactors). Lagoons were considered in the past as being capable of providing only secondary equivalent treatment. However, with add-on treatment after the lagoons (e.g. Intermittent sand filters), many lagoon treatment systems are capable of producing secondary or tertiary quality effluent.

During the establishment of sewage works, site-specific effluent limits (including averaging periods) are provided by the Ministry's Regional Technical Support Section, considering the assimilative capacity of the receivers and the minimum treatment requirements provided in Procedure F-5-1. The designer of the sewage works then selects objective values that are acceptable to the Ministry and are less (i.e. more stringent) than the effluent limits, in order to provide an adequate safety factor based on the designer's confidence/experience with the technology chosen and other site-specific conditions. The sewage works are then designed (and operated) to meet these design objectives in a reliable and consistent manner. Therefore, the values that are to be used in the determination of the level of treatment that applies to the sewage works must be based on the design objectives, and not the effluent limits.

Two common parameters used in almost all sewage works designs and performance evaluations are CBOD₅ (carbonaceous biochemical oxygen demand) (BOD₅ – biochemical oxygen demand - for primary sewage works) and total suspended solids (TSS). Therefore, it is logical that the objective values of these two parameters are used to determine the level of treatment at the sewage works.

Level of Treatment:

Primary:

Wastewater treatment plants that have only settling/sedimentation (with or without chemical addition) and providing 30% and 50% or better reduction of BOD₅ and TSS respectively are considered primary plants (MOE Procedures F-5-1 and F-5-5).

Secondary:

Wastewater treatment plants that have biological processes (e.g. activated sludge process and its variations, fixed film processes) or physical-chemical processes producing an effluent quality of CBOD₅ and TSS of 15 mg/L or better are considered secondary plants (MOE Design Guidelines for Sewage Works, 2008).

Secondary Equivalent:

Wastewater treatment plants producing an effluent quality of CBOD₅ of 25 mg/L and TSS of 30 mg/L or better are considered as secondary equivalent plants.

Note: Wastewater treatment plants that provide only primary settling of solids and the addition of chemicals to improve the removal of TSS (and phosphorus) are not considered as secondary treatment plants or secondary equivalent plants (MOE Design Guidelines for Sewage Works, 2008).

Tertiary:

Wastewater treatment plants that have biological processes (e.g. activated sludge process and its variations, fixed film processes) and/or physical-chemical processes producing an effluent quality of CBOD₅ and TSS of 5 mg/L or better are considered tertiary plants.

Note: Biological processes such as nitrification, denitrification and enhanced biological phosphorus removal can be part of either a secondary or tertiary treatment plant. They may be described as secondary treatment plant with nitrification, secondary treatment plant with enhanced biological phosphorus removal, tertiary treatment plant with nitrification etc.

Sewer System Type:

Sanitary Sewers:

Pipes that convey sanitary sewage flows made up of wastewater discharges from residential, commercial, institutional and industrial establishments plus extraneous flow components from such sources as groundwater and surface run off.

Combined Sewers:

Pipes that convey both sanitary sewage and stormwater runoff through a single-pipe system.

Partially Separated Sewers:

Exist when either a portion of the combined sewer area was retrofitted to separate (sanitary and storm) sewers and/or a service area with combined sewers has had a new development area with separate sewers added to the service area, whatever the case may be, the final flows will be combined sewage.

Nominally Separated Sewers:

These sewers are constructed as separate sewers, but the sanitary sewers accept stormwater from roof and foundation drains (i.e., these are separated sewers in name only).

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s).
2377-ALXPQL issued on July 7, 2017.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

- a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
- b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of
the Environmental Protection Act
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 24th day of August, 2018



Fariha Pannu, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

YK/

c: DWMD Supervisor, MECP Barrie
Igor Sapun, Hatch Corporation



Ontario

Ministry of the
Environment,
Conservation and
Parks

Notice of Modification to Sewage Works

RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA ON-SITE PRIOR TO THE SCHEDULED IMPLEMENTATION DATE.

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 Number 0284-B2ML52	Issuance Date (mm/dd/yy) 08/24/18	Notice number (if applicable) 2019-01#2
ECA Owner The Corporation of the City of Barrie	Municipality The Corporation of the City of Barrie	

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

(Attach a detailed description of the sewage works)

The modifications generally consist of the installation of a new digested sludge transfer pipeline to be located in existing tunnels and underground, from existing Secondary Digester No. 1 to the existing Biosolids Holding Tank. Tie ins to existing sludge transfer piping will be made at these locations following successful installation, testing, and commissioning of the new pipeline. After the new pipeline is placed into service, the existing digested sludge transfer pipeline will be decommissioned and removed from service. Anticipated environmental effects are negligible. Contract limits duration of any sludge pumping interruption to 12 hours. Spill control plan will be implemented and tie-ins will occur within a building, minimizing risk. List of documentation as follows:


1. Sludge Transfer Line Replacement Project, Contract No. FIN2018-135T, Issued for Tender Drawings and Specifications prepared by GHD Limited, dated 11/23/18.
2. Barrie Wastewater Treatment Facility, Sludge Transfer Pip Replacement Project, Pre Design Report prepared by GHD Limited, dated April 2018.

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) Daniel Rizzuti	PEO License Number 100160750
Signature 	Date (mm/dd/yy) 05/09/19
Name of Employer GHD Limited	


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 modification 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) SALA ARANIVASUNDARAN, REN, PMP	Owner representative's title (Print) DIRECTOR OF ENGINEERING
Owner Representative's Signature 	Date (mm/dd/yy) July 4 / 2019

EAPB Form July 26, 2018



Memorandum

Draft for Review

May 23, 2019

To:	Luc Paquin, Wesley Reid, City of Barrie	Ref. No.:	11155347
From:	<i>DR WPCW</i> Daniel Rizzuti, Bill White, GHD	Tel:	519-884-0510
CC:	File		
Subject:	Detailed Description of Sewage Works Project 2018-135: Barrie Wastewater Treatment Facility Sludge Transfer Line Replacement		

Existing 150 mm cement lined ductile iron (CLDI) sludge transfer pipe from Digester Control Building No. 2 to the Sludge Holding Tank is approaching the end of its service life. Additionally, the existing routing is longer than necessary and can be shortened. Project scope includes:

1. Install approximately 85 metres of new 150 mm nominal diameter, Schedule 40S, 316 stainless sludge transfer pipe via existing Service Tunnel Nos. 7, 8, and 11, through the Basement Pump Room in Digester Control Building No. 1, and into the southernmost concrete window well outside the western face of the building
2. Install approximately 45 metres of new buried 150 mm nominal diameter, DR11 HDPE sludge transfer pipe from the southernmost concrete window well outside the western face of Digester Control Building No. 1 the basement adjacent to the existing Sludge Holding Tank, and connect to existing 150 mm nominal diameter CLDI sludge transfer piping
3. Install and connect new 150 mm magnetic flowmeter, complete with bypass pipe section
4. Pressure test pipe
5. Commission flow meter
6. Switch over from existing 150 mm CLDI pipe to new, 150 mm stainless steel and HDPE sludge transfer pipe
7. Remove existing 150 mm CLDI piping in tunnels, and cap and abandon buried piping in place
8. Heat trace exposed portion
9. Refer to design report, drawings and specifications for more details

CC. Operations



Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED CERTIFICATE OF APPROVAL
AIR
NUMBER 1316-5MKTGU
Issue Date: October 23, 2006

The Corporation of the City of Barrie
PO Box 400 Stn Main
Barrie, Ontario
L4M 4T5

Site Location: Barrie Water Pollution Control Centre
249 Bradford Street
Barrie City, County of Simcoe

RECEIVED

NOV 07 2006

CLERK'S OFFICE

You have applied in accordance with Section 9 of the Environmental Protection Act for approval of:

- one (1) odour control system, designated as OCS-IW, used to treat odorous air originating from the Influent Works Building equipped with 6.37 cubic metres of biofilter media having a continuous water consumption rate of 0.063 litre per second used for the media humidification and an intermittent water consumption rate of 0.25 to 0.38 litre per second utilized for the media irrigation, exhausting to the atmosphere at a maximum volumetric flow rate of 0.21 cubic metre per second and a maximum temperature of 25 degrees Celsius, through a stack, having an exit diameter of 0.15 metre, extending 3.0 metres above grade;
- one (1) standby diesel generator set, designated as SDG, having a nameplate capacity of 1080 kilowatts, operating at a maximum rate of 790 kilowatts to provide standby power to the Water Pollution Control Centre during emergency situations, exhausting to the atmosphere, through a stack, having an exit diameter of 0.3 metre, extending 2.5 metres above roof and 7.5 metres above grade;
- one (1) digester gas and natural gas fired engine No. 1, designated as ENG-1, having a rated heat input of 2.81 million kilojoules per hour, exhausting to the atmosphere at a maximum volumetric flow rate of 0.54 cubic metre per second through a stack, having an exit diameter of 0.25 metre, extending 3.05 metres above the roof and 12.1 metres above grade;
- one (1) digester gas and natural gas fired engine No. 2, designated as ENG-2, having a rated heat input of 2.81 million kilojoules per hour, exhausting to the atmosphere at a maximum volumetric flow rate of 0.54 cubic metre per second through a stack, having an exit diameter of 0.25 metre, extending 3.05 metres above the roof and 12.1 metres above grade;
- two (2) digester gas and natural gas fired boilers, each having a rated heat input of 3.53 and 1.94 million kilojoules per hour respectively, exhausting to the atmosphere at a maximum volumetric flow rate of 1.28 cubic metres per second through a common stack BOL, having an exit diameter of 0.5 metre,

extending 3.05 metres above the roof and 12.1 metres above grade;

- one (1) standby candlestick flare, designated as FLR, used to burn digester gas originating from the anaerobic digestion of sewage, having a maximum heat input of 7.11 million kilojoules per hour, exhausting to the atmosphere through a stack, having an exit diameter of 0.2 metre, extending approximately 6.4 metres above grade;
- one (1) odour control system designated as OCS-SR, used to treat odourous air originating from the septage receiving tank equipped with one (1) activated carbon adsorption unit, containing 91 kilograms of activated carbon, exhausting to the atmosphere at a maximum volumetric flow rate of 0.095 cubic metre per second and a temperature of 20 degrees Celsius, through a stack, having an exit diameter of 0.1 metre, extending 1.7 metres above grade;
- two (2) Aerobic Digester Reactor Mixers, installed with the tops of the mixers approximately 4 metres above grade, to provide sludge mixing in the aerobic sludge digesters. Each mixer is equipped with an 11 kilowatt, 1,760 rpm motor and has a rated capacity of 349.0 litres per second;
- nine (9) Aeration Mixers, installed approximately 2.5 metres above grade, serving three (3) high purity oxygen covered reactors, with each reactor served by one (1) 30 kilowatt Aeration Mixer and two (2) 20 kilowatt Aeration Mixers;
- twenty (20) Rotating Biological Contactors, operating in five stages in series, with four (4) Rotating Biological Contactors in each stage. Each Rotating Biological Contactor has dimensions of 3.61 metres in diameter by 7.98 metres in length, with a contacting surface area of 15,552 square metres and is equipped with a motor, rated at 6.5 amps at 1160 rpm;
- two (2) Aeration Blowers, capable of pumping ambient air into the Septage Receiving Tank at a rate of 0.05 cubic metres per second, operating with one (1) Aeration Blower on duty and one (1) Aeration Blower on standby;
- two (2) silencers, with one (1) silencer installed on the inlet of each of the two Aeration Blowers pumping ambient air into the Septage Receiving Tank, each silencer capable of providing the following minimum values of Insertion-Loss in 1/1 octave frequency bands:

Centre Frequency (Hertz)	63	125	250	500	1000	2000	4000
Insertion-Loss (decibel)	30	33	35	37	35	33	32

- two (2) silencers, with one (1) silencer installed on the discharge of each of the two Aeration Blowers pumping ambient air into the Septage Receiving Tank, each silencer capable of providing the following minimum values of Insertion-Loss in 1/1 octave frequency bands:

Centre Frequency (Hertz)	63	125	250	500	1000	2000	4000
Insertion-Loss (decibel)	35	37	39	40	42	40	38

all in accordance with an Application for a Certificate of Approval (Air), submitted by The Corporation of the City of Barrie, dated March 6, 2003 and signed by Dawn McAlpine and all supporting information associated with the application, including the information relied upon in issuance of the Certificate of Approval No. 8-3278-93-006 dated August 13, 1993; the Emission Summary and Dispersion Modelling Report prepared by CH2MHILL, dated March 6, 2003 and signed by Kimberly Ireland; the revised Emission Summary and Dispersion Modelling Report (Addendum #1) prepared by CH2MHILL, dated October 28, 2003 and signed by Kimberly Ireland; the acoustical report entitled "Noise Impact Assessment, Barrie Water Pollution Control Centre" prepared by Valcoustics Canada Ltd., dated August 11, 2004 and signed by John Emeljanow; the revised Emission Summary and Dispersion Modelling Report (Addendum #2) prepared by CH2MHILL, dated March 30, 2005 and signed by Kimberly Ireland; a letter with the subject heading "Addendum #3 for Application for Amendment to Certificate of Approval (Air) for the Barrie Water Pollution Control Centre", prepared by CH2MHILL, dated August 4, 2005 and signed by Sinclair Garner and Kimberly Ireland; a letter with the subject heading "Addendum #2 for Application for Amendment to Certificate of Approval (Air) for the Barrie Water Pollution Control Centre", prepared by CH2MHILL, dated August 25, 2005 and signed by Sinclair Garner; an updated report entitled "Addendum #4 for Application for Amendment to Certificate of Approval (Air) for the Barrie Water Pollution Control Centre", prepared by CH2MHILL, dated March 3, 2006 and signed by Sinclair Garner and Kimberly Ireland; a facsimile transmission with the subject heading "Addendum #5 for the Barrie Water Pollution Control Centre", prepared by Kimberly Ireland of CH2MHILL, dated September 20, 2006; and a facsimile transmission with the subject heading "Comments Regarding Draft CofA for the Barrie Water Pollution Control Centre", prepared by Kimberly Ireland of CH2MHILL, dated September 28, 2006.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

- (1) "Acoustical Consultant" means a person currently active in the field of environmental acoustics and noise/vibration control, who is familiar with Ministry noise guidelines and procedures and has a combination of formal university education, training and experience necessary to assess noise emissions from a Facility;
- (2) "Acoustic Audit" means an investigative procedure consisting of measurements and/or acoustic modelling of all sources of noise emissions due to the operation of the Facility, assessed to determine compliance with the performance limits for the Facility regarding noise emissions, completed in accordance with the procedures set in Publication NPC-103 and reported in accordance with Publication NPC-233;
- (3) "Acoustic Audit Report" means a report presenting the results of an Acoustic Audit, prepared in accordance with Publication NPC-233;
- (4) "Act" means the Environmental Protection Act;
- (5) "Certificate" means this Certificate of Approval;
- (6) "Company" means The Corporation of the City of Barrie;

- (7) "Director" means any Ministry employee appointed by the Minister pursuant to Section 5 of the Act;
- (8) "District Manager" means the District Manager of the appropriate local district office of the Ministry, where the Facility is geographically located;
- (9) "Equipment" means the odour control system and the flare described in the Company's application, this Certificate and in the supporting documentation submitted with the application, to the extent approved by this Certificate;
- (10) "Facility" means the entire operation located on the property where the Equipment is located;
- (11) "Independent Acoustical Consultant" means an Acoustical Consultant not representing the Company, and not involved in the noise impact assessment or the design/implementation of noise control measures for the Facility. The Independent Acoustical Consultant shall not be retained by the consultant involved in the noise/vibration impact assessment or the design/implementation of noise/vibration control measures for the Facility;
- (12) "Manual" means a document or a set of documents that provide written instructions to staff of the Company;
- (13) "Ministry" means the Ontario Ministry of the Environment;
- (14) "Publication NPC-103" means Publication NPC-103 of the Model Municipal Noise Control By-Law, Final Report, August, 1978, as amended;
- (15) "Publication NPC-205" means Publication NPC-205, Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban), October, 1995; and
- (16) "Publication NPC-233" means Publication NPC-233, Information to be Submitted for Approval of Stationary Sources of Sound, October 1995.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

- 1. The Company shall carry out testing of the standby generator set at the reduced load capacity and when the winds are from the north.
- 2. The Company shall restrict periodic testing of the standby generator set to the daytime period between 7:00 AM and 7:00 PM.
- 3. The Company shall, at all times, ensure that the noise emissions from the Facility comply with the limits determined in accordance with Ministry Publication NPC-205.

OPERATION AND MAINTENANCE

4. The Company shall ensure that the Equipment is properly operated and maintained at all times. The Company shall:
- (1) prepare, not later than three (3) months after the date of this Certificate, and update, as necessary, a Manual outlining the operating procedures and a maintenance program for the Equipment, including:
 - (a) routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the Equipment suppliers;
 - (b) emergency procedures;
 - (c) procedures for any record keeping activities relating to operation and maintenance of the Equipment; and
 - (d) all appropriate measures to minimize noise and odorous emissions from all potential sources;
 - (2) implement the recommendations of the Manual.

RECORD RETENTION

5. The Company shall retain, for a minimum of two (2) years from the date of their creation, all records and information related to or resulting from the recording activities required by this Certificate, and make these records available for review by staff of the Ministry upon request. The Company shall retain:
- (1) all records on the maintenance, repair and inspection of the Equipment;
 - (2) all records of the date, time, duration, fuel consumption rate, wind direction and reason, whenever the diesel generator set is operated; and
 - (3) all records on the environmental complaints; including:
 - (a) a description, time and date of each incident;
 - (b) wind direction at the time of the incident; and
 - (c) a description of the measures taken to address the cause of the incident and to prevent a similar occurrence in the future.

NOTIFICATION OF COMPLAINTS

6. The Company shall notify the District Manager, in writing, of each environmental complaint within two (2) business days of the complaint. The notification shall include:
 - (1) a description of the nature of the complaint; and
 - (2) the time and date of the incident;

ACOUSTIC AUDIT

7. The Company shall carry out acoustic audit measurements on the actual noise emissions due to the operation of the Facility. The Company:
 - (1) shall carry out acoustic audit measurements in accordance with the procedures in Publication NPC-103;
 - (2) shall submit an Acoustic Audit Report on the results of the Acoustic Audit, prepared by an Independent Acoustical Consultant, in accordance with the requirements of Publication NPC-233, to the District Manager and the Director not later than three (3) months after the date of this Certificate or commencement of operation of the Facility.
8. The Director:
 - (1) may not accept the results of the Acoustic Audit if the requirements of Publication NPC-233 were not followed;
 - (2) may require the Company to repeat the Acoustic Audit if the results of the Acoustic Audit are found unacceptable to the Director.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition No. 1 is included to emphasize that the Equipment must be operated according to a procedure that will result in compliance with the Act, the regulations and this Certificate.
2. Condition No. 2 is included to ensure that the proposed standby operation, excluding emergency situations, is not extended beyond the stated hours. Operation outside these hours, when ambient sound levels are significantly lower, may result in non-compliance with the established sound level limits.
3. Condition No. 3 is included to provide the minimum performance requirements considered necessary to prevent an adverse effect resulting from the operation of the Facility.
4. Condition No. 4 is included to emphasize that the Equipment must be maintained and operated according to a procedure that will result in compliance with the Act, the regulations and this Certificate.
5. Condition No. 5 is included to require the Company to keep records and to provide information to staff of the Ministry so that compliance with the Act, the regulations and this Certificate can be verified.

6. Condition No. 6 is included to require the Company to notify staff of the Ministry so that compliance with the Act, the regulations and this Certificate can be verified.
7. Condition No. 7 is included to require the Company to gather accurate information so that the environmental impact and subsequent compliance with the Act, the regulations and this Certificate can be verified.
8. Condition No. 8 is included to ensure that the Acoustic Audit is carried out in accordance with procedures set in the Ministry's Noise Guidelines and verifies compliance with Condition No. 3.

This Certificate of Approval revokes and replaces Certificate(s) of Approval No. 8-3278-93-006 issued on August 13, 1993

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 9, *Environmental Protection Act*
Ministry of Environment and Energy
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca

The above noted works are approved under Section 9 of the Environmental Protection Act.

DATED AT TORONTO this 23rd day of October, 2006

From: Stuhlemmer, Brian (MECP) [mailto:Brian.Stuhlemmer@ontario.ca]
Sent: Friday, February 07, 2020 8:33 AM
To: Luc Paquin <Luc.Paquin@barrie.ca>
Cc: Martin Shaw <Martin.Shaw@barrie.ca>; Hood, Cindy (MECP) <cindy.hood@ontario.ca>; Broeckel, Sheri (MECP) <Sheri.Broeckel@ontario.ca>
Subject: RE: ECA 0284-B2ML52 - proposed works, 2017-042 WwTF Upgrades

Thanking-you for the updates Luc,
Confirming receipt of your notification to the Ministry of completion and commissioning of proposed works for the wastewater treatment system. By way of this email, I am forwarding the municipality's notice to the Ministry's District Manager in concordance with the terms and conditions within Environmental Compliance Approval # 284-B2ML52.

3. CONSTRUCTION OF PROPOSED WORKS / RECORD DRAWINGS

1. All Proposed Works in this Approval shall be constructed and installed and must commence operation within five (5) years of issuance of this Approval, after which time the Approval ceases to apply in respect of any portions of the Works not in operation. In the event that the construction, installation and/or operation of any portion of the Proposed Works is anticipated to be delayed beyond the time period stipulated, the Owner shall submit to the Director an application to amend the Approval to extend this time period, at least six (6) months prior to the end of the period. The amendment application shall include the reason(s) for the delay and whether there is any design change(s).
2. Within thirty (30) days of commencement of construction, the Owner shall prepare and submit to the District Manager a schedule for the completion of construction and commissioning operation of the Proposed Works. The Owner shall notify the District Manager within thirty (30) days of the commissioning operation of any Proposed Works. Upon completion of construction of the Proposed Works, the Owner shall prepare and submit a statement to the District Manager, certified by a Professional Engineer, that the Proposed Works is constructed in accordance with this Approval.
3. Within one (1) year of completion of construction of the Proposed Works, a set of record drawings of the Works shall be prepared or updated. These drawings shall be kept up to date through revisions undertaken from time to time and a copy shall be readily accessible for reference at the Works.

Regards,
Brian H. Stuhlemmer
Ministry of the Environment, Conservation and Parks
Barrie District Office, 54 Cedar Pointe Drive, Unit 1203
Barrie, ON, L4N 5R7 • T (705) 721-3768



24/7 Spills Action Centre | (800) 268-6060
24/7 Pollution Hotline | (866) 663-8477 • moe.tips@ontario.ca

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<https://www.ontario.ca/page/ministry-environment-conservation-parks>

<https://www.facebook.com/ONenvironment/>

<https://twitter.com/ONenvironment>

From: Luc Paquin <Luc.Paquin@barrie.ca>

Sent: February 06, 2020 4:03 PM

To: Stuhlemmer, Brian (MECP) <Brian.Stuhlemmer@ontario.ca>

Cc: Martin Shaw <Martin.Shaw@barrie.ca>; Dan O'Neill <Dan.O'Neill@barrie.ca>; Kiran Suresh <Kiran.Suresh@barrie.ca>; Sherry Diemert <Sherry.Diemert@barrie.ca>; Sandy Coulter <Sandy.Coulter@barrie.ca>

Subject: RE: ECA 0284-B2ML52 - proposed works, 2017-042 WwTF Upgrades

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Brian,

Referencing the MECP ECA 0284-B2ML52, please note that the following Proposed Works at the Barrie Wastewater Treatment Facility have been commissioned and have been placed into service:

Secondary Treatment Systems, Biological Treatment

Existing three (3) mixers within the selector tank have been relocated at different location within the tank.

Three (3) new mixers within the selector have been installed to increase the total number of mixers to six (6) within the selector.

Sludge Management System, Sludge Digestion, Primary Digesters

The two existing 100kW circuits of the 200kW existing heat exchanger within Primary Digester No.3 have been combined into one.

Two (2) new heat exchangers within Primary Digester No.3 have been installed, each having a capacity of approximately 300kW.

Should you have any questions, please feel free to contact us.

Luc Paquin

Senior Project Administration Technologist, Construction/
technologue senior de la gestion de projet, construction
Certified health & safety worker representative/
représentant certifié des travailleurs pour la santé et la sécurité

Infrastructure Department



City of Barrie: City Hall, 70 Collier Street, P.O. Box 400, Barrie ON, L4M 4T5
Office: 705-739-4220 x5226 | Fax: 705-739-4248

www.barrie.ca

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From: Stuhlemmer, Brian (MECP) [<mailto:Brian.Stuhlemmer@ontario.ca>]
Sent: 3-Apr-19 08:45
To: Luc Paquin <Luc.Paquin@barrie.ca>; Martin Shaw <Martin.Shaw@barrie.ca>
Subject: RE: 2017-042 WwTF Upgrades (heat exchanger, selector mixers, water balancing) - Commencement of Construction

Thanking-you for the schedule.

Will distribute at the local Office as appropriate.

Regards,

Brian H. Stuhlemmer

Inspector | inspecteur, Provincial Officer | Agent provincial

Ministry of the Environment, Conservation and Parks

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Barrie District Office, 54 Cedar Pointe Drive, Unit 1203

Barrie, ON, L4N 5R7 • T (705) 739-6384



From: Luc Paquin <Luc.Paquin@barrie.ca>
Sent: April 02, 2019 4:07 PM

To: Martin Shaw <Martin.Shaw@barrie.ca>

Cc: Stuhlemmer, Brian (MECP) <Brian.Stuhlemmer@ontario.ca>; Allen Baker <Allen.Baker@barrie.ca>; Dan O'Neill <Dan.O'Neill@barrie.ca>; Greg Jorden <Greg.Jorden@barrie.ca>; Sandy Coulter <Sandy.Coulter@barrie.ca>

Subject: FW: 2017-042 WwTF Upgrades (heat exchanger, selector mixers, water balancing) - Commencement of Construction

Martin,

Appended for your information and as per the Barrie Wastewater Treatment Facility ECA, please find the construction schedule for the plant heat exchanger, water balancing, and selector tank mixers project.

Please note that the commissioning for the mixers portion of the project, although not specifically identified on the schedule will be occurring around the second week of May 2019.

Luc Paquin

Senior Project Administration Technologist, Construction/

technologue senior de la gestion de projet, construction

Certified health & safety worker representative/

représentant certifié des travailleurs pour la santé et la sécurité

Engineering Department



City of Barrie: City Hall, 70 Collier Street, P.O. Box 400, Barrie ON, L4M 4T5

Office: 705-739-4220 x5226 | Fax: 705-739-4248

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From: Martin Shaw <Martin.Shaw@barrie.ca>

Sent: March 12, 2019 4:10 PM

To: Stuhlemmer, Brian (MECP) <Brian.Stuhlemmer@ontario.ca>

Cc: Sandy Coulter <Sandy.Coulter@barrie.ca>; Greg Jorden <Greg.Jorden@barrie.ca>; Dan O'Neill <Dan.O'Neill@barrie.ca>; Allen Baker <Allen.Baker@barrie.ca>; Luc Paquin <Luc.Paquin@barrie.ca>

Subject: Commencement of Construction

Hi Brian

This is just an informal heads up that we will begin work on the selector upgrades and digester heater upgrades this week. This work (the “Proposed Works”) was the reason for re-issuing the ECA last year.

We will follow up with a schedule within 30 days of commencement of construction as required by the ECA. The work is expected to continue at least into May. We will temporarily switch from using the selector to the old splitter box. This is explicitly provided for in the ECA. The selector contents will be transferred into the tankage that remains in use. We expect no bypasses or overflows or significant loss of treatment nor do we expect any unusual air emissions.

Should you have any questions or comments please feel free to contact me.

Thanks,

Martin Shaw, P. Eng.,
Supervisor of Technical Services
Wastewater Operations Branch
Environmental Services Department
(705)739-4220 x 5242



February 3, 2020

Reference No. 11155347

Aaron Smits, Project Manager
BGL Contractors Corporation
608 Colby Drive
Waterloo, ON N2V 1A2

By email

Dear Mr. Smits:

**Re: Substantial Performance – Contract No. 2018-135Q
Sludge Transfer Line Replacement at the Barrie Wastewater Treatment Facility
249 Bradford Street, Barrie, Ontario**

GHD Limited and the City of Barrie are in receipt of BGL Contractors Corporation's revised application for Substantial Performance dated January 16, 2020. In accordance with the Construction Act, the above-noted project is certified as Substantially Performed. Enclosed is a Certificate of Substantial Performance for this contract.

BGL will note that Payment Certificate 7 included two cost items which have not yet been approved as Change Orders, and for which no payment was made:

- CO 002 for pipe re-routing (value \$5,170.00) which has not yet been formally executed; and
- CO 003 for HDPE electrofusion (Value \$3,395.53).

These items are expressly excluded from the calculation as they are not yet approved or paid extra costs.

Please arrange for the publication of this Certificate of Substantial Performance in a construction trade newspaper, i.e. Daily Commercial News, and provide proof of the publication to the City and GHD. The basic holdback will become eligible for payment sixty (60) days after the date of the publication.