



2019 Annual Performance Report

Craigleith Wastewater Treatment Plant

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Executive Summary

This report has been prepared as required by Amended Environmental Compliance Approval 5338-ASUR85, Section 11 issued to the Craigleith Wastewater Treatment Plant.

Section 11 (4) requires the Owner to prepare performance reports on a calendar year basis and submit to the Water Supervisor by March 31 of the calendar year following the period being reported upon. The report shall contain, but shall not be limited to, the following information pertaining to the reporting period:

- a. Summary and interpretation of all Influent monitoring data, including sewage characteristics, flow rates and a comparison to the values used in the design of the Works;
- b. 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. Summary of all operating issues encountered, and corrective actions taken;
- d. 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;
- e. Summary of any effluent quality assurance or control measures undertaken;
- f. Summary of the calibration and maintenance carried out on all Influent, and Final Effluent monitoring equipment;
- g. Summary of efforts made to achieve the design objectives;
- h. Tabulation of the volume 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;
- i. Summary of any complaints received, and any steps taken to address the complaints;
- j. Summary of all Bypasses, Overflows, spills within the meaning of Part X of EPA and abnormal discharge events, and other abnormal operating conditions;
- k. Copy of all Notice of Modifications to Sewage Works submitted to the Water Supervisor under paragraph 1.d. of Condition 10, with a summary report on status of implementation of all modification.

All the requirements listed in Section 11 (4) have been met and will be further explored throughout the report. The Town continues to successfully operate the Craigleith Wastewater Treatment System in accordance with regulatory requirements.

Facility Information

The Craigleith Wastewater Treatment Plant is an extended aeration treatment plant with a rated capacity of 8,133 m³/day. Extended aeration is a modification of the conventional activated sludge treatment process. This form of treatment was selected to allow for the fluctuating loads associated with the recreational / seasonal residential area serviced by the plant, and to limit the quantity of sludge generated by the plant. The treatment process

selected (extended aeration) produces a very low volume of sludge compared to a conventional activated sludge plant.

Due to the sensitivity of the receiving body of water (the Mary Ward shoals area of Georgian Bay), the treatment process is required to produce a high-quality effluent with an extremely low level of phosphorus. In order to reduce phosphorus to the required level, it is necessary to apply a chemical coagulant (aluminum sulphate) and to provide tertiary treatment of the plant effluent prior to discharge. The tertiary treatment in this plant is achieved through the use of gravity sand filters.

The following subsections details the various monitoring streams required for compliance at the Craileith Wastewater Treatment Plant.

Monitoring and Compliance

Town Staff ensure that at all times the sewage works and related equipment and appurtenances which are installed or used to achieve compliance are properly operated and maintained.

A. Interpretation of Influent Monitoring and Analytical Data

A comprehensive interpretation of all monitoring and analytical data collected during the reporting period, in comparison to the effluent quality and quantity criteria, is outlined below:

Capacity Assessment – Table No. 1

| Year | 2019 | 2018 | 2017 | 2016 | 2015 |
|--|-------------|-------------|-------------|-------------|-------------|
| Average Day Flow (m ³ /d) | 3,440 | 3,284 | 3,383 | 3,204 | 2,863 |
| Average Design Capacity (m ³ /d) | 8,133 | 8,133 | 8,133 | 8,133 | 8,133 |
| % of capacity (based on average daily flows) | 42% | 40% | 39% | 39% | 35% |
| Peak Day Flow (m ³ /d) | 8,931 | 10,491 | 8,956 | 12,428 | 6,529 |
| Peak Design Capacity | 19,640 | 19,640 | 19,640 | 19,640 | 19,640 |
| Raw Sewage Total Flow (m ³) | 1,254,469 | 1,197,175 | 1,232,773 | 1,172,044 | 1,045,200 |

Capacity rating is based on Annual Flow Data.

2019 Raw Sewage Loading Objectives (kg/d) – Table No. 2

| Influent Parameter | Design | Annual Average Loading | % of Design | Was Design Exceeded? |
|------------------------|--------|------------------------|-------------|----------------------|
| BOD | 1,261 | 487 | 38% | No |
| Total Suspended Solids | 1,454 | 664 | 46% | No |
| Total Phosphorus | 81 | 7.99 | 10% | No |
| Total Kjeldahl | 291 | 62 | 21% | No |

Chart No. 1: Craigleith Wastewater Treatment Plant 2019 Monthly Flow Data

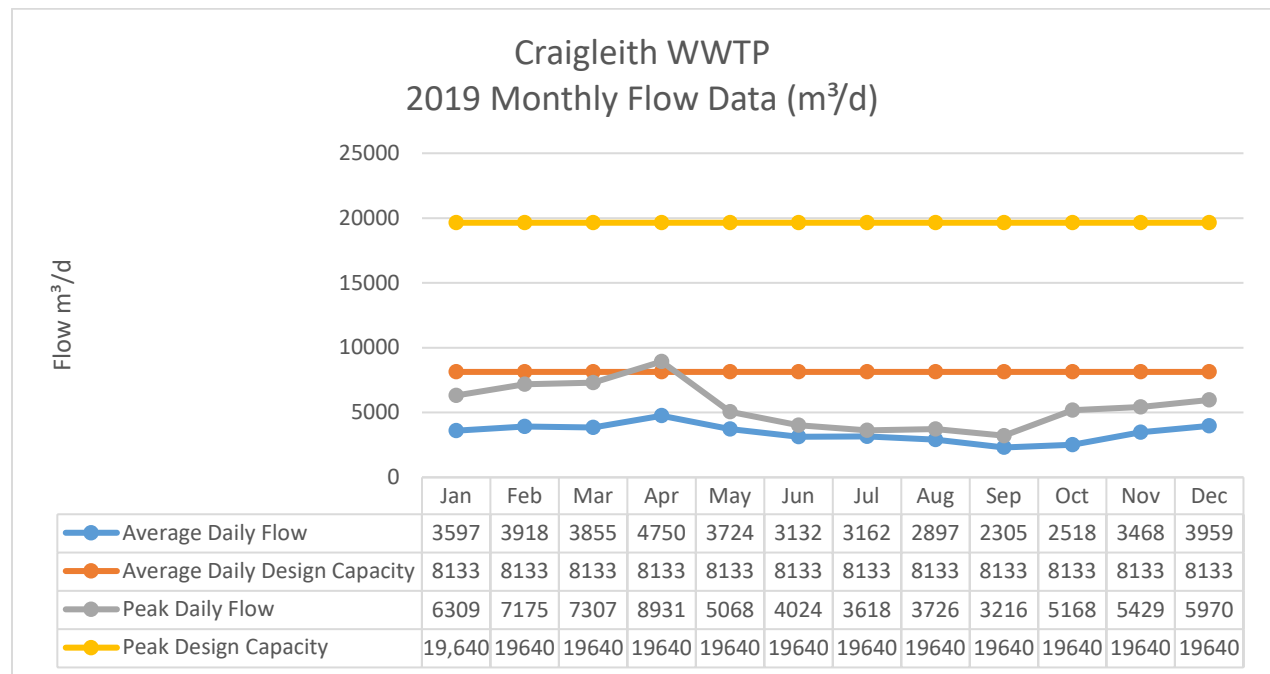
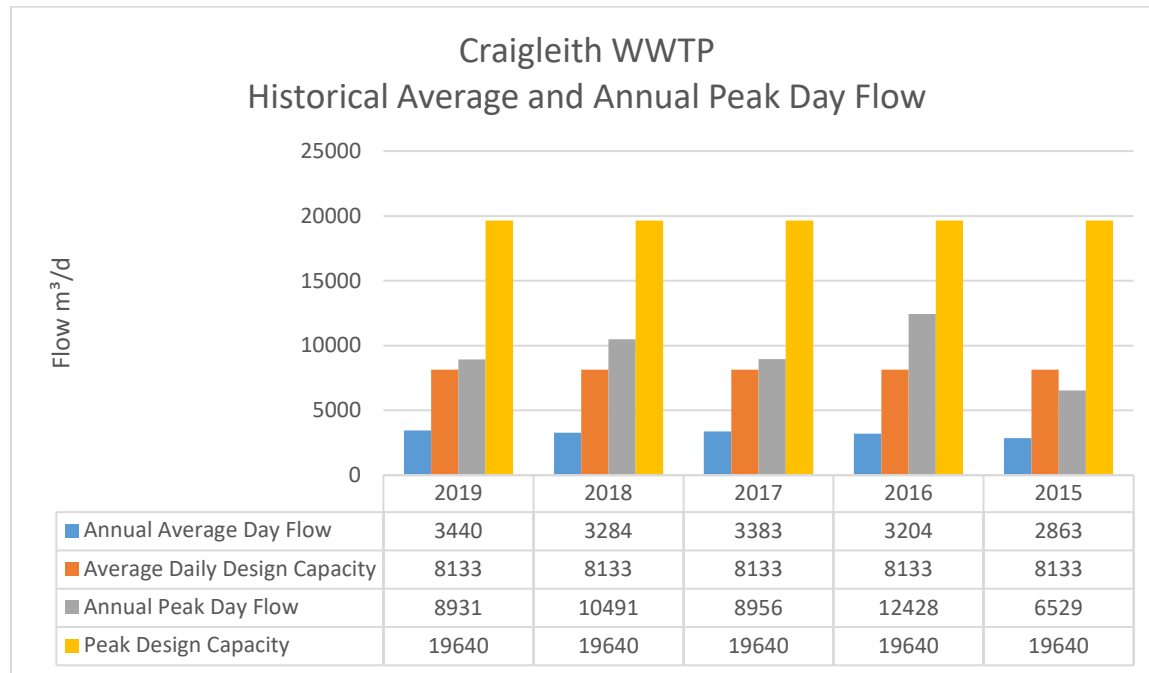


Chart No 2: Craigleith WWTP Historical Average and Peak Day Flow



The Annual Peak Day Flow is calculated using the average of the monthly Peak Day Flow events.

B. Summary and Interpretation of Final Effluent Monitoring Data

2019 Effluent Objectives

Amended Compliance Approval Number 5338-ASUR85 establishes the following effluent limits:

Table No. 3

| Effluent Parameter | Concentration Objective (mg/L) | Concentration Achieved (mg/L) | Was Objective Met? |
|------------------------|--------------------------------|-------------------------------|--------------------|
| CBOD5 | 10 | 2.33 | Yes |
| Total Suspended Solids | 5 | 2.43 | Yes |
| Total Phosphorus | 0.20 | 0.06 | Yes |
| Un-ionized Ammonia | 0.10 | 0.005 | Yes |
| E.Coli | 200 organisms per 100 mL | 2.8 (Geometric Mean) | Yes |
| pH | 6.5-8.5 inclusive | 7.5 | Yes |

pH was maintained at 7.5 which is compliant with the range of 6.5 to 9.5 inclusive, at all times.

2019 Plant Performance

Table No. 4

| Effluent Parameter Average Daily Effluent Flow 2747m3 | Design (kg/d) | Annual Average Loading (kg/d) | Was Design Exceeded? |
|--|----------------------|--|---------------------------------|
| CBOD5 | 122 | 6.31 | No |
| Total Suspended Solids | 122 | 6.46 | No |
| Total Phosphorus | 2.4 | 0.167 | No |
| Un-ionized Ammonia | 1.6 | 0.015 | No |

2019 Final Effluent Compliance Limits

Table No. 5

| Final Effluent Parameter | Concentration Limit (mg/L) | Concentration Achieved (mg/L) | Was Objective Met? |
|---------------------------------|---------------------------------------|--|---------------------------|
| COD5 | 15 | 2.33 | Yes |
| Total Suspended Solids | 15 | 2.43 | Yes |
| Total Phosphorus | 0.30 | 0.064 | Yes |
| Un-ionized Ammonia | 0.20 | 0.005 | Yes |
| E.Coli | 200 organisms per 100 mL | 2.8 (Geometric Mean) | Yes |
| pH | 6.5 – 9.5 inclusive | 7.5 | Yes |

Chart No. 3 – Craigleith WWTP Monthly Average Effluent Waste Loadings

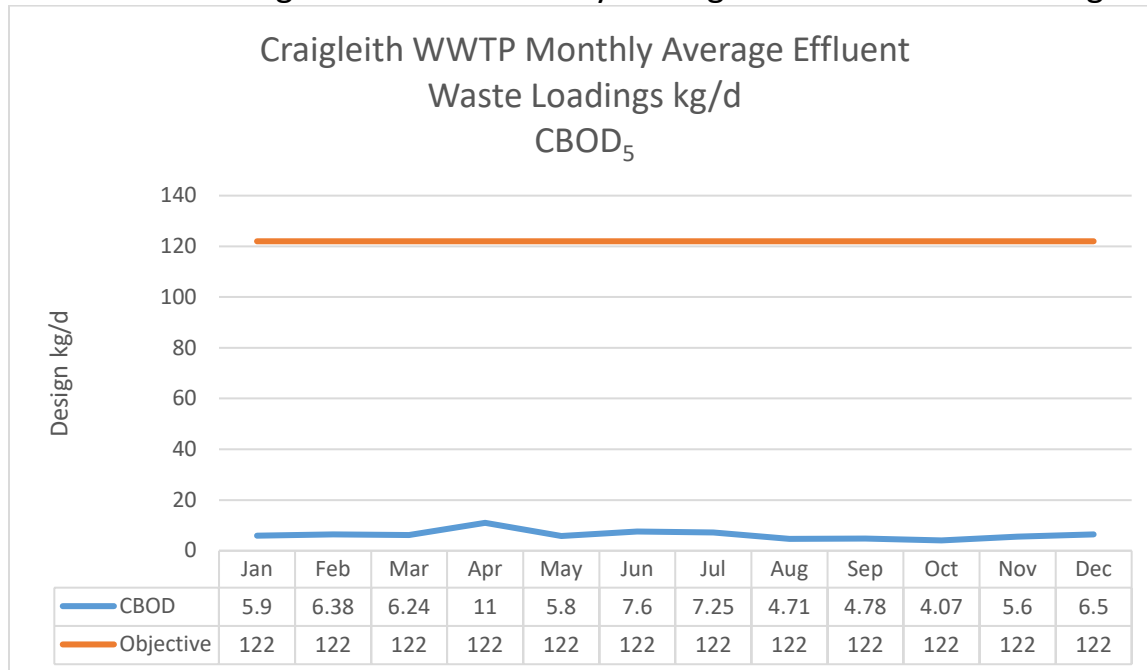


Chart No. 4 – Craigleith Effluent Waste Loadings – Suspended Solids

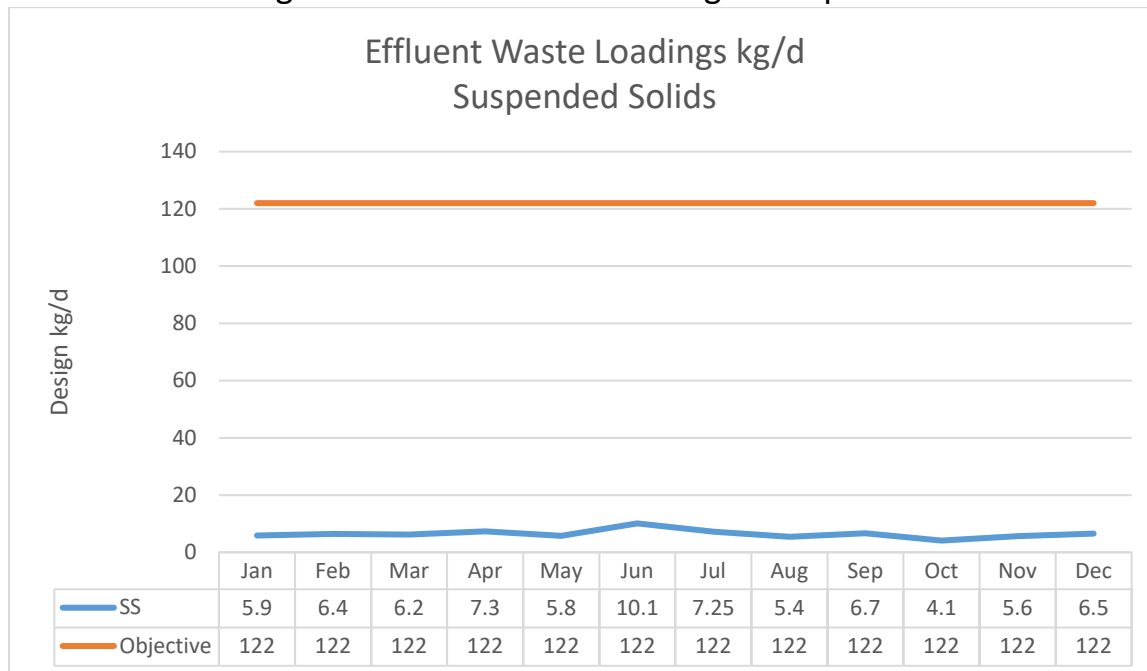
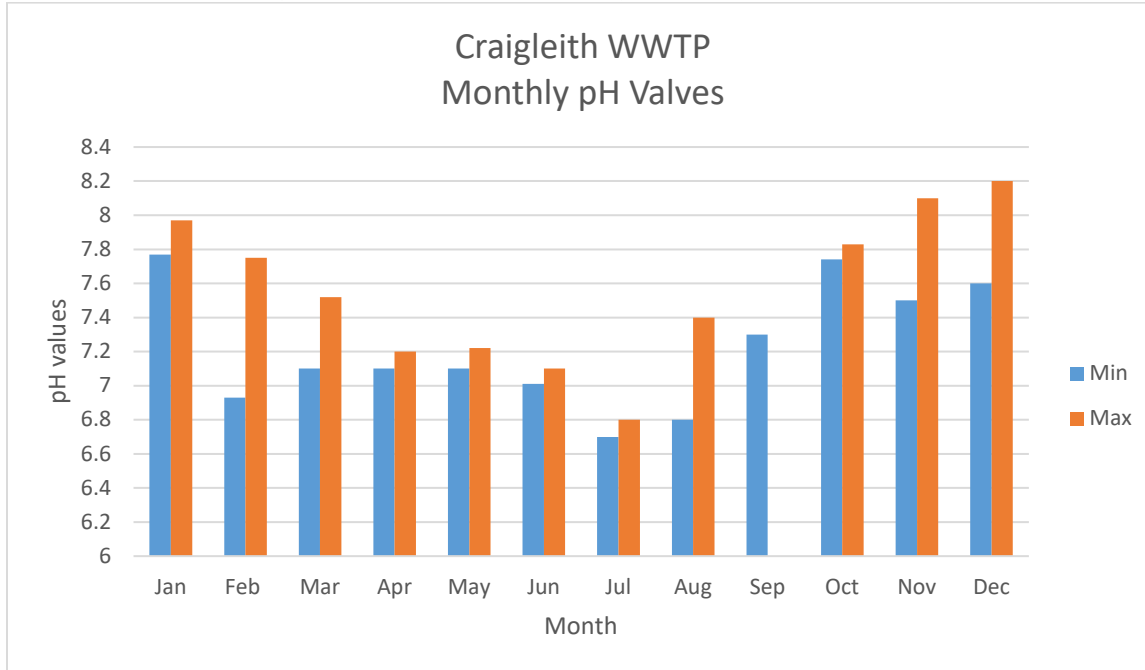


Chart No. 5 – Craigleith WWTP Monthly pH Valves



C. Summary of Operating Issues Encountered and Corrective Actions Taken

There were no operating issues during this reporting period.

D. Summary of Normal and Emergency Repairs and Maintenance Activities Performed

- All flow meters calibrated
- Three hundred (300) manholes were inspected
- 1,600 meters of collection system flushed
- 7,671 meters of sewer mains and 1,619 meters of laterals were assessed during the sewer main condition assessment
- A total of (10) ten pumps at the Craigleith WWTP were serviced
- A total of (6) six pumps in the collection system were serviced
- (4) Four blowers were serviced
- Emergency lighting replacement
- Upgrades to SCADA Programmable Logic Control (PLC)
- Replacement of SCADA System Servers

In accordance with Condition (8) of the ECA, 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.

The Craigleith WWTP employs a planned maintenance program that ensures the sewage works and related equipment installed or used to achieve compliance are properly operated and

maintained. Licensed Operators perform routine maintenance on all equipment including pumps, monitoring equipment, alarm systems, safety equipment, and other treatment components. Both routine and non-routine (emergency) maintenance activities are conducted in accordance with manufacturers' instructions.

E. Effluent Quality Control Measures

Effluent quality assurance is controlled by monthly effluent concentrations and waste loading calculations which are submitted to the Owen Sound Office Ministry of the Environment Conservation and Parks (MECP).

As indicated by the effluent concentration and waste loading chart, the Craigleith WWTP continues to experience a high degree of removal efficiency, thus this facility was operated within its Environmental Compliance Approval design objective.

Table No. 6

| Effluent Parameter | % Removal Efficiency (Annual Average) |
|---------------------------|--|
| CBOD5 | 99.95 % |
| Suspended Solids | 99.95 % |
| Total Phosphorus | 99.99 % |
| Unionized Ammonia | 99.99 % |

F. Evaluation of Calibration and Maintenance Conducted on Monitoring Equipment

The Town is required to monitor and record the flow rate and daily quantity of the following sewage streams with an accuracy to within plus or minus 15 per cent of the actual flowrate:

- a. Influent flow to the Sewage Treatment Plant is measured by continuous flow measuring devices and instrumentations/pumping rates;
- b. Final Effluent discharged from the Sewage Treatment Plant is measured by continuous flow measuring devices and instrumentations/pumping rates.

Calibration of the monitoring equipment was completed in April 2019 and is attached for reference as Appendix A. All calibration results received met the accuracy requirement.

G. Summary of Efforts Made to Achieve Design Objectives

Through a set maintenance schedules and weekly in-house compliance monitoring lab work, Operations Staff monitor the design objectives for the Craigleith WWTP.

H. Volume of Sludge generated in 2019 / Anticipated Volumes in 2020

Secondary sludge is treated aerobically in a two-stage digester. Gravity thickening is achieved in the holding tanks to approximately 3 to 4 % solids. Loadings increased slightly in 2019 resulting in 4,478 cubic meters of bio-solids removed. 1,728 cubic meters were removed for agriculture application under NASM # 23982 and 2,750 cubic meters were sent to the Biosolids Contractor's storage lagoons due to wet weather conditions. The anticipated volume for agriculture use in 2020 is 5,000 cubic meters.

I. Summary of Complaints Received in 2019

There were (4) four odor complaints received at the Craighleith Wastewater Treatment Plant in 2019. The complaints were related to hauled in leachate. The landfill is installing a new form of odor control to assist with odor issues. Copies of the odor complaints were sent to the local MECP Office.

J. Summary of Bypasses, Overflow, or other situations outside Normal Operating Conditions

In accordance with Condition 5 of the ECA, this report must provide a summary of all by-passes, spills or abnormal discharge events.

A by-pass refers to the diversion of sewage around one or more unit processes within the treatment facility, whereby diverted sewage flows are returned to the treatment facility upstream of the final effluent sampling location and are discharged to the environment through the plant outfall. By-passes are prohibited except in certain situations and may be planned (i.e. for maintenance or research purposes) or unplanned (i.e. emergency situations or high flow conditions).

A plant overflow means a discharge to the environment from the sewage treatment facility at a location other than the plant outfall or into the plant outfall downstream of the final effluent sampling locations. Overflows are prohibited except in certain situations and special reporting, sampling, and recording requirements apply in the event of an overflow. Overflows may be generally the result of heavy rainfall or snow melt events, such that the system becomes hydraulically overloaded.

Spills are releases of pollutants into the natural environment from or out of a structure, vehicle or other container that is abnormal in quality or quantity in light of all the circumstances of the discharge. Spills are generally the result of mechanical, electrical, automation or process failures. Abnormal discharge events include any other abnormal events not otherwise classified as a bypass, overflow, or spill.

There were no by-passes, overflows, spills or abnormal discharge events for the Craighleith WWTP during the reporting period.

K. Summary of Notice of Modifications to Sewage Works Completed

There were no Notice of Modifications to Sewage Works Completed in 2019.