



Wastewater Operations

Annual Performance Report
~ Cookstown Water Pollution Control Plant ~
ECA #9741-B4GRWZ
~ Town of Innisfil ~

Reporting Year – 2020

Introduction

Effective January 1, 2016, the Town of Innisfil (TOI) transferred ownership of its municipal sewage works to InnServices Utilities Inc. (InnServices). InnServices is a municipal service corporation, wholly-owned by the Town of Innisfil, charged with the responsibility to operate, maintain and expand the municipal sewage works that service the Town of Innisfil.

InnServices has prepared this Summary Report for the operations conducted during the 2020 calendar year.

This Annual Report has been prepared to meet the following commitments:

- To provide InnServices Utilities Inc. Board of Directors, as Owners of the sewage works, a summary of the operations and maintenance of the Cookstown Water Pollution Control Plant that took place during the reporting period of January 1 to December 31, 2020; and
- To comply with Condition 11 of ECA #9741-B4GRWZ

This Annual Report, provided to the InnServices Board of Directors and Town of Innisfil Mayor and Council, conveys information related to the performance of operations and maintenance, which aids decision making related to system expansion needs.

The Cookstown Water Pollution Control Plant (WPCP) is a package extended aeration facility constructed in 1986, located at 59 Victoria Street West in Cookstown. The treated effluent is discharged seasonally, as guided by the ECA, to Innisfil Creek through a combination of force and gravity mains. The collection system consists of approximately 14 km of gravity sewers servicing the community of Cookstown.

Environmental Compliance Approval

For the reporting period covered in this report, InnServices Utilities Inc. was defined as the Operating Authority of the Cookstown Water Pollution Control Plant (WPCP) and the associated collection system.

The treatment facility and collection system are operated under the following Certificates of Classification:

Class II Wastewater Treatment certificate #950
Class I Wastewater Collection certificate #1479

The Cookstown WPCP operated under Environmental Compliance Approval (ECA) #9741-B4GRWZ on May 29, 2019. The ECA identifies a design capacity of 825 m³/day.

ECA Number 4098-BC2SMK was issued May 30, 2019 for the Cookstown Sewage Collection System.

Influent Monitoring

The 2020 average daily influent flow was 586 m³ or 71% of plant capacity.

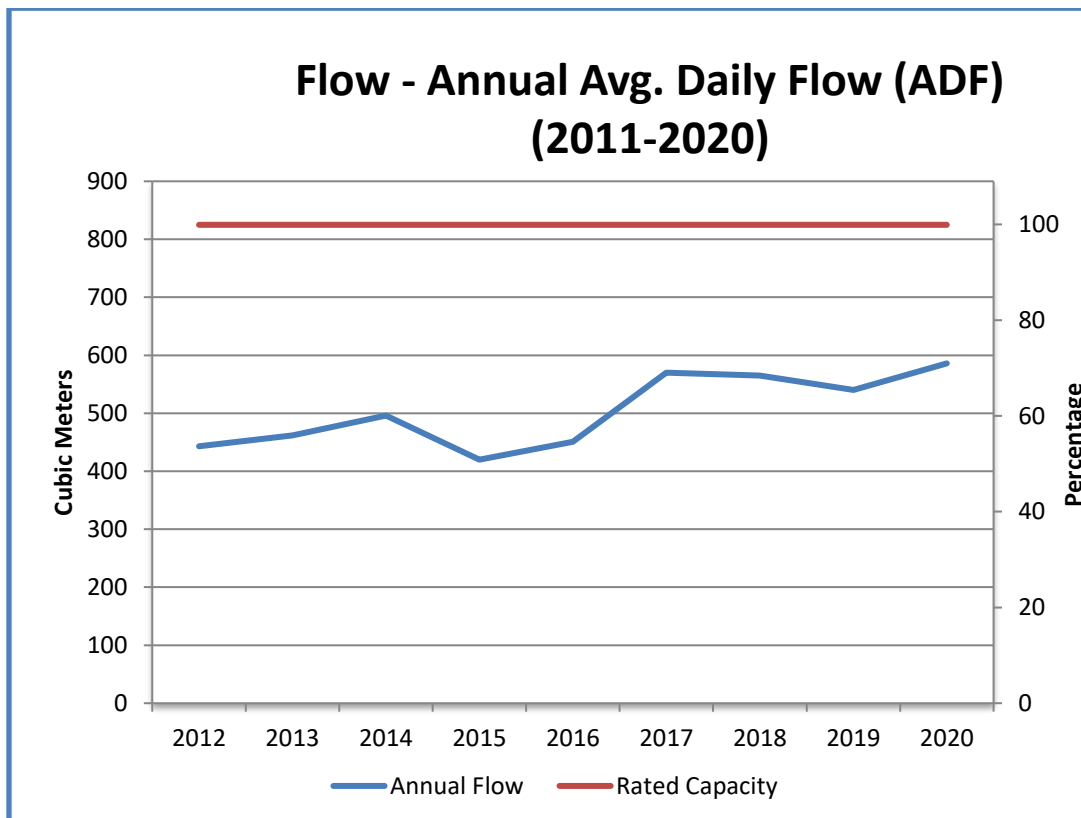
The plant received a raw influent total of 214,408 m³ for the entire year.

The 2020 maximum daily flow occurred January 11, when the flow recorded was 2,542.6 m³.

The overall removal efficiency is 94.3%.

Cookstown Flows	Design Capacity	80% of Rated Capacity	2020 Flows	Performance
Daily Flow	825 m ³ / day	660 m ³ / day	586 m ³ /day Avg. Daily Flow	71% of Design
Peak Flow	2634 m ³ /day	2107 m ³ / day	2542.6 m ³ /day (Jan. 11, 2020)	96.5% of Design
Annual Total	-----	-----	214,408	

Figure 1 below provides a visual display of the annual average day influent flow trend for the ten year period of 2011 – 2020.



Monitoring of influent requires monthly sampling. The annual averages and removal efficiencies are depicted in this table:

Cookstown WPCP Parameter-Influent	Sample Type	Minimum Frequency	Monthly Average (mg/L)	Removal Efficiency
CBOD5	Grab	Monthly	210	98.7%
Total Suspended Solids (TSS)	Grab	Monthly	229	98.6%
Total Phosphorus (TP)	Grab	Monthly	4.62	98.7%
Total Kjeldahl Nitrogen (TKN)	Grab	Monthly	49.3	87.8%
Total Ammonia Nitrogen	Grab	Monthly	41.58	87.9%

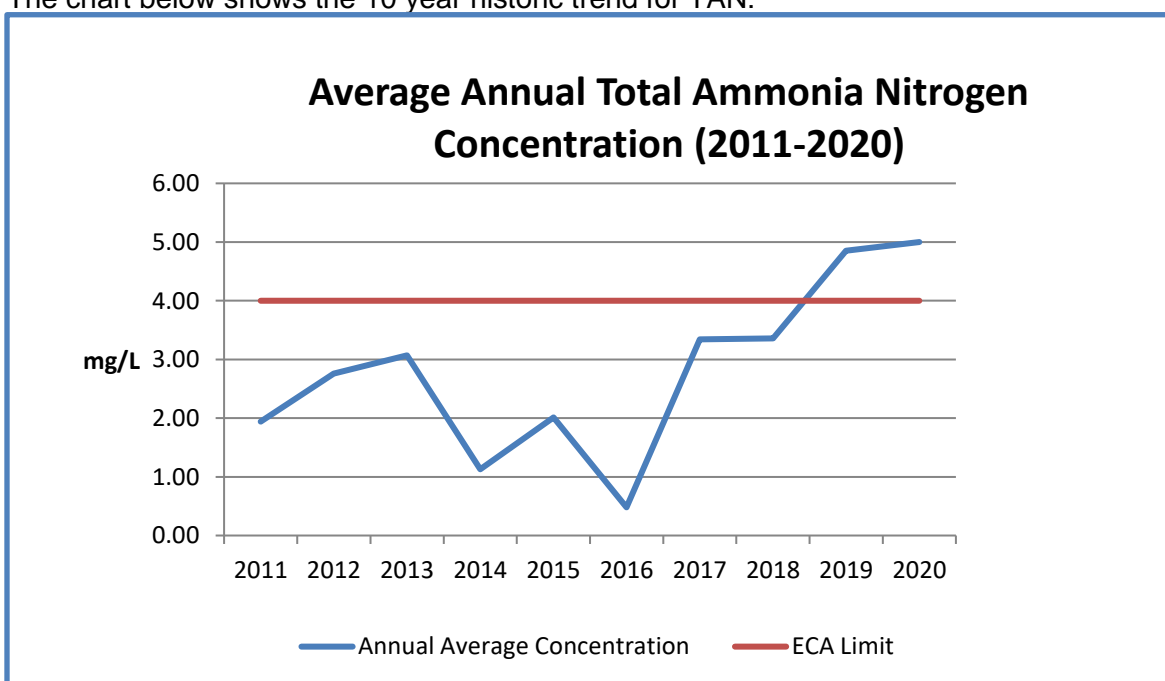
Final Effluent Monitoring

A total of 184,604 m³ of final effluent was discharged from the polishing lagoon during the discharge periods of January through April, and October through December, 2020.

Discharge activities were suspended April 21, 2020 due to elevated Total Ammonia Nitrogen. Exceedance Report #8483-BZ5KL3N was generated to capture the April TAN exceedance (5.0 mg/L).

The annual average concentration for Total Ammonia Nitrogen (TAN) was 4.99 mg/L which exceeded the limit of 4.0 mg/L. This was reported to the District MECP office, Exceedance Report #1200-BZ5KC5 has been generated to capture this exceedance.

The chart below shows the 10 year historic trend for TAN:



The table below identifies the effluent limits as set out in the ECA and the corresponding 2020 Effluent Quality data:

Cookstown WPCP Effluent Parameter	ECA Effluent Limits (mg/L unless otherwise indicated)	2020 Treated Effluent Annual Average Concentration (mg/L unless otherwise indicated)
<i>CBOD₅</i>	25	2.95
Total Suspended Solids	25	3.10
Total Phosphorus	1.0	0.05
Total Phosphorus Load	300 kg/year	10.50 kg/year
TAN - Total Ammonia Nitrogen (Ammonia Nitrogen + Ammonium Nitrogen)	4.0	4.99

Effluent Discharge 2020 Cookstown WPCP		
Month	Maximum Discharge Rate	Total Discharge (m³)
January	10 L/sec	22,630
February	10 L/sec	19,643
March	10 L/sec	20,993
April	60 L/sec	71,132
May	10 L/sec	0
October	10 L/sec	8,978
November	10 L/sec	18,828
December	10 L/sec	22,400
Total		184,604

Monitoring Schedule

Influent sampling is required at a minimum frequency of monthly by grab sampling. The influent sampling point is located in the Inlet Works.

Monitoring of final effluent is done during the designated discharge period (October 1 – May 31) except for April. In April, effluent is required to be sampled once per week, the first sample is collected one day after commencement of lagoon draw-down, and the last within one day before the holding level in the lagoon is attained.

The pH and temperature of the Final Effluent is determined in the field at the time of sampling.

Sampling type is determined by the parameter and includes grab, probe or analyzer. Samples for final effluent reporting were collected from the sample ports on the discharge side of the effluent pumps at the outlet of the storage pond.

Flow rates for influent and final effluent discharge are monitored by continuous flow measuring devices.

As per Condition 9.1.b of the ECA, effective July, 2020, Tuesday was designated as the scheduled day for sampling, except for statutory holidays when this shifts to the next appropriate day. This schedule will be maintained throughout 2020-21. The scheduled sample day will be rotated (July 2021) to Monday and is expected to be maintained in for the next year.

Operational Issues

Much of the equipment, structures mechanisms and apparatus forming the Works are aging and require frequent assessment. Repair and/or replacement is completed when necessary, those items of larger scope are put forth as Capital Works Projects.

An extreme weather event January 11-12 resulted in a bypass. Detailed report is attached to this report.

In October, the effluent pumps stopped working due to frequent plugging with aquatic weeds and algae from the lagoon. Discharge was sporadic until the following corrective actions were taken:

Inline basket strainers were installed in front of the effluent pumps to catch the weeds before plugging the pumps

An external contractor harvested and cleaned approximately 6400 square feet of invasive Eurasian Milfoil weed around the effluent outlet of the East lagoon.

During this time, brief discharge from the West lagoon resulted in a reported October monthly TAN exceedance of 6.2 mg/L. (Exceedance Report 4377-BV8MTK was generated to capture this exceedance.)

An engineering consulting firm has been engaged to develop control processes and address operational issues. Proposals are being evaluated and prioritized

Maintenance Activities

The Maintenance Mechanic and Operations Staff perform a variety of scheduled, preventative, predictive and reactive maintenance on a variety of equipment throughout the year. Equipment replacement and upgrades contribute to greater process control at the Plant and increased capacity in the collection system.

Notable maintenance activities in 2020 include:

- Commutator motor replaced
- Survey of lagoons conducted, free board level determined, level stakes in place
- Original aerator #1 put back in service
- Raw wet well cleaned out

- Alum pump #1 rotor and hose replaced, surge protector installed
- Communication network upgraded
- Lights in control building replaced with LED

Effluent Quality Assurance

Analytical tests to monitor required parameters are performed by SGS Environmental Services, which is accredited by Canadian Association for Laboratory Accreditation Inc. (CALA) in accordance with the recognized International Standard ISO/IEC 17025:2005. Plant operation and performance is monitored by licensed operators.

An in-house lab facility is being set up in the Cookstown WPCP Control Building. There is a dedicated operator assigned to analyze regular monitoring parameters to assist plant operation.

Calibration

Annual verifications/calibrations of flow monitoring equipment were performed in October, 2020 by a third party instrumentation and controls technician. This included influent and effluent monitoring equipment.

All were found to be within the tolerance of the equipment as recommended by the manufacturer.

Summary of efforts made to achieve Design Objective

Design Objectives were achieved more than 50% of the year.

The 2020 average daily influent flow was 586 m³, which equates to 71% of the plant's design rated capacity of 825 m³ per day.

The annual average effluent concentration for TAN has trended higher to the point of non-compliance for 2020. An engineering consulting firm has been engaged to help find a solution. They are conducting an assessment of data, operational processes and equipment to determine changes that may be implemented to meet effluent limits.

The first project in 2021 will be replacement of a 7 hp aerator with a new 10 hp aerator equipped with a blower to increase oxygenation capacity.

An operator has been dedicated to the Cookstown WPCP full time to provide consistent operations and monitoring activities.

An on-site lab has been set up for analysis of regular monitoring parameters to assist in plant operation.

Sludge generation and removal

There were no activities related to the disposal of sludge (NASM) during 2020.

Complaints

Customer Service inquiries are received and logged through the Town of Innisfil. There were six (6) inquiries logged related to the Cookstown WPCP facility and collections system in 2020.

One (1) sewer back-up, no corrective action by IUI was necessary.

Three (3) inquiries regarding manhole lids

The other two were inquiries regarding servicing to vacant lots.

Bypass and Spills

There was one (1) bypass reported in 2020. The incident was related to an extreme weather event January 11, 2020.

This incident was reported to the Spills Action Centre and followed up with a detailed report, which is attached to this report.

Notices of Modifications to Sewage Works

There were no Notices of Modification submitted to the Water Supervisor as per Paragraph 1.d of Condition 10.

Efforts to Achieve Conformance with Procedure F-5-1

InnServices Utilities (IUI) Engineering group have been working on a number of projects and initiatives to eliminate Bypass/Overflow incidents. These include, but are not limited to the following in 2020:

- Regular flushing and inspection program; CCTV inspection is required 5 years as per ECA# 4098-BC2SMK, Condition 3.2.b
- Condition assessment of multiple manholes
- Flow Monitoring of active subdivisions.
- Install bulkheads from un-occupied subdivision phases to existing sewer system
- CCTV inspections in subdivision developments: mainline twice - prior to UGC and after AGC, but before top asphalt; and once for laterals (prior to occupancy)
- Sanitary exfiltration testing of new sewers; low pressure air testing is a requirement for subdivision developments
- External MH wrapping of horizontal joints is a requirement on all new projects

Operations has proposed the following for 2021:

- Influent flowmeter replacement and chamber upgrade
- Effluent pump upgrade to meet the challenges that happen at the beginning of discharge season
- Cleaning lagoons
- Aeration upgrade

IUI Engineering has identified the following practices and projects proposed for 2021:

- Looking at External MH wrapping of horizontal joints and frame/moduloc on all projects (Capital and Development)
- Looking at Replacing MH lids with Waterproof MH Lids in grassed, low lying, or in areas with regular flooding

- Bulkhead requirement added to Town Standards with regular Inspections and confirmation requirements
- Look at opportunities for more MH rehabilitation.
- Look at opportunities for more Sewer rehabilitation.
- Look at Wrapping of pipe to MH Connections (similar to Region of Peel)
- Look at Rebate program for disconnection of sump pump from sanitary (similar to City of Barrie)
- Add I&I info and education to Town website
- Flow monitoring of new developments from first occupancy till assumption and emergency measures to be established for high flow events
- MH condition assessment program (Private and Municipal) to be developed

New Sewer Use By-law is currently under legal review, with anticipated presentation to TOI Council in Q2-2021. The new by-law includes items such as

- temporary capping of existing laterals during demolition to eliminate future infiltration,
- mainline sewer lining of a lateral for permanent abandonment for a demolition to eliminate future infiltration, and
- right-of-entry (ROE) to ensure access to private property for future I&I investigation

The need for a detailed Bypass/Overflow procedure has been recognized. This will be developed in 2021.

Cookstown WPCP Bypass – January 11, 2020

Cookstown Water Pollution Control Plant (WPCP)
 Wastewater System Number 110002265; ECA Number 9741-B4GRWZ
 59 Victoria Street, Innisfil, ON
 Event Report # 904042

On January 11, 2020, a significant rainfall of approximately 65 mm over a 24-hour period resulted in flooding in some low lying areas within Innisfil.

Due to this severe weather event, the raw wet well levels at the Cookstown WPCP were nearing critical levels.

The Overall Responsible Operator (Dave Sparrow) took corrective actions to prevent this. He arranged for a hauler to attend. The hauler drew the raw sewage out of the wet well and transported it to the west lagoon until levels could be maintained by the system. Equalization valve between lagoons remained open. This had minimal effect on the storage level of the lagoon (minimum effective storage capacity of each lagoon is 53,040 m³).

Total volume bypassed was approximately 147 cubic meters over 5.25 hours.
 A detailed summary of operational issues and corrective actions taken is below.

Notifications were communicated to Nick Lymer at MECP Spills Action Centre (SAC) and Felicia Rativ, Medical Officer of Health at the Simcoe-Muskoka District Health Unit.

Operational Issue	Corrective Action
Communications with Cookstown WPCP are down, alarms still functioning. High level alarms	ORO sent an operator to assess situation
Raw flows are excessive, single pump (rated for 30L/s) is not keeping up with flows	2 nd pump put into service as per ORO; combined capacity 48L/s is just maintaining levels. Operator remains to monitor

ORO on site. Plant above peak flows – raw pumps no longer able maintain levels	ORO arranged for Region of Huronia Environmental Services (ROHES) to bring a truck to haul out of wet well
Wet well level at critical level	Hauling begins, Spills Action notified
Raw pumps keeping up with flows	Hauling ceased

- This extreme weather event, in conjunction with frozen ground, lead to historic excessive flows over a short term duration
- Prior to this event, Blue Sky Energy Engineering & Consulting Inc. was engaged to prepare an Operations Manual including process control targets and troubleshooting guidelines. Part of this work will also include a spill prevention control and countermeasure plan.
- InnServices' Emergency & Contingency plan is being assessed collaboratively with TOI
- Review and revision of InnServices' Emergency Communication Plan is underway
- We are currently discharging effluent from the east lagoon in accordance with parameters set out in the ECA

Submitted to MECP February 14, 2020

