Water Operations

Annual Summary Report

~ Stroud Drinking Water System ~

~ Town of Innisfil ~

Reporting Year - 2019

InnServices Utilities Inc.

Stroud Drinking Water System

Introduction

Effective January 1, 2016, the Town of Innisfil transferred ownership of its municipal drinking water systems 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 drinking water systems that service the Town of Innisfil.

The Stroud Drinking Water System services a population of approximately 1836, on 612 residential connections, with an additional 37 commercial connections.
The system relies on 3 drilled wells located on the same property as the pump house.
The distribution system is comprised of approximately 12.5 kilometers of PVC piping and cast iron piping, 79 hydrants and 116 valves.

InnServices has prepared this Summary Report for the operations conducted during the 2019 calendar year.

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

- To provide InnServices Utilities Inc. Board of Directors, as "Owners" of the drinking water system, a summary of the operations and maintenance of the Stroud Drinking Water System that took place during the reporting period of January 1, 2019 to December 31, 2019;
- To provide a status update of the systems capabilities and capacities as of December 31, 2019, and;
- To satisfy the requirements of O. Reg. 170/03 Schedule 22

An Annual Report was prepared and submitted to the MECP for the Stroud Drinking Water System in order to fulfill the requirements of Section 11 of Ontario Regulation 170/03.

The Annual Report identifies specific details regarding the overall quality of the Town's drinking water and is available on the Town's website (https://innisfil.ca/annual-reports-drinking-water) and at InnServices Headquarters at 7251 Yonge St., Innisfil, Ontario.

This Summary Report consolidates the information that is required in Section 11 and Schedule 22 of O. Reg. 170/03, and provides information to the InnServices Board of Directors and Town of Innisfil Mayor and Council related to the operations, maintenance, drinking water quality, and system capacities of the Innisfil Heights Drinking Water System, which aids decision making related to system expansion needs, and assists Board and Council in meeting their Statutory Standard of Care requirements.

MECP Approvals

The Stroud Drinking Water System is classified as a Large Municipal Residential drinking water system, as defined by Ontario Regulation 170/03.

The **Safe Drinking Water Act, 2002** requires that the Owner of a municipal drinking water system have MECP approvals in the form of a Drinking Water Works Permit (DWWP) and a Municipal Drinking Water Licence (MDWL). The DWWP provides a description of the overall system and provides the authority to establish or alter the drinking water system. The MDWL provides the authority to use or operate the system.

The DWWP and MDWL in effect at the end of the reporting period covered in this report are as follows:

DWWP # 120-204, Issue #3 (Issued January 8, 2016)
MDWL # 120-104, Issue #3 (Issued January 8, 2016)

For the reporting period covered by this report, InnServices Utilities Inc. was defined as the Operating Authority of the Stroud Drinking Water System.

InnServices Utilities Inc. has established and maintains accreditation to the Drinking Water Quality Management Standard Version 2-2017 (DWQMS) under Certificate of Accreditation # 0130775, issued September 23, 2014 by SAI Global. The Certificate of Accreditation expires September 21, 2020.

Drinking Water System

The Stroud Drinking Water system relies on three drilled wells as its source of groundwater.
Sodium hypochlorite is used for primary and secondary disinfection.
A Duplex Greensand Pressure Filter system reduces iron and manganese in the drinking water.
A 2-cell, grade level 1263 cubic meter capacity clearwell is designed to provide adequate contact time for disinfection purposes, also providing fire protection for the community.
A 125 kilowatt standby generator at the pump house ensures that the system is provided with water in the event of a power failure.
Significant expense incurred related to equipment installation and repair was related to recirculation pump ($26,000) and high lift pump repairs ($1500).

Analytical Laboratory Water Quality Monitoring

Bacteriological Analysis

Bacteriological testing is completed to verify that no microbiological contamination of the treated drinking water can be detected. Raw water is also analyzed to inform operations of the level of microbiological contamination the drinking water system is contending with. Bacteriological monitoring for the reporting period was conducted as required by Ontario Regulation 170/03.
SGS Environmental Services, Lakefield, Ontario, conducted the bacteriological analysis of the drinking water.

One (1) incident of non-compliance with the Ontario Drinking Water Standards related to bacteriological analysis was reported by our laboratory during the reporting period. (1 Total Coliform in a distribution sample). Required Corrective action was to resample and test, which showed zero Total Coliform.

Microbiological testing done under the Schedule 10 of Regulation 170/03, during this reporting period:

	Number of Samples	Range of E. coli Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)	Number of HPC Samples	Range of HPC Results (min #)-(max #)
Raw	156	0-0	0-1	N/A	N/A
Treated	61	0-0	0-0	61	0-25
Distribution	201	0-0	0-1*	201	0-2000

Chemical Analysis

Chemical analysis of this water supply is conducted as required by Ontario Regulation 170/03.
SGS Environmental Services, Lakefield, Ontario, conducted the required chemical analyses for the drinking water system during the reporting period. This lab, as well as any laboratories to which they sub-contract certain types of analyses, are licensed by the MECP and accredited by the Canadian Association for Laboratory Accreditation (CALA) and/or Standard Council Canada (SCC).
Zero (0) incidents of non-compliance with Ontario Drinking Water Standards related to chemical analysis were reported during 2019.
A summary of all analytical results for Organic and Inorganic testing completed during the reporting period is attached in Appendix A.

In 2019, Operations staff have added a recirculation pump to help reduce the formation of THM's and Total Haloacetic Acids in the Distribution system.

Continuous Water Quality Monitoring

Free Chlorine Residual

The Stroud Drinking Water System utilizes NSF® certified 12% sodium hypochlorite to meet primary disinfection requirements and provide an adequate chlorine residual for secondary disinfection requirements.

Free Chlorine residual is monitored for secondary disinfection requirements through the collection of grab samples throughout the distribution system, as required within O. Reg. 170/03. Additionally, grab samples are taken and analyzed for free chlorine residual when microbiological samples are taken throughout the distribution system. Ontario Regulation 170/03 requires that sufficient residual be available in the water to achieve a residual of greater than 0.05 mg/L at all points in the distribution system.

During the reporting period covered by this report, zero (0) incidents of non-compliance with these requirements were reported.

A summary of the chlorination monitoring that took place directly after primary disinfection is achieved is depicted below:

	Number of Grab Samples	**Range of Results (min #)-(max #)**	**Unit of Measure**
Chlorine	8760	0.73– 5.00*	mg/L
Fluoride (If the DWS provides fluoridation)	n/a	n/a	n/a

All instances where Free Chlorine Residual (FCR) was less than 1.00 mg/L were investigated and confirmed to coincide with a power outage, calibration activities, and/or appropriate corrective actions were taken to remove non-compliant water from the system.

Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument:

*A Greensand Filtration System at the Stroud Well System removes manganese and iron from the distribution water, and requires an order under the Municipal Drinking Water License to measure the total suspended solids (discharged outside the Well House) on a quarterly basis.				
Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
08-Jan-16	Total Suspended Solids (NOTE: annual average)	19-Nov-2019	5.75	mg/L

Plant Flow Monitoring

Raw Water Takings

The Stroud Drinking Water System utilizes groundwater wells as its raw water source. The raw water takings from groundwater wells are authorized by the MECP through a Permit to Take Water (PTTW). During the reporting period, the system took water under PTTW# 3344-A6HKCT.

Raw water takings for 2019 were reported to the electronic Water Taking Recording System (WTRS).
There were zero (0) incidents of non-compliance related to water takings in 2019.

Table 1 below provides a summary of the Stroud Drinking Water System's raw water takings in 2019.

Table 1: Summary of 2019 Raw Water Takings

	Units	PTTW# 3344-A6HKCT			2019 Takings
		Well #1	Well #2	Well #3	
PTTW Daily Maximum	(m^3/day)	677.16	397.44	1,637.28	2,711.88
Maximum Day	(m^3/day)	303	211	929	957
Average Day	(m^3/day)	6	23	441	471
Total Annual Takings	(m^3)	2327	8371	161,068	171,766

System Performance Summary

The volume of daily treated water delivered to the distribution system is authorized by the MECP through the designation of a Rated Capacity within the Municipal Drinking Water Licence (MDWL). The well system is operating at approximately 18% of the rated capacity of 2622 m^3/day. At the maximum flow, treated water demand flow in 2019 was 36.5% of the rated capacity.

Table 2 below provides a summary of the Stroud Drinking Water System's treated water demand in 2019.

Zero (0) incidents of non-compliance related to the rated capacity were reported in 2019.

Table 2: Summary of 2019 Treated Water Demand

System Rated Capacity (m^3/day)	2,622
Maximum Day (m^3/day)	957
Average Day (m^3/day)	471
Total Annual Demand (m^3)	171,766
System Performance-rated capacity	18%
System Performance – at Maximum Flow	36.5%

Distribution Flow Monitoring

The Stroud Drinking Water System produces water for distribution to homes and businesses within the Town of Innisfil (TOI).

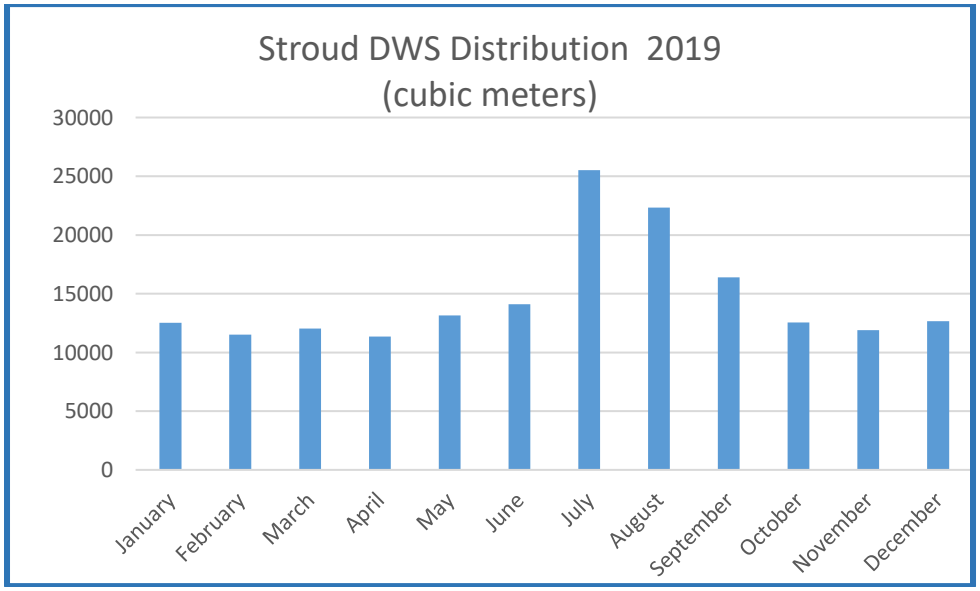
The following tables and graphs demonstrate the monthly water system demand.

Table 3, on page 6, demonstrates the monthly volumes of drinking water directed toward the Stroud distribution system in 2019.

Table 3: Monthly Water Demand

	Treated Water Demand (m^3)
January	12,535
February	11,506
March	12,041
April	11,340
May	13,152
June	14,099
July	25,514
August	22,327
September	16,388
October	12,537
November	11,905
December	12,667
Annual Total	**176,010**

The following graph provides a visual display of the information provided in Table 3.



MECP Annual Inspection

An Announced Focused inspection was conducted on May 28, 2019 by the Ministry of the Environment Conservation and Parks. The inspection covered the period of June 12, 2018– May 28, 2019.

Items of Non Compliance
There were five (5) items of non-compliance identified. Four related to water quality monitoring requirements prescribed by legislation were not conducted within the required frequency. Corrective Actions have been taken to ensure sampling occurs within the legislated frequency.
It was also noted that all specified corrective actions were not taken to address adverse conditions. Resampling was only completed at the adverse site and was not done on an upstream and downstream location as required. Corrective Actions have been taken to ensure Corrective Actions to address adverse conditions as prescribed.

Provincial Officer's Orders
No Provincial Officer's Orders were issued in the Report as a result of the 2019 inspection.

Inspection Risk Rating
This year, as a result of the non-compliance identified, the Stroud system received an Inspection Risk Rating of 13.94%, resulting in a Compliance Rating of 86.06%.

Appendix A – Chemical Analysis

Organic and Inorganic parameters testing is required at least once every 36 months from a raw water supply that is ground water.

Inorganic Parameter	Sample Date	**Result Value**	Unit of Measure	Exceedance
Antimony	20-Nov-2018	0.02	µg/L	No
Arsenic	20-Nov-2018	<0.2	µg/L	No
Barium	20-Nov-2018	309	µg/L	No
Boron	20-Nov-2018	90	µg/L	No
Cadmium	20-Nov-2018	<0.003	µg/L	No
Chromium	20-Nov-2018	0.37	µg/L	No
Mercury	20-Nov-2018	<0.01	µg/L	No
Selenium	20-Nov-2018	<0.04	µg/L	No
Sodium	19-Dec-2016	40.3	Mg/L	Yes
Uranium	20-Nov-2018	<0.002	µg/L	No
Fluoride	19-Dec-2016	0.4	mg/L	No
Nitrite	18-Nov-2019	<0.003	mg/L	No
Nitrate	18-Nov-2019	0.026	mg/L	No

Organic Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	20-Nov-2018	<0.02	µg/L	No
Atrazine + N-dealkylated metobolites	20-Nov-2018	<0.01	µg/L	No
Azinphos-methyl	20-Nov-2018	<0.05	µg/L	No
Benzene	20-Nov-2018	<0.32	µg/L	No
Benzo(a)pyrene	20-Nov-2018	<0.004	µg/L	No
Bromoxynil	20-Nov-2018	<0.33	µg/L	No
Carbaryl	20-Nov-2018	<0.05	µg/L	No
Carbofuran	20-Nov-2018	<0.01	µg/L	No
Carbon Tetrachloride	20-Nov-2018	0.25	µg/L	No
Chlorpyrifos	20-Nov-2018	<0.02	µg/L	No
Diazinon	20-Nov-2018	<0.02	µg/L	No
Dicamba	20-Nov-2018	<0.2	µg/L	No
1,2-Dichlorobenzene	20-Nov-2018	<0.41	µg/L	No
1,4-Dichlorobenzene	20-Nov-2018	<0.36	µg/L	No
1,2-Dichloroethane	20-Nov-2018	<0.35	µg/L	No
1,1-Dichloroethylene (vinylidene chloride)	20-Nov-2018	<0.33	µg/L	No
Dichloromethane	20-Nov-2018	<0.35	µg/L	No
2-4 Dichlorophenol	20-Nov-2018	<0.15	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	20-Nov-2018	<0.19	µg/L	No
Diclofop-methyl	20-Nov-2018	<0.4	µg/L	No
Dimethoate	20-Nov-2018	<0.03	µg/L	No

Organic Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Diquat	20-Nov-2018	< 1	µg/L	No
Diuron	20-Nov-2018	<0.03	µg/L	No
Glyphosate	20-Nov-2018	< 1	µg/L	No
Malathion	20-Nov-2018	<0.02	µg/L	No
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	20-Nov-2018	<0.00012	Mg/L	No
Metolachlor	20-Nov-2018	<0.01	µg/L	No
Metribuzin	20-Nov-2018	<0.02	µg/L	No
Monochlorobenzene	20-Nov-2018	<0.3	µg/L	No
Paraquat	20-Nov-2018	<1	µg/L	No
Pentachlorophenol	20-Nov-2018	<0.15	µg/L	No
Phorate	20-Nov-2018	<0.01	µg/L	No
Picloram	20-Nov-2018	< 1	µg/L	No
Polychlorinated Biphenyls(PCB)	20-Nov-2018	<0.04	µg/L	No
Prometryne	20-Nov-2018	<0.03	µg/L	No
Simazine	20-Nov-2018	<0.01	µg/L	No
Terbufos	20-Nov-2018	<0.01	µg/L	No
Tetrachloroethylene	20-Nov-2018	<0.35	µg/L	No
2,3,4,6-Tetrachlorophenol	20-Nov-2018	<0.20	µg/L	No
Triallate	20-Nov-2018	<0.01	µg/L	No
Trichloroethylene	20-Nov-2018	<0.44	µg/L	No
2,4,6-Trichlorophenol	20-Nov-2018	<0.25	µg/L	No
Trifluralin	20-Nov-2018	<0.02	µg/L	No
Vinyl Chloride	20-Nov-2018	<0.17	µg/L	No

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	Date of Sample
Sodium	40.3	mg/L	19-Dec-2016

Distribution Sampling

Based on results of community lead sampling program conducted, Innisfil Heights DWS has qualified for reduced sampling protocol as per O. Reg .170/03 Schedule 15.1. Under this protocol, only alkalinity and pH are required from 2 sampling points for each summer and winter period. Lead is tested every third 12-month period.

Location Type	**Number of Samples**	**Range of Lead Results* (min#) – (max #)**	**Unit of Measure**	**Number of Exceedances**
Plumbing	n/a	n/a	n/a	n/a
Distribution	4	191-199	mg/L	0

Trihalomethanes (THMs) are sampled on a quarterly basis in accordance with O. Reg. 170/03 Schedule 13. The most recent sample results:

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
THM (latest rolling annual average (RAA)**)**	Nov. 18, 2019	88.67	µg/L	No

Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards. (Lead and THM only)

Parameter	Result Value	Unit of Measure	Date of Sample
THM (RAA)	94.75	µg/L	Q1 - Jan. 14, 2019
THM (RAA)	91.50	µg/L	Q2 - May 21, 2019
THM (RAA)	90.83	µg/L	Q3 - Aug. 6, 2019
THM (RAA)	88.67	µg/L	Q4 - Nov. 18, 2019