



Water Operations

Annual Summary Report
~ Stroud Drinking Water System ~
DWS #220006204
~ Town of Innisfil ~

Reporting Year - 2021

InnServices Utilities Inc.

Stroud DWS

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 (DWS) 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 2021 calendar year.

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

- To provide InnServices Utilities Inc. Board of Directors, as “Owners” of the DWS, a summary of the operations and maintenance of the Stroud DWS that took place during the reporting period of January 1 to December 31, 2021;
- To provide a status update of the systems capabilities and capacities as of December 31, 2021 and;
- To satisfy the requirements of O. Reg 170/03 Section 11
- To satisfy the requirements of O. Reg.170/03 Schedule 22

The Annual Summary Report identifies specific details regarding the overall quality of the drinking water submitted to the Ministry of the Environment Conservation and Parks (MECP) for the Stroud DWS and is available on the Town of Innisfil website (<https://innisfil.ca/en/my-government/annual-water-performance-reports.aspx?mid=3185>) and at InnServices Headquarters at 7251 Yonge St., Innisfil, Ontario.

This report 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 Stroud DWS, 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 DWS is classified as a Large Municipal Residential DWS, as defined by Ontario Regulation 170/03.

The **Safe Drinking Water Act, 2002** requires that the Owner of a municipal DWS 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 DWS. The MDWL provides the authority to use or operate the system.

The Stroud DWS operated under the following:

DWWP # 120-204, Issue #4, issued December 15, 2020

MDWL # 120-104, Issue #4, issued December 15, 2020

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

InnServices Utilities Inc. has established and maintains accreditation to the Drinking Water Quality Management Standard Version 2-2017 (DWQMS) under Certificate of Accreditation # 0136878, issued November 4, 2020 by SAI Global. The Certificate of Accreditation expires September 20, 2023.

Drinking Water System

The Stroud DWS 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.

Expenses incurred in relation to equipment installation, repair or replacement amounted to approximately \$9343:

Valve actuator - \$4462

Security fencing - \$4882

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 DWS 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.

Zero (0) items of non-compliance with the Ontario Drinking Water Standards related to bacteriological analyses occurred during the reporting period.

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	0-13	N/A	N/A
Treated	52	0-0	0-0	52	0-1
Distribution	191	0-0	0-0	191	0-29

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 DWS 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).

InnServices engaged the Walkerton Clean Water Centre to undertake a study to investigate THM (Trihalomethanes) and HAA (Haloacetic Acids) formation in the Stroud DWS. Raw water quality was assessed in 2020, which identified a high level of naturally occurring ammonia in the raw water. Bench scale testing was conducted in 2020, pilot studies for treatment options were undertaken during 2021. Short-term treatment options were weighed against the long-term solution (connecting to the Innisfil-Lake Simcoe Drinking Water System in approximately five years) and deemed they would not add value to the existing system.

Meanwhile, Operations is closely monitoring chlorine levels and reservoir circulation time, has increased frequency of dead-end flushing, and had uni-directional flushing (UDF) performed on the distribution system.

With the issuance of the new Municipal Drinking Water Licence December 15, 2020, the Ministry has added a requirement to increase testing and monitoring of the health-related parameters for THM and HAAs from quarterly to monthly, beginning in January 2021. There were zero out-of-compliance events related to the THM or HAA levels in 2021.

One (1) incident of non-compliance with Ontario Drinking Water Standards related to chemical analysis was reported during 2021. Sodium in the drinking water is tested every 60 months. Results were above the Maximum Allowable Concentration, but below the Aesthetic Objective. This is not a concern for most people. The Simcoe Muskoka District Health Unit was advised, and they share this information with physicians who may need to consider the potential impact on their patients. InnServices has posted this information on their website, in billing inserts, and will share the information from time to time on social media.

A summary of all analytical results for Organic and Inorganic testing is attached in Appendix A.

Continuous Water Quality Monitoring

Free Chlorine Residual

The Stroud DWS 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	0.0– 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 0.50 mg/L were investigated and confirmed to be isolated instantaneous readings, or 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
20-Dec-2021	Total Suspended Solids (NOTE: annual average)	19-Nov-2021	8.0	mg/L

Plant Flow Monitoring

Raw Water Takings

The Stroud DWS 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# 7607-BTCTQD

Raw water takings for 2021 were reported to the electronic Water Taking Recording System (WTRS).

There were zero (0) incidents of non-compliance related to water takings in 2021.

Table 1 below provides a summary of the Stroud DWS's raw water takings in 2021.

Table 1: Summary of 2021 Raw Water Takings

	Units	PTTW# 7607-BTCTQD			2021 Takings
		Well #1	Well #2	Well #3	
PTTW Daily Maximum	(m ³ /day)	984.96	397.44	1,637.28	3019.68
Maximum Day	(m ³ /day)	310.33	11.19	1204.8	1204.8
Average Day	(m ³ /day)	6.2	510.7	518	518
Total Annual Takings	(m ³)	2,252	396.6	186,409.4	189,057.9

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 17% of the rated capacity of 3020 m³/day. At the maximum flow, treated water demand flow in 2021 was 40% of the rated capacity.

Table 2 below provides a summary of the Stroud DWS's treated water demand in 2021. Zero (0) incidents of non-compliance related to the rated capacity were reported in 2021.

Table 2: Summary of 2021 Treated Water Demand

System Rated Capacity (m ³ /day)	3020
Maximum Day (m ³ /day)	1204.8
Average Day (m ³ /day)	518
Total Annual Demand (m ³)	189,057.9
System Performance-rated capacity	17%
System Performance – at Maximum Flow	40%

Distribution Flow Monitoring

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

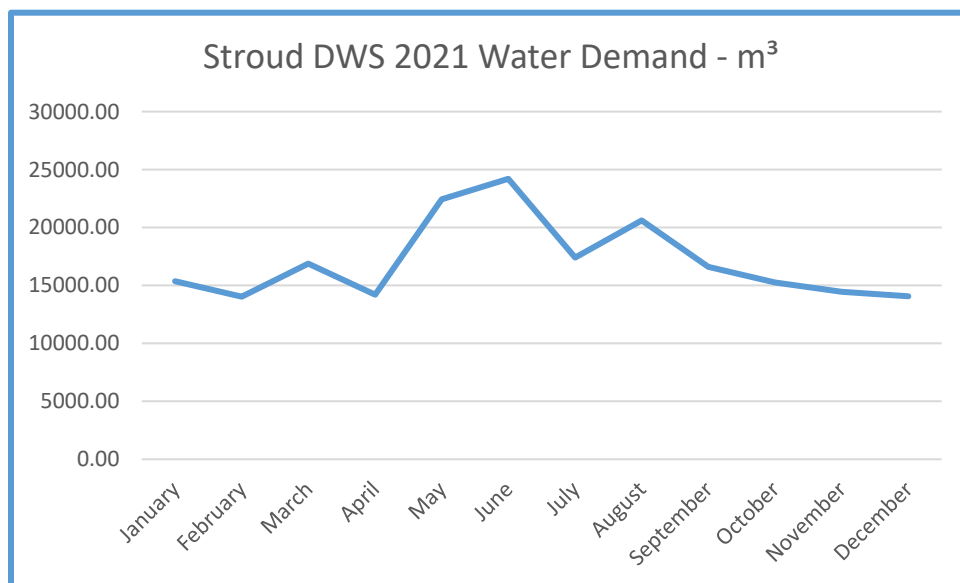
The following table and graph demonstrate the monthly water system demand.

Table 3 demonstrates the monthly volumes of drinking water directed toward the Stroud distribution system in 2021.

Table 3: Monthly Water Demand

	Treated Water Demand (m³)
January	15,373
February	14,028
March	16,881
April	14,208
May	22,425
June	24,201
July	17,418
August	20,612
September	16,610
October	15,259
November	14,448
December	14,056
Annual Total	205,519

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



MECP Annual Inspection

The MECP annual inspection was not conducted until February 10, 2022, due to scheduling complicated by COVID-19 restrictions. The report is not currently available.

As reported last year, an Announced Focused inspection was conducted on December 3, 2020, by the Ministry of the Environment, Conservation and Parks. The inspection covered the period of June 4, 2019 to December 3, 2020.

Items of Non-Compliance

There were zero (0) item of non-compliance identified during the inspection period.

Provincial Officer's Orders

No Provincial Officer's Orders were issued in the Report as a result of the 2020 inspection.

Inspection Risk Rating

Last year the Stroud system received an Inspection Risk Rating of 0%, resulting in a Compliance Rating of 100%.

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	25-Nov-2021	<0.06	µg/L	No
Arsenic	25-Nov-2021	<0.2	µg/L	No
Barium	25-Nov-2021	322	µg/L	No
Boron	25-Nov-2021	106	µg/L	No
Cadmium	25-Nov-2021	<0.003	µg/L	No
Chromium	25-Nov-2021	0.18	µg/L	No
Mercury	25-Nov-2021	<0.01	µg/L	No
Selenium	25-Nov-2021	<0.04	µg/L	No
Uranium	25-Nov-2021	<0.002	µg/L	No
Nitrite	25-Nov-2021	<0.003	mg/L	No
Nitrate	25-Nov-2021	0.026	mg/L	No

Organic Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	25-Nov-2021	<0.02	µg/L	No
Atrazine + N-dealkylated metabolites	25-Nov-2021	<0.01	µg/L	No
Azinphos-methyl	25-Nov-2021	<0.05	µg/L	No
Benzene	25-Nov-2021	<0.32	µg/L	No
Benzo(a)pyrene	25-Nov-2021	<0.004	µg/L	No
Bromoxynil	25-Nov-2021	<0.33	µg/L	No
Carbaryl	25-Nov-2021	<0.05	µg/L	No
Carbofuran	25-Nov-2021	<0.01	µg/L	No
Carbon Tetrachloride	25-Nov-2021	0.25	µg/L	No
Chlorpyrifos	25-Nov-2021	<0.02	µg/L	No
Diazinon	25-Nov-2021	<0.02	µg/L	No
Dicamba	25-Nov-2021	<0.2	µg/L	No
1,2-Dichlorobenzene	25-Nov-2021	<0.41	µg/L	No
1,4-Dichlorobenzene	25-Nov-2021	<0.36	µg/L	No
1,2-Dichloroethane	25-Nov-2021	<0.35	µg/L	No
1,1-Dichloroethylene (Vinylidene chloride)	25-Nov-2021	<0.33	µg/L	No
Dichloromethane	25-Nov-2021	<0.35	µg/L	No
2-4 Dichlorophenol	25-Nov-2021	<0.15	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	25-Nov-2021	<0.19	µg/L	No
Diclofop-methyl	25-Nov-2021	<0.4	µg/L	No
Dimethoate	25-Nov-2021	<0.06	µg/L	No
Diquat	25-Nov-2021	< 1	µg/L	No
Diuron	25-Nov-2021	<0.03	µg/L	No
Glyphosate	25-Nov-2021	< 1	µg/L	No
Malathion	25-Nov-2021	<0.02	µg/L	No

Organic Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	25-Nov-2021	<0.00012	Mg/L	No
Metolachlor	25-Nov-2021	<0.01	µg/L	No
Metribuzin	25-Nov-2021	<0.02	µg/L	No
Monochlorobenzene	25-Nov-2021	<0.3	µg/L	No
Paraquat	25-Nov-2021	<1	µg/L	No
Pentachlorophenol	25-Nov-2021	<0.15	µg/L	No
Phorate	25-Nov-2021	<0.01	µg/L	No
Picloram	25-Nov-2021	< 1	µg/L	No
Polychlorinated Biphenyls(PCB)	25-Nov-2021	<0.04	µg/L	No
Prometryne	25-Nov-2021	<0.03	µg/L	No
Simazine	25-Nov-2021	<0.01	µg/L	No
Terbufos	25-Nov-2021	<0.01	µg/L	No
Tetrachloroethylene	25-Nov-2021	<0.35	µg/L	No
2,3,4,6-Tetrachlorophenol	25-Nov-2021	<0.20	µg/L	No
Triallate	25-Nov-2021	<0.01	µg/L	No
Trichloroethylene	25-Nov-2021	<0.44	µg/L	No
2,4,6-Trichlorophenol	25-Nov-2021	<0.25	µg/L	No
Trifluralin	25-Nov-2021	<0.02	µg/L	No
Vinyl Chloride	25-Nov-2021	<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
N/A			

One water sample is taken every 60 months to test for Sodium and Fluoride

Parameter	Date of Sample	Result	Unit of Measure	Exceedance
Sodium*	25-Nov-2021	35.6	mg/L	Yes
Sodium re-sample	29-Nov-2021	36.4	mg/L	Yes
Fluoride	25-Nov-2021	0.29	mg/L	No

*Sodium result was reported to both the MECP and the Simcoe Muskoka District Health Unit.

One water sample is taken every 3 months and tested for nitrate and nitrite

Parameter	Date of latest Sample	Result	Unit of Measure	Exceedance
Nitrite	19-Nov-2021	<0.003	mg/L	No
Nitrate	19-Nov-2021	0.023	mg/L	No

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 Alkalinity Results Minimum - maximum	Range of Lead Results- 2020	Number of Exceedances
		Aesthetic Objective 30-500 Mg/L	Maximum Concentration 10.0 µg/L	
Distribution	4	190-201 Mg/L	0.07 – 0.19 µg/L	0

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

Parameter	Sample Date	Result Value	Maximum Allowable Concentration
THM (latest rolling annual average)	03-Dec-2021	92.31 µg/L	100 µg/L
HAA (latest rolling annual average)	03-Dec-2021	65.23 µg/L	80 µg/L

Lead, Haloacetic Acids or Trihalomethanes results that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards

Parameter	Result Value	Unit of Measure	Date of Sample
THM (running annual average)	Q1 – 98.76	µg/L	January-March
	Q2 – 98.17	µg/L	April-June
	Q3 – 91.83	µg/L	July-September
	Q4 – 92.31	µg/L	October-December
HAA (running annual average)	Q1 – 76.15	µg/L	January-March
	Q2 – 76.05	µg/L	April-June
	Q3 – 68.09	µg/L	July-September
	Q4 – 65.23	µg/L	October-December