



26557 Civic Centre Rd.
Keswick, Ontario L4P 3G1

2020 ANNUAL SUMMARY REPORT FOR TOWN OF GEORGINA MUNICIPAL COUNCIL

DRINKING WATER SYSTEM NO.260062686

Schedule 22; Summary Reports for Municipalities, O. Reg. 170/03 – Drinking Water Systems





Summary

This annual summary report provides the results of sampling, testing and monitoring of the Keswick-Sutton drinking water subsystem as required by the *Safe Drinking Water Act, SDWA 2002*.

Background

The Town of Georgina (the Town) operates the water distribution system, and The Regional Municipality of York (York Region) provides the treatment and storage of drinking water.

Section 19 of the Safe Drinking Water Act: Standard of Care, requires every person who on behalf of the municipality oversees the accredited operating authority of the system or exercises decision-making authority over the system, to act honestly, competently and with integrity while exercising a level of care, diligence and skill to protect the health and safety of the users of the Town's drinking water system. This includes, the Mayor, Municipal Councilors, Management and *Ministry of Environment, Conservation and Parks (MECP)* Certified Operators.

Schedule 22, of O. Reg. 170/03, under the *Safe Drinking Water Act* require owners of municipal drinking water systems to prepare annual reports describing the operation of the drinking water system and the results of testing performed that ensures residents are provided with safe drinking water. This report covers the period from January 1, 2020 to December 31, 2020.

The Drinking Water System

The source of water supply for the Keswick-Sutton subsystem is Lake Simcoe. York Region owns and operates two water treatment plants, one in Keswick and one in Willow Beach. York Region also owns and operates four (4) water storage tanks. Water is taken from Lake Simcoe at each plant and undergoes a complete treatment process consisting of screening, filtration, taste and odor control, disinfection and fluoridation before being supplied to the Town's water distribution system. York Region also carries out extensive testing at each plant and summarizes the results of these tests in an annual report. The reports describe the treatment and chemicals used in the process in more detail.

Copies of York Region's annual report may be obtained by contacting York Region at 1-877-464-9675, accessing the Region's website [Drinking Water Quality and Monitoring | York Region](#). A copy of the Region's report may also be obtained at the Georgina Municipal office, located at 26557 Civic Centre Road, Keswick, Ontario.

The Town owns and operates the water distribution system that receives water from the York Region treatment plants. The system is comprised of two (2) water pumping stations, watermains, service connections (up to the property line), valves, hydrants, meters, and connected appurtenances.



Ministry of the Environment, Conservation and Parks (MECP) Inspection

The *Compliance and Enforcement Regulation (O. Reg. 242/05)* of the *SDWA* requires the MECP to carry out a number of specific activities such as taking mandatory actions and conducting inspections of municipal residential drinking water systems.

Due to the unforeseen and unprecedented circumstances brought about by COVID-19 restrictions and limitations, the *MECP* did not perform the annual inspection of the Drinking Water Distribution System in the 2020 Calendar Year. The 2020 inspection will instead be completed as soon as feasible in the 2021 calendar year.

2019 Annual MECP Inspection

The Ministry of Environment, Conservation and Parks (MECP) performed an inspection of the Town drinking water distribution system on November 4, 2019. In 2019 The MECP Inspector performed an off-site desktop audit, and an on-site inspection of processes, operations manuals, standard operating procedures, logbooks, operator certification and training credentials, water quality, water quality monitoring processes, reporting procedures, and corrective actions. Resulting from the Inspection, the Town was provided with zero (0) *non-conformities*, and one (1) *Best Management Practice (BMP)*.

The Town received an inspection rating of 100% in 2019. This score indicates highest possible inspection rating, and the lowest possible risk rating for drinking water systems. The inspection rating indicates that there were no instances of non-compliance with the requirements of the Safe Drinking Water Act, the Regulations, the system's approval, drinking water works permit, municipal drinking water licence, and any orders applicable to the system.

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2019-2020)

DWS Name: KESWICK-SUTTON DISTRIBUTION SYSTEM
DWS Number: 260062686
DWS Owner: Georgina, The Corporation Of The Town Of
Municipal Location: Georgina
Regulation: O.REG 170/03
Category: Large Municipal Residential System
Type Of Inspection: Adhoc
Inspection Date: November 4, 2019
Ministry Office: York-Durham District

Maximum Question Rating: 244

Inspection Module	Non-Compliance Rating
Treatment Processes	0 / 35
Operations Manuals	0 / 28
Logbooks	0 / 18
Certification and Training	0 / 28
Water Quality Monitoring	0 / 51
Reporting & Corrective Actions	0 / 63
Treatment Process Monitoring	0 / 21
TOTAL	0 / 244

Inspection Risk Rating | 0.00%

FINAL INSPECTION RATING: 100.00%



Top Requested Water Quality Parameters

Chlorine	Lead (Pb)	Sodium (Na)*	Fluoride (F)**
Range 0.00 – 2.14 mg/L	Range <0.0005 mg/L – 0.0009 mg/L	33.2 mg/L	0.56 mg/L
		*Data provided by York Region	*Data provided by York Region

*The owner of a drinking water system and the operating authority for the system shall ensure that at least one water sample is taken every 60 months and tested for sodium. **Data provided by York Region.**

**If a drinking water system provides fluoridation, the owner of the system and the operating authority for the system shall ensure that a water sample is taken at the end of the fluoridation process at least once every day and is tested for fluoride. Data provided by York Region.

Water Quality in the drinking water system remains excellent.

Adverse Water Quality Incidents (AWQI)

Resulting from Watermain / Water Service leaks, or resulting from operational challenges (i.e. low chlorine concentration realized via weekly flushing or daily chlorine testing); Town staff reported seven (7) potential *Adverse Water Quality Incidents (AWQI)* to the *MECP Spills Action Centre (SAC)* and to the *York-Durham Public Health Unit (PHU)*. The Town took immediate corrective action in accordance with *O. Reg. 170/03: Drinking Water Systems*.

For each incident; the location of the potential adverse sample, as well as upstream and downstream locations were flushed, then sampled for microbiological contamination and free chlorine concentration. The results of each sample returned negative for the presence of Microbiological contamination, and free chlorine concentrations remained within acceptable parameters.

Lead Testing in Drinking Water Systems & Plumbing

There is considerable province-wide public interest in the amount of Lead (Pb) found in samples of drinking water taken in schools and day-cares. The Town is currently only required to test for Lead in the distribution system, not in private plumbing. All test performed by Town staff for Lead in the municipal distribution system are significantly below the Regulatory Limit. See “Lead Testing” section below.

The school boards are required to perform regular testing for lead in their plumbing, as well as perform regular flushing of the plumbing system to ensure any potential lead in the plumbing is purged (*O.Reg 243/07; Schools, Private Schools and Child Care Centers*). The Regulatory Limit for Lead is 0.010 mg/L.



Microbiology Testing from January 1 to December 31, 2020

Town of Georgina MECP Certified Drinking Water Operators take water samples from various locations serviced by the Keswick-Sutton water distribution system every week. The York-Durham Environmental Laboratory in Pickering analyses and tests each sample for the presence of bacteria. York Region and Durham Regions joint own and operate this accredited laboratory. [York Durham Regional Environmental Lab - Region of Durham](#)

Testing under *Schedule 10 of O.Reg 170/03: Drinking Water Systems*, a total of 752 water samples from the Keswick-Sutton distribution system were analyzed for the presence of coliform bacteria (total coliforms, and E.coli) between January 1, 2020 and December 31, 2020. Of the 752 microbiological samples taken in 2020, zero (0) samples tested positive for microbiological contamination.

210 samples were also analyzed using the heterotrophic plate count (HPC) method to check for general bacteria within the drinking water. This test is used as a supplement to the routine analysis for coliform bacteria and is used as an aide in assessing overall drinking water quality and the condition of the distribution system. At minimum, 25% of all routine microbiological sampling tests must be tested for HPC. The sampling quantity of 210 is 29% of all routine microbiological samples, surpassing the *MECP* and *SDWA* requirement.

The *MECP* Operational Guideline determines a maximum allowable concentration of 500 CFU/mL HPC. The maximum concentration of HPC analyzed within the Town's water distribution system in 2020 was 32 CFU/mL.

HPC Range in Colony Forming Units (CFU/mL)	Number of Samples
0	150
1 to 10	57
11 to 20	2
20+	1
Total HPC Sample Count	210

The results above indicate overall drinking water quality is acceptable as all HPC samples throughout 2020 are well below the regulatory limit of 500 CFU/mL.

Chlorine Residual

The Town is required to routinely monitor for “free chlorine residual” concentrations in order to ensure that secondary disinfection of the drinking water is maintained in the distribution system and that bacteria do not develop within the drinking water distribution system.



Each of the 752 microbiological samples taken from the Town's drinking water distribution system are required to have a free chlorine test analyzed in conjunction to ensure the drinking water at the time of sampling is sufficiently disinfected. Thus in 2020 under *Schedule 10 of O.Reg 170/03*, the Town's *MECP* Certified Operators analyzed 752 free chlorine samples during routine and emergency microbiological sampling.

The Town's *MECP* Certified Operators perform a Weekly Flushing program on the Drinking Water Distribution System. The flushing is done at blow-off valves, fire hydrants, and sample stations. This is done to purge stagnant water from within the distribution system (ie. "dead ends"), allowing free chlorine residuals to be monitored and maintained at acceptable levels. 1956 free chlorine residual samples were analyzed while performing the water distribution system Weekly Flushing Program in 2020.

Town *MECP* Certified Operations staff are also required to take daily samples at specific locations throughout the Town. 1946 free chlorine samples were taken during the Daily Chlorine sampling program.

Free chlorine residuals must also be taken during routine Quarterly testing for Trihalomethanes (THM's) and Haloacetic Acids (HAA's). THM's and HAA's are disinfection by-products and are a good indicator of the efficacy of the chlorine disinfection process. Eight (8) free chlorine residuals were analyzed during routine THM sampling and eight (8) free chlorine residuals were analyzed during routine HAA sampling in 2020.

In total under *Schedule 7 of O.Reg 170/03: Drinking Water Systems*, 4670 free chlorine residual grab samples were analyzed in 2020. The range of free chlorine residual from the 4670 samples analyzed was 0.00 mg/L to 2.14 mg/L. The legislated minimum acceptable chlorine residual is 0.05 mg/L and the maximum is 4.00 mg/L.

On four (4) occasion through 2020 Town staff detected free chlorine results below the minimum acceptable residual of 0.05mg/L. On each occasion staff performed corrective actions as per *O.Reg 170/03*. The prescribed corrective action is to flush the system, test for chlorine residual and take test for the presence of bacteria.

Sampling and testing was performed for each AWQI All each AWQI was sampled and on each occasion the samples returned negative for the presence of microbiological contamination, indicating the measures taken per *O.Reg 170/03* are sufficient in managing the waters safety and potability.

Below is the summary of each low chlorine residual event.

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
Aug 17, 2020	Chlorine Residual	< 0.05	mg/L	Flush, monitor and rush microbiological	Aug 17, 2020 – Flush, test for chlorine residual



				samples in accordance with O.Reg. 170/03	and take microbiological samples
Sep 23, 2020	Chlorine Residual	< 0.05	mg/L	Flush, monitor and rush microbiological samples in accordance with O.Reg. 170/03	Sep 23, 2020 – Flush, test for chlorine residual and take microbiological samples
Sep 28, 2020	Chlorine Residual	< 0.05	mg/L	Flush, monitor and rush microbiological samples in accordance with O.Reg. 170/03	Sep 28, 2020 – Flush, test for chlorine residual and take microbiological samples
Oct 31, 2020	Chlorine Residual	< 0.05	mg/L	Flush, monitor and rush microbiological samples in accordance with O.Reg. 170/03	Oct 31, 2020 – Flush, test for chlorine residual and take microbiological samples

Lead Testing

In 2007, the Ontario Government required municipal and non-municipal drinking water systems to undertake mandatory semi-annual testing for lead in drinking water to ensure levels meet the standards set forth in *O.Reg.169/03: Ontario Drinking Water Quality Standards and O.Reg.170/03: Drinking Water Systems*, under the *Safe Drinking Water Act, SDWA 2002*. The Ontario drinking water quality standard for lead is 10 micrograms per litre (10 µg/L) or 0.010 milligrams per litre (0.010 mg/L). This standard is based on the national guideline set by Health Canada.

The lead testing performed over the past decade has demonstrated that the vast majority of municipal and non-municipal residential drinking water systems have met the regulated standards. As a result, the Ministry has amended regulations under the *SDWA* to clarify requirements for lead testing and to introduce an automatic lead testing exemption within plumbing systems for municipal drinking water systems serving under 50,000 people.

Systems serving under 50,000 users can transfer to a “reduced” lead sampling schedule on condition that no more than 10% of samples taken within the latest two (2) sampling periods do not exceed half of the 10ug/mL standard (0.010 mg/L). Since the Town has not had any exceedances for lead since 2007, the Town automatically follows this “reduced” lead sampling schedule for the water distribution system, and is exempt from Lead sampling within the plumbing system. Lead samples are taken every 36-months on a rolling three (3) year schedule under “reduced” sampling protocol. Each year semi-annual alkalinity and pH sampling is mandatory, whereas lead must be sampled every 36-months on a semi-annual basis (summer, and winter).

The table below outlines the rolling three (3) year “reduced” Lead sampling schedule. In 2019, sampling was carried out as per year two (Y2).



Sample Period (Year)	1 st Round Sampling	Date of 1 st Round Sampling	2 nd Round Sampling	Date of 2 nd Round Sampling	# of Samples per Period	Sampling Requirements
Y2	Dec 15/19 to Apr 15/20	March 2020	Jun 15/20 to Oct 15/20	September 2020	4	Alkalinity and pH
Y3	Dec 15/20 to Apr 15/21	March 2021	Jun 15/21 to Oct 15/21	September 2021	4	Alkalinity, pH and Lead
Y1	Dec 15/21 to Apr 15/22	March 2022	Jun 15/22 to Oct 15/22	September 2022	4	Alkalinity and pH

As of 2020, the Town was on year two (Y2) of this cycle, thus, was not required to sample for Lead in 2020. All Lead results from the previous 14 years of lead sampling the distribution system are below the regulatory limit of 0.010 mg/L. The Town is expected to sample and test for Lead in the distribution system in 2021.

In total, four (4) samples were taken on March 4, 2020 and were tested for pH and Alkalinity, and four (4) samples were taken on September 16, 2020 and were tested for Alkalinity and pH. All results were within acceptable tolerance.

The table below summarizes the sample results, which demonstrate that the results are all within compliance limits.

Sample Date	Number of Samples	Lead (mg/L) Min. – Max.	Alkalinity CaCO ₃ (mg/L)	pH Min. – Max.
Mar. 4/20	4	N/A	108– 111	7.67 – 7.82
Sep. 16/20	4	N/A	96.6 – 110	6.93 – 7.86
<i>MAC – (Maximum Allowable Concentration)</i> <i>OG – (Operational Guideline)</i>		<i>MAC</i> <i>0.01mg/L</i>	<i>OG</i> <i>500mg/L</i>	<i>OG</i> <i>6.5 – 8.5</i>

Trihalomethanes (THM'S) and Haloacetic Acids (HAA's) Testing

Ten (10) samples were tested for Trihalomethanes (THM's). The maximum 12-month running average allowable limit is 100 µg/L. The results of the Town samples for the THM 12-month running average for 2020 was 61.08 µg/L, demonstrating the Town's results are all within compliance limits.

Town staff and Region of York have initiated a more detailed review of the formation of THMs and HAAs in the drinking water distribution system due to the THM 12-month running average (61.08 µg/L) exceeding half of the regulatory limit.



Eight (8) samples were tested for Haloacetic Acids (HAA's). The maximum 12-month running average allowable limit is 80 µg/L. The results of the Town samples for the HAA 12-month running average for 2020 was 38.75 µg/L, demonstrating the Town's results are all within compliance limits.

	Date of Sample	Running Annual Average (µg/L)	ODWS Regulatory Limit	Exceedance
Trihalomethanes (THM's)	February 3, 2020	61.31	100 µg/L	No
	May 4, 2020	60.70		
	August 5, 2020	61.99		
	November 2, 2020	61.08		
Haloacetic Acid (HAA's)	February 3, 2020	40.25	80 µg/L	No
	May 4, 2020	38.88		
	August 05, 2020	39.00		
	November 6, 2020	38.75		

Nitrate and Nitrite Testing

Nitrites (NO₂⁻) and Nitrates (NO₃⁻) are naturally occurring chemical compounds which contain the nitrogen and oxygen molecules. In the natural environment, ammonia (NH₃) is oxidized by aerobic bacteria into the unstable nitrite ion, then further reacts into the more stable nitrate ion.

Oxidation of ammonia in drinking water is common, and is present in both surface water and ground water sources. The *MECP* has placed limits to the maximum allowable concentration (MAC) of nitrites and nitrates in drinking water. Nitrates are limited to 10mg/L, and nitrites, being the more reactive compound are limited to 1mg/L. Potential health risks are associated with infants under 6-months of age via the disorder "Methemoglobinemia", otherwise known as "blue baby syndrome".

The prime source of ammonia in raw water supplies is from agriculture (fertilizer), animal waste, and septic tank contamination. High levels of ammonia may also be present from naturally occurring sources in groundwater.

The Region of York performs Nitrate and Nitrite testing of the drinking water at the treatment facilities where the water enters the distribution system as required under Schedule 13, O.Reg. 170/03. In 2020, the Town's Environmental Services team began quarterly sampling for nitrites and nitrates as a precaution to ensure drinking water quality is maintained throughout the distribution system. All test results for nitrites and nitrates were well below the Maximum Allowable Concentration (MAC), as noted in the tables below.



	Date of Sample	MAC*	Results
Nitrite (NO ₂ ⁻) as N	February 19, 2020	1mg/L	<0.05mg/L
Nitrate (NO ₃ ⁻) as N		10mg/L	<0.50mg/L

	Date of Sample	MAC*	Results
Nitrite (NO ₂ ⁻) as N	May 19, 2020	1mg/L	<0.05mg/L
Nitrate (NO ₃ ⁻) as N		10mg/L	<0.50mg/L

	Date of Sample	MAC*	Results
Nitrite (NO ₂ ⁻) as N	August 7, 2020	1mg/L	<0.05mg/L
Nitrate (NO ₃ ⁻) as N		10mg/L	<0.50mg/L

	Date of Sample	MAC*	Results
Nitrite (NO ₂ ⁻) as N	November 11, 2020	1mg/L	<0.05mg/L
Nitrate (NO ₃ ⁻) as N		10mg/L	<0.50mg/L

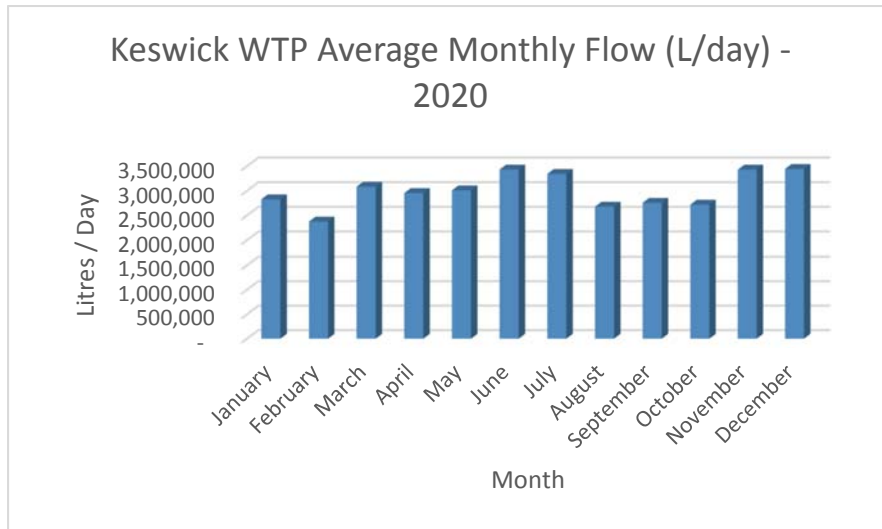
*MAC = Maximum Allowable Concentration

The Town will continue to sample for nitrites and nitrates through the 2021 year.

System Monthly Average Flow (L/day)

Keswick Water Treatment Plant (Operated by York Region)

The following chart shows the average flow of water produced (treated) in the Keswick Water Treatment Plant and is expressed in litres per day.*





Permitted and Actual Maximum Daily Withdrawal – (Keswick):

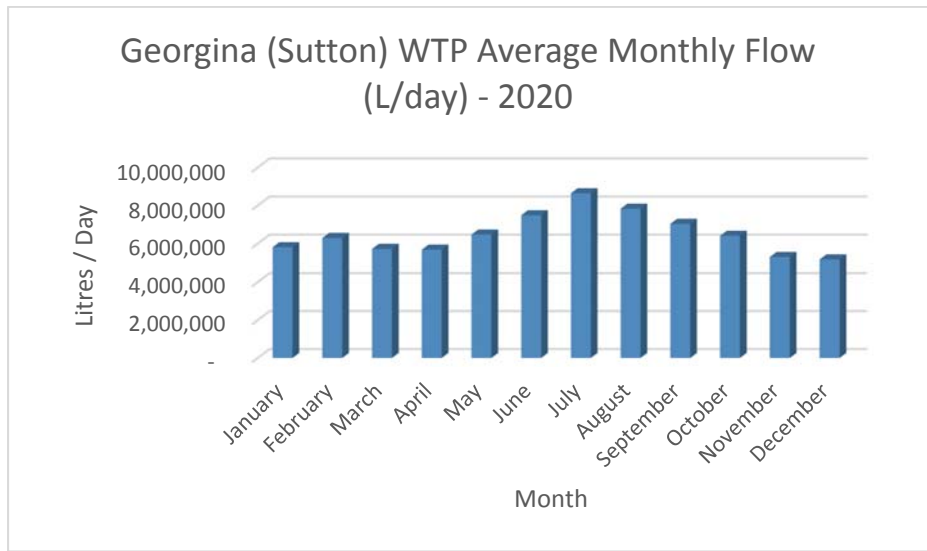
The following table shows the maximum volume of water produced in a single day from the Keswick Water Treatment Plant (Keswick WTP) compared to the maximum withdrawal permitted by the Ministry of the Environment, Conservation and Parks (MECP).*

Keswick WTP	Litres
Maximum Permitted Withdrawal Keswick WTP (L/day)	18,150,000
Maximum Daily (L/day)	5,438,000
Maximum Monthly Average Flow (L/day)	3,444,260
Total Volume Keswick WTP (L/year)	1,100,266,160

*All data provided by the Regional Municipality of York

Georgina Water Treatment Plant – Willow Beach (Operated by York Region)

The following chart shows the average flow of water produced (treated) in the Georgina Water Treatment Plant (Georgina WTP), and is expressed in litres per day.*



Permitted and Actual Maximum Daily Withdrawal (Georgina WTP) :

The following table shows the maximum volume of water produced in a single day from the Georgina WTP compared to the maximum withdrawal permitted by the MECP.*

Georgina WTP	Litres
Maximum Permitted Withdrawal Georgina WTP (L/day)	50,000,000
Maximum Daily (L/day)	12,585,000
Maximum Monthly Average Flow (L/day)	8,644,516
Total Volume Georgina WTP (L/year)	2,375,110,500

*All data provided by the Regional Municipality of York



The Drinking Water Quality Management Standard

The *Drinking Water Quality Management Standard (DWQMS)* sets out a framework for the operating authority and the owner of a drinking water system to develop a *Quality Management System (QMS)* that is relevant and appropriate for the system.

The *DWQMS* contains elements of both the ISO 9001 standard with respect to management systems and the hazard analysis and critical control points (HACCP) standard with respect to product safety. The *DWQMS* also incorporates the HACCP approach to risk assessment and reflects the multi-barrier approach for drinking water safety.

Accredited Operating Authority

Part III, Section 13 of the SDWA requires the Owner of the Drinking Water System to:

1. **Obtain, or become an Accredited Operating Authority of the Drinking Water System.** In order to become accredited, an Operating Authority must establish and maintain a *Quality Management System (QMS)*. Minimum requirements for the *QMS* are specified in the *Drinking Water Quality Management Standard (DWQMS)*, approved under *Section 21* of the *SDWA*.

Certificate of Re-Accreditation for the Town's *QMS* was received on November 7, 2018, and is valid until November 23, 2021. The Re-Accreditation was provided by the accreditation body SAI Global, through process of auditing elements fundamental to ensuring the long-term sustainability of the Towns' drinking water system, including; the *DWQMS*, operating plans, financial plans, water quality, risk management processes, and maintenance, rehabilitation and renewal of infrastructure activities used to supply drinking water, and ensure system security. Audits are conducted annually to facilitate the Towns' ability to consistently deliver safe drinking water to the public, and to enhance consumer protection through the effective application and continual improvement of the *QMS*.

In August 2020 the accreditation body performed an annual Audit on the Town's *DWQMS*. The Town received zero (0) non-conformities.

2. **Obtain a *Municipal Drinking Water License (MDWL)* and a *Drinking Water Works Permit (DWWP)*** to operate a water system. The Town received its latest *MDWL (No. 119-101)* and *DWWP (No. 119-201)* on June 7, 2016, and is valid until June 6, 2021. In December 2020, Environmental Services staff applied with the *MECP* to renew its *MDWL* until 2026.

Private Wells

Residents that obtain water from private wells are encouraged to take samples periodically to determine if their water is safe to drink. Sample bottles may be obtained at the Civic Centre and returned to the same location for testing conducted by the Ministry of Health laboratory at no cost to the residents.