



Ministry of the Environment and Climate Change

**MATTAWA DRINKING WATER SYSTEM
Inspection Report**

Site Number:	210001905
Inspection Number:	1-I2E8O
Date of Inspection:	May 31, 2018
Inspected By:	Vesna Alimpic

Table of Contents:

OWNER INFORMATION	2
CONTACT INFORMATION	2
INSPECTION DETAILS	2
DRINKING WATER SYSTEM COMPONENT DESCRIPTION	3
INSPECTION SUMMARY	5
Introduction	5
Source	5
Capacity Assessment	6
Treatment Processes	6
Treatment Process Monitoring	8
Operations Manuals	9
Security	9
Certification and Training	10
Water Quality Monitoring	10
Water Quality Assessment	12
Reporting and Corrective Actions	12
Other Inspection Findings	13
NON COMPLIANCE WITH REGULATORY REQUIREMENTS AND	14
ACTIONS REQUIRED	
SUMMARY OF BEST PRACTICE ISSUES AND RECOMMENDATIONS	15
SIGNATURES	16

APPENDICES

APPENDIX A – INSPECTION RATING RECORD
APPENDIX B – STAKEHOLDER APPENDIX
APPENDIX C – HAA SAMPLING CONCERNS LETTER

OWNER INFORMATION:

Company Name:	MATTAWA, THE CORPORATION OF THE TOWN OF	Unit Identifier:	
Street Number:	160		
Street Name:	WATER St		
City:	MATTAWA		
Province:	ON	Postal Code:	P0H 1V0

CONTACT INFORMATION

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Type:	Owner	Name:	Finnigan Daniel
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Title:	Process Compliance Technician, The Corporation of the Town of Mattawa		

Type:	Operator	Name:	John Aucoin
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Title:	Operator-in-Charge, The Corporation of the Town of Mattawa		

Type:	Health Unit	Name:	Robert A-Muhong
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INSPECTION DETAILS:

Site Name:	MATTAWA DRINKING WATER SYSTEM
Site Address:	400 BISSETT ST MATTAWA P0H 1V0
County/District:	Mattawa
MOECC District/Area Office:	North Bay Area Office
Health Unit:	NORTH BAY PARRY SOUND DISTRICT HEALTH UNIT

Conservation Authority:	North Bay Mattawa Conservation Authority
MNR Office:	
Category:	Large Municipal Residential
Site Number:	210001905
Inspection Type:	Announced
Inspection Number:	1-I2E8O
Date of Inspection:	May 31, 2018
Date of Previous Inspection:	Oct 03, 2017

COMPONENTS DESCRIPTION

Site (Name): MOE DWS Mapping
Type: DWS Mapping Point

Sub Type:

Site (Name): WELL 1 RAW
Type: Source

Sub Type: Ground

Comments:

Well # 1 was constructed in 1958 per well record 4300581. It is the larger of the two wells located within the well house at 400 Bissett Street. It is a gravel wall type of construction and had a total depth of 26.5 m. A 660 mm diameter steel outer casing extends from grade to a depth of 19.1m. A 400 mm diameter inner casing extends from grade to 22.1 m and a 400 mm diameter stainless steel screen extends from 22.1 m to 26.7 m. Well #1 is equipped with a 100 Hp vertical turbine pump and is rated at 53 L/s at a 105.8 m TDH. The pump is set at approximately 21.9 m below grade. The well head is approximately 30 cm above the pumphouse floor. Well # 1 is generally operated as the duty well from 6 am to midnight to meet higher water demand period. The switchover of well pumps is controlled by a timer within the system's programmable logic controller.

Site (Name): WELL 2 RAW
Type: Source

Sub Type: Ground

Comments:

Well # 2 was constructed in 1949 per well record 4300579. It is the smaller of the two wells located within the well house at 400 Bissett Street. It is a gravel wall type well construction and has a total depth of 23.8 m. A 560 mm diameter steel outer casing extends from grade to a depth of 18.6 m. A 300 mm diameter inner casing extends from grade to 20.6 m and a 300 mm diameter #6 stainless steel screen extends from 20.6 m to 23.6 m. Well # 2 is equipped with a 40 Hp vertical turbine pump and is rated at 22.7 L/s at a 91.5 m TDH. The pump is set at approximately 17.3 m below grade. The well head is approximately 15 cm above the pumphouse floor. Well # 2 is generally operated as the duty well from midnight to 6 a.m. for energy conservation purposes.

Site (Name): PUMPHOUSE
Type: Treated Water POE

Sub Type: Pumphouse

Comments:

The pumphouse is located at 400 Bissett Street. Raw water flows from the wells into a common 200 mm discharge header within the pump house. Primary disinfection is achieved using two ultraviolet reactors. Each unit is capable of providing a minimum ultraviolet dosage of 40 mJ/cm² at a peak flow rate of 75.7 L/s and raw water ultraviolet transmittance of 95%.

Secondary disinfection with 12% sodium hypochlorite is completed in the common discharge header prior to entry to the distribution system. The hypochlorite system consists of one 560 L storage tank, with spill containment, and two chemical metering pumps (one duty and one standby) with discharge lines into the common discharge header. The chemical metering pumps are equipped with an automatic switch-over device and controls which provide for flow proportional dosing. If both dosing pumps fail an alarm to the pager is initiated and the raw water pumps automatically

shut down. A sample line is installed on the 150 mm discharge header so that continuous on-line monitoring for free chlorine residual can be achieved. Treated water is also piped back from the point of entry to the distribution system to be used for cooling of the diesel generator and the UV reactors during their warm up cycle and for water lubrication of the pump for Well # 1.

A supervisory control and data acquisition (SCADA) system was put in place in 2011 to enhance the automated control of the water production and treatment components and to produce the required performance and monitoring reports. Backup power is supplied by a 300 kW diesel generator equipped with an automatic transfer switch and a 2,200 L capacity above ground fuel tank. This system can run the entire pumphouse, as well as a nearby sewage lift station. Other meters and appurtenances are contained within the pumphouse in accordance with the requirements of system's recently issued Municipal Drinking Water Licence and Drinking Water Works Permit.

Site (Name): RESERVOIR

Type: Other

Sub Type: Reservoir

Comments:

The in-ground reservoir has an operating capacity of 795 cubic metres and is located 700 metres to the northwest of the well house. The normal high operating water level in the reservoir is approximately 70 metres of elevation above the well house. The reservoir is located within a fenced compound and is equipped with two access hatches, two vent pipes and an overflow pipe. Monitoring of the reservoir level is used to control the operation of the well pumps at the pumphouse.

Site (Name): DISTRIBUTION

Type: Other

Sub Type: Other

Comments:

The population of Mattawa is approximately 2,150. The distribution system is fed from the well house when the pumps are operating, with excess water being directed to the elevated in ground reservoir. When the well pumps are off the distribution is gravity fed from the reservoir. The system has approximately 1050 service connections to residential and commercial consumers. There is approximately 20,000 metres of various sized cast iron, ductile iron and polyvinyl chloride piping. There are 107 fire hydrants and 239 valves in the distribution system.

INSPECTION SUMMARY:

Introduction

- The primary focus of this inspection is to confirm compliance with Ministry of the Environment and Climate Change (MOECC) legislation as well as evaluating conformance with ministry drinking water related policies and guidelines during the inspection period. The ministry utilizes a comprehensive, multi-barrier approach in the inspection of water systems that focuses on the source, treatment and distribution components as well as management practices.

This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O.Reg. 170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.

This report is based on a "focused" inspection of the system. Although the inspection involved fewer activities than those normally undertaken in a detailed inspection, it contained critical elements required to assess key compliance issues. This system was chosen for a focused inspection because the system's performance met the ministry's criteria, most importantly that there were no deficiencies as identified in O.Reg. 172/03 over the past 3 years. The undertaking of a focused inspection at this drinking water system does not ensure that a similar type of inspection will be conducted at any point in the future.

This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.

On May 31, 2018 ministry Water Inspector Vesna Alimpic conducted an inspection of Mattawa Drinking Water System (DWS). The inspector was accompanied with Daniel Finnigan, the Operator with Overall Responsibility (ORO) for the system, John Aucoin, Operator in Charge, Joshua DeWaal, Operator in Charge and Fraser Bartlett, Operator in Training, all with the Corporation of the Town of Mattawa provided the inspector with data and information required for the completion of the inspection report.

The Corporation of the Town of Mattawa is the owner and operating authority for the Mattawa Drinking Water System and Distribution System.

Inspection included a tour and physical review of the components of the drinking water system and a review of the system documents for the period from the last inspection conducted on October 2, 2017 to the date of the current inspection. This period is referred to as the "inspection period" in this report.

Specifically, this included a review and assessment of operating practices in relation to the following documents:

- Drinking Water System Regulation O. Reg. 170/03
- Certification of Drinking Water Systems Operators Regulation O. Reg. 128/04
- Permit to Take Water (PTTW) No. 1546-9GHPLM dated February 27th, 2014
- Municipal Drinking Water Licence (MDWL) No. 195-101 Issue No. 2 dated July 25th, 2016
- Municipal Drinking Water Licence (MDWL) No. 195-101 Issue No. 1 dated September 26th, 2011
- Drinking Water Works Permit (DWWP) No. 195-201 Issue No. 2 dated July 25th, 2016
- Drinking Water Works Permit (DWWP) No. 195-201 Issue No. 1 dated September 23rd, 2011.

Source

- The owner was maintaining the production well(s) in a manner sufficient to prevent entry into the well of surface water and other foreign materials.

Source

The wells are located in the Mattawa Water Treatment Plant building. Well casings extend more than 15 cm above the floor of the building. There was no indication of possibility of entry of surface water and other foreign materials into the wells.

- **Measures were in place to protect the groundwater and/or GUDI source in accordance with any the Municipal Drinking Water Licence and Drinking Water Works Permit issued under Part V of the SDWA.**

There have been no works on the wells during the inspection period. As a part of regular maintenance, motors on the well pumps are lubricated annually. Mr. Finnigan informed the inspector that there are plans to replace the pump in the Well # 2 and scour the well. Mr. Finnigan indicated that the ministry will be informed of any changes in due time.

Capacity Assessment

- **There was sufficient monitoring of flow as required by the Municipal Drinking Water Licence or Drinking Water Works Permit issued under Part V of the SDWA.**

As per DWWP, there are magnetic flow meters installed on the discharge of Well # 2 and on the treated water discharge from the well house to the distribution system. The production from Well # 1 is calculated as the difference in flow between the treated water and raw water readings.

- **The owner was in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the Municipal Drinking Water Licence issued under Part V of the SDWA.**

Section 1.1 of Schedule C of Municipal Drinking Water Licence No. 195-101 Issue No. 2 specifies that the maximum daily volume of treated water the flows from the Mattawa Water Treatment Plant to the distribution system must not exceed the rated capacity of 6 540 m³/day.

The maximum daily volume of treated water recorded during the inspection period was 1802.89 m³/day on March 28, 2018, which is approximately 27 percent of the maximum flow rate.

Treatment Processes

- **The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit.**

All physical components listed on the DWWP were observed to be in place at the facility. They were all installed, connected to the system and operational.

A couple of upgrades were made at the Mattawa Water Treatment Plant since the previous inspection. The first upgrade relates to the installation of a new free chlorine residual analyzer at the plant that will measure free chlorine residual at the point where water leaves the pump house to flow towards reservoir and distribution. At the time of preparation of this inspection report, the analyzer was not connected to the facility wide integrated process control system (SCADA). Mr. Finnigan indicated that the addition of the chlorine analyzer once it is fully functional will be recorded in a "Form 2 – Record of Minor Modifications or Replacements to the Drinking Water System" as published by the ministry. The second upgrade relates to installation of a new chart recorder for trending and SCADA recording in the water plant programmable logic controller (PLC). As the existing chart recorder was operating poorly, it was replaced with a new chart recorder with the same functions.

- **Records indicated that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a Drinking Water Works Permit and/or Municipal Drinking Water Licence issued under Part V of the SDWA at all times that water was being supplied to consumers.**

Section 1-3 of Schedule 1 of O. Reg. 170/03 requires that the owner of a drinking water system that uses water

Treatment Processes

from a raw water supply that is ground water must ensure that the water treatment equipment provided is designed to be capable of achieving, at all times, primary disinfection in accordance with the ministry's Procedure for Disinfection of Drinking Water in Ontario, including at least 99 per cent (2 log) removal or inactivation of viruses by the time water enters the distribution system.

Section 1-2(2) of Schedule 1 of O. Reg. 170/03 requires that the owner of a drinking water system and the operating authority for the system must ensure that the water equipment required by Section 1-3 is operated in a manner that achieves the design capabilities it is required to have under this section.

The MDWL No. 195-101 Issue No. 2 assigns 2 log removal credits for viruses to the existing UV disinfection system. In order to achieve the assigned removal credits for primary disinfection, the UV system must be operated within the validated limits for flow rate, calculated UV dosage, UV Transmittance, and UV lamp status in accordance with MDWL. A UV reactor is operating off specification when it operates outside of the validated range.

The MDWL specifies the following criteria for achievement of assigned log removal/inactivation credits for the process of UV disinfection at Mattawa DWS:

Duty UV Sensor Checks and Calibration:

1. Duty UV sensors shall be checked on at least a monthly basis against a reference UV sensor or at a frequency as otherwise recommended by the UV equipment manufacturer;
2. When comparing a duty UV sensor to a reference UV sensor, the calibration ratio (intensity measured with the duty UV sensor/intensity measured with the reference UV sensor) shall be less than or equal to 1.2;
3. If the calibration ratio is greater than 1.2, the duty UV sensor shall be replaced with a calibrated UV sensor or a UV sensor correction factor shall be applied while the problem with the UV sensor is being resolved;
4. Reference UV sensors shall be checked against a Master Reference Assembly at a minimum frequency of once every three years or on a more frequent basis depending upon the recommendations of the equipment manufacturer;

Operational Requirements:

5. Ultraviolet light disinfection equipment shall have a feature that ensures that no water is directed to users of water treated by the equipment or that causes an alarm to sound in the event that the equipment malfunctions, loses power or ceases to provide the appropriate level of disinfection;
6. Water shall not flow through a UV reactor when the reactor's UV lights are off or not fully energized;
7. UV lamp status shall indicate whether each UV lamp is on or off;
8. All UV sensors shall operate within their calibration range or corrective measures shall be taken; and
9. Installed or replaced UV equipment components shall be equal or better than the components used during validation testing unless the UV equipment was revalidated.

A review of the information regarding duty UV sensor checks and calibration confirmed that the duty UV sensors are checked on monthly basis against a reference sensor. The ratio of the intensity measured with the duty UV sensor against the intensity measured with the reference sensor was less than 1.2 during the comparisons of duty and reference UV sensors. The reference sensor was last calibrated in February 2014 and 2017.

A review of the information regarding operational requirements confirmed that the UV disinfection equipment is equipped with a feature that no water is directed towards users without the appropriate level of disinfection; water does not flow through a UV reactor when the reactor's UV lights are off or not fully energized; there is an indication of UV lamp status on SCADA indicating whether each UV lamp is on or off; all UV sensors operated within their calibration range during the inspection period and the replaced UV equipment components were equal with the components used during validation testing.

A review of the data provided indicated that the treatment equipment was operated in a manner that achieved the

Treatment Processes

required design capabilities during the inspection period.

- **Records confirmed that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/l free or 0.25 mg/l combined.**

A review of distribution system chlorine residuals confirmed that the free chlorine residual was never less than 0.05 mg/L. The free chlorine residual measured in the distribution system ranged from 0.21 mg/L to 0.90 mg/L during the inspection period.

- **The primary disinfection equipment was equipped with alarms or shut-off mechanisms that satisfied the standards described in Section 1-6 (1) of Schedule 1 of Ontario Regulation 170/03.**

Section 1-6(1) of Schedule 1 of O. Reg. 170/03 states that the owner must ensure that the disinfection equipment is designed and operated so that, if the disinfection equipment malfunctions, loses power or ceases to provide the appropriate level of disinfection, no water is directed to users and a certified operator takes appropriate action at the location where the equipment is installed before water is again directed to users.

The UV reactors are equipped with alarms and shut off mechanisms. The alarm set point for the UV dosage is set at 48 mJ/cm². If the UV dosage falls below 48 mJ/cm², the duty UV reactor (UVR) will alarm and shut down both the UVR unit and the duty well pump. The standby UVR is then brought on-line and the duty pump re-started when the UVR unit completes its required start-up protocols. In case of an alarm on the stand-by UVR unit, the unit would alarm and shut off the UVR unit and the duty well pump. In this case, an operator intervention is required to resolve the issue and continue with water treatment. The UVR will shut off after 60 seconds cumulative time with dosage below 48 mJ/cm². Additionally, a callout alarm is triggered in case UV transmittance falls below 95%.

Treatment Process Monitoring

- **The secondary disinfectant residual was measured as required for the distribution system.**

Subsection 7-2(3) of Schedule 7 of O. Reg. 170/03 requires that the owner of a large municipal residential system that provides secondary disinfection and the operating authority for the system must ensure that at least seven distribution samples are taken each week and are tested immediately for free chlorine residual. Unless at least one sample is taken on each day of the week, at least four of the samples must be taken on one day of the week, at least 48 hours after the last sample was taken in the previous week. At least three of the samples must be taken on a second day of the week, at least 48 hours after the last sample was taken. When more than one sample is taken on the same day of the week under paragraph 1 or 2, each sample must be taken from a different location.

According to the information provided, free chlorine residuals were measured daily during the inspection period.

- **Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test.**

A review of daily logs confirmed that the operators examine the results of continuous monitoring within 72 hours of the test.

- **The owner and operating authority ensured that the primary disinfection equipment had a recording device that continuously recorded the performance of the disinfection equipment.**

Performance of the disinfection equipment is continuously monitored and recorded using a supervisory control and data acquisition (SCADA) control system and a chart recorder. MDWL specifies that the ultraviolet light disinfection equipment must test for the test parameters set out in Column 4 of the MDWL (Column 4 test parameters: calculated UV dose, flow rate; UV transmittance, UV lamp status) at a testing frequency of once every five (5) minutes or less and record the test data at a recording frequency of once every four (4) hours or less.

Treatment Process Monitoring

According to the information provided, SCADA performs tests for the test parameters every 12 seconds and the chart recorder tests every 5 seconds. Calculated UV dose and flow rate are recorded continuously. UV transmittance is recorded every second and minimum, maximum and average values are shown in daily reports. UV lamp status is monitored on the SCADA screen and recorded indirectly by recording of flow rate – when there is flow, the UV lamp is active.

- **All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.**

Section 6-5 (1) of Schedule 8 of O. reg. 170/03 specifies that the continuous monitoring equipment must be checked and calibrated in accordance with the manufacturer's instructions. If the manufacturer's instructions do not indicate how often to check and calibrate the continuous monitoring equipment, the equipment must be checked and calibrated as often as necessary to ensure that test results are within the following margins of error: in the case of free chlorine residual, 0.05 mg/L, if the concentrations usually measured by the equipment are less than or equal to 1.0 mg/L, and proportionally higher if the concentrations usually measured are greater than 1.0 milligrams per litre.

A review of daily log sheet for the facility confirmed that the continuous chlorine analyzer is checked daily against a hand held chlorine analyzer. Continuous chlorine analyzer is adjusted when the difference between two measurements of the same sample is greater than 5%, as per manufacturer's instructions. The handheld chlorine analyzers are verified against verification standards on a monthly basis. In case they fail verification, they are sent to a third party for calibration.

Operations Manuals

- **The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.**

The operations and maintenance manuals contain the information related to the safe and efficient operation of the system. Drawings of the treatment system are available at the treatment plant, while the drawings of the distribution system with appurtenances related to the system are kept at the Public Works building.

- **The operations and maintenance manuals met the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA.**

Condition 16 of the MDWL specifies the required contents of the operation and maintenance manual. A review of the operation and maintenance manual confirmed that the required information was available for reference by all persons responsible for the operation or maintenance of the drinking water system.

Mr. Finnigan indicated that the procedure for addressing of non-compliances with respect to regulatory requirements and/or risk to raw well water quality is being incorporated into the well inspection and maintenance procedures from the operations and maintenance manual. The fire emergency SOP mentioned in the previous inspection report has not yet been developed.

Security

- **The owner had provided security measures to protect components of the drinking water system.**

The facility is equipped with an intrusion alarm system, security fencing and lighting. Operators visit the treatment plant daily.

The in-ground reservoir is located within a secured fenced compound. The reservoir's control and monitoring systems are contained within a locked building equipped with entry alarms.

Certification and Training

- **The overall responsible operator had been designated for each subsystem.**
Mr. Dan Finnigan is designated as the Operator with Overall Responsibility (ORO) for Mattawa Water Treatment Plant. Mr. Raymond Belanger, the Chief Administration Officer/Treasurer of The Corporation of the Town of Mattawa is designated as the backup ORO.
- **Operators in charge had been designated for all subsystems which comprised the drinking-water system.**
- **All operators possessed the required certification.**
- **Only certified operators made adjustments to the treatment equipment.**

Water Quality Monitoring

- **All microbiological water quality monitoring requirements for distribution samples were being met.**
Section 10-2 of Schedule 10 of O. Reg. 170/03 requires that the owner of a drinking-water system and the operating authority for the system must ensure that at least ten distribution samples are taken every month, with at least one of the samples being taken in each week. The owner of the drinking-water system and the operating authority for the system must ensure that each of the samples is tested for *Escherichia coli* and total coliforms and that at least 25 per cent of the samples required to be taken are tested for general bacteria population expressed as colony counts on a heterotrophic plate count (HPC).

A review of the sampling records confirmed that samples from distribution were collected weekly and tested for *E. coli* and total coliforms, resulting in 12 to 15 monthly samples during the inspection period. Three to four distribution samples were tested for HPC monthly, satisfying the requirement that at least 25 per cent of the 10 required monthly distribution samples are tested for HPC.
- **All microbiological water quality monitoring requirements for treated samples were being met.**
Section 10-3 of Schedule 10 of O. Reg. 170/03 requires the owner of a drinking-water system and the operating authority for the system must ensure that a treated water sample is taken at least once every week and tested for *Escherichia coli*, total coliforms and general bacteria population expressed as colony counts on a heterotrophic plate count (HPC).

A review of the sampling records confirmed that samples of treated water were collected weekly and tested for *Escherichia coli*, total coliforms and HPC during the inspection period.
- **All inorganic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**
Section 13-2 of Schedule 13 of O. Reg. 170/03 requires that the owner of a large municipal residential system and the operating authority for the system must ensure that at least one treated water sample is taken every 36 months, if the system obtains water from a raw water supply that is ground water. The owner of a large municipal residential system and the operating authority for the system must ensure that each of the samples is tested for every parameter set out in Schedule 23 (Inorganics).

Subsection 6-1.1(6) of Schedule 6 of O. Reg. 170/03 specifies that if this Regulation requires at least one water sample to be taken every 36 months and tested for a parameter, the owner of the drinking water system and the operating authority for the system must ensure that at least one sample that is taken during a 36-month period for the purpose of being tested for that parameter is taken not more than 60 days before or after the third anniversary of the day a sample was taken for that purpose in the previous 36-month period.

Water Quality Monitoring

Sampling for the purpose of testing for Schedule 23 parameters was conducted on July 28, 2015.

Note: Required sampling period for Schedule 23 parameters is from May 29, 2018 to no later than September 26, 2018.

- **All organic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

Section 13-4 of Schedule 13 of O. Reg. 170/03 requires that the owner of a large municipal residential system and the operating authority for the system must ensure that at least one treated water sample is taken every 36 months, if the system obtains water from a raw water supply that is ground water. The owner of a large municipal residential system and the operating authority for the system must ensure that each of the samples is tested for every parameter set out in Schedule 24 (Organics).

Subsection 6-1.1(6) of Schedule 6 of O. Reg. 170/03 specifies that if this Regulation requires at least one water sample to be taken every 36 months and tested for a parameter, the owner of the drinking water system and the operating authority for the system must ensure that at least one sample that is taken during a 36-month period for the purpose of being tested for that parameter is taken not more than 60 days before or after the third anniversary of the day a sample was taken for that purpose in the previous 36-month period.

Sampling for the purpose of testing for Schedule 24 parameters was conducted on July 28, 2015.

Note: Required sampling period for Schedule 24 parameters is from May 29, 2018 to no later than September 26, 2018.

- **All haloacetic acid water quality monitoring requirements prescribed by legislation are being conducted within the required frequency and at the required location.**

Section 13-6.1 of Schedule 13 of O. Reg. 170/03 requires that the owner of a drinking water system that provides chlorination and the operating authority for the system must ensure that at least one distribution sample is taken in each calendar quarter, from a point in the drinking water systems distribution system, or plumbing that is connected to the drinking water system, that is likely to have an elevated potential for the formation of haloacetic acids and tested for haloacetic acids (HAA).

A review of sampling data confirmed that the samples for haloacetic acids were collected quarterly during the inspection period, i.e. on October 19, 2017, January 16, 2018 and April 12, 2018. Concentrations of HAAs in the collected samples were below the method detection limit.

Note: It has been observed that all three HAA samples were collected at the same location, which is located at the extremity of the distribution system. HAAs will generally form at the beginning of the distribution system. The Ministry has reached out to municipal drinking water systems' owners and operators in May 2018 with guidance for collection and developing of monitoring program for HAAs. Please find the guidance attached in Appendix C.

- **All trihalomethane water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location.**

Subsection 13-6 of Schedule 13 of O. Reg. 170/03 requires the owner of a drinking water system that provides chlorination and the operating authority for the system must ensure that at least one distribution sample is taken in each calendar quarter, from a point in the drinking water system's distribution system that is likely to have an elevated potential for the formation of trihalomethanes and tested for trihalomethanes (THMs).

According to O. Reg. 169/03, the standard for THMs is 0.100 mg/L (100 µg/L) expressed as a RAA, where RAA is defined as "the running annual average of quarterly results" for THMs for a drinking water system. O. Reg. 170/03

Water Quality Monitoring

defines the "calendar quarter" as the three-month period that begins on January 1, April 1, July 1 or October 1.

For the purpose of assessing the compliance with the limit for THMs, a calculation of the running annual average of quarterly results was performed outside of the inspection period for samples collected and tested for THMs on following dates:

- July 11, 2017 with result of 4.6 µg/L.
- October 10, 2017 with result of 2.8 µg/L
- January 16, 2018 with result of 2.0 µg/L
- April 12, 2018 with result of 2.9 µg/L

The Running Annual Average for THMs was 3.08 µg/L as of April 12, 2018.

- **All nitrate/nitrite water quality monitoring requirements prescribed by legislation were conducted within the required frequency for the DWS.**

Section 13-7 of Schedule 13 of O. Reg. 170/03 requires that the owner of a drinking water system and the operating authority for the system must ensure that at least one water sample is taken every three months and tested for nitrate and nitrite.

A review of the sampling records confirmed that during the inspection period samples of treated water were collected every three months, i.e. on October 10, 2017, January 16 and April 12, 2018.

- **All sodium water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

Section 13-8 of Schedule 13 requires that the owner of a drinking water system and the operating authority for the system must ensure that at least one treated water sample is taken every 60 months and tested for sodium.

The most recent sodium sample was collected on January 16, 2018.

- **All fluoride water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

Section 13-9 of Schedule 13 requires that the owner of a drinking water system and the operating authority for the system must ensure that at least one treated water sample is taken every 60 months and tested for fluoride.

The most recent fluoride sample was collected on January 16, 2018.

- **Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.**

Water Quality Assessment

- **Records showed that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O.Reg. 169/03).**

Reporting & Corrective Actions

- **When the primary disinfection equipment, other than that used for chlorination or chloramination, has failed causing an alarm to sound or an automatic shut-off to occur, a certified operator responded in a timely manner and took appropriate actions.**

Other Inspection Findings

- **The following items are noted as being relevant to the Drinking Water System:**

A watermain break that resulted in draining of the reservoir and reduction of pressure at the treatment plant of less than 20 psi, was reported as an adverse water quality incident on December 20, 2017. Following the requirements of ministry's Watermain Disinfection Procedure for a category 1 watermain break, the watermain break was repaired, flushed, and sampled. The local medical officer of health and the ministry were contacted informing them of the incident.

Based on the review of the available information about the watermain break on December 20, 2018, improperly disinfected water was not directed to users during the incident. It has been observed that the Spills Action Centre was informed within 1 hour and 45 minutes and the Health Unit was informed within 2 hours and 9 minutes from the discovery of the incident. While the delay in notification is acceptable for an incident that is not specifically listed in Schedule 16 of the O. Reg. 170/03, please note that adverse water incidents listed in Schedule 16 require immediate notifications to the local Medical Officer of Health and the ministry.

NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED

This section provides a summary of all non-compliance with regulatory requirements identified during the inspection period, as well as actions required to address these issues. Further details pertaining to these items can be found in the body of the inspection report.

Not Applicable

SUMMARY OF RECOMMENDATIONS AND BEST PRACTICE ISSUES

This section provides a summary of all recommendations and best practice issues identified during the inspection period. Details pertaining to these items can be found in the body of the inspection report. In the interest of continuous improvement in the interim, it is recommended that owners and operators develop an awareness of the following issues and consider measures to address them.

Not Applicable

SIGNATURES

Inspected By:

Vesna Alimpic

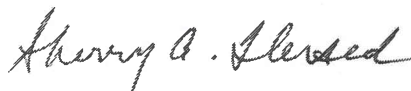
Signature: (Provincial Officer)



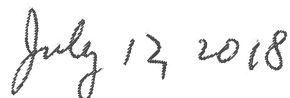
Reviewed & Approved By:

Sherry Ilersich

Signature: (Supervisor)



Review & Approval Date:



Note: This inspection does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they apply or may apply to this facility. It is, and remains, the responsibility of the owner and/or operating authority to ensure compliance with all applicable legislative and regulatory requirements.

APPENDIX A

INSPECTION RATING RECORD

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2018-2019)

DWS Name: MATTAWA DRINKING WATER SYSTEM
DWS Number: 210001905
DWS Owner: Mattawa, The Corporation Of The Town Of
Municipal Location: Mattawa

Regulation: O.REG 170/03
Category: Large Municipal Residential System
Type Of Inspection: Focused
Inspection Date: May 31, 2018
Ministry Office: North Bay Area Office

Maximum Question Rating: 391

Inspection Module	Non-Compliance Rating
Source	0 / 28
Capacity Assessment	0 / 30
Treatment Processes	0 / 77
Operations Manuals	0 / 28
Certification and Training	0 / 42
Water Quality Monitoring	0 / 112
Reporting & Corrective Actions	0 / 21
Treatment Process Monitoring	0 / 53
TOTAL	0 / 391

Inspection Risk Rating 0.00%

FINAL INSPECTION RATING: 100.00%

Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2018-2019)

DWS Name: MATTAWA DRINKING WATER SYSTEM
DWS Number: 210001905
DWS Owner: Mattawa, The Corporation Of The Town Of
Municipal Location: Mattawa

Regulation: O.REG 170/03
Category: Large Municipal Residential System
Type Of Inspection: Focused
Inspection Date: May 31, 2018
Ministry Office: North Bay Area Office

Maximum Question Rating: 391

Inspection Risk Rating 0.00%

FINAL INSPECTION RATING: 100.00%

APPENDIX B

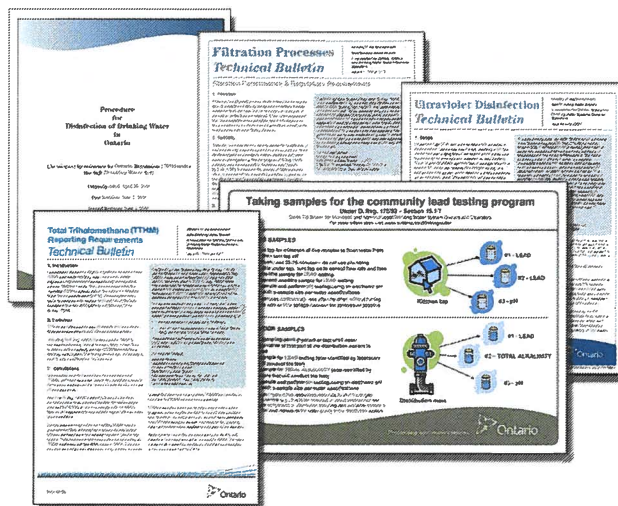
STAKEHOLDER APPENDIX

Key Reference and Guidance Material for Municipal Residential Drinking Water Systems

Many useful materials are available to help you operate your drinking water system. Below is a list of key materials owners and operators of municipal residential drinking water systems frequently use.

To access these materials online click on their titles in the table below or use your web browser to search for their titles. Contact the Public Information Centre if you need assistance or have questions at 1-800-565-4923/416-325-4000 or picemail.moe@ontario.ca.

For more information on Ontario's drinking water visit www.ontario.ca/drinkingwater and email drinking.water@ontario.ca to subscribe to drinking water news.



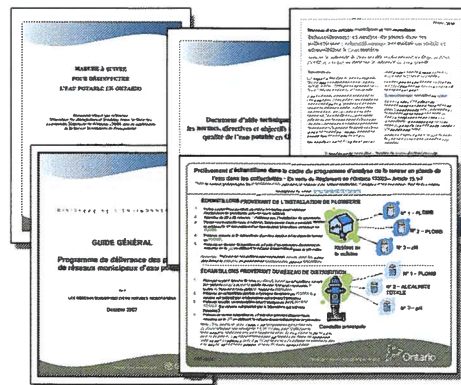
PUBLICATION TITLE	PUBLICATION NUMBER
Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils	7889e01
FORMS: Drinking Water System Profile Information, Laboratory Services Notification, Adverse Test Result Notification Form	7419e, 5387e, 4444e
Procedure for Disinfection of Drinking Water in Ontario	4448e01
Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids	7152e
Total Trihalomethane (TTHM) Reporting Requirements Technical Bulletin (February 2011)	8215e
Filtration Processes Technical Bulletin	7467
Ultraviolet Disinfection Technical Bulletin	7685
Guide for Applying for Drinking Water Works Permit Amendments, Licence Amendments, Licence Renewals and New System Applications	7014e01
Certification Guide for Operators and Water Quality Analysts	
Guide to Drinking Water Operator Training Requirements	9802e
Taking Samples for the Community Lead Testing Program	6560e01
Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption	7423e
Guide: Requesting Regulatory Relief from Lead Sampling Requirements	6610
Drinking Water System Contact List	7128e
Technical Support Document for Ontario Drinking Water Quality Standards	4449e01

ontario.ca/drinkingwater

Principaux guides et documents de référence sur les réseaux résidentiels municipaux d'eau potable

De nombreux documents utiles peuvent vous aider à exploiter votre réseau d'eau potable. Vous trouverez ci-après une liste de documents que les propriétaires et exploitants de réseaux résidentiels municipaux d'eau potable utilisent fréquemment.

Pour accéder à ces documents en ligne, cliquez sur leur titre dans le tableau ci-dessous ou faites une recherche à l'aide de votre navigateur Web. Communiquez avec le Centre d'information au public au 1 800 565-4923 ou au 416 325-4000, ou encore à picemail.moe@ontario.ca si vous avez des questions ou besoin d'aide.



Pour plus de renseignements sur l'eau potable en Ontario, consultez le site www.ontario.ca/eaupotable ou envoyez un courriel à drinking.water@ontario.ca pour suivre l'information sur l'eau potable.

TITRE DE LA PUBLICATION	NUMÉRO DE PUBLICATION
Prendre soin de votre eau potable – Un guide destiné aux membres des conseils municipaux	7889f01
Renseignements sur le profil du réseau d'eau potable, Avis de demande de services de laboratoire, Formulaire de communication de résultats d'analyse insatisfaisants et du règlement des problèmes	7419f, 5387f, 4444f
Marche à suivre pour désinfecter l'eau potable en Ontario	4448f01
Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids (en anglais seulement)	7152e
Total Trihalomethane (TTHM) Reporting Requirements: Technical Bulletin (février 2011) (en anglais seulement)	8215e
Filtration Processes Technical Bulletin (en anglais seulement)	7467
Ultraviolet Disinfection Technical Bulletin (en anglais seulement)	7685
Guide de présentation d'une demande de modification du permis d'aménagement de station de production d'eau potable, de modification du permis de réseau municipal d'eau potable, de renouvellement du permis de réseau municipal d'eau potable et de permis pour un nouveau réseau	7014f01
Guide sur l'accréditation des exploitants de réseaux d'eau potable et des analystes de la qualité de l'eau de réseaux d'eau potable	
Guide sur les exigences relatives à la formation des exploitants de réseaux d'eau potable	9802f
Prélèvement d'échantillons dans le cadre du programme d'analyse de la teneur en plomb de l'eau dans les collectivités	6560f01
Échantillonnage et analyse du plomb dans les collectivités : échantillonnage normalisé ou réduit et admissibilité à l'exemption	7423f
Guide: Requesting Regulatory Relief from Lead Sampling Requirements (en anglais seulement)	6610
Liste des personnes-ressources du réseau d'eau potable	7128f
Document d'aide technique pour les normes, directives et objectifs associés à la qualité de l'eau potable en Ontario	4449f01

ontario.ca/eaupotable

APPENDIX C

HAA SAMPLING CONCERNS LETTER



May 9, 2018

Re: Haloacetic Acids (HAAs) Sampling Concerns

Municipal Drinking Water System Owners/Operators,

The purpose of this document is to clarify ministry guidance for HAAs sampling. HAAs are disinfection by-products (DBPs) that are formed when dissolved organic matter reacts with chlorine which is added for the purpose of disinfection. Detailed information on HAAs can be found in "Health Canada (2008) Guidelines for Canadian Drinking Water Quality: Guideline Technical Document — Haloacetic Acids".

HAAs are a collection of several different compounds. The haloacetic acids most commonly found in drinking water are monochloroacetic acid (MCA), dichloroacetic acid (DCA), trichloroacetic acid (TCA), monobromoacetic acid (MBA) and dibromoacetic acid (DBA). Total HAAs is the sum of these five haloacetic acids. The HAAs most commonly found in the distribution system of drinking water systems are TCA and DCA. However the presence of bromide ions can result in the formation of MBA and DBA.

Volatilization of HAA is not expected in the distribution system as HAAs have low vapour pressure and high water solubility. TCA appears to be the most persistent HAA followed by DCA and then MCA.

Factors influencing the creation of HAAs

The levels of DBPs formed depend on many water quality parameters and operating conditions. In the case of HAAs, higher precursor concentrations (synthetic and natural organic matter, bromide ion) in the raw water, chlorine dose, chlorination pH, water temperature and the residence time will influence the type (THMs, HAAs, etc.) and the levels of DBPs formed. Studies found that surface water sources are more likely to produce higher HAAs than ground water sources.

HAAs concentrations are found to be higher in the distribution system, usually just after the chlorination process. Health Canada studies performed in 2002 and 2003 indicated that concentration of HAAs peaked in the distribution system closer to the chlorine addition point and decreased in the extremities of the system. Furthermore, the location of peak HAA values in a distribution system tends to change throughout the year, it is likely to be closer to the chlorine addition point in the summer and fall and further away from the point in the winter and spring. Precipitation and runoff events can also affect DBPs.

Sampling Points for HAAs

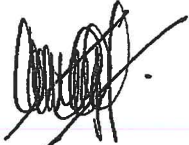
The ministry has recognized that more than one sampling location may be needed to characterize the HAAs levels throughout a municipal distribution system. HAA concentrations

can vary within and between distribution systems and so monitoring samples should be taken at points in the "middle" of the distribution system (i.e. an average water age, post re-chlorination). In light of the recently introduced HAAs standard of 80 µg/L, which will come in to force on January 1, 2020, the following guidance should be used in developing your monitoring program:

1. As a general rule, all samples described below should be obtained from a sampling point where the free (combined) chlorine residual concentration is maintained over 0.2 mg/L (1.0 mg/L) respectively.
2. First year of sampling: A system's established THM sampling point may be appropriate provided the chlorine concentrations are as described in item 1. If the residual is below the concentrations listed, use a nearby sampling point that meets the recommended residual.
3. Second year of sampling (*recommended order of selection*):
 - a. Where a system re-chlorinates via a booster station, samples should be obtained in the distribution system after the booster station.
 - b. If the system does not have booster stations, but has storage facilities where re-chlorination occurs, the sampling should be at points after the storage facilities.
 - c. If the system does not re-chlorinate, but has storage the sampling should be at points after the storage facilities.
 - d. If the system does not re-chlorinate nor have storage, obtain the sample from another point in the distribution system.
4. Third year of sampling:
 - a. If neither of the running annual averages for HAAs calculated (after year one and two) were higher than one-half of the standard (40 µg/L), the sampling point used in the first year of sampling can be used for compliance in future years.
 - b. If one of the running annual averages is over 40 µg/L, the municipality is required to choose a third sampling point using the same criteria as the second year, and obtain samples from this sampling point for the third year. The municipality will then be required to sample from the point which had the highest individual sample result for future years.

The outlined sampling plan is intended to be flexible and recognizes that municipalities have been sampling for HAAs since 2017.

Questions can be directed to: drinking.water@ontario.ca.



Cammy Mack
Director, Compliance, Promotion and Support Branch
Ministry of the Environment and Climate Change