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February 28, 2019

Town of Fort Frances
320 Portage Ave.
Fort Frances, ON
P9A 3P9

Attention: Craig Miller, Environmental and Facilities Superintendent

Dear Mr. Miller:

Re: Fort Frances Drinking Water System Inspection Report (2018/2019)

Please find attached the 2018/2019 municipal water works inspection report. The unannounced inspection was conducted on February 11 and 12, 2019. The time and co-operation of all operators involved was greatly appreciated.

One non-compliance issue was identified during the inspection. Actions required to address the non-compliance is included on pages 11 of the inspection report. Please note that "Actions Required" are linked to incidents of non-compliance with regulatory requirements contained within an Act, a Regulation, or site-specific approvals, licenses, permits, orders, or instructions. Such violations could result in the issuance of mandatory abatement instruments including Orders, tickets, penalties, or referrals to the ministry's Investigations and Enforcement Branch.

Best practice issues and associated recommendations, for the continued improvement of operations of the Fort Frances drinking-water system, are provided on pages 12 and 13 of the inspection report. *"Recommended Actions"* convey information that the owner or operating authority should consider implementing in order to advance efforts already in place to address such issues as emergency preparedness, the fulsome availability of information to consumers, and conformance with existing and emerging industrial standards. Please note that items which appear as recommended actions do not, in themselves, constitute violations.

In order to measure individual inspection results, the Ministry has established an inspection compliance risk framework based on the principles on the Inspection, Investigation &

Enforcement (II&E) Secretariat and advice in internal/external risk experts. The Inspection Summary Rating Record (IRR), included as Appendix B of the inspection report, provides the Ministry, the system owner and the local Public Health Units with a summarized quantitative measure of the drinking water system's annual inspection and regulated water quality testing performance. Please note the attached IRR methodology memo describing how the risk rating model has improved to better reflect the health related and administrative non-compliance found in an inspection report. IRR ratings are published (for the previous inspection year) in the Ministry's Chief Drinking Water Inspector's Annual Report. If you have any questions or concerns regarding the rating, please contact Dave Manol, Drinking Water Program Supervisor, at (807) 475-1689.

Section 19 of the Safe Drinking Water Act (Standard of Care) creates a number of obligations for individuals who exercise decision-making authority over municipal drinking water systems. Please be aware that the Ministry has encouraged such individuals, particularly municipal councilors, to take steps to be better informed about the drinking water systems over which they have decision-making authority. These steps could include asking for a copy of this inspection report and a review of its findings. Further information about Section 19 can be found in *"Taking Care of Your Drinking Water: A guide for members of municipal council"* found under "Resources" on the Drinking Water Ontario website at www.ontario.ca/drinkingwater.

If you have any questions or comments in regards to this inspection, or if you would like to discuss Ontario's drinking water legislation, please contact Carolyn Lacroix at (807) 468-2727.

Sincerely,

C Lacroix

Ministry of the Environment, Conservation and Parks
Northern Region - Kenora Area Office

CL/cl

cc. Northwestern Health Unit
21 Wolsley Street
Kenora, Ontario
P9N 3W7

Attention: Thomas Nabb, Program Manager

cc. Ministry of Natural Resources and Forestry
922 Scott Street
Fort Frances, Ontario
P9A 6S7

Attention: Greg Chapman, District Manager

cc. Ministry of the Environment, Conservation and Parks
435 James Street South
Suite 331
Thunder Bay, Ontario
P7E 6S7

Attention: Dave Manol, Drinking Water Supervisor

cc. Kenora Area Office
File Number: DK DY WI – 540

Ontario

Ministry of the Environment, Conservation and Parks

FORT FRANCES DRINKING WATER SYSTEM

Inspection Report

Site Number:	220000978
Inspection Number:	1-I4TQ4
Date of Inspection:	Feb 04, 2019
Inspected By:	Carolyn Lacroix

TABLE OF CONTENTS

Page

Owner Information
Contact Information 2

Inspection Details
Drinking Water System Components Description 2

Inspection Summary
Introduction 4
Capacity Assessment 4
Treatment Processes 5
Treatment Process Monitoring 5
Operations Manuals 7
Logbooks 7
Security 7
Certification and Training 7
Water Quality and Monitoring 8
Water Quality Assessment 10
Reporting and Corrective Actions 10
Other Inspection Findings 10

Non-Compliance with Regulatory Requirements and Actions Required 11

Summary of Best Practice Issues and Recommendations 12

Signatures 14

Appendices
Appendix A – Key Reference Materials
Appendix B – Inspection Summary Rating Record
Appendix C – HAA Sampling Concerns Letter

OWNER INFORMATION:

Company Name: FORT FRANCES, THE CORPORATION OF THE TOWN OF
Street Number: 320 **Unit Identifier:**
Street Name: PORTAGE Ave
City: FORT FRANCES
Province: ON **Postal Code:** P9A 3P9

CONTACT INFORMATION

INSPECTION DETAILS:

Site Name: FORT FRANCES DRINKING WATER SYSTEM
Site Address: 901 COLONIZATION RD E FORT FRANCES P9A 3P9
County/District: Fort Frances
MECP District/Area Office: Kenora Area Office
Health Unit: NORTHWESTERN HEALTH UNIT
Conservation Authority:
MNR Office: Fort Frances District Office
Category: Large Municipal Residential
Site Number: 220000978
Inspection Type: Unannounced
Inspection Number: 1-I4TQ4
Date of Inspection: Feb 04, 2019
Date of Previous Inspection: Jan 22, 2018

COMPONENTS DESCRIPTION

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

Site (Name): SOURCE
Type: Source **Sub Type:** Surface
Comments:
The raw water supply for the Fort Frances municipal drinking water system is taken from the Rainy River at the outflow of Rainy Lake. The source water is generally of good quality, however it can be subject to elevated levels of colour, turbidity, and dissolved organic carbon.
Source water is gravity-fed into a low-lift pump well located within the plant. It is then drawn through a 630 mm diameter, 190 m long intake line that is equipped at the terminal end with a stainless steel screen. Coarse material is screened at the initial intake point and again through a set of screens within the raw water well.

Site (Name): TREATED WATER
Type: Treated Water POE **Sub Type:** Pumphouse
Comments:
Three (3) vertical turbine low lift pumps deliver raw water through a common header equipped with alum and soda

ash injection points, an in-line mixer, and a flow meter. Alum is added at all times when water is being produced; soda ash is added only when needed based on the pH of the raw water supply. Polymer is then injected as the water passes into two solids contact clarifiers. The clarifiers are equipped with blow-down devices to remove excess sludge, which is discharged to the municipal sanitary sewer. Clarified water passes through one of four dual media (anthracite coal/sand) filters. Each filter effluent line is monitored for pH and turbidity. Water is disinfected in a baffled contact chamber by the addition of chlorine gas. Soda ash, used for pH adjustment is added to the clearwell, as well as hydrofluosilicic acid. Treated water flows are measured using an in-line flow meter.
Four high lift pumps (rated at 63.1 L/s (2), 94.7 L/s and 126.2 L/s) pressurize treated water as it is directed to the distribution system. Distribution system pressure is also maintained by the elevated storage tank located in the southwest portion of Fort Frances.
A complete description of the treatment system can be found in Drinking Water Works Permit No. 224-201.

Site (Name): DISTRIBUTION (WATER INSPECTION)
Type: Other **Sub Type:** Other
Comments:
The Fort Frances distribution system services a population of approximately 8,000 in Town, and another 300 people in the neighbouring community of Couchiching First Nation. The distribution system is comprised of ductile steel, cast iron, and PVC piping. The original system was installed in the early 1900's. As older pipes are replaced, PVC piping comprises an increasing proportion of the works. Some sections of the distribution system have been looped at the recommendation of a consulting engineer, however several dead ends still remain. The distribution system is 70.73 kilometres in length and contains 399 fire hydrants.
A 4,500 cubic meter elevated storage tower is located in the southwest portion of the town. A telemetry system is used to maintain water levels in the tower. A paced-to-flow chlorination system injects liquid calcium hypochlorite at the outflow from the storage tower to maintain adequate chlorine residuals in the distribution system.

INSPECTION SUMMARY:

Introduction

- **The primary focus of this inspection is to confirm compliance with Ministry of the Environment, Conservation and Parks (MECP) 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.

  This unannounced, focused inspection was conducted on February 4 and 5, 2019, by Water Inspector, Carolyn Lacroix. The inspection included a tour of the Drinking Water System (DWS) components, document review and interview with DWS personnel. The inspection review period is the period of time from the date of the previous Ministry of the Environment Conservation and Parks (MECP) inspection conducted on January 22 and 23, 2018, to the date of this inspection, unless otherwise stated.
  Text highlighted in bold-type is computer-generated based on yes/no responses to standard questions answered during the inspection. Supporting information, in regular font, has been added by the undersigned Water Inspector to qualify standard responses and to provide additional guidance/information.

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.**

  Conditions 2.1.1 and 2.1.2, Schedule C, Municipal Drinking Water Licence (MDWL) #224-101, requires continuous measurements and recording of the flow rate and daily volume of raw water flowing into the water treatment plant (WTP) and of treated water flowing from the WTP into the distribution system. The Fort Frances WTP is equipped with one raw water flow meter and one treated water flow meter.
  There were no losses of flow data during the inspection review period.

- **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.**

  Condition 1.1, Schedule C, MDWL #224-101, identifies the rated capacity of the Fort Frances WTP as 17,000 m^3/day. This represents the maximum daily volume of treated water that is allowed to be directed to the distribution system from the WTP.
  During the review period, the highest volume of treated water pumped to the distribution system in a single day was 5780 m^3, in August 2018. This represents 34 % of the rated capacity of the plant.

Capacity Assessment

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.**

  During the inspection, the undersigned Water Inspector toured the WTP and the water tower.
  The following discrepancy was noted in Schedule A of Drinking Water Works Permit (DWWP) #224-201:
  - The alum chemical metering pump is described as "having a calibration cylinder controlled automatically on the basis of the raw water flow". A new chemical metering pump has been installed and the new pump does not have a calibration cylinder. The instrument is now calibrated manually by weighing a sample.
  During the next Drinking Water Works Permit and Municipal Drinking Water License renewal, the above item is to be updated.

- **The owner/operating authority was not in compliance with the requirement to prepare Form 1 documents as required by their Drinking Water Works Permit during the inspection period.**

  Municipal Water Works Permit (MWWP) # 224-201 allows for the Fort Frances drinking water system to be altered by adding, modifying, replacing or extending a watermain within the distribution system if certain conditions are met. These conditions are outlined in MWWP in Schedule B, section 3.0.
  During the review period, Frenette Ave. was looped between 1st St. E. and 2nd St. E. and a Form 1 was not generated prior to the work being completed.

- **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.**

  In accordance with O. Reg. 170/03, Schedule 1-2(2), surface water systems must have chemically assisted filtration and disinfection and achieve an overall performance of at least a 2-log (99%) removal/inactivation of Cryptosporidium oocysts, a 3-log (99.9%) removal/inactivation of Giardia cysts, and a 4-log (99.99%) removal/inactivation of viruses, by the time the water is delivered to the first consumer.
  The Fort Frances WTP achieves the above performance criteria using conventional treatment consisting of coagulation, flocculation, sedimentation filtration, and chlorine disinfection.
  Trends on the SCADA system were reviewed to ensure that minimum chlorine residuals were met continuously. Under worst case conditions (temp 0.5 degrees Celsius, pH 7.5, clearwell level 60% capacity, treated water flow 17 000 cubic meters per day), the plant must maintain their chlorine residual above 0.85 mg/L. Records reviewed during the inspection confirmed that the system was providing the required level of treatment throughout the inspection review period. If the treated water chlorine residual dropped below the alarm set point, the high lift pumps will shut down and stop the flow of water to the distribution system. At the time of the inspection, the treated water low level chlorine alarm was set to 1.2 mg/L.
  Daily chemical feed and feed output reports were reviewed and demonstrated the consistent use of alum at all times the plant was treating water.
  Monthly turbidity summaries were reviewed to ensure that the filtered water turbidity was less than or equal to 0.3 NTU in 95% of the measurements taken each month. This was met throughout the inspection review 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.**

  Distribution chlorine levels must be maintained at or above 0.05 mg/L at all times. The lowest recorded chlorine level in the distribution system during the inspection review period was 0.24 mg/L.

Treatment Process Monitoring

- **Primary disinfection chlorine monitoring was conducted at a location approved by Municipal Drinking Water Licence and/or Drinking Water Works Permit issued under Part V of the SDWA, or at/near a location where the intended CT has just been achieved.**

  The treated water chlorine residual is monitored by a continuous analyzer at the point where treated water enters the distribution system.

- **Continuous monitoring of each filter effluent line was being performed for turbidity.**

  All four filters in the WTP are equipped with turbidity analyzers. Continuous turbidity data from each filter is printed daily, reviewed by operators and filed in the WTP office. There were no gaps in continuous data during the review period.

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

  Daily chlorine residuals are collected from the water tower, meeting the requirements of O. Reg. 170/03, Schedule 7, subsections 7-2(3),(4). Chlorine residuals are also collected during bacteriological sampling.

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

  Upon arrival at the WTP each morning, operators observe chlorine residuals from the previous 24 hour period on the circle chart recorder which is located next to the continuous chlorine analyzer.
  The circle chart recorder will hold up to a week of chlorine data. Operators then review a printout of the turbidity readings off each filter for the previous 24 hour period. These printouts display turbidity in 15 minute intervals; each 15 minute data set includes the minimum, maximum and mean turbidity value for the prior 15 minute time period. Operators then review continuous data for the previous 24 hour period on the SCADA computer.
  The operations manual has a standard operating procedure for "Reviewing Continuous Monitoring Turbidity Test Results".

- **All continuous monitoring equipment utilized for sampling and testing required by O. Reg.170/03, or Municipal Drinking Water Licence or Drinking Water Works Permit or order, were equipped with alarms or shut-off mechanisms that satisfy the standards described in Schedule 6.**

  Currently, the alarm set points for chlorine and turbidity are as follows:
  • Final Effluent Low Chlorine Alarm = 1.20 mg/L - If final effluent chlorine levels drop below this set point, an alarm will sound immediately and the high lift pumps will shut down. The system will run off of the water tower.
  • Final Effluent High Chlorine Alarm = 3.2 mg/L - calls out operator on duty
  • Filter Effluent Turbidity High Alarm = 0.3 NTU - plant alarm sounds, if the filter effluent turbidity continues to exceed the set point for more than 10 min, the filter that is exceeding will shut down and a call out will be made to the on-call operator
  • Filter Effluent Turbidity High High Alarm = 0.80 NTU - plant immediately alarms, calls out the on-call operator and filter shuts down
  • Filter Effluent Turbidity Low Alarm = - 0.1 mg/L

- **Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format.**

  Final effluent chlorine residuals and filter effluent turbidity from of each filter, are read and recorded in the SCADA system every 60 seconds. Final effluent chlorine residuals are also documented on a chart recorder.
  Daily, the SCADA system prints out a summary of all the filter effluent turbidity data. Based on the data collected every 60 seconds, every 15 minutes, the mean, maximum and average values of the previous 15 minutes of data are recorded.

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

  O. Reg. 170/03, Schedule 6, section 6-5(1)8, requires that the continuous monitoring equipment must be checked and calibrated in accordance with the manufacturer's instructions.
  The Rosemont Chlorine Residual Analyzer is used to continuously monitor the treated water chlorine residual. The instruction manual for this instrument does not state how frequently the instrument is to be calibrated; therefore, O. Reg. 170/03, Schedule 6, section 6-5(1)10 applies. This section requires that the instrument be checked and calibrated as frequently as necessary to ensure that the margin of error for free chlorine residual test results are within 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 mg/L.
  Documentation shows that the analyzer was last calibrated by an outside party on August 21, 2018 and had been previously calibrated on August 21, 2017. In addition, manual chlorine residuals are taken daily and compared to the on-line analyzer. If the analyzer starts to drift, an in- house calibration is completed.
  Rosemount Clarity II Turbidity Analyzers are used to continuously monitor the filter effluent turbidity on each filter. The instruction manual, for these instruments requires that they be calibrated annually. Documentation shows that the filter 1, 3 and 4 turbidity analyzers were calibrated on August 23, 2018 and had been previously calibrated on August 21, 2017 (filter #2 was not calibrated because it is currently off-line and there are no plans to bring it back on-line at this time). In addition, in-house calibrations of the # 1, 3 and 4 filter effluent turbidity analyzers are completed monthly.

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 Manual contains computer generated print outs from the SCADA system, of the components of the drinking water system, as well as a complete process diagram for the entire system.

- **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.**

Logbooks

- **Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.**

  Only certified operators make entries in the logbook.

Security

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

  Security measures provided at the WTP include:
  • "No Trespassing" signs;
  • alarm system; and
  • locked doors when employees are not present.
  Security measures provided at the water tower include:
  • "No Trespassing" signs; and
  • a fence around the water tower that is gated and locked
  There are a limited number of keys available for the WTP and the water tower.

Certification and Training

- **The overall responsible operator had been designated for each subsystem.**

  The Fort Frances WTP is a Class 3 subsystem and the distribution system is a Class 2 subsystem. Two operators operated as the ORO for both subsystems during the review period. The ORO's hold valid certificates that are at the same level or higher than both subsystems.
  The ORO listed in the distribution log book on Friday, remains the ORO for the subsystem throughout the weekend. The ORO for the WTP is listed in the WTP log book daily.

- **Operators in charge had been designated for all subsystems which comprised the drinking-water system.**

  Only operators with the appropriate level of certification were designated as the OIC for the review period. The OIC for the WTP is listed in the WTP log book daily. The OIC's for the distribution system is listed in the distribution log book daily, except for on weekends. The OIC's documented on Friday remains the OIC's for the weekend.

- **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.**

  O. Reg. 170/03, Schedule 10, section 10-2 requires owners and operating authorities of DWS's that serve 100,000 people or fewer to ensure that at least eight distribution samples plus one additional distribution sample for every 1,000 people served by the system are taken each month.
  At least one of the samples must be taken each week. The samples must be tested for E. coli and total coliform bacteria with at least 25% of the required samples to be tested for general bacteria measured using heterotrophic plate counts (HPC).
  The Fort Frances DWS serves a population of approximately 8,000 people; therefore, at least 16 distribution samples must be taken every month. This requirement was met throughout the inspection review period, except for in December 2018. During this month, weekly microbiological samples were taken; however, due to a snow storm, the courier service was unable to deliver the December 27, 2018 samples to the lab, prior to them expiring. On December 31, 2018, operators became aware that the samples arrived at the lab past their holding time and notified the local ministry office to discuss. Since it was the end of the month, there was not enough time to re-take the expired samples.

- **All microbiological water quality monitoring requirements for treated samples were being met.**

  Section 10-3, Schedule 10, O. Reg. 170/03 requires at least one treated water sample to be taken every week from the point of entry to the distribution system and tested for total coliform bacteria, E. coli and HPC. This requirement was met throughout the inspection review period except for during the week of December 27, 2018. During this week, a treated water sample was taken on December 27, 2018, but due to a snow storm, the courier service was unable to deliver this sample prior to it expiring. Operators became aware of this issue on December 31, 2018 and notified the local ministry office. Operators resumed weekly sampling later this week.

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

  Treated water samples must be taken at least once every 12 months (+/- 30 days from the anniversary of the previous sampling date) and tested for the inorganic parameters listed in O. Reg. 170/03, Schedule 23. These parameters were last sampled for on March 6, 2018 and had been previously sampled on March 7, 2017.

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

Water Quality Monitoring

Treated water samples must be taken at least once every 12 months (+/- 30 days from the anniversary of the previous sampling date) and tested for organic parameters listed in O. Reg. 170/03, Schedule 24. These parameters were last sampled for on March 6, 2018, and had been previously sampled on March 7, 2017.

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

  In accordance with section 13-6.1, Schedule 13, O. Reg. 170/03, a sample from the distribution system or plumbing is required to be taken and tested for Haloacetic acid (i.e. HAAs) once in each calendar quarter, from a location that is likely to have an elevated potential for the formation of HAA's.
  During the inspection review period, HAA samples were collected from the water tower in each calendar quarter.

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

  In accordance with section 13-6, Schedule 13, O. Reg. 170/03, a sample from the distribution system or plumbing is required to be taken and tested for Trihalomethanes (i.e. HAAs) once in each calendar quarter, from a location that is likely to have an elevated potential for the formation of THM's.
  During the inspection review period, THM samples were collected from the water tower, in each calendar quarter. The running annual average THM concentration at the time of the inspection was 54.65 ug/L, the maximum acceptable concentration is 100 ug/L.

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

  Treated water samples must be taken every three months for analysis of nitrate and nitrite, in accordance with O. Reg. 170/03, Schedule 13, section 13-7. During the inspection review period, samples were collected in each calendar quarter. All nitrate and nitrite samples were collected from the WTP at the point of entry to the distribution system.

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

  Sodium samples must be collected from the WTP at the point of entry to the distribution system at least once every 60 months to meet the requirements of O. Reg. 170/03, Schedule 13, section 13-8. A sodium sample was last collected from the Fort Frances WTP on March 9, 2015 and the result was 16.4 mg/L. It had been previously sampled on March 8, 2010.

- **The required daily samples were being taken at the end of the fluoridation process.**

  Schedule 7, section 7-4 of O. Reg. 170/03 requires that 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. Fluoride residuals were being recorded daily by operators. Fluoride is monitored by a continuous analyzer at the same location as the treated water chlorine analyzer, after treatment, prior to water leaving the plant.
  During the review period, the highest observed fluoride residual observed from the daily recording of fluoride residuals was 0.81mg/L. The limit for fluoride is 1.5 mg/L.

- **All water quality monitoring requirements imposed by the Municipal Drinking Water Licence and Drinking Water Works Permit were being met.**

  Suspended solids are required to be monitored quarterly at the point of discharge to the Rainy River. Records indicate that manual composite samples were collected quarterly during the inspection review period and were tested for suspended solids.

- **Records confirmed that chlorine residual tests were being conducted at the same time and at the same**

Water Quality Monitoring

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

- **Where required continuous monitoring equipment used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person responded in a timely manner and took appropriate actions.**

  On average, it takes an operator approximately 10 minutes to respond to an alarm call out. Only certified operators responded to alarms during the inspection review period.

Other Inspection Findings

- **The following issues were also noted during the inspection:**

  1. O. Reg. 170/03, Schedule 13, section 13-6.1(1) requires that in each calendar quarter, a sample be taken and tested for HAA's from a point in the drinking water system's distribution system, or plumbing that is connected to the drinking water system, that is likely to have an elevated potential for the formation of HAA's. In 2017, HAA samples were taken from the water tower, a location toward the end of the distribution system. In 2018, HAA samples were taken as follows:
  - Quarter 1 - location in middle of distribution system
  - Quarter 2 - location near the water treatment plant
  - Quarter 3 - water tower
  - Quarter 4 - water tower

  On May 9, 2018, the MECP distributed a letter to municipalities, clarifying ministry guidance on HAA sampling. The guidance provided in the letter differs from how the Town of Fort Frances is choosing their HAA sampling locations.
  2. Although the Fort Frances WTP has calculated a worst case scenario CT calculation and the calculation is kept in a filing cabinet at the water treatment plant office, it is not included in the operations manual. Operators may not be aware that the sample CT calculation can be found in the filing cabinet location.
  3. For the majority of the review period, the same operator was designated as the distribution ORO and two other operators were designated as distribution OIC's. This was written in the log book daily, except for on weekends. There was an understanding amongst operators that these same individuals would remain designated as the ORO and OIC's over the weekend.
  4. On occasion, it was not always made clear during maintenance or repair of the distribution system, who determined the category/level of contamination of the maintenance or repair. This determination is to be made by the OIC.
  5. On occasion, an entry was made by an operator in the WTP log book and was directly followed by another operator's log book entry, with no space between the entries. This made it challenging to distinguish who made the entry because the entries were not written as two separate entries, by two separate operators.
  6. On June 30, 2018, filter #3 was taken off-line at approximately 21:30 and was brought back into service on July 5, 2018. During this time the monthly filter effluent turbidity reading summaries for June 30, 2018 and July 1, 2018, did not reflect that this filter was off-line. This error impacts the accuracy of the monthly filter effluent turbidity calculation. The monthly calculations for June and July 2018 have been re-calculated and demonstrate this criteria was met for the review period.
  7. Some of the operations manual content are not up to date i.e. contact information, watermain break repair procedure.

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.

1. **The owner/operating authority was not in compliance with the requirement to prepare Form 1 documents as required by their Drinking Water Works Permit during the inspection period.**

   Municipal Water Works Permit (MWWP) # 224-201 allows for the Fort Frances drinking water system to be altered by adding, modifying, replacing or extending a watermain within the distribution system if certain conditions are met. These conditions are outlined in MWWP in Schedule B, section 3.0.
   During the review period, Frenette Ave. was looped between 1st St. E. and 2nd St. E. and a Form 1 was not generated prior to the work being completed.

   Action(s) Required:

   By April 5, 2019, the owner is to submit to the undersigned officer a completed Form 1, for the loop on Frenette Ave. between 1st. E and 2nd St. E. The documentation is to include written verification from:
   - a Professional Engineer stating hat the watermain loop meets the requirements of condition 3.1.1 of MWWP #224-201, Schedule B, section 3 and
   - the owner of the drinking water system stating that the watermain loop meets the requirements of conditions 3.1.2 to 3.1.6 of MWWP # 224-201, Schedule B, section 3.

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.

1. **The following issues were also noted during the inspection:**
   1. To date, the majority of HAA samples have been taken from the water tower.
   2. The Fort Frances WTP worst case scenario CT calculation is kept in a filing cabinet in the plant office and not he operations manual.
   3. For the majority of the review period, the same operator was designated as the distribution ORO and two other operators were designated as distribution OIC's. This was written in the log book daily, except for on weekends. There was an understanding amongst operators that these same individuals would remain designated as the ORO and OIC's over the weekend.
   4. On occasion, it was not always made clear during maintenance or repair of the distribution system, who determined the category/level of contamination of the maintenance or repair. This determination is to be made by the OIC.
   5. On occasion, an entry was made by an operator in the WTP log book and was directly followed by another operator's log book entry, with no space between the entries. This made it challenging to distinguish who made the entry because the entries were not written as two separate entries, by two separate operators.
   6. On June 30, 2018, filter #3 was taken off-line at approximately 21:30 and was brought back into service on July 5,
   2018. During this time the monthly filter effluent turbidity reading summaries for June 30, 2018 and July 1, 2018, did not reflect that this filter was off-line. This error impacts the accuracy of the monthly filter effluent turbidity calculation. The monthly calculations for June and July 2018 have been re-calculated and demonstrate this criteria was met for the review period.
   7. Some of the operations manual content are not up to date i.e. contact information, watermain break repair procedure.

   Recommendation:

   1. On May 9, 2018, the ministry sent a letter to all municipal drinking water system owners clarifying the ministry's guidance for HAA sampling. This letter suggests that in each year leading up to implementation of the HAA standard, HAA's are to be sampled annually from different locations (i.e. beginning, middle and end of distribution system).
   Attached in Appendix C is a copy of this letter. It is recommended that the details of this letter be reviewed and compared to where HAA samples have already been taken, in each calendar quarter, when determining the HAA sampling locations for 2019.
   2. In addition to keeping a copy of the CT calculation in the WTP office filing cabinet, a copy should also be kept in the operations manual. The calculation should also include a description of the process used to achieve primary and secondary disinfection.
   3. It is recommended that it be indicated in the log book, who is designated as the ORO and OIC over the weekend. This may be documented and clarified in the Friday log book entry.
   4. It is recommended that the template that is used to track the details pertaining to watermain maintenance/repair, be updated to include a section that prompts the individual who made the determination of the category of the watermain maintenance/repair, to document their name. This determination is to be made by an OIC.
   5. It is recommended that if an operator makes a new entry in the log book that they leave a space between their entry and the previous entry made by another operator. All entries made by an officer are to be signed off on by the operator who made the entry.
   6. It is recommended that the computer technician re-assess how filter effluent turbidity data points are summarized

in the monthly filter effluent print out and ensure the monthly calculation is being completed accurately.

7. It is recommended that the content of the operations manual be reviewed and updated where necessary. Particular attention shall be made to the contact information and the watermain break procedure.

SIGNATURES

Inspected By: Signature: (Provincial Officer)

Carolyn Lacroix

Reviewed & Approved By: Signature: (Supervisor)

Dave Manol

Review & Approval Date: February 28, 2019

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.

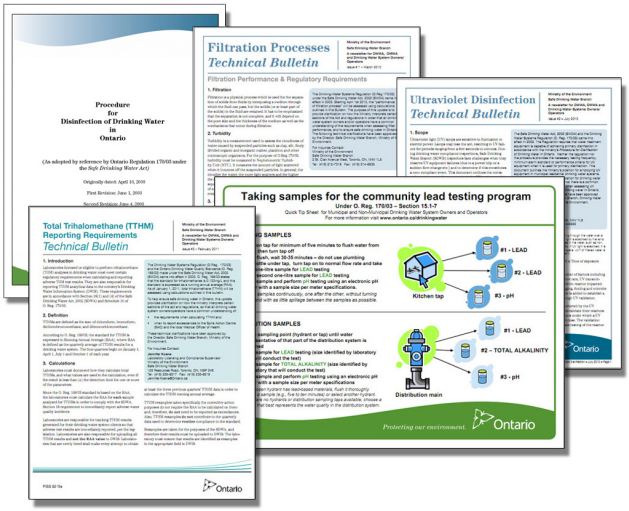
Key Reference Materials

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

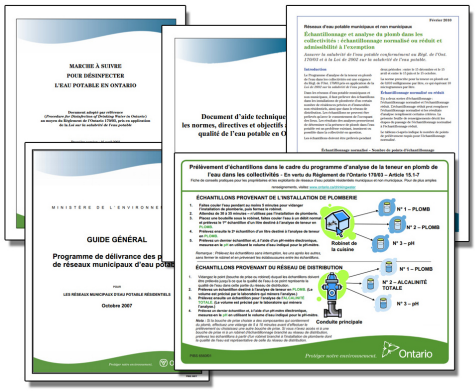
PIBS 8990b01

Ontario

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 Thrihalomethanes 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

PIBS 8990b01

Ontario

Inspection Summary Rating Record

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

DWS Name:	FORT FRANCES DRINKING WATER SYSTEM
DWS Number:	220000978
DWS Owner:	Fort Frances, The Corporation Of The Town Of
Municipal Location:	Fort Frances
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Focused
Inspection Date:	February 4, 2019
Ministry Office:	Kenora Area Office

Maximum Question Rating: 452

Inspection Module	Non-Compliance Rating
Capacity Assessment	0 / 30
Treatment Processes	4 / 60
Operations Manuals	0 / 28
Logbooks	0 / 14
Certification and Training	0 / 42
Water Quality Monitoring	0 / 124
Reporting & Corrective Actions	0 / 21
Treatment Process Monitoring	0 / 133
TOTAL	**4 / 452**

Inspection Risk Rating	**0.88%**

FINAL INSPECTION RATING:	**99.12%**

Inspection Rating Record Generated On 28-FEB-19 (Inspection ID: 1-I4TQ4).

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

DWS Name:	FORT FRANCES DRINKING WATER SYSTEM
DWS Number:	220000978
DWS Owner:	Fort Frances, The Corporation Of The Town Of
Municipal Location:	Fort Frances
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Focused
Inspection Date:	February 4, 2019
Ministry Office:	Kenora Area Office

Non-compliant Question(s)	Question Rating
Treatment Processes	
Is the owner/operating authority able to demonstrate that, when required during the inspection period, Form 1 documents were prepared in accordance with their Drinking Water Works Permit?	4
TOTAL QUESTION RATING	4

Maximum Question Rating: 452

Inspection Risk Rating	**0.88%**

FINAL INSPECTION RATING:	**99.12%**

Inspection Rating Record Generated On 28-FEB-19 (Inspection ID: 1-I4TQ4).

APPLICATION OF THE RISK METHODOLOGY USED FOR MEASURING MUNICIPAL RESIDENTIAL DRINKING WATER SYSTEM INSPECTION RESULTS

The Ministry of the Environment (MOE) has a rigorous and comprehensive inspection program for municipal residential drinking water systems (MRDWS). Its objective is to determine the compliance of MRDWS with requirements under the Safe Drinking Water Act and associated regulations. It is the responsibility of the municipal residential drinking water system owner to ensure their drinking water systems are in compliance with all applicable legal requirements.

This document describes the risk rating methodology, which has been applied to the findings of the Ministry's MRDWS inspection results since fiscal year 2008-09. The primary goals of this assessment are to encourage ongoing improvement of these systems and to establish a way to measure this progress.

MOE reviews the risk rating methodology every three years to account for legislative and societal changes that affect acceptable risk levels. As a result of the most recent review, the methodology has been modified to present an improved metric for the evaluation of the risk/safety of MRDWS operations.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains up to 14 inspection modules and consists of approximately 120 regulatory questions. Those protocol questions are also linked to definitive guidance that

PIBS 6797e

ministry inspectors use when conducting MRDWS inspections. The questions address a wide range of regulatory issues, from administrative procedures to drinking water quality monitoring. Additionally, the inspection protocol contains a number of non-regulatory questions.

A team of drinking water specialists in the ministry have assessed each of the inspection protocol regulatory questions to determine the risk (not complying with the regulation) to the delivery of safe drinking water. This assessment was based on established provincial risk assessment principles, with each question receiving a risk rating referred to as the Question Risk Rating. Based on the number of areas where a system is deemed to be non-compliant during the inspection, and the significance of these areas to administrative, environmental, and health consequences, a risk-based inspection rating is calculated by the ministry for each drinking water system.

It is important to be aware that an inspection rating that is less than 100 per cent does not mean that the drinking water from the system is unsafe. It shows areas where a system's operation can improve. To that end, the ministry works with owners and operators of systems to make sure they know what they need to do to achieve full compliance.

The inspection rating reflects the inspection results of the specific drinking water system for the reporting year. Since the methodology is applied consistently over a period of years, it serves as a comparative measure both provincially and in relation to the individual system. Both the drinking water system and the public are able to track the performance over time, which encourages continuous improvement and allows systems to identify specific areas requiring attention.

The ministry's annual inspection program is an important aspect of our drinking water safety net. The ministry and its partners share a common commitment to excellence and we continue to work toward the goal of 100 per cent regulatory compliance.

Determining Potential to Compromise the Delivery of Safe Water

The risk management approach used for MRDWS is aligned with the Government of Ontario's Risk Management Framework. Risk management is a systematic approach to identifying potential hazards; understanding the likelihood and consequences of the hazards; and taking steps to reduce their risk if necessary and as appropriate.

The Risk Management Framework provides a formula to be used in the determination of risk:

RISK = LIKELIHOOD × CONSEQUENCE
(of the consequence)

Every regulatory question in the inspection protocol possesses a likelihood value (L) for an assigned consequence value (C) as described in **Table 1** and **Table 2**.

TABLE 1:

Likelihood of Consequence Occurring	Likelihood Value
0% - 0.99% (Possible but Highly Unlikely)	L = 0
1 – 10% (Unlikely)	L = 1
11 – 49% (Possible)	L = 2
50 – 89% (Likely)	L = 3
90 – 100% (Almost Certain)	L = 4

TABLE 2:

Consequence	Consequence Value
Medium Administrative Consequence	C = 1
Major Administrative Consequence	C = 2
Minor Environmental Consequence	C = 3
Minor Health Consequence	C = 4
Medium Environmental Consequence	C = 5
Major Environmental Consequence	C = 6
Medium Health Consequence	C = 7
Major Health Consequence	C = 8

The consequence values (0 through 8) are selected to align with other risk-based programs and projects currently under development or in use within the ministry as outlined in **Table 2**.

The Question Risk Rating for each regulatory inspection question is derived from an evaluation of every identified consequence and its corresponding likelihood of occurrence:

- All levels of consequence are evaluated for their potential to occur
- Greatest of all the combinations is selected.

The Question Risk Rating quantifies the risk of non-compliance of each question relative to the others. Questions with higher values are those with a potentially more significant impact on drinking water safety and a higher likelihood of occurrence. The highest possible value would be 32 (4×8) and the lowest would be 0 (0×1).

Table 3 presents a sample question showing the risk rating determination process.

TABLE 3:

Does the Operator in Charge ensure that the equipment and processes are monitored, inspected and evaluated?

Risk = Likelihood × Consequence							
C=1	C=2	C=3	C=4	C=5	C=6	C=7	C=8
Medium Administrative Consequence	**Major** Administrative Consequence	**Minor** Environmental Consequence	**Minor** Health Consequence	**Medium** Environmental Consequence	**Major** Environmental Consequence	**Medium** Health Consequence	**Major** Health Consequence
L=4 (Almost Certain)	L=1 (Unlikely	L=2 (Possible)	L=3 (Likely)	L=3 (Likely)	L=1 (Unlikely	L=3 (Likely)	L=2 (Possible)
R=4	**R=2**	**R=6**	**R=12**	**R=15**	**R=6**	**R=21**	**R=16**

Application of the Methodology to Inspection Results

Based on the results of a MRDWS inspection, an overall inspection risk rating is calculated. During an inspection, inspectors answer the questions that relate to regulatory compliance and input their responses as “yes”, “no” or “not applicable” into the Ministry’s Laboratory and Waterworks Inspection System (LWIS) database. A “no” response indicates non-compliance. The maximum number of regulatory questions asked by an inspector varies by: system (i.e., distribution, stand-alone), type of inspection (i.e., focused, detailed), and source type (i.e., groundwater, surface water).

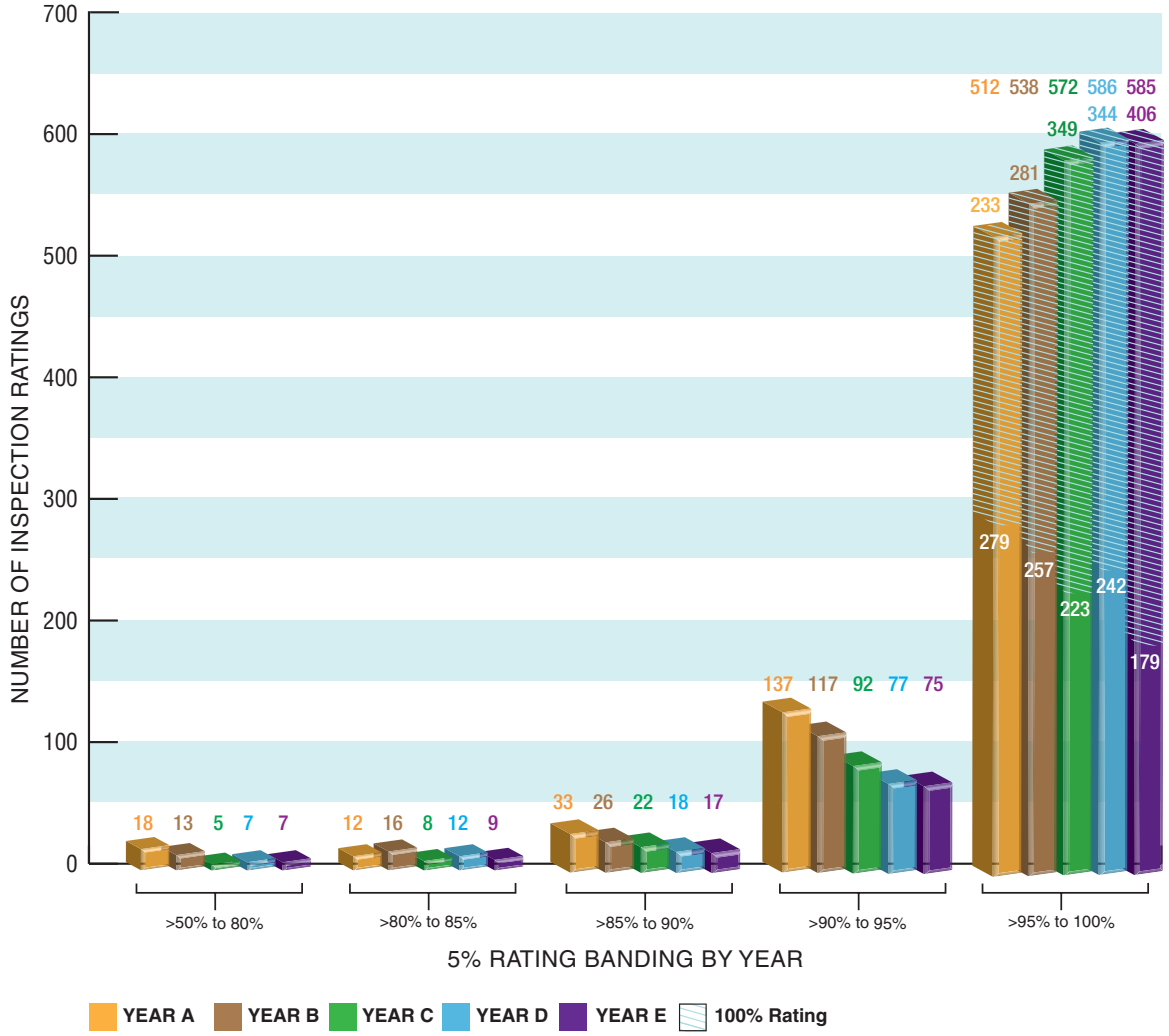
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

Application of the Methodology for Public Reporting

The individual MRDWS Total Inspection Ratings are published with the ministry's Chief Drinking Water Inspector's Annual Report.

Figure 1 presents the distribution of MRDWS ratings for a sample of annual inspections. Individual drinking water systems can compare against all the other inspected facilities over a period of inspection years.

Figure 1: Year Over Year Distribution of MRDWS Ratings



Reporting Results to MRDWS Owners/Operators

A summary of inspection findings for each system is generated in the form of an Inspection Rating Record (IRR). The findings are grouped into the 14 possible modules of the inspection protocol, which would provide the system owner/operator with information on the areas where they need to improve. The 14 modules are:

1. Source
2. Permit to Take Water
3. Capacity Assessment
4. Treatment Processes
5. Process Wastewater
6. Distribution System
7. Operations Manuals
8. Logbooks
9. Contingency and Emergency Planning
10. Consumer Relations
11. Certification and Training
12. Water Quality Monitoring
13. Reporting, Notification and Corrective Actions
14. Other Inspection Findings

For further information, please visit **www.ontario.ca/drinkingwater**

Letter – Re: HAA Sampling Concerns

Ministry of the Environment and Climate Change

Compliance, Promotion and Support Branch

2nd floor
40 St. Clair Ave West
Toronto ON M4V 1M2

Ministère de l'Environnement et de l'Action en matière de changement climatique

Direction de la promotion de la conformité et du soutien

2ème étage
40, avenue St. Clair Ouest
Toronto (Ontario) M4V 1M2

Ontario

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