Ministry of the Environment, Conservation and Parks
Eastern Region
Belleville Area Office
345 College Street East
Belleville ON K8N 5S7

Ministère de l'Environnement, de la Protection de la nature et des Parcs
Région de l'Est
Bureau du secteur de Belleville
345, rue College Est
Belleville (Ontario) K8N 5S7

Ontario

December 9, 2024

Typhany Choinard, Chief Administrative Officer
The Corporation of the Municipality of Centre Hastings
7 Furnace Street
Madoc, Ontario K0K 2M0

RE: Inspection of the Madoc Drinking Water System at 109 Rollins Street, Madoc, Ontario K0K 2M0 on October 9, 2024 | Planned Event No. 1-312856640

Attached to this letter is the report for the recent announced inspection completed at the Madoc Drinking Water System. This report provides an assessment of compliance and conformance based on observations and information available during the inspection review period only.

Instances of non-compliance and/or non-conformance were not identified during the inspection. There are no further actions required on your part and the inspection can be considered closed.

Additional findings and applicable comments, where provided, will be found within the report.

The corresponding Inspection Risk Rating (IRR) and Risk Methodology document are also included. The IRR is a summarized quantitative measure of the drinking water system's annual inspections and is published in the Ministry's Chief Drinking Water Inspector's Annual Report. The Risk Methodology document describes the risk rating methodology which has been applied to the findings of the Ministry's municipal residential drinking water system/licensed laboratory inspection results.

If you have questions or concerns, please contact me by email at shayna.maracle@ontario.ca by telephone at (613) 449 – 0504.

Shayna Maracle
Water Compliance Officer
Badge No. 2063
Tel: (613) 449 – 0504
Email: shayna.maracle@ontario.ca

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Attachments: Inspection Report, Inspection Risk Rating Report, Risk Methodology, and Reference and Guidance Material for Municipal Residential Drinking Water Systems

Cc: Amber Coupland, Senior Operations Manager, Ontario Clean Water Agency, acoupland@ocwa.com

Allison McCann, Safety Process and Compliance Manager, Ontario Clean Water Agency, amccann@ocwa.com

Brad Robinson, Process and Compliance Technician, Ontario Clean Water Agency, brobinson@ocwa.com

Kevin Hart, Manager of Public Works, The Corporation of the Municipality of Centre Hastings, khart@centrehastings.com

Dr. Ethan Toumishey, Medical Officer of Health, Hastings Prince Edward Public Health, etoumishey@hpeph.ca

Health Unit Inspector, Hastings Prince Edward Public Health, ehfax1@hpeph.ca

Amy Dickens, Source Water Protection Coordinator, Quinte Conservation, adickens@quinteconservation.ca

MADOC DRINKING WATER SYSTEM
Physical Address: 109 ROLLINS ST, , MADOC, ON K0K 2K0

INSPECTION REPORT

System Number:	220001575
Entity:	THE CORPORATION OF THE MUNICIPALITY OF CENTRE HASTINGS ONTARIO CLEAN WATER AGENCY
Inspection Start Date:	October 07, 2024
Site Inspection Date:	October 09, 2024
Inspection End Date:	December 02, 2024
Inspected By:	Shayna Maracle
Badge #:	2063


(signature)

INTRODUCTION

Purpose

This announced focused inspection was conducted to confirm compliance with Ministry of the Environment, Conservation and Parks' (MECP) legislation and conformance with ministry drinking water policies and guidelines.

Scope

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 and the operation of the system.

The inspection of the drinking water system included both the physical inspection of the component parts of the system listed in section 4 "Systems Components" of the report and the review of data and documents associated with the operation of the drinking water system during the review period.

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 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.

Facility Contacts and Dates

The drinking water system is owned by The Corporation of the Municipality of Centre Hastings and operated by Ontario Clean Water Agency (OCWA).

The system serves an estimated population of 1, 400 and is categorized as a Large Municipal Residential System. Information reviewed for this inspection covered the time period of October 26, 2023 to October 9, 2024. The system is classified as a class II water treatment subsystem and a class I water distribution and supply subsystem.

The Water Compliance Officer/Provincial Officer was assisted by Ministry employee Jennifer McLean and met with Amber Coupland, Brad Robinson, and Erin Ball with OCWA as part of the inspection process.

Systems/Components

All locations associated with primary disinfection were visited as part of this inspection. The following sites were visited as part of the inspection of the drinking water system:
- Rollins Street Pumphouse, 109 Rollins Street Madoc ON
- Marmora Street Pumphouse, 34 Marmora Street Madoc ON

An outstation is a component of a drinking water system that is not located at either a water treatment plant or a well supply and is generally not associated with primary treatment, for example reservoirs, booster stations, and re-chlorination facilities located within the distribution system. Outstations may be visited on a rotational basis as part of a ministry inspection. This inspection included the inspection of:
- Madoc Standpipe, 119 McKenzie Street Madoc ON

Permissions/Approvals

This drinking water system was subject to specific conditions contained within the following permissions and/or approvals (please note this list is not exhaustive) at the time of the inspection in addition to the requirements of the SDWA and its regulations:
- Municipal Drinking Water Licence (MDWL) Number 153-101, Issue 5
- Drinking Water Works Permit (DWWP) Number 153-201, Issue 4
- Permit to Take Water (PTTW) 2600-B5FQPP

Background and Compliance

A previous drinking water system inspection was issued on January 19, 2024 and resulted in an Inspection Report Rating of 100.00%. The report cited three recommendations of best management practice (BMP).

NON-COMPLIANCE

This should not be construed as a confirmation of full compliance with all potential applicable legal requirements. These inspection findings are limited to the components and/or activities that were assessed, and the legislative framework(s) that were applied. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.

If you have any questions related to this inspection, please contact the signed Provincial Officer.

RECOMMENDATIONS

This should not be construed as a confirmation of full conformance with all potential applicable BMPs. These inspection findings are limited to the components and/or activities that were assessed, and the legislative framework(s) that were applied. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.

If you have any questions related to this inspection, please contact the signed Provincial Officer.

INSPECTION DETAILS

This section includes all questions that were assessed during the inspection.

Ministry Program: DRINKING WATER | **Regulated Activity:** DW Municipal Residential

Question ID	DWMR1007001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 1-2 | (1)1;

Question:
Was the owner maintaining the production well(s) in a manner sufficient to prevent entry into the well of surface water and other foreign materials?

Compliance Response(s)/Corrective Action(s)/Observation(s):
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.

The DWS has three wells within the DWWP system description. Well No. 1 serves only as a monitoring well. Well No. 3 (well tag number A035531) serves as the production well for the Rollins Street Pumphouse. Well No. 4 (well tag number A211163) serves as the production well for the Marmora Street Pumphouse.

At the time of inspection both production wells had a vermin proof cap affixed to the casing. Well casings extended greater than 40 cm above ground level. All visible electrical components were adequately connected and covered. Earth mounding appeared to be sufficient.

Question ID	DWMR1009001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | 31 | (1);

Question:
Were measures in place to protect the groundwater and/or GUDI source in accordance with the Municipal Drinking Water Licence and Drinking Water Works Permit?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Measures were in place to protect the groundwater and/or GUDI source.

The Quinte Region Source Protection Plan delineates the wellhead protection area (WHPA) for the Madoc DWS. The Plan includes policies, developed in consultation with the local community, to address drinking water threats identified in the science-based Assessment Report.

The operating authority has prepared standard operating procedure (SOP) number 22 "above grade well inspection". The SOP states above grade well components must be inspected at

least annually. Records indicated that during the inspection period all wells associated with the DWS were inspected. As per the SOP the inspection should include but is not limited to the following:
- removal of vegetation surrounding well casing
- inspection well cap and casing
- inspection of air vent
- identify any signs of surface water intrusion
- identify abnormal equipment function
- review of water quality data and flow monitors

The operating authority has prepared SOP number 23 "below grade well inspection". The SOP states the need for inspection is based on operational and/or mechanical needs or analytical results. The SOP provides conditions that may trigger a below grade inspection. Both wells have recently undergone a below grade inspection as maintenance activities were being conducted. Well No. 3 completed on September 19, 2024 and Well No. 4 on October 29, 2024.

Question ID	DWMR1014001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | 31 | (1);

Question:
Was flow monitoring performed as required by the Municipal Drinking Water Licence or Drinking Water Works Permit?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Flow monitoring was performed as required.

Flow measuring devices were installed in accordance with the measurement locations prescribed by Schedule A of the DWWP. The flow rate and daily volume of treated water and raw water are monitored and recorded in accordance with the flow measurement and recording requirements of the MDWL.

It should be noted the Marmora Street Pumphouse is not equipped with a treated water flow meter. The raw water flow meter is used to monitor the daily treated volume. The treated water flow rate is not monitored. It is reasonable to assume the flow that is flushed to waste and used for backwashing filters is not accounted for in the treated water flow volume.

Question ID	DWMR1016001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | 31 | (1);

Question:
Was the owner in compliance with the conditions associated with maximum flow rate or the rated/operational capacity in the Municipal Drinking Water Licence?

Compliance Response(s)/Corrective Action(s)/Observation(s):
The owner was in compliance with the conditions associated with maximum flow rate and/or the rated/operational capacity conditions.

Schedule C of the MDWL prescribes a rated capacity for the Rollins Street Pumphouse of 1,150 m3/day and the Marmora Street Pumphouse 1,470 m3/day. The maximum daily volume of treated water flowing from the treatment to the distribution system shall not exceed these values.

During the inspection period the maximum daily treated water
volume for the Rollins Street Pumphouse was 804 m3/day recorded on May 7, 2024. The maximum daily treated was volume for the Marmora Street Pumphouse was 791 m3/day recorded on July 7, 2024.

Question ID	DWMR1018001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | 31 | (1);

Question:
Did the owner ensure that equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit?

Compliance Response(s)/Corrective Action(s)/Observation(s):
The owner ensured that equipment was installed as required.

At the time of inspection the Rollins Street Pumphouse and the Marmora Street Pumphouse treatment systems were installed as per the DWWP. No deviations were noted.

Question ID	DWMR1025001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | 31 | (1);

Question:
Were all parts of the drinking water system that came in contact with drinking water disinfected in accordance with a procedure listed in Schedule B of the Drinking Water Works Permit?

Compliance Response(s)/Corrective Action(s)/Observation(s):
All parts of the drinking water system were disinfected as required.

Schedule B of the DWWP requires parts to be disinfected in accordance with the following procedures:
- Ministry's Watermain Disinfection Procedure
- AWWA C652 Standard for Disinfection of Water Storage Facilities
- AWWA C653 Standard for Disinfection of Water Treatment Plants
- AWWA C654 Standard for Disinfection of Wells

On September 19, 2024 Well No. 3 was placed out of service to replace a portion of rise pipe within the well. This replacement was necessary as air was entering the piping of the treatment system. The well was disinfected and two microbiological samples were collected in accordance with AWWA C654. In order to reduce the risk of a low water storage tower level and loss of pressure the well was brought back in service prior to receiving the microbiological samples results. Well No. 4 does not have the capacity to serve the system at this time. The AWWA C654 standard requires sample results to be obtained before returning to service. As the procedure was not fully completed a pre-cautionary boil water advisory was issued and adverse water quality incident no. 166386 was reported to the Ministry. On September 21, 2024 the samples results were received and the pre-cautionary boil water advisory was rescinded.

The OA has reported that no activities in the inspection period required the use of other disinfection procedures mentioned above.

Question ID	DWMR1023001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 1-2 | (2);

Question:
Did records indicate that the treatment equipment was operated in a manner that achieved the design capabilities prescribed by O. Reg. 170/03, Drinking Water Works Permit and/or Municipal Drinking Water Licence at all times that water was being supplied to consumers?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Records indicated that the treatment equipment was operated in a manner that achieved the design capabilities prescribed.

The DWS is comprised of two treatment systems the Rollins Street Pumphouse (Well No. 3) and the Marmora Street Pumphouse (Well No. 4). Both wells are considered to be groundwater under the direct influence of surface water (GUDI). In accordance with the Procedure for Disinfection of Drinking Water in Ontario the source water requires at a minimum a 2-log (99%) removal or inactivation of Cryptosporidium oocysts, a 3-log (99.9%) removal or inactivation of Giardia cysts and a 4-log (99.99%) removal or inactivation of viruses before the water is delivered to the first consumer. Primary disinfection pathogen log removal/inactivation credits are assigned to UV disinfection and chlorination components. The DWS achieves primary disinfection through ultraviolet disinfection and chlorination for both treatment systems.

For well No. 3 the minimum free chlorine residual required in the worst case conditions scenario is 0.8 mg/L. The UV unit has a rated capacity of 17 L/s and minimum dose of 40 mJ/cm2. UV intensity is continually monitored and alarmed and will lock-out the plant if the intensity falls below 31.4
W/m2 . Records indicate that during the inspection period the CT achieved was greater than the CT required. The lowest free chlorine residual was 1.28 mg/L recorded on June 11, 2024. The lowest UV intensity was 31.93 W/m2 (UV 1) and 35.52 W/m2 (UV 2) during the

inspection period.

For well No. 4 the minimum free chlorine residual required in the worst case conditions scenario is 1.0 mg/L. The UV unit has a rated capacity of 17 L/s and minimum dose of 40 mJ/cm2. UV intensity is continually monitored and alarmed and will lock-out the plant if the intensity falls below 31.4
W/m2 . Records indicate that during the inspection period the CT achieved was greater than the CT required. The lowest free chlorine residual was 1.06 mg/L recorded on July 30, 2024. The lowest UV intensity was 28.80 W/m2 (UV 1) and 30.38 W/m2 (UV 2) during the inspection period.

The OA has reported that instantaneous blips during run cycles at well No. 4 are believed to be a power supply or communication issue. A technician has reviewed this. It is very inconsistent as to when it occurs and difficult to trouble shoot. Operators will continue to monitor the situation.

Question ID	DWMR1026001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 1-6 | (2);

Question:
If primary disinfection equipment did not use chlorination or chloramination, was the equipment equipped with alarms or shut-off mechanisms that satisfy the standards described in Schedule 1-6 of O. Reg. 170/03?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Primary disinfection equipment was equipped with alarms or shutoff mechanisms that satisfied the standards.

Schedule 1-6 states the owner and the operating authority shall ensure that the disinfection equipment is designed and operated in accordance with the standards described or that, the equipment has a feature that ensures that no water is directed to users in the event that the equipment malfunctions, loses power or ceases to provide the appropriate level of disinfection; and if equipment malfunctions, loses power or ceases to provide the appropriate level of disinfection, an operator takes appropriate action at the location where the equipment is installed before water is again directed to users. The standards referred to state the alarm criteria (location of alarm signal, operator alarm response, and use of continuous monitoring equipment).

The system uses multiple UV units to achieve primary disinfection in addition to chlorination. All UV units associated with the system are equipped with a control panel that continuously monitors the performance of the disinfection equipment. The UV units have an integrated alarm system that notifies operators should the disinfection equipment fail. The alarm set points were reported to be 31.4 W/m2 (Rollins Street Pumphouse) and 28.4 W/m2 (Marmora Street Pumphouse). A butterfly valve is connected to all the units and the control panels; should an alarm initiate the valve will close to shut-off the flow of water.

Question ID	DWMR1024001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 1-2 | (2);

Question:
Did records confirm that the water treatment equipment which provides chlorination or chloramination for secondary disinfection was operated as required?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Records confirmed that the water treatment equipment which provides chlorination or chloramination for secondary disinfection was operated as required.

Schedule 1-5 of O. Reg. 170/03 states equipment that is designed to be capable of secondary disinfection using chlorination or chloramination in accordance with the Ministry's Procedure for Disinfection of Drinking Water in Ontario and that is designed to be capable of achieving, at all locations within the distribution system, a free chlorine residual of 0.2 mg/L if the drinking water system provides chlorination. The owner/operating authority shall report an adverse test result should the concentration of free chlorine residual be less than 0.05 mg/L.

Records indicate that during the inspection period the minimum free chlorine residual was recorded to be 1.15 mg/L on August 24 and 25. On May 28 calibrations of monitoring equipment were carried out which resulted in a false reading of 0 mg/L. The operator had documented the next minute reading to be 1.79 mg/L.

Question ID	DWMR1033001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 7-2 | (3); SDWA | O. Reg. 170/03 | 7-2 | (4);

Question:
Was secondary disinfectant residual tested as required for the large municipal residential distribution system?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Secondary disinfectant residual was tested as required.

The secondary disinfection chlorine residual is monitored through a continuous analyzer. The analyzer is located near the end of the distribution system at 326 Durham Street S, Madoc ON.

Question ID	DWMR1030001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 7-2 | (1); SDWA | O. Reg. 170/03 | 7-2 | (2);

Question:
Was primary disinfection chlorine monitoring being conducted at a location approved by Municipal Drinking Water Licence and/or Drinking Water Works Permit or at/near a location

where the intended CT had just been achieved?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Primary disinfection chlorine monitoring was conducted as required.

Schedule 7-2 of O. Reg. 170/03 requires sampling and testing for free chlorine residual to carried out by continuous monitoring equipment at or near a location where the intended contact time has just been completed in accordance with the Ministry's Procedure for Disinfection of Drinking Water in Ontario. Schedule E of the MDWL states contact time is achieved at the chlorine contact tank (Rollins Street Pumphouse) and the chlorine contact pipe (Marmora Street Pumphouse).

At the time of inspection the free chlorine monitoring equipment was reported to be obtaining a sample from after the contact tank and pipe.

Question ID	DWMR1032001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 7-3 | (2);

Question:
If the drinking water system obtained water from a surface water source and provided filtration, was continuous monitoring of each filter effluent line performed for turbidity?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Continuous monitoring of each filter effluent line was performed for turbidity.

The Rollins Street Pumphouse and the Marmora Street Pumphouse are equipped with two filter treatment trains each consisting of two filter units. At the time of inspection all filter train effluent lines had a continuous turbidity monitoring analyzer.

Question ID	DWMR1035001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 6-5 | (1)1-4;

Question:
Were operators examining continuous monitoring test results and did they examine the results within 72 hours of the test?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Operators were examining continuous monitoring test results as required.

Question ID	DWMR1038001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 6-5 | (1)1-4;

Question:
Was continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements performing tests for the parameters with at least the minimum frequency and recording data with the prescribed format?

Compliance Response(s)/Corrective Action(s)/Observation(s):
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 and recording data with the prescribed format.

The table found in Schedule 6-5 of O. Reg. 170/03 lists the minimum testing and recording frequency for continuous monitoring equipment. A summary of applicable parameters and the frequencies is as follows:
- Free chlorine residual required to achieve primary disinfection 5 minutes
-Free chlorine residual in a distribution sample 1 hour
- Turbidity 15 minutes

Question ID	DWMR1037001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 6-5 | (1)5-10; SDWA | O. Reg. 170/03 | 6-5 | (1.1);

Question:
Were 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, equipped with alarms or shut-off mechanisms that satisfied the standards described in Schedule 6?

Compliance Response(s)/Corrective Action(s)/Observation(s):
All required continuous monitoring equipment utilized for sampling and testing were equipped with alarms or shut-off mechanisms that satisfied the standards

The table found in Schedule 6-5 of O. Reg. 170/03 lists the minimum and maximum alarm standards for free and total chlorine residuals (primary and secondary disinfection) and turbidity. The OA has reported the following alarm set points for the system:
- Turbidity 1 NTU for 12 minutes
- Free chlorine for primary disinfection minimum 1 mg/L
- Free chlorine for primary disinfection maximum 3 mg/L
- Free chlorine for secondary disinfection minimum 0.50 mg/L
- Free chlorine for secondary disinfection maximum 4.0 mg/L

Question ID	DWMR1040001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 6-5 | (1)1-4; SDWA | O. Reg. 170/03 | 6-5 | (1)5-10;

Question:
Were all continuous analysers calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation?

Compliance Response(s)/Corrective Action(s)/Observation(s):
All continuous analysers were calibrated, maintained, and operated as required.

Records indicate continuous monitoring equipment was calibrated on May 27, 2024 by Tower Electronics Canada Inc.

Question ID	DWMR1108001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 6-5 | (1)5-10; SDWA | O. Reg. 170/03 | 6-5 | (1.1);

Question:
Where continuous monitoring equipment used for the monitoring of free chlorine residual, total chlorine residual, combined chlorine residual or turbidity, required by O. Reg. 170/03, Municipal Drinking Water Licence, Drinking Water Works Permit, or order triggered an alarm or an automatic shut-off, did a qualified person respond as required and take appropriate actions?

Compliance Response(s)/Corrective Action(s)/Observation(s):
A qualified person responded as required and took appropriate actions.

Question ID	DWMR1039001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 1-6 | (3);

Question:
If primary disinfection equipment that does not use chlorination or chloramination was used, did the owner and operating authority ensure the equipment had a recording device that continuously recorded the performance of the disinfection equipment?

Compliance Response(s)/Corrective Action(s)/Observation(s):
The owner and operating authority ensured that the primary disinfection equipment had a recording device that continuously recorded the performance of the disinfection equipment.

Question ID	DWMR1109001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 1-6 | (1); SDWA | O. Reg. 170/03 | 1-6 | (2);

Question:
If the system used equipment for primary disinfection other than chlorination or

chloramination and the equipment malfunctioned, lost power, or ceased to provide the appropriate level of disinfection, causing an alarm or an automatic shut-off, did a certified operator respond as required and take appropriate actions?

Compliance Response(s)/Corrective Action(s)/Observation(s):
A certified operator responded as required and took appropriate actions.

The monthly summary report for both UV systems was provided for review as required by condition 1.6.4 of the MDWL. The summary report contains the following information:
- date and time
- duration
- UV bank
- volume treated
- actions taken

Question ID	DWMR1042001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | 31 | (1);

Question:
If UV disinfection was used, were duty sensors and reference UV sensors checked and calibrated as per the requirements of Schedule E of the Municipal Drinking Water Licence or at a frequency as otherwise recommended by the UV equipment manufacturer?

Compliance Response(s)/Corrective Action(s)/Observation(s):
All UV sensors were checked and calibrated as required.

Schedule E of the MDWL states the log removal/inactivation credit assignment criteria for the UV disinfection treatment component.

The duty UV sensors shall be checked on at least a monthly basis against a reference UV sensor. Records indicated that during the inspection period all duty sensors were checked monthly against a reference sensor. The calibration ration (duty sensor UV intensity/reference sensor UV intensity) shall be less than or equal to 1.2. Should the calibration ratio be greater than 1.2 the duty sensor shall be replaced. Records indicate all calibration ratios were less than 1.2 during the inspection period.

The reference UV sensor shall be checked against a master reference assembly at a minimum frequency of once every three years or more frequently depending on the recommendations of the manufacturer. Records confirm the master reference assembly was calibrated on April 11, 2022 by Trojan UV.

Question ID	DWMR1099001	**Question Type**	Information

Legislative Requirement(s):
Not Applicable

Question:
Do records show that water provided by the drinking water system met the Ontario Drinking Water Quality Standards?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Records showed that all water sample results met the Ontario Drinking Water Quality Standards.

Question ID	DWMR1083001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 10-3;

Question:
Were treated microbiological sampling requirements prescribed by Schedule 10-3 of O. Reg. 170/03 for large municipal residential systems met?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Treated microbiological sampling requirements were met.

During the inspection period treated water samples were collected at least once a week and tested for E.coli (EC), Total Coliforms (TC), and Heterotrophic Plate Count (HPC). Samples were collected at least 5 days and not more than 10 days from the previous as per the sampling frequency prescribed by Schedule 6 of O. Reg. 170/03.

Well 3 analytical results for EC and TC were 0 CFU/100mL and HPC 0 - 2 CFU/1mL. Well 4 analytical results for EC and TC were 0 CFU/100mL and HPC ranged from 0 - 24 CFU/1mL.

Question ID	DWMR1081001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 10-2 | (1); SDWA | O. Reg. 170/03 | 10-2 | (2); SDWA | O. Reg. 170/03 | 10-2 | (3);

Question:
Were distribution microbiological sampling requirements prescribed by Schedule 10-2 of O. Reg. 170/03 for large municipal residential systems met?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Distribution microbiological sampling requirements were met.

The system serves a population of approximately 1,400 as per Schedule 10-2 at least nine distribution samples are required to be tested monthly. At least one sample is to be taken in each week of the month. During the inspection period distribution water samples were collected as required and tested for EC and TC. At least 25% of the samples collected were tested for HPC.

Analytical results for EC and TC were 0 CFU/100mL and HPC ranged from 0 - 30 CFU/1mL.

Question ID	DWMR1096001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 6-3 | (1);

Question:
Did records confirm that chlorine residual tests were conducted at the same time and location as microbiological samples?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Records confirmed that chlorine residual tests were conducted as required.

Question ID	DWMR1084001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 13-2;

Question:
Were inorganic parameter sampling requirements prescribed by Schedule 13-2 of O. Reg. 170/03 met?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Inorganic parameter sampling requirements were met.

Treated water samples are required to be taken every 12 months and tested for every parameter listed in Schedule 23 of O. Reg. 170/03.

During the inspection period treated water samples were collected from Well 3 and Well 4 on March 11, 2024 and tested for the prescribed parameters. Samples were taken not more than 30 days before or after the first anniversary of the day of the previous samples in accordance with the sampling frequency of Schedule 6 of O. Reg. 170/03.

Question ID	DWMR1085001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 13-4 | (1); SDWA | O. Reg. 170/03 | 13-4 | (2); SDWA | O. Reg. 170/03 | 13-4 | (3);

Question:
Were organic parameter sampling requirements prescribed by Schedule 13-4 of O. Reg. 170/03 met?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Organic parameter sampling requirements were met.

Treated water samples are required to be taken every 12 months and tested for every parameter listed in Schedule 24 of O. Reg. 170/03.

During the inspection period treated water samples were collected from Well 3 and Well 4 on March 11, 2024 and tested for the prescribed parameters. Samples were taken not more than 30 days before or after the first anniversary of the day of the previous samples in accordance with the sampling frequency of Schedule 6 of O. Reg. 170/03.

Question ID	DWMR1086001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 13-6.1 | (1); SDWA | O. Reg. 170/03 | 13-6.1 | (2); SDWA | O. Reg. 170/03 | 13-6.1 | (3); SDWA | O. Reg. 170/03 | 13-6.1 | (4); SDWA | O. Reg. 170/03 | 13-6.1 | (5); SDWA | O. Reg. 170/03 | 13-6.1 | (6);

Question:
Were haloacetic acid sampling requirements prescribed by Schedule 13-6 of O. Reg. 170/03 met?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Haloacetic acid sampling requirements were met.

One distribution sample is required to be collected and tested in each calendar quarter. During the inspection period distribution water samples were collected on the following dates:
- January 15, 2024
- April 8, 2024
- July 2, 2024

The running annual average of quarterly results is 0.006mg/L. The maximum allowable concentration under the Drinking Water Quality Standards is 0.08mg/L.

Question ID	DWMR1087001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 13-6 | (1); SDWA | O. Reg. 170/03 | 13-6 | (2); SDWA | O. Reg. 170/03 | 13-6 | (3); SDWA | O. Reg. 170/03 | 13-6 | (4); SDWA | O. Reg. 170/03 | 13-6 | (5); SDWA | O. Reg. 170/03 | 13-6 | (6);

Question:
Were trihalomethane sampling requirements prescribed by Schedule 13-6 of O. Reg. 170/03 met?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Trihalomethane sampling requirements were met.

One distribution sample is required to be collected and tested in each calendar quarter. During the inspection period distribution water samples were collected on the following dates:
- January 15, 2024
- April 8, 2024
- July 2, 2024

The running annual average of quarterly results is 0.02mg/L. The maximum allowable

concentration under the Drinking Water Quality Standards is 0.100mg/L.

Question ID	DWMR1088001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 13-7;

Question:
Were nitrate/nitrite sampling requirements prescribed by Schedule 13-7 of O. Reg. 170/03 met?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Nitrate/nitrite sampling requirements were met.

One treated water sample is required to be tested every three months. During the inspection period treated water samples were collected and tested for nitrate and nitrite as required. Samples were collected at least 60 days and not more than 120 days after the previous sample as per the prescribed sampling frequency of Schedule 6 of O. Reg. 170/03.

The maximum nitrate concentration was 2.46 mg/L (Well 3) and 3.27 mg/L (Well 4). The maximum nitrite concentration was 0.006 mg/L (Well 3) and 0.003 mg/L (Well 4).

Question ID	DWMR1089001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 13-8;

Question:
Were sodium sampling requirements prescribed by Schedule 13-8 of O. Reg. 170/03 met?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Sodium sampling requirements were met.

One treated water sample is required to be tested every 60 months. A sample was not required to be analyzed during the inspection period.

The July 10, 2023 samples were collected and tested not more than 90 days before or after the fifth anniversary of the previous in accordance with the sampling frequency prescribed by Schedule 6 of O. Reg. 170/03.

Question ID	DWMR1090001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 13-9;

Question:
Where fluoridation is not practiced, were fluoride sampling requirements prescribed by Schedule 13-9 of O. Reg. 170/03 met?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Fluoride sampling requirements were met.

One treated water sample is required to be tested every 60 months. A sample was not required to be analyzed during the inspection period.

The July 10, 2023 samples were collected and tested not more than 90 days before or after the fifth anniversary of the previous in accordance with the sampling frequency prescribed by Schedule 6 of O. Reg. 170/03.

Question ID	DWMR1094001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | 31 | (1);

Question:
Were water quality sampling requirements imposed by the Municipal Drinking Water Licence and Drinking Water Works Permit met?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Water quality sampling requirements were met.

Schedule C of the MDWL imposes additional sampling, testing, and monitoring requirements for the system. The sampling frequency, test parameters, and monitoring location can be found in Table 5: Drinking Water Health Related Parameters of Schedule C. A summary of the sampling requirements is as follows:
- Well 3 annual raw and treated water sample to be tested for antimony
- Well 4 quarterly raw and treated water sample to be tested for antimony
- Well 4 monthly raw and treated water sampling to be tested for arsenic

Drinking water test results confirm all additional sampling requirements imposed by the MDWL were met during the inspection period.

Question ID	DWMR1113001	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 10.1 | (3);

Question:
Were changes to the system registration information provided to the ministry within ten (10) days of the change?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Changes to the system registration information were provided as required.

On October 15, 2024 DWS profile was updated to reflect a change in the operating authority's alternate contact.

Question ID	DWMR1060001	Question Type	Legislative

Legislative Requirement(s):
SDWA | 31 | (1);

Question:
Did the operations and maintenance manual(s) meet the requirements of the Municipal Drinking Water Licence?

Compliance Response(s)/Corrective Action(s)/Observation(s):
The operations and maintenance manual(s) met the requirements of the Municipal Drinking Water Licence.

At the time of inspection the operations and maintenance manual needed to be updated to include the UV validation certificates. The OA has updated the manual to include the certificates as prescribed by condition 16.2.3 of the MDWL.

Question ID	DWMR1062001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 7-5;

Question:
Did records or other record keeping mechanisms confirm that operational testing not performed by continuous monitoring equipment was done by a certified operator, water quality analyst, or person who met the requirements of Schedule 7-5 of O. Reg. 170/03?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was done by a certified operator, water quality analyst, or person who met the requirements of Schedule 7-5 of O. Reg. 170/03.

Question ID	DWMR1071001	Question Type	BMP

Legislative Requirement(s):
Not Applicable

Question:
Did the owner provide security measures to protect components of the drinking water system?

Compliance Response(s)/Corrective Action(s)/Observation(s):
The owner provided security measures to protect components of the drinking water system.

Question ID	DWMR1073001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 128/04 | 23 | (1);

Question:
Was an overall responsible operator designated for all subsystems which comprise the drinking water system?

Compliance Response(s)/Corrective Action(s)/Observation(s):
An overall responsible operator (ORO) was designated for all subsystem.

During the inspection period two individuals were designated as the ORO for the subsystems (treatment and distribution). Both designated individuals hold a valid class 3 water treatment licence and a class 2 water distribution and supply licence.

Question ID	DWMR1074001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 128/04 | 25 | (1);

Question:
Were operators-in-charge designated for all subsystems which comprise the drinking water system?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Operators-in-charge were designated for all subsystems.

OCWA uses a duty OIC and OIC designation primarily to track hours for operator licencing. Duty OIC designation is for the operator that works full time in a facility. OIC designation is for an operator that works part time in a facility. The duty OIC is the primary OIC for the facility where an OIC is only designated while there on site.

Question ID	DWMR1075001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 128/04 | 22;

Question:
Were all operators certified as required?

Compliance Response(s)/Corrective Action(s)/Observation(s):
All operators were certified as required.

The electronic logbook indicated that Erin Ball who holds a valid operator-in-training certificate was designated OIC on August 14 and 15, 2024. The OA has reported this entry was made in error. A note has been added to the logs to correct the error and list Derek Chapman as the designated operator on these days.

A search of the Ontario Water Wastewater Certification Office operator listing report

confirmed the validity of all certifications.

Question ID	DWMR1076001	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 1-2 | (2);

Question:
Were adjustments to the treatment equipment only made by certified operators?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Adjustments to the treatment equipment were only made by certified operators.

Records indicate that treatment equipment adjustments made by an operator-in-training were directed by a certified operator.

Question ID	DWMR1117001	Question Type	Information

Legislative Requirement(s):
Not Applicable

Question:
Were there any other items related to the drinking water system that should be recognized in the report?

Compliance Response(s)/Corrective Action(s)/Observation(s):
The following items were noted as being relevant to the drinking water system:

AWQI # 166386 was reported on September 19, 2024 as a self imposed precautionary BWA was issued. Well No. 3 was required to be brought back into service prior to obtaining bacteriological sample results as per the procedure for disinfection of wells. Well no. 4 does not have capacity needed to serve the DWS alone. This AWQI was reported for notification purposes.

INSPECTION RISK RATING REPORT (IRR)

DWS Name:	MADOC DRINKING WATER SYSTEM
DWS Number:	220001575
DWS Owner:	THE CORPORATION OF THE MUNICIPALITY OF CENTRE HASTINGS
Municipal Location:	MADOC
Regulation:	O.REG. 170/03
DWS Category:	DW Municipal Residential
Type of Inspection:	Focused
Compliance Assessment Start Date:	Oct-7-2024
Ministry Office:	Belleville Area Office

Maximum Risk Rating: 521

Inspection Module	Non Compliance Risk (X out of Y)
Capacity Assessment	0/30
Certification and Training	0/42
Logbooks	0/14
Operations Manuals	0/14
Reporting & Corrective Actions	0/46
Source	0/14
Treatment Processes	0/249
Water Quality Monitoring	0/112
Overall - Calculated	**0/521**

Inspection Risk Rating:	**0.00%**

Final Inspection Rating:	**100.00%**

DWS Name:	MADOC DRINKING WATER SYSTEM
DWS Number:	220001575
DWS Owner Name:	THE CORPORATION OF THE MUNICIPALITY OF CENTRE HASTINGS
Municipal Location:	MADOC
Regulation:	O.REG. 170/03
DWS Category:	DW Municipal Residential
Type of Inspection:	Focused
Compliance Assessment Start Date:	Oct-7-2024
Ministry Office:	Belleville Area Office

All legislative requirements were met. No detailed rating scores.

Maximum Question Rating: 521

Inspection Risk Rating:	**0.00%**

FINAL INSPECTION RATING:	**100.00%**

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.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains 15 inspection modules consisting of approximately 100 regulatory questions. Those protocol questions are also linked to definitive guidance that ministry inspectors use when conducting MRDWS inspections.

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The questions address a wide range of regulatory issues, from administrative procedures to drinking water quality monitoring. The inspection protocol also contains a number of non-regulatory questions.

A team of drinking water specialists in the ministry 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 less than 100 per cent does not mean the drinking water from the system is unsafe. It shows areas where a system's operation can improve. 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 related to regulatory compliance and input their "yes", "no" or "not applicable" responses 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).

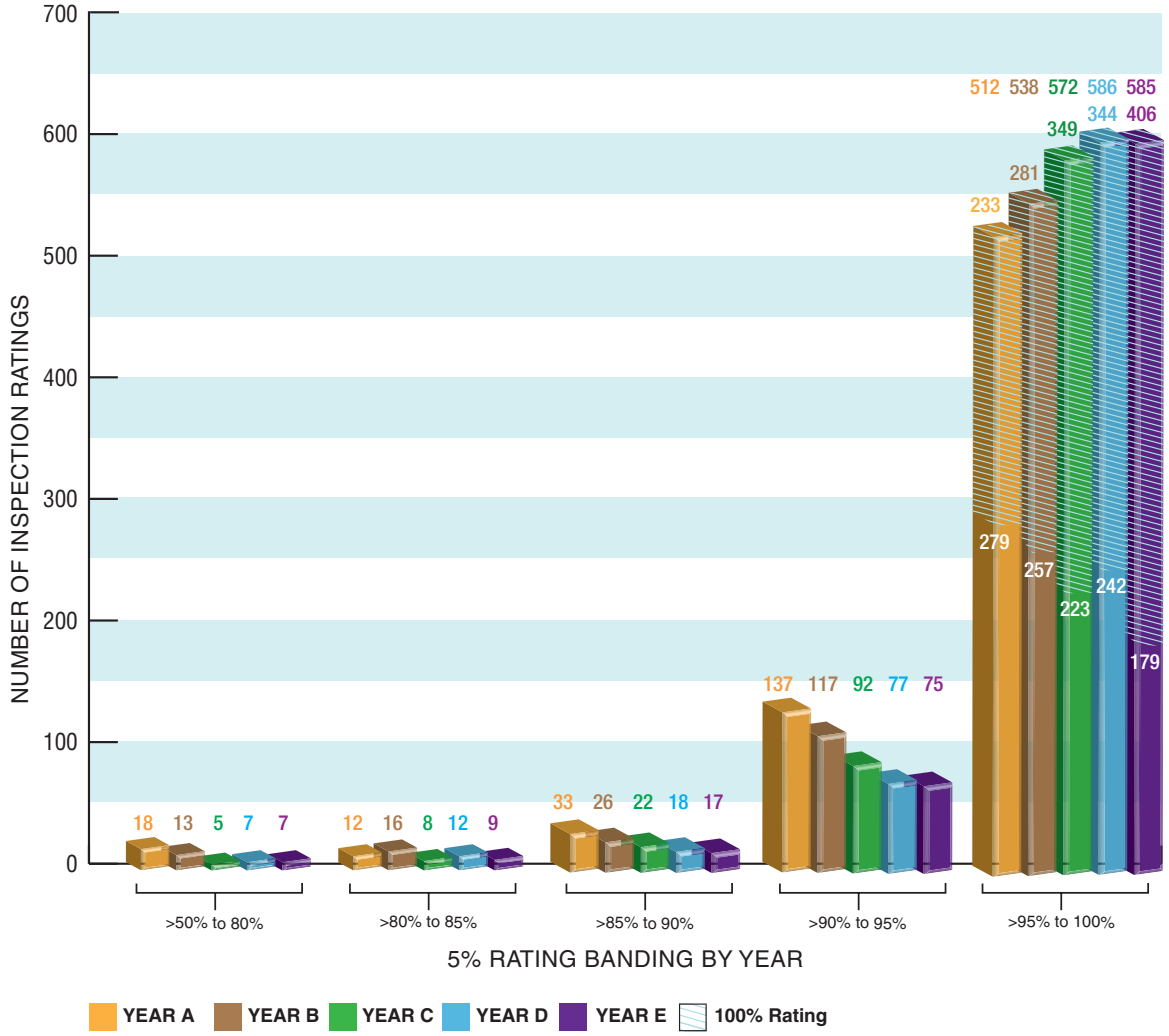
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

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 15 possible modules of the inspection protocol, which would provide the system owner/operator with information on the areas where they need to improve. The 15 modules are:

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

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

STAKEHOLDER GUIDE

February 2, 2023

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 below or use your web browser to search for their titles. Contact the Ministry if you need assistance or have questions at 1-866-793-2588 or waterforms@ontario.ca.
For more information on Ontario's drinking water visit www.ontario.ca/page/drinking-water

Click on the publication below to access it

- Drinking Water System Profile Information Form - 012-2149E
- Laboratory Services Notification Form – 012-2148E
- Adverse Test Result Notification Form – 012-4444E
- Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils
- Procedure for Disinfection of Drinking Water in Ontario
- Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids
- Filtration Processes Technical Bulletin
- Ultraviolet Disinfection Technical Bulletin
- Guide for Applying for Drinking Water Works Permit Amendments, & License Amendments
- Certification Guide for Operators and Water Quality Analysts
- Training Requirements for Drinking Water Operator
- Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption
- Drinking Water System Contact List – 7128E01
- Ontario's Drinking Water Quality Management Standard - Pocket Guide
- 2020 Watermain Disinfection Procedure
- List of Licensed Laboratories