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Ministry of the Environment,
Conservation and Parks

Ministère de l'Environnement, de
la Protection de la nature et des Parcs

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October 14, 2022

Attention: Zach Drinkwalter Township of Ramara CAO

**Re: 2022 Drinking Water Inspection Report
Davey Drive Subdivision Drinking Water System**

Please find enclosed the Ministry of the Environment, Conservation and Parks Inspection Report for Davy Drive Subdivision Drinking Water System (Water Works # 220007141). The physical inspection process took place on July 22, 2022.

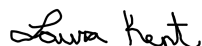
The primary focus of this inspection is to confirm compliance with Ministry of the Environment, Conservation and Parks legislation and authorizing documents, as well as evaluating conformance with Ministry drinking water-related policies and guidelines during the inspection review period.

No issues of non-compliance or best management practices were identified in the inspection. No Provincial Officer's Orders were issued in conjunction with this inspection.

In order to measure individual inspection results, the Ministry has established an inspection compliance risk framework based on the principles of the Inspection, Investigation & Enforcement (II&E) Secretariat and advice of internal and risk experts. The Inspection Summary Rating Record (IRR) provides the Ministry, the system owner and the associated Public Health Units with a summarized quantitative measure of the drinking water system's annual inspection and regulated water quality testing performance. Please note that due to a recent change in IT systems, the IRR cannot currently be generated at the same time as the inspection report. The IRR will be sent separately, typically within one to two months, and prior to any public release. 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 Sheri Broeckel, Drinking Water Program Supervisor, at 705-716-3712.

If you have any questions regarding the inspection report please feel free to contact the undersigned at (705) 716-5655 or laura.kent@ontario.ca.

Sincerely,



Laura Kent
Water Inspector
Provincial Officer
Barrie District Office, Ministry of the Environment Conservation and Parks

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DAVY DRIVE SUBDIVISION DRINKING WATER SYSTEM
7230 DAVY DR, RAMARA, ON, L0K 2B0

Inspection Report

System Number: 220007141
Entity: CORPORATION OF THE
TOWNSHIP OF RAMARA
Inspection Start Date: 07/22/2022
Inspection End Date: 10/04/2022
Inspected By: Laura Kent
Badge #: 1123

Laura Kent

(signature)

NON-COMPLIANCE/NON-CONFORMANCE ITEMS

This should not be construed as a confirmation of full compliance with all potential applicable legal requirement and 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:**

Question ID	MRDW1001001	Question Type	Information
Question:			
What was the scope of this inspection?			
Legislative Requirement	Not Applicable		
Observation			
<p>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 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.</p> <p>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.</p> <p>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.</p> <p>The Davy Drive Subdivision Drinking Water System is owned by the Corporation of the Township of Ramara and operated by the Ontario Clean Water Agency (OCWA) and serves an estimated population of 112 people. The Davy Drive Subdivision Drinking Water System is categorized as a small municipal residential drinking water system, as defined by Ontario Regulation 170/03 and operates under DWS number 220007141.</p> <p>The Davy Drive Subdivision Drinking Water System consists of 4 wells, treatment equipment, two distribution sample points and two blow offs, one at each end of the distribution system. The supply wells are considered to have the potential to be ground water under the direct influence of surface water (GUDI). Treatment is provided by UV inactivation and chlorination for primary disinfection, after filtration. Chlorination is provided for secondary disinfection.</p> <p>Raw water from the four wells is injected with sodium hypochlorite and potassium permanganate prior to passing through two greensand filters to remove the oxidized iron and manganese. Water then flows through cartridge filters, including a one micron absolute filter before being dosed by UV light. Both of the UV units are equipped with a solenoid valve which will stop the flow of water in the event of a power failure, malfunction</p>			

or the required dosage not being delivered by the UV units. Water is then injected with sodium hypochlorite prior to the 43 cubic metre storage standpipe. Two high lift pumps discharge water to the distribution system. There are no storage structures within the distribution system. The distribution system consists of 50 mm diameter polyethylene watermain.

The drinking water inspection included: physical inspection of the treatment equipment and facility; interview with OCWA staff; and a review of relevant documents and data from the period of December 23, 2021 to July 22, 2022 (hereafter referred to as the "inspection review period"). The previous inspection of the Davy Drive Subdivision Drinking Water System was conducted on December 23, 2021.

Question ID	MRDW1000001	Question Type	Information
Question: Does this drinking water system provide primary disinfection?			
Legislative Requirement	Not Applicable		
Observation			
This Drinking Water System provides for both primary and secondary disinfection and distribution of water. Chlorination and UV inactivation are used for primary disinfection. Chlorination is used for secondary disinfection.			

Question ID	MRDW1018001	Question Type	Legislative
Question: Has the owner ensured that all equipment is installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit?			
Legislative Requirement	SDWA 31 (1);		
Observation			
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 installed equipment appeared to meet the description contained in Schedule A of Drinking Water Works Permit 147-206 Issue Number 5. The two alterations reflected in Schedule C of Drinking Water Works Permit 147-206 Issue Number 5 are the installation of treatment equipment in response to the source water being GUDI and the installation of the standpipe.			

Question ID	MRDW1025001	Question Type	Legislative
Question:			

Were all parts of the drinking water system that came in contact with drinking water (added, modified, replaced or extended) disinfected in accordance with a procedure listed in Schedule B of the Drinking Water Works Permit?

Legislative Requirement	SDWA 31 (1);
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Observation

All parts of the drinking water system were disinfected in accordance with a procedure listed in Schedule B of the Drinking Water Works Permit. Section 2.3 of Schedule B of Drinking Water Works Permit 147-206 Issue Number 5 states that all parts of the drinking water system in contact with drinking water that are added, modified, replaced, extended shall be disinfected in accordance with a procedure approved by the Director or in accordance with the applicable provisions of the following documents:

- a) Until August 3, 2022 the ministry's Watermain Disinfection Procedure, dated November 2015. As of August 4, 2022 the ministry's Watermain Disinfection Procedure, dated August 1, 2020.
- b) Subject to condition 2.3.2, any updated version of the ministry's Watermain Disinfection Procedure;
- c) AWWA C652 – Standard for Disinfection of Water-Storage Facilities;
- d) AWWA C653 – Standard for Disinfection of Water Treatment Plants; and
- e) AWWA C654 – Standard for Disinfection of Wells.

The Operating Authority has developed a Standard Operating Procedure (SOP) for disinfection of drinking water system components. The SOP states that the required standards are to be followed as per the Drinking Water Works Permit.

Question ID	MRDW1024001	Question Type	Legislative
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Question:

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

Legislative Requirement	SDWA O. Reg. 170/03 1-2 (2);
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Observation

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. During the inspection review period the lowest chlorine residual measured in the Davy Drive Subdivision distribution system was 0.43 mg/L. At the time of inspection, the Inspector measured a free chlorine residual of 1.01 mg/L and the Operator measured a free chlorine residual of 1.03 mg/L at the same time from Sample Station #2.

Question ID	MRDW1038001	Question Type	Legislative
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Question:	
Is continuous monitoring equipment that is being utilized to fulfill O. Reg. 170/03 requirements 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?	
Legislative Requirement	SDWA O. Reg. 170/03 6-5 (1)1-4;
Observation	
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.	

Question ID	MRDW1035001	Question Type	Legislative
Question:			
Are operators examining continuous monitoring test results and are they examining the results within 72 hours of the test?			
Legislative Requirement	SDWA O. Reg. 170/03 6-5 (1)1-4; SDWA O. Reg. 170/03 6-5 (1)5-10;		
Observation			
Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test. Subsection 6-5. (1) 3. of Schedule 6 of Ontario Regulation 170/03 requires that test results recorded under paragraph 1 or 2 must be examined, within 72 hours after the tests are conducted by a certified operator, in the case of, a small municipal residential system, such as Davy Drive Subdivision Drinking Water System. During the inspection review period records indicate that trending data was reviewed within 72 hours of the test being conducted. Operators are able to log on remotely to view the continuous analyser data. The Operating Authority has developed a Standard Operating Procedure for how Operators are to complete the review of continuous monitoring data.			

Question ID	MRDW1037001	Question Type	Legislative
Question:			
Are all continuous monitoring equipment utilized for sampling and testing required by O. Reg. 170/03, or MDWL or DWWP or order, equipped with alarms or shut-off mechanisms that satisfy the standards described in Schedule 6?			
Legislative Requirement	SDWA O. Reg. 170/03 6-5 (1)1-4; SDWA O. Reg. 170/03 6-5 (1)5-10; SDWA O. Reg. 170/03 6-5 (1.1);		

Observation
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. In the event that the continuous chlorine or turbidity analysers record a value below or above the set points an alarm is sent to an Operator. The setpoints exceed the requirements of the Table in Schedule 6 of Ontario Regulation 170/03. The low chlorine alarm setpoint is at a level high enough to try and afford an operator enough time to respond before primary disinfection is compromised. Operators regularly test the chlorine and turbidity alarms to ensure they are functioning properly.

Question ID	MRDW1040000	Question Type	Legislative
Question:			
Are all continuous analysers calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation?			
Legislative Requirement	SDWA O. Reg. 170/03 6-5 (1)1-4; SDWA O. Reg. 170/03 6-5 (1)5-10;		
Observation			
All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation. Annually a third party performs calibrations on the continuous analysers. Operators change probes and electrolyte as required. Operators make comparisons of the continuous analysers with handheld units regularly and make adjustments when the difference is more than approximately 0.2 mg/L.			

Question ID	MRDW1034001	Question Type	Legislative
Question:			
Is the secondary disinfectant residual measured as required for the small municipal residential distribution system?			
Legislative Requirement	SDWA O. Reg. 170/03 7-2 (5); SDWA O. Reg. 170/03 7-2 (6);		
Observation			
The secondary disinfectant residual was measured as required for the small municipal residential distribution system. Subsection 7-2 (5) of Schedule 7 of Ontario Regulation 170/03 requires that the owner of a small municipal residential system that provides secondary disinfection and the operating authority for the system shall ensure that at least two distribution samples are taken each week in accordance with subsection (6) and are tested immediately for free chlorine residual, if the system provides chlorination and does not provide chloramination.			

Subsection (6) states that at least one of the distribution samples referred to in subsection (5) must be taken at least 48 hours after, and during the same week as, one of the other distribution samples referred to in subsection (5).

During the inspection review period free chlorine residuals were measured at least twice per week in the Davy Drive Subdivision distribution system with at least 48 hours between the samples collected each week.

Question ID	MRDW1099001	Question Type	Information
Question:			
Do records show 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)?			
Legislative Requirement	Not Applicable		
Observation			
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).			

Question ID	MRDW1082001	Question Type	Legislative
Question:			
For SMR systems, are all microbiological water quality monitoring requirements for distribution samples prescribed by legislation being met?			
Legislative Requirement	SDWA O. Reg. 170/03 11-2 (1); SDWA O. Reg. 170/03 11-2 (2);		
Observation			
All microbiological water quality monitoring requirements prescribed by legislation for distribution samples in a small municipal residential system were being met. Section 11-2 of Schedule 11 of Ontario Regulation 170/03 requires that the owner of a drinking water system and the operating authority for the system ensure that at least one distribution sample is taken every two weeks, if the system provides treatment equipment in accordance with Schedule 1 or 2 and the equipment is operated in accordance with that Schedule, and ensure that each of the samples taken is tested for Escherichia coli, total coliforms and general bacteria population expressed as colony counts on a heterotrophic plate count (HPC) if secondary disinfection is provided. A distribution sample was collected every two weeks during the inspection review period and tested for the required parameters.			

Question ID	MRDW1096001	Question Type	Legislative
Question: Do records confirm that chlorine residual tests are being conducted at the same time and at the same location that microbiological samples are obtained?			
Legislative Requirement	SDWA O. Reg. 170/03 6-3 (1);		
Observation Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.			

Question ID	MRDW1086001	Question Type	Legislative
Question: Are all haloacetic acid water quality monitoring requirements prescribed by legislation conducted within the required frequency and at the required location?			
Legislative Requirement	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);		
Observation All haloacetic acid water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location. Section 13-6.1 of Schedule 13 of Ontario Regulation 170/03 requires that the owner of a drinking water system that provides chlorination or chloramination and the operating authority for the system shall ensure that at least one distribution sample is taken in each calendar quarter, 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 haloacetic acids (HAA), and have the samples tested for haloacetic acids. The standard of 0.80 mg/L for HAA as a reportable limit came into effect on January 1, 2020. During the inspection review period a sample was collected from the Davy Drive Subdivision distribution system in February 2022 and May 2022 and tested for HAA as required. The average for HAA during the inspection review period was 56.55 ug/L. The Davy Drive Subdivision Drinking Water System is not eligible for reduced sampling of HAAs at this time, as there have been results above 0.040 mg/L in the previous 12 consecutive calendar quarters.			

Question ID	MRDW1087001	Question Type	Legislative
Question:			

Have all trihalomethane water quality monitoring requirements prescribed by legislation been conducted within the required frequency and at the required location?	
Legislative Requirement	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);
Observation	
<p>All trihalomethane water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location. Section 13-6 of Schedule 13 of Ontario Regulation 170/03 requires that the owner of a drinking water system that provides chlorination or chloramination and the operating authority for the system shall ensure that at least one distribution sample is taken in each calendar quarter, 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 trihalomethanes (THMs). The samples are to be tested for THMs.</p> <p>During the inspection review period samples were collected and tested for THMs from the Davy Drive Subdivision distribution system in February 2022 and May 2022. The average for THMs during the inspection review period was 57.5 ug/L.</p> <p>The Davy Drive Subdivision Drinking Water System is not eligible for reduced sampling of THMs at this time, as there have been results above 0.050 mg/L in the previous 12 consecutive calendar quarters.</p>	

Question ID	MRDW1094001	Question Type	Legislative
Question:			
Are all water quality monitoring requirements imposed by the MDWL and DWWP being met?			
Legislative Requirement	SDWA 31 (1);		
Observation			
<p>All water quality monitoring requirements imposed by the MDWL or DWWP issued under Part V of the SDWA were being met. Condition 1.5 of Schedule C of Municipal Drinking Water Licence 147-106 Issue Number 5 states that in respect of an effluent discharged into the natural environment from a treatment system or treatment subsystem component listed in column 1 of Table 3:</p> <p>1.5.1 the annual average concentration of a test parameter identified in column 2 shall:</p> <p>a) not exceed the value in column 3 of the same row; and</p> <p>b) be calculated at least once monthly as the running annual average based on the previous twelve months of results:</p> <p>Table 3 and Table 7 of Schedule C of Municipal Drinking Water Licence 147-106 Issue Number 5 states that the Davy Drive water works filter backwash system must be sampled quarterly for total suspended solids with an annual average concentration limit of 25 mg/L and total chlorine residual to be sampled monthly with an annual average concentration</p>			

limit of 0.02 mg/L and iron with an annual sample frequency and annual average concentration limit of 1 mg/L.

Condition 1.5.2 of Municipal Drinking Water Licence 147-106 Issue Number 5 states that where the maximum concentration of a test parameter identified in column 2 exceeds the value in column 3, the concentration shall be reported to the local Ministry district office within 72 hours of receipt of the last lab result used in the calculation.

Condition 1.5.6 of Schedule C of Municipal Drinking Water Licence 147-106 Issue Number 5 states that the requirement for the owner to comply with conditions 1.5.1 to 1.5.5 for the Total Chlorine Residual shall come into effect on February 4, 2023.

During the inspection review period the backwash water was sampled at the point of discharge in February and May as required. The average of the total suspended solids results during the inspection review period was 4.5 mg/L. Iron was tested from the sample collected in February 2022 and had a result of 1.4 mg/L. The previous three quarterly samples tested for Iron had results of 0.951 mg/L in May 2021, 0.434 mg/L in August 2021 and 1.24 mg/L in November 2021. The running annual average for Iron after the February 2022 sample was 1.00 mg/L, equal to but not in exceedance of the limit of 1 mg/L.

Issue Number 6, dated September 22, 2022, of Municipal Drinking Water Licence 147-106 does not include sampling requirements for the Davy Drive Water Works Filter Backwash system.

Question ID	MRDW1059000	Question Type	Legislative
Question:			
Do the operations and maintenance manuals contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the system?			
Legislative Requirement	SDWA O. Reg. 128/04 28;		
Observation			
<p>The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system. The Davy Drive Water Works Operations and Maintenance Manual was updated with Ontario Clean Water Agency (OCWA) procedures in January 2022 and the updated Permit and Approval was included in May 2022. The Manual includes an overview of the facility, operation and maintenance programs for the different treatment equipment components, emergency generator and distribution system components. Water quality and flow monitoring maintenance and requirements as well as record and reporting requirements are detailed. The manual includes a CT calculation worksheet, though it isn't typically used as UV inactivation provides all required log removal credits with the exception of two log removal for viruses under normal operating conditions.</p> <p>Contingency and Emergency plans are available to deal with potential problems that may arise with the drinking water system.</p> <p>The Operating Authority may update the Operations Manual to provide more clarity about alarming situations for intensity and transmittance values for the UV units.</p> <p>During the inspection review period there were numerous instances of the UV</p>			

transmittance being recorded as below the alarm threshold without an alarm being generated.

Question ID	MRDW1060000	Question Type	Legislative
Question:			
Do the operations and maintenance manuals meet the requirements of the DWWP and MDWL issued under Part V of the SDWA?			
Legislative Requirement	SDWA 31 (1);		
Observation			
<p>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. Section 16.2 of Schedule B of Municipal Drinking Water Licence 147-106 Issue Number 5 requires that the operations and maintenance manual or manuals, shall include at a minimum:</p> <p>16.2.1 The requirements of this licence and associated procedures;</p> <p>16.2.2 The requirements of the drinking water works permit for the drinking water system;</p> <p>16.2.3 A description of the processes used to achieve primary and secondary disinfection within the drinking water system, including where applicable:</p> <p>a) A copy of the CT calculations that were used as the basis for primary disinfection under worst case operating conditions and other operating conditions, if applicable; and</p> <p>b) The validated operating conditions for UV disinfection equipment, including a copy of the validation certificate;</p> <p>16.2.4 Procedures for monitoring and recording the in-process parameters necessary for the control of any treatment subsystem and for assessing the performance of the drinking water system;</p> <p>16.2.5 Procedures for the operation and maintenance of monitoring equipment;</p> <p>16.2.6 Contingency plans and procedures for the provision of adequate equipment and material to deal with emergencies, upset conditions and equipment breakdown;</p> <p>16.2.7 Procedures for dealing with complaints related to the drinking water system, including the recording of the nature of the complaint and any investigation and corrective action taken in respect of the complaint;</p> <p>16.2.8 An inspection schedule for all wells associated with the drinking water system, including all production wells, standby wells, test wells and monitoring wells;</p> <p>16.2.9 Well inspection and maintenance procedures for the entire well structure of each well including all above and below grade well components; and</p> <p>16.2.10 Remedial action plans for situations where an inspection indicates non-compliance with respect to regulatory requirements and/or risk to raw well water quality.</p> <p>The Davy Drive Water Works Operations and Maintenance Manual and Contingency and Emergency Plan meet the requirements of the Municipal Drinking Water Licence.</p>			

Question ID	MRDW1061001	Question Type	Legislative
Question: Are logbooks properly maintained and contain the required information?			
Legislative Requirement	SDWA O. Reg. 128/04 27 (1); SDWA O. Reg. 128/04 27 (2); SDWA O. Reg. 128/04 27 (3); SDWA O. Reg. 128/04 27 (4); SDWA O. Reg. 128/04 27 (5); SDWA O. Reg. 128/04 27 (6); SDWA O. Reg. 128/04 27 (7);		
Observation			
<p>Logbooks were properly maintained and contained the required information. The Operating Authority uses electronic logs as well as a number of spreadsheets for the recording of information regarding the Davy Drive Subdivision Drinking Water System. Records include all required information.</p> <p>There were numerous instances when the UV transmittance (UVT) was recorded as being below the alarm threshold during the inspection review period and an alarm was not generated. Operators did not make notes of these instances. For many of these instances the facility was not producing water. An investigation into the cause of the readings being below the threshold and not generating an alarm revealed an issue with the values being recorded, but not with the functioning of the units or the alarming capabilities when disinfection was compromised. The Operating Authority took immediate action to rectify the issue of the values not accurately recording once they were aware of the issue. The UV units will be replaced. All alarm instances were well documented in the logbook.</p>			

Question ID	MRDW1062001	Question Type	Legislative
Question: Do records or other record keeping mechanisms confirm that operational testing not performed by continuous monitoring equipment is being done by a certified operator, water quality analyst, or person who meets the requirements of O. Reg. 170/03 7-5?			
Legislative Requirement	SDWA O. Reg. 170/03 7-5;		
Observation			
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.			

Question ID	MRDW1071000	Question Type	BMP
Question: Has the owner provided security measures to protect components of the drinking water system?			

Legislative Requirement	Not Applicable
Observation	
<p>The owner had provided security measures to protect components of the drinking water system. The pumphouse which houses the treatment equipment for the Davy Drive Subdivision Drinking Water System is locked and alarmed for forced entry. The pumphouse property is fenced. The four wells and the sample stations are kept locked. There are no other storage structures within the distribution system. The Operating Authority has developed a standard operating procedure to be followed in the event of a security breach.</p>	

Question ID	MRDW1073001	Question Type	Legislative
Question:			
Has the overall responsible operator been designated for all subsystems which comprise the drinking water system?			
Legislative Requirement	SDWA O. Reg. 128/04 23 (1);		
Observation			
<p>The overall responsible operator had been designated for each subsystem. The Davy Drive Subdivision Drinking Water System is comprised of a Water Distribution Class 1 and Water Treatment Class 1 subsystem. The Overall Responsible Operator is designated for both of the subsystems. The Operator acting as the ORO is indicated in the electronic logbook on each day that entries are made.</p>			

Question ID	MRDW1074001	Question Type	Legislative
Question:			
Have operators-in-charge been designated for all subsystems for which comprise the drinking water system?			
Legislative Requirement	SDWA O. Reg. 128/04 25 (1);		
Observation			
<p>Operators-in-charge had been designated for all subsystems which comprise the drinking water system. The Davy Drive Subdivision Drinking Water System is comprised of a Water Distribution Class 1 and Water Treatment Class 1 subsystem. The Operators In Charge (OIC) are designated for both of the subsystems. The Operator acting as the OIC is indicated in the electronic logbook on each day that entries are made.</p>			

Question ID	MRDW1075001	Question Type	Legislative
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Question: Do all operators possess the required certification?	
Legislative Requirement	SDWA O. Reg. 128/04 22;
Observation All operators possessed the required certification.	

Question ID	MRDW1076001	Question Type	Legislative
Question: Do only certified operators make adjustments to the treatment equipment?			
Legislative Requirement	SDWA O. Reg. 170/03 1-2 (2);		
Observation Only certified operators made adjustments to the treatment equipment.			

Question ID	MRDW1117001	Question Type	Information
Question: Are there any other DWS related items that should be recognized in this report?			
Legislative Requirement	Not Applicable		
Observation The following items are noted as being relevant to the Drinking Water System: There were numerous instances when the UV transmittance (UVT) was recorded as being below the alarm threshold during the inspection review period and an alarm was not generated. Operators did not make notes of these instances. Wiper blade cycles and air bubbles could cause false readings of the UVT, however an alarm should have been generated when the values were recorded. It was determined through an investigation involving the manufacturer of the UV units that the values being recorded by the SCADA system are not accurate. The values in the UV units are accurate and will alarm in the event of a value below the thresholds, but a malfunction is happening with the values being recorded by the SCADA system. As soon as the Operating Authority was aware of this malfunction they immediately began steps to rectify the issue.			

Question ID	MRDW1007001	Question Type	Legislative
Question: Is the owner maintaining the production well(s) in a manner sufficient to prevent entry into			

the well of surface water and other foreign materials?	
Legislative Requirement	SDWA O. Reg. 170/03 1-2 (1);
Observation	
<p>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. Subsection 1-2. (1) 1. of Schedule 1 of Ontario Regulation 170/03 requires that the owner of a drinking water system shall ensure that any well that serves as an entry point of raw water supply is constructed and maintained to prevent surface water and other foreign materials from entering the well. There are four supply wells for Davy Drive Subdivision Drinking Water System. Each of the wells has a secure cap and screened vent. Well 1 is located in the pumphouse and the other three wells are located outside on the pumphouse property. Notices are posted that the area is a well head protection zone. The Operating Authority performs monthly inspections of the wells and more extensive maintenance and inspections are regularly scheduled. Raw water samples were collected from each well monthly during the inspection review period, with the exception of Well 4 not being sampled in February 2022 and March 2022 due to it being offline.</p> <p>During the inspection review period Well 1 had three raw water sample result values for total coliform other than zero, ranging between 1 cfu/100mL and 14 cfu/100mL. All results for Escherichia coli (E. coli) during the inspection review period were zero for Well 1.</p> <p>During the inspection review period Well 2 had two results for total coliform other than zero. One value was overgrown so could not be given a numeric value, and the other result was 1 cfu/100 mL. One result for E. coli was overgrown so could not be given a numeric value. All other results for E. coli were zero for Well 2 during the inspection review period.</p> <p>During the inspection review period Well 3 had raw water results other than zero for total coliforms during six months of the inspection review period ranging between 1 cfu/100 mL and 14 cfu/100 mL. All results for Escherichia coli during the review period were zero for Well 3.</p> <p>During the inspection review period Well 4 had raw water results other than zero for total coliforms during five months of the inspection review period ranging between 1 cfu/100 mL and 20 cfu/100 mL. All results for Escherichia coli during the review period were zero for Well 4.</p> <p>The supply wells have been identified as being potentially groundwater under the direct influence of surface water (GUDI). Filtration and UV inactivation were installed to address the GUDI potential.</p>	

Question ID	MRDW1009001	Question Type	Legislative
Question:			
Are measures in place to protect the groundwater and/or GUDI source in accordance with any MDWL and DWWP issued under Part V of the SDWA?			
Legislative Requirement	SDWA 31 (1);		

Observation
<p>Measures were in place to protect the groundwater and/or GUDI source in accordance with the Municipal Drinking Water Licence and Drinking Water Works Permit issued under Part V of the SDWA. Condition 16.2.8 of Schedule B of Municipal Drinking Water Licence 147-106 Issue Number 5 requires an inspection schedule for all wells associated with the drinking water system, including all production wells, standby wells, test wells and monitoring wells.</p> <p>Condition 16.2.9 of Schedule B of Municipal Drinking Water Licence 147-106 Issue Number 5 requires well inspection and maintenance procedures for the entire well structure of each well including all above and below grade well components.</p> <p>Condition 16.2.10 of Schedule B of Municipal Drinking Water Licence 147-106 Issue Number 5 requires remedial action plans for situations where an inspection indicates non-compliance with respect to regulatory requirements and/or risk to raw well water quality. The Operating Authority has developed a Well Inspection, Maintenance and Monitoring Plan. The Plan outlines the steps for performing monthly well inspections, monthly water level monitoring and inspections of unexposed well structure. The indicators of the well casing being potentially compromised and infiltration of surface contamination are outlined.</p> <p>Monthly well inspections were documented in the Davy Drive logbook during the inspection review period.</p>

Question ID	MRDW1014001	Question Type	Legislative
Question:			
Is there sufficient monitoring of flow as required by the MDWL or DWWP issued under Part V of the SDWA?			
Legislative Requirement	SDWA 31 (1);		
Observation			
<p>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. Condition 2.1 of Schedule C of Municipal Drinking Water Licence 147-106 Issue Number 5 requires that for each treatment subsystem, continuous flow measurement and recording shall be undertaken for the flow rate and daily volume of treated water that flows from the treatment subsystem to the distribution system, and the flow rate and daily volume of water that flows into the treatment subsystem.</p> <p>There is a magnetic flow meter installed on each of the four raw water lines, as well as on the combined raw water header, and a magnetic flow meter installed on the distribution header. Each of the flow meters provides a 4-20 mA signal. Raw and treated water flows are continuously recorded on the SCADA system.</p>			

Question ID	MRDW1016001	Question Type	Legislative
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Question:	
Is the owner in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the MDWL issued under Part V of the SDWA?	
Legislative Requirement	SDWA 31 (1);
Observation	
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. Table 1 of Schedule C of Municipal Drinking Water Licence 147-106 Issue Number 5 states that the rated capacity for Davy Drive Water Works is 75.69 m3/day. This value was not exceeded during the inspection review period. There is no maximum flow rate identified in Table 2 of Schedule C of the Licence.	

Question ID	MRDW1023001	Question Type	Legislative
Question:			
Do records indicate that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a DWWP and/or MDWL issued under Part V of the SDWA at all times that water was being supplied to consumers?			
Legislative Requirement	SDWA O. Reg. 170/03 1-2 (2);		
Observation			
Records indicated that the treatment equipment was operated in a manner that achieved the design capabilities required under O. Reg. 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. Primary disinfection for the Davy Drive Subdivision Drinking Water System is achieved by UV inactivation and sodium hypochlorite injection. Sodium hypochlorite is also used for secondary disinfection. In efforts to ensure minimum treatment is provided at all times, a series of fail safes have been incorporated into the SCADA system. Internal alarms based on the UV sensors will close the solenoid valve associated with each of the two UV units if the required dosage is not being provided. Dosage is calculated based on the measured UV transmittance (UVT) and UV intensity which is calculated based on the measured voltage. The UV transmittance and UV intensity will cause alarms if either value is below the setpoint. For UVT the alarm setpoint is 75%. The manufacturer indicated that there is an accuracy of +/- 5% for the UVT sensor. The units NSF certification is based on a level of 70% UVT so a threshold of 75% was chosen to account for the accuracy range. There were numerous instances during the inspection review period when the UV transmittance (UVT) was recorded as being below the alarm threshold and an alarm was not generated. Wiper blade cycles and air bubbles could cause false readings of the UVT, however an alarm should have been generated if the values were recorded past the alarm delay buffer and wiper blade cycle, or approximately 10 minutes. It was determined			

through an investigation involving the manufacturer of the UV units that the UV values being recorded by the SCADA system are not accurate. The values in the UV units being used to calculate dosage are accurate and will alarm accurately in the event of a value below the thresholds, but a malfunction is happening with the values being recorded by the SCADA system, resulting in values being recorded below the alarm threshold that are not accurate to the dosage being provided. Once aware of this issue the Operating Authority began steps immediately to rectify the issue. The internal sensors are still measuring accurately and would alarm in the event that the required dosage is not being provided. This was verified through Operator testing.

The intensity alarm setpoint is 70% for an audible alarm and notifies Operators that the lamp is nearing the end of life. At 60% UV intensity the Operator would be called out and the solenoid valve would close. The chlorine residual alarm set point is at a level intended to afford an operator time to respond prior to disinfection being compromised.

Schedule E of Municipal Drinking Water Licence 147-106 Issue Number 5 indicates that UV disinfection accounts for 2 log inactivation of Cryptosporidium Oocysts, 3 log inactivation of Giardia Cysts and 2 log inactivation of viruses. Chlorination is accredited with 2+ log removal of viruses. The one micron absolute cartridge filters are not accredited with any removal credits in the Licence.

The Procedure for Disinfection of Drinking Water in Ontario indicates that in order for Cartridge filters to claim the 2.0 log cryptosporidium oocyst removal credit, the cartridge bag filters should normally meet the performance criterion for filtered water turbidity of less than or equal to 0.2 NTU in 95% of the measurements each month. This criteria was met for each of the filter trains during the inspection review period.

In order to determine if primary disinfection was achieved at the Davy Drive Subdivision Drinking Water System during the inspection review period, flow rates, free chlorine residuals, turbidity values, UV dosage values, UV intensity values, UV transmittance values, sample results and the logsheets were reviewed. These records indicate that during the inspection review period the treatment equipment was operated as required to achieve the disinfection requirements.

Question ID	MRDW1026001	Question Type	Legislative
Question:			
If primary disinfection equipment that does not use chlorination or chloramination is provided, is the equipment equipped with alarms or shut-off mechanisms that satisfy the standards described in Section 1-6 (1) of Schedule 1 of Ontario Regulation 170/03?			
Legislative Requirement	SDWA O. Reg. 170/03 1-6 (1);		
Observation			
The primary disinfection equipment was equipped with alarms or shut-off mechanisms that satisfied the standards described in Section 1-6 (1) of Schedule 1 of O. Reg. 170/03. Subsection 1-6. (1) of Schedule 1 of Ontario Regulation 170/03 requires that if primary disinfection equipment that does not use chlorination or chloramination is provided by a			

drinking water system, the owner of the system and the operating authority for the system shall ensure that the disinfection equipment is designed and operated in accordance with the standards described in subsection (2), or that,

(a) the disinfection equipment has a feature that ensures that no water is directed to users of water treated by the equipment in the event that the equipment malfunctions, loses power or ceases to provide the appropriate level of disinfection; and

(b) if the disinfection equipment malfunctions, loses power or ceases to provide the appropriate level of disinfection, a certified operator takes appropriate action at the location where the equipment is installed before water is again directed to users of water treated by the equipment.

The two NSF certified Hallet 30 UV units that provide primary disinfection for the Davy Drive Subdivision Drinking Water System are each equipped with a solenoid valve that will shut down the supply of water in the event that the UV dosage drops below that required for primary disinfection. There is a lamp UV sensor and a water UV sensor in each of the UV units. In the event that the UV transmittance or intensity drops below the minimum set point, the wiper blade is initiated to try and rectify the issue. If after the wiper blade passes over the quartz sleeve the readings are not above the minimum set points, an alarm is sent to the on-call Operator who is able to check the system remotely with his or her phone, and the solenoid valve closes. While the wiper blade is cleaning, the lowest UV transmittance value is held by the sensor and recorded. Operators attend the site in the event of an alarm. The standpipe provides approximately 1.5 days of storage, so that supply to consumers is not interrupted in the event that the solenoid valves associated with a UV units close. The function of the solenoid valves is tested every three months.

As previously discussed, there were numerous instances when the UV transmittance (UVT) was recorded as being below the alarm threshold during the inspection review period and an alarm was not generated. For some of these instances the wiper blade was able to resolve the issue. Wiper blade cycles and air bubbles could cause false readings of the UVT, however an alarm should have been generated if the low values were recorded past the time delay for the units trying to clear the problem. It was determined through an investigation involving the manufacturer of the UV units that the values being recorded by the SCADA system are not accurate. The values measured by the UV units are accurate and will alarm in the event of a value below the thresholds, but a malfunction is happening with the values being recorded by the SCADA system. The Operating Authority is currently working towards rectifying this issue by replacing the UV units. The Operating Authority tested the alarming capabilities of the UV units to ensure that they will alarm when required.

Question ID	MRDW1030000	Question Type	Legislative
<p>Question:</p> <p>Is primary disinfection chlorine monitoring being conducted at a location approved by MDWL and/or DWWP issued under Part V of the SDWA, or at/near a location where the intended CT has just been achieved?</p>			
Legislative Requirement	SDWA O. Reg. 170/03 7-2 (1); SDWA O. Reg. 170/03 7-2 (2);		

Observation
<p>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. Schedule E of Municipal Drinking Water Licence 147-106 Issue Number 5 indicates that 2+ log removal/inactivation credits are achieved by chlorination in the standpipe. A continuous chlorine analyser is fed sample water after the standpipe, prior to entering the distribution system. The chlorine analyser is equipped with alarm capabilities for high and low levels, as indicated in the Instrument and Control section of Schedule A of Drinking Water Works Permit 147-206 issue Number 5.</p>

Question ID	MRDW1032001	Question Type	Legislative
Question:			
If the drinking water system obtains water from a surface water source and provides filtration, is continuous monitoring of each filter effluent line being performed for turbidity?			
Legislative Requirement	SDWA O. Reg. 170/03 7-3 (2);		
Observation			
Continuous monitoring of each filter effluent line was being performed for turbidity.			

Question ID	MRDW1039000	Question Type	Legislative
Question:			
If primary disinfection equipment that does not use chlorination or chloramination is provided, has the owner and operating authority ensured that the equipment has a recording device that continuously records the performance of the disinfection equipment?			
Legislative Requirement	SDWA O. Reg. 170/03 1-6 (3);		
Observation			
<p>The owner and operating authority ensured that the primary disinfection equipment had a recording device that continuously recorded the performance of the disinfection equipment. The two UV units installed for primary disinfection at Davy Drive Subdivision Drinking Water System continuously record intensity and transmittance which are calculated based on the voltage. The UV dosage is also recorded, calculated with the real time intensity and transmittance values.</p> <p>As a result of an investigation into UV transmittance values being below the alarm threshold and not causing an alarm it was determined that there is an issue with how values from the UV units are being recorded by the SCADA system. Once aware the Operating Authority began immediate steps to rectify the situation.</p>			

Question ID	MRDW1109001	Question Type	Legislative
Question:			
If the system uses equipment for primary disinfection other than chlorination or chloramination and the equipment has malfunctioned, lost power or ceased to provide the appropriate level of disinfection, causing an alarm or an automatic shut-off, did a qualified person respond in a timely manner and take appropriate actions?			
Legislative Requirement	SDWA O. Reg. 170/03 1-6 (1);		
Observation			
When failure(s) of primary disinfection equipment, other than that used for chlorination or chloramination, caused an alarm to sound or an automatic shut-off to occur, a certified operator responded in a timely manner and took appropriate actions. Primary disinfection is achieved for the Davy Drive Subdivision Drinking Water System through ultraviolet inactivation following cartridge filtration, and chlorination. During the inspection review period there were three alarm instances for UV unit 1. Operators took appropriate actions for each instance including noting that the solenoid valve had closed. The configuration of the equipment allows for water to flow through one or the other UV unit in the event that one of the UV units is off line.			

Question ID	MRDW1042001	Question Type	Legislative
Question:			
If UV disinfection is used were duty sensors and reference UV sensors checked and calibrated as per the requirements of Schedule E of the MDWL or at a frequency as otherwise recommended by the UV equipment manufacturer?			
Legislative Requirement	SDWA 31 (1);		
Observation			
All UV sensors were checked and calibrated as required. Schedule E of Municipal Drinking Water Licence 147-106 Issue Number 5 states that in order for UV disinfection to be able to claim the log removal credits outlined in the Schedule E table the following criteria must be met for the duty sensor checks and calibration:			
<ol style="list-style-type: none"> 1. Duty UV sensors shall be checked on at least once every 720 hours of run time against a reference UV sensor or at a frequency as otherwise recommended by the UV equipment manufacturer; 2. When comparing a duty UV sensor to a reference UV sensor, the calibration ratio (intensity measured with the duty UV sensor/intensity measured with the reference UV sensor) shall be less than or equal to 1:2; 3. If the calibration ratio is greater than 1:2, the duty UV sensor shall be replaced with a calibrated UV sensor or a UV sensor correction factor shall be applied while the problem with the UV sensor is being resolved; 			

4. Reference UV sensors shall be checked against a Master Reference Assembly at a minimum frequency of once every three years or on a more frequent basis depending upon the recommendations of the equipment manufacturer.

The manufacturer of the UV units installed at Davy Drive Subdivision Drinking Water System recommends that the UV sensors be calibrated once per year. It should be noted that in the event of a drift from the factory calibration the sensor would only drift downwards, resulting in premature alarms rather than a risk to disinfection requirements not being met without alarms being initiated.

The Operating Authority has the UV sensors calibrated annually by the equipment manufacturer. During the inspection review period the sensors for both UV units were replaced by ones calibrated by the manufacturer in July 2022.

Question ID	MRDW1084001	Question Type	Legislative
Question:			
Are all inorganic water quality monitoring requirements prescribed by legislation conducted within the required frequency?			
Legislative Requirement	SDWA O. Reg. 170/03 13-2;		
Observation			
All inorganic water quality monitoring requirements prescribed by legislation were conducted within the required frequency. Subsection 13-2 (3) of Schedule 13 of Ontario Regulation 170/03 requires that the owner of a small municipal residential system and the operating authority for the system shall ensure that, at least one water sample is taken every 60 months and tested for every parameter set out in Schedule 23. During the inspection review period treated water samples were tested for all Schedule 23 parameters on August 21, 2019. Prior to that treated water samples were tested for all Schedule 23 parameters on August 16, 2016.			

Question ID	MRDW1088000	Question Type	Legislative
Question:			
Are all nitrate/nitrite water quality monitoring requirements prescribed by legislation conducted within the required frequency for the DWS?			
Legislative Requirement	SDWA O. Reg. 170/03 13-7;		
Observation			
All nitrate/nitrite water quality monitoring requirements prescribed by legislation were conducted within the required frequency for the DWS. Section 13-7 of Schedule 13 of Ontario Regulation 170/03 requires that the owner of a drinking water system and the operating authority for the system shall ensure that at least one water sample is taken every three months and tested for nitrate and nitrite.			

During the inspection review period samples tested for nitrate and nitrite were collected from the treated water point of entry for Davy Drive Subdivision Drinking Water System in February 2022 and May 2022 as required.

Question ID	MRDW1089000	Question Type	Legislative
Question:			
Are all sodium water quality monitoring requirements prescribed by legislation conducted within the required frequency?			
Legislative Requirement	SDWA O. Reg. 170/03 13-8;		
Observation			
<p>All sodium water quality monitoring requirements prescribed by legislation were conducted within the required frequency. Section 13-8 of Schedule 13 of Ontario Regulation 170/03 requires that the owner of a drinking water system and the operating authority for the system shall ensure that at least one water sample is taken every 60 months and tested for sodium.</p> <p>Section 6-1.1 (7) of Schedule 6 of Ontario Regulation 170/03 states that if this Regulation requires at least one water sample to be taken every 60 months and tested for a parameter, the owner of the drinking water system and the operating authority for the system shall ensure that at least one sample that is taken during a 60-month period and for the purpose of being tested for that parameter is taken not more than 90 days before or after the fifth anniversary of the day a sample was taken for that purpose in the previous 60-month period.</p> <p>The most recent treated water sample tested for sodium was collected on August 12, 2020 from the Davy Drive Subdivision Drinking Water System with a result of 25.2 mg/L. A resample was collected to be tested for sodium on August 24, 2020 with a result of 23.4 mg/L. Sodium results greater than 20 mg/L are an ongoing occurrence for the Davy Drive Subdivision Drinking Water System.</p>			

Question ID	MRDW1090000	Question Type	Legislative
Question:			
Where fluoridation is not practiced, are all fluoride water quality monitoring requirements prescribed by legislation conducted within the required frequency?			
Legislative Requirement	SDWA O. Reg. 170/03 13-9;		
Observation			
<p>All fluoride water quality monitoring requirements prescribed by legislation were conducted within the required frequency. Section 13-9 of Schedule 13 of Ontario Regulation 170/03 requires that if a drinking water system does not provide fluoridation, the owner of the system and the operating authority for the system shall ensure that a water sample is taken</p>			

at least once every 60 months and tested for fluoride.
Section 6-1.1 (7) of Schedule 6 of Ontario Regulation 170/03 states that if this Regulation requires at least one water sample to be taken every 60 months and tested for a parameter, the owner of the drinking water system and the operating authority for the system shall ensure that at least one sample that is taken during a 60-month period and for the purpose of being tested for that parameter is taken not more than 90 days before or after the fifth anniversary of the day a sample was taken for that purpose in the previous 60-month period.
A treated water sample was collected on August 15, 2017 and tested for fluoride. Prior to that a sample was collected on August 22, 2012, from the treated water sample point at Davy Drive Subdivision Drinking Water System and tested for fluoride.

Question ID	MRDW1085001	Question Type	Legislative
Question: Are all organic water quality monitoring requirements prescribed by legislation conducted within the required frequency?			
Legislative Requirement	SDWA O. Reg. 170/03 13-4 (1); SDWA O. Reg. 170/03 13-4 (2); SDWA O. Reg. 170/03 13-4 (3);		
Observation			
All organic water quality monitoring requirements prescribed by legislation were conducted within the required frequency. Subsection 13-4 (3) of Schedule 13 of Ontario Regulation 170/03 requires that the owner of a small municipal residential system and the operating authority for the system shall ensure that, at least one water sample is taken every 60 months and tested for every parameter set out in Schedule 24. During the inspection review period treated water samples were tested for all Schedule 24 parameters on August 21, 2019. Prior to that treated water samples were tested for all Schedule 24 parameters on August 16, 2016.			