Ministry of the Environment, Conservation and Parks

Barrie District

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

District de Barrie

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February 5, 2021

John Pinsent, Chief Administrative Officer
The Corporation of the Township of Ramara
2297 Highway 12, PO Box 130
Brechin, ON L0K 1B0
(email jpinsent@ramara.ca)

Dear Mr. Pinsent

RE: Communal Drinking Water Inspection Report #1- O72U7
Brechin & Lagoon City Drinking Water System
Date of MECP inspection: November 17, 2020

Please find enclosed the Ministry of the Environment, Conservation and Parks Inspection Report for the Brechin & Lagoon City Drinking Water System (Water Works # 210001273) inspection. The physical inspection process took place on November 17, 2020.

The primary focus of this inspection was to confirm compliance with Ministry's legislation and control documents, as well as conformance with Ministry drinking water related policies for the inspection period. The Ministry is implementing a rigorous and comprehensive approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as water system management practices.

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), included as Appendix A of the inspection report, 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. 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 or concerns regarding this inspection report, please contact the undersigned at 705-791-6359.

Respectfully,

Aaron Mattson
Drinking Water Inspector
Barrie District Office
Drinking Water and Environmental Compliance Division
Ministry of the Environment, Conservation and Parks

Cc: *Kathy Sipos, Director of Infrastructure, Township of Ramara* *ksipos@ramara.ca*
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Barrie District Office File, MECP

Ontario

Ministry of the Environment, Conservation and Parks

BRECHIN & LAGOON CITY DRINKING WATER SYSTEM

Inspection Report

Site Number:	210001273
Inspection Number:	1-O72U7
Date of Inspection:	Nov 17, 2020
Inspected By:	Aaron Mattson

OWNER INFORMATION:

Company Name: RAMARA, THE CORPORATION OF THE TOWNSHIP OF
Street Number: 2297 **Unit Identifier:**
Street Name: HIGHWAY 12 Hwy
City: BRECHIN
Province: ON **Postal Code:** L0K 1B0

CONTACT INFORMATION

INSPECTION DETAILS:

Site Name: BRECHIN & LAGOON CITY DRINKING WATER SYSTEM
Site Address: 2 POPLAR Crescent BRECHIN ON L0K 1B0
County/District: RAMARA
MECP District/Area Office: Barrie District
Health Unit: SIMCOE MUSKOKA DISTRICT HEALTH UNIT
Conservation Authority:
MNR Office:
Category: Large Municipal Residential
Site Number: 210001273
Inspection Type: Announced
Inspection Number: 1-O72U7
Date of Inspection: Nov 17, 2020
Date of Previous Inspection: Nov 01, 2019

COMPONENTS DESCRIPTION

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

Site (Name): INTAKE STRUCTURE/SYSTEM
Type: Source **Sub Type:** Surface
Comments:
The raw water intake structure for the facility is located approximately 400 metres offshore to the east in Lake Simcoe. A raw water low lift pumping station situated at the facility draws water from the lake through a 300 millimetre diameter intake pipe. The low lift pumping station is equipped with two manually cleaned screens and three vertical turbine pumps, one of which is rated at a capacity of 2,435 cubic metres per day and the other two are rated at 2,029 cubic metres per day. There is a 100 mm diameter pipe for backflushing. A small pump operates on a continuous basis, providing raw water from the raw water wet well to continuous monitoring equipment measuring raw source water quality parameters turbidity, pH and temperature.
Prior to being directed to the treatment train, the raw water is dosed through a diffuser into the wet well by a paced to flow pre-chlorination system and by a paced to flow coagulation system that utilizes polyaluminum chloride. The water is then directed through a 200 millimetre pipe equipped with an ABB magnetic flowmeter, and injected with carbon dioxide for pH control prior to entering the filtration system. The carbon dioxide system consists of two 340 kg stainless steel refillable storage cylinders containing liquefied carbon dioxide gas. A wall-mounted metering panel is installed, equipped with an actuated control valve and bypass piping, gas feed flowmeter, filter, carbon dioxide gas

pressure regulator and isolating manual ball valves. There is an indoor carbon dioxide detector installed.

Site (Name): TREATED WATER
Type: Treated Water POE **Sub Type:** Pumphouse
Comments:
The Brechin and Lagoon City water treatment plant is a surface water treatment facility with chemically assisted filtration.
Raw water from the wet well flows through an ABB magnetic flow meter with a 4-20 milliamp signal connected to the SCADA system for continuous monitoring and recording purposes. Raw water is directed to a filtration system which begins with four spiral flow flocculation tanks that each provide 12.7 cubic metres volume. Water then flows to two filters, each equipped with two surface agitators and three backwash wastewater collection troughs, and are comprised of 1,140 millimetres of granulated activated carbon over sand and gravel sitting on a 200 millimetre underdrain. The filters are designed to provide a total maximum day filtration treatment capacity of 4,000 m3. The vertical turbine backwash wastewater pump has a capacity of 7,514 cubic metres per day at 9.1 TDH, providing a potential backwash rate of 44 metres per hour. Water discharging from the filters is monitored separately by two continuous on-line turbidity analysers that have signal outputs connected to a datalogging device and an auto dialer for continuous monitoring and alarming purposes. During backwash cycles, filter to waste water is directed to an 80 cubic metre backwash holding tank, equipped with two manually controlled submersible pumps that discharge to the sanitary sewer at a controlled rate and an overflow weir that is directed to the same sanitary sewer. All flows from the backwash cycles are monitored by a flow meter located on the backwash holding tank discharge pipe.
After passing through the filters, the partially treated water is dosed with sodium hypochlorite in the combined filter discharge header. The primary sodium hypochlorite disinfection system consists of one approximately 300 litre chemical storage tank, two chemical metering pumps (one duty, one standby), each rated at 10.5 litres/hour, and an alarm with automatic switchover on duty pump failure. After chemical dosing, the water is directed into a 1,091 cubic metre concrete in-ground reservoir situated under and adjacent to the pumphouse. The reservoir is equipped with baffling and an ultrasonic level measuring device for treatment control and high lift pump lockout at 3.89 metres water depth to maintain adequate chlorine contact time. Water discharging from the reservoir is monitored by on-line turbidity and chlorine analysers that have signal outputs connected to a datalogging device and an auto dialer for continuous monitoring and alarming purposes. The water for these analysers is drawn continuously by a pump to ensure that the water is being drawn from a location that represents the point at which CT is being achieved. Water then passes into a 6.8 metre by 2.1 metre by 4.65 metre high lift pump wet well where one submersible pump with a rating of 1,944 m3/d and four vertical turbine pumps rated with one pump at 1,145 m3/d, one pump with capacity of 1,728 m3/d and two pumps with capacities of 4,536 m3/d, all at TDH of 70 m provide water to the distribution system. Each pump is equipped with lockout features for low water level and low chlorine residuals. Treated water flows through an ABB magnetic flowmeter prior to being discharged to the distribution system. High lift pumps are activated based on the Brechin tower level.
A secondary disinfection system is also located after the reservoir that is comprised of one chemical storage tank, two chemical metering pumps (one duty, one standby), with an alarm and automatic switchover on duty pump failure. Sodium hypochlorite is injected through a diffuser into the high lift wet well at a constant rate during high lift pump operation.
There are three continuous, on-line turbidimeters measuring in NTU's which are separately supplied with continuous samples from each of the filter effluent lines and the treated water supply from the same location identified for the chlorine analyzer. Each of the analyzers are equipped with signal outputs connected to a datalogging device and an auto dialer for continuous monitoring and reporting purposes.
A 24 hour alarm system continuously monitors illegal entry, power interruptions, low pressure, low filter levels, low and high levels in the clearwell and the Brechin elevated storage tower and treated water quality for turbidity and free available chlorine residual. The water treatment plant is equipped with one (1) stand-by 175 kW diesel engine generator set with sufficient capacity to run the works for 32 hours.

Site (Name): DISTRIBUTION (WATER INSPECTION)
Type: Other **Sub Type:** Reservoir

Comments:
The Brechin and Lagoon City distribution system services approximately 1,264 service connections and an approximate population of 2,618 persons. Of these, approximately five are considered industrial, 40 are commercial and five are institutional users.
Lagoon City has approximately 11,800 m of PVC, ductile iron and asbestos cement watermains ranging in diameter from 150 mm to 300 mm.
Brechin has approximately 6,100 m of PVC watermains ranging in diameter from 150 mm to 250 mm.
A treated water elevated reservoir is located within Brechin that provides a storage volume of 945 cubic meters and is equipped with a level sensor that controls high lift pump activation through telephone communication lines. In addition, the owner has installed an uninterruptible power supply at the tower to maintain communication capabilities in the event of power failure.

INSPECTION SUMMARY:

Introduction

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

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

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

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

  The Brechin and Lagoon City Drinking Water System is owned by the Corporation of the Township of Ramara and serves an estimated population of 2,618 people in the communities of Brechin and Lagoon City. Since September 1, 2020, the Ontario Clean Water Agency (OCWA) has been the operating authority for the facility, with the Township having had responsibility for the time previous to this.
  The Brechin and Lagoon City Drinking Water System is categorized as a large municipal residential drinking water system, as defined by Ontario Regulation 170/03 and operates under DWS number 210001273.
  The Brechin and Lagoon City Drinking Water System draws water from Lake Simcoe. Treatment consists of chemically assisted filtration and chlorination. Three low lift pumps draw water from Lake Simcoe. Raw water is injected with carbon dioxide for pH adjustment, sodium hypochlorite and polyaluminum chloride. Water is then directed to four spiral flow flocculators and two filter-absorbers. Water is then injected with sodium hypochlorite and directed to the clearwell. Five highlift pumps discharge treated water to the distribution system. There is an elevated storage tower in the town of Brechin.
  This inspection was conducted pursuant to section 81 of the Safe Drinking Water Act in order to assess compliance with the requirements of Ontario Regulation 170/03 and other Ministry control documents. The drinking water inspection included: physical inspection of the treatment equipment and facility; interview with Township of Ramara/OCWA staff; and a review of relevant documents and data from the period of November 1, 2019 to November 17, 2020 (hereafter referred to as the "inspection review period").

Source

- **The owner had a harmful algal bloom monitoring plan in place.**

  The operating authority has developed an SOP for responding to a blue-green algae bloom. In summary, the SOP requires the following:
  • When a bloom is identified, begin weekly sampling of raw and treated water. Continue until the bloom is no longer suspected or observed in and around the intake, or until two weekly ELISA analyses show no presence of microcystin-LR.

Source

• Report all treated water microcystin results >1.5 micrograms/Litre (including provisional results) as per O. Reg. 170 adverse reporting requirements.
• Follow directions given by local MOH and MOE.

Capacity Assessment

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

  Condition 2.1 of Schedule C of Municipal Drinking Water Licence 147-101 prescribes that the Owner undertake continuous measurement and recording of the flow rate and daily volume of water conveyed into the treatment subsystem and into the distribution system from the treatment subsystem.
  There is a magnetic flow meter installed on the raw water intake header as well as on the treated water discharge header. The SCADA system records the raw and treated water flows via a 4-20 mA signal from each flow meter. Flow monitoring data is captured by the SCADA system and is capable of being monitored remotely by the operators via laptop.

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

  Condition 1.1 of Schedule C of Municipal Drinking Water Licence 147-101 prescribes that flows from the treatment subsystem to the distribution system shall not exceed 4,000 cubic metres/day. Based on a review of flow data for the inspection review period, there were no exceedances of the prescribed flow capacity.

Treatment Processes

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

  Drinking Water Works Permit 147-201 and Municipal Drinking Water Licence 147-101, issued on July 19, 2019, were in effect during the inspection review period. At the time of the physical inspection, the equipment at the treatment facility appeared to be installed in accordance with these authorizing documents.

- **The owner/operating authority was in compliance with the requirement to prepare Form 1 documents as required by their Drinking Water Works Permit during the inspection period.**

  Condition 3.3 of Schedule B of Drinking Water Works Permit 147-201 prescribes that the owner must record all watermain additions, modifications, replacements and extensions on a "Form 1 – Record of Watermains Authorized as a Future Alteration". During the inspection review period, two modifications were made to the distribution system and were documented on the appropriate forms.

- **The owner/operating authority was in compliance with the requirement to prepare Form 2 documents as required by their Drinking Water Works Permit during the inspection period.**

  Condition 4.6 of Schedule B of Drinking Water Works Permit 147-201 prescribes that the owner must record all minor modifications to the works on a "Form 2 – Record of Minor Modifications or Replacements to the Drinking Water System". During the inspection review period, one modification was made to the works and was documented on the appropriate form.

- **The owner/operating authority was in compliance with the requirement to prepare Form 3 and associated documents as required by their Drinking Water Works Permit during the inspection period.**

  Condition 5.8 of Schedule B of Drinking Water Works Permit 147-201 prescribes that the owner must record all modifications to air emissions equipment on a "Form 3 – Record of Addition, Modification or Replacement of Equipment Discharging a Contaminant of Concern to the Atmosphere". During the inspection review period, one modification was made to the equipment and was documented on the appropriate form.

Treatment Processes

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

  Section 1-4 of Schedule 1 Ontario Regulation 170/03 prescribes that the Owner of a drinking water system that obtains water from a raw water supply that is surface water shall ensure provision of water treatment equipment that is designed to be capable of chemically assisted filtration or better, and is designed to be capable of achieving, at all times, primary disinfection in accordance with the Ministry's Procedure for Disinfection of Drinking Water in Ontario. Primary disinfection for a surface water source includes at least 99 per cent removal or inactivation of Cryptosporidium oocysts, at least 99.9 per cent removal or inactivation of Giardia cysts and at least 99.99 per cent removal or inactivation of viruses by the time water enters the distribution system. Section 1-5 of Schedule1 of Ontario Regulation170/03 prescribes that the Operator of a drinking water system shall ensure provision of water treatment equipment that is designed to be capable of secondary disinfection (where necessary): using chlorination or chloramination in accordance with the Ministry's Procedure for Disinfection of Drinking Water in Ontario; or, provide other water treatment equipment that, in the opinion of a licensed engineering practitioner, is designed to be capable of providing secondary disinfection that is equivalent to or better than the secondary disinfection provided by the chlorination or chloramination equipment.
  Condition 1 of Schedule E of Municipal Drinking Water Licence 147-101 states that the Brechin and Lagoon City Water Works achieves 2 log removal of cryptosporidium oocysts, 2 log removal of giardia cysts and one log removal of viruses by direct filtration, and 1 log removal of giardia cysts and 3+ log removal of viruses by chlorination, if the applicable log removal/inactivation credit assignment criteria is met.
  The log removal/inactivation credit assignment criteria for direct filtration are:
  1. A chemical coagulant shall be used at all times when the treatment plant is in operation;
  2. Chemical dosages shall be monitored and adjusted in response to variations in raw water quality;
  3. Effective backwash procedures shall be maintained including filter-to-waste or an equivalent procedure during filter ripening to ensure that effluent turbidity requirements are met at all times;
  4. Filtrate turbidity shall be continuously monitored from each filter; and each month shall be met for each filter.
  5. Performance criterion for filtered water turbidity of less than or equal to 0.3 NTU in 95% of the measurements each month shall be met for each filter.
  The coagulant and carbon dioxide systems are tied into the raw water pumps, so that coagulant is used at all times when the treatment plant is in operation. Raw water is continuously monitored for turbidity. The daily logsheet indicates the dosage for the pre-chlorine, reservoir chlorine and coagulant, as well as the amount used in 24 hours. Operators monitor the dosage and make adjustments where necessary in response to raw water quality. Backwash cycles for both filters are initiated manually based on the head loss for each filter and observations of raw water quality, and include a filter-to-waste portion. A continuous turbidity analyser is installed on each filter effluent line, and values are continuously recorded by the SCADA system. The daily logsheet includes a calculation of the percentage of turbidity readings that are less than 0.3 NTU.
  The log removal/inactivation credit assignment criteria for chlorination are:
  1. Sampling and testing for free chlorine residual shall be carried out by continuous monitoring equipment in the treatment process 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; and
  2. At all times, CT provided shall be greater than or equal to the CT required to achieve the log removal credits assigned.
  Based on continuously recorded and manually sampled data provided by the Owner and reviewed during the course of this inspection, it appears that the required level of treatment was provided at all times during the inspection review period. Sufficient contact time is afforded to all users of the system by the in-ground contact chamber, and treatment integrity is supported by auxillary and duty chemical feed pumps with automatic switch over if one pump fails. In addition, distribution of treated water is halted if there are any disruptions in the process that could result in a failure of appropriate treatment.

Treatment Processes

- **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.**

  Subsection 1-2 (2), paragraph 4 of Schedule 1 of Ontario Regulation 170/03 states that if chlorination is provided for secondary disinfection, the owner shall ensure that the equipment is operated so that, at all times and at all locations within the distribution system, the free chlorine residual is never less than 0.05 milligrams/Litre. Records indicated that there were no free chlorine residuals less than 0.05 milligrams/Litre within the distribution system at any time during the inspection review period.

- **Where an activity has occurred that could introduce contamination, all parts of the drinking water system were disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit.**

  Condition 2.3 of Schedule B of Drinking Water Works Permit 147-201 Issue Number 4 states that all parts of the drinking water system in contact with drinking water which are:
  2.3.1 Added, modified, replaced, extended; or
  2.3.2 Taken out of service for inspection, repair or other activities that may lead to contamination, shall be disinfected before being put into service in accordance with a procedure approved by the Director or in accordance with the applicable provisions of the following documents:
  a) The ministry's Watermain Disinfection Procedure, effective January 29, 2017;
  c) AWWA C653 – Standard for Disinfection of Water Treatment Plants; and
  d) AWWA C654 - Standard for Disinfection of Wells.
  The Brechin and Lagoon City Water Works Contingency and Emergency Plan, which was updated in January 2019, references the watermain disinfection procedure and the most recent version of ANSI/AWWA C651 Standard for Disinfecting Water Mains where required. The ministry's Watermain Disinfection Procure is appended in the Contingency Plan. Since September of 2020, the new Operating Authority (OCWA) has implemented their standardized watermain SOP which meets all of the requirements of this condition.

Treatment Process Monitoring

- **Primary disinfection chlorine monitoring was not 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.**

  Subsection 7-2 (1) of Schedule 7 of Ontario Regulation 170/03 states that drinking water systems that use chlorination for primary disinfection must have continuous monitoring equipment sampling and testing for free chlorine residuals 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".
  At the time of the physical inspection, the chlorine residual was being monitored at the beginning of the chlorine contact chamber, a location which is not at the point at which the intended contact time has been completed.

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

  Subsection 7-3 (2) (b) of Schedule 7 of Ontario Regulation 170/03 requires that if a drinking water system obtains water from a raw water supply that is surface water and the system provides filtration the owner of the system shall ensure that sampling and testing for turbidity is carried out by continuous monitoring equipment on each filter effluent line.
  There are two continuous turbidity analysers for the two filter effluent lines and two continuous analysers that measure the turbidity of the treated water and the raw water.

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

  Subsections 7-2(3) and 7-2(4) of Ontario Regulation 170/03 prescribe the following:
  (3) The owner of a large municipal residential system that provides secondary disinfection and the operating authority for the system shall ensure that at least seven distribution samples are taken each week in accordance

Treatment Process Monitoring

with subsection (4) and are tested immediately for,
(a) free chlorine residual, if the system provides chlorination and does not provide chloramination; or
(b) combined chlorine residual, if the system provides chloramination.
(4) The following rules apply to the distribution samples referred to in subsection (3) unless at least one sample is taken on each day of the week:
1. At least four of the samples must be taken on one day of the week, at least 48 hours after the last sample was taken in the previous week.
2. At least three of the samples must be taken on a second day of the week, at least 48 hours after the last sample was taken on the day referred to in paragraph 1.
3. When more than one sample is taken on the same day of the week under paragraph 1 or 2, each sample must be taken from a different location.
Based on records reviewed, the Operating Authority is testing secondary disinfection residuals in the distribution system at the appropriate frequencies and are taking the requisite number of samples.

- **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

  During the inspection review period, continuous monitoring test results were reviewed by certified operators within 72 hours. Operators are capable of monitoring the results remotely and comments are entered electronically onto the daily logsheets or into the on-site logbook.

- **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.**

  Subsection 6-5 (1) paragraph 5i and subsection 6-5 (1.1) paragraph 1 of Schedule 6 of Ontario Regulation 170/03 set out standards for continuous monitoring equipment that is used to conduct sampling and testing required by the regulation.
  All continuous analysers are equipped with alarms or shut-off mechanisms and are linked to the SCADA system to alert on-call operators in the event of an alarm.

- **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.**

  Subsection 6-5(1) of Schedule 6 of Ontario Regulation 170/03 sets out standards to be adhered to where continuous monitoring equipment is used for sampling and testing required under Ontario Regulation 170/03, for a parameter set out in the Table included in Schedule 6. For the Brechin & Lagoon City Drinking Water System, this subsection applies to the continuous chlorine analyser used to monitor primary disinfection residuals at or near the intended contact time. In the case of primary disinfection chlorine residual monitoring, paragraph 1, subparagraph i of subsection 6-5(1) of Schedule 6 and the associated Table requires that the continuous analyser test for free chlorine residual once every five minutes, at a minimum.
  Data generated during the inspection review period from the continuous analysers used to monitor primary and operational parameters associated with the Brechin & Lagoon City Drinking Water System was reviewed in conjunction with this inspection. The data indicated that these continuous analysers measured and recorded parameters more frequently than the required frequency set out in the Table included in Schedule 6. The on-line analysers capture the parameter test results every second and upload the minimum, maximum and average results to SCADA every 5 minutes.

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

Treatment Process Monitoring

Subsection 6-5 (1) 8 of Schedule 6 of Ontario Regulation 170/03 prescribes that the continuous monitoring equipment must be checked and calibrated in accordance with the manufacturer's instructions. Subsection 6-5(1)10 states that if the manufacturer's instructions do not indicate how often to check and calibrate the continuous monitoring equipment and paragraph 9 does not apply, the equipment must be checked and calibrated as often as necessary to ensure that test results are within the following margins of error:
i. In the case of free chlorine residual, 0.05 milligrams per litre, if the concentrations usually measured by the equipment are less than or equal to 1.0 milligrams per litre, and proportionally higher if the concentrations usually measured are greater than 1.0 milligrams per litre,
ii. In the case of free chlorine residual and total chlorine residual measured for the purpose of determining combined chlorine residual, 0.05 milligrams per litre, if the concentrations usually measured by the equipment are less than or equal to 1.0 milligrams per litre, and proportionally higher if the concentrations usually measured are greater than 1.0 milligrams per litre.
Operational staff perform verifications of the continuous chlorine residual analysers using a portable handheld device multiple times weekly. If a comparative assessment indicates significant differences, the operator will calibrate the continuous analysers as per the manufacturer's instructions. Records of these maintenance activities are made on the daily pumphouse log sheets. In addition, the continuous analysers are calibrated by a qualified company on an annual basis.

Operations Manuals

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

  In January 2019 the Operating Authority undertook a review and performed revisions of the Operations and Maintenance Manuals for the Lagoon City Water Works. The revisions were performed to ensure that the procedures and information contained in the Manuals accurately reflected the activities performed by operators and the installed equipment. In addition, the new Operating Authority (OCWA) reviewed and updated the manuals in September of 2020.
  The Manual indicates that all adjustments or works undertaken on the system are to be incorporated into the Manual prior to work being completed and that the Operating Authority and all Operators are to review the documents annually to ensure accuracy and familiarity with the content.

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

  Condition 16.2 of Schedule B of Municipal Drinking Water Licence 147-101 prescribes that the following must be contained within the Operations Manual:
  16.2.1 The requirements of this licence and associated procedures;
  16.2.2 The requirements of the drinking water works permit for the drinking water system;
  16.2.3 A description of the processes used to achieve primary and secondary disinfection within the drinking water system, including where applicable:
  a) A copy of the CT calculations that were used as the basis for primary disinfection under worst case operating conditions; and
  b) The validated operating conditions for UV disinfection equipment, including a copy of the validation certificate;
  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;
  16.2.5 Procedures for the operation and maintenance of monitoring equipment;
  16.2.6 Contingency plans and procedures for the provision of adequate equipment and material to deal with emergencies, upset conditions and equipment breakdown;
  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;
  The Operations Manual for the Brechin & Lagoon City Drinking Water System appears to include the prescribed requirements. In addition, all manufacturer's manuals for equipment in use at the treatment facilities are retained for

Operations Manuals

operator's reference and use.

Logbooks

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

  Subsection 7-5 (1) of Schedule 7 of Ontario Regulation 170/03 prescribes that chlorine residual and turbidity tests not performed by continuous monitoring equipment must be conducted by a certified operator or water quality analyst. A review of records indicated that manual chlorine residual and turbidity tests undertaken during the inspection review period were conducted by certified operators.

Security

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

  The pumphouse for the Brechin & Lagoon City Drinking Water System is constructed of brick with a locking door containing restriction signs, is outfitted with dusk to dawn exterior lighting and is equipped with intrusion alarms. In addition, all sample stations within the distribution system are locked as well as the water tower in Brechin which is also fenced.

Certification and Training

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

  Subsection 23 (1) of Ontario Regulation 128/04 prescribes that a municipal residential drinking water system must have a designated overall responsible operator (ORO). The ORO shall be an operator who holds a certificate for that type of subsystem and that is of the same class or higher than the class of that subsystem. The Brechin & Lagoon City Well Supply system is classified as a Water Distribution Class 1 subsystem and Water Treatment Class II subsystem. At the time of the inspection the Overall Responsible Operator was designated for both subsystems.

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

  Subsection 25 (1) of Ontario Regulation 128/04 prescribes that one or more operators shall be designated as operators-in-charge (OIC) of the drinking water system. Subsection 25 (5) states that a person who holds an operator-in-training certificate shall not be designated as an OIC. Duties of an OIC are laid out in section 26 of Ontario Regulation 128/04.
  Operators in in charge have been designated for both the Water Distribution Class I and the Water Treatment Class II subsystems.

- **All operators possessed the required certification.**

  Section 22 of Ontario Regulation 128/04 prescribes that the owner or operating authority of a subsystem shall ensure that every operator employed in the subsystem holds,
  (a) a certificate applicable to that type of subsystem; or
  (b) a certificate applicable to that subsystem, in the case of an operator who holds a conditional certificate issued or renewed under section 10.
  It appears that all operators employed in the subsystems hold an appropriate certificate.

- **Only certified operators made adjustments to the treatment equipment.**

  Subsection 1-2 (2) paragraph 5 of Schedule 1 of Ontario Regulation 170/03 prescribes that adjustments to water treatment equipment must be made only by certified operators. Based on a review of pumphouse logbook entries, it appears that only certified operators made adjustments to treatment equipment during the inspection review period.

Certification and Training

Water Quality Monitoring

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

  Subsection 10-2 (1) of Schedule 10 of Ontario Regulation 170/03 prescribes that the Owner and the Operating Authority of a large municipal residential drinking-water system ensure that at least eight distribution system samples are taken every month plus an additional sample for each 1,000 population served (10 samples total for the Brechin & Lagoon City Drinking Water System), with at least one of the samples being taken in each week. In addition, subsection 10-2 (2) requires that each of the samples taken under subsection (1) is tested for Escherichia coli and total coliforms, and that 25 percent of the samples are tested for general bacteria population expressed as colony counts on a heterotrophic plate count. Records provided by the Owner and reviewed during the course of this inspection indicate that the Operating Authority took the appropriate number of samples and tested for the requisite parameters during the inspection review period.

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

  Subsection 10-3 (1) of Schedule 10 of Ontario Regulation 170/03 prescribes that the Owner and the Operating Authority of a large municipal residential drinking-water system ensure that a treated water sample is taken at least once every week and tested for Escherichia coli, total coliforms and general bacteria population expressed as colony counts on a heterotrophic plate count. Records provided by the Owner and reviewed during the course of this inspection indicate that the Operating Authority sampled and tested for the requisite parameters on a weekly basis during the inspection review period.

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

  Section 13-2 of Schedule 13 of Ontario Regulation 170/03 requires that the owner of a large municipal residential system and the operating authority for the system shall ensure that, at least one water sample is taken every 12 months and tested for every parameter set out in Schedule 23, if the system obtains water from a raw water supply that is surface water.
  Subsection 6-1.1 (5) of Schedule 6 of Ontario Regulation 170/03 states that if this Regulation requires at least one water sample to be taken every 12 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 12-month period for the purpose of being tested for that parameter is taken not more than 30 days before or after the first anniversary of the day a sample was taken for that purpose in the previous 12-month period.
  During the inspection review period treated water samples were collected and tested for every Schedule 23 parameter on August 12, 2020. Prior to that, samples were collected and tested for all parameters listed in Schedule 23 on August 21, 2019.

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

  Section 13-4 of Schedule 13 of Ontario Regulation 170/03 requires that the owner of a large municipal residential system and the operating authority for the system shall ensure that, at least one water sample is taken every 12 months and tested for every parameter set out in Schedule 24, if the system obtains water from a raw water supply that is surface water.
  Subsection 6-1.1 (5) of Schedule 6 of Ontario Regulation 170/03 states that if this Regulation requires at least one water sample to be taken every 12 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 12-month period for the purpose of being tested for that parameter is taken not more than 30 days before or after the first anniversary of the day a sample was taken for that purpose in the previous 12-month period.
  During the inspection review period treated water samples were collected and tested for every Schedule 24 parameter on August 12, 2020. Prior to that, samples were collected and tested for all parameters listed in

Water Quality Monitoring

Schedule 24 on August 21, 2019.

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

  Section 13-6.1 of Schedule 13 of 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 requirement to sample for HAA came into effect on January 1, 2017. The standard for HAA as a reportable limit came into effect on January 1, 2020.
  During the inspection review period, samples were collected from the Brechin & Lagoon City Drinking Water System distribution system on the following dates and submitted to an accredited laboratory for analysis of HAAs: November 27, 2019; February 26, 2020; May 5, 2020; and, August 12, 2020.
  The requisite number of samples were collected throughout the inspection review period with at least one sample being taken in each calendar quarter.

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

  Subsections 13-6 (1) and (2) of Schedule 13 of Ontario Regulation 170/03 prescribes that the owner/operating authority of a drinking water system that provides chlorination shall ensure at least one distribution system 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 and have that sample tested for trihalomethanes (THMs).
  During the inspection review period, samples were collected from the Brechin & Lagoon City Drinking Water System distribution system on the following dates and submitted to an accredited laboratory for analysis of THMs: November 27, 2019; February 26, 2020; May 5, 2020; and, August 12, 2020.
  The requisite number of samples were collected throughout the inspection review period with at least one sample being taken in each calendar quarter.

- **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 prescribes that at least one water sample is collected every three months and tested for nitrate and nitrite. Treated water samples were collected from the Brechin & Lagoon City Drinking Water System on the following dates and submitted to an accredited laboratory for analysis of nitrate and nitrite: November 27, 2019; February 26, 2020; May 5, 2020; and, August 12, 2020.
  The requisite number of samples were collected throughout the inspection review period in the appropriate time frames.

- **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.
  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 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.
  The most recent treated water sample tested for sodium was collected on August 12, 2020 from the Brechin and Lagoon City Drinking Water System. A resample was collected and tested for sodium on August 24, 2020. Prior to

Water Quality Monitoring

that a sample was taken and tested for sodium on August 25, 2015.

- **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 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 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.
  The most recent treated water sample was collected and tested for fluoride on August 15, 2017.

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

  During the inspection review period, free chlorine residual tests were conducted at the same time and location that treated and distribution system samples were collected for microbiological analysis, as required by subsection 6-3(1) of Schedule 6 of Ontario Regulation 170/03.

Water Quality Assessment

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

  A sample taken on August, 2020 of treated water showed a result of 34.8 milligrams/Litre for sodium (reportable limit is 20 milligrams/Litre). A resample of the treated water taken on August 24, 2020 confirmed the exceedance with a result of 31.5 milligrams/Litre.

Reporting & Corrective Actions

- **Corrective actions (as per Schedule 17) had been taken to address adverse conditions, including any other steps that were directed by the Medical Officer of Health.**

  One adverse water quality incident occurred during the inspection review period . The following is a summary of these incidents and the corrective actions taken by the operating authority:
  A sample taken on August, 2020 of treated water showed a result of 34.8 milligrams/Litre for sodium (reportable limit is 20 milligrams/Litre). A resample of the treated water taken on August 24, 2020 confirmed the exceedance with a result of 31.5 milligrams/Litre. No further actions were required.

- **All required notifications of adverse water quality incidents were immediately provided as per O. Reg. 170/03 16-6.**

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

  Upon review of logbook entries and SCADA data, it appears that a qualified person responded in a timely manner and took appropriate actions in each instance that continuous monitoring equipment triggered an alarm.

NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED

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

1. **Primary disinfection chlorine monitoring was not 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.**

   Subsection 7-2 (1) of Schedule 7 of Ontario Regulation 170/03 states that drinking water systems that use chlorination for primary disinfection must have continuous monitoring equipment sampling and testing for free chlorine residuals 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".
   At the time of the physical inspection, the chlorine residual was being monitored at the beginning of the chlorine contact chamber, a location which is not at the point at which the intended contact time has been completed.

   Action(s) Required:

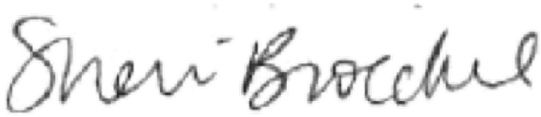
   At the time of the physical inspection, the operator was made aware of this issue and immediately replumbed the feed line to the continuous chlorine residual analyser so that a treated water sample was being drawn from a point after the intended CT was being achieved. As it is assumed that this sample point has not been altered since that time, no further actions are required.

SUMMARY OF RECOMMENDATIONS AND BEST PRACTICE ISSUES

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

Not Applicable

SIGNATURES

Inspected By:	Signature: (Provincial Officer)
Aaron Mattson	
Reviewed & Approved By:	Signature: (Supervisor)
Sheri Broeckel	
Review & Approval Date:	February 5, 2021

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

Inspection Rating Record

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2020-2021)

DWS Name:	BRECHIN & LAGOON CITY DRINKING WATER SYSTEM
DWS Number:	210001273
DWS Owner:	Ramara, The Corporation Of The Township Of
Municipal Location:	Ramara
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Focused
Inspection Date:	November 17, 2020
Ministry Office:	Barrie District

Maximum Question Rating: 514

Inspection Module	Non-Compliance Rating
Capacity Assessment	0 / 30
Treatment Processes	0 / 89
Operations Manuals	0 / 28
Logbooks	0 / 14
Certification and Training	0 / 42
Water Quality Monitoring	0 / 112
Reporting & Corrective Actions	0 / 66
Treatment Process Monitoring	21 / 133
TOTAL	**21 / 514**

Inspection Risk Rating	**4.09%**

FINAL INSPECTION RATING:	**95.91%**

Inspection Rating Record Generated On 04-FEB-21 (Inspection ID: 1-O72U7).

Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2020-2021)

DWS Name:	BRECHIN & LAGOON CITY DRINKING WATER SYSTEM
DWS Number:	210001273
DWS Owner:	Ramara, The Corporation Of The Township Of
Municipal Location:	Ramara
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Focused
Inspection Date:	November 17, 2020
Ministry Office:	Barrie District

Non-compliant Question(s)	Question Rating
Treatment Process Monitoring	
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?	21
TOTAL QUESTION RATING	21

Maximum Question Rating: 514

Inspection Risk Rating	**4.09%**
FINAL INSPECTION RATING:	**95.91%**

Inspection Rating Record Generated On 04-FEB-21 (Inspection ID: 1-O72U7).