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Conservation and Parks**

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February 12, 2019

Sent by Email: spatterson@deeperiver.ca

The Corporation of the Town of Deep River
100 Deep River Road
Deep River, Ontario
K0J 1P0

Attention: Sean Patterson, Director of Public Works

Re: 2018-2019 Inspection Report, Deep River Drinking Water System, DWS #
220000923

The enclosed report documents findings of the inspection that was performed at the Deep River drinking water system on January 16, 2019.

Two sections of the report, namely "Non-compliance with Regulatory Requirements and Actions Required" and "Summary of Recommendations and Best Practice Issues", if found, may cite due dates for the submission of information or plans to my attention.

Please note that "Non-compliance with Regulatory Requirements and Actions Required" are linked to incidents of non-compliance with regulatory requirements contained within an Act, a Regulation, or site-specific approvals, licenses, permits, orders, or instructions. Such violations may result in the issuance of mandatory abatement instruments which could include orders, tickets, penalties, or referrals to the ministry's Environmental Enforcement and Compliance Office.

"Summary of Recommendations and Best Practice Issues" convey information that the owner or operating authority should consider implementing in order to advance efforts already in place to address such issues as emergency preparedness, the fulsome availability of information to consumers, and conformance with existing and emerging industry standards. Please note that items which appear as recommended actions do not, in themselves, constitute violations.

There are no Required or Recommended Actions associated with this inspection report.

Section 19 of the Safe Drinking Water Act, 2002 (Standard of Care) cites a number of obligations of individuals who exercise decision-making authority over municipal drinking water systems. The ministry encourages individuals, particularly municipal councillors, to take steps to be well informed about the drinking water systems over

which they have decision-making authority. These steps could include asking for a copy of this inspection report and a review of its findings.

Thank you for the assistance afforded to me during the conduct of the compliance assessment. Should you have any questions regarding the content of the enclosed report, please do not hesitate to contact me.

Yours truly,

Christina Des Rochers
Water Inspector, Provincial Officer #1439
Drinking Water and Environmental Compliance Division
Ministry of the Environment, Conservation and Parks
Ottawa District Office
613-521-3450 ext. 231

ec:

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c:

File SI-RE-DE-RI 540 (2018)



Ministry of the Environment, Conservation and Parks

DEEP RIVER DRINKING WATER SYSTEM

Inspection Report

Site Number:	220000923
Inspection Number:	1-18X8K
Date of Inspection:	Jan 16, 2019
Inspected By:	Christina Des Rochers

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OWNER INFORMATION:

Company Name: DEEP RIVER, THE CORPORATION OF THE
Street Number: 100 **Unit Identifier:**
Street Name: DEEP RIVER ROAD Rd
City: DEEP RIVER
Province: ON **Postal Code:** K0J 1P0

CONTACT INFORMATION

Type: Owner **Name:** Sean Patterson
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Email: spatterson@deepriver.ca
Title: Director of Public Works, Town of Deep River

Type: Operating Authority **Name:** Brad Sweet
Phone: (613) 687-2141 **Fax:** (613) 687-7138
Email: bsweet@ocwa.com
Title: Operations Manager, OCWA, Laurentian View Cluster

Type: Operating Authority **Name:** Stephen Bird
Phone: (613) 584-3141 **Fax:** (613) 584-2534
Email: sbird@ocwa.com
Title: Operator, OCWA, Ottawa Valley Hub

Type: Operating Authority **Name:** Brenda Royce
Phone: (613) 687-2141 **Fax:** (613) 687-7138
Email: broyce@ocwa.com
Title: Process and Compliance Technician, OCWA, Laurentian View Cluster

INSPECTION DETAILS:

Site Name: DEEP RIVER DRINKING WATER SYSTEM
Site Address: 177 RIVER RD DEEP RIVER K0J 1P0
County/District: Deep River
MECP District/Area Office: Ottawa District
Health Unit: RENFREW COUNTY AND DISTRICT HEALTH UNIT
Conservation Authority:
MNR Office: Pembroke District Office
Category: Large Municipal Residential
Site Number: 220000923
Inspection Type: Unannounced
Inspection Number: 1-18X8K
Date of Inspection: Jan 16, 2019
Date of Previous Inspection:

COMPONENTS DESCRIPTION

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

Sub Type:

Site (Name): SOURCE WATER
Type: Source

Sub Type: Surface Water

Comments:

The Deep River Water Treatment Plant (WTP) obtains raw water from the Ottawa River. The Ottawa River watershed comprises an extensive drainage basin (approximately 146,000 square kilometers) with approximately 40% of the watershed entering the river upstream of the town. Land use upstream of Deep River is predominantly undeveloped forest with limited agricultural, forestry and mining activity. The communities upstream of Deep River include Rolphton, Stonecliffe, Deux Rivieres, Mattawa and Temiskaming. Other activities include the Rapides-des-Joachims (Da Swisha) Hydroelectric Generating Station, the Mattawa Hydroelectric Generating Station, Driftwood Provincial Park and Trans Canada Highway No. 17.

The Ottawa River water quality is characterized by low turbidity (0.8 - 5.3 NTU), moderate to high colour (4 - 60 TCU), and low alkalinity (9 - 34 mg/L as CaCO₃), which is typical for Northern Ontario, as stated in the Design Brief by Jp2g Consultants Inc. (December 2004). Results of sampling and testing between January 2000 and March 2003 indicate the pH ranges between 6.72 and 7.78; and Dissolved Organic Carbon (DOC) ranges from 5 - 7.4. With respect to microbiological contamination of the raw water, the Engineer's Report prepared by Azurix North America Engineering Corp. (January 2001) outlines that sewage bypassing at upstream municipalities is of concern. Azurix concludes that E. coli is present in approximately 50% of raw water samples, and total coliforms are present in about 75% of samples.

Site (Name): LOW LIFT PUMPING STATION
Type: Source

Sub Type: Pumphouse

Comments:

The intake works for the Deep River WTP is located at the Low Lift Pumping Station and consists of a 750 mm diameter intake extending approximately 91m into the Ottawa River terminating at a depth of approximately 9 m below the surface.

The low lift pumping station consists of a 9.14 m by 1.52 m by 5.64 m deep low lift pump well and above ground building, equipped with three (3) submersible pumps (3 duty, controlled by hours of operation), each rated at 83.1 L/s at 25 m TDH; and a raw water main from the low lift pumping station to the water treatment plant.

Site (Name): WATER TREATMENT PROCESS
Type: Treated Water POE

Sub Type: Treatment Facility

Comments:

The Deep River WTP comprises of the following:

- an in-line static mixer, 300 mm diameter;
- three (3) package flocculation and clarification (Actiflo®) units, each rated at raw water flow rate of 4,773 m³/d, consisting of: a rapid mixing basin, an injection chamber, a maturation chamber and a high rate ballasted settling basin, scraper and inclined tube settlers; four (4) sand recirculation pumps (three duty and one standby); three (3) hydrocyclones; electrical and mechanical equipment and control;
- three (3) dual media sand and anthracite filters with a total area of 56.7 m²;
- two (2) air scour blowers equipped with 18.6 kW motor (one duty, one standby);

- two (2) backwash variable speed vertical turbine pumps (one duty, one standby) each rated at 236 L/s at a TDH of 22 m;
- piping and control to facilitate filter to waste;
- electrical and mechanical equipment and control;
- two (2) clear wells, one with a capacity of 1,364 m³, and a second with a capacity of 1,507 m³; and two (2) pump wells, one with a capacity of 90 m³ and the other with a capacity of 110 m³;
- four (4) vertical turbine high lift pumps (one duty, three standby), each rated at 87 L/s at a TDH of 82 m;
- a gaseous chlorine disinfection system consisting of one (1) bank of four (4) 68.2 kg cylinders;
- chlorine solution lines, one leading to an injection point at the filter outlet header prior to the clear wells, and the other leading to an injection point in the pump well upstream of the high lift header; and,
- a chlorine gas scrubber system.

The chemical storage and feed systems consist of the following:

- a primary coagulant (PAS8) feed system consisting of two (2) liquid coagulant tanks, one (1) tank is 51,200 L capacity and one (1) day tank is 6,600 L, and two (2) chemical feed metering pumps (one duty, one standby) with a flow capacity of 101 L/hr and chemical feed line prior to the Actiflo® units;
- pH/alkalinity adjustment consisting of two (2) tanks, one (1) is 51,200 L and one (1) day tank of 3,400 L, of liquid caustic soda and four (4) chemical feed metering pumps (two duty, two standby) each with a flow capacity of 60 L/hr and chemical feed lines to the raw water pipe (pre-alkalinity) just upstream of the static mixer, and to the distribution header;
- coagulant aid for the water treatment clarifiers consisting of two (2) dry polymer preparation systems each consisting of 3,400 L dissolving tank with mixer; four (4) chemical feed metering pumps (three duty, one standby) each with a flow capacity of 90 L/hr and chemical feed lines to the three package treatment units injection chambers;
- coagulant aid for the wastewater clarifier unit consisting of two (2) dry polymer preparation systems each consisting of 3,100 L dissolving tank with mixer; three (3) chemical feed metering pumps (two duty, one standby) each with a flow capacity of 45 L/hr and chemical feed lines to the hydrocyclones reject pipe, and to surge tank pumps discharge pipe;
- coagulant aid for the dewatering centrifuge consisting of one (1) dry polymer preparation systems each consisting of 3,400 L dissolving tank with mixer; two (2) chemical feed metering pumps (one duty, one standby) each with a flow capacity of 90 L/hr and chemical feed lines to the sludge dewatering centrifuge inlet; and,
- dechlorination chemical (sodium bisulfite) feed system, which is currently not operational and; • hydrofluosilicic acid feed system consisting of a 210 L storage tank and two (2) chemical feed metering pumps (one duty, one standby) each with a flow capacity of 4 L/hr and chemical feed line to the distribution header.

Process instrumentation for the WTP consists of eight (8) turbidimeters continuously monitoring the raw water, Actiflo® units (clarified water), filter effluent, treated water and the wastewater clarifier supernatant; one (1) pH meter continuously monitoring the raw water feed to clarifiers after the static mixer, Actiflo® units (at the end of each unit

prior to the filters), treated water prior to and after final pH adjustment; one (1) chlorine analyzer monitoring prior to clearwell #1 to provide early indication of changes in residual; two (2) chlorine residual analyzers continuously monitoring the treated water at the end of the clear wells and before leaving the WTP (on the discharge header); one sulfite ion monitor continuously monitoring the wastewater clarifier supernatant discharge pipe (not in use); and a fluoride ion analyzer continuously monitoring the fluoride residual in the treated water on the distribution header.

The WTP is further equipped with a standby 600 kW diesel generator complete with fuel storage tank for back-up power.

Site (Name): ELEVATED STORAGE TANK
Type: Other **Sub Type:** Reservoir

Comments:

The Town of Deep River stores treated water in a 1,513 m³ elevated water storage tank (30.5 m) located on the corner of Deep River Road and Highway 17, south of the water treatment plant. Treated water flows by gravity from the tower into the municipal distribution system. Water level sensors contained within the elevated storage tank activate/deactivate operation of the high lift pumps. The reservoir is contained within a locked security perimeter fence. A small cinder block structure located near the base of the tower and within the perimeter fencing contains all valves necessary for draining and isolating the tower.

Site (Name): DISTRIBUTION SYSTEM
Type: Other **Sub Type:** Other

Comments:

The Deep River drinking water system services a population of approximately 4,109 persons. Construction of the Town of Deep River's Water Distribution System was initiated in 1945, and has seen numerous extensions and modifications over the past sixty years. The Town's consumers are not provided with individual water meters.

Deep River DWS is also connected to CNL with approximately 9,000 m of 300 mm diameter watermain pipe from the booster pumping station to the CNL site.

The water mains are constructed of mostly cast iron, ductile iron and polyvinyl chloride (PVC), and range in diameter from 102 mm (4 inches) to 406 mm (16 inches). There is approximately 75 km of water mains within the distribution system and approximately 242 hydrants and hydrant valves.

Site (Name): PROCESS WASTEWATER
Type: Other **Sub Type:** Other

Comments:

Process wastewater is generated from filter backwashing, filter to waste activities and from the sand residuals and drainage from the Actiflo® treatment process (Actiflo® waste). The filter backwash wastewater and Actiflo® wastewater discharge to the wastewater surge tanks and the wastewater lamella tube settlers clarifier; while the Actiflo® overflow, clearwell overflow and filter to waste discharge directly to the ditch and the river. The hydrocyclone waste discharges to the lamella clarifier.

The residue management facility (wastewater treatment) consists of two (2) filter backwash wastewater surge tanks, each approximately 113 m³, equipped with two (2) transfer pumps; wastewater tube settlers clarifier with supernatant discharge line to the river; and a sludge thickener tank equipped with two sludge pumps that convey the thickened sludge to a dewatering centrifuge with supernatant discharge to wastewater surge tanks. The screw conveyor was extended to allow emptying into a dump truck for disposal.

There is a sodium bisulfite feed system that is operational but it is not being used. There is currently no need to dechlorinate the supernatant being discharged to the Ottawa River as there is no chlorine present in the supernatant being discharged to the river.

Site (Name): PROPOSED ALTERATIONS

Type: Other

Sub Type: Other

Comments:

Schedule C: Authorization to Alter the Drinking Water System, dated April 15, 2016, to be incorporated into the existing works once operational. All equipment listed in Schedule C has been put into service with the exception of:

Booster Pumping Station (new), located at Balmer Bay Road, next to the hospital:

- three (3) horizontal pumps each rated at 26 L/s at 69.7 m TDH
 - two (2) chemical feed pumps and 338 L storage tank for the re-chlorination system
 - 113 kW diesel generator and fuel storage tank
 - inlet and outflow chlorine residual analyzers
-

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 inspection began January 16, 2019, when the unannounced physical inspection of Deep River Drinking Water System (DWS) was conducted consisting of a visual inspection of the facility, including treatment and pumping equipment, and instrumentation and controls. Inspection interviews and review of on-site operational information and log sheets also took place on that date.

This inspection covers the period from January 1, 2018 to December 31, 2018. Specifically, this inspection examines compliance with Municipal Drinking Water Licence (MDWL) #189-101 and Drinking Water Works Permit (DWWP) #189-201, in addition to relevant Ministry of the Environment, Conservation and Parks (MECP) legislation as addressed in specific inspection questions.

Representing the operating authority, Ontario Clean Water Agency (OCWA) at the inspection were Stephen Bird, Senior Operator and Brenda Royce, Process and Compliance Technician.

Additional review of documentation and information relevant to the inspection was conducted at MECP offices.

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.**

MDWL #189-101 Schedule C, 2.0 Flow Measurement and Recording Requirements states:

2.1 For each treatment subsystem identified in column 1 of Table 1 and in addition to any other flow measurement and recording that may be required, continuous flow measurement and recording shall be undertaken for:

2.1.1 The flow rate and daily volume of treated water that flows from the treatment subsystem to the distribution system.

Capacity Assessment

2.1.2 The flow rate and daily volume of water that flows into the treatment subsystem.

There are no flow monitoring devices specifically referenced in DWWP #189-201, however flow into the Deep River treatment system is monitored via three (3) flow meters, one at the head of each Actiflo unit, and into the distribution system by one (1) flow meter located on the treated water discharge header.

- **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.**

MDWL #189-10 Schedule C, 1.0 System Performance, 1.1 Rated Capacity states that the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed 13,638 m³/day.

At no time during the inspection review period did the flow into the treatment system exceed the rated capacity. The maximum flow rate from the treatment system to the distribution system recorded during the inspection review period was 4,790 m³/day.

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.**

A visual inspection of the Deep River water treatment plant reveals that the Schedule A of DWWP #189-201 does not accurately describe the equipment installed.

OCWA staff have confirmed that an application to amend the DWWP to reflect installed equipment was submitted in May 2018 in response to the previous MECP inspection. MECP Licensing and Approvals Section provided a draft update for owner/operator review on January 24, 2019 and a finalized update to the DWWP is expected to be issued in the coming weeks.

A Schedule C, Authorization to Alter the Drinking Water System was issued for the extension of drinking water supply to the Chalk River Nuclear Laboratories. A Director's Notification Form for the works was submitted on May 9, 2018.

- **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.**

Deep River DWS utilizes chemically assisted filtration and chlorination to provide primary disinfection.

MDWL #189-101, Schedule E: Pathogen Log Removal/Inactivation Credits requires that chemical coagulant be used at all time when the treatment plant is in operation and that a filtrate turbidity performance criterion of less than or equal to 0.3 NTU in 95% of measurements from each filter each month be met. Further, sampling and testing for free chlorine residual is to be carried out by continuous monitoring equipment at or near a location where the intended contact time (CT) has been completed and CT provided shall be greater than or equal to the CT required to achieve required log removal of viruses.

Each of the three dual media sand anthracite filters present at the Deep River DWS is programmed to run to waste at turbidity levels equal to or greater than 0.3 NTU. Treated water free chlorine residual targets 2.0 mg/L; this level of chlorination ensures CT in excess of the required values.

A review of operational data and logbooks confirms that CT was provided at all times water was directed to users.

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.**

Treatment Process Monitoring

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

Chlorine is injected prior to filtered water entering the clearwells. The total volume of both clearwell cells is used to calculate CT and primary disinfection chlorine monitoring is performed as water leaves the clearwell.

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

Three (3) package Actiflo® units provide flocculation and clarification processes, prior to water being directed to three (3) dual media filters.

Each filter is equipped with a dedicated, continuously monitored effluent turbidity analyzer. As noted previously, the filters will run-to-waste at an alarm setpoint of 0.3 NTU.

Operators log the time that filters run above 0.3NTU; typically during the time required to bring a filter online after a backwash cycle.

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

Secondary disinfectant residual is monitored via grab sampling in the Deep River DWS distribution system.

Habitually chlorine residual is analyzed at four sites on one week day, in conjunction with microbiological sampling, and at three sites on another week day, a minimum of 48 hours later.

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

The primary treatment system (chemically assisted filtration and chlorination) is monitored and alarmed such that a) free chlorine levels of 1.15 mg/L or less at the point where primary disinfection is meant to have been achieved will result in a shutdown of the lowlift pumps and b) filter effluent turbidity of 0.3 NTU or greater results in a shutdown of filter operation. In both scenarios, the lockouts prevent the distribution of partially treated water to users.

- **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.**

Data is recorded instantaneously via SCADA and recorded in OCWA's WISKI database. WISKI records in two minute intervals, the data points represent the average value of instantaneous data collected over the two minutes.

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

OCWA maintains records of scheduled and completed monthly in-house calibrations of online treated and distribution chlorine, and turbidity analyzers. In-house calibrations of portable chlorine and turbidity analyzers are

Treatment Process Monitoring

also tracked via work order.

Operations Manuals

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

Updated/additional maintenance manuals have been received and SOPs prepared for the works constructed under the Schedule C related to the Chalk River Nuclear Laboratory pumping station and distribution extension.

- **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.**

MDWL #189-101, Schedule B: General Conditions, 16.0 Operations and Maintenance Manual, 16.2 states:

The operations and maintenance manual or manuals, shall include at a minimum:

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;

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.**

Security

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

The Deep River water treatment plant, booster pumping station, and elevated tower are all located within locked, fenced enclosures and all doors are equipped with contact alarms connected to the SCADA monitoring system.

Security

Certification and Training

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

Deep River DWS is currently defined as Water Treatment Class III and Water Distribution Class I.

The current overall responsible operator (ORO) holds Water Treatment III and Water Distribution II licences.

- **Operators in charge had been designated for all subsystems which comprised the drinking-water system.**
Operators meeting the required certification levels and assigned as OIC are designated daily and the assignment is clearly recorded in the logbook.
- **All operators possessed the required certification.**
- **Only certified operators made adjustments to the treatment equipment.**

Water Quality Monitoring

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

O. Reg. 170/03 10-2 states:

(1) The owner of a drinking water system and the operating authority for the system shall ensure that,

(a) if the system serves 100,000 people or less, at least eight distribution samples, plus one additional distribution sample for every 1,000 people served by the system, are taken every month, with at least one of the samples being taken in each week; and

(2) The owner of the drinking water system and the operating authority for the system shall ensure that each of the samples taken under subsection (1) is tested for, (a) *Escherichia coli*; and (b) total coliforms.

(3) The owner of the drinking water system and the operating authority for the system shall ensure that at least 25 per cent of the samples required to be taken under subsection (1) are tested for general bacteria population expressed as colony counts on a heterotrophic plate count.

Based on a self reported population of approximately 4,100 people, twelve (12) distribution samples are required to be collected each month from the Deep River distribution system.

Habitually, four samples are collected from distribution sampling locations each week. A minimum of sixteen samples were collected each month from the Deep River distribution system and analyzed as required during the inspection review period.

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

O. Reg. 170/03 10-3 states:

The owner of a drinking water system and the operating authority for the system shall ensure that a water sample is taken at least once every week and tested for, (a) *Escherichia coli*; (b) total coliforms; and (c) general bacteria population expressed as colony counts on a heterotrophic plate count.

Samples were collected and analyzed as required during the inspection review period.

Water Quality Monitoring

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

As required under O. Reg. 170/03 Schedule 13-2, sampling frequency for any parameter of Schedule 23, provided previous sample results have not exceeded one-half MAC, is one sample every 12 months for a surface water.

The most recent samples for analysis of Schedule 23 parameters were collected on January 9, 2018. The previous samples were collected on February 10, 2017. These dates meet the requirement of the regulation.

There have been no exceedances of the one-half MAC during the inspection review period.

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

As required under O. Reg. 170/03 Schedule 13-4, sampling frequency for any parameter of Schedule 24, provided previous sample results have not exceeded one-half MAC, is one sample every 12 months for a surface water system.

The most recent samples for analysis of Schedule 24 parameters were collected on January 9, 2018. The previous samples were collected on February 10, 2017. These dates meet the requirement of the regulation.

There have been no exceedances of the one-half MAC during the inspection review period.

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

As required under O. Reg. 170/03 Schedule 13-6.1 (1), samples must be collected quarterly from a point in the distribution system likely to have elevated potential for the formation of haloacetic acids (HAA).

Effective January 1, 2020, a standard for HAAs will be introduced. The standard will be 0.08 mg/L (80 ug/L) and will be expressed as a rolling annual average (RAA).

Samples were collected as required on January 9, April 3, July 3, and October 9, 2018.

As of the date of the site visit, the rolling annual average (RAA) concentration of HAAs in the Deep River DWS is 74.1 ug/L.

HAAs may form if humic acids are present in source/treated water. As HAAs tend to decline over time within a distribution system, it is recommended that an investigation into sampling locations be performed to determine a sampling point most representative of "a point in the distribution system likely to have elevated potential for the formation of haloacetic acids (HAA)."

This investigation could include, but is not limited to, collecting samples from a variety of locations within the system during the course of a calendar year to compare levels of HAAs found across the distribution system.

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

As required under O. Reg. 170/03 Schedule 13-6 (1), samples must be collected quarterly from a point in the distribution system likely to have elevated potential for the formation of trihalomethanes (THM).

Samples were collected as required on January 9, April 3, July 3, and October 2, 2018.

Water Quality Monitoring

As of the date of the site visit, the RAA concentration of THMs in the Deep River DWS is 90.7 ug/L.

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

As required under O. Reg. 170/03 Schedule 13-7, samples must be collected and analyzed for nitrate and nitrite quarterly.

Samples were collected as required on January 9, April 3, July 3, and October 2, 2018.

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

As required under O. Reg. 170/03 Schedule 13-8, sampling for analysis of sodium must take place every 60 months.

The Deep River DWS operating authority elects to collect samples for sodium annually. During the inspection review period, a sample was collected on January 9, 2018. The previous sample was collected on February 10, 2017.

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

Fluoride levels are continuously monitored prior to treated water entering the distribution system.

Additionally, operators perform daily grab samples for in-house analysis on weekdays (Monday-Friday).

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

MDWL #189-101 Schedule C: System Specific Conditions, 1.0 System Performance, 1.5 Residue Management, identifies that the annual average of suspended solids in the effluent discharged from a treatment subsystem shall not exceed an annual average concentration of 25 mg/L.

Further, 4.0 Additional Sampling, Testing and Monitoring, Environmental Discharge Parameters requires that manual composite samples (meaning at least three grab samples taken during a discharge event) be collected monthly for analysis of suspended solids from the effluent pipe discharging to the Ottawa River.

Samples are collected as required during the inspection review period.

The annual average of suspended solids discharged to the Ottawa River in 2018 was 2.1 mg/L.

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

Water Quality Assessment

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

Reporting & Corrective Actions

- **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.**

AWQI #138553, sodium (Na)=21 mg/L was reported on January 12, 2018.

Reporting & Corrective Actions

A resample was collected on January 16, 2018, returning results of Na= 20 mg/L. No other corrective actions were required by the Renfrew County and District Health Unit.

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

AWQI #138553 was verbally reported to the Spills Action Centre and the Renfrew County and District Health Unit on January 12, 2018.

- **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.**

Logbooks clearly demonstrate that certified operators responded as required to all alarm events.

NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED

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

Not Applicable

SUMMARY OF RECOMMENDATIONS AND BEST PRACTICE ISSUES

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

Not Applicable

SIGNATURES

Inspected By:

Christina Des Rochers

Signature: (Provincial Officer)

Reviewed & Approved By:

Charlie Primeau

Signature: (Supervisor)

Review & Approval Date: 12/02/2019

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

APPENDIX A
INSPECTION RATING RECORD

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



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

This document describes the risk rating methodology, which has been applied to the findings of the Ministry's MRDWS inspection

results since fiscal year 2008-09. The primary goals of this assessment are to encourage ongoing improvement of these systems and to establish a way to measure this progress.

MOE reviews the risk rating methodology every three years.

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

ontario.ca/drinkingwater

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

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

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

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

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

Determining Potential to Compromise the Delivery of Safe Water

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

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

$$\text{RISK} = \text{LIKELIHOOD} \times \text{CONSEQUENCE}$$

(of the consequence)

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

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

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

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

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

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

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

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

TABLE 3:

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

Risk = Likelihood × Consequence

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

Application of the Methodology to Inspection Results

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

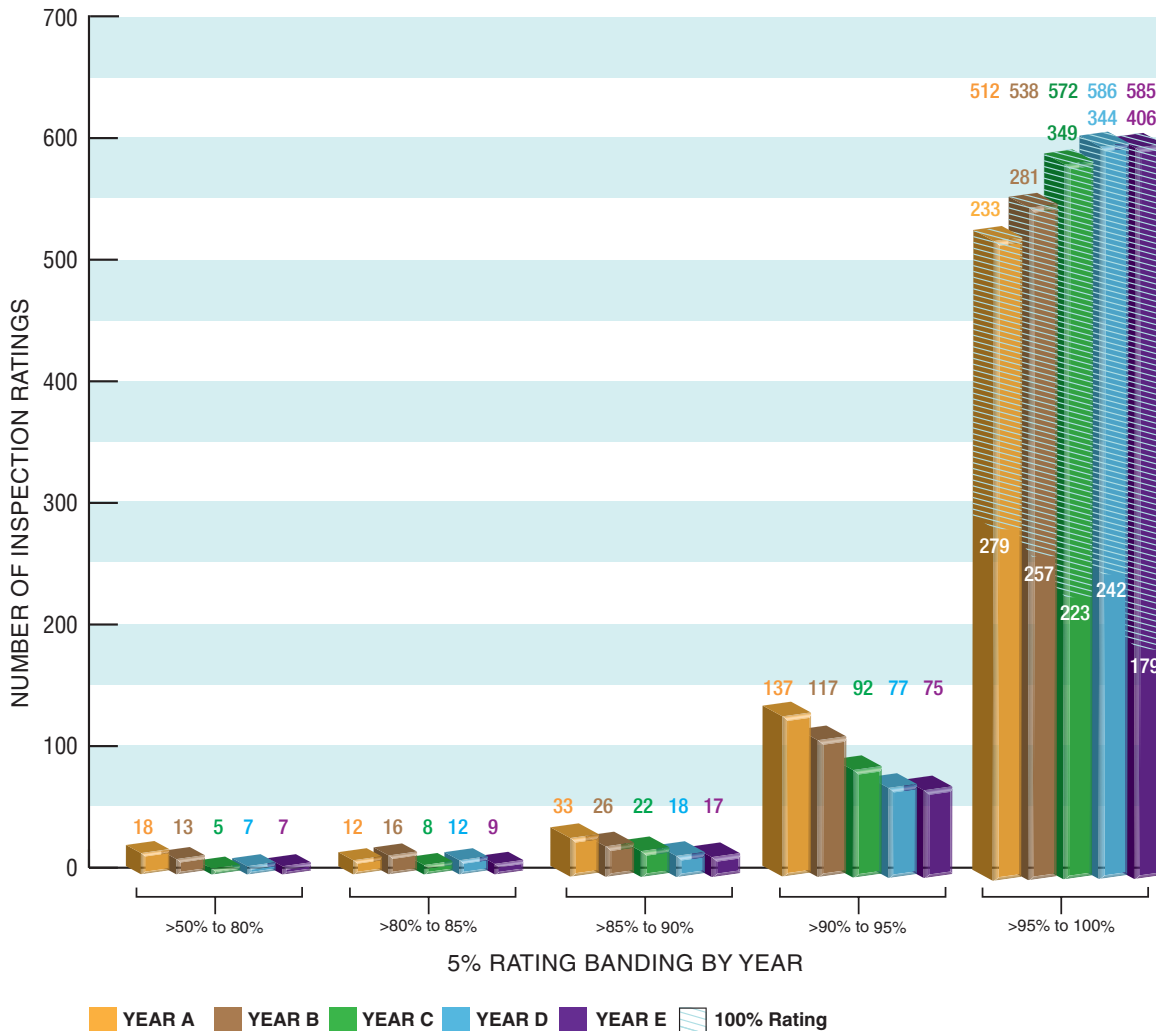
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

Application of the Methodology for Public Reporting

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

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

Figure 1: Year Over Year Distribution of MRDWS Ratings



Reporting Results to MRDWS Owners/Operators

A summary of inspection findings for each system is generated in the form of an Inspection Rating Record (IRR). The findings are grouped into the 15 possible modules of the inspection protocol,

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

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

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

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

DWS Name:	DEEP RIVER DRINKING WATER SYSTEM
DWS Number:	220000923
DWS Owner:	Deep River, The Corporation Of The
Municipal Location:	Deep River

Regulation: O.REG 170/03
Category: Large Municipal Residential System
Type Of Inspection: Focused
Inspection Date: January 16, 2019
Ministry Office: Ottawa District

Maximum Question Rating: 493

Inspection Module	Non-Compliance Rating
Capacity Assessment	0 / 30
Treatment Processes	0 / 56
Operations Manuals	0 / 28
Logbooks	0 / 14
Certification and Training	0 / 42
Water Quality Monitoring	0 / 124
Reporting & Corrective Actions	0 / 66
Treatment Process Monitoring	0 / 133
TOTAL	0 / 493

Inspection Risk Rating	0.00%
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FINAL INSPECTION RATING:	100.00%
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Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2018-2019)

DWS Name: DEEP RIVER DRINKING WATER SYSTEM
DWS Number: 220000923
DWS Owner: Deep River, The Corporation Of The
Municipal Location: Deep River

Regulation: O.REG 170/03
Category: Large Municipal Residential System
Type Of Inspection: Focused
Inspection Date: January 16, 2019
Ministry Office: Ottawa District

Maximum Question Rating: 493

Inspection Risk Rating | 0.00%

FINAL INSPECTION RATING: | 100.00%

APPENDIX B

STAKEHOLDER SUPPORT

[DRINKING WATER SYSTEM PROFILE INFORMATION FORM](#)
[\[CLICK FOR LINK TO FORM\]](#)

[NOTICES OF ADVERSE TEST RESULTS AND ISSUE](#)
[RESOLUTION FORM](#)
[\[CLICK FOR LINK TO FORM\]](#)

[NOTICE OF LEAD EXCEEDANCE TEST RESULT](#)
[\[CLICK FOR LINK TO FORM\]](#)

[LIST OF ACCREDITED LABORATORIES](#)
[\[CLICK FOR LINK TO INFORMATION\]](#)

[LABORATORY SERVICES NOTIFICATION FORM](#)
[\[CLICK FOR LINK TO FORM\]](#)

[BECOMING A CERTIFIED DRINKING WATER OPERATOR](#)
[\[CLICK FOR LINK TO GUIDANCE\]](#)

[BECOMING A LIMITED SYSTEM OPERATOR](#)
[\[CLICK FOR LINK TO GUIDANCE\]](#)

[ONTARIO REGULATION 170/03 \(DRINKING WATER SYSTEMS](#)
[REGULATION\)](#)
[\[CLICK FOR LINK TO LEGISLATION\]](#)

[TAKING CARE OF YOUR DRINKING WATER: A GUIDE FOR](#)
[MEMBERS OF MUNICIPAL COUNCILS](#)
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**Ministry of the Environment, Conservation and Parks
Drinking Water System Inspection Report**