

**Ministry of the Environment
and Climate Change**

Ottawa District Office
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**Ministère de l'Environnement et
de l'Action en matière de
changement climatique**

Bureau du district d'Ottawa
2430, promenade Don Reid, Unité 103
Ottawa (Ontario)
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January 22, 2018

Sent by Email: rmcgee@deepriver.ca

Town of Deep River
100 Deep River Road, P.O. Box 400
Deep River, Ontario
K0J 1P0

Attention: Mr. Ric McGee, Chief Administrative Officer/Clerk

Dear Mr. McGee:

Re: 2017-2018 Inspection Report

The enclosed report documents findings of the inspection that was performed at the Deep River drinking water system on January 4, 2018.

Two sections of the report, namely "Actions Required" and "Recommended Actions" cite due dates for the submission of information or plans to my attention.

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

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

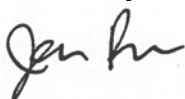
In order to measure individual inspection results, the ministry continues to adhere to an inspection compliance risk framework based on the principles of the Inspection, Investigation & Enforcement (II&E) Secretariat and advice of internal/external risk experts. The Inspection Rating Record (IRR), appended to the inspection report, provides the ministry, the system owner and the local Public Health Unit with a summarized quantitative measure of the drinking water system's annual inspection and

regulated water quality testing performance. Please note the IRR methodology document, also appended to the inspection report, describes how the risk model was improved to better reflect any health related and administrative non-compliance issues that may be cited in our inspection reports. IRR ratings are published in the ministry's Chief Drinking Water Inspector's Annual Report. If you have any questions or concerns regarding the rating, please contact Jim Mahoney, Water Compliance Supervisor, at 613-548-6902.

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 councilors, 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,



Jen Bitten, B.Sc.
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Ministry of the Environment & Climate Change
Safe Drinking Water Branch
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JB

Enclosure

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- Brenda Royce, Process & Compliance Technician, Ontario Clean Water Agency – Ottawa Valley Hub, 560 Abbie Lane, Petawawa, ON K8H 2X2, broyce@ocwa.com
 - Mike Grace, Manager, Environmental Health, Renfrew County and District Health Unit, 7 International Dr., Pembroke, ON K8A 6W5, mgrace@rcdhu.com
 - John Swick, District Manager, Ministry of Natural Resources, Pembroke District Office, 31 Riverside Dr., Pembroke, ON K8A 8R6, john.swick@ontario.ca
- c: File SI-RE-DE-RI 540 (2017)



Ministry of the Environment and Climate Change

**DEEP RIVER DRINKING WATER SYSTEM
Inspection Report**

Site Number:	220000923
Inspection Number:	1-FM9P8
Date of Inspection:	Jan 04, 2018
Inspected By:	Jen Bitten

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OWNER INFORMATION:

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

CONTACT INFORMATION

Type:	Owner	Name:	Ric McGee
Phone:	(613) 584-2000	Fax:	(613) 584-3237
Email:	rmcgee@deepriver.ca		
Title:	CAO/Clerk, Town of Deep River		
Type:	Owner	Name:	Sean Patterson
Phone:	(613) 584-2000	Fax:	(613) 584-3237
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:	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
MOECC 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:	Announced
Inspection Number:	1-FM9P8
Date of Inspection:	Jan 04, 2018
Date of Previous Inspection:	Dec 21, 2016

COMPONENTS DESCRIPTION

Site (Name):	MOE DWS Mapping
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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 Rolphonton, Stonecliffe, Deux Rivières, 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 - 5.3NTU), moderate to high colour (4 - 60TCU), and low alkalinity (9 - 34mg/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 750mm diameter intake extending approximately 91m into the Ottawa River terminating at a depth of approximately 9m below the surface.

The low lift pumping station consists of a 9.14m by 1.52m by 5.64m deep low lift pump well and above ground building, equipped with three (3) submersible pumps (2 duty, 1 standby), each rated at 83.1L/s at 25m 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, 300mm diameter;
- three (3) package flocculation and clarification (Actiflo®) units, each rated at raw water flow rate of 4,773m³/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 56.7m²;
- two (2) air scour blowers equipped with 18.6kW motor (one duty, one standby);
- two (2) backwash variable speed vertical turbine pumps (one duty, one standby) each rated at 236L/s at a TDH of

22m;

- piping and control to facilitate filter to waste;
- electrical and mechanical equipment and control;
- two (2) clear wells, one with a capacity of 1,364m³, and a second with a capacity of 1,507m³; and two (2) pump wells, one with a capacity of 90m³ and the other with a capacity of 110m³;
- four (4) vertical turbine high lift pumps (one duty, three standby), each rated at 87L/s at a TDH of 82m;
- a gaseous chlorine disinfection system consisting of one (1) bank of four (4) 68.2kg 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 one (1) 40,000L capacity liquid coagulant tank and two (2) chemical feed metering pumps (one duty, one standby) with a flow capacity of 80L/hr and chemical feed line prior to the Actiflo® units;
- pH/alkalinity adjustment consisting of one (1) 40,000L tank of liquid caustic soda and four (4) chemical feed metering pumps (two duty, two standby) each with a flow capacity of 60L/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 3100L dissolving tank with mixer; four (4) chemical feed metering pumps (three duty, one standby) each with a flow capacity of 90L/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 3100L dissolving tank with mixer; three (3) chemical feed metering pumps (two duty, one standby) each with a flow capacity of 45L/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 two (2) dry polymer preparation systems each consisting of 800L dissolving tank with mixer; two (2) chemical feed metering pumps (one duty, one standby) each with a flow capacity of 90L/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 210L storage tank and two (2) chemical feed metering pumps (one duty, one standby) each with a flow capacity of 4L/hr and chemical feed line to the distribution header.

Process instrumentation for the WTP consists of seven (7) turbidimeters continuously monitoring the raw water, Actiflo® units (clarified water), filter effluent, treated water and the wastewater clarifier supernatant; six (6) pH meters 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 600kW 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 1,513m³ elevated water storage tank (30.5m) 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 4216 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 3570m of 300mm 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 102mm (4 inches) to 406mm (16 inches). There is approximately 75km of water mains within the distribution system and approximately 236 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 113m³, 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 26L/s at 69.7m TDH
 - two (2) chemical feed pumps and 338L storage tank for the re-chlorination system
 - 113kW 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 and Climate Change (MOECC) 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.

Deep River Drinking Water System is owned by the Town of Deep River and operated by the Ontario Clean Water Agency (OCWA).

An inspection of the Deep River Drinking Water System occurred on January 4, 2018. It was attended by Ministry of the Environment and Climate Change (MOECC) Water Inspector Jen Bitten and OCWA Laurentian View Cluster staff.

The inspection period referenced throughout this report includes December 21, 2016 - January 4, 2018.

Deep River DWS Licenses & Permits:

Municipal Drinking Water License (MDWL) #189-101 [Issue #3], expires January 12, 2021

Drinking Water Works Permit (DWWP) #189-201 [Issue #2]

Permit to Take Water (PTTW) #8528-9ECQJP, expires on December 31, 2023

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.
- 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.

Municipal Drinking Water Licence #189-101 specifies a rated capacity for the treatment system of 13638m³/day. A review of treated flows over the inspection period indicates a maximum treated flow of 3532m³/day with an average flow just over 2100m³/day (approximately 15% of the rated 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.**

Since the last inspection, most of the equipment listed in Schedule C has been put into service and a Director Notification Form is required for those upgrades.

The equipment listed in Schedule A of the DWWP is installed and operational as required. Some equipment and instrumentation has been removed or is no longer operational. Some of the the equipment descriptions in Schedule C for the upgrades requires clarification. There are enough changes that an amendment application should be submitted as soon as possible to clarify exactly what is in the plant.

Schedule C, Issue #1, Authorization to Alter the Drinking Water System has been added to the DWWP for the extension to supply drinking water to Chalk River Nuclear Laboratories. A Director Notification Form is required within thirty (30) days of placing the equipment into service. The booster station will require a Director Notification Form to be submitted once placed into service.

- **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.**

A tour of the plant facilities was provided by the operators. The operators record a significant amount of data and readings throughout the process for the Deep River WTP on the Daily Rounds Sheets and Operational Summary sheets. These readings are manually entered into and managed by a data management program. Online treated water chlorine analyzer readings and treated water fluoride readings are automatically entered with in-house readings and other data entered manually by operators. A review of operational data provided indicates that the plant is operated within the requirements.

- **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 residuals are measured at the end of the clearwells in order to monitor primary disinfection at the plant. Online analyzers also monitor chlorine residuals entering the clearwell and leaving plant, just prior to distribution.

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

There are three (3) package Actiflo® units providing flocculation and clarification processes, which is then directed to three (3) dual media filters. Each filter is equipped with a dedicated turbidity analyzer, continuously measuring filter effluent turbidity. The filters will filter-to-waste at the alarm setpoint 0.3NTU with operators recording the time that they run above 0.3NTU, usually during the time to bring a filter online.

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

Operators follow an in-house laboratory schedule to complete the distribution chlorine residuals. Operators take at least one (1) chlorine residual within the distribution system on a daily basis (weekdays) with four (4) taken on one day and three (3) taken on another, separated by at least forty-eight (48) hours.

- **Operators were examining continuous monitoring test results and they were examining the results within**

Treatment Process Monitoring

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 chlorine analyzer alarm at 1.15mg/L for low and 2.85mg/L for high which will lockout the lowlift pumps. The three (3) turbidity analyzers alarm at 0.3NTU and will filter to waste.
- **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.**
- **All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.**
Operators check and calibrate all analyzers as required.

Operations Manuals

- **The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.**
The Operations Manuals will likely need to be revised to include procedures for the new equipment and service to the Chalk River Nuclear Laboratories. Schedule B, Condition 16.3 of the MDWL specifies that procedures necessary for the operation and maintenance of any alterations to the drinking water system shall be incorporated into the operations and maintenance manual or manuals prior to those alterations coming into operation.
- **The operations and maintenance manuals met the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA.**

Logbooks

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

Security

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

Certification and Training

- **The overall responsible operator had been designated for each subsystem.**
Deep River WTP is a Class III Water Treatment plant and the distribution system is classified as a Class I Water Distribution system. An appropriately certified operator is designated as the Overall Responsible Operator (ORO) which is noted in the logbook each day.
- **Operators in charge had been designated for all subsystems which comprised the drinking-water system.**
Operators In Charge (OIC) are also noted in the logbook each day. All operators designated OIC are appropriately certified. When the OIC is not on-site, any Operators In Training (OITs) must include the name of the designated OIC in the logbook.

Certification and Training

- 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.

The number of distribution samples required each month is determined by the population of the system under Schedule 10-2 - a minimum of eight (8) distribution samples per month with an additional sample for every 1000 people served by the system with at least one (1) sample taken per week.

Deep River DWS serves a population of approximately 4100 people (according to the 2016 Census data), requiring twelve (12) distribution samples each month, testing for E.coli, total coliform and 25% of samples tested for Heterotrophic Plate Count (HPC).

A review of results provided show that all samples were taken and analyzed as required.

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

Treated water samples are required on a weekly basis under Schedule 10-3, testing for E.coli, total coliform and HPC.

A review of results provided show that all samples were taken and analyzed as required.

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

Inorganic (Schedule 23) parameters are required every twelve (12) months for a surface water source under Schedule 13-2. These were completed on February 10, 2017, previous samples were completed in January 2016.

All results were well within the Ontario Drinking Water Quality Standards (ODWQS).

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

Organic (Schedule 24) parameters are required every twelve (12) months for a surface water source under Schedule 13-3. These were completed on February 10, 2017, previous samples were completed in January 2016.

All results were well within the Ontario Drinking Water Quality Standards (ODWQS).

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

Haloacetic acids (HAAs) sampling is required every three (3) months under Schedule 13-6.1 from a point that is likely to have elevated HAA levels. The ODWQS for HAAs will be 80µg/L beginning on January 1, 2020 and will be based on the running annual average (RAA) of the last four (4) results, same calculation as for THMs.

Samples for HAAs were taken in 2017 as required, with a current RAA of 73.7µg/L.

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

THM sampling is required every three (3) months from a point in the distribution system that is likely to have

Water Quality Monitoring

elevated THM levels (ie. the farthest point) under Schedule 13-6. The ODWQS for THMs is 100µg/L, based on the running annual average (RAA) of the last four (4) sample results.

Samples for THMs were taken as required, with a current RAA of 87.5µg/L.

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

Nitrate/nitrite sampling is required every three (3) months from the treated water location under Schedule 13-7. These samples have been taken and analyzed as required.

Nitrate results ranged from 0.18mg/L - 0.27mg/L, well within the ODWQS of 10.0mg/L.

Nitrite results were consistently less than 0.10mg/L, also well within the ODWQS of 1.0mg/L.

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

Sodium sampling is required every 60 months. It was last sampled for on February 10, 2017 and indicated a result of 12.0mg/L. Notification to the local Medical Officer of Health is required for results >20mg/L and the aesthetic objective for sodium is 200mg/L.

Sodium sampling is required again in 2022.

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

Fluoride is continuously monitored prior to the distribution system.

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

Municipal Drinking Water License #189-101, states a Residue Management requirement for a Total Suspended Solids (TSS) annual average of 25mg/L, sampling on a monthly basis and discharging directly to the Ottawa River. The system has no issues meeting this limit and the 2017 annual average was 3mg/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

- **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.**

Operators record call-ins in the logbook as well as a written call-in report. Records indicate the time the alarm was received, the time of arrival at the plant, actions taken to resolve the issue and time completed.

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:

Jen Bitten

Signature: (Provincial Officer)

Reviewed & Approved By:

James Mahoney

Signature: (Supervisor)

Review & Approval Date: 22/01/2018

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

STAKEHOLDER SUPPORT

Key Reference and Guidance Material for Municipal Residential Drinking Water Systems

Many useful materials are available to help you operate your drinking water system. Below is a list of key materials owners and operators of municipal residential drinking water systems frequently use.

To access these materials online click on their titles in the table below or use your web browser to search for their titles. Contact the Public Information Centre if you need assistance or have questions at 1-800-565-4923/416-325-4000 or picemail.moe@ontario.ca.

For more information on Ontario's drinking water visit www.ontario.ca/drinkingwater and email drinking.water@ontario.ca to subscribe to drinking water news.



PUBLICATION TITLE	PUBLICATION NUMBER
Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils	7889e01
FORMS: Drinking Water System Profile Information, Laboratory Services Notification, Adverse Test Result Notification Form	7419e, 5387e, 4444e
Procedure for Disinfection of Drinking Water in Ontario	4448e01
Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids	7152e
Total Trihalomethane (TTHM) Reporting Requirements Technical Bulletin (February 2011)	8215e
Filtration Processes Technical Bulletin	7467
Ultraviolet Disinfection Technical Bulletin	7685
Guide for Applying for Drinking Water Works Permit Amendments, Licence Amendments, Licence Renewals and New System Applications	7014e01
Certification Guide for Operators and Water Quality Analysts	
Guide to Drinking Water Operator Training Requirements	9802e
Taking Samples for the Community Lead Testing Program	6560e01
Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption	7423e
Guide: Requesting Regulatory Relief from Lead Sampling Requirements	6610
Drinking Water System Contact List	7128e
Technical Support Document for Ontario Drinking Water Quality Standards	4449e01

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APPENDIX B

INSPECTION RATING RECORD

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2017-2018)

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 4, 2018
Ministry Office: Ottawa District

Maximum Question Rating: 448

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 / 21
Treatment Process Monitoring	0 / 133
TOTAL	0 / 448

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 - 2017-2018)

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 4, 2018

Ministry Office: Ottawa District

Maximum Question Rating: 448

Inspection Risk Rating	0.00%
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FINAL INSPECTION RATING:	100.00%
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APPENDIX C

INSPECTION RATING RECORD METHODOLOGY

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



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

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

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

MOE reviews the risk rating methodology every three years.

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

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

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

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

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

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

Determining Potential to Compromise the Delivery of Safe Water

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

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

RISK = LIKELIHOOD × CONSEQUENCE
(of the consequence)

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

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

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

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

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

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

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

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

TABLE 3:							
Does the Operator in Charge ensure that the equipment and processes are monitored, inspected and evaluated?							
Risk = Likelihood × Consequence							
C=1	C=2	C=3	C=4	C=5	C=6	C=7	C=8
Medium Administrative Consequence	Major Administrative Consequence	Minor Environmental Consequence	Minor Health Consequence	Medium Environmental Consequence	Major Environmental Consequence	Medium Health Consequence	Major Health Consequence
L=4 (Almost Certain)	L=1 (Unlikely)	L=2 (Possible)	L=3 (Likely)	L=3 (Likely)	L=1 (Unlikely)	L=3 (Likely)	L=2 (Possible)
R=4	R=2	R=6	R=12	R=15	R=6	R=21	R=16

Application of the Methodology to Inspection Results

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

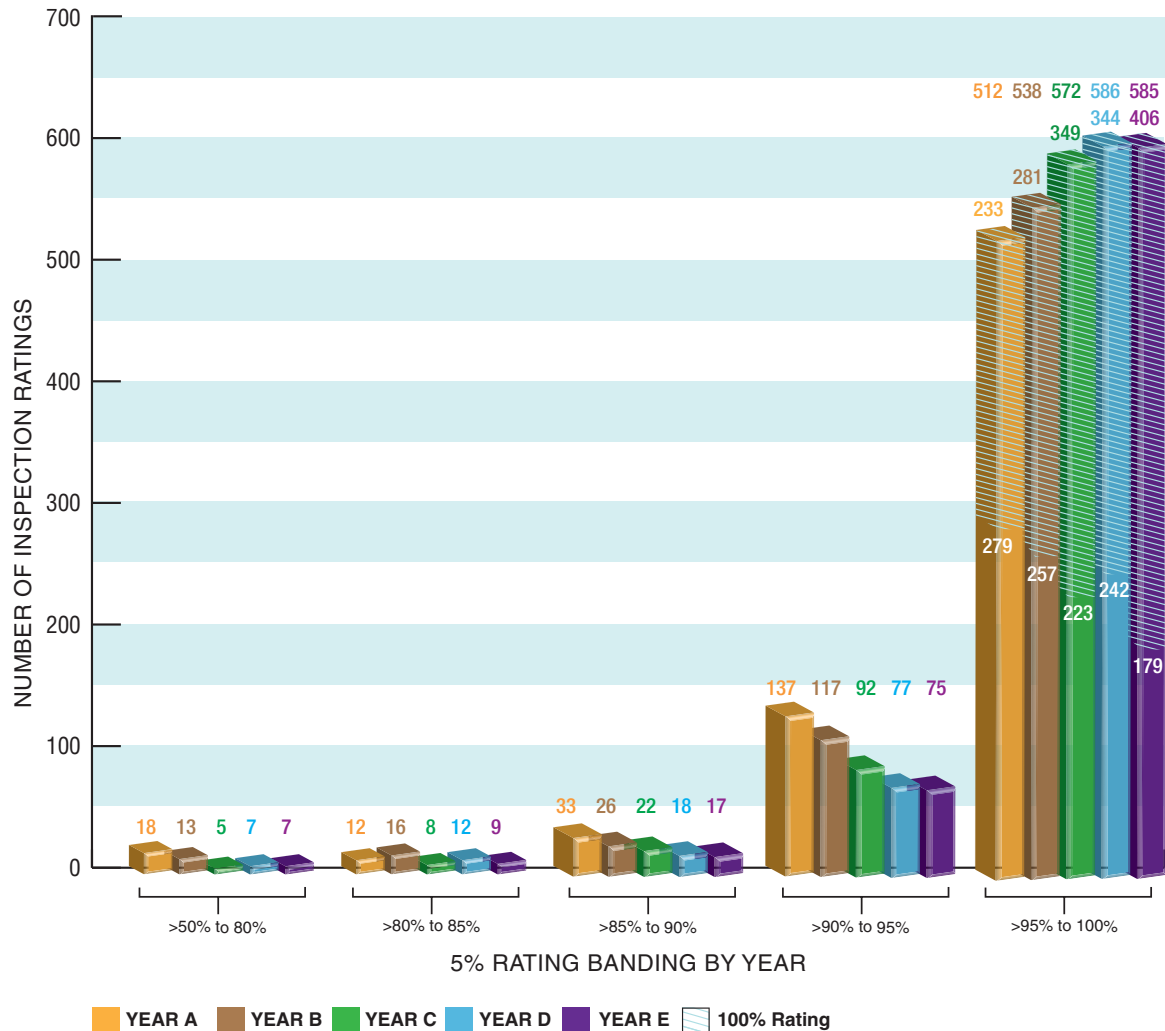
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

Application of the Methodology for Public Reporting

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

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

Figure 1: Year Over Year Distribution of MRDWS Ratings



Reporting Results to MRDWS Owners/Operators

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

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

- | | | | |
|-------------------------|---------------------------------|--|--|
| 1. Source | 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