

Ministry of the Environment,
Conservation and Parks

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

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January 4, 2022

by email: clerk@southriverontario.com

Mr. Don McArthur
Clerk-Administrator
The Corporation of the Village of South River
63 Marie Street
South River, Ontario
P0A 1X0

**RE: South River Drinking Water System No. 220013562
2021-22 Annual Drinking Water System Inspection Report**

On October 26, 2021 I conducted the annual inspection of the South River Drinking Water System. The inspection included a physical inspection of the South River Water Treatment Plant, an interview with Mr. Darren Aljoe, Overall Responsible Operator, Ontario Clean Water Agency and a document review for the period of December 9, 2020 to October 25, 2021. The resulting inspection report is attached.

There is one (1) issue of non-compliance with regulatory requirements identified during the inspection and addressed in the section "*Non-Compliance /Non-Conformance Items*" of the inspection report. The action required to address this issue of non-compliance and the deadline for the action are specified in the field "*Observation/Corrective Action(s)*" of each question. This section of the inspection report is found on pages 2 to 3.

Attached in Appendix A is a document entitled "DWS Components Information" and in Appendix B is a document titled "Key Reference and Guidance Material for Municipal Residential Drinking Water Systems".

Section 19 of the Safe Drinking Water Act, 2002 (Standard of Care) creates a number of obligations for individuals who exercise decision-making authority over municipal drinking water systems. Please be aware that the Ministry has encouraged such individuals, particularly municipal councilors, to take steps to be better 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 review of its findings. Further information about Section 19 can be found in "Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils" found at <https://www.ontario.ca/page/drinking-water>.

To measure the individual inspection results, the Ministry has established an inspection compliance risk framework based on the principles of the Inspection, Investigation and Enforcement Secretariat and the advice of internal and external risk experts.

Please note that due to a change in IT systems, the Inspection Rating Report (IRR) cannot be generated at the same time as the inspection report. The IRR will be sent separately and prior to any public release (typically within 1-2 month of the completion of the inspection)".

IRR ratings are published (for the previous inspection year) in the Ministry's Chief Drinking Water Inspector's Annual Report. If you have any questions or concerns regarding the rating, please contact Sherry Ilersich, Water Compliance Supervisor at (705) 845-1544.

Electronic copies of this inspection report have been sent to the North Bay Parry Sound Health Unit and the North Bay-Mattawa Conservation Authority in accordance with the Ministry's Municipal Drinking Water Inspection Protocol.

Thank you for your co-operation. If you have any questions about this inspection report, please contact me at (705) 491-2781 or by email at vesna.alimpic@ontario.ca.

Sincerely,



Vesna Alimpic
Water Inspector/Provincial Officer
Drinking Water and Environmental Compliance Division
Ministry of the Environment, Conservation and Parks
North Bay Office

c: Paul Dyrda, Senior Operations Manager, Near North Cluster, Ontario Clean Water Agency (OCWA)
Yvan Rondeau, Safety, Process and Compliance Manager, North Eastern Ontario Hub, OCWA
Joshua Gravelle, Process and Compliance Technician, North Eastern Ontario Hub, OCWA
Darren Aljoe, Operator with Overall Responsibility, North Eastern Ontario Hub, OCWA
Robert A-Muhong, Manager, Environmental Health Programs, North Bay Parry Sound District Health Unit
David Ellingwood, Supervisor, Source Water Protection, North Bay-Mattawa Conservation Authority
Sherry Ilersich, Water Compliance Supervisor, Timmins/North Bay, Northern Region, Drinking Water and Environmental Compliance Division, Ministry of the Environment, Conservation and Parks



SOUTH RIVER DRINKING WATER SYSTEM
28 HOWARD ST, SOUTH RIVER, ON, P0A 1X0

Inspection Report

System Number: 220013562
Inspection Start Date: 10/26/2021
Inspection End Date: 01/04/2022
Inspected By: Vesna Alimpic
Badge #: 1882

A handwritten signature in black ink that reads "VAlimpic".

(signature)

NON-COMPLIANCE/NON-CONFORMANCE ITEMS

The following item(s) have been identified as non-compliance/non-conformance, based on a "No" response captured for a legislative or best management practice (BMP) question (s), respectively.

Question Group: Other Inspection Findings

Question ID	MRDW1115000	
Question	Question Type	Legislative Requirement
In the event that an issue of non-compliance outside the scope of this inspection protocol is identified, a "No" response may be used if further actions are deemed necessary (and approved by the DW Supervisor) to facilitate compliance.	Legislative	Not Applicable
Observation/Corrective Action(s)		
<p>The following instance(s) of non-compliance were also noted during the inspection:</p> <p>Waste streams from the facility are treated in the facility's wastewater system. The sludge from the clarifier blowdown is directed to the wastewater surge tank. The supernatant from the wastewater surge tank is directed to the clarification tank; the settled solids are directed to the sludge holding tank. The filter backwash water is discharged to the clarification tank. The supernatant from the clarification tank is decanted and discharged to a storm sewer which discharges to the lake. The sludge that is built up in the clarification cell is pumped to the sludge holding tank. The tanks are equipped with level monitors triggering the pumping of supernatant to a storm sewer that discharges to a lake. The sludge from the sludge thickening tank is pumped to the sludge bagging system that dries out the sludge with addition of polymer and is disposed of at the local landfill 3-5 times/week.</p> <p>In period 2011 to 2021, there have been fourteen (14) reported events of spills or overflows from this facility's wastewater treatment system. Volumes of spilled supernate in this period ranged from 0.05 to 280 m³.</p> <p>In period 2011 to 2019, these events were spills of supernate and filter backwash caused by unadjusted system or faulty equipment.</p> <p>In period April 2019 to November 2021, there were five reported incidents of overflows or spills from South River WTP wastewater treatment facility:</p> <ul style="list-style-type: none"> - April 2, 2019 (date when the event was reported to MECP) - supernate and sludge discharging from a storm water grate on obstructed discharge pipe to Forest Lake. There was a layer of sludge surrounding the grate which indicates of possible backwash spills. Estimated volume of spilled sludge was 2 to 3 m³. Corrective action was to replace the storm sewer pipe and site clean up. - September 16, 2019 - spill of supernatant while backwashing due to operator error. Estimated volume of supernatant was 15 m³. Corrective action was to close valves and clean up the spill. - September 19, 2019 - overflow of supernate due to faulty level sensor. Estimated overflow volume was 7.2 m³. Corrective action taken was to adjust supernatant pump setpoints in SCADA and clean transducer. - December 27, 2020 - multiple backwashes of filters overwhelming the waste tank and SCADA did 		

not signal the overflow. Approximate volume spilled 10 m³. Corrective action taken was to adjust SCADA setpoints and clean up the site.

- May 5, 2021 - Overflow of supernate and sludge during maintenance of the system. Corrective action was to clean up the site.

The operating agency indicated that the following actions were also taken to address the issues of overflows and spills from the facility's wastewater system:

- polymer has been changed twice over the years - currently used is LT27AG,
- sludge is removed from the sludge tank once a year and
- internal alarm has been added to SCADA to warn of overflows.

Condition 10.1 to MDWL states that "Nothing in this licence or the drinking water works permit shall be read as to permit the discharge of a contaminant into the natural environment that causes or is likely to cause an adverse effect."

Condition 31(1) to Safe Drinking Water Act specifies that no person shall use or operate a municipal drinking-water system that was established before or after this section comes into force except under the authority of and in accordance with an approval under this Part or municipal drinking-water licence.

Required action:

By no later than February 4, 2022 the owner and the operating authority are required to provide Vesna Alimpic, Water Inspector and Provincial Officer, Ministry of Environment, Conservation and Parks with an Action Plan specifying the planned actions and timelines to prevent, with the objective to eliminate, future spills and overflows from South River WTP wastewater system to the environment.

The action plan is to be provided by email to vesna.alimpic@ontario.ca or by mail to 191 Booth Road, Unit 16 & 17, North Bay, ON, P1A 4K3.

INSPECTION DETAILS

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

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

Question ID	MRDW1001000	
Question	Question Type	Legislative Requirement
What was the scope of this inspection?	Information	Not Applicable
Observation		
<p>The primary focus of this inspection is to confirm compliance with Ministry of the Environment, Conservation and Parks (MECP) legislation as well as evaluating conformance with ministry drinking water policies and guidelines during the inspection period. The ministry utilizes a comprehensive, multi-barrier approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as management practices.</p> <p>This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O.Reg. 170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.</p> <p>This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.</p> <p>On October 26, 2021 Ministry of the Environment, Conservation and Parks Water Inspector and Provincial Officer Vesna Alimpic conducted an inspection of the South River Drinking Water System (DWS) with assistance from Darren Aljoe, Ontario Clean Water Agency (OCWA), Overall Responsible Operator for the DWS.</p> <p>The Corporation of the Village of South River is the owner of the system. The operating authority for the South River DWS is OCWA.</p> <p>The inspection included a tour and physical review of the components of the drinking water system and a review of the system documents for the period from the last inspection completed on December 9, 2020 to the date of the current inspection. This period is referred to as the "inspection period" in this report. Specifically, this included a review and assessment of operating practices in relation to the following documents:</p> <ul style="list-style-type: none"> - Drinking Water Systems Regulation O. Reg. 170/03 - Certification of Drinking Water Systems Operators Regulation O. Reg. 128/04 - Permit to Take Water (PTTW) No. 4340-BA6RUQ, issued March 19, 2019 - Municipal Drinking Water Licence (MDWL) No. 200-101, Issue No. 4 dated January 15, 2021 - Drinking Water Works Permit (DWWP) No. 200-201, Issue No. 4 dated January 15, 2021 and - Previous ministry inspection report dated December 9, 2020. 		

Question ID	MRDW1000000		
Question	Question Type	Legislative Requirement	
Does this drinking water system provide primary disinfection?	Information	Not Applicable	
Observation			
This Drinking Water System provides for both primary and secondary disinfection and distribution of water.			

Question ID	MRDW1012000		
Question	Question Type	Legislative Requirement	
Does the owner have a harmful algal bloom monitoring plan in place that meets the requirements of the MDWL?	Legislative	SDWA 31 (1)	
Observation			
<p>The owner had a harmful algal bloom monitoring plan in place.</p> <p>Condition 6 to MDWL requires the owner to develop and keep up to date a Harmful Algal Bloom (HAB) monitoring, reporting and sampling plan, to be implemented when a potential harmful algal bloom is suspected or present. Conditions 6.1 to 6.4 specify the requirements for the content of the plan, implementation, training, definition of a HAB and sampling.</p> <p>Based on the review of HAB reports in ministry's files, it appears that Forest Lake, the source water for South River DWS does not have a history of confirmed HAB.</p> <p>A review of the HAB plan for South River WTP resulted in the following observations:</p> <ul style="list-style-type: none"> - A copy of the plan is kept in the facility's SOP binder, - The plan is implemented from June 1 to October 31 each year, - All relevant DWS staff were trained on the Plan prior to the beginning of 2021 warm season, - There is proactive weekly sampling for microcystins of raw and treated water. - There are provisions in the Plan for reporting and notifying when a HAB is suspected or occurring, sampling of raw and treated water, actions based on raw water microcystin results and treated water microcystin-LR results, treatment considerations and maintenance and training on the SOP. There was a typo in the number of consecutive samples required to consider an incident of suspected/observed HAB resolved; it was corrected during the preparation of this inspection report. <p>Samples of raw water collected from June 1 to October 31, 2021 did not have detectable concentrations of microcystin.</p> <p>Note: On December 3, 2021, the operating authority requested further guidance from the ministry's Environmental Permissions Branch regarding the requirement for visual observations. As shared with the operating authority on December 15, 2021, Environmental Permissions Branch and Water Program Services Unit confirmed that for areas with no history of persistent blooms, the requirements are to have visual monitoring and a plan for weekly sampling if there is a</p>			

suspected/observed bloom. The owner and the operating authority are instructed to follow the provided guidance and amend the HAB SOP for South River with visual observations.

Question ID	MRDW1014000	
Question	Question Type	Legislative Requirement
Is there sufficient monitoring of flow as required by the MDWL or DWWP issued under Part V of the SDWA?	Legislative	SDWA 31 (1)
Observation		
<p>There was sufficient monitoring of flow as required by the Municipal Drinking Water Licence or Drinking Water Works Permit issued under Part V of the SDWA.</p> <p>Condition 2.1 to the MDWL specifies that for South River Drinking Water System and in addition to any other flow measurement and recording that may be required, continuous flow measurement and recording shall be undertaken for:</p> <p>2.1.1 The flow rate (L/s) and daily volume (m³/day) of treated water that flows from the treatment subsystem to the distribution system and</p> <p>2.1.2 The flow rate (L/s) and daily volume (m³/day) of water that flows into the treatment subsystem.</p> <p>As required by the MDWL, there were a raw water flow meter and a treated water flow meter installed and in operation during the inspection. The flow measuring equipment was in service at all times during the inspection period.</p>		

Question ID	MRDW1016000	
Question	Question Type	Legislative Requirement
Is the owner in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the MDWL issued under Part V of the SDWA?	Legislative	SDWA 31 (1)
Observation		
<p>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. The MDWL prescribes that for South River Drinking Water System, the maximum daily volume of treated water that flows from the treatment system to the distribution system shall not exceed 1680 m³/day.</p> <p>A review of treated water flows confirmed that the maximum flow rate was not exceeded during the inspection period.</p> <p>The maximum daily flow into the distribution system during the inspection period was 845.8 m³ on October 4, 2021 which is 50.3% of the rated capacity.</p>		

Question ID	MRDW1030000	
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Question	Question Type	Legislative Requirement
Is primary disinfection chlorine monitoring being conducted at a location approved by MDWL and/or DWWP issued under Part V of the SDWA, or at/near a location where the intended CT has just been achieved?	Legislative	SDWA O. Reg. 170/03 7-2 (1), SDWA O. Reg. 170/03 7-2 (2)
Observation		
<p>Primary disinfection chlorine monitoring was conducted at a location approved by Municipal Drinking Water Licence and/or Drinking Water Works Permit issued under Part V of the SDWA, or at/near a location where the intended CT has just been achieved.</p> <p>The DWWP lists two on-line chlorine residual analyzers, one for the purpose of monitoring primary disinfection at the point of entry and one for preliminary Clearwell 1 monitoring.</p> <p>The POE chlorine analyzer is located at the high lift header, prior to the entry of treated water into the distribution system and is used to confirm that the intended CT has been achieved.</p>		

Question ID	MRDW1032000	
Question	Question Type	Legislative Requirement
If the drinking water system obtains water from a surface water source and provides filtration, is continuous monitoring of each filter effluent line being performed for turbidity?	Legislative	SDWA O. Reg. 170/03 7-3 (2)
Observation		
<p>Continuous monitoring of each filter effluent line was being performed for turbidity.</p> <p>There are two SCADA trended, monitored and alarmed turbidity analysers installed, one on each of the two filter effluent lines. These analysers draw water from locations prior to the clearwell inlets. These analysers operate at all a times, including during filter backwashes.</p>		

Question ID	MRDW1033000	
Question	Question Type	Legislative Requirement
Is the secondary disinfectant residual measured as required for the large municipal residential distribution system?	Legislative	SDWA O. Reg. 170/03 7-2 (3), SDWA O. Reg. 170/03 7-2 (4)
Observation		
<p>The secondary disinfectant residual was measured as required for the distribution system.</p> <p>Subsection 7-2(3) of Schedule 7 of O. Reg. 170/03 requires that the owner of a large municipal residential system that provides secondary disinfection and the operating authority for the system must ensure that at least seven distribution samples are taken each week and are tested immediately for free chlorine residual. Unless at least one sample is taken on each day of the</p>		

week, at least four of the samples must be taken on one day of the week, at least 48 hours after the last sample was taken in the previous week. At least three of the samples must be taken on a second day of the week, at least 48 hours after the last sample was taken. When more than one sample is taken on the same day of the week under paragraph 1 or 2, each sample must be taken from a different location.

According to the data provided, secondary disinfectant was measured as required during the inspection period.

Question ID	MRDW1037000	
Question	Question Type	Legislative Requirement
Are all continuous monitoring equipment utilized for sampling and testing required by O. Reg.170/03, or MDWL or DWWP or order, equipped with alarms or shut-off mechanisms that satisfy the standards described in Schedule 6?	Legislative	SDWA O. Reg. 170/03 6-5 (1) 1-4,SDWA O. Reg. 170/03 6-5 (1)5-10,SDWA O. Reg. 170/03 6-5 (1.1)
Observation		
<p>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.</p> <p>Section 6-5 of Schedule 6 of O. Reg. 170/03 requires that the continuous monitoring equipment causes an alarm to sound when a test result for a parameter is above the maximum alarm standard or below the minimum alarm standard specified in the regulation. The maximum alarm standard for turbidity is 1.0 Nephelometric Turbidity Units (NTU). The minimum alarm standard for free chlorine residual required to achieve primary disinfection is 0.1 mg/L less than the concentration of free chlorine residual that is required to achieve primary disinfection.</p> <p>Section 6-5(1)5 of Schedule 6 of O. Reg. 170/03 requires that where an automatic shut-off mechanism is not used on a continuous monitoring equipment, in addition to alarming when the test result for a parameter is outside the range prescribed in the table to Schedule 6-5, the continuous monitoring equipment must cause an alarm to signal if the analyzer loses power or malfunctions so that an operator can be immediately alerted and take appropriate action.</p> <p>The high turbidity alarm for each filter effluent line is normally set at 0.45 NTU, but may range from 0.4 NTU to 0.6 NTU. If turbidity crosses the set point, the alarm signals on the monitor displaying Sensory Control and Data Acquisition (SCADA) and also alarms a security company contracted by the operating authority which immediately informs the on-call operator of the alarm. There is an automatic shut off mechanism for filter package plants for filter effluent turbidity which activates at 1 NTU.</p> <p>According to the CT calculation spreadsheet provided by the operating authority, under the worst-case conditions of temperature at 0.5 degrees, water pH at 8.5, flow rate at 85 L/s and clearwell levels at 2.5 m, a free chlorine residual of 1 mg/L is sufficient to achieve CT disinfection. The</p>		

minimum alarm standard under worst-case conditions would therefore be 0.9 mg/L. The low free chlorine residual alarm for primary disinfection is normally set at 1.75 mg/L and may range from 1.5 mg/L to 2.0 mg/L.

There are no programmed high lift pump (HLP) shut-offs for low free chlorine residual readings. The distribution system is pressurized by the HLPs and a loss of pressure could prove to be catastrophic for system integrity. The WTP has uninterruptable power supplies (UPSs) to support the analysers during power losses. Additionally, SCADA registers analyser power loss or malfunctions for all three instruments and will activate a call-out alarm for any of the three affected by this issue and will disable the affected package plant(s) for the affected turbidity analyser(s).

Question ID	MRDW1038000		
Question	Question Type	Legislative Requirement	
Is continuous monitoring equipment that is being utilized to fulfill O. Reg. 170/03 requirements performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format?	Legislative	SDWA O. Reg. 170/03 6-5 (1) 1-4	
Observation			
Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format.			

Question ID	MRDW1035000		
Question	Question Type	Legislative Requirement	
Are operators examining continuous monitoring test results and are they examining the results within 72 hours of the test?	Legislative	SDWA O. Reg. 170/03 6-5 (1) 1-4,SDWA O. Reg. 170/03 6-5 (1)5-10	
Observation			
Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test.			

Question ID	MRDW1040000		
Question	Question Type	Legislative Requirement	
Are all continuous analysers calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation?	Legislative	SDWA O. Reg. 170/03 6-5 (1) 1-4,SDWA O. Reg. 170/03 6-5	

		(1)5-10
Observation		
<p>All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.</p> <p>There is a monthly routine for calibration and maintenance of online turbidity analyzers. The manufacturer's prepared stabilized formazin turbidity standards are used to calibrate and verify the measurements against a bench-top turbidity analyzer.</p> <p>Verifications of the POE free chlorine on-line continuous analyzer are performed monthly comparing measured values with a pocket chlorine analyzer.</p>		

Question ID	MRDW1108000	
Question	Question Type	Legislative Requirement
Where continuous monitoring equipment used for the monitoring of free chlorine residual, total chlorine residual, combined chlorine residual or turbidity, required by Regulation 170, an Order, MDWL, or DWWP issued under Part V, SDWA, has triggered an alarm or an automatic shut-off, did a qualified person respond in a timely manner and take appropriate actions?	Legislative	SDWA O. Reg. 170/03 6-5 (1) 1-4,SDWA O. Reg. 170/03 6-5 (1)5-10,SDWA O. Reg. 170/03 6-5 (1.1)
Observation		
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.		

Question ID	MRDW1018000	
Question	Question Type	Legislative Requirement
Has the owner ensured that all equipment is installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit?	Legislative	SDWA 31 (1)
Observation		
The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit.		

Question ID	MRDW1021000	
Question	Question Type	Legislative Requirement
Is the owner/operating authority able to demonstrate that, when required during the inspection period, Form 2 documents were prepared in accordance with their Drinking Water Works Permit?	Legislative	SDWA 31 (1)

Observation
<p>The owner/operating authority was in compliance with the requirement to prepare Form 2 documents as required by their Drinking Water Works Permit during the inspection period. The following Form 2 documents were prepared during the inspection period and signed by the owner representative:</p> <ul style="list-style-type: none"> - Addition of green sand on top of silica sand layer and beneath the granular activated carbon; February 8, 2021, - Removal of unused coagulant-aid polymer chemical dosing pumps and storage tanks; February 18, 2021, - Relocation of chlorine injection point from common filter effluent to individual filter effluent streams, March 1, 2021, - Installation of a larger day tank for waste system polymer; March 15, 2021, - Addition of potassium permanganate injection point at the filter backwash header; March 19, 2021, - Replacement of one large capacity sodium hypochlorite storage tank with two smaller tanks for individual dosing to separate effluent streams, April 23, 2021 and - Utilization of unused post-filter chlorine injection point for atmospheric vacuum air injection; May 19, 2021.

Question ID	MRDW1023000	
Question	Question Type	Legislative Requirement
Do records indicate that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a DWWP and/or MDWL issued under Part V of the SDWA at all times that water was being supplied to consumers?	Legislative	SDWA O. Reg. 170/03 1-2 (2)
Observation		
<p>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.</p> <p>Section 1-4 of Schedule 1 of O. Reg. 170/03 requires the owner of a surface water drinking water system must ensure the provision of water treatment equipment that is designed to be capable of chemically assisted filtration, and is designed to be capable of achieving, at all times, primary disinfection in accordance with the Ministry's Procedure for Disinfection of Drinking Water in Ontario, including at least 99 per cent (2-log) removal or inactivation of Cryptosporidium oocysts, at least 99.9 per cent (3-log) removal or inactivation of Giardia cysts and at least 99.99 per cent (4-log) removal or inactivation of viruses by the time water leaves the point of entry units or water enters the distribution system.</p> <p>The MDWL No. 200-101 requires the following minimum log removal/inactivation for South River Water Treatment Plant (WTP): 2-log removal or inactivation of Cryptosporidium oocysts, 3-log removal or inactivation of Giardia cysts and 4-log removal or inactivation of viruses. The process of conventional filtration is assigned 2-log removal or inactivation of Cryptosporidium</p>		

oocysts, 2.5-log removal or inactivation of Giardia cysts and 2-log removal or inactivation of viruses. The process of chlorination is assigned 0.5 log removal of Giardia cysts and 2-log removal or inactivation of viruses.

Schedule E of the MDWL No. 200-101 specifies the following criteria for achievement of assigned log removal/inactivation credits for the process of conventional filtration at South River WTP:

1. A chemical coagulant shall be used at all times when the treatment plant is in operation;
2. Chemical dosages shall be monitored and adjusted in response to variations in raw water quality;
3. Effective backwash procedures shall be maintained including filter-to-waste or an equivalent procedure during filter ripening to ensure that effluent turbidity requirements are met at all times;
4. Filtrate turbidity shall be continuously monitored from each filter; and
5. Performance criterion for filtered water turbidity of less than or equal to 0.3 NTU in 95% of the measurements each month shall be met for each filter.

According to the review of logbooks, monitoring trends for filter effluent turbidity, round sheets for the WTP and reported monthly filter performances by the operating authority for the inspection period, the process of conventional filtration at the South River WTP satisfied the required criteria for the achievement of removal/inactivation credits.

The MDWL specifies the following criteria for achievement of assigned log removal/inactivation credits for the process of chlorination at South River WTP:

1. Sampling and testing for free chlorine residual shall be carried out by continuous monitoring equipment in the treatment process at or near a location where the intended contact time has just been completed in accordance with the Ministry's Procedure for Disinfection of Drinking Water in Ontario; and
2. At all times, CT provided shall be greater than or equal to the CT required to achieve the log removal credits assigned.

Sampling and testing for free chlorine residual is carried out at the high lift header, downstream of the location where the intended contact time has just been completed. Calculation of CT is performed by an Excel sheet with specified minimum required CT depending of water temperature, water pH and free chlorine residual at clearwell exit, high lift pumps flow rate, clearwell level and baffle conditions.

Based on the review of facility's logbooks, monitoring trends for finished water free chlorine residual and a review of call out work orders for the inspection period, it appears that the process of chlorination at South River WTP satisfied the required criteria for the achievement of removal/inactivation credits.

Question ID	MRDW1024000	
Question	Question Type	Legislative Requirement
Do records confirm 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	Legislative	SDWA O. Reg. 170/03 1-2 (2)

was never less than 0.05 mg/l free or 0.25 mg/l combined?		
Observation		
<p>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.</p> <p>Based on the review of monthly free chlorine residual sheets, the lowest free chlorine residual measured in the distribution during the inspection period was on August 31, 2021 at 0.32 mg/L.</p> <p>Note: Previous inspection report gave a recommendation to the owner and/or operator that they should consider completing and recording results for regular free chlorine residual tests at the dead ends and extremities of the distribution system to ensure the provision of adequate secondary disinfectant residual to all parts of the distribution system. Following this recommendation on July 20, 2021 free chlorine residuals were taken from all 6 bleeders with concentrations above 0.05 mg/L.</p>		

Question ID	MRDW1025000	
Question	Question Type	Legislative Requirement
Were all parts of the drinking water system that came in contact with drinking water (added, modified, replaced or extended) disinfected in accordance with a procedure listed in Schedule B of the Drinking Water Works Permit?	Legislative	SDWA 31 (1)
Observation		
<p>All parts of the drinking water system were disinfected in accordance with a procedure listed in Schedule B of the Drinking Water Works Permit.</p> <p>Condition 2.3 to MDWL requires that all parts of the drinking water system in contact with drinking water which are:</p> <p>2.3.1 Added, modified, replaced, extended; or</p> <p>2.3.2 Taken out of service for inspection, repair or other activities that may lead to contamination, shall be disinfected before being put into service in accordance with a procedure approved by the Director or in accordance with the applicable provisions of the following documents:</p> <p>a) The ministry's Watermain Disinfection Procedure, effective August 1, 2016;</p> <p>b) AWWA C652 – Standard for Disinfection of Water-Storage Facilities;</p> <p>c) AWWA C653 – Standard for Disinfection of Water Treatment Plants; and d) AWWA C654 – Standard for Disinfection of Wells.</p> <p>On February 2, 2021 OCWA submitted a request to the Director to use alternate procedure for disinfection for replacement of granulated activated carbon (GAC) in South River DWS package plants. The request was approved by the Director on February 4, 2021. A review of the operational records confirmed that the approved procedure was followed during the filter media replacement on February 23 and March 2, 2021.</p>		

Question ID	MRDW1062000	
Question	Question Type	Legislative Requirement
Do records or other record keeping mechanisms confirm that operational testing not performed by continuous monitoring equipment is being done by a certified operator, water quality analyst, or person who meets the requirements of O. Reg. 170/03 7-5?	Legislative	SDWA O. Reg. 170/03 7-5
Observation		
Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.		

Question ID	MRDW1060000	
Question	Question Type	Legislative Requirement
Do the operations and maintenance manuals meet the requirements of the DWWP and MDWL issued under Part V of the SDWA?	Legislative	SDWA 31 (1)
Observation		
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.		
Note: Previous inspection report had the following recommendations regarding documentation for the DWS:		
<ol style="list-style-type: none"> 1. The Operator should consider updating the process flow diagram included in the DWWP to include accurate equipment and chemicals. 2. The Owner should attempt to compile an accurate inventory of locations, sizes, lengths and material types of installed watermains and should keep accurate records for any new or replacement watermains which they install going forward. 		
The operating authority provided the following updates regarding the recommendations:		
<ol style="list-style-type: none"> 1. SCADA overview screen has been updated with details about piping, layout of equipment and chemicals used and injection points and is available at the WTP. 2. The owner already has an inventory list of water assets and map from GIS which contains lengths and types of pipes. 		

Question ID	MRDW1071000	
Question	Question Type	Legislative Requirement
Has the owner provided security measures to protect components of the drinking water system?	BMP	Not Applicable
Observation		
The owner had provided security measures to protect components of the drinking water system.		

The intake and the WTP are locked and secured with alarms at all times. All doors are equipped with intrude alarms; there is a motion sensor in the control room. There is bright exterior lightning outside the WTP. A monitoring camera was installed on the low lift pump building.

Question ID	MRDW1073000		
Question	Question Type	Legislative Requirement	
Has the overall responsible operator been designated for all subsystems which comprise the drinking water system?	Legislative	SDWA O. Reg. 128/04 23 (1)	
Observation			
The overall responsible operator has been designated for each subsystem.			
For the South River WTP and Distribution System, OCWA is designated ORO. The On-call operator is designated as the ORO. The ORO is alternated on a weekly basis between operators Darren Aljoe and Dan Finnigan as per the On-call schedule, each serving as backup ORO to each other. Alternate operators that may function as Designated ORO while on call for this facility are Gerry Duguay, Don Michaud and Tim Fraser.			

Question ID	MRDW1074000		
Question	Question Type	Legislative Requirement	
Have operators in charge been designated for all subsystems for which comprise the drinking water system?	Legislative	SDWA O. Reg. 128/04 25 (1)	
Observation			
Operators-in-charge had been designated for all subsystems which comprised the drinking water system.			
The operator attending the subsystem and having the required subsystem operator certificate is designated as an operator in charge.			

Question ID	MRDW1075000		
Question	Question Type	Legislative Requirement	
Do all operators possess the required certification?	Legislative	SDWA O. Reg. 128/04 22	
Observation			
All operators possessed the required certification.			

Question ID	MRDW1076000		
Question	Question Type	Legislative Requirement	
Do only certified operators make adjustments to the treatment equipment?	Legislative	SDWA O. Reg. 170/03 1-2 (2)	

Observation
Only certified operators made adjustments to the treatment equipment.

Question ID	MRDW1099000	
Question	Question Type	Legislative Requirement
Do records show that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O. Reg.. 169/03)?	Information	Not Applicable
Observation		
Records showed that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O.Reg. 169/03).		

Question ID	MRDW1096000	
Question	Question Type	Legislative Requirement
Do records confirm that chlorine residual tests are being conducted at the same time and at the same location that microbiological samples are obtained?	Legislative	SDWA O. Reg. 170/03 6-3 (1)
Observation		
Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.		

Question ID	MRDW1081000	
Question	Question Type	Legislative Requirement
Are all microbiological water quality monitoring requirements for distribution samples being met?	Legislative	SDWA O. Reg. 170/03 10-2 (1),SDWA O. Reg. 170/03 10-2 (2),SDWA O. Reg. 170/03 10-2 (3)
Observation		
All microbiological water quality monitoring requirements for distribution samples were being met.		
Section 10-2 of Schedule 10 of O. Reg. 170/03 requires that the owner of a drinking-water system and the operating authority for the system must ensure that at least eight distribution samples are taken every month, with at least one of the samples being taken in each week. The owner of the drinking-water system and the operating authority for the system must ensure that each of the samples is tested for Escherichia coli and total coliforms and that at least 25 per cent of the		

samples required to be taken are tested for general bacteria population expressed as colony counts on a heterotrophic plate count (HPC).

A review of sampling records confirmed that at least 12 distribution samples are collected in a month and tested for Escherichia coli and total coliforms. At least one sample is taken each week and tested for HPC, meeting the requirement to have at least 25 per cent of the samples tested for HPC.

Question ID	MRDW1083000		
Question	Question Type	Legislative Requirement	
Are all microbiological water quality monitoring requirements for treated samples being met?	Legislative	SDWA O. Reg. 170/03 10-3	
Observation			
All microbiological water quality monitoring requirements for treated samples were being met.			
Section 10-3 of Schedule 10 of O. Reg. 170/03 requires the owner of a drinking-water system and the operating authority for the system must ensure that a treated water sample is taken at least once every week and tested for Escherichia coli, total coliforms and general bacteria population expressed as colony counts on a heterotrophic plate count (HPC).			
During the inspection period, samples of treated water were collected once every week and tested for Escherichia coli, total coliforms and HPC.			

Question ID	MRDW1084000		
Question	Question Type	Legislative Requirement	
Are all inorganic water quality monitoring requirements prescribed by legislation conducted within the required frequency?	Legislative	SDWA O. Reg. 170/03 13-2	
Observation			
All inorganic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.			
Subsection 13-2 of Schedule 13 of O. Reg. 170/03 requires that owner of a large municipal residential system and the operating authority for the system must ensure that at least one water sample is taken every 12 months, if the system obtains water from a raw water supply that is surface water and that each of the samples is tested for every parameter set out in Schedule 23.			
A sample was collected on January 18, 2021 and tested for every parameter set out in Schedule 23.			

Question ID	MRDW1085000		
Question	Question	Legislative	

	Type	Requirement
Are all organic water quality monitoring requirements prescribed by legislation conducted within the required frequency?	Legislative	SDWA O. Reg. 170/03 13-4 (1),SDWA O. Reg. 170/03 13-4 (2),SDWA O. Reg. 170/03 13-4 (3)
Observation		
<p>All organic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.</p> <p>Subsection 13-4 of Schedule 13 of O. Reg. 170/03 requires that owner of a large municipal residential system and the operating authority for the system shall ensure that at least one water sample is taken every 12 months, if the system obtains water from a raw water supply that is surface water and tested for every parameter set out in Schedule 24.</p> <p>A sample was collected on January 18, 2021 and tested for every parameter set out in Schedule 24.</p>		

Question ID	MRDW1086000	
Question	Question Type	Legislative Requirement
Are all haloacetic acid water quality monitoring requirements prescribed by legislation conducted within the required frequency and at the required location?	Legislative	SDWA O. Reg. 170/03 13-6.1 (1),SDWA O. Reg. 170/03 13-6.1 (2),SDWA O. Reg. 170/03 13-6.1 (3), SDWA O. Reg. 170/03 13-6.1 (4),SDWA O. Reg. 170/03 13-6.1 (5),SDWA O. Reg. 170/03 13-6.1 (6)
Observation		
<p>All haloacetic acid water quality monitoring requirements prescribed by legislation are being conducted within the required frequency and at the required location.</p> <p>Section 13-6.1 of Schedule 13 of O. Reg. 170/03 requires that the owner of a drinking water system that provides chlorination and the operating authority for the system must ensure that at least one distribution sample is taken in each calendar quarter, from a point in the drinking water systems distribution system, or plumbing that is connected to the drinking water system, that is likely to have an elevated potential for the formation of haloacetic acids and tested for haloacetic</p>		

acids (HAAs). O. Reg. 170/03 defines the "calendar quarter" as the three-month period that begins on January 1, April 1, July 1 or October 1. Effective January 1, 2020, a standard for HAAs was introduced. The standard is 0.08 mg/L (80 µg/L) and will be expressed as a running annual average (RAA) of quarterly results.

During the inspection period, samples were collected and tested for total haloacetic acids from a location in the distribution system that has shown higher concentrations of HAAs in samples collected from three different locations in period January 2017 to October 2019. Current RAA for HAAs is 0.036 mg/L (36 µg/L).

Question ID	MRDW1087000	
Question	Question Type	Legislative Requirement
Have all trihalomethane water quality monitoring requirements prescribed by legislation been conducted within the required frequency and at the required location?	Legislative	SDWA O. Reg. 170/03 13-6 (1)
Observation		
<p>All trihalomethane water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location.</p> <p>Subsection 13-6 of Schedule 13 of O. Reg. 170/03 requires the owner of a drinking water system that provides chlorination and the operating authority for the system must ensure that at least one distribution sample is taken in each calendar quarter, from a point in the drinking water system's distribution system that is likely to have an elevated potential for the formation of trihalomethanes and tested for trihalomethanes (THMs). O. Reg. 169/03 sets the standard for THMs as 0.100 mg/L (100 µg/L) expressed as a RAA, where RAA is defined as "the running annual average of quarterly results" for THMs for a drinking water system. O. Reg. 170/03 defines the "calendar quarter" as the three-month period that begins on January 1, April 1, July 1 or October 1.</p> <p>Previous inspection report indicated that historical sampling data appeared to indicate that other locations within the distribution system may have greater THM formation potential than the selected sample locations for 2019-2020 inspection period. There was a recommendation in the previous inspection report that the operator should evaluate their historical THM sampling results and choose the locations with the greatest disinfection by-product formation potential for future sampling locations.</p> <p>Following the recommendation from the previous inspection report, the operating authority conducted a program of sampling from more than one location in July 2021 to determine the locations with highest THM forming potential. Total of nine (9) samples from different locations were collected on July 20, 2021. Sampling results show that the highest concentration of THM was found in Grant St bleeder line at 0.061 mg/L (61 µg/L). Based on this program, the operating authority plans to sample for THM at this location in future, unless inaccessible due to winter weather.</p> <p>During the inspection period, samples were collected and tested for THMs with the required frequency. Current RAA for THMs is 0.042 mg/L (42 µg/L).</p>		

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Question ID	MRDW1088000	
Question	Question Type	Legislative Requirement
Are all nitrate/nitrite water quality monitoring requirements prescribed by legislation conducted within the required frequency for the DWS?	Legislative	SDWA O. Reg. 170/03 13-7
Observation		
<p>All nitrate/nitrite water quality monitoring requirements prescribed by legislation were conducted within the required frequency for the DWS.</p> <p>Section 13-7 of Schedule 13 of O. Reg. 170/03 requires that the owner of a drinking water system and the operating authority for the system must ensure that at least one water sample is taken every three months and tested for nitrate and nitrite.</p> <p>During the inspection period, samples were collected and tested for nitrate and nitrite with the required frequency.</p>		

Question ID	MRDW1089000	
Question	Question Type	Legislative Requirement
Are all sodium water quality monitoring requirements prescribed by legislation conducted within the required frequency?	Legislative	SDWA O. Reg. 170/03 13-8
Observation		
<p>All sodium water quality monitoring requirements prescribed by legislation were conducted within the required frequency.</p> <p>Section 13-8 of Schedule 13 requires that the owner of a drinking water system and the operating authority for the system must ensure that at least one treated water sample is taken every 60 months and tested for sodium.</p> <p>For the purpose of Section 13-8, a sodium sample was collected on January 22, 2018 with concentration of 24.6 mg/L, exceeding the parameter limit set by O. Reg. 169/03. This was reported as an adverse water quality incident to Spills Action Centre and North Bay Parry Sound Public Health Unit (NBPSDHU) and a resample was taken on January 30, 2018 with sodium concentration at 24 mg/L. Since the first sodium exceedance in 2013 and as per the Health Unit request, notifications have been posted at locations used by the public to advise of elevated levels of sodium for persons following low sodium diet.</p> <p>A sample of treated water was collected on January 18, 2021 and tested for sodium with the result of 49.3 mg/L. There was no requirement to report the exceedance of parameter limit to SAC and NBPSDHU as per Subsection 16-3(1)8 of Schedule 16 to O. Reg. 170/03 that requires that the concentration of sodium exceeding 20 mg/L is to be reported as an adverse water quality incident unless a report in respect to sodium exceedance had been made in the previous 57 month.</p>		

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Question ID	MRDW1090000	
Question	Question Type	Legislative Requirement
Where fluoridation is not practiced, are all fluoride water quality monitoring requirements prescribed by legislation conducted within the required frequency?	Legislative	SDWA O. Reg. 170/03 13-9
Observation		
<p>All fluoride water quality monitoring requirements prescribed by legislation were conducted within the required frequency.</p> <p>Section 13-9 of Schedule 13 requires that the owner of a drinking water system and the operating authority for the system must ensure that at least one treated water sample is taken every 60 months and tested for fluoride.</p> <p>The most recent fluoride sample was collected on January 18, 2021.</p>		

Question ID	MRDW1100000	
Question	Question Type	Legislative Requirement
Did any reportable adverse/exceedance conditions occur during the inspection period?	Information	Not Applicable
Observation		
<p>There were no reportable adverse/exceedances during the inspection period. There were no reportable adverse/exceedance conditions during the inspection period.</p>		

Question ID	MRDW1115000	
Question	Question Type	Legislative Requirement
In the event that an issue of non-compliance outside the scope of this inspection protocol is identified, a "No" response may be used if further actions are deemed necessary (and approved by the DW Supervisor) to facilitate compliance.	Legislative	Not Applicable
Observation		
<p>The following instance(s) of non-compliance were also noted during the inspection:</p> <p>Waste streams from the facility are treated in the facility's wastewater system. The sludge from the clarifier blowdown is directed to the wastewater surge tank. The supernatant from the wastewater surge tank is directed to the clarification tank; the settled solids are directed to the sludge holding tank. The filter backwash water is discharged to the clarification tank. The supernatant from the clarification tank is decanted and discharged to a storm sewer which discharges to the lake. The sludge that is built up in the clarification cell is pumped to the sludge holding tank. The tanks are equipped with level monitors triggering the pumping of supernatant to</p>		

a storm sewer that discharges to a lake. The sludge from the sludge thickening tank is pumped to the sludge bagging system that dries out the sludge with addition of polymer and is disposed of at the local landfill 3-5 times/week.

In period 2011 to 2021, there have been fourteen (14) reported events of spills or overflows from this facility's wastewater treatment system. Volumes of spilled supernate in this period ranged from 0.05 to 280 m³.

In period 2011 to 2019, these events were spills of supernate and filter backwash caused by unadjusted system or faulty equipment.

In period April 2019 to November 2021, there were five reported incidents of overflows or spills from South River WTP wastewater treatment facility:

- April 2, 2019 (date when the event was reported to MECP) - supernate and sludge discharging from a storm water grate on obstructed discharge pipe to Forest Lake. There was a layer of sludge surrounding the grate which indicates of possible backwash spills. Estimated volume of spilled sludge was 2 to 3 m³. Corrective action was to replace the storm sewer pipe and site clean up.
- September 16, 2019 - spill of supernatant while backwashing due to operator error. Estimated volume of supernatant was 15 m³. Corrective action was to close valves and clean up the spill.
- September 19, 2019 - overflow of supernate due to faulty level sensor. Estimated overflow volume was 7.2 m³. Corrective action taken was to adjust supernatant pump setpoints in SCADA and clean transducer.
- December 27, 2020 - multiple backwashes of filters overwhelming the waste tank and SCADA did not signal the overflow. Approximate volume spilled 10 m³. Corrective action taken was to adjust SCADA setpoints and clean up the site.
- May 5, 2021 - Overflow of supernate and sludge during maintenance of the system. Corrective action was to clean up the site.

The operating agency indicated that the following actions were also taken to address the issues of overflows and spills from the facility's wastewater system:

- polymer has been changed twice over the years - currently used is LT27AG,
- sludge is removed from the sludge tank once a year and
- internal alarm has been added to SCADA to warn of overflows.

Condition 10.1 to MDWL states that "Nothing in this licence or the drinking water works permit shall be read as to permit the discharge of a contaminant into the natural environment that causes or is likely to cause an adverse effect."

Condition 31(1) to Safe Drinking Water Act specifies that no person shall use or operate a municipal drinking-water system that was established before or after this section comes into force except under the authority of and in accordance with an approval under this Part or municipal drinking-water licence.

Required action:

By no later than February 4, 2022 the owner and the operating authority are required to provide Vesna Alimpic, Water Inspector and Provincial Officer, Ministry of Environment, Conservation and Parks with an Action Plan specifying the planned actions and timelines to prevent, with the objective to eliminate, future spills and overflows from South River WTP wastewater system to

the environment.

The action plan is to be provided by email to vesna.alimpic@ontario.ca or by mail to 191 Booth Road, Unit 16 & 17, North Bay, ON, P1A 4K3.

Question ID	MRDW1059000	
Question	Question Type	Legislative Requirement
Do the operations and maintenance manuals contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the system?	Legislative	SDWA O. Reg. 128/04 28
Observation		
The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.		

Question ID	MRDW1061000	
Question	Question Type	Legislative Requirement
Are logbooks properly maintained and contain the required information?	Legislative	SDWA O. Reg. 128/04 27 (1), SDWA O. Reg. 128/04 27 (2), SDWA O. Reg. 128/04 27 (3), SDWA O. Reg. 128/04 27 (4), SDWA O. Reg. 128/04 27 (5), SDWA O. Reg. 128/04 27 (6), SDWA O. Reg. 128/04 27 (7)
Observation		
Logbooks were properly maintained and contained the required information.		

APPENDIX B
REFERENCE MATERIALS

DWS Component Information Report for 220013562

as of 14-DEC-2021

Drinking Water System Profile Information

DWS #	220013562
MOE Assigned Name	South River Drinking Water System
Category	LMRS
Regulation	O.REG 170/03
DWS Type	Water Treatment Plant
Source Type	Surface Water
Address	28 Howard Street, South River, Ontario, POA 1X0, Canada
Region	Northern Region
District	North Bay Area Office
Municipality	South River
Public Health Unit	North Bay Parry Sound District Health Unit

LWIS Component Name	LWIS Component Type	LWIS Component Sub-Type	Component Address	Comments
Distribution System	Other	Class I		<ul style="list-style-type: none"> - The South River distribution system supplies approximately 1110 people according to the 2016 census. It is classified as a Class I Water Distribution Subsystem (#1497). - As of December 2021, there were 508 total service connections: 454 residential and multi-residential services; 38 commercial connections (mix of commercial, industrial and institutional); and 16 separate residential services in Machar Township fed from a watermain in South River Village. - Two service additions are planned in 2021 (one residential and one commercial). - There are 30 customers who do not receive water, but who are billed for fire protection. - The distribution system infrastructure consists of a mixture of cast iron, ductile iron, asbestos and PVC piping. Pipes range in diameter from 300 mm down to 100 mm. The installed length of pipe in the entire distribution system is not currently known. - Fire protection is provided. - There are 11 dead end locations, approximately 60 main valves and 66 fire hydrants. There are no water storage facilities, no rechlorination facilities, pressure boosting facilities, flow monitoring or residual monitoring facilities. There are no known pressure sustaining or regulating valves. - There are no DWSs which receive water from this distribution system and there other DWSs supplying water to this DWS.
Chemical Addition Systems	Other	Treatment Facility	28 Howard St.,	<p>Chemical Addition Systems –</p> <ul style="list-style-type: none"> - All of the solution chemical tanks are situated on or in secondary containment vessels. - All of the pumps are variable speed and chemical addition is flow paced. - Coagulant System – Currently feeding potassium chloride into the raw water header prior to the in-line mixer. There are two metering pumps (one duty and one standby) each rated at approximately 5 L/hour. There is a polyethylene bulk storage tank (approximately 15000 L capacity) which is filled from the exterior of the plant by tanker and which is vented to the exterior of the WTP. A transfer pump, drawing from the bulk tank and controlled

DWS Component Information Report for 220013562

as of 14-DEC-2021

LWIS Component Name	LWIS Component Type	LWIS Component Sub-Type	Component Address	Comments
				<p>by a float switch in the adjacent, approximately 450 L day tank, maintains solution level in the day tank. Coagulant is fed continuously while the SCADA system registers raw water flows. A failure of this system will shut-down water production at the WTP.</p> <p>- pH Adjustment System – Currently feeding sodium carbonate (soda ash) into the raw water header prior to the in-line mixer and the HLPW discharge. Bagged, dry powdered is batched on site in a mixing tank using distribution water. It is transferred to the day tank/bulk tank and withdrawn by three metering pumps (on pre-package plant, one post HLPW and one standby) each rated at approximately 3 L/hour.</p> <p>The pre-filtration pumps are triggered by raw water flows and the post HLPW pump is triggered by treated water flows).</p> <p>- Iron and Manganese Control System - Currently feeding potassium permanganate into the raw water header prior to the in-line mixer. There is a single metering pump (converted pre-filter chlorine pump) rated at approximately 3 L/hour. There is a polyethylene storage tank (approximately 1500 L capacity) with an in-tank mixer. Material is received in 220 L drums and transferred to the day tank.</p> <p>Chemical is fed continuously while the SCADA system registers raw water flows.</p> <p>- Polymer Feed System – Flocculation aid and sludge thickening agent – Currently feeding 'Mag 25' into the recirculation chambers in both package plants and into the sludge holding/thickening tank. There are three metering pumps (one for each package plant and one for the sludge thickening tank) each rated at approximately 6 L/hour. There is a polyethylene mixing, aging and storage tank (approximately 450 L capacity). Chemical is batched on-site and transferred to the storage tank and fed continuously while the SCADA registers raw water flows for the package plants and when backwashing occurs. Additional application may occur during sludge thickening practices.</p> <p>- Sodium Hypochlorite Feed System – Primary and Secondary Disinfection – Feeding liquid sodium hypochlorite into the common filter effluent line prior to the clearwells and into the treated water header prior to the final free chlorine residual analyzer (if needed). There are three metering pumps (two duty, one standby) each rated at approximately 3 L/hour. Material is received in 220 L drums and transferred to the approximately 350 L day tank. Chemical is fed continuously to the filter effluent line while the SCADA system registers raw water flows and manually to the HLP discharge line as desired. A failure of both pumps will lock-out the LLPs and effectively stop water production.</p>
Forest Lake (South River)	Source	Surface	Tom Thomson Lane,	<p>- The intake facilities consist of a 300 mm diameter intake pipe extending 232 m into Forest Lake, with a flared elbow in a wooden and concrete crib located at a depth of 4.5 m. An isolation valve is located in the low lift pumping station (LLPS). Two plastic, 15 mm lines (unused) reportedly run from the LLPS to the intake, one for pre-chlorination for zebra muscle control (with diffuser) and the second for raw water sampling.</p>

DWS Component Information Report for 220013562

as of 14-DEC-2021

LWIS Component Name	LWIS Component Type	LWIS Component Sub-Type	Component Address	Comments
				<ul style="list-style-type: none"> - The LLPS is located approximately 170 m south of the eastern end of Howard Street, at the south end of Tom Thomson Lane. The locked, entry alarmed building contains a 4.2 m deep raw water well, dual manual screens which separate the low lift intake well and the low lift pump well. There are continuous level monitors trended to the Sensory Control and Data Acquisition (SCADA) system at the water treatment plant (WTP) on either side of the screens. There are three submersible electric-driven low lift pumps (LLPs), each rated at 10 L/s, which typically operate automatically (manual control is possible) and sequentially in response to clearwell level sensors. Each LLP discharge is equipped with backflow prevention and manual valves. A low lift pressure control valve will return water to the intake pipe if there is too much pressure in the raw water main to the WTP. The LLPs will lock-out on a low level alarm from the low lift pump well level switch. - The raw watermain to the WTP is 200 mm diameter stainless steel with an isolation valve at the LLPS discharge point. It runs approximately 400 m subsurface to the WTP. At the WTP inlet, there is a continuously monitored magnetic flow meter, a mechanical control valve, a raw water sample tap, and a supply line feeding the raw water turbidity analyzer and pH meter, both continuously monitored through SCADA. - Chemical addition begins immediately after the analyzer supply line. Analyzer discharge is directed to the roadside ditch.
Generator	Stand-By Power Generation		28 Howard St.,	Emergency backup power is provided by a 135 kW radiator cooled diesel generator housed in a separate building located approximately 20 m to the east of the WTP. The fuel is contained in a double walled storage tank outside and to the rear of the generator building. The generator is programmed for automatic starts and stops on power interruptions and restoration. It is monitored and alarmed for operational parameters.
Treated Water	Plant Classification	Class Iii	28 Howard St.,	<ul style="list-style-type: none"> - Treatment consists of chemical addition, coagulation, flocculation, sedimentation, filtration and disinfection by chlorination with contact time. The WTP has a rated capacity of 1680 m3/day. All of the processes are completed within the approximately 26 m long, 21 m wide enclosed WTP building located at 28 Howard Street, the Village of South River, District of Parry Sound, Ontario. - Raw water passes the raw water analyzers and is injected with liquid potassium permanganate (iron and manganese control by oxidation/precipitation), sodium carbonate (soda ash – for elevation of pH (powder batched on-site)) and liquid potassium chloride (coagulant). These chemical feeds are triggered by raw water flows and are flow paced. After chemical injection and prior to entering the package plants the water passes through an in-line mixer. - A coagulant feed failure will lock-out the LLPs and effectively stop treatment. - Water is then typically directed equally into two Napier Reid package treatment plants via individual headers and

DWS Component Information Report for 220013562

as of 14-DEC-2021

LWIS Component Name	LWIS Component Type	LWIS Component Sub-Type	Component Address	Comments
				<p>automated valves (plants can operate individually).</p> <ul style="list-style-type: none"> - Within the separate package plants, water flows into flocculation tanks, each equipped with a flash mixer (0.38 kW variable speed motor), a vertical flocculator (0.56 kW variable speed motor) and a floc recirculator (0.56 kW variable speed motor). The flocculation tanks provide a 30 minute detention time. - A polymer is injected into the flocculator chambers (at the recirculator) as a coagulant aid. - Continuous pH monitoring is completed within the mixing/flocculation chamber. An unused pH analyzer is also located at each package plant inlet. - Following flocculation, the water flows into two semi-circular settling/clarification chambers. Each chamber has level monitoring, inclined tube settlers, 150 mm inlet piping and 150 mm sludge collection and recirculation headers. Each tank is designed for an overflow rate of 2.4 m/hour. Settled sludge is drawn down via an automated valve to the backwash clarification tank. - The clarified water overflows from the tube settlers in the clarifiers into gravity fed, individual multi-media filters consisting of garnet, silica sand and granulated activated carbon (GAC) with gravel underlayers. There is continuous level monitoring on the surface of each filter. Continuous turbidity monitoring is completed on each filter effluent line with programmable LLP lock-outs on high/high alarm set point for the affected plant(s) to effectively stop water production. Continuous flow monitoring is also completed on each filter effluent line. - Filter backwashes are triggered on programmed pass through volume (typical), time, filtered water turbidity and/or head-loss pressure monitoring. Backwashes are completed using chlorinated water from the clearwells via two submersible, 15 HP pumps. Each backwash line has continuous flow monitoring, automated valving and backflow prevention. - Filter-to-waste is completed during filter ripening. Backwash water is directed to the backwash effluent handling system (backwash clarification tank). - Filtered water is directed into a common header and injected with a 12% sodium hypochlorite solution for primary and secondary disinfection. Continuous, pre-contact free chlorine residual monitoring (operational purposes) is completed on this water. The header splits and chlorinated water is directed equally (typical, but manual valving exists to isolate individual cells) into a two celled (each with an approximate capacity of 573 m3), subsurface, concrete walled, baffled clear well reservoir beneath the WTP. Each cell is equipped with continuous level monitoring (controls LLPs), low level lock-outs for emergency low levels and valved lines feeding the high lift pump well (HLPW) by gravity and high lift pump (HLP) draw down. Overflows are directed to the roadside ditch. - The HLPW has an estimated capacity of 140 m3. Six (6) vertical turbine HLPs (two rated at 7 L/s at 45 m total dynamic head (TDH) with 5.6 kW motors; two rated at 14 L/s at 45 m TDH with 11.2 kW motors; and two fire pumps (one duty, one standby) rated at 56 L/s at 38 m TDH with 22 kW motors) are situated above and draw from this tank (sequential starts on system pressure monitoring set

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as of 14-DEC-2021

LWIS Component Name	LWIS Component Type	LWIS Component Sub-Type	Component Address	Comments
				<p>points). These pumps direct treated water to the common discharge header which is equipped with a post-contact sodium hypochlorite injection point, a sodium carbonate injection point (post treatment pH adjustment), a continuously monitored treated water turbidity analyzer, a treated water/distributed water continuously monitored magnetic flow meter, continuous distribution system /treated water discharge pressure monitoring, continuous treated water pH monitoring, a plant supply line with flow monitoring and backflow prevention, and, a continuously monitored treated water free chlorine residual analyzer. Treated water leaves the WTP is directed underground into the South River Distribution System.</p> <ul style="list-style-type: none"> - The SCADA system continuously collects and monitors information from instruments and sensor throughout the works and automatically controls plant processes and generates alarms. - There is an on-site septic system.
Wastewater Treatment System	Other	Dewatered	28 Howard St.,	<ul style="list-style-type: none"> - The South River Water Treatment Plant Process generates wastewater through: filter backwashing, and clarifier blow-down to remove sludge. - Filter backwash water is directed to the clarification tank. The supernatant from the clarification tank is decanted and discharged to a storm sewer which discharges to the lake. The settled solids from the clarification tank are pumped to the sludge holding tank.. - Clarifier blow-down is directed to the wastewater surge tank. Supernatant from the wastewater surge tank is directed to the clarification tank, while the settled solids are directed to the sludge holding tank. - The sludge holding tank receives settled solids from both the clarification tank and the waste surge tank. Supernatant from the sludge holding tank is directed to the clarification tank. The settled solids from the sludge holding tank are pumped to the sludge bagging system 3-5 times/week for disposal at Machar Township Landfill. - There are two process wastewater polymer systems; one system consists of a storage tank, mechanical mixer, and a single metering pump that injects polymer into the package plant waste effluent line (common pipe for both clarifier blowdown and filter backwash water). The second system forms part of the twelve (12) bag sludge dewatering system. - A description of process wastewater equipment is available in Section 1 of Drinking Water Works Permit No.200-201.

APPENDIX B
SYSTEM COMPONENTS

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:

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

(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).

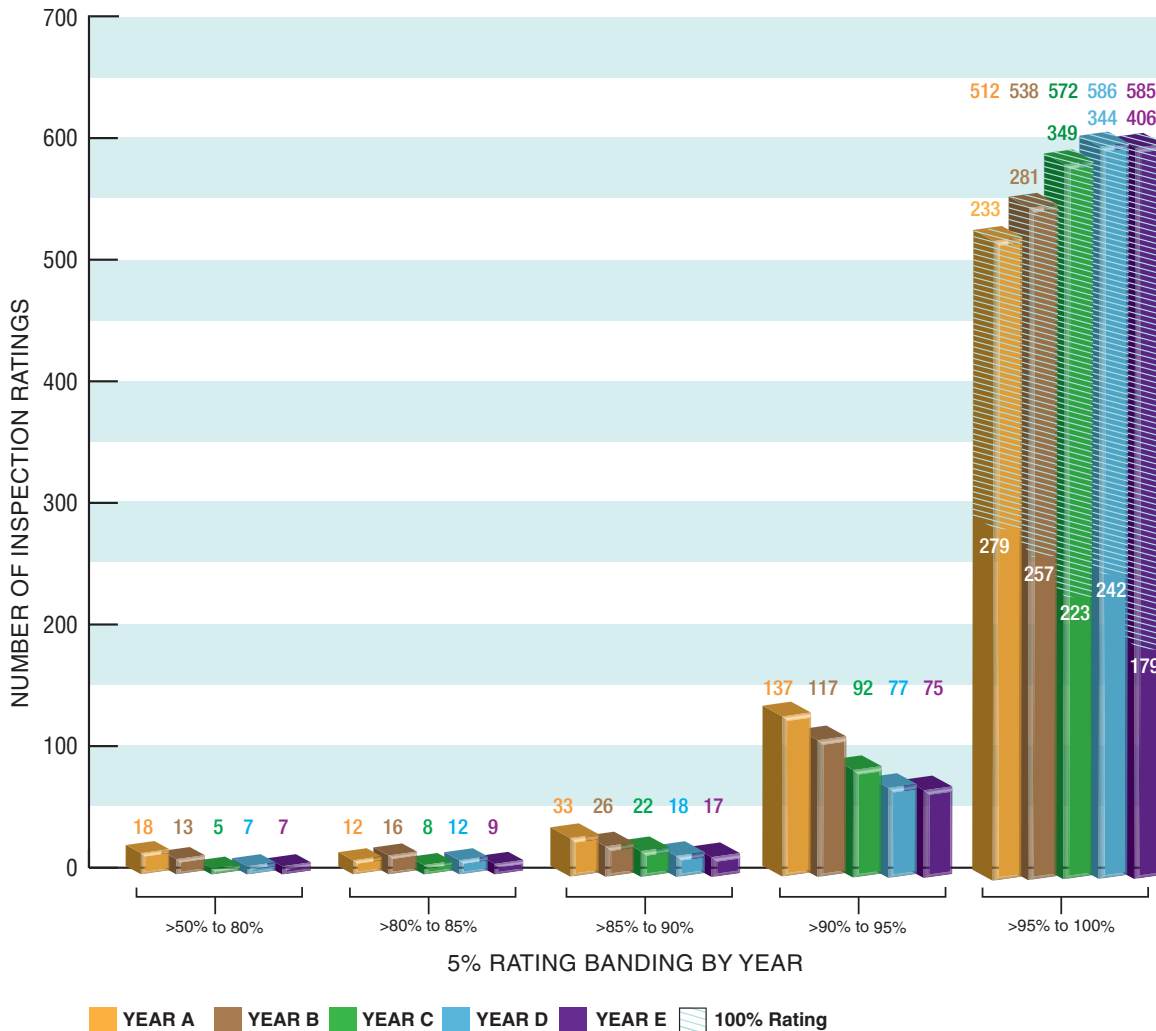
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

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