

January 18, 2022

Clerk Administrator Don McArthur and Council
The Corporation of the Village of South River
63 Marie Street,
South River, ON P0A 1X0

Re: 2021 Annual/Summary Report for the South River Drinking Water System

Dear Don McArthur and Council:

Ontario's Drinking-Water Systems Regulation (O. Reg. 170/03), made under the *Safe Drinking Water Act in 2002*, requires that the owner of a drinking water system prepare an Annual Report and an Annual Summary Report of the operation of the system and the quality of its water.

Annual Report

The annual report must cover the period of January 1st to December 31st in a year and must be prepared not later than February 28th of the following year. Pursuant to the legislative requirements, enclosed for your records is the 2021 Annual Report for the South River Drinking Water System.

In accordance with Section 11 (6), the annual report must:

- (a) contain a brief description of the drinking-water system, including a list of water treatment chemicals used by the system during the period covered by the report;
- (b) summarize any reports made to the Ministry under subsection 18 (1) of the Act or section 16-4 of Schedule 16 during the period covered by the report;
- (c) summarize the results of tests required under the Regulation, or an approval or order, including an OWRA order, during the period covered by the report and, if tests required under this Regulation in respect of a parameter were not required during that period, summarize the most recent results of tests of that parameter;
- (d) describe any corrective actions taken under Schedule 17 or 18 during the period covered by the report;
- (e) describe any major expenses incurred during the period covered by the report to install, repair or replace required equipment; and
- (f) if the case of a large municipal residential system or a small municipal residential system, include a statement of where a report prepared under Schedule 22 will be available for inspection under subsection 12 (4) O. Reg. 170/03, s. 11 (6).

In addition, Section 11 (7) gives the direction that a copy of an annual report for the system is given, without charge, to every person who requests a copy and be made available for inspection by any member of the public during normal business hours. The reports should be made available at the office of the Village, or at a location that is accessible to the users of the water system.

Summary Report

The annual summary report must cover the period of January 1st to December 31st in a year and must be prepared not later than March 31st of the following year. Pursuant to the legislative requirements, enclosed for your records is the 2021 Annual Summary for the South River Drinking Water System.

As required in *Schedule 22, Summary Reports for Municipalities*, the annual summary must:

- (2) (a) list the requirements of the Act, the regulations, the system's approval, drinking water works permit, municipal drinking water licence, and any orders applicable to the system that were not met at any time during the period covered by the report; and
 - (b) for each requirement referred to in clause (a) that was not met, specify the duration of the failure and the measures that were taken to correct the failure.
- (3) The report must also include the following information for the purpose of enabling the owner of the system to assess the capability of the system to meet existing and planned uses of the system:
 1. A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows.
 2. A comparison of the summary referred to in paragraph 1 to the rated capacity and flow rates approved in the system's approval, drinking water works permit or municipal drinking water licence, or if the system is receiving all of its water from another system under an agreement pursuant to subsection 5 (4), to the flow rates specified in the written agreement.

In addition, Section 12 (1) – 4 – gives the direction that a copy of the annual summary for the system is given, without charge, to every person who requests a copy and be made available for inspection by any member of the public during normal business hours. The reports should be made available at the office of the Village, or at a location that is accessible to the users of the water system.

These reports were prepared by the Ontario Clean Water Agency on behalf of the Village of South River and are based on information kept on record by OCWA at the South River WTP. The reports cover the period January 1st to December 31st 2021.

Please note that any Provincial Officers Orders or non-compliance issues that you have received directly from the MOE should be reviewed. Where non-compliance with the Order or Issue is evident and it is not included in the attached 2021 Annual/Summary Report, then we recommend that this information be added to the report.

After your review and inclusion of any additional information, this report is to be provided to the Council members representing the Village of South River before March 31, 2022. Please ensure this distribution.

Yours truly,
Ontario Clean Water Agency

Joshua Gravelle
Process and Compliance Technician

Copy to: Vesna Alimpic, Drinking Water Inspector, Ministry of the Environment, Conservation and Parks



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

South River Drinking Water System

2021 ANNUAL/SUMMARY REPORT

Prepared by the Ontario Clean Water Agency
on behalf of the Village of South River



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INTRODUCTION

Municipalities throughout Ontario have been required to comply with Ontario Regulation 170/03 made under the Safe Drinking Water Act (SDWA) since June 2003. The Act was enacted following recommendations made by Commissioner O'Conner after the Walkerton Inquiry. The Act's purpose is to protect human health through the control and regulation of drinking water systems. O. Reg. 170/03 regulates drinking water testing, use of licensed laboratories, treatment requirements and reporting requirements.

Section 11 of Regulation 170/03 requires the owner to produce an Annual Report. This report must include the following:

1. Description of system & chemical(s) used
2. Summary of any adverse water quality reports and corrective actions
3. Summary of all required testing
4. Description of any major expenses incurred to install, repair or replace equipment

This annual report must be completed by February 28th of each year.

Section 22 of the regulation also requires a Summary Report which must be presented & accepted by Council by March 31st of each year for the preceding calendar year.

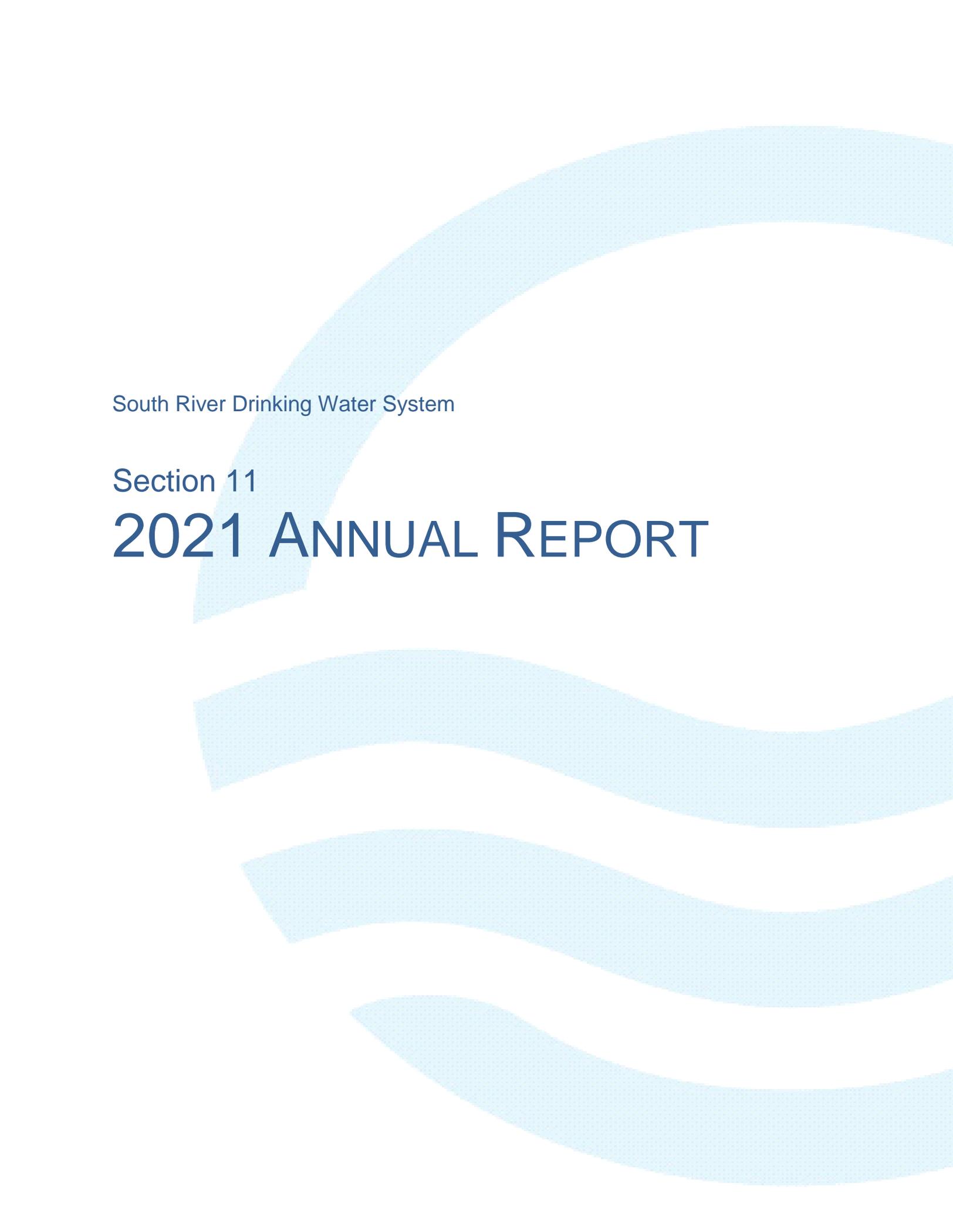
The report must list the requirements of the Act, its regulations, the system's Drinking Water Works Permit (DWWP), Municipal Drinking Water Licence (MDWL), Certificate of Approval (if applicable), and any Provincial Officer Order the system failed to meet during the reporting period. The report must also specify the duration of the failure, and for each failure referred to, describe the measures that were taken to correct the failure.

The Safe Drinking Water Act (2002) and the drinking water regulations can be viewed at the following website: <http://www.e-laws.gov.on.ca>.

To enable the Owner to assess the rated capacity of their system to meet existing and future planned water uses, the following information is also required in the report.

1. A summary of the quantities and flow rates of water supplied during the reporting period, including the monthly average and the maximum daily flows,
2. A comparison of the summary to the rated capacity and flow rates approved in the systems approval, drinking water works permit or municipal drinking water licence or a written agreement if the system is receiving all its water from another system under an agreement.

The reports have been prepared by the Ontario Clean Water Agency (OCWA) on behalf of the Owner and presented to council as the 2021 Annual/Summary Report.



South River Drinking Water System

Section 11

2021 ANNUAL REPORT



Section 11 - ANNUAL REPORT

1.0 Introduction

Drinking-Water System Name: SOUTH RIVER DRINKING WATER SYSTEM
Drinking-Water System No.: 220013562
Drinking-Water System Owner: The Corporation of the Village of South River
Drinking-Water System Category: Large Municipal, Residential System
Period being reported: January 1, 2021 to December 31, 2021

Does your Drinking Water System serve more than 10,000 people? No

Is your annual report available to the public at no charge on a web site on the Internet? Yes,

<https://southriver.ca/en/community-services/water-department>

Location where Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.

South River Municipal Office,
63 Marie Street,
South River, Ontario
P0A 1X0

Drinking Water Systems that receive drinking water from the South River Drinking Water System

The South River Drinking Water System (DWS) provides all drinking water to the community of South River.

The Annual Report was not provided to any other Drinking Water System Owners.

The Ontario Clean Water Agency prepared the 2021 Annual/Summary Report for the South River DWS and provided a copy to the system owner; the Corporation of the Village of South River. The South River DWS is a stand-alone system that does not receive water from or send water to another system.

Notification to system users that the Annual Report is available for viewing is accomplished through:

- A notice which is posted on the Village website that the annual report is available for viewing in the public binder at the municipal office.



- A newsletter is included Bi-monthly with the municipal utility billing.
- Discussions during public council meetings.

2.0 Description of the Drinking Water System (DWS No. 220013562)

The South River Drinking Water System (DWS) is owned by The Corporation of the Village of South River and consists of a Class 3 water treatment subsystem and a Class 1 water distribution subsystem. The Ontario Clean Water Agency is designated as the Overall Responsible Operator for the South River Water Treatment Plant (WTP) and the South River Water Distribution System.

The South River DWS has an approved rated capacity of 1680 m³/day and provides a potable water supply to the Village of South River.

Raw Water Supply

The plant raw water intake consists of a 300 millimeter (mm) diameter intake pipe extending 232 meters (m) into Forest Lake, with a flared elbow in a wooden and concrete crib located at a depth of 4.5 m. The low lift pumping station is located approx. 170 m south of Howard Street off the gravel access road. The low lift pumping station consists of a raw water well, dual manual screens and three (3) submersible pumps (two duty pumps and one standby), each rated at 10.0 litres per second (L/s) at 11.0 m of total dynamic head (TDH) that pump water to the treatment plant. In accordance with the Permit To Take Water (PTTW), the allowable rate of water taking is 19.3 L/s with a maximum daily volume of 1680 cubic meters per day (m³/d).

Water Treatment

The South River Water Treatment facility, owned by the Village of South River, was commissioned in May of 2000. The plant provides full conventional treatment to raw water drawn from Forest Lake, a dam controlled section of the South River. Treatment consists of chemically assisted coagulation, flocculation, clarification and filtration in dual package plants followed by disinfection with sodium hypochlorite before entering the distribution system. This is a pressurized system due to there being no elevated treated water storage reservoir in the community. The water treatment facility consists of two (2) Conventional Napier Reid package plants each rated at 840 m³/d with flocculation tanks, up flow clarifiers, and filters each consisting of multi-media that includes Garnet Sand, Silica Sand, Greensand Plus and Granular Activated Carbon (GAC) both with surface areas of 4.49 square meters (m²). The chemical feed system consists of two (2) coagulant (polyaluminum chloride (PACl)) metering pumps, one (1) duty and one (1) standby, each with the capacity of 30 litres per hour (L/hour) and one (1) 15 cubic meters (m³) storage tank; three (3) alkalinity and pH adjustment (soda ash) metering pumps with a capacity of 30 L/hour and one storage tanks; two (2) post disinfection (sodium hypochlorite) metering pumps, each rated at 7.5 L/hour and two storage tanks; two (2) pre-oxidizer (potassium permanganate (KMNO₄)) metering pump with a capacity of 18 L/hour and one (1) storage tank. Raw water entering the plant is injected with soda ash and PACl. Sodium hydroxide was replaced by Soda Ash August 10, 2016. Soda ash offers numerous advantages such as affordability, ease and safety of handling and transportation. Furthermore, Soda Ash is more effective at increasing alkalinity. Aluminum sulphate (Alum) was replaced by PACl June 7, 2017. PACl has greater flexibility, coagulates at a wider pH range, creates better floc formation at low temperatures, requires lower dosage, reduces sludge production and reduces wear on pumping



equipment due to the lower dosing rates. Following rapid mixing, the water flows into the flocculation tank. Treated water overflows from the clarifiers through two multimedia filters consisting of Garnet Sand, Silica Sand and GAC. Recently, Greensand Plus was incorporated to assist with iron and manganese removal. Filtered water is then injected with a 12% sodium hypochlorite solution and directed to a baffled clear well reservoir located beneath the plant. Treated water is pumped from the clearwell, and directed to the distribution system by a high lift pumping system. A second chlorination point and pH adjustment is available prior to the point of entry to the distribution system, if needed.

A six month trial using KMNO_4 began December 20, 2017. The six month trial involved injecting KMNO_4 at the raw water header. An existing pre-chlorination injection system originally incorporated at the facility on the raw water header intended for sodium hypochlorite was utilized for the KMNO_4 . Sodium hypochlorite was trialed in 2016 at 12% concentration, but with near freezing surface water temperatures and detention time of the package plants the oxidation process was ineffective. In an attempt to improve treated water quality KMNO_4 was used as a pre-oxidizing agent. Based on a review of published jar testing reports with similar raw characteristics, it was proposed that depending on iron and manganese concentrations the dosage range for KMNO_4 would be approximately 1.5 to 4.0 milligrams per litre (mg/L). Continuous monitoring of the iron and manganese concentrations as well as subsequent jar testing was the basis for dosage. However, the intention was to slightly under-dose KMNO_4 which would oxidize most of the iron and manganese to eliminate potential colour related issues in the drinking water system rather than overshoot with potential for pink treated water occurrences. Using KMNO_4 suited the water quality in South River due to fluctuations of iron and manganese levels caused by thermal turnover. KMNO_4 trial successful as of June 20, 2018 and is now permanently being used as a pre-oxidizing agent.

Water Storage and Pumping Capabilities

An in ground clearwell reservoir located under the facility has the approximate capacity of 1,536 m^3 of useable storage. The water supply system is a pressurized system. High lift pumps at the treatment facility run continually to maintain water pressure in the water distribution system piping which delivers the treated water to the systems users. There are four high lift pumps, two (2) pumps each rated at 7 L/s at a TDH of 45 m; two (2) pumps each rated at 14 L/s at a TDH of 45 m. The high lift pumps are controlled by variable frequency drives and sequence automatically to maintain system pressure and flow demands. In addition there are two (2) high lift fire pumps each rated at 56 L/s at a TDH of 38 m.

Waste Management

A wastewater treatment system consists of a two cell backwash holding tank / settling tank with approximately 210 m^3 total capacity; one (1) sludge pump rated at 5.0 L/s pumping to a 4500 L sludge storage tank and a two (2) unit bag sludge dewatering system. Process waste is generated at the South River WTP from clarifier blowdown to remove sludge and filter backwashing. The sludge from the clarifier blow down is directed to the sludge thickening tank with the decant from this tank being directed to the clarification tank. The filter backwash water goes to the clarification tank with the sludge that is built up pumped to the sludge thickening tank. The supernatant from the clarification tank is decanted and discharged to a storm sewer which discharges to the lake. The sludge from the sludge thickening tank is pumped to the sludge bagging system 3-5 times/week for disposal. Composite samples of the effluent are collected monthly.



Emergency Power

Standby emergency power is provided by one (1) 135 kilowatt (kW) radiator cooled diesel generator housed in a separate building. It has one (1) double walled external fuel tank with the capacity of 1135 L for diesel fuel storage.

Distribution System

The South River DWS is classified as a Large Municipal Residential Drinking Water System which serves a population of approximately 1100 consumers, with around 500 connections. The South River distribution system consists of a mixture of cast iron, ductile iron, asbestos and polyvinyl chloride (PVC) piping ranging in size from 300 mm in diameter down to 50 mm diameter. As of December 2010 there is: 250 m of 50 mm, 1984 m of 100 mm, 6657 m of 150 mm, 1401 m of 200 mm, 1451 m of 250 mm, and 685 m of 300 mm. The length of the entire system is therefore approximately 12.43 kilometers (km). There are 11 dead end locations and 66 fire hydrants. There is no water storage tower or reservoir in the distribution system. The distribution system typically undergoes routine flushing twice a year, in the spring and in the fall.

3.0 List of Water Treatment Chemicals Used Over the Reporting Period

The following chemicals were used in the treatment process at the South River Water Treatment Plant.

- Polyaluminum Chloride (PACl) - Coagulation/Flocculation
- Potassium Permanganate (KMNO₄) – Iron and Manganese Control
- Magnafloc LT27AG Anionic Polymer – Sludge Waste System
- Sodium Carbonate (Soda Ash) – Alkalinity and pH Adjustment
- Sodium Hypochlorite – Disinfection

4.0 Significant Expenses Incurred in the Drinking Water System

OCWA is committed to maintaining the assets of the drinking water system and maintains a program of scheduled inspection and maintenance activities using a computerized Work Management System (WMS). OCWA implemented a new Workplace Management System (Maximo) in 2015, which better maintains and optimizes facility assets. All routine maintenance activities conducted at the water treatment plant were accomplished in 2021.

Significant expenses incurred in the drinking water system include:

- GAC media replaced and Greensand Plus incorporated to assist with iron and manganese removal for each filter. Form 2 and Director's Notification completed.
- Coagulant aid system removal due to the use of PACl. Form 2 and Director's Notification completed.
- Larger waste system polymer day tank installed, larger tank allows for better mixing. Form 2 completed.
- Sodium hypochlorite injection point switched from common filter effluent stream to individual filter effluent streams. Form 2 and Director's Notification completed.



- Addition of potassium permanganate injection point and pump at the backwash header with second pump, to aid in regeneration of greensand media. Form 2 and Director's Notification completed.
- Removed single large capacity sodium hypochlorite polyethylene storage tank with incorporation of two smaller capacity polyethylene tanks separately dedicated to each Package Plant Chlorine injection for trial monitoring of individual dosing. Form 2 and Director's Notification completed.
- Utilize abandoned common Post Filter Chlorine Injection point for Atmospheric Vacuum Air Injection to incorporate maximum dissolved oxygen potential within Filter streams. This method will be evaluated long term for effects on potential disinfection by-product reduction and increased oxygen temperature dependent based solubility influencing treated water palatability. Water source prone to seasonal movement variability and cover from freeze-over where oxygen interference could result in periodic concentration reduction. Form 2 completed.
- Replacement waste tank polymer injection peristaltic pump ordered.
- Plant #1 filter to waste valve actuator failed. A replacement ordered.

5.0 Drinking Water System Highlights

- The Ministry of the Environment, Conservation and Parks (MECP) performed an annual inspection on December 9, 2020. The inspection included a physical assessment of the South River WTP and a document review. The system received a risk rating of 0.0 % and a final inspection rating of 100 %. Another MECP inspection held on October 26, 2021. The inspection included a physical assessment of the South River WTP and a document review. One non-compliance item identified and addressed. The system received a risk rating of 0.0 % and a final inspection rating of 100 %.
- SAI Global conducted an off-site external 12-month surveillance audit of the South River Drinking Water System's Quality and Environmental Management System (QEMS). The system and processes associated with the QEMS were evaluated on May 12, 2021 to ensure implementation of the Operational Plan and procedures and conformance to the Drinking Water Quality Management Standard. There was one (1) opportunity for improvement (OFI) identified, which has been resolved. Re-accreditation achieved on May 21, 2019.
- Electrical Safety Authority (ESA) Inspection completed on November 26, 2021, no defects identified.
- Proactively sampling for microcystins from June to October, to ensure no contamination due to blue green algae.

6.0 Details on Notices of Adverse Test Results and Other Problems Reported to & Submitted to the Spills Action Center

Based on information kept on record by OCWA, zero (0) adverse water quality incidents were reported to the Ministry of the Environment's Spills Action Centre (MOE SAC) in 2021; however, one spill was reported, details below.

SAC Reference 1-GH993 – Supernatant Spill

Start Date & Time: May 21, 2021 at 0930 hours

Termination: May 21, 2021 at 0935 hours

Duration: 5 minutes

Approximate volume: 0.1 m³

Details: While wasting sludge from package plants into waste system, level exceeded and entered overflow header and out onto ditch surface.

Receiver: N/A

Actions: Sludge residual cleaned up.

Reporting: Verbal & written reports to MOE SAC, faxed to EC as required, also notification made to local MECF inspector Vesna Alimpic via email.

7.0 Microbiological Testing Performed During the Reporting Period

Summary of Microbiological Data

Sample Type	No. of Samples	Range of <i>E. coli</i> Results (min to max)	Range of Total Coliform Results (min to max)	# of HPC Samples	Range of HPC Results (min to max)
Raw (Lake)	52	0 to NDOGT	2 to NDOGT	0	N/A
Treated	52	0 to 0	0 to 0	52	0 to 2
Distribution	156	0 to 0	0 to 0	53	0 to 1

Maximum Allowable Concentration (MAC) for *E. coli* = 0 Counts/100 mL

MAC for Total Coliforms = 0 Counts/100 mL

“<” denotes less than the laboratory’s method detection limit.

NDOGT = No Data, Overgrown with Target

NDOGHPC = No Data, Overgrown with HPC

Notes: One microbiological sample is collected and tested each week from the raw and treated water supply. A total of three microbiological samples are collected and tested each week from the South River distribution system.

Refer to *Appendix A* for a monthly summary of microbiological test results.

8.0 Operational Testing Performed During the Reporting Period

Continuous Monitoring in the Treatment Process

Parameter	No. of Samples	Range of Results (min to max)	Unit of Measure
Filter #1 Turbidity	8760	0.009 to 1.82	NTU
Filter #2 Turbidity	8760	0.0 to 2.0	NTU
Free Chlorine	8760	1.05 to 4.95	mg/L

Notes: For continuous monitors 8760 is used as the number of samples.

CT is the concentration of chlorine in the water times the time of contact that the chlorine has with the water. It is used to demonstrate the level of disinfection treatment in the water. CT calculations are performed and/or CT is verified via plant SCADA for the South River water plant if the free chlorine residual level drops below 1.00 mg/L to ensure primary disinfection is achieved.



Effective backwash procedures, including filter to waste are in place to ensure that the effluent turbidity requirements are met all times. The plant is configured to shut down and creates a callout whenever turbidity reaches 1.00 NTU for 0 seconds.

Summary of Chlorine Residual Data in the Distribution System

Parameter	No. of Samples	Range of Results (min to max)	Unit of Measure	Standard
Free Chlorine	364	0.32 to 3.40	mg/L	0.05

Note: A total of seven operational checks for chlorine residual in the distribution system are collected each week. Four (4) samples are tested one day and three (3) on a second day. The sample sets are collected at least 48-hours apart and samples collected on the same day are from different locations.

Refer to *Appendix B* for a monthly summary of the above operational data.

Summary of Nitrate & Nitrite Data (sampled at the water treatment plant)

Date of Sample	Nitrate Result Value	Nitrite Result Value	Unit of Measure	Exceedance
January 18	0.053	< 0.003	mg/L	No
April 19	0.298	< 0.003	mg/L	No
July 20	0.067	< 0.003	mg/L	No
October 25	0.060	< 0.003	mg/L	No

Maximum Allowable Concentration (MAC) for Nitrate = 10 mg/L
 MAC for Nitrite = 1 mg/L

Summary of Total Trihalomethane Data (sampled in the distribution system)

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
Jan. 18	29.0	ug/L	49.50	No
Apr. 19	30.0			
July 20	51.0			
Oct. 25	88.0			

Maximum Allowable Concentration (MAC) for Total Trihalomethanes = 100 ug/L (Four Quarter Running Average)

Summary of Total Haloacetic Acids Data (sampled in the distribution system)

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
Jan. 18	29.8	ug/L	36.90	No
Apr. 19	28.6			
July 20	32.1			
Oct. 25	57.1			

Maximum Allowable Concentration (MAC) for Total Haloacetic Acids= 80 ug/L (Four Quarter Running Average)



Summary of Most Recent Lead Data

(Applicable to the following drinking water systems; large municipal residential systems, small, municipal residential systems, and non-municipal year-round residential systems)

The South River DWS was eligible to follow the “Exemption from Plumbing Sampling” as described in section 15.1-5(9) and 15.1-5(10) of Schedule 15.1 of Ontario Regulation 170/03. The exemption applies to a drinking water system if, in two consecutive periods at reduced sampling, not more than 10% of all samples from plumbing exceed the maximum allowable concentration (MAC) of 10 ug/L for lead. As such, the system was required to test for lead, total alkalinity and pH in two distribution sample collected during the periods of December 15 to April 15 (winter period) and June 15 to October 15 (summer period). This testing is required in every 12-month period with lead testing in every third 12-month period.

Two rounds of lead, alkalinity and pH testing were carried out on April 12th and October 7th of 2021. Results are summarized in the table below.

Summary of Lead, pH & Alkalinity Data

Date of Sample	No. of Samples	Sample Location/ID	Lead (mg/L)	Field pH	Alkalinity (mg/L)
April 12	1	Hydrant #61	0.0001	7.21	16.0
April 12	1	Hydrant #26	<0.0001	7.65	16.1
Oct. 7	1	Hydrant #61	0.0005	7.23	34.7
Oct. 7	1	Hydrant #26	0.0003	7.31	32.1

Most Recent Schedule 23 Inorganic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	Standard	Exceedance
Antimony	<MDL 0.9	ug/L	6	No
Arsenic	<MDL 0.2	ug/L	10	No
Barium	13.0	ug/L	1000	No
Boron	5.0	ug/L	5000	No
Cadmium	<MDL 0.003	ug/L	5	No
Chromium	1.35	ug/L	50	No
Mercury	<MDL 0.01	ug/L	1	No
Selenium	0.1	ug/L	50	No
Uranium	0.023	ug/L	20	No

Note: Sample required every 12 months (sample date = January 18, 2021)



Most Recent Schedule 24 Organic Data Tested at Water Treatment Plant

TREATED WATER	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Alachlor (ug/L) - TW	2021/01/18	<MDL 0.02	5.0	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2021/01/18	<MDL 0.01	5.0	No	No
Azinphos-methyl (ug/L) - TW	2021/01/18	<MDL 0.05	20.0	No	No
Benzene (ug/L) - TW	2021/01/18	<MDL 0.32	1.0	No	No
Benzo(a)pyrene (ug/L) - TW	2021/01/18	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW	2021/01/18	<MDL 0.33	5.0	No	No
Carbaryl (ug/L) - TW	2021/01/18	<MDL 0.05	90.0	No	No
Carbofuran (ug/L) - TW	2021/01/18	<MDL 0.01	90.0	No	No
Carbon Tetrachloride (ug/L) - TW	2021/01/18	<MDL 0.17	2.0	No	No
Chlorpyrifos (ug/L) - TW	2021/01/18	<MDL 0.02	90.0	No	No
Diazinon (ug/L) - TW	2021/01/18	<MDL 0.02	20.0	No	No
Dicamba (ug/L) - TW	2021/01/18	<MDL 0.2	120.0	No	No
1,2-Dichlorobenzene (ug/L) - TW	2021/01/18	<MDL 0.41	200.0	No	No
1,4-Dichlorobenzene (ug/L) - TW	2021/01/18	<MDL 0.36	5.0	No	No
1,2-Dichloroethane (ug/L) - TW	2021/01/18	<MDL 0.35	5.0	No	No
1,1-Dichloroethylene (ug/L) - TW	2021/01/18	<MDL 0.33	14.0	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2021/01/18	<MDL 0.35	50.0	No	No
2,4-Dichlorophenol (ug/L) - TW	2021/01/18	<MDL 0.15	900.0	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2021/01/18	<MDL 0.19	100.0	No	No
Diclofop-methyl (ug/L) - TW	2021/01/18	<MDL 0.4	9.0	No	No
Dimethoate (ug/L) - TW	2021/01/18	<MDL 0.06	20.0	No	No
Diquat (ug/L) - TW	2021/01/18	<MDL 1.0	70.0	No	No
Diuron (ug/L) - TW	2021/01/18	<MDL 0.03	150.0	No	No
Glyphosate (ug/L) - TW	2021/01/18	<MDL 1.0	280.0	No	No
Malathion (ug/L) - TW	2021/01/18	<MDL 0.02	190.0	No	No
Metolachlor (ug/L) - TW	2021/01/18	<MDL 0.01	50.0	No	No
Metribuzin (ug/L) - TW	2021/01/18	<MDL 0.02	80.0	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2021/01/18	<MDL 0.3	80.0	No	No
Paraquat (ug/L) - TW	2021/01/18	<MDL 1.0	10.0	No	No
PCB (ug/L) - TW	2021/01/18	<MDL 0.04	3.0	No	No
Pentachlorophenol (ug/L) - TW	2021/01/18	<MDL 0.15	60.0	No	No
Phorate (ug/L) - TW	2021/01/18	<MDL 0.01	2.0	No	No
Picloram (ug/L) - TW	2021/01/18	<MDL 1.0	190.0	No	No
Prometryne (ug/L) - TW	2021/01/18	<MDL 0.03	1.0	No	No
Simazine (ug/L) - TW	2021/01/18	<MDL 0.01	10.0	No	No
Terbufos (ug/L) - TW	2021/01/18	<MDL 0.01	1.0	No	No
Tetrachloroethylene (ug/L) - TW	2021/01/18	<MDL 0.35	10.0	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2021/01/18	<MDL 0.2	100.0	No	No
Triallate (ug/L) - TW	2021/01/18	<MDL 0.01	230.0	No	No
Trichloroethylene (ug/L) - TW	2021/01/18	<MDL 0.44	5.0	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2021/01/18	<MDL 0.25	5.0	No	No
2-methyl-4-chlorophenoxyacetic acid (MCPA) (ug/L) - TW	2021/01/18	<MDL 0.12	100.0	No	No
Trifluralin (ug/L) - TW	2021/01/18	<MDL 0.02	45.0	No	No
Vinyl Chloride (ug/L) - TW	2021/01/18	<MDL 0.17	1.0	No	No

Note: Sample required every 12 months (sample date = January 18, 2021)

Inorganic or Organic Test Results that Exceeded Half the Standard Prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards.

No inorganic or organic parameter(s) listed in Schedule 23 and 24 of Ontario Regulation 170/03 exceeded half the standard found in Schedule 2 of the Ontario Drinking Water Standard (O. Reg. 169/03) during the reporting period.



Most Recent Sodium Data Sampled at the Water Treatment Plant

Date of Sample	No. of Samples	Result Value	Unit of Measure	Standard	Exceedance
January 18, 2021	1	49.3	mg/L	20	Yes (see note)
January 20, 2020	1	50.3	mg/L	20	Yes (see note)
January 22, 2018(Compliance)	1	24.6	mg/L	20	Yes (AWQI #138657)
January 30, 2018 (resample)	1	24.0	mg/L	20	Yes (AWQI #138657)

Note: Sample required every 60 months. Next sampling scheduled for January 2023.

The aesthetic objective for sodium in drinking water is 200 mg/L at which it can be detected by a salty taste. It is required that the local Medical Officer of Health be notified when the concentration exceeds 20 mg/L so that persons on sodium restricted diets can be notified by their physicians. The adverse sodium result was reported to MOE SAC and the NBPSDHU on January 29, 2018 as required under Schedule 16 of O. Reg. 170/03 (AWQI# 138657).

Most Recent Fluoride Data Sampled at the Water Treatment Plant

Date of Sample	No. of Samples	Result Value	Unit of Measure	Standard	Exceedance
January 18, 2021	1	<0.06	mg/L	1.5	No

Note: Sample required every 60 months. Next sampling scheduled for January 2026.

Summary of Additional Testing Performed in Accordance with a Legal Instrument.

Condition 1.5 of Schedule C to Municipal Drinking Water Licence (MDWL) #200-101 requires that the annual average concentration of total suspended solids (TSS) from the effluent discharged to Forest Lake not exceed 25 mg/L. Further, Condition 4.4 of Schedule C to the MDWL requires that composite samples are collected every month.

The South River Water Treatment Plant did not exceed this limit in 2021.

Summary of Total Suspended Solids Data from the Effluent Discharge

Date of Sample	No. of Samples	Result Value	Unit of Measure	Annual Average	Limit
January	1	21	mg/L	6.25	25
February	1	4			
March	1	4			
April	1	6			
May	1	5			
June	1	4			
July	1	4			
August	1	3			
September	1	9			
October	1	4			
November	1	6			
December	1	5			



South River Drinking Water System

Schedule 22

2021 SUMMARY REPORT

FOR MUNICIPALITIES



Schedule 22 - SUMMARY REPORTS FOR MUNICIPALITIES

1.0 Introduction

Drinking-Water System Name:	SOUTH RIVER DRINKING WATER SYSTEM
Municipal Drinking Water Licence (MDWL) No.:	200-101-4 (issued January 15, 2021)
Drinking Water Work Permit (DWWP) No.:	200-201-4 (issued January 15, 2021)
Permit to Take Water (PTTW) No.:	4340-BA6RUQ (issued March 14, 2019)
Period being reported:	January 1, 2021 to December 31, 2021

2.0 Requirements the System Failed to Meet

According to information kept on record by OCWA, the South River Drinking Water System has complied with all the requirements set out in the system's MDWL, its DWWP, the Act and its Regulations.

The previous MECP inspection report dated December 9, 2020 identified zero non-compliance items and 4 best management practices from 2020, all items have been addressed.

The latest MECP inspection report dated October 26, 2021 identified one non-compliance item. Item has been addressed.

According to the information kept on record by OCWA; there was one non-compliance issues during 2021, as noted in recent inspection report.

Also, it should be noted that, zero (0) adverse water quality incidents were reported to the MOE's Spills Action Center; however, one spill was reported. Refer to *Section 6.0 – Details on Notices of Adverse Test Results and Other Problems Reported to & Submitted to the Spills Actions Center* on page 8 of this report for details.



Issue Identified in Report/Order	Required Action or Recommendation Identified in Report/Order	Resp.for Action Item? <i>(Client, OCWA, Joint)</i>	Issue Analysis	Status <i>(Complete or In Progress)</i>
<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. 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:</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. 	<p>- 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:</p> <ul style="list-style-type: none"> - 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: <p>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.</p> 	<p>Joint</p>	<p>Village approved following plan: In the near term: Waste Tanks to be pumped twice annually preferably in January/February and August/September to better maintain sludge blanket especially since historically rapid accumulation occurs beginning in December.</p> <p>Add external alarming. Completed on January 7, 2021.</p> <p>For planning and future capital approval: Replace current pressure based transducer embedded in Waste Clarifier Tank where Decant Pump is located with an overhead Ultrasonic device to allow for more accurate measurements. To be completed within 6 months.</p> <p>Plan sent to MECP on January 6, 2021. The issuing Provincial Officer accepted the action plan on January 7, 2021, prior to requested date of February 4, 2022. Will remain in progress until all upgrades completed.</p>	<p>In Progress</p>



3.0 Summary of Quantities and Flow Rates

Flow Monitoring

MDWL No. 200-101 requires the owner to install a sufficient number of flow measuring devices to permit the continuous measurement and recording of:

- the flow rate and daily volume of treated water that flows from the treatment subsystem the distribution system, and
- the flow rate and daily volume of water that flows into the treatment subsystem.

The flow monitoring equipment identified in the MDWL is present and operating as required. These flow meters are calibrated on an annual basis as specified in the manufacturers' instructions.

Water Usage

The following water usage tables summarize the quantities and flow rates of water taken and produced during the 2021 reporting period, including total monthly volumes, average monthly volumes, maximum monthly volumes, and maximum flow rates.

Raw Water

2021 - Monthly Summary of Water Takings from the Source (Forest Lake)

Regulated by Permit to Take Water (PTTW) #4340-BA6RUQ , issued March 14, 2019

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	17269	13661	14469	13735	11190	13301	13679	12628	11989	14352	12051	12819	161142
Average Volume (m ³ /d)	557	488	467	458	361	443	441	407	400	463	402	414	442
Maximum Volume (m ³ /d)	765	754	609	742	603	619	600	559	610	648	595	657	765
PTTW - Maximum Allowable Volume (m ³ /day)	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680
Maximum Flow Rate (L/min)	581	807	516	560	496	816	514	707	908	573	517	561	908
PTTW - Maximum Allowable Flow Rate (L/min)	1160	1160	1160	1160	1160	1160	1160	1160	1160	1160	1160	1160	1160

The system's Permit to Take Water #4340-BA6RUQ allows the municipality to withdraw a maximum volume of 1680 cubic meters from Forest Lake each day. A review of the raw water flow data indicates that the system never exceeded this allowable limit having a maximum volume of 765 m³ in January 2021. The Permit also allows a maximum flow rate of 1160 litres per minute (L/min). At no point during the reporting period did the system exceed this rate having a maximum recorded flow of 908 L/min in September 2021.



Treated Water

2021 - Monthly Summary of Treated Water Supplied to the Distribution System

Regulated by Municipal Drinking Water Licence (MDWL) #200-101 - Issue 4, issued Jan. 15, 2021

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	14570	11467	11346	10867	9965	10992	10709	10337	9800.3	11707	9191	9510	130461
Average Volume (m ³ /d)	470	410	366	362	321	366	345	333	327	378	306	307	358
Maximum Volume (m ³ /d)	636	640	419	602	384	456	503	375	405	846	404	336	846
MDWL - Rated Capacity (m ³ /day)	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680	1680

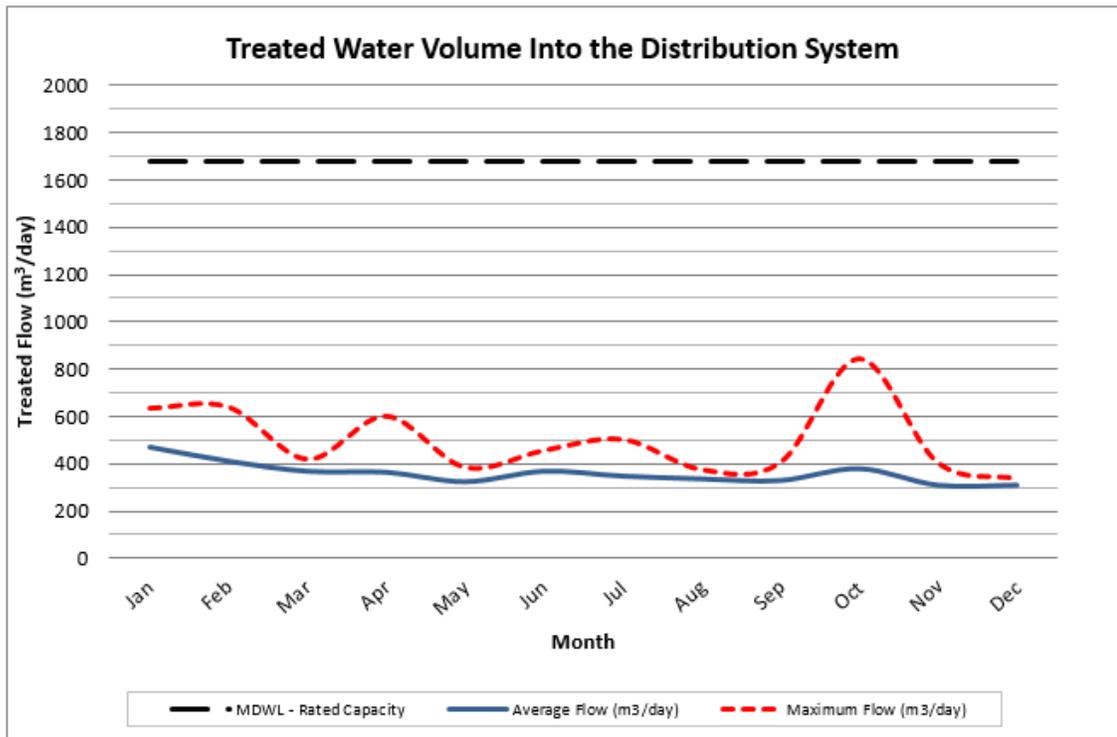
Schedule C, Section 1.1 of MDWL No. 200-101 states that the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed a maximum flow rate of 1680 m³ on any calendar day. The South River DWS complied with this limit having a recorded maximum volume of 846 m³/day in October 2021, which is 50.4% of the rated capacity.

Figure 1 compares the average and maximum flow rates into the distribution system to the rated capacity of the system identified in the MDWL. This information enables the Owner to assess the system's existing and future planned water usage needs.

Comparison of the Flow Summary to Systems Licence & Permit

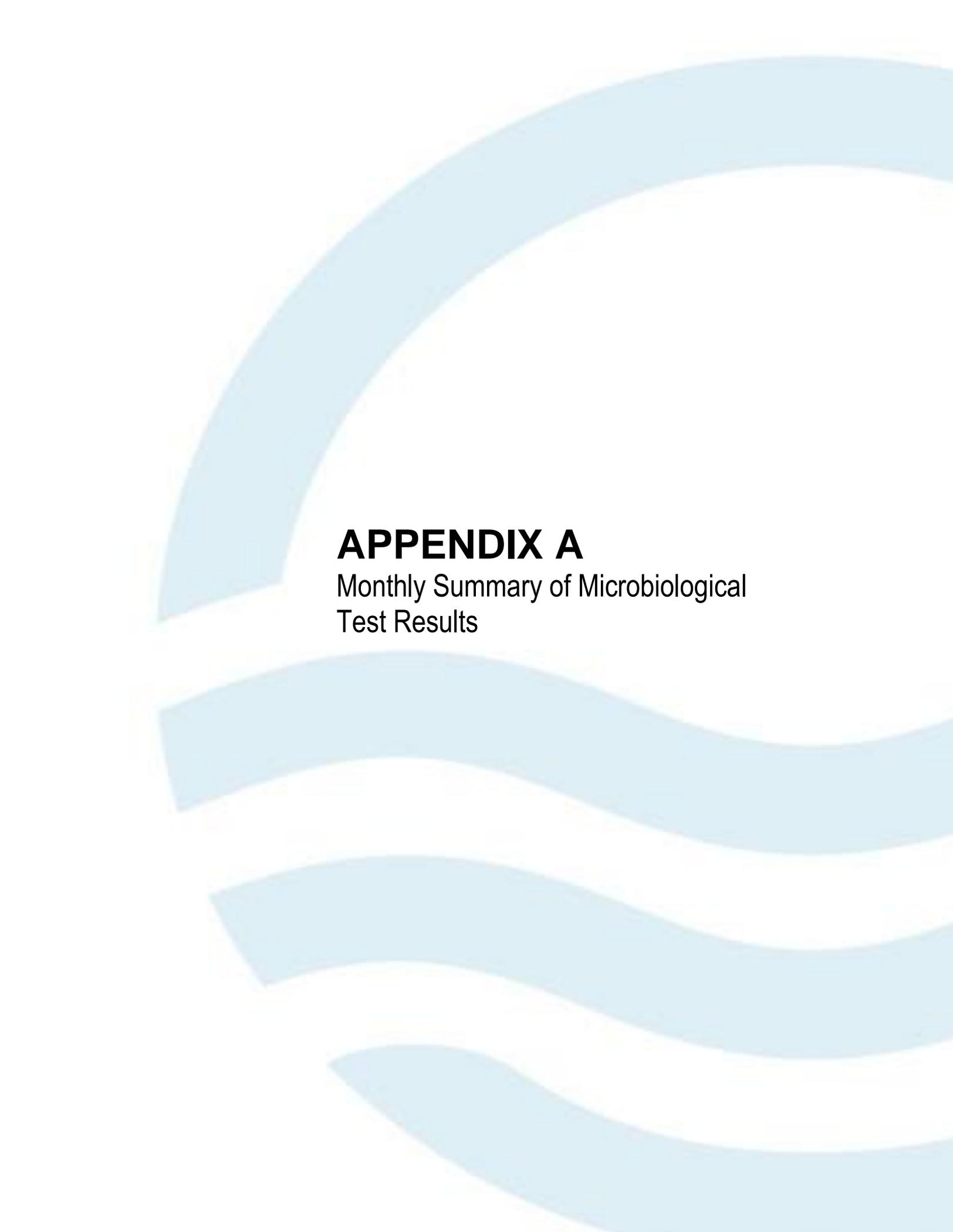
Rated Capacity of the Plant (MDWL)	1680 m ³ /day	
Average Daily Flow for 2021	358 m ³ /day	21.3% of the rated capacity
Maximum Daily Flow for 2021	846 m ³ /day	50.4% of the rated capacity
Total Treated Water Produced in 2021	130,461 m ³	

The South River WTP is rated to produce 1680 cubic meters of water per day as specified in the system's Municipal Drinking Water Licence. The average daily flow was 358 m³ per day, which is 21.3% of the rated capacity. This information clearly shows that the plant is well within its rated capacity and is able to meet current demands of consumers.



CONCLUSION

In 2021, according to information kept on record by OCWA; the South River DWS met the terms and conditions outlined in its site specific drinking water works permit and municipal drinking water licence having zero adverse water quality incidents and one incident of non-compliance during the reporting period. The system was able to operate within the water taking limits of the permit and in accordance with the rated capacity of the licence while meeting the community's demand for water use.



APPENDIX A

Monthly Summary of Microbiological
Test Results

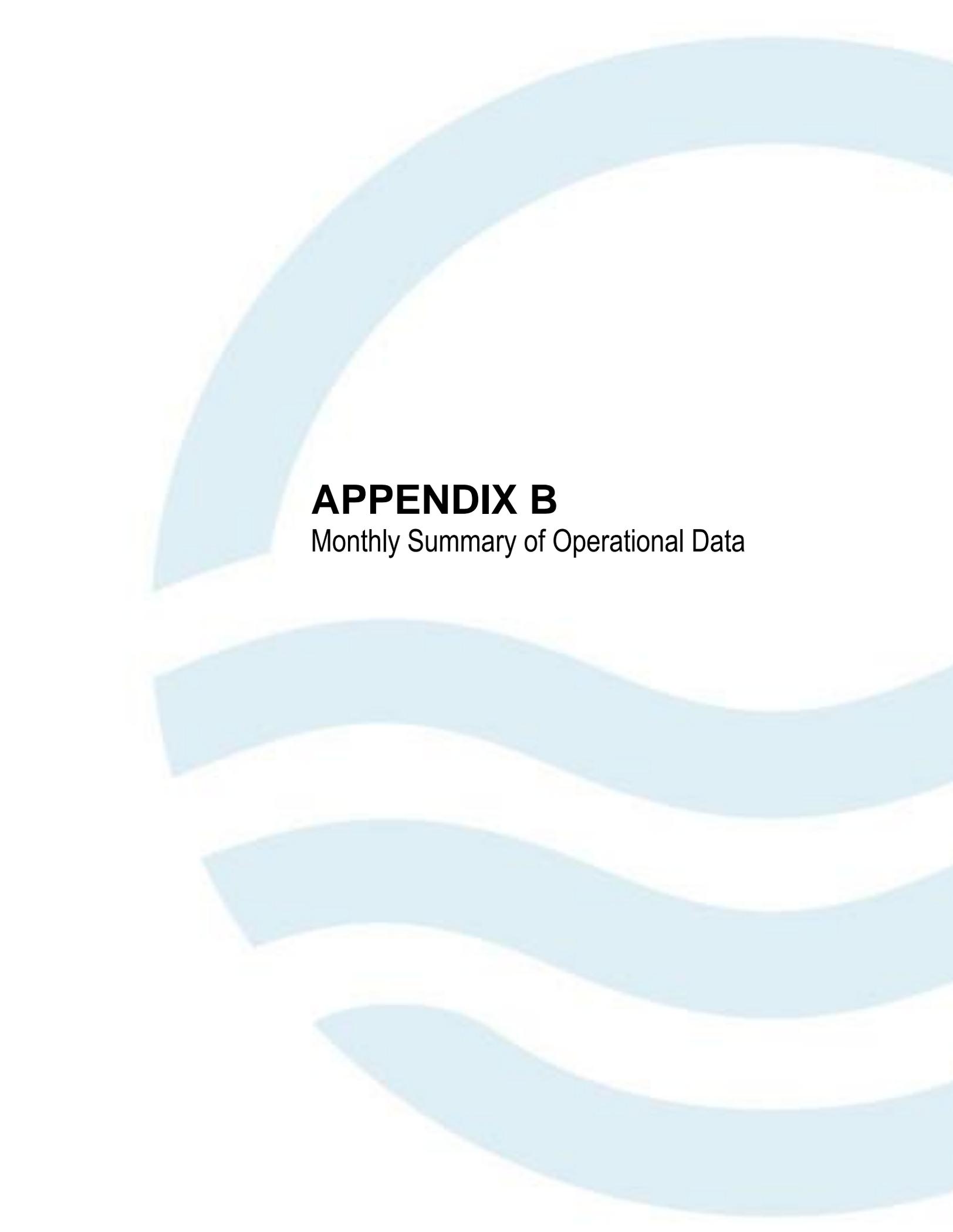
**South River Drinking Water System
Monthly Summary of Microbiological Test Results**

From: 01/01/2021 to 31/12/2021

Report extracted 01/18/2022 13:47

Facility Org Number: 5083
Facility Works Number: 220013562
Facility Name: SOUTH RIVER DRINKING WATER SYSTEM
Facility Owner: Municipality: The Corporation of the Municipality of South River
Facility Classification: Class 3 Water Treatment
Total Design Capacity: 1680.0 m3/day

	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Min
Distribution Water / E. Coli - cfu/100mL																
Count Lab	12	12	15	12	12	15	12	15	12	12	15	12	156			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Distribution Water / HPC - cfu/mL																
Count Lab	4	4	5	4	4	6	4	5	4	4	5	4	53			
Max Lab	0	0	1	1	0	0	0	0	0	0	0	0			1	
Mean Lab	0	0	0.2	0.25	0	0	0	0	0	0	0	0		0.038		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Distribution Water / Total Coliform: TC - cfu/100mL																
Count Lab	12	12	15	12	12	15	12	15	12	12	15	12	156			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Raw Water / E. Coli: EC - cfu/100mL																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	1	20	NDOGT	1	5	20	20	8	60	40	20	1			NDOGT	
Mean Lab	0.25	7.5	2.5	0.5	2.5	4.6	12	2.2	15.25	14.25	5.6	0.25		5.529		
Min Lab	0	1	0	0	0	0	4	0	0	2	1	0				0
Raw Water / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	96	112	NDOGT	83	110	1080	120	22	460	440	102	190			NDOGT	
Mean Lab	67.5	91	89.75	61.5	72.75	464.4	66.5	12.4	129.5	149.25	79	89		118.549		
Min Lab	42	74	39	39	31	122	13	2	2	35	55	52				2
Treated Water / E. Coli: EC - cfu/100mL																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Treated Water / HPC - cfu/mL																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	2	0	0	1	0	0	0	0	1	0	0	0			2	
Mean Lab	0.5	0	0	0.25	0	0	0	0	0.25	0	0	0		0.077		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Treated Water / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0



APPENDIX B

Monthly Summary of Operational Data

**South River Drinking Water System
Monthly Summary of Operational Data**

From: 01/01/2021 to 31/12/2021

Report extracted 01/18/2022 13:59

Facility Org Number: 5083
Facility Works Number: 220013562
Facility Name: SOUTH RIVER DRINKING WATER SYSTEM
Facility Owner: Municipality: The Corporation of the Municipality of South River
Facility Classification: Class 3 Water Treatment
Total Design Capacity: 1680.0 m3/day

	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Min
Distribution Water / CI Residual: Free DW1 - mg/L																
Count IH	8	8	9	9	8	9	9	9	8	9	9	9	104			
Max IH	2.2	2.9	1.98	1.96	2.01	2.7	2.16	2.01	2.5	1.84	2.6	2.6			2.9	
Mean IH	1.644	2.086	1.697	1.592	1.744	1.497	1.418	1.426	1.596	1.296	1.75	1.821		1.625		
Min IH	0.63	1.58	1.38	1.35	1.51	0.97	0.87	0.82	0.83	0.69	0.97	1.19				0.63
Distribution Water / CI Residual: Free DW2 - mg/L																
Count IH	8	8	9	9	8	9	9	9	8	9	9	9	104			
Max IH	2.2	2.3	2.7	1.91	2.11	3.4	1.9	2.2	2.04	1.59	2.2	2.7			3.4	
Mean IH	1.772	1.896	1.902	1.672	1.723	1.824	1.286	1.523	1.734	1.339	1.633	1.92		1.682		
Min IH	1.36	1.65	1.52	1.34	1.51	1.29	0.83	1.04	1.49	1.07	0.91	1.18				0.83
Distribution Water / CI Residual: Free DW3 - mg/L																
Count IH	8	8	9	9	8	9	9	9	8	9	9	9	104			
Max IH	2.14	2.2	2.14	2.2	1.85	2.6	2.6	1.64	2.16	1.86	3	2.03			3	
Mean IH	1.716	1.684	1.839	1.629	1.666	1.728	1.623	1.084	1.468	1.208	1.694	1.518		1.569		
Min IH	1.2	0.71	1.45	1.34	1.38	0.66	1.01	0.32	1.06	0.88	0.9	0.51				0.32
Distribution Water / CI Residual: Free DW4 - mg/L																
Count IH	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max IH	1.74	2.5	2.4	1.69	2.01	2.2	2.5	1.74	1.71	1.2	1.98	1.84			2.5	
Mean IH	1.603	2	1.96	1.553	1.415	1.746	1.568	1.364	1.503	1.083	1.716	1.583		1.599		
Min IH	1.48	1.38	1.54	1.37	0.72	1.24	0.77	1.12	1.26	0.94	1.45	1.38				0.72
Filter 1 / Turbidity - NTU																
Max OL	0.891	1.818	0.464	0.073	0.209	0.373	0.273	0.545	0.409	0.391	0.3	0.182			1.818	
Mean OL	0.015	0.081	0.025	0.018	0.019	0.021	0.025	0.036	0.038	0.024	0.017	0.017		0.028		
Min OL	0.009	0.009	0.009	0.009	0.009	0.018	0.018	0.018	0.018	0.018	0.009	0.009				0.009
Filter 2 / Turbidity - NTU																
Max OL	0.63	0.79	2	0.07	0.6	0.91	0.24	0.45	0.36	0.45	0.24	0.37			2	
Mean OL	0.024	0.018	0.026	0.02	0.021	0.033	0.024	0.029	0.026	0.029	0.021	0.022		0.024		
Min OL	0.01	0.01	0	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02				0
Treated Water / CI Residual: Free (Min = 1.0 mg/L) - mg/L																
Max OL	2.82	3.35	4.95	4.85	4.76	4.52	4.42	3.44	4.28	3.48	4.82	3.55			4.95	
Mean OL	2.365	2.558	2.565	2.383	2.489	2.465	2.412	2.453	2.726	2.627	2.636	2.512		2.516		
Min OL	1.45	1.77	1.45	1.67	1.44	1.18	1.12	1.6	1.65	1.1	1.73	1.05				1.05