

Stirling

Drinking Water System

Annual Water Report

Reporting Period of January 1, 2022- December 31, 2022

This report has been prepared to satisfy the annual reporting requirements of the Provincial Regulations and Guidelines established by the Ministry of Environment and Climate Change including the section 11 and Schedule 22 reports identified in O.Reg 170/03, Drinking Water Systems Regulation and the Permit to Take Water Reports identified in O.Reg 387/04, Water taking and Transfer Regulation.

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Report Availability

Population Served	< 10,000
Website where the annual report can be viewed by the public	www.stirling-rawdon.com
Alternate location where annual report is available free of charge.	Stirling-Rawdon Municipal Office
How the system users are notified that the annual report is available and is free of charge?	Public access/ notice via the web Public access/ notice via newspaper
Number of Designated Facilities Served	None
Has a copy of this report been provided to all Designated Facilities?	N/A
Number of Interested Parties reported to	2
Has a copy of this report been provided to all interested Parties?	Yes
The following Drinking Water Systems receive drinking water from this system	N/A
Has a copy of this report been provided to connected users?	N/A

Compliance Report Card

Drinking Water System Number	220001566
System Owner:	The Corporation of The Township of Stirling-Rawdon
Operating Authority	The Township of Stirling-Rawdon
Drinking Water System Category	Large Municipal Residential
Reporting Period	January 1, 2022 – December 31, 2022

Event Summary	# of Events	Date	Details
Ministry of Environment Conservation and Parks Inspections	1	January 5, 2023	Announced Inspection
Ministry of Labour Inspections	0		
DWQMS Audits	2	(1) November 25 2022 December 2, 2022 (2) December 9, 2022	(1) Internal Audit (2) Surveillance System Audit
AWQI's	0	N/A	N/A
Non-Compliance	0	N/A	
Community Complaints		5	Each complaint was investigated and documented. The majority of the complaints dealt with plumbing issues or water quality concerns that were investigated and determined to be caused by internal plumbing issues.
Spills	0		

Quality Control Measures

The Township of Stirling-Rawdon Drinking Water and Wastewater Facilities are operated by Township of Stirling-Rawdon Staff. Each facility has comprehensive manuals that detail operations, maintenance, instrumentation and emergency procedures. All procedures are kept current and accurate through an annual review process detailed in the Municipalities Drinking Water Quality Management System (DWQMS). Additional quality control measures are exercised by:

- Tracking and implementing maintenance activities through a work order tracking system.
- Use of sampling schedules for external laboratory sampling
- Active member of the Ontario Water/Wastewater Agency Response Network
- Increased calibration frequencies to ensure equipment accuracy.

System Process Description

Raw Source

Raw water sources for the Stirling Drinking Water System are from four separate groundwater wells; Well 1,3,4 and 5. The groundwater wells are considered Ground Water Under The Direct Influence of Surface Water (GUDI) with effective in-situ treatment.

Treatment

The Facility utilizes sodium hypochlorite, and two ultraviolet disinfection units (one duty, one standby) for a two stage primary disinfection treatment. Secondary treatment is provided from the sodium hypochlorite injection at the water treatment plant. The treatment system at the plant has on-line chlorine analyzers for pre and post chlorine residuals, an on-line turbidimeter for treated water turbidity and UV Dosage which is monitored on the individual reactor controls as well as the SCADA/PLC. The SCADA/PLC has alarming capabilities to lock the plant out during a failure of the disinfection system, analyzers or components.

Treatment Chemicals used in the reporting period:

Chemical Name	Use	Supplier
Sodium Hypochlorite	Disinfection	Brenntag

Summary of Non-Compliance

Adverse Water Quality Incidents

Date	AWQI #	Cause			Corrective Action Taken
		Parameter	Result	Exceedance of	
None					

Non-Compliance Identified in a Ministry Inspection:

Ministry of The Environment and Conservation and Parks Inspection Rating of 100%

Legislation	Requirement(s) system failed to meet	Duration of the failure (i.e. date(s))	Corrective Action	Status
None				

Flows

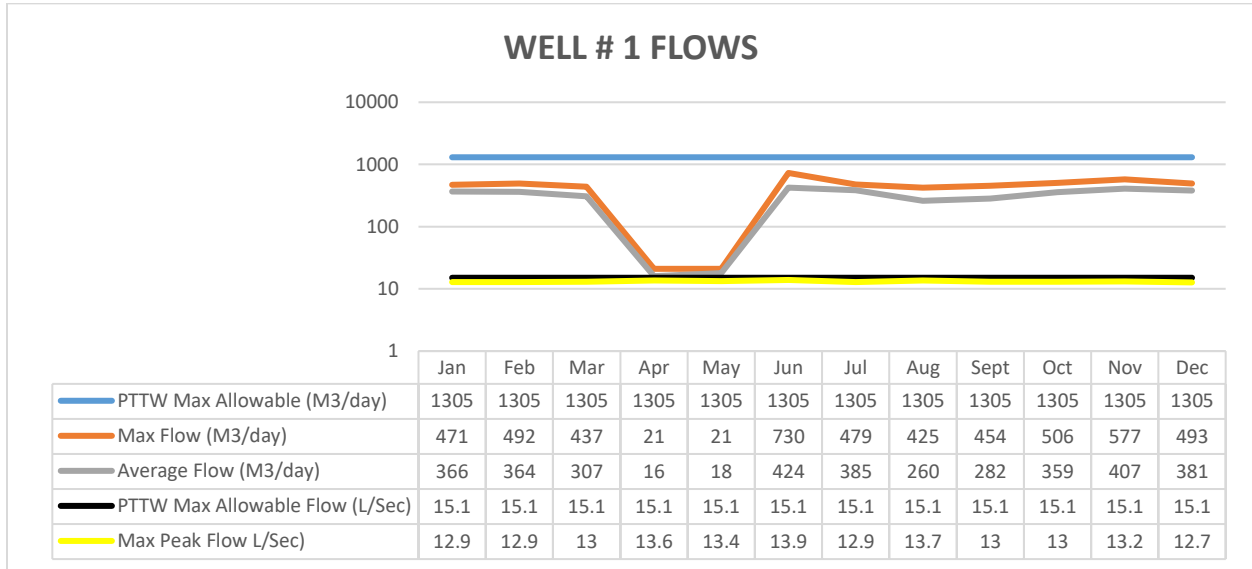
The Stirling Drinking Water System has a rated capacity of 2687 m³/day. Additional flow data can be found under the water taking and transfer data.

Raw Water Flows

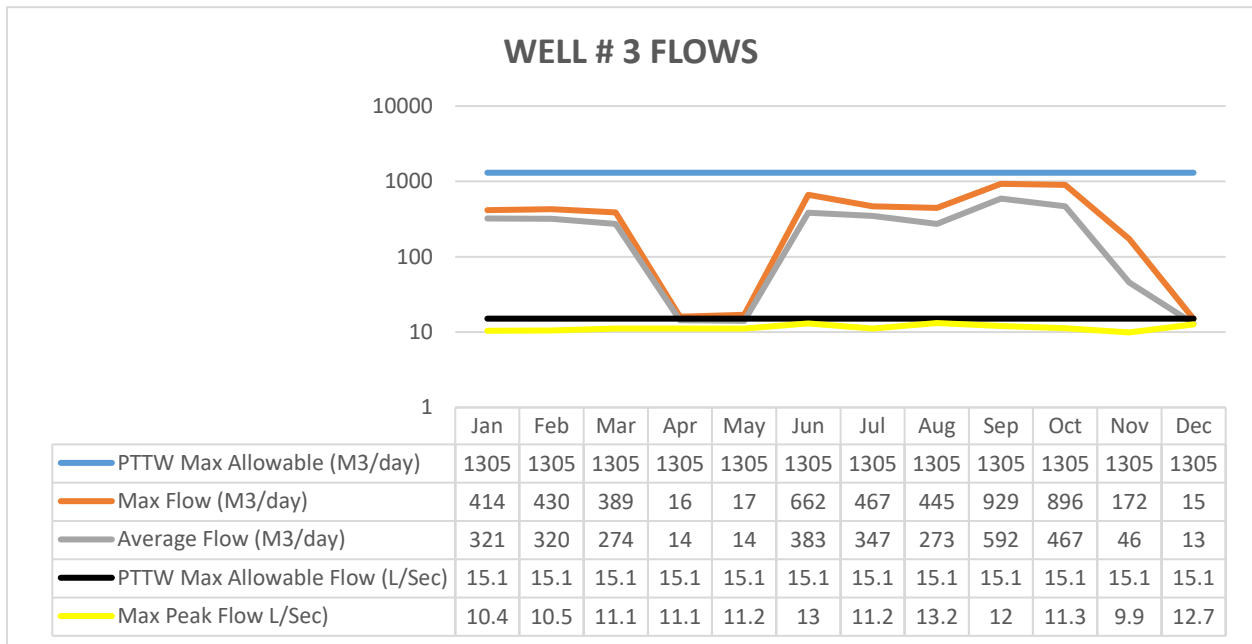
The Raw Water flows are regulated under Permit to Take Water

- RW1 = Raw Water Well 1
- RW3 = Raw Water Well 3
- RW4 = Raw Water Well 4
- RW5 = Raw Water Well 5
- TW = Treated Water
- DW = Distribution Water

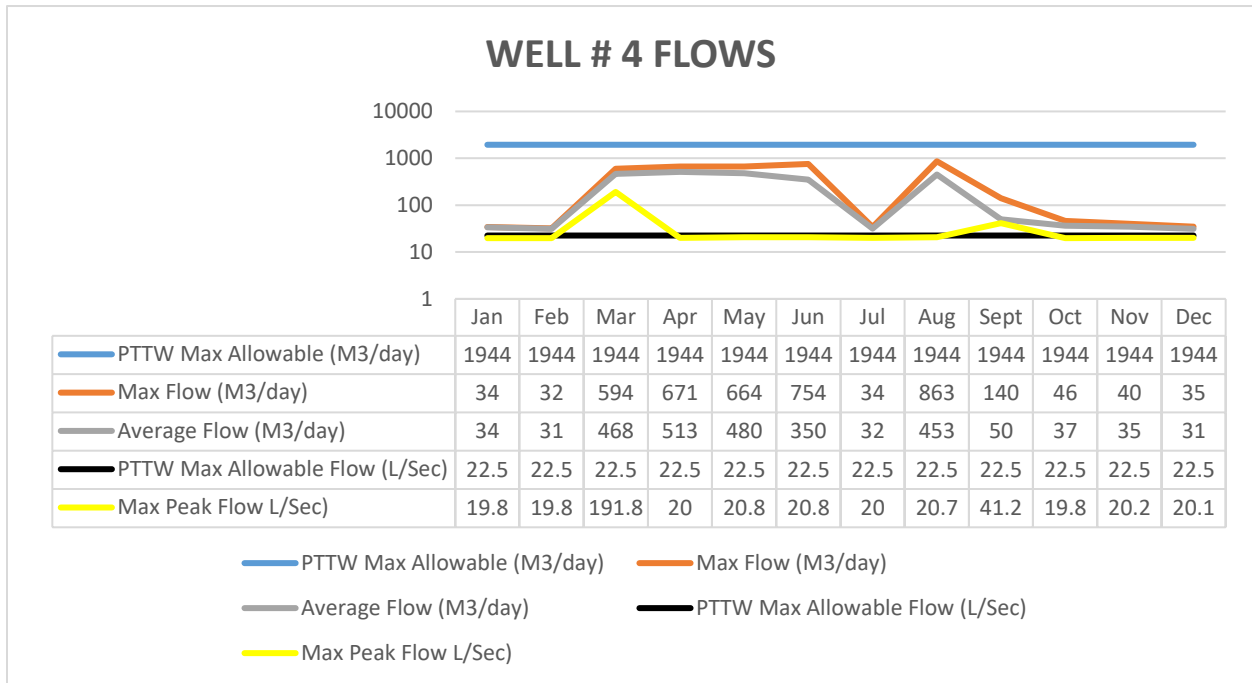
Raw Water Daily Rate of Taking: RW 1



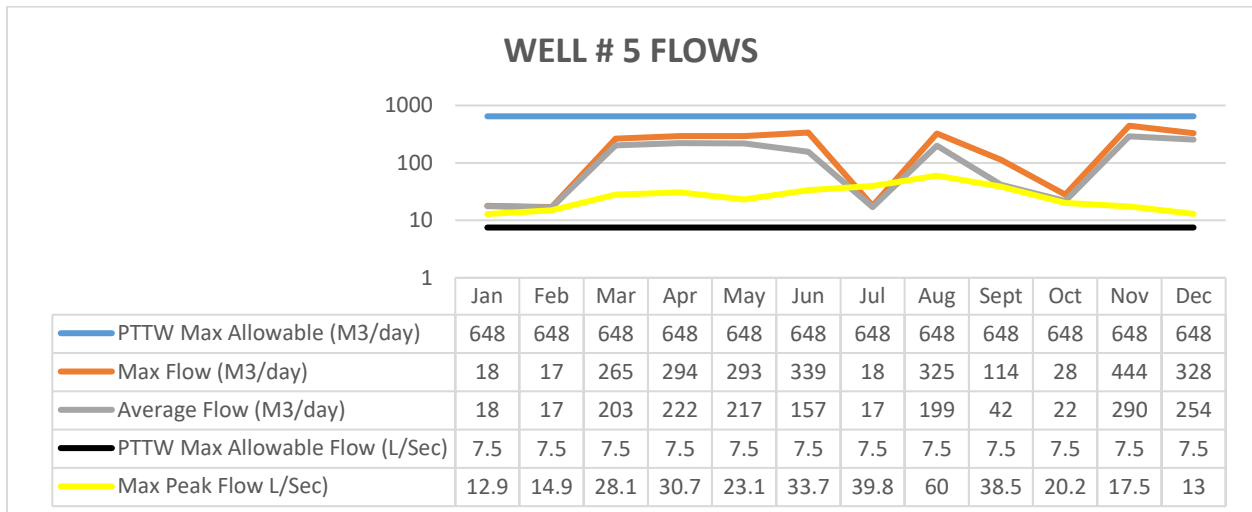
Raw Water Daily Rate of Taking: RW 3



Raw Water Daily Rate of Taking: RW 4



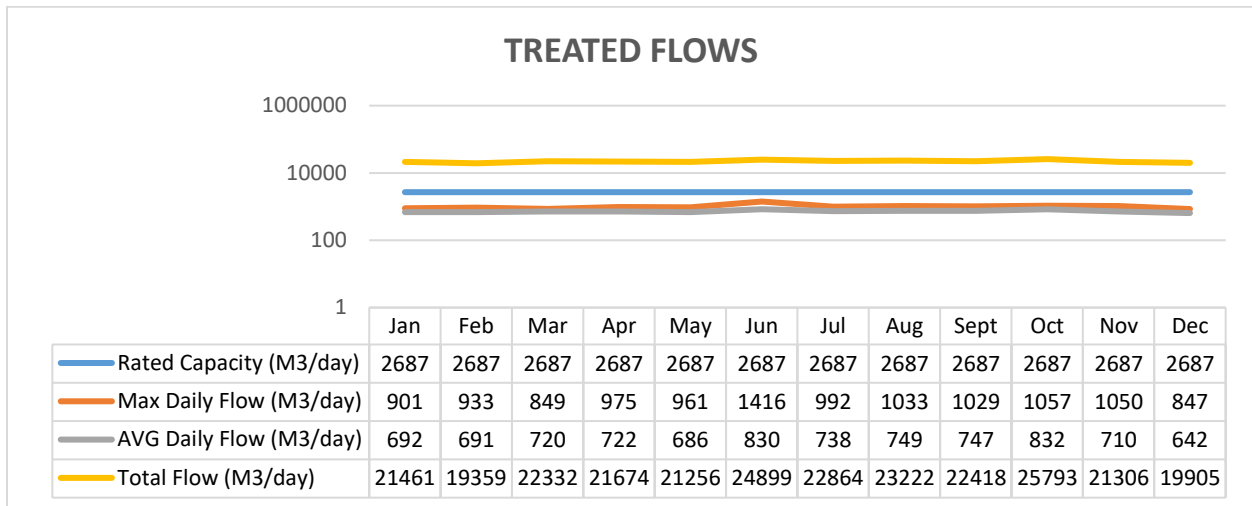
Raw Water Daily Rate of Taking: RW 5



Peak flows exceed the PTTW Max Allowable Peak Flow instantaneously when the well pump starts and the system is pumping to waste.

Treated Water Flows

Treated water flows are regulated under the Municipal Drinking Water Licence.



Regulatory Sample Results Summary

Microbiological Testing

Location	Number of Samples	E.Coli Results (min) – (max)	Total Coliform Results (min) – (max)	Number of HPC Samples	HPC Results (min) – (max)
Raw – RW1	52	0-0	0-67	-	-
Raw – RW3	52	0-0	0-4	-	-
Raw – RW4	52	0-0	0-6	-	-
Raw – RW5	52	0-0	0-5	-	-
Treated - TW	52	0-0	0-0	52	0-1
Distribution - DW	156	0-0	0-0	156	0-20

Operational Testing

Parameter	Range of Results (Min-Max Value)
Turbidity, Treated	0.014-2.05 NTU *
Treated, Free Chlorine	1.03-4.50 mg/L
Distribution, Free Chlorine	0.37-2.75 mg/L*

*Instrument spikes and dips recorded by on-line instrumentation are result of various maintenance and calibration activities. Power interruptions may also cause instrument readings to provide inaccurate readings. All events are reviewed for compliance with O. Reg. 170/03 and if warranted, are reported to the Ministry of Environment Conservation and Parks as Adverse Water Quality Incidents.

In- House Testing

Parameter	# of grab samples taken	Range of Results (min # - max #)
Turbidity, Raw Well 1 (NTU)	52	0.06-0.60 NTU
Turbidity, Raw Well 3 (NTU)	52	0.07-0.60 NTU
Turbidity, Raw Well 4 (NTU)	52	0.08-0.59 NTU
Turbidity, Raw Well 5 (NTU)	52	0.07-0.60 NTU
Turbidity, Treated Water (NTU)	365	0.06-0.65 NTU
Treated, Free Chlorine (mg/L)	365	1.55-3.34 mg/L
Distribution, Free Chlorine (mg/L)	365	0.86-2.37 mg/L

Lead Sampling

The lead sampling program is required under O.Reg 170/03. This system qualified for the plumbing exemption.

Location	Date	Lead	pH	Alkalinity (mg/L) as CaCO ₃
-	-	10 (MAC)	6.5-8.5	30-500
Hydrant # 85	Mar 22 2022	0.28	8.05	299
Hydrant # 18	Mar 22 2022	1.35	7.76	271
Hydrant # 85	Sept 20 2022	1.07	8.19	287
Hydrant # 18	Sept 20 2022	3.36	8.24	287

Inorganic Parameters							
Parameter	Units	Sample Date	Sample Location	Result Value	MAC	Exceedance	
						MAC	1/2 MAC
Antimony	ug/L	Oct 11 2022	TW	0.60	6	No	No
Arsenic	ug/L	Oct 11 2022	TW	0.30	25	No	No
Barium	ug/L	Oct 11 2022	TW	296	1000	No	No
Boron	ug/L	Oct 11 2022	TW	32	5000	No	No
Cadmium	ug/L	Oct 11 2022	TW	0.003	5	No	No
Chromium	ug/L	Oct 11 2022	TW	0.14	50	No	No
Mercury	ug/L	Oct 11 2022	TW	0.01	1	No	No
Selenium	ug/L	Oct 11 2022	TW	0.33	5	No	No
Uranium	ug/L	Oct 11 2022	TW	0.002	20	No	No
Fluoride	mg/L	May 15 2018	TW	0.13	1.5	No	No
Nitrite	mg/L	Jan 18 2022	TW	0.003	1.000	No	No
Nitrite	mg/L	Apr 5 2022	TW	0.003	1.000	No	No
Nitrite	mg/L	Aug 12 2022	TW	0.003	1.000	No	No
Nitrite	mg/L	Oct 11 2022	TW	0.003	1.000	No	No
Nitrate	mg/L	Jan 18 2022	TW	0.768	10.000	No	No
Nitrate	mg/L	Apr 5 2022	TW	1.16	10.000	No	No
Nitrate	mg/L	Aug 12 2022	TW	1.64	10.000	No	No
Nitrate	mg/L	Oct 11 2022	TW	1.43	10.000	No	No

Organic Parameters							
Parameter	Units	Sample Date	Sample Location	Result Value	MAC	Exceedance	
						MAC	1/2 MAC
Alachlor	ug/l	Oct 11 2022	TW	0.02	5	No	No
Atrazine + N-dealkylated metabolites	ug/l	Oct 11 2022	TW	0.01	5	No	No
Azinphos-Methyl	ug/l	Oct 11 2022	TW	0.05	20	No	No
Benzene	ug/l	Oct 11 2022	TW	0.32	1	No	No
Benzo (a) pyrene	ug/l	Oct 11 2022	TW	0.004	0.01	No	No
Bromoxynil	ug/l	Oct 11 2022	TW	0.33	5	No	No
Carbaryl	ug/l	Oct 11 2022	TW	0.05	90	No	No
Carbofuran	ug/l	Oct 11 2022	TW	0.01	90	No	No
Carbon Tetrachloride	ug/l	Oct 11 2022	TW	0.17	5	No	No
Chlorpyrifos	ug/l	Oct 11 2022	TW	0.02	90	No	No
Diazinon	ug/l	Oct 11 2022	TW	0.02	20	No	No
Dicamba	ug/l	Oct 11 2022	TW	0.2	120	No	No
1,2-Dichlorobenzene	ug/l	Oct 11 2022	TW	0.41	200	No	No
1,4 - Dichlorobenzene	ug/l	Oct 11 2022	TW	0.36	5	No	No
1,2- Dichloroethane	ug/l	Oct 11 2022	TW	0.35	5	No	No
1,1- Dichloroethylene	ug/l	Oct 11 2022	TW	0.33	14	No	No
Dichloromethane (methylene Chloride)	ug/l	Oct 11 2022	TW	0.35	50	No	No
2,4-Dichlorophenol	ug/l	Oct 11 2022	TW	0.15	900	No	No
2,4-Dichlorophenoxy acetic acid)2,4-D)	ug/l	Oct 11 2022	TW	0.19	100	No	No
Diclofop-methyl	ug/l	Oct 11 2022	TW	0.4	9	No	No
Dimethoate	ug/l	Oct 11 2022	TW	0.06	20	No	No
Diquat	ug/l	Oct 11 2022	TW	1	70	No	No
Diuron	ug/l	Oct 11 2022	TW	0.03	150	No	No
Glyphosate	ug/l	Oct 11 2022	TW	1	280	No	No
Malathion	ug/l	Oct 11 2022	TW	0.02	190	No	No
Metolachlor	ug/l	Oct 11 2022	TW	0.01	50	No	No
Metribuzin	ug/l	Oct 11 2022	TW	0.02	80	No	No
MCPA	ug/l	Oct 11 2022	TW	0.00012	0.1	No	No
Monochlorobenzene (Chlorobenzene)	ug/l	Oct 11 2022	TW	0.3	80	No	No
Paraquat	ug/l	Oct 11 2022	TW	1	10	No	No
PCB	ug/l	Oct 11 2022	TW	0.04	3	No	No
Pentachlorophenol	ug/l	Oct 11 2022	TW	0.15	60	No	No
Phorate	ug/l	Oct 11 2022	TW	0.01	2	No	No
Picloram	ug/l	Oct 11 2022	TW	1	190	No	No
Prometryne	ug/l	Oct 11 2022	TW	0.03	1	No	No
Simazine	ug/l	Oct 11 2022	TW	0.01	10	No	No

Terbufos	ug/l	Oct 11 2022	TW	0.01	1	No	No
Tetrachloroethylene	ug/l	Oct 11 2022	TW	0.35	10	No	No
2,3,4,6- Tetrachlorophenol	ug/l	Oct 11 2022	TW	0.2	100	No	No
Triallate	ug/l	Oct 11 2022	TW	0.01	230	No	No
Trichloroethylene	ug/l	Oct 11 2022	TW	0.44	50	No	No
2,4,6-Trichlorophenol	ug/l	Oct 11 2022	TW	0.25	5	No	No
Trifluralin	ug/l	Oct 11 2022	TW	0.02	45	No	No
Vinyl Chloride	ug/l	Oct 11 2022	TW	0.17	2	No	No
Trihalomethane Total	ug/l	Jan 18 2022	DW	36	100	No	No
	ug/l	Apr 5 2022	DW	51	100	No	No
	ug/l	Aug 12 2022	DW	40	100	No	No
	ug/l	Oct 12 2022	DW	23	100	No	No
	ug/l		DW	RAA= 37.50	100	No	No
Total Haloacetic Acids	ug/l	Jan 18 2022	DW	5.3	80	No	No
	ug/l	Apr 5 2022	DW	5.9	80	No	No
	ug/l	Aug 12 2022	DW	5.3	80	No	No
	ug/l	Oct 12 2022	DW	26.1	80	No	No
				RAA= 10.65	80	No	No
60 months							
Sodium	mg/l	May 15 2018	TW	29.6	20	Yes	Yes
Fluoride	mg/l	May 15 2018	TW	0.13	1.5	No	No

- MAC= Maximum Allowable Concentration as per O.Reg 169/03
- Sodium and Fluoride were tested in 2018. Sodium exceeded and was reported to MOH,MECP as well as public notification.

Maintenance Summary Highlights:

Major expenses incurred to install, repair or replace required equipment

- Annual flow meter calibrations
- Annual back flow prevention device inspection
- Annual lifting device inspections
- Annual Diesel Generator Inspection
- Semi-annual maintenance on UV disinfection equipment
- Distribution valve changed on Henry St
- Distribution hydrant changed on Rodgers Drive

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- **Installation of new process piping, valves, flow meters and controls at the Water Treatment Plant.**
 - **Annual fire hydrant flushing and maintenance**
 - **Annual distribution valve turning and maintenance**
 - **Installation of new watermain and hydrant on portions of Henry St and West Front St.**

Maintenance Summary

The Township of Stirling-Rawdon uses a work order tracking system to ensure work orders are complete and equipment is maintained as per manufacturer’s specifications. Work orders are issued on a weekly, monthly, annual or on an as needed basis to provide the required service to the drinking water system. Capital projects are listed each year in the annual capital budget and are ranked based on priority through the Municipalities Asset Management Plan.

Water Treatment and Distribution Operation/maintenance work orders completed	Number of complete work orders 221
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Drinking Water Quality Management System

The Township of Stirling-Rawdon contracted QMI-SAI Global Canada to conduct the DWQMS Audit for the Stirling Drinking Water System. On December 9, 2022 an off-site Surveillance System Audit was conducted.

Water Taking and Transfer Data

Data for the reporting period of January 1, 2022 – December 31, 2022 was submitted electronically to the Ministry of the Environment Conservation and Parks on January 23, 2023 under Permit to Take Water PTTW 6214-8T3JXP and 1760-C5UNBR.