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2/28/2024

Warren Large Municipal Residential Drinking Water System Report

January 1, 2023 – December 31, 2023

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Prepared by
THE CITY OF GREATER SUDBURY FOR
THE CORPORATION OF THE MUNICIPALITY OF MARKSTAY-WARREN

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Introduction

This document is prepared to satisfy Section 11, Schedule 22 of the Ontario Regulation 170/03 (O. Reg 170/03) under the Safe Drinking Water Act. The City of Greater Sudbury (CGS) is the operating authority and therefore is responsible for creating and reporting the document to the owner, The Corporation of the Municipality of Markstay-Warren.

Section 11 of Schedule 22 of O. Reg 170/03 states that the annual water quality and summary report must contain the following information:

- A description of the drinking water system along with a list of chemicals used by the system.
- A description of any major expenses incurred during the period covered by the report to install, repair, or replace required equipment.
- A summary of all adverse water quality incidents (AWQI) reported to the Ministry along with the list of corrective actions taken in response all AWQIs.
- A summary of all test results required under the regulation, under an approval, municipal drinking water licence or order.
- A statement of where the report will be available for inspection.

Schedule 22 of O. Reg 170/03 states that the report must list the requirements of the Act, the regulations, the system's approval, and any order that the system failed to meet at any time during the period covered by the report. The quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows must also be included in the report along with a comparison to the rated capacity and flow rates approved in the systems approvals document.

System Description

The Warren Drinking Water system, 210000755, is within the Large Municipal Residential category under the O. Reg 170/03 descriptor. The Corporation of the Municipality of Markstay-Warren is the owner, and the City of Greater Sudbury is the operator.

The Warren drinking water system consists of:

- two ground water wells
- three treated water pumps
- two hydro pneumatic tanks
- a disinfection system that utilises 12 % sodium hypochlorite (chlorine) and
- analyzers that monitor raw water as well as the treated water free chlorine residuals.

Raw water is pumped through the water treatment system and then through a 100 mm water main into the treated water reservoir, located just outside of the water treatment building. Primary disinfection is provided by injecting chlorine into the raw water at the well pumps discharge header. Secondary disinfection is provided at the treated water discharge header. The treated water reservoir volume is a 560 m³ and is made up of a dual-celled in-ground

reinforced concrete structure. The facility is equipped with a diesel power standby generator rated at 230 kW.

The distribution system consists asbestos cement main together with hydrants, valves, services to lot line, stops and service boxes. The distribution system was constructed in 1961.

The drinking water treatment system is monitored 24/7, 365 days a year from the Wanapitei Water Treatment plant via SCADA system.

Table 1 Information to be provided under Section 11 (O.Reg.170/03)

Population Served	<500
Does your Drinking Water System serve more than 10 000 people?	No
Location where Summary Report required under O. Reg. 170/03	Markstay-Warren Municipal Office, 21 Main Street South, Markstay, ON P0M 2G0
Number of Designated Facilities served:	None
Did you provide a copy of your annual report to all Designated Facilities you serve?	NA
Number of Interested Authorities you report to	None
Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?	NA
List all Drinking-Water Systems (if any), and their DWS Number which receive all their drinking water from your system	NA
Indicate how you notified system users that your annual report is available and free of charge	notice via the web - notice via a Public Library - notice via Government Office
Indicate if you notified system users that your annual report is available and is free of charge using alternate methods	Yes

Expenditures

No significant expenditures were incurred other than normal operation and maintenance.

System Failures and Corrective Actions

There were no Adverse Water Quality Incidents (AWQI) that were reported to the Ministry of the Environment, Conservation and Parks (MECP) or to the Spills Action Center (SAC).

Annual Water Quality Data

The raw water along with the treated potable water and Distribution water were tested for all parameters set out in the O. Reg 170/03 Schedules. All test results returned were not reportable and within regulatory limits.

Twenty five percent of the samples taken were tested for heterotrophic plate count (HPC). The treated water analyses varied from no presence to a count of 50 cfu/100 ml. The distribution also was tested within the same percentage and the analysis varied from no presence to 10 cfu/100 ml.

One coliform unit was detected within the raw water, but it did not carry on to the treated water due to the disinfection of the raw water.

All organic and inorganic sampling was completed in accordance with the regulation. Analysis demonstrates that none of the samples exceeded the maximum allowable limits (MAC).

Haloacetic acids are disinfection by-products with a provincial maximum allowable limit of 80 ug/L. The haloacetic acids results have varied from quarter to quarter and the end of year running average was 15ug/L. HAAs are currently showing a downward trend.

Trihalomethanes (THMs) are another disinfection by-product in potable water that has a limit of 100 ug/L under regulatory requirements. As of the fourth quarter the running average was 28.9 ug/L. This parameter is also showing a downward trend.

Lead analysis completed within the distribution system showed very low trace residuals with a laboratory result of 0.3 ug/L. This system is not required to sample residential and commercial establishments for lead as they have been granted a reduced sampling schedule by the MECP.

Alkalinity for the system was on average 310 mg/L with an average pH of 7.4.

Table 4 Microbiological Testing

	Number of Samples	Range of E. Coli Results (min) to (max)	Range of Total Coliform Results (min) to (max)	Number of HPC samples	Range of HPC Results (min) to (max)
Raw Well Pump #1	52	0 to 0	0 to 1	NA	NA
Raw Well Pump #2	52	0 to 0	0 to 0	NA	NA
Treated Water	52	0 to 0	0 to 0	52	10 to 10
Distribution	112	0 to 0	0 to 0	60	10 to 40

Table 5 Operational Testing

	Number of Grab Samples	Range of Results (min) to (max)
Free Chlorine Residual Well Discharge mg/L	8760 (continuous analyzer)	0.39mg/L to 3.81mg/L

Table 6 Organic and Inorganic Testing

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	2023/12/05	0.0005	mg/L	No
Arsenic	2023/12/05	0.0021	mg/L	No
Barium	2023/12/05	0.112	mg/L	No
Boron	2023/12/05	0.012	mg/L	No
Cadmium	2023/12/05	0.0001	mg/L	No
Chromium	2023/12/05	0.0056	mg/L	No
Mercury	2023/12/05	0.0001	mg/L	No
Selenium	2023/12/05	0.0012	mg/L	No
Uranium	2023/12/05	0.0019	mg/L	No
Nitrite	2023/03/14	0.05	mg/L	No
	2023/06/06	0.05	mg/L	No
	2023/09/12	0.05	mg/L	No
	2023/12/05	0.05	mg/L	No
Nitrate	2023/03/14	4.69	mg/L	No
	2023/06/06	4.31	mg/L	No
	2023/09/12	4.25	mg/L	No
	2023/12/05	3.74	mg/L	No

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	2023/12/05	0.000275	mg/L	No
Atrazine + N-dealkylated metabolites	2023/12/05	0.0005	mg/L	No
Azinphos-methyl	2023/12/05	0.000206	mg/L	No
Benzene	2023/12/05	0.0001	mg/L	No
Benzo(a)pyrene	2023/12/05	9e-006	mg/L	No
Bromoxynil	2023/12/05	9.27e-005	mg/L	No
Carbaryl	2023/12/05	0.002	mg/L	No
Carbofuran	2023/12/05	0.004	mg/L	No
Carbon Tetrachloride	2023/12/05	0.0002	mg/L	No
Chlorpyrifos	2023/12/05	0.000206	mg/L	No

Diazinon	2023/12/05	0.000206	mg/L	No
Dicamba	2023/12/05	8.11e-005	mg/L	No
1,2-Dichlorobenzene	2023/12/05	0.0002	mg/L	No
1,4-Dichlorobenzene	2023/12/05	0.0003	mg/L	No
1,2-Dichloroethane	2023/12/05	0.0002	mg/L	No
1,1-Dichloroethylene (vinylidene chloride)	2023/12/05	0.0003	mg/L	No
Dichloromethane	2023/12/05	0.001	mg/L	No
2-4 Dichlorophenol	2023/12/05	0.0002	mg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	2023/12/05	0.000348	mg/L	No
Diclofop-methyl	2023/12/05	0.000116	mg/L	No
Dimethoate	2023/12/05	0.000206	mg/L	No
Diquat	2023/12/05	0.0002	mg/L	No
Diuron	2023/12/05	0.01	mg/L	No
Glyphosate	2023/12/05	0.02	mg/L	No
Malathion	2023/12/05	0.000206	mg/L	No
Metolachlor	2023/12/05	0.000138	mg/L	No
Metribuzin	2023/12/05	0.000138	mg/L	No
Monochlorobenzene	2023/12/05	0.0005	mg/L	No
Paraquat	2023/12/05	0.0002	mg/L	No
Pentachlorophenol	2023/12/05	0.0003	mg/L	No
Phorate	2023/12/05	0.000138	mg/L	No
Picloram	2023/12/05	8.11e-005	mg/L	No
Polychlorinated Biphenyls(PCB)	2023/12/05	6e-005	mg/L	No
Prometryne	2023/12/05	6.88e-005	mg/L	No
Simazine	2023/12/05	0.000206	mg/L	No
Terbufos	2023/12/05	0.000138	mg/L	No
Tetrachloroethylene	2023/12/05	0.0003	mg/L	No
2,3,4,6-Tetrachlorophenol	2023/12/05	0.0003	mg/L	No
Triallate	2023/12/05	0.000138	mg/L	No
Trichloroethylene	2023/12/05	0.0002	mg/L	No
2,4,6-Trichlorophenol	2023/12/05	0.0002	mg/L	No
Trifluralin	2023/12/05	0.000138	mg/L	No
Vinyl Chloride	2023/12/05	0.0001	mg/L	No
MCPA	2023/12/05	0.00579	mg/L	No

Water Takings and Well Flows

Warren wells are equipped with two pumps. Pump one is the duty pump and pump two, which produces a lower flow rate, is the standby pump. From January 1st to December 31st of 2023 well pump one produced 63,199 m³ of water while well pump two produced 7,439 m³. The municipal drinking water licence stipulates the maximum amount of water that can be taken from each well pumps and in 2023 well 1 used approximately 20% of its capacity and well 2 used approximately 3.1 % of its capacity.

Table 7 Well pump 1 flows

	Total Flow m ³	Average Daily Flow m ³ /d	Maximum Daily Flow m ³ /d	Instantaneous Peak Flow L/s	MDWL Daily Maximum Permitted m ³ /d	MDWL Annual Permitted m ³ /d	% Capacity
January	3,145	242	1,310	151.2	864	315,360	11.7
February	2,774	277	2,163	158.1	864	315,360	11.5
March	3,104	196	1,271	175.2	864	315,360	11.6
April	2,459	248	1,491	139.9	864	315,360	9.5
May	3,514	307	2,163	163.9	864	315,360	13.1
June	4,435	391	2,163	203.8	864	315,360	17.1
July	4,388	310	2,163	189.4	864	315,360	16.4
August	3,867	290	2,092	216.8	864	315,360	14.4
September	4,204	323	2,163	280.7	864	315,360	16.2
October	8,221	427	2,163	366.8	864	315,360	30.7
November	10,735	313	2,108	414.6	864	315,360	41.4
December	12,353	448	2,163	436.9	864	315,360	46.1
Total	63,199				864	315,360	20.0

Table 8 Well Pump 2 flows

	Total Flow m ³	Average Daily Flow m ³ /d	Maximum Daily Flow m ³ /d	Instantaneous Peak Flow L/s	MDWL Daily Maximum Permitted m ³ /d	MDWL Annual Permitted m ³ /d	% Capacity
January	145	140	1,310	151.2	648	236,520	0.7
February	30	159	2,163	158.1	648	236,520	0.2
March	25	113	1,271	175.2	648	236,520	0.1
April	464	145	1,491	139.9	648	236,520	2.4
May	37	177	2,163	163.9	648	236,520	0.2
June	26	224	2,163	203.8	648	236,520	0.1
July	363	180	2,163	189.4	648	236,520	1.8
August	1,892	175	2,092	224.6	648	236,520	9.4
September	2,987	200	2,163	291.9	648	236,520	15.4
October	1,364	251	2,163	366.8	648	236,520	6.8
November	48	180	2,108	414.6	648	236,520	0.2
December	59	257	2,163	436.9	648	236,520	0.3
Total	7,439				648	236,520	3.1

Conclusion

CGS has operated the system from January 1st 2023 to December 31st 2023 within all regulatory requirements. As demonstrated within this report the town of Warren has provided its residents with safe drinking water with no risk of ill health effects to the public. Water takings from the aquifer was minimal to the amount allotted by MECP.