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Warren Large Municipal Residential Drinking Water System Reports Covering January 1, 2025– December 31, 2025

Reg 170/03 Schedule 22 Annual Water Summary Report
Reg 170/03 Section 11 Annual Water Quality Report

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 (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 (2) ground water wells,
- three (3) treated water pumps,
- two (2) hydro pneumatic tanks,
- a disinfection system that utilises 12 % sodium hypochlorite (chlorine),
- analyzers that monitor raw water as well as the treated water free chlorine residuals, and
- distribution analyser that was installed November 25, 2025.

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 m^3 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 of asbestos cement main together with hydrants, valves, services to lot line, stops and service boxes. The distribution system was constructed in 1961.

The drinking was 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 then 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

The reservoir underwent an inspection. Only one side was able to get inspected this year at a cost of $2,781. No other significant expenditures were incurred other than normal operation and maintenance.

System Failures and Corrective Actions

AWQI#	Date	Parameter	Result	Corrective Action
170506	10/23/2025	Total Coliform	1	Resample, upstream and downstream also

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 (25 %) of the samples taken were tested for heterotrophic plate count (HPC). The analysed treated water varied from no presence to a count of 10 CFU/100 mL. Twenty five percent (25 %) of the distribution system was also tested for HPC and the results varied from no presence to 30 CFU/100 mL.

All organic and inorganic sampling was completed in accordance with the regulation in 2023. Analysis resulted in no samples exceeding the maximum allowable concentrations (MAC). Next round of sampling will be in 2026.

Haloacetic acids are disinfection by-products with a provincial maximum allowable limit, based on running annual average (RAA), of 80 µg/L. The haloacetic acids results have varied from quarter to quarter and the end of year RAA was 11 µg/L. HAAs are currently showing an overall downward trend.

Trihalomethanes (THMs) are another disinfection by-product in potable water that has a RAA limit of 100 µg/L under regulatory requirements. As of the fourth quarter the RAA was 34.65 µg/L. This parameter is also showing an overall downward trend.

Lead analysis completed within the distribution system showed very low trace residuals with a laboratory results ranging from 0.2 to 0.6 µg/L results below the reportable limit of 10 µg/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 306 mg/L with an average pH of 7.6.

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 0	NA	NA
Raw Well Pump #2	55	0 to 0	0 to 0	NA	NA
Treated Water	52	0 to 0	0 to 0	52	<10 to 10
Distribution	109	0 to 0	0 to 1	52	<10 to 30

Table 5 Operational Testing

	Number of Grab Samples	Range of Results (min) to (max)
Free Chlorine Residual Well Discharge mg/L	8760 (continuous analyzer)	0.09 mg/L to 3.58 mg/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	2024/03/05	0.05	mg/L	No
	2024/06/04	0.05	mg/L	No
	2024/09/03	0.05	mg/L	No
	2024/12/03	0.05	mg/L	No
Nitrate	2024/03/05	3.37	mg/L	No
	2024/06/04	4.23	mg/L	No
	2024/09/03	4.76	mg/L	No
	2024/12/03	4.54	mg/L	No

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	2023/12/05	0.000275	mg/L	No
Atrazine + N-dealkylated metobolites	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-6	mg/L	No
Bromoxynil	2023/12/05	9.27e-5	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-5	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-5	mg/L	No
Polychlorinated Biphenyls(PCB)	2023/12/05	6e-5	mg/L	No
Prometryne	2023/12/05	6.88e-5	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 operated as pump one (PW-1) being the duty pump and therefore the main producing well. Well pump two (PW-2) being the standby production well was the lower producer. From January 1st to December 31st, 2025, well PW-1 produced 49,843 m^3 of water while well PW-2 produced 2,403 m^3. The municipal drinking water licence stipulates the maximum amount of water that can be taken from each well pumps and in 2025 well PW-1 used 15.8 % of its capacity and well PW-2 used 1.0 % of its capacity.

Table 7 Well pump 1 flows

Warren Primary Well "PW-1"							
	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	% Capacity
January	4,692	375	2,163	187.2	864	315,360	17.5
February	3,248	328	2,163	178.2	864	315,360	13.4
March	3,461	382	2,163	257.0	864	315,360	12.9
April	4,013	329	2,163	202.8	864	315,360	15.5
May	4,321	286	1,827	185.4	864	315,360	16.1
June	4,477	374	2,163	229.1	864	315,360	17.3
July	4,205	343	2,163	192.2	864	315,360	15.7
August	4,568	146	2,162	246.6	864	315,360	17.1
September	4,252	36	203	203.5	864	315,360	16.4
October	4,448	366	2,163	176.7	864	315,360	16.6
November	4,300	319	2,253	180.2	864	315,360	16.6
December	3,858	364	2,163	174.2	864	315,360	14.4
Total	49,843				864	315,360	15.8

Table 8 Well Pump 2 flows

Warren Primary Well "PW-2"							
	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	% Capacity
January	20	215	2,163	187.2	648	236,520	0.1
February	527	190	2,163	178.2	648	236,520	2.9
March	1,012	224	2,163	257.0	648	236,520	5.0
April	83	189	2,163	202.8	648	236,520	0.4
May	26	165	1,827	185.4	648	236,520	0.1
June	155	215	2,163	229.1	648	236,520	0.8
July	360	199	2,163	192.2	648	236,520	1.8
August	38	85	2,162	246.6	648	236,520	0.2
September	52	22	203	203.5	648	236,520	0.3
October	23	211	2,163	176.7	648	236,520	0.1
November	40	183	2,253	180.2	648	236,520	0.2
December	68	209	2,163	174.2	648	236,520	0.3
Total	2,403				648	236,520	1.0

Conclusion

CGS has operated the system from January 1st, 2025, to December 31st, 2025, 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 were minimal compared to the amount permitted by the MECP.