

Merrickville Drinking Water System

Waterworks # 220001227
System Category – Large Municipal Residential

Annual Water Report

Prepared For: Village of Merrickville-Wolford

Reporting Period of January 1st – December 31st 2023

Issued: February 26, 2024

Revision: 0

Operating Authority:



This report has been prepared to satisfy the annual reporting requirements in O.Reg 170/03 Section 11 and Schedule 22

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Revision History

Date	Revision #	Revision Notes
February 26, 2024	0	Annual report issued

Report Availability

This system does not serve more than 10,000 residence and the annual reports will be available to users at The Village of Merrickville-Wolford Office. Notification will be at the Municipal Office and copies provided free of charge if requested. The Village of Merrickville-Wolford is located at: 317 Brock St. W. PO Box 340, Merrickville, Ontario K0G 1N0.

Compliance Report Card

Compliance Event	# of Events
Ministry of Environment Inspections	- 1 Ministry inspection on May 10 th , 2023 - Final Inspection Rating: 100%
Ministry of Labour Inspections	- No Ministry of Labour Inspections in 2023
QEMS External Audit	- 1 QMS Audit on November 21 st , 2023 - 1 Minor OFI noted <ul style="list-style-type: none"> o Clarification on a critical control point in the Risk Assessment element
AWQI's/BWA	- 0/0
Non-Compliance	- No Non-Compliances in 2023
Community Complaints	- No complaints recorded in 2023
Spills	- No spills in 2023
Watermain Breaks	- 1 watermain break in 2023

System Process Description

Raw Source

Well 1 is located on the north side of Main Street East approximately 60 metres east of St. Lawrence Street. Well 1 consists of a 35 meter deep drilled groundwater production well, equipped with a submersible deep well pump, with a discharge pipe connecting to a well pump header in the main pump house described below, including a vented watertight galvanized steel enclosure over the wellhead.

Well 2 is located on the north side of Main Street East approximately 60 metres east of St. Lawrence Street. Well 2 consists of a 49 meter deep drilled groundwater production well, equipped with a submersible deep well pump, with a discharge pipe connecting to the Clearwell in the main pump house described below, including a vented watertight galvanized steel enclosure over the wellhead.

Well 4 is located on the north side of Main Street East approximately 85 metres east of St. Lawrence Street. Well 4 consists of a 50 meter deep drilled groundwater production well, equipped with a submersible deep well pump, connecting to a pipe discharging to the Clearwell in the main pump house described below, including a vented watertight galvanized steel enclosure over the wellhead.

The Main Pump house is comprised of a building located at the site of Well 1, housing treatment, pumping and control equipment, including a pump header and appurtenances including a flow meter, discharging into a dual celled Clearwell described below; two centrifugal high lift pumps, one duty pump and one standby pump connected to the pumping station discharge main; and one centrifugal fire pump.

The Clearwell consists of two cells located below and extending behind the main pump house. Clearwell Cell Number 1 is un-baffled, and has a storage volume of 590 cubic meters (m³). Clearwell Cell 2 is baffled and has a storage volume of 141 m³.

Treatment

Disinfection is provided using sodium hypochlorite (a liquid form of chlorine) injected into the Clearwell reservoir. One sodium hypochlorite feed system injects sodium hypochlorite solution into the raw water discharge line of Well 1. The second chemical metering system is located in Well House 4 and injects sodium hypochlorite solution into the common raw water discharge line of Wells 2 and 4.

Treatment Chemicals used during the reporting year:

Chemical Name	Use	Supplier
Sodium Hypochlorite	Disinfection	Brenntag

Distribution

The pressure for the distribution system is maintained by the high lift pumps at the main pump house. There is approximately 8 km of water distribution mains with water service connections, hydrants, valves and manual blow-offs.

Summary of Non-Compliance

Adverse Water Quality Incidents

Date	AWQI #	Location	Problem	Details	Legislation	Corrective Action Taken
No AWQI's to report in 2023.						

Non-Compliance

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
There was no non-compliance issues reported during the reporting period.				

Non-Compliance Identified in a Ministry Inspection:

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
There was no non-compliances in 2023				

Flows

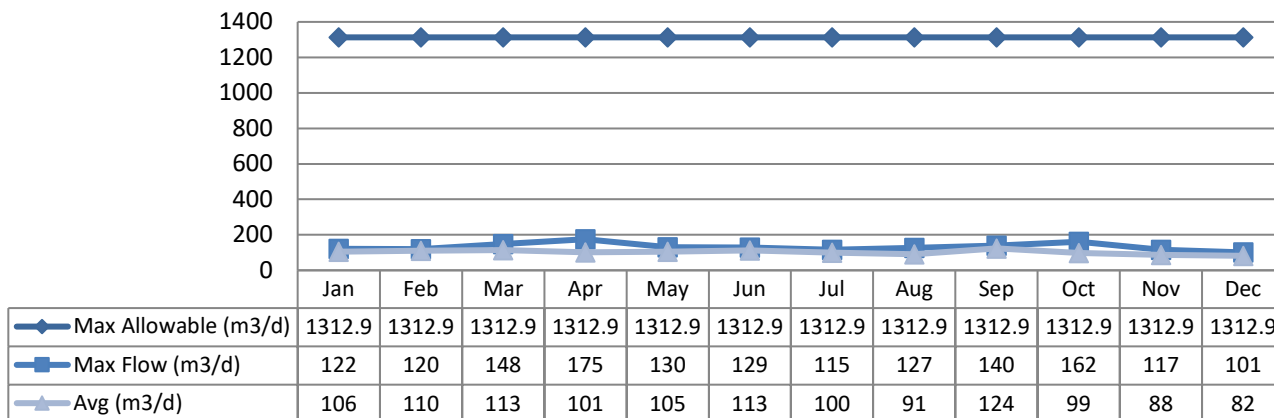
The Merrickville Drinking Water System is operating on average under half the rated capacity.

Raw Water Flows

The Raw Water flows are regulated under the Permit to Take Water. The 2023 Raw Flow Data was submitted to the Ministry electronically under permit #2110-AP9LSG, and the confirmation is attached in Appendix A.

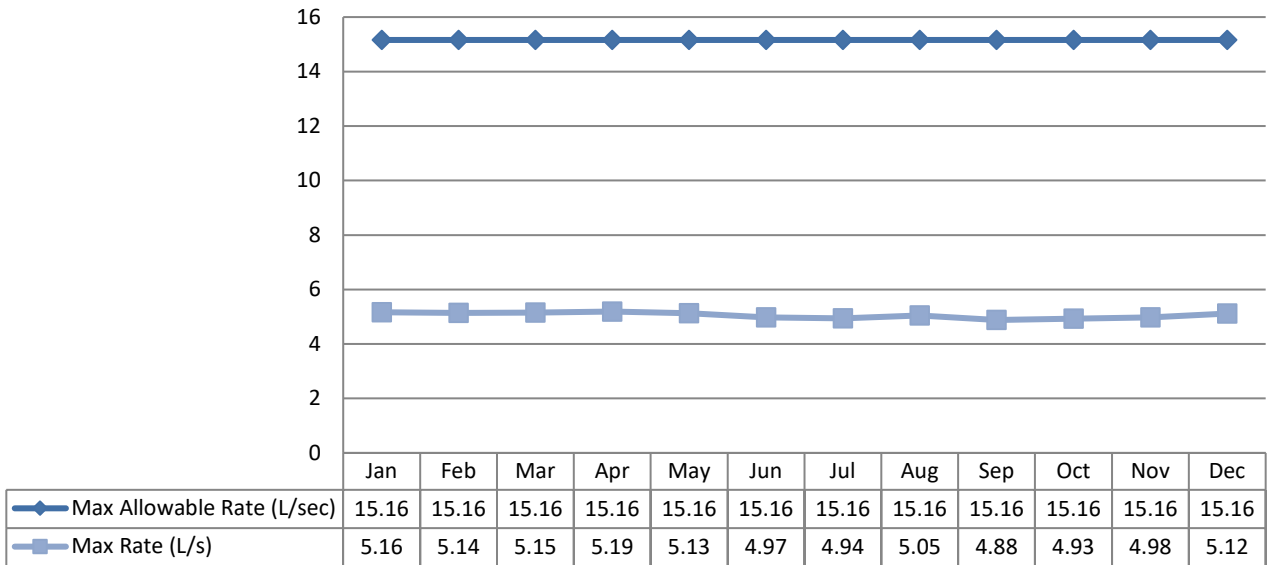
Well # 1 Total Monthly Flows (m3/d)

Max Allowable PTTW



Well #1 Monthly Rated Flows (L/s)

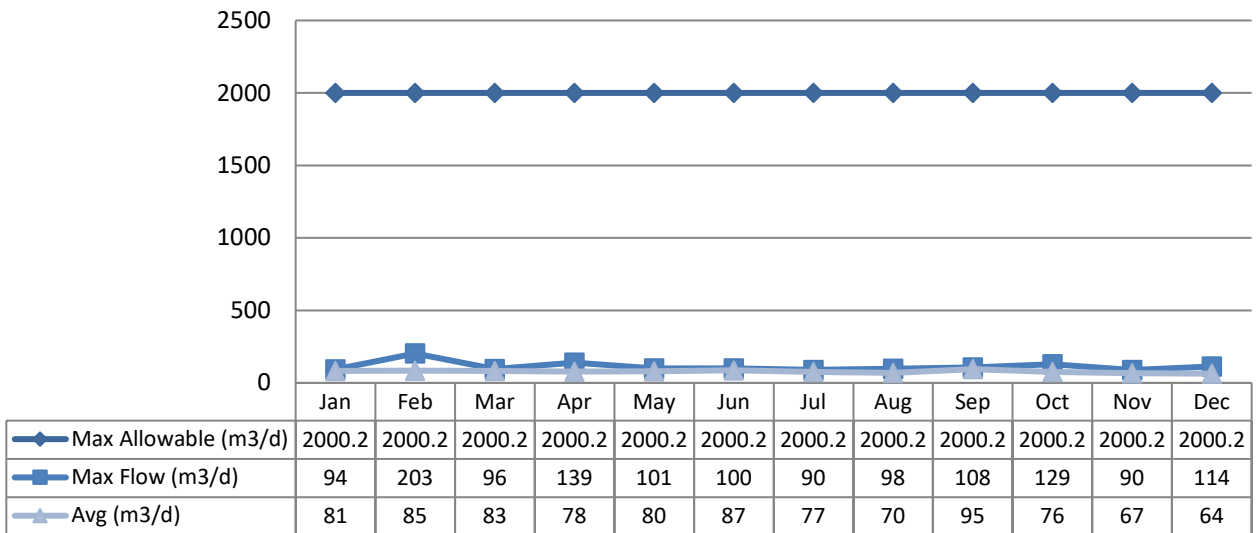
Max allowable rate - PTTW



*The pump for Well #1 is rated for 7.9 L/s

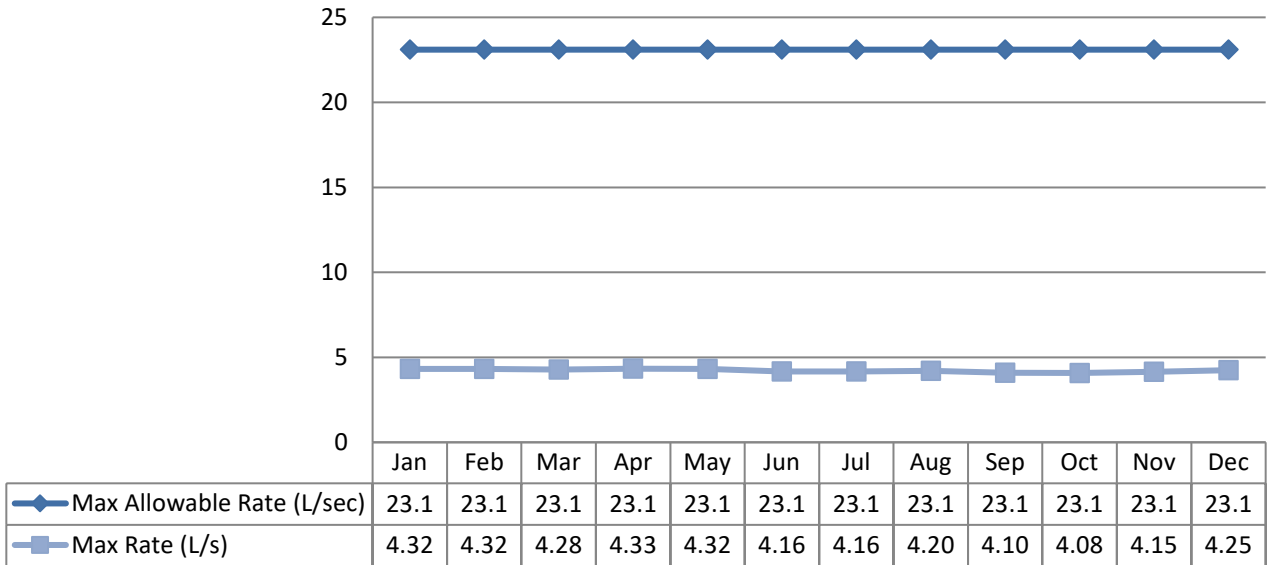
Well # 2 Total Monthly Flows (m3/d)

Max Allowable PTTW



Well #2 Monthly Rated Flows (L/s)

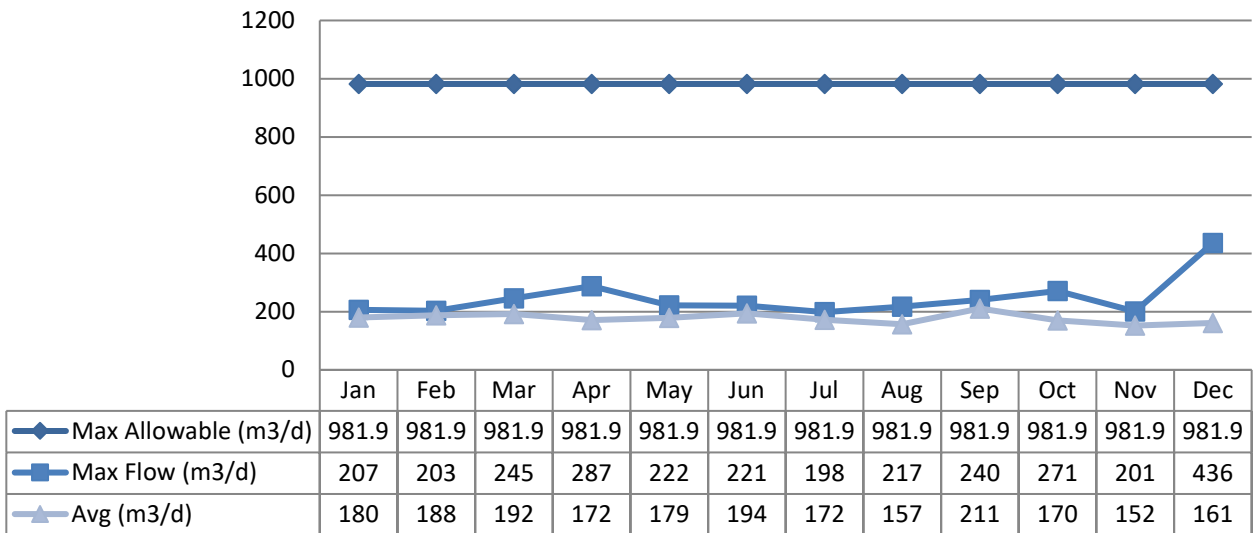
Max allowable rate - PTTW



*The pump for Well #2 is rated for 4.7 L/s

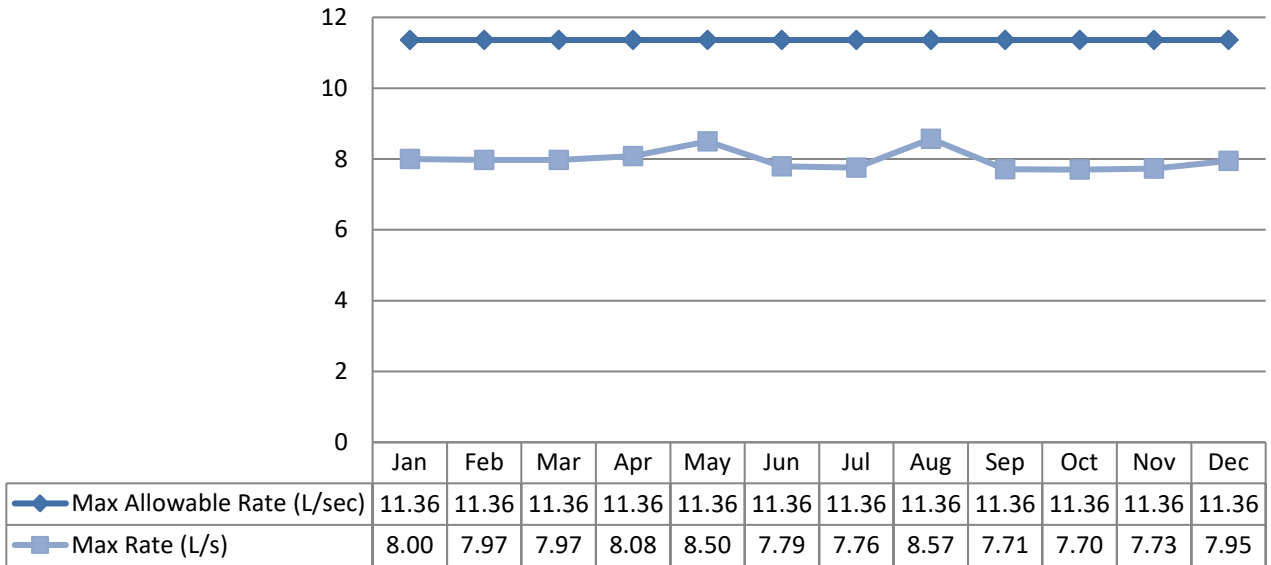
Well # 4 Total Monthly Flows (m3/d)

Max Allowable PTTW



Well #4 Monthly Rated Flows (L/s)

Max allowable rate - PTTW



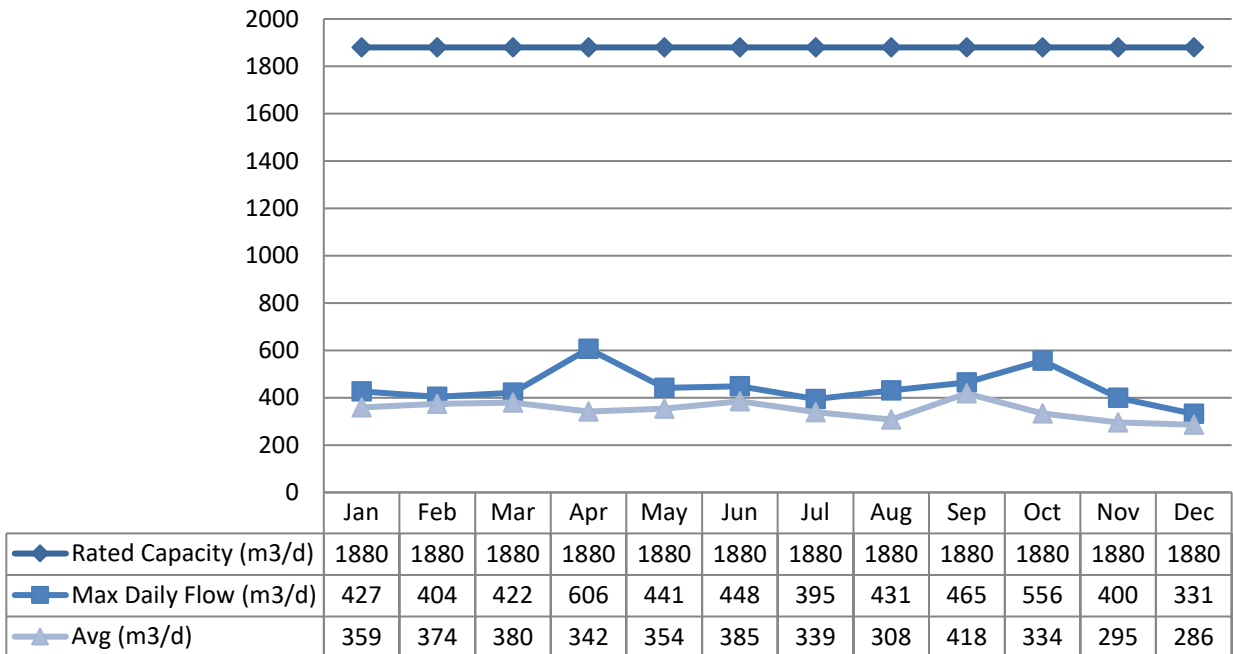
*The pump for Well #4 is rated for 9.2 L/s

Treated Water Flows

The Treated Water flows are regulated under the Municipal Licence.

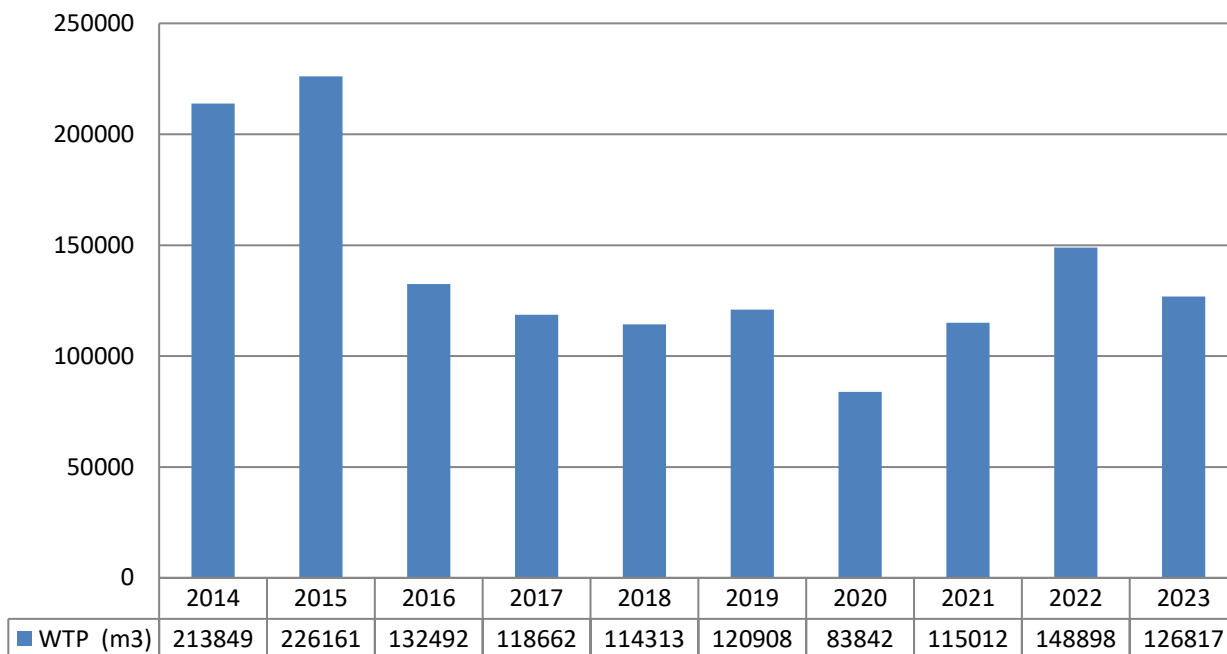
Monthly Rated Flows

Rated Capacity - MDWL



Annual Total Flow Comparison

Total Annual m³



Regulatory Sample Results Summary

Microbiological Testing

	No. of Samples Collected	Range of E.Coli Results		Range of Total Coliform Results		Range of HPC Results	
		Min	Max	Min	Max	Min	Max
Raw Water	156	0	0	0	1		
Treated Water	52	0	0	0	0	10	310
Distribution Water	115	0	0	0	0	10	200

Operational Testing

	No. of Samples Collected	Range of Results	
		Minimum	Maximum
Turbidity, In-House (NTU) – RW 1	12	0.38	0.72
Turbidity, In-House (NTU) – RW 2	12	0.39	0.86
Turbidity, In-House (NTU) – RW 4	12	0.40	0.62
Free Chlorine Residual, On-Line (mg/L) - TW	8760	0.73	1.49
Free Chlorine Residual, In-House (mg/L) - TW	52	1.00	1.26
Free Chlorine Residual, On-Line (mg/L) - DW	8760	0.30	2.00
Free Chlorine Residual, DW Field (mg/L) - DW	115	0.23	1.16

NOTE: spikes recorded by on-line instrumentation were a result of air bubbles and various maintenance/calibration activities. All spikes are reviewed for compliance with O.Reg 170/03

Inorganic Parameters

These parameters are tested as a requirement under 170/03. Sodium and Fluoride are required to be tested every 5 years. Nitrate and Nitrite are tested quarterly and the metals are tested annually as required under 170/03. In the event any of the parameters exceed half of the maximum allowable concentration the parameter is required to be sampled quarterly.

- MAC = Maximum Allowable Concentration as per O.Reg 169/03
- BDL = Below the laboratory detection level

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Treated Water					
Antimony: Sb (ug/L) - TW	2023/01/09	<BDL 0.1	6.0	No	No
Arsenic: As (ug/L) - TW	2023/01/09	0.1	10.0	No	No
Barium: Ba (ug/L) - TW	2023/01/09	100.0	1000.0	No	No
Boron: B (ug/L) - TW	2023/01/09	146.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2023/01/09	<BDL 0.01	5.0	No	No
Chromium: Cr (ug/L) - TW	2023/01/09	<BDL 2.0	50.0	No	No
Mercury: Hg (ug/L) - TW	2023/01/09	<BDL 0.02	1.0	No	No
Selenium: Se (ug/L) - TW	2023/01/09	2.0	50.0	No	No
Uranium: U (ug/L) - TW	2023/01/09	0.95	20.0	No	No
Additional Inorganics					
Fluoride (mg/L) - TW	2019/01/07	<BDL 0.1	1.5	No	No
Nitrite (mg/L) - TW	2023/01/03	<BDL 0.1	1.0	No	No
Nitrite (mg/L) - TW	2023/04/03	<BDL 0.05	1.0	No	No
Nitrite (mg/L) - TW	2023/07/04	0.05	1.0	No	No
Nitrite (mg/L) – TW	2023/10/03	0.05	1.0	No	No
Nitrate (mg/L) - TW	2023/01/03	<BDL 0.1	10.0	No	No
Nitrate (mg/L) - TW	2023/04/03	<BDL 0.05	10.0	No	No
Nitrate (mg/L) - TW	2023/07/04	<BDL 0.05	10.0	No	No
Nitrate (mg/L) – TW	2023/10/03	0.05	10.0	No	No
Sodium: Na (mg/L) - TW	2021/02/01	36.2	20*	Yes	Yes

*There is no "MAC" for Sodium. The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified mg/L when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.

Schedule 15 Sampling:

The Schedule 15 Sampling is required under O.Reg 170/03. This system is under the plumbing exemption. No plumbing samples were collected. Next lead samples due July 2024.

Distribution System	Number of Sampling Points	Number of Samples	Range of Results		MAC (ug/L)	Number of Exceedances
			Minimum	Maximum		
Alkalinity (mg/L)	5	5	253	278	N/A	N/A
pH	5	5	7.08	7.21	N/A	N/A
Lead (ug/l)	3	3	0.07	0.39	10	0

Organic Parameters

These parameters are tested annually as a requirement under O.Reg 170/03. In the event any of the parameters exceed half of the maximum allowable concentration the parameter is required to be sampled quarterly.

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Treated Water					
Alachlor (ug/L) - TW	2023/01/09	<BDL 0.3	5.0	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2022/01/10	<BDL 1.0	20.0	No	No
Azinphos-methyl (ug/L) - TW	2023/01/09	<BDL 1.0	20.0	No	No
Benzene (ug/L) - TW	2023/01/09	<BDL 0.5	1.0	No	No
Benzo(a)pyrene (ug/L) - TW	2023/01/09	<BDL 0.006	0.01	No	Yes
Bromoxynil (ug/L) - TW	2023/01/09	<BDL 0.5	5.0	No	No
Carbaryl (ug/L) - TW	2023/01/09	<BDL 3.0	90.0	No	No
Carbofuran (ug/L) - TW	2023/01/09	<BDL 1.0	90.0	No	No
Carbon Tetrachloride (ug/L) - TW	2023/01/09	<BDL 0.2	2.0	No	No
Chlorpyrifos (ug/L) - TW	2023/01/09	<BDL 0.5	90.0	No	No
Diazinon (ug/L) - TW	2023/01/09	<BDL 1.0	20.0	No	No
Dicamba (ug/L) - TW	2023/01/09	<BDL 1.0	120.0	No	No
1,2-Dichlorobenzene (ug/L) - TW	2023/01/09	<BDL 0.5	200.0	No	No
1,4-Dichlorobenzene (ug/L) - TW	2023/01/09	<BDL 0.5	5.0	No	No
1,2-Dichloroethane (ug/L) - TW	2023/01/09	<BDL 0.5	5.0	No	No
1,1-Dichloroethylene (ug/L) - TW	2023/01/09	<BDL 0.5	14.0	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2023/01/09	<BDL 5.0	50.0	No	No
2,4-Dichlorophenol (ug/L) - TW	2023/01/09	<BDL 0.2	900.0	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2023/01/09	<BDL 1.0	100.0	No	No
Diclofop-methyl (ug/L) - TW	2023/01/09	<BDL 0.9	9.0	No	No
Dimethoate (ug/L) - TW	2023/01/09	<BDL 1.0	20.0	No	No
Diquat (ug/L) - TW	2023/01/09	<BDL 5.0	70.0	No	No
Diuron (ug/L) - TW	2023/01/09	<BDL 5.0	150.0	No	No
Glyphosate (ug/L) - TW	2023/01/09	<BDL 25.0	280.0	No	No
Malathion (ug/L) - TW	2023/01/09	<BDL 5.0	190.0	No	No
2-Methyl-4chlorophenoxyacetic Acid (MCPA)	2023/01/09	<BDL 10.0	100.0	No	No
Metolachlor (ug/L) - TW	2023/01/09	<BDL 3.0	50.0	No	No
Metribuzin (ug/L) - TW	2023/01/09	<BDL 3.0	80.0	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2023/01/09	<BDL 0.5	80.0	No	No
Paraquat (ug/L) - TW	2023/01/09	<BDL 1.0	10.0	No	No
PCB (ug/L) - TW	2023/01/09	<BDL 0.05	3.0	No	No
Pentachlorophenol (ug/L) - TW	2023/01/09	<BDL 0.2	60.0	No	No
Phorate (ug/L) - TW	2023/01/09	<BDL 0.3	2.0	No	No
Picloram (ug/L) - TW	2023/01/09	<BDL 5.0	190.0	No	No

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Prometryne (ug/L) - TW	2023/01/09	<BDL 0.1	1.0	No	No
Simazine (ug/L) - TW	2023/01/09	<BDL 0.5	10.0	No	No
Terbufos (ug/L) - TW	2023/01/09	<BDL 0.5	1.0	No	No
Tetrachloroethylene (ug/L) - TW	2023/01/09	<BDL 0.5	10.0	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2023/01/09	<BDL 0.2	100.0	No	No
Triallate (ug/L) - TW	2023/01/09	<BDL 10.0	230.0	No	No
Trichloroethylene (ug/L) - TW	2023/01/09	<BDL 0.5	5.0	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2023/01/09	<BDL 0.2	5.0	No	No
Trifluralin (ug/L) - TW	2023/01/09	<BDL 0.5	45.0	No	No
Vinyl Chloride (ug/L) - TW	2023/01/09	<BDL 0.2	1.0	No	No

Distribution Water	Sample Year	RAA	MAC	No. of Exceedances	
				MAC	½ MAC
Trihalomethane: Total (ug/L) RAA - DW	2023	14.25	100	No	No
Haloacetic Acids: Total (ug/L) RAA - DW	2023	5.3	80	No	No

RAA= Running Annual Average

MAC = Maximum Allowable Concentration as per O.Reg 169/03

BDL = Below the laboratory detection level

Additional Legislated Samples

There was no additional sampling required.

Major Maintenance Summary


WO #	Description
3205709	Repair sanitary discharge pipe at treatment plant
3205710	Replace treated water chlorine analyzer on September 26 th , 2023
3289533	Rebuild 2 McAvity and two Darling B-50 hydrants
3624921	Emergency Roof Repair Well House #4
3665502	Duty Pump #1 rebuild
3205012	Emergency plumbing repairs at Well House #2

Distribution Maintenance

Date	Location Reference	Category	Details	Corrective Repair
10/19/23	130 Broadway St W	1	Circumferential crack due to age of pipe and poor bedding	6" X 16" Stainless Steel repair clamp installed

Appendix A

WTRS Data and Submission Confirmation



Ministry of the Environment,
Conservation and Parks

| [WT DATA](#) | [USER PROFILE](#) | [CONTACT US](#) | [HELP](#) | [HOME](#) | [LOGOUT](#) |

Location: [WTRS](#) / [WT DATA](#) / [Input WT Record](#)

WTRS-WT-008

Water Taking Data submitted successfully.

Confirmation:

Thank you for submitting your water taking data online.

Permit Number: 2110-AP9LSG
Permit Holder: THE CORPORATION OF THE VILLAGE OF MERRICKVILLE-WOLFORD.
Received on: Jan 24, 2024 8:42 AM

This confirmation indicates that your data has been received by the Ministry, but should not be construed as acceptance of this data if it differs from that specified on the Permit Number, assigned to the Permit Holder stated above.

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MERRICKVILLE2 WOLFORD2 | 2024/01/24
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