

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 2020

Issued: February 24, 2021

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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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.

There are no additional drinking water systems that receive water from this facility.

Compliance Report Card

Compliance Event	Details
Ministry of Environment Inspections	Inspection July 22, 2020 <ul style="list-style-type: none"> Inspection Rating 100%
Ministry of Labour Inspections	No inspections during the reporting period.
QEMS External Audit	One (1) External On-Site Audit
AWQI's/BWA	1 - AWQI reported during the reporting period
Non-Compliance	No non-compliance reported during the reporting period
Community Complaints	No community complaints during the reporting period
Spills	No reportable spills during the reporting period.
Watermain Breaks	1 – 300 Block of Drummond Street East

System Process Description

Raw Water

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 metre 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 metre 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 metre 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 an 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 unbaffled, and has a storage volume of 590 cubic metres (m³). Clearwell Cell 2 is baffled and has a storage volume of 141 m³.

Disinfection

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.

Back-up Power

Emergency or standby power is provided to the Main Pump house using a stationary 120 kW diesel generator set.

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	Details	Legislation	Corrective Action Taken
2020-04-28	149937	Distribution System	Treated Water Turbidity over 1.0 NTU due to Fire Department taking water from fire hydrant 36	Reg. 170/03	Flush Hydrant 75 for 30 min; adjusted Well 4 Chemical pump up; increased Chlorine dosage

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 were no non-compliances identified in the Ministry Inspection.				

Flows

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

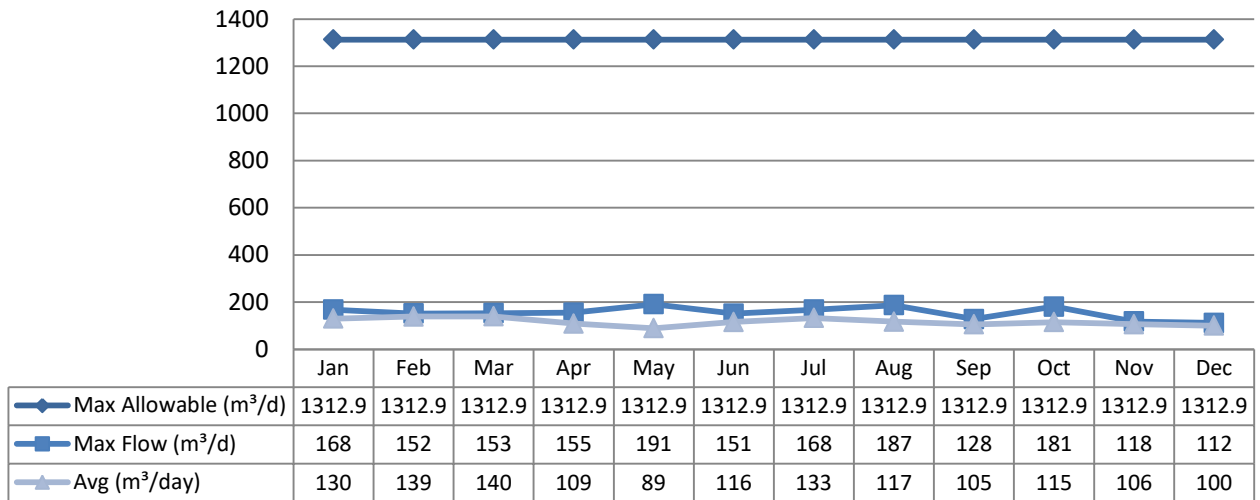
Raw Water Flows

The Raw Water flows are regulated under the Permit to Take Water. 2020 Raw Flow Data was submitted to the Ministry electronically under permit #4573-73AR7F. The data was submitted on February 9, 2021 and the confirmation is attached in Appendix A.

Well 1

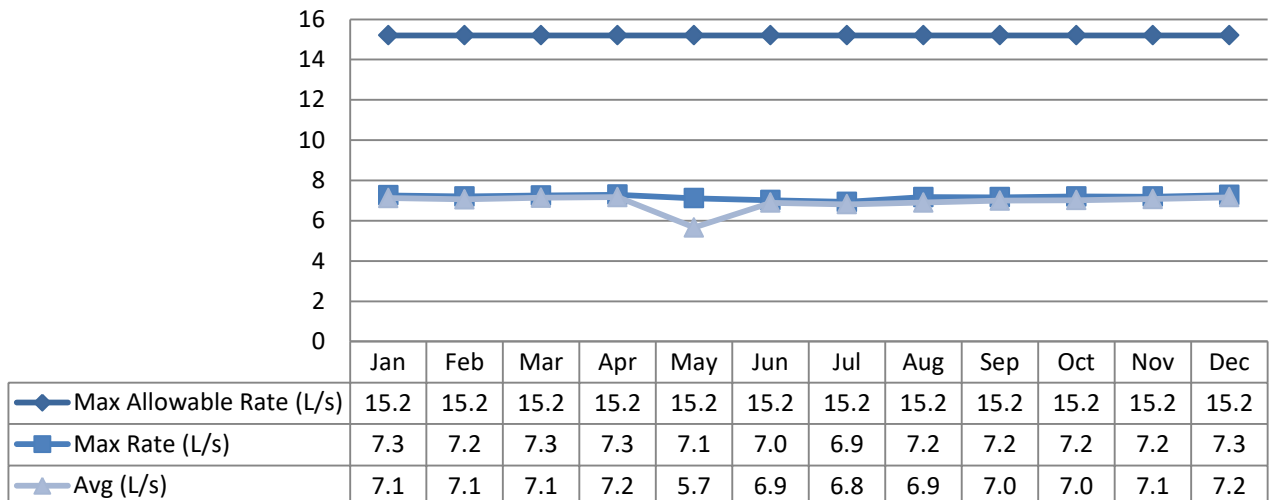
Total Monthly Flows (m³/d)

Max Allowable PTTW



Monthly Rated Flows (L/s)

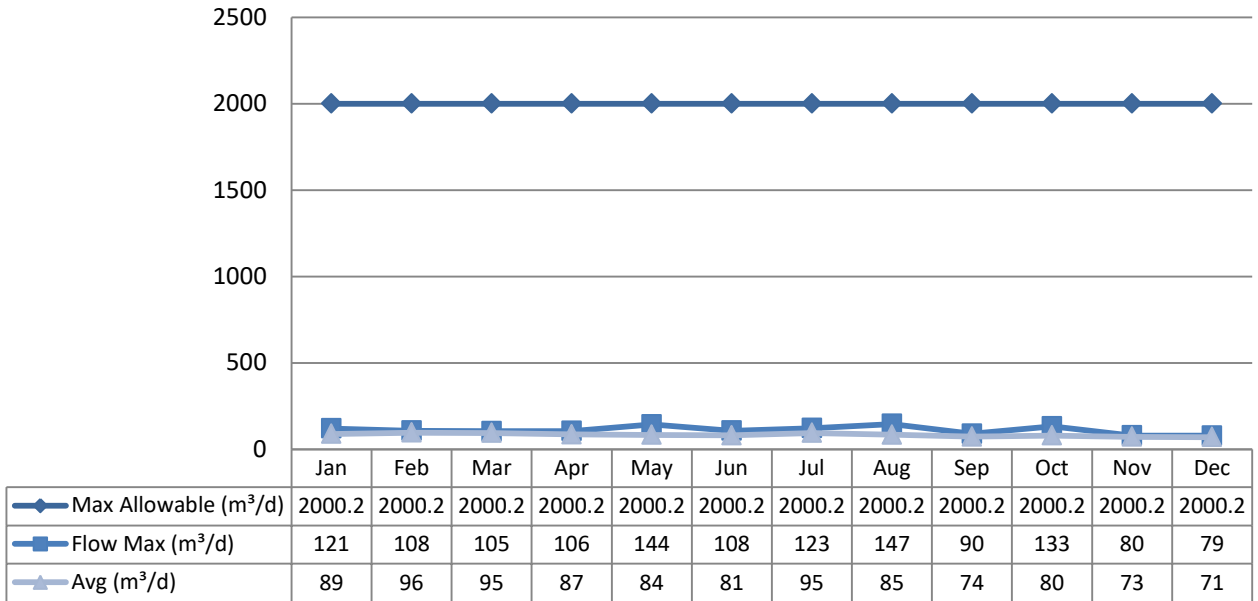
Max allowable rate - PTTW



Well 2

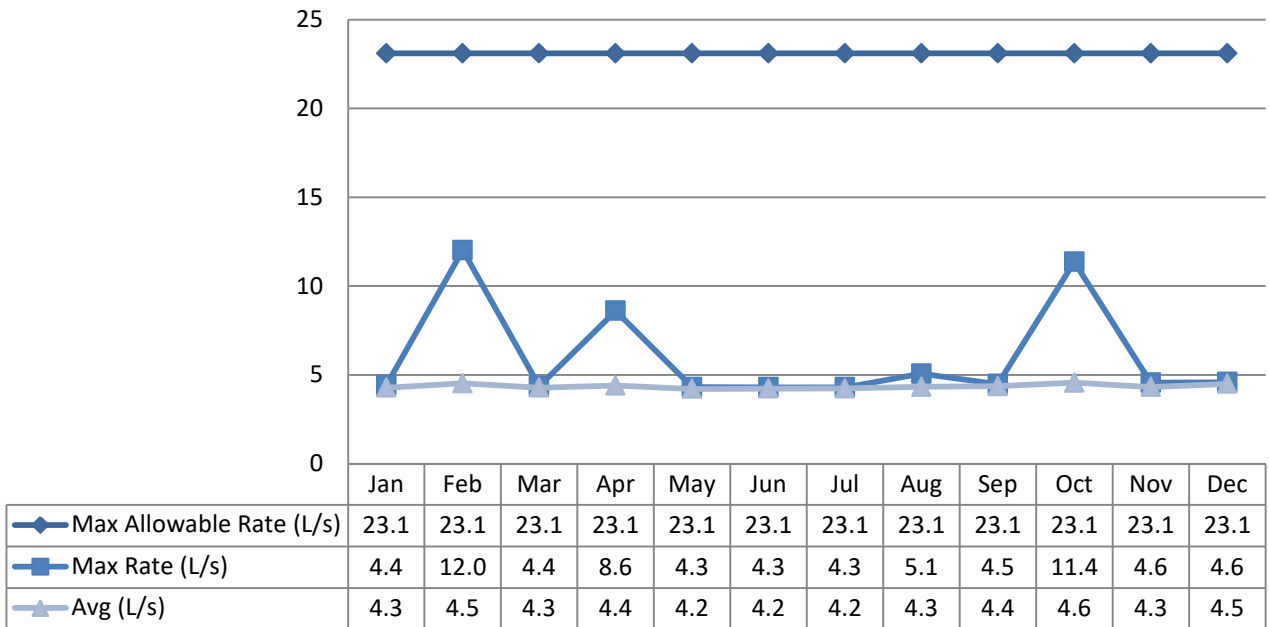
Total Monthly Flows (m³/d)

Max Allowable PTTW



Monthly Rated Flows (L/s)

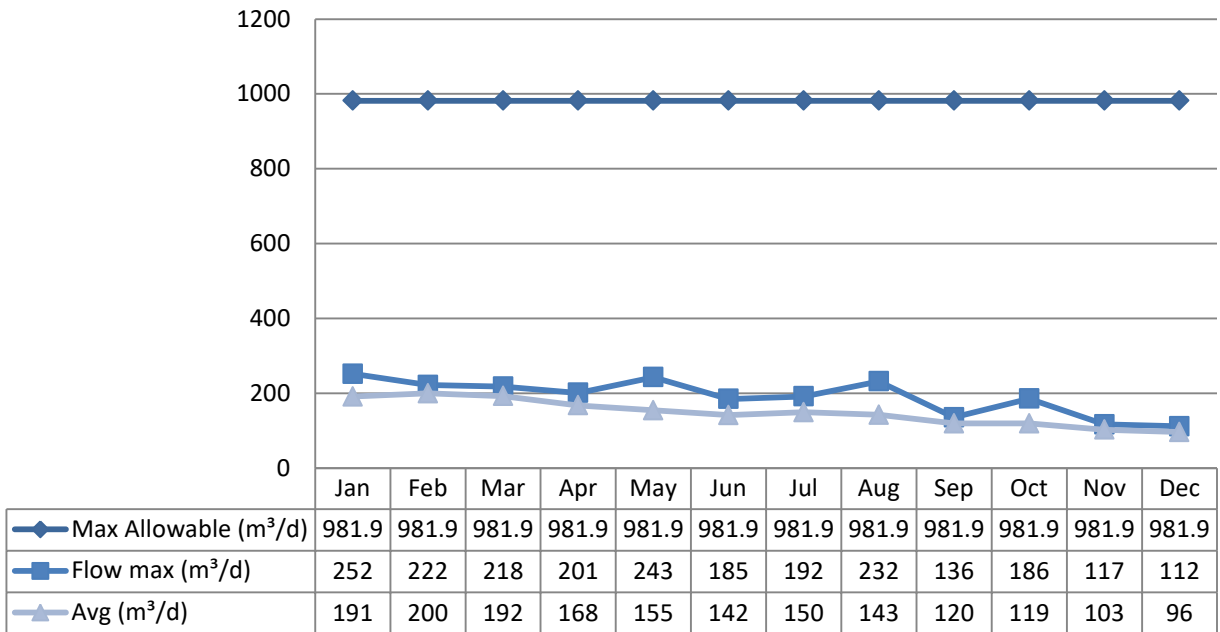
Max allowable rate - PTTW



Well 4

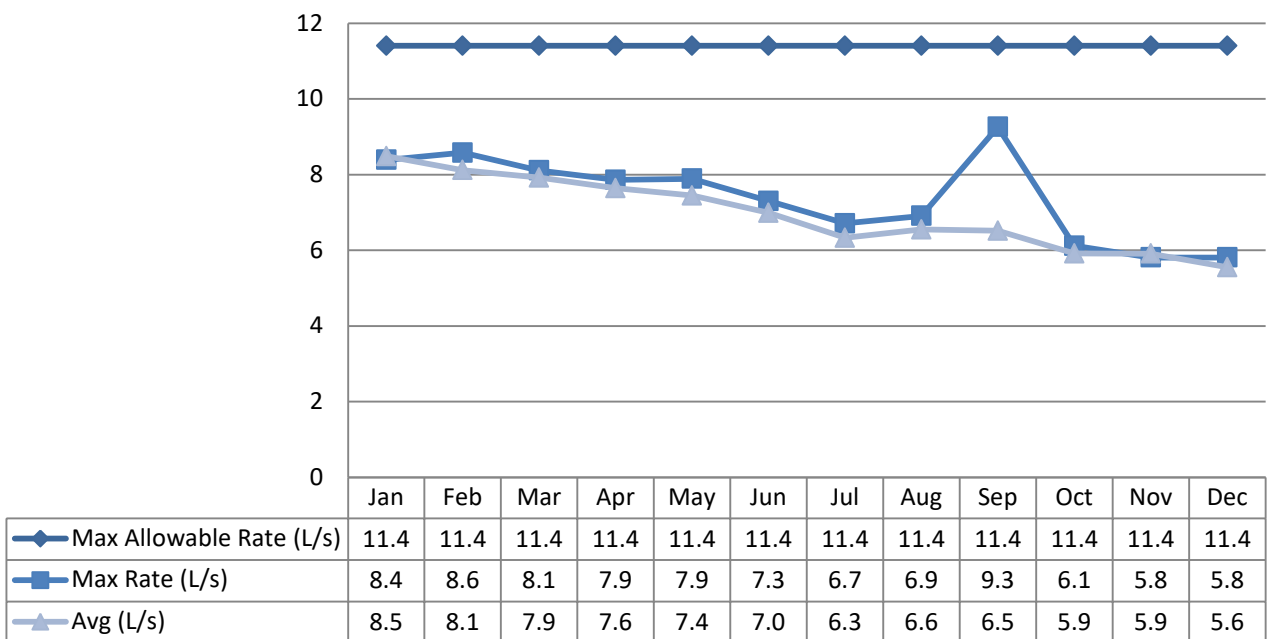
Total Monthly Flows (m³/d)

Max Allowable PTTW



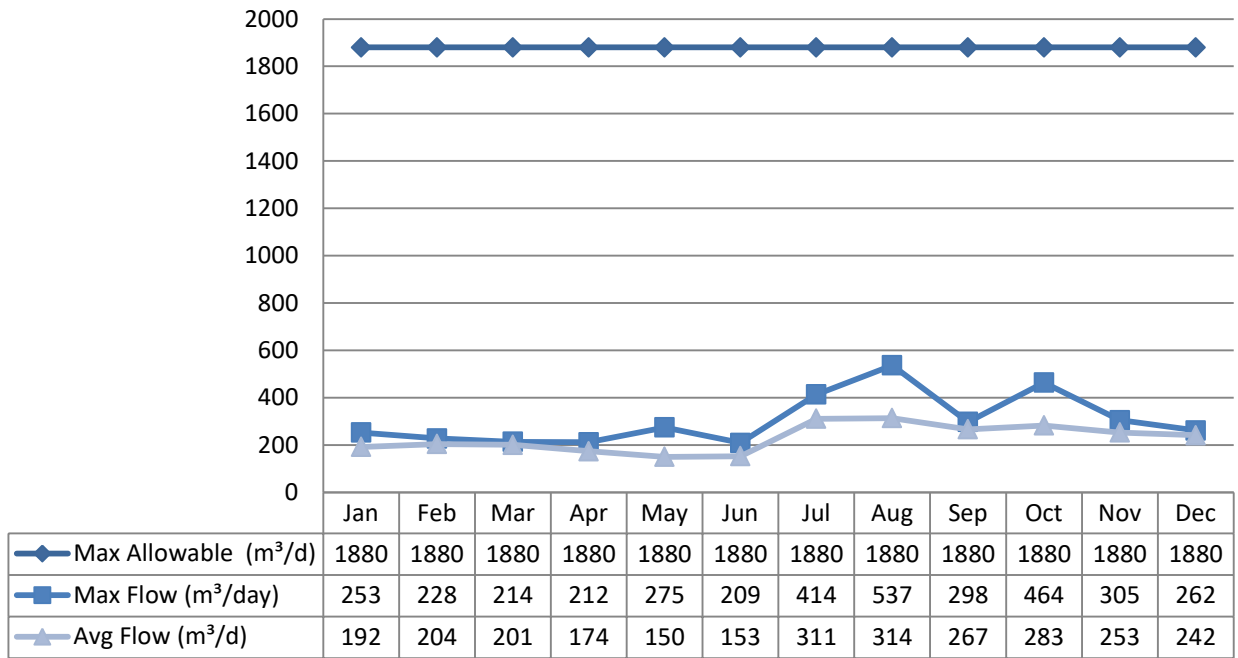
Monthly Rated Flows (L/s) Review January and November

Max allowable rate - PTTW



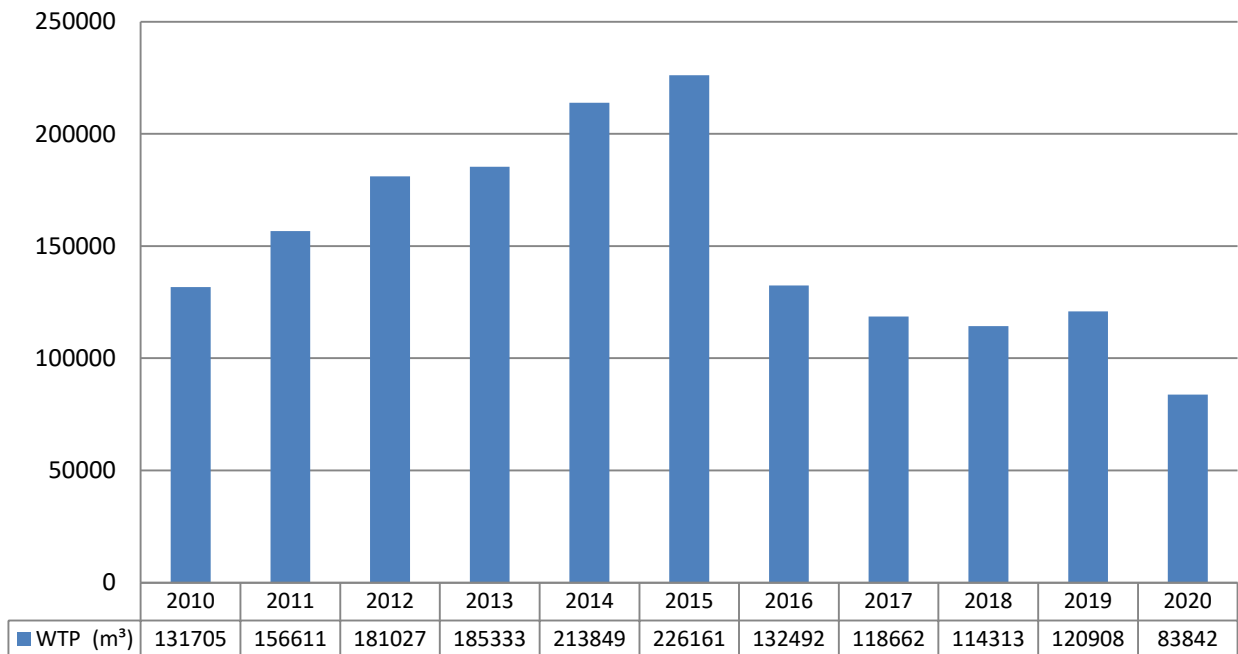
System Water Flows

The System Water flows are regulated under the Municipal Licence.



Annual Total Flow Comparison

Total Annual m³



Regulatory Sample Results Summary

Microbiological Testing

	No. of Samples	Range of E.coli Results		Range of Total Coliform Results		No. of HPC Samples	Range of HPC Results	
		Min	Max	Min	Max		Min	Max
RW Well 1	51	0	0	0	0	28	10	90
RW Well 2	52	0	0	0	0	11	10	50
RW Well 4	51	0	0	0	0	11	10	30
Treated Water	51	0	0	0	0	51	10	10
Distribution System	112	0	0	0	0	110	10	240

Operational Testing

	No. of Samples Collected	Range of Results	
		Minimum	Maximum
Turbidity, In-House (NTU) - RW1	10	0.33	0.74
pH, In-House (---) - RW1	10	7.12	7.61
Turbidity, In-House (NTU) - RW2	10	0.41	0.71
pH, In-House (---) – RW2	10	7.10	7.67
Turbidity, In-House (NTU) - RW4	10	0.39	0.77
pH, In-House (---) – RW4	10	7.06	7.58
Free Chlorine Residual, On-Line (mg/L) - TW	8760	0.94	2.00
Free Chlorine Residual, In-House (mg/L) - TW	114	0.98	1.41
Free Chlorine Residual, On-Line (mg/L) - DW	8760	0.28	2.00
Free Chlorine Residual, In-House (mg/L) - DW	116	0.21	1.37

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

Physical Parameters

Parameter	Range of Results
Treated Water Alkalinity (mg/L)	243 - 261
Treated Water Colour (TCU)	2 – 2
Treated Water Conductivity (uS/cm)	677 - 695
Treated Water pH	7.94 – 8.07
Treated Water Hardness (as CaCO ₃) (mg/L)	280 - 318

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 every 5 years 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.

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Treated Water					
Antimony: Sb (ug/L) - TW	2020/01/06	< 0.1	6.0	No	No
Arsenic: As (ug/L) - TW	2020/01/06	0.1	10.0	No	No
Barium: Ba (ug/L) - TW	2020/01/06	101.0	1000.0	No	No
Boron: B (ug/L) - TW	2020/01/06	142.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2020/01/06	< 0.02	5.0	No	No
Chromium: Cr (ug/L) - TW	2020/01/06	< 2.0	50.0	No	No
Mercury: Hg (ug/L) - TW	2020/01/06	< 0.02	1.0	No	No
Selenium: Se (ug/L) - TW	2020/01/06	1.0	50	No	No
Uranium: U (ug/L) - TW	2020/01/06	0.78	20.0	No	No
Additional Inorganics					
Fluoride (mg/L) - TW	2019/01/07	<MDL 0.1	1.5	No	No
Nitrite (mg/L) - TW	2020/01/06	<MDL 0.1	1.0	No	No
Nitrite (mg/L) - TW	2019/04/06	<MDL 0.1	1.0	No	No
Nitrite (mg/L) - TW	2019/08/04	<MDL 0.1	1.0	No	No
Nitrite (mg/L) - TW	2019/10/19	<MDL 0.1	1.0	No	No
Nitrate (mg/L) - TW	2019/01/06	<MDL 0.1	10.0	No	No
Nitrate (mg/L) - TW	2019/04/06	<MDL 0.1	10.0	No	No
Nitrate (mg/L) - TW	2019/08/04	<MDL 0.1	1.0	No	No
Nitrate (mg/L) - TW	2019/10/19	<MDL 0.1	1.0	No	No
Sodium: Na (mg/L) - TW	2016/01/04	31.8	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.

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

BDL = Below the laboratory detection level

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. Lead sampling will be required in July 2021.

Distribution System	Number of Sampling Points	Number of Samples	Range of Results		MAC (mg/L)	Number of Exceedances
			Minimum	Maximum		
Alkalinity (mg/L)	6	6	242	251	N/A	N/A
pH	6	6	7.04	7.43	N/A	N/A
Lead (mg/L)	-	-	-		0.001	N/A

Organic Parameters

These parameters are tested every 5 years 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 (mm/dd/yyyy)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Treated Water					
Alachlor (ug/L) - TW	2020/01/06	< 0.3	5.00	No	No
Azinphos-methyl (ug/L) - TW	2020/01/06	< 1.0	20.00	No	No
Benzene (ug/L) - TW	2020/01/06	< 0.5	1.00	No	No
Benzo(a)pyrene (ug/L) - TW	2020/01/06	< 0.005	0.01	No	No
Bromoxynil (ug/L) - TW	2020/01/06	< 0.5	5.00	No	No
Carbaryl (ug/L) - TW	2020/01/06	< 3.0	90.00	No	No
Carbofuran (ug/L) - TW	2020/01/06	< 1.0	90.00	No	No
Carbon Tetrachloride (ug/L) - TW	2020/01/06	< 0.2	2.00	No	No
Chlorpyrifos (ug/L) - TW	2020/01/06	< 0.5	90.00	No	No
Diazinon (ug/L) - TW	2020/01/06	< 1.0	20.00	No	No
Dicamba (ug/L) - TW	2020/01/06	< 10.0	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW	2020/01/06	< 0.5	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW	2020/01/06	< 0.5	5.00	No	No
1,2-Dichloroethane (ug/L) - TW	2020/01/06	< 0.5	5.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2020/01/06	< 5.0	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW	2020/01/06	< 0.1	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2020/01/06	< 10.0	100.00	No	No
Diclofop-methyl (ug/L) - TW	2020/01/06	< 0.9	9.00	No	No
Dimethoate (ug/L) - TW	2020/01/06	< 1.0	20.00	No	No
Diquat (ug/L) - TW	2020/01/06	< 5.0	70.00	No	No
Diuron (ug/L) - TW	2020/01/06	< 5.0	150.00	No	No
Glyphosate (ug/L) - TW	2020/01/06	< 25.0	280.00	No	No
Malathion (ug/L) - TW	2020/01/06	< 5.0	190.00	No	No
Methoxychlor (ug/L) - TW	2020/01/06	< 3.0	900.00	No	No
Metolachlor (ug/L) - TW	2020/01/06	< 3.0	50.00	No	No
Metribuzin (ug/L) - TW	2020/01/06	< 1.0	80.00	No	No
Paraquat (ug/L) - TW	2020/01/06	< 1.0	10.00	No	No
PCB (ug/L) - TW	2020/01/06	< 0.05	3.00	No	No
Pentachlorophenol (ug/L) - TW	2020/01/06	< 0.1	60.00	No	No
Phorate (ug/L) - TW	2020/01/06	< 0.3	2.00	No	No
Picloram (ug/L) - TW	2020/01/06	< 15.0	190.00	No	No
Prometryne (ug/L) - TW	2020/01/06	< 0.1	1.00	No	No
Simazine (ug/L) - TW	2020/01/06	< 0.5	10.00	No	No
Terbufos (ug/L) - TW	2020/01/06	< 0.5	1.00	No	No
Tetrachloroethylene (ug/L) - TW	2020/01/06	< 0.5	10.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2020/01/06	< 0.1	100.00	No	No

	Sample Date (mm/dd/yyyy)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Triallate (ug/L) - TW	2020/01/06	< 10.0	230.00	No	No
Trichloroethylene (ug/L) – TW	2020/01/06	< 0.5	5.00	No	No
2,4,6-Trichlorophenol (ug/L) – TW	2020/01/06	< 0.1	5.00	No	No
2-Methyl-4-chlorophenoxyacetic acid (MCPA) (ug/L) - TW	2020/01/06	<10.0	100.0	No	No
Trifluralin (ug/L) - TW	2020/01/06	< 0.5	45.00	No	No
Vinyl Chloride (ug/L) - TW	2020/01/06	< 0.2	1.00	No	No
Distribution					
Trihalomethane: Total (ug/L) Annual Average - DW	2020	21.3	100.00	No	No
Haloaceticacid: Total (ug/L) Annual Average- DW	2020	6.1	80.00	No	No

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#	Details
1584592	Capital Blanket Items under \$200
1586687	Capital SCADA Commission
1587160	Capital Well 4 Electrical Panel
1918184	Capital Supplies Hach / Metcon
1964016	Capital Fire Pump VFD Upgrade
1623287	Capital Chemical pump rebuild kits
1790709	Capital SAI Global DWQMS External Audit
1790856	Capital Well 2 + 4 Replace Dehumidifier
1833472	Capital RW Supply Pump Replace
2000377	Capital Pump Suction Repair Duty Pump 2
2037842	Capital RW CL2 Analyzer-SCADA

Distribution Maintenance Highlights

Date	Location Reference	Operator	Details	Corrective Repair
January 4, 2020	306 Drummond St. E	J.M.	Circumferential break in Watermain	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: Feb 9, 2021 12:52 PM

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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