

# Merrickville Drinking Water System

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Waterworks # 220001227  
System Category – Large Municipal Residential

## Annual Water Report

Prepared For: Village of Merrickville-Wolford

Reporting Period of January 1<sup>st</sup> – December 31<sup>st</sup> 2018

Issued: February 28, 2018

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 systems additional drinking water systems that receive water from this facility.

## Compliance Report Card

Compliance Event	Details
Ministry of Environment Inspections	Report received on June 29th, 2018 Inspection on May 15th, 2018. Inspection Rating 100%
Ministry of Labour Inspections	There were no inspections during the reporting period.
QEMS External Audit	One (1) External On-Site Audit <ul style="list-style-type: none"> <li>2 OFI (Opportunity for Improvement) Element 3 – Commitment and Endorsement and Element 13- Essential Supplies/Services</li> </ul>
AWQI's/BWA	There were no AWQI's during the reporting period.
Non-Compliance	There was no non-compliance reported during the reporting period.
Community Complaints	Two (2) related to coloured water.
Spills	There were no reportable spills during the reporting period.
Watermain Breaks	1

## 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.

The upgrades to the Merrickville Drinking-Water System included the extension of the well casings of Well 2 and 4 to approximately 450 mm above ground elevation; and the installation of fine mesh stainless steel screening over all openings to the well houses.

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 upgrades to the Merrickville Drinking-Water System included the extension of the well casing of Well 2 and 4 to approximately 450 mm above ground elevation; and the installation of fine mesh stainless steel screening over all openings to the well houses.

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 reservoir 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 (m<sup>3</sup>). Clearwell Cell 2 is baffled and has a storage volume of 141 m<sup>3</sup>.

### 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	Problem	Details	Legislation	Corrective Action Taken
There was no adverse water quality incidents reported during the reporting period.						

### 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 inspection during this period.				

## Flows

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

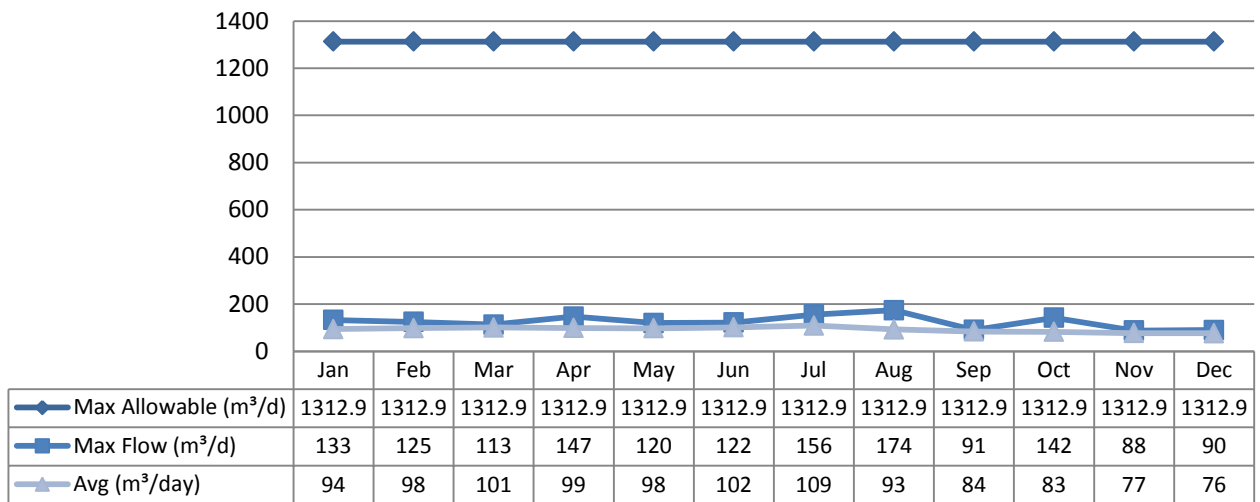
### Raw Water Flows

The Raw Water flows are regulated under the Permit to Take Water. 2018 Raw Flow Data was submitted to the Ministry electronically under permit #4573-73AR7F. The confirmation and a copy of the data that was submitted are attached in Appendix A.

#### Well 1

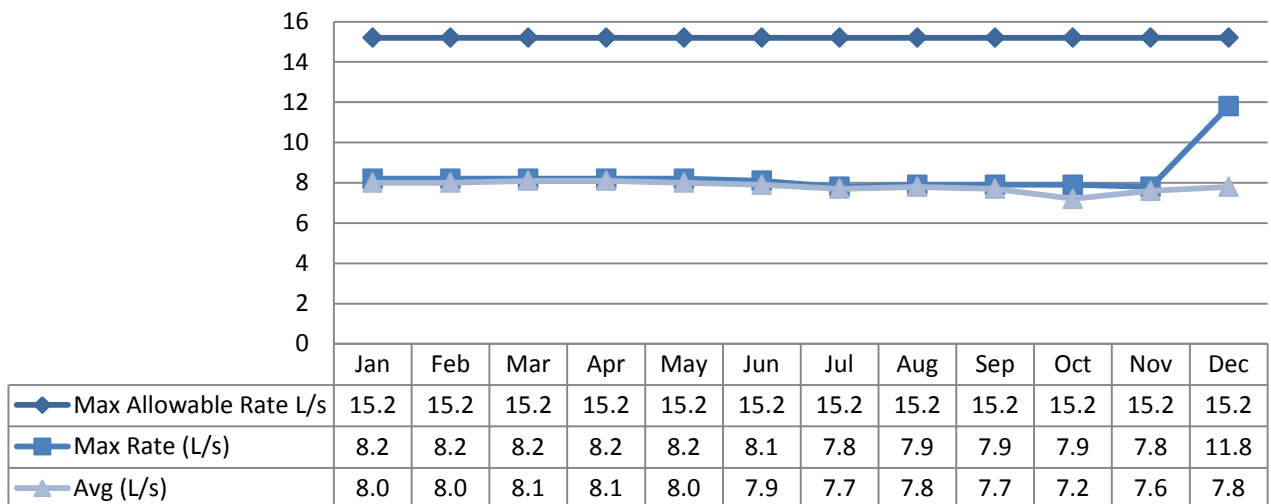
#### Total Monthly Flows (m<sup>3</sup>/d)

Max Allowable PTTW



#### Monthly Rated Flows (L/s)

Max allowable rate - PTTW

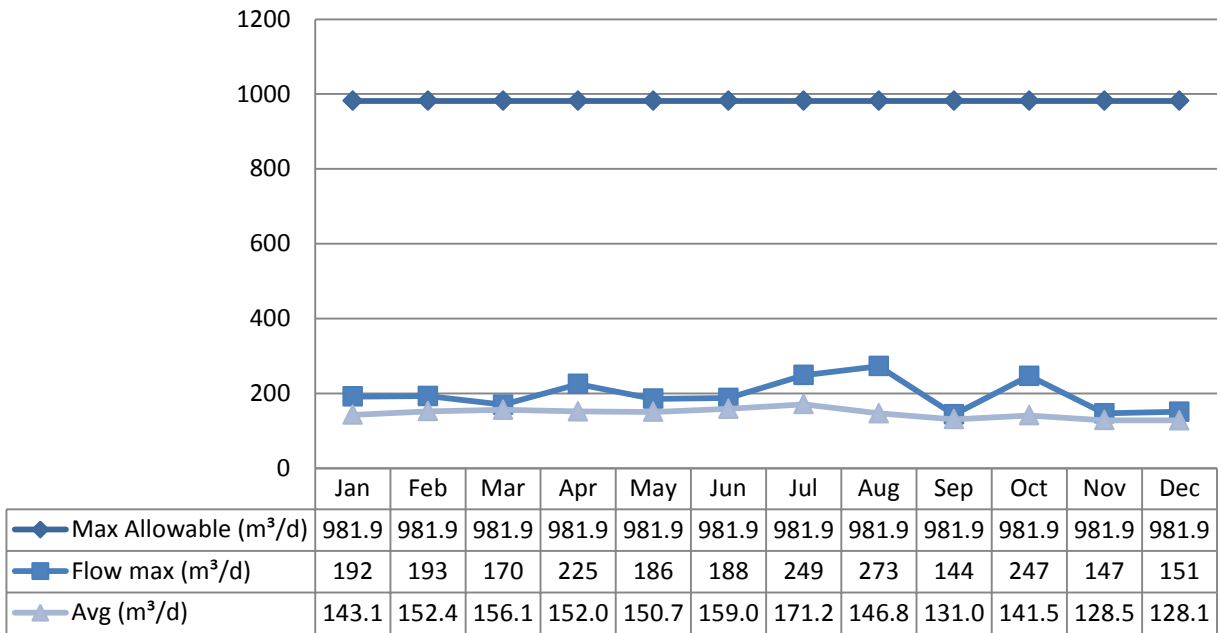




Well 4

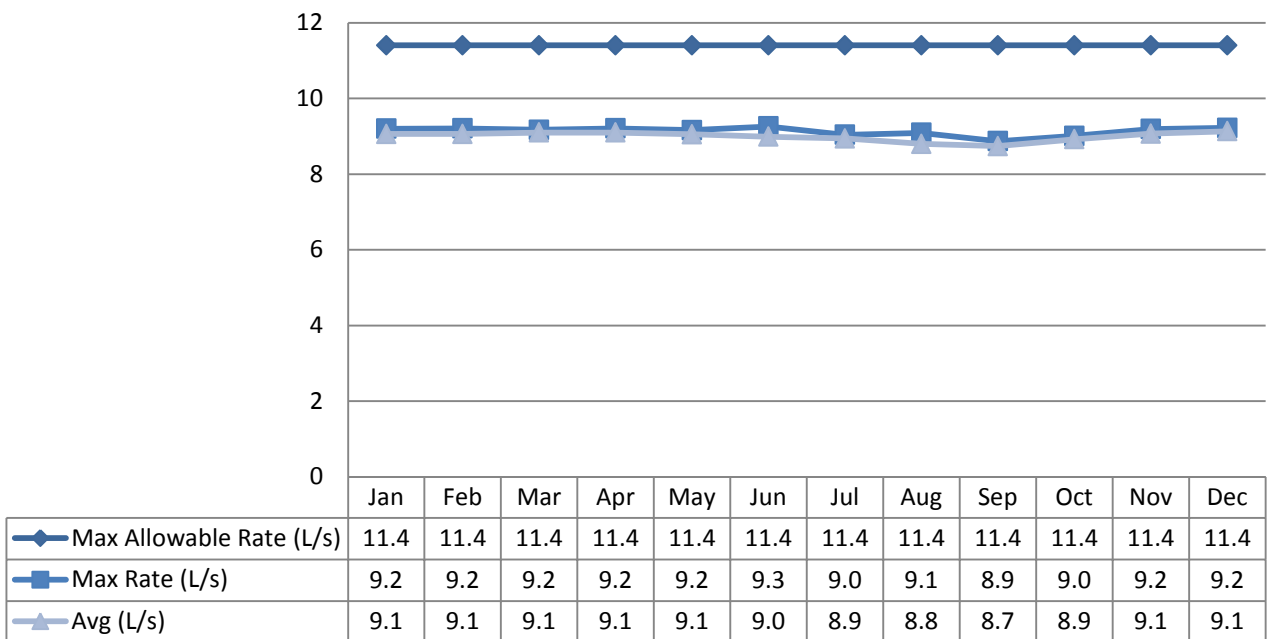
Total Monthly Flows (m<sup>3</sup>/d)

Max Allowable PTTW



Monthly Rated Flows (L/s)

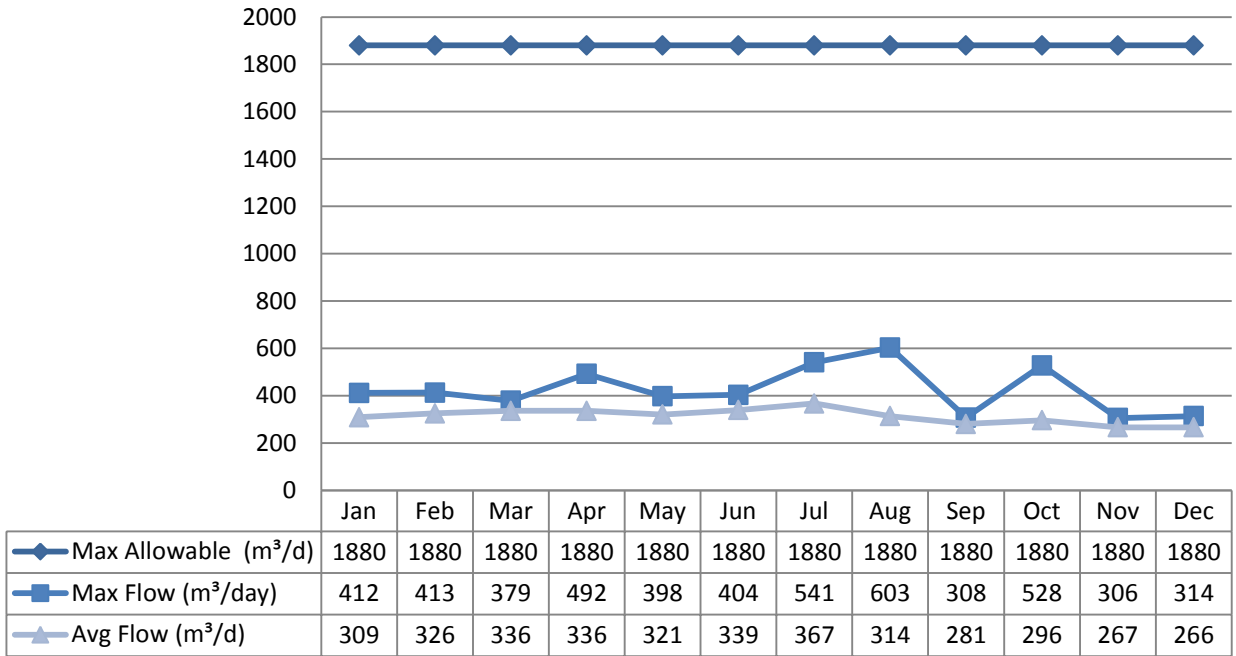
Max allowable rate - PTTW





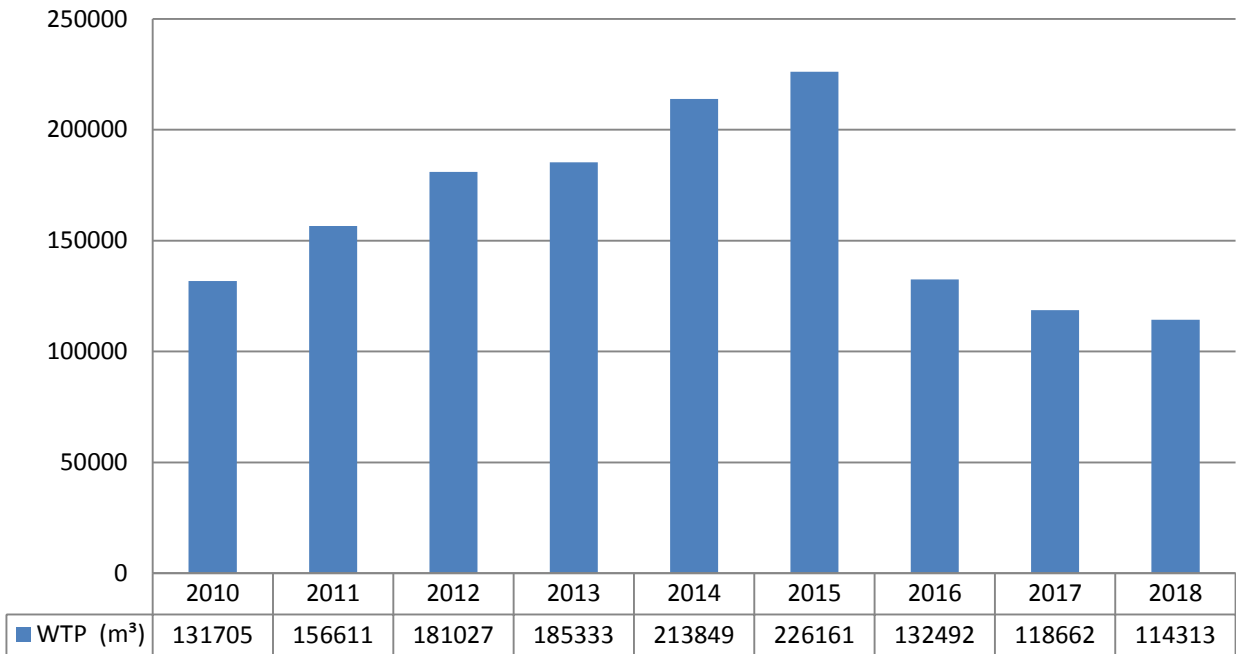
**System Water Flows**

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	52	0	0	0	1	24	2	190
RW Well 2	52	0	0	0	0	12	10	100
RW Well 4	52	0	0	0	0	16	10	430
Treated Water	52	0	0	0	0	52	2	310
Distribution System	117	0	0	0	0	117	2	40

### Operational Testing

	No. of Samples Collected	Range of Results	
		Minimum	Maximum
Turbidity, In-House (NTU) - RW1	9	0.36	0.66
pH, In-House (---) - RW1	9	7.32	7.66
Turbidity, In-House (NTU) - RW2	9	0.41	0.61
pH, In-House (---) – RW2	9	7.19	7.66
Turbidity, In-House (NTU) - RW4	9	0.5	0.77
pH, In-House (---) – RW4	9	7.12	7.70
Free Chlorine Residual, On-Line (mg/L) - TW	152	0.52	2.0
Free Chlorine Residual, In-House (mg/L) - TW	152	0.52	1.32
Free Chlorine Residual, On-Line (mg/L) - DW	131	0.23	0.97

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)	244 - 271
Treated Water Colour (TCU)	2 - 2
Treated Water Conductivity (uS/cm)	667 - 698
Treated Water pH	7.9 – 8.11
Treated Water Hardness (as CaCO <sub>3</sub> ) (mg/L)	271 - 308

## 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
<b>Treated Water</b>					
Antimony: Sb (ug/L) - TW	2018/01/02	< 0.1	6.0	No	No
Arsenic: As (ug/L) - TW	2018/01/02	0.8	25.0	No	No
Barium: Ba (ug/L) - TW	2018/01/02	101.0	1000.0	No	No
Boron: B (ug/L) - TW	2018/01/02	146.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2018/01/02	< 0.02	5.0	No	No
Chromium: Cr (ug/L) - TW	2018/01/02	< 2.0	50.0	No	No
Mercury: Hg (ug/L) - TW	2018/01/02	< 0.02	1.0	No	No
Selenium: Se (ug/L) - TW	2018/01/02	3.0	50	No	No
Uranium: U (ug/L) - TW	2018/01/02	0.98	20.0	No	No
<b>Additional Inorganics</b>					
Fluoride (mg/L) - TW	2018/10/01	0.4	1.5	No	No
Nitrite (mg/L) - TW	2018/01/02	<MDL 0.1	1.0	No	No
Nitrite (mg/L) - TW	2018/04/03	<MDL 0.1	1.0	No	No
Nitrite (mg/L) - TW	2018/07/03	<MDL 0.1	1.0	No	No
Nitrite (mg/L) - TW	2018/10/01	<MDL 0.1	1.0	No	No
Nitrate (mg/L) - TW	2018/01/02	<MDL 0.1	10.0	No	No
Nitrate (mg/L) - TW	2018/04/03	<MDL 0.1	10.0	No	No
Nitrate (mg/L) - TW	2018/07/03	<MDL 0.1	1.0	No	No
Nitrate (mg/L) - TW	2018/10/01	<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.

Distribution System	Number of Sampling Points	Number of Samples	Range of Results		MAC (mg/L)	Number of Exceedances
			Minimum	Maximum		
Alkalinity (mg/L)	12	12	247	283	N/A	N/A
pH	4	4	7.11	7.58	N/A	N/A
Lead (ug/l)	1	1	0.00008		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
<b>Treated Water</b>					
Alachlor (ug/L) - TW	2018/01/02	< 0.3	5.00	No	No
Azinphos-methyl (ug/L) - TW	2018/01/02	< 1.0	20.00	No	No
Benzene (ug/L) - TW	2018/01/15	< 0.5	1.00	No	No
Benzo(a)pyrene (ug/L) - TW	2018/01/02	< 0.005	0.01	No	No
Bromoxynil (ug/L) - TW	2018/01/02	< 0.3	5.00	No	No
Carbaryl (ug/L) - TW	2018/01/02	< 3.0	90.00	No	No
Carbofuran (ug/L) - TW	2018/01/02	< 1.0	90.00	No	No
Carbon Tetrachloride (ug/L) - TW	2018/01/15	< 0.2	2.00	No	No
Chlorpyrifos (ug/L) - TW	2018/01/02	< 0.5	90.00	No	No
Diazinon (ug/L) - TW	2018/01/02	< 1.0	20.00	No	No
Dicamba (ug/L) - TW	2018/01/02	< 5.0	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW	2018/01/15	< 0.1	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW	2018/01/15	< 0.2	5.00	No	No
1,2-Dichloroethane (ug/L) - TW	2018/01/15	< 0.1	5.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2018/01/15	< 0.3	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW	2018/01/02	< 0.1	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2018/01/02	< 5.0	100.00	No	No
Diclofop-methyl (ug/L) - TW	2018/01/02	< 0.5	9.00	No	No
Dimethoate (ug/L) - TW	2018/01/02	< 1.0	20.00	No	No
Diquat (ug/L) - TW	2018/01/02	< 5.0	70.00	No	No
Diuron (ug/L) - TW	2018/01/02	< 5.0	150.00	No	No
Glyphosate (ug/L) - TW	2018/01/02	< 25.0	280.00	No	No
Malathion (ug/L) - TW	2018/01/02	< 5.0	190.00	No	No
Methoxychlor (ug/L) - TW	2018/01/02	< 3.0	900.00	No	No
Metolachlor (ug/L) - TW	2018/01/02	< 3.0	50.00	No	No
Metribuzin (ug/L) - TW	2018/01/02	< 3.0	80.00	No	No
Paraquat (ug/L) - TW	2018/01/02	< 1.0	10.00	No	No
PCB (ug/L) - TW	2018/01/02	< 0.05	3.00	No	No
Pentachlorophenol (ug/L) - TW	2018/01/02	< 0.1	60.00	No	No
Phorate (ug/L) - TW	2018/01/02	< 0.3	2.00	No	No
Picloram (ug/L) - TW	2018/01/02	< 5.0	190.00	No	No
Prometryne (ug/L) - TW	2018/01/02	< 0.1	1.00	No	No
Simazine (ug/L) - TW	2018/01/02	< 0.5	10.00	No	No
Terbufos (ug/L) - TW	2018/01/02	< 0.3	1.00	No	No
Tetrachloroethylene (ug/L) - TW	2018/01/15	< 0.2	10.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2018/01/02	< 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	2018/01/02	< 10.0	230.00	No	No
Trichloroethylene (ug/L) - TW	2018/01/15	< 0.1	50.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2018/01/02	< 0.1	5.00	No	No
2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) (ug/L) -	2018/01/02	< 5.0	280.00	No	No
Trifluralin (ug/L) - TW	2018/01/02	< 0.5	45.00	No	No
Vinyl Chloride (ug/L) - TW	2018/01/15	< 0.2	1.00	No	No
<b>Distribution</b>					
Trihalomethane: Total (ug/L) Annual Average - DW	2018/01/01	24.95	100.00	No	No
Haloaceticacid: Total (ug/L) Annual Average- DW	2018/01/01	5.3	N/A	N/A	N/A

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

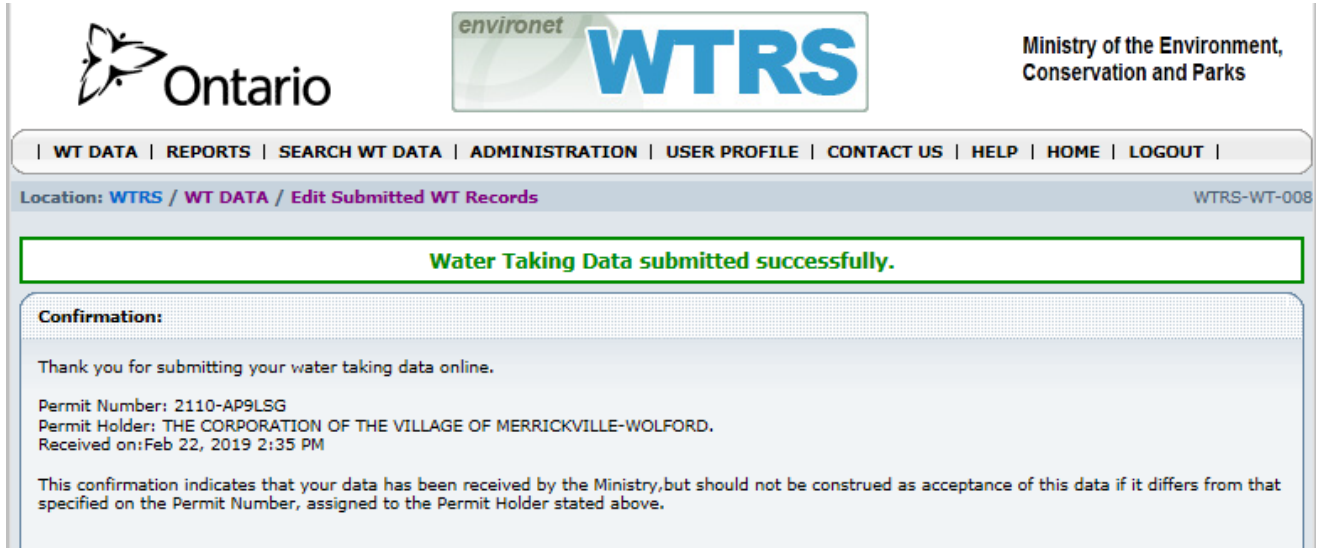
WO#	Details
664876	Capital Blanket Items under \$200
742809	Capital DWQMS 3rd party audit
900050	Capital Emergency Lighting
821843	Capital RW supply pressure tank replace
821567	Capital Falcon Dialer issue
823949	Corrective Well 2 alarm wire replace
899335	Capital Install ventilation fan
628699	Capital Panel relocation for PLC upgrade
862341	Capital PLC upgrade project
702068	Capital Analyzer Membrane Caps
822004	Capital Duty Pump 2 replacement
628278	Capital Clearwell Level Indicator

### Distribution Maintenance Highlights

Date	Location Reference	Operator	Details	Corrective Repair
Nov-17-2018	300 Block Drummond St E.	Troy Murphy	Water main break 300 Block of Drummond St E.	Installed repair band

# Appendix A

## WTRS Data and Submission Confirmation



The screenshot displays the WTRS (Water Taking Reporting System) interface. At the top left is the Ontario logo. In the center is the 'environet WTRS' logo. At the top right is the text 'Ministry of the Environment, Conservation and Parks'. Below the logos is a navigation menu with links: WT DATA, REPORTS, SEARCH WT DATA, ADMINISTRATION, USER PROFILE, CONTACT US, HELP, HOME, and LOGOUT. The current location is indicated as 'WTRS / WT DATA / Edit Submitted WT Records' with the ID 'WTRS-WT-008'. A green-bordered box contains the message 'Water Taking Data submitted successfully.' Below this is a 'Confirmation:' section with the following text: 'Thank you for submitting your water taking data online.', 'Permit Number: 2110-AP9LSG', 'Permit Holder: THE CORPORATION OF THE VILLAGE OF MERRICKVILLE-WOLFORD.', and 'Received on: Feb 22, 2019 2:35 PM'. A final note states: '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.'