

Carleton Place Drinking Water System

Waterworks # 210000372
System Category – Large Municipal Residential

Annual Water Report

Prepared For: Town of Carleton Place

Reporting Period of January 1st – December 31st 2018

Issued: February 28, 2019

Revision: 1

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 serve more than 10,000 residence and the annual reports will be available to residents at the Town of Carleton Place Municipal Office and on the website (www.carletonplace.ca).

Notification will be provided on the website and at the Municipal Office and copies provided free of charge if requested.

The Town of Carleton Place Municipal Office is located at 175 Bridge Street, Carleton Place, Ontario,

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

Compliance Report Card

Compliance Event	# of Events
Ministry of Environment Inspections	Completed January 10 th , 2018 Inspection Rating - 95.35%
Ministry of Labour Inspections	No Inspections during the reporting period
QEMS External Audit	One (1) External Surveillance Audit <ul style="list-style-type: none"> 1 (OFI) Opportunity for Improvement in Element 8 Risk Assessment Outcomes
AWQI's/BWA	See AWQI section
Non-Compliance	See Non-Compliance section
Community Complaints	<ul style="list-style-type: none"> 18 Service Related Issues (Noise, Low Pressure / No Water) 5 Taste & Odour 12 Visual
Spills	There were no spills reported during the reporting period.
Watermain Breaks	No Watermain breaks during the reporting period.

System Process Description

Raw Source

The source water for the Carleton Place DWS is the Mississippi River. The water intake is a 600 millimetre (mm) diameter intake pipe complete with an upturned elbow at the river which is surrounded by a coarse screen.

Raw water is directed through the intake pipe into a raw water well, the first of which is equipped with a 1/4 inch opening mesh screen. The wet well is equipped with four (4) vertical turbine low lift pumps which are operator selectable and are automatically controlled by the water level in the treated water clear well.

The raw water is directed by the low lift pumps into a 400 mm diameter stainless steel header which extends to the Actiflo™ treatment process. The common raw water header is equipped with a flow meter. An in-line static mixer and coagulant injection point are located just upstream of the flow meter. The system is designed to provide pre-chlorination with chlorine gas at this point, dependent on the time of year and the source water conditions. A chlorine injection point is also located near the raw water intake and is used for pre-chlorination / zebra mussel control.

Treatment

The Carleton Place Drinking Water System (DWS) provides a potable water supply to the residents of Carleton Place. The facilities consist of a Class III Actiflo treatment process operated by the Ontario Clean Water Agency and a Class I water distribution system operated by the Carleton Place Public Works. Raw water is drawn from the Mississippi River.

The treatment process involves Coagulation / flocculation / sedimentation, filtration, post-chlorination (primary disinfection) and seasonal distribution system chlorine residual (secondary disinfection). This multiple barrier approach helps to ensure consistently compliant drinking water quality, and ultimately improves the level of public health protection.

Actiflo treatment (coagulant/flocculation/sedimentation)

The treatment system consists of two (2) Actiflo™ treatment trains operating in parallel. Each treatment train consists of a coagulation tank, an injection tank, a maturation tank and lamella settling tubes. Each treatment train is complete with Microsand recirculation pumps, piping and Hydrocyclones, which are used to separate the Microsand from residual solids. A polymer coagulant aid is added to the process at the Hydrocyclones.

Filtration

The effluent from the two (2) Actiflo™ settling tanks is discharged to a concrete splitter box which divides the flow to three (3) cylindrical double compartment dual media (sand/anthracite) gravity filters. The filters are each equipped with underdrains, self-contained backwash storage compartments, air scour systems and automated control valves for backwash operations.

Filtered water is chlorinated and fluoridated prior to being directed to two (2) underground storage reservoirs, which include isolation gates and piping for flow control. The Carleton Place DWS has provision to add lime to the filtered water. Four (4) vertical turbine high lift pumps discharge treated water into the distribution system via a common 450 mm diameter discharge header.

Filter to Waste is directed to the backwash flow residue compartment.

Residual Management

Backwash wastewater and Actiflo™ residuals are discharged to a two compartment settling tank equipped with two sludge pumps and two supernatant pumps. One compartment is configured to receive the Actiflo residuals and one compartment is configured to receive the filter backwash residue. The Actiflo compartment is configured to send all residues to the on-site pumping station. The pumping station pumps the residue to the sewer collection system.

The filter backwash compartment is configured to pump the supernatant is discharged to the Mississippi

River while settled sludge is discharged to the sanitary sewer.

Treatment Chemicals used during the reporting year:

Chemical Name	Use	Supplier
PAS8	Primary Coagulation	Kemira
Polymer	Coagulation Aid	BASF
Hydrofluorosilic Acid	Fluoridation	Brenntag
Chlorine Gas	Primary Disinfection	Brenntag
Sodium Hypochlorite	Distribution Disinfection Boosting	Brenntag

Distribution

The distribution system for the Town of Carleton Place includes a 3,180 m³ elevated water storage tower located on Nelson Street, east of Park Street. The water tower has provision for chlorine boosting with sodium hypochlorite, however, this is only used in the summer during warmer temperatures to maintain adequate chlorine residual in the distribution system.

Summary of Non-Compliance

Adverse Water Quality Incidents

AWQI #	Date	Legislation	Problem	Details	Corrective Action Taken
141404	August 4-7, 2018	Reg. 170/03	No trending for filter 1A effluent turbidity	No trending recorded for filter 1A effluent turbidity due to unit malfunction on August 4, 2018 at 2:05. Trending was restored August 7, 2018	Work with manufacturer to add alarm function. Analyzer was returned to service immediately. No indication of adverse water.
142501	September 1-2, 2018	Reg. 170/03	No trending for filter 1A effluent turbidimeter trending	No trending reported on filter 1A effluent turbidimeter trending due to a unit malfunction. Self-clean function has been stopped.	Work with manufacturer to add alarm function. Trending off line from September 1 @ 00:03 - September 2 @ 1321. Analyzer was returned to service immediately. No indication of adverse water.

Non-Compliance

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
170/03	The treatment plant lost trending on the SCADA computer due to a	March 15, 2018 13:00-13:58	Corrective Action Taken Capital Controls came on-site to see if they could recover	Closed

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
	planned power outage. The High lift pump ran during this period and all analyzers were functioning just not trending to the PLC. Operators were on-site		the trending. They were unsuccessful.	
170/03	Turbidimeter 2A left on hold after calibration	June 27 th , 2018 09:18 – June 29 th 11:40	All other turbidity analyzers indicated no adverse results. Staff reviewed maintenance procedures.	Closed

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
170/03	Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was not performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and/or was not recording data with the prescribed format.	Continuous turbidimeter for Filter #3B was taken off-line to be cleaned and calibrated, and the unit was inadvertently left in hold position from 8:55 AM on June 20, 2017, until 3:53 PM on June 21, 2017	Work with manufacturer to add alarm function.	On-going

Flows

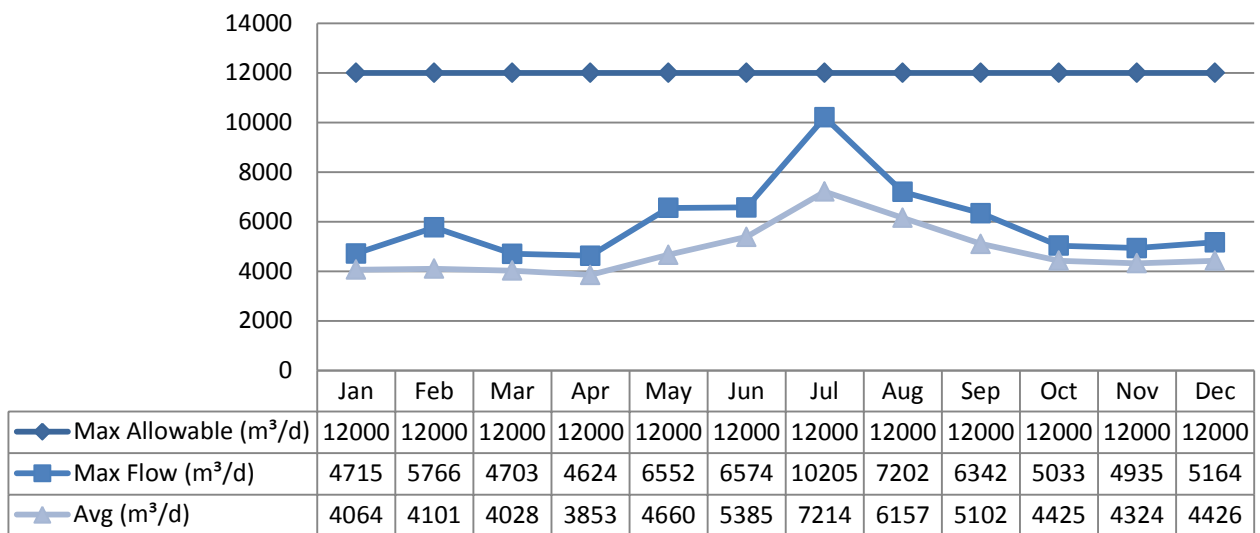
The Carleton Place Drinking Water System exceeded half the rated capacity on average in the months of July and August. Max daily flows exceeded half the capacity in May, June, July, August and September.

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 #1310-9UHPPW. The confirmation and a copy of the data that was submitted are attached in Appendix A.

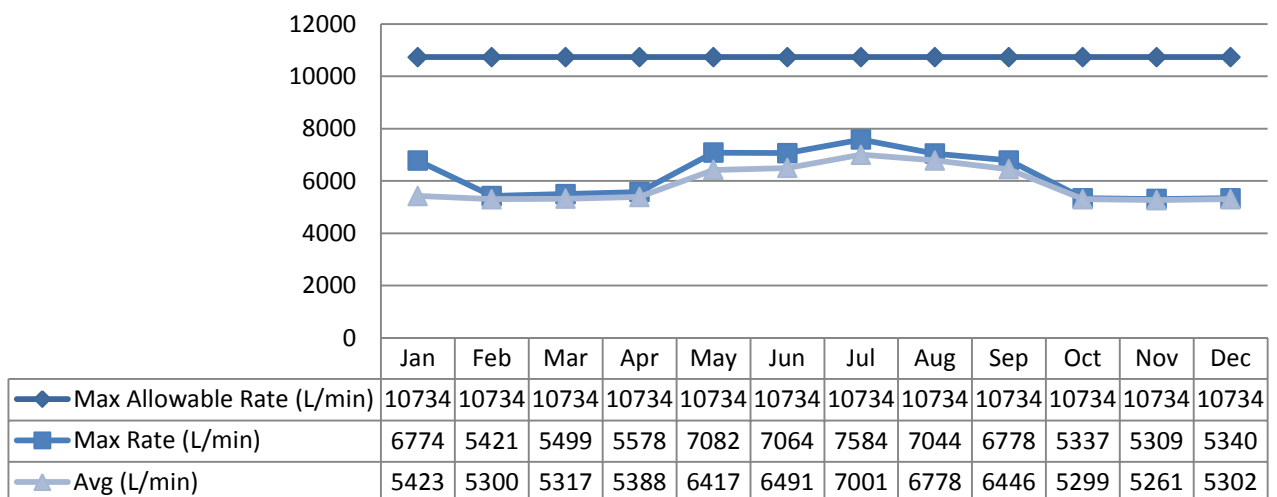
Total Monthly Flows (m³/d)

Max Allowable PTTW



Monthly Rated Flows (L/min)

Max allowable rate - PTTW

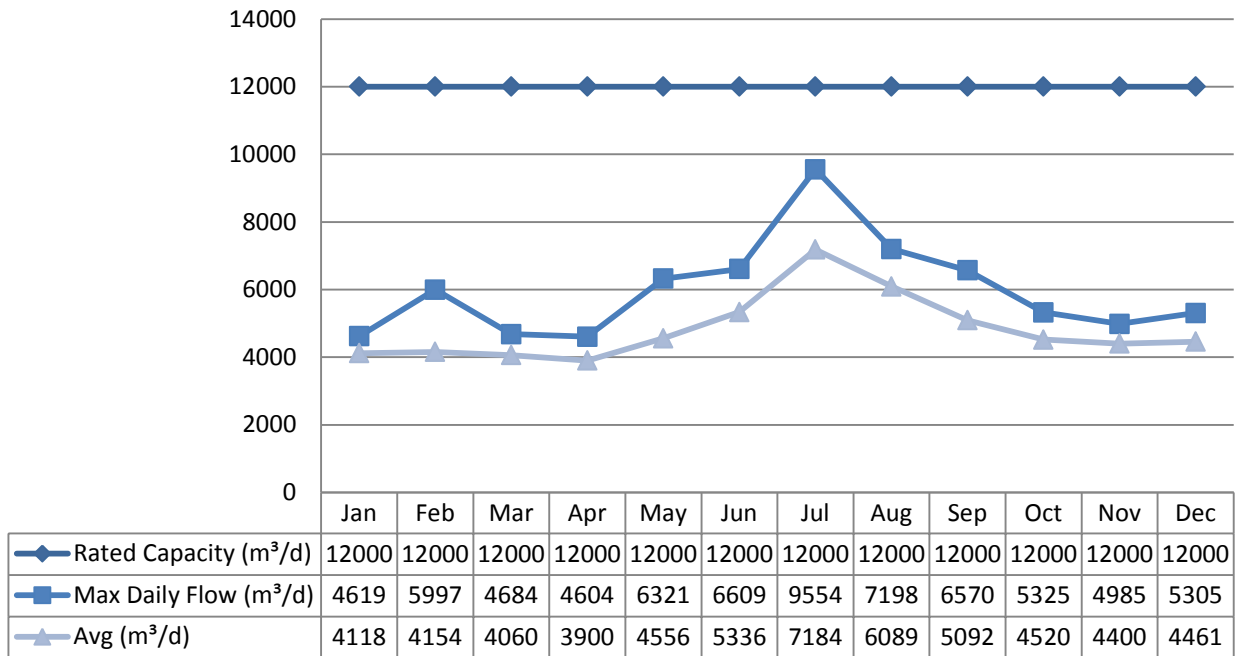


Treated Water Flows

The Treated Water flows are regulated under the Municipal Licence.

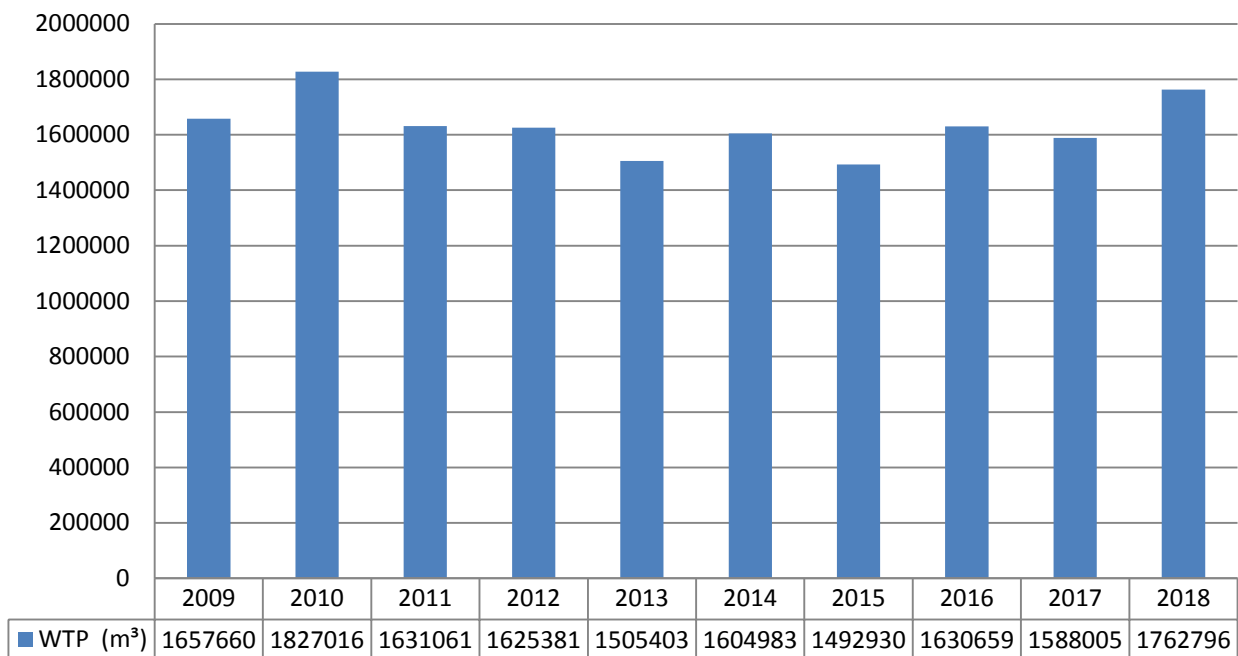
Monthly Rated Flows

Rated Capacity - MDWL



Annual Total Flow Comparison

Total Annual m³



Regulatory Sample Results Summary

Microbiological Testing

	No. of Samples Collected	Range of E.Coli		Range of Total Coliform Results		Number of HPC Samples	Range of HPC Results	
		Min	Max	Min	Max		Min	Max
Raw Water	52	0	20	0	124			
Treated Water	51	0	0	0	0	52	2	86
Distribution System	368	0	0	0	0	108	2	4

Operational Testing

	No. of Samples Collected	Range of Results	
		Minimum	Maximum
Turbidity, On-Line (NTU) - RW	8760	0.62	1.6
Turbidity, In-House (NTU) - RW	101	0.081	2.55
Turbidity, On-Line (NTU) - TW	8760	0	2
Turbidity, On-Line (NTU) - Filt1A	8760	0	1.45
Turbidity, On-Line (NTU) - Filt1B	8760	0	0.7
Turbidity, On-Line (NTU) - Filt2A	8760	0	2
Turbidity, On-Line (NTU) - Filt2B	8760	0	2
Turbidity, On-Line (NTU) - Filt3A	8760	0	2
Turbidity, On-Line (NTU) - Filt3B	8760	0	1.65
Free Chlorine Residual, On-Line (mg/L) - TW	8760	0.114	4.05
Free Chlorine Residual, In-House (mg/L) - TW	118	1.43	2.53
Free Chlorine Residual, TW Field (mg/L) Lab Upload - TW	65	1.52	2.32
Total Chlorine Residual, In-House (mg/L) - TW	115	1.52	2.9
Free Chlorine Residual, On-Line (mg/L) - DW	8760	0	5
Free Chlorine Residual, DW Field (mg/L) Lab Upload - DW	362	0.6	2.14
Fluoride Residual, On-Line (mg/L) - TW	8760	0	1.16
Fluoride Residual, In-House (mg/L) - TW	114	0.25	1.02

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

Laboratory Samples

Parameter	# of grab samples taken	Range of Results (min # - max #)
Raw Water Alkalinity (mg/L)	12	70 - 112 mg/L
Raw Water Colour (TCU)	12	2 - 28
Raw Water Dissolved Organic Carbon (mg/L)	12	5.5 - 8.2
Raw Water Total Organic Carbon (mg/L)	12	5.5 - 8.3
Raw Water pH	12	7.71 - 8.49
Treated Water Alkalinity (mg/L)	12	46 - 66

Parameter	# of grab samples taken	Range of Results (min # - max #)
Treated Aluminum (ug/L)	12	30 - 90 ug/L
Treated Water Colour (TCU)	12	2 - 17
Treated Water Conductivity (uS/cm)	12	189 - 236
Treated Water Dissolved Organic Carbon (mg/L)	12	2.2- 6.6
Treated Water Fluoride (mg/L)	12	0.1 - 1.0
Treated Water Total Organic Carbon (mg/L)	12	2.2 – 6.8
Treated Water Total Hardness (mg/L)	12	75 - 99
Treated Water pH	12	7.32 - 7.64

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	2018/01/10	<MDL 0.1	6.0	No	No
Arsenic: As (ug/L) - TW	2018/01/10	0.3	10.0	No	No
Barium: Ba (ug/L) - TW	2018/01/10	40.0	1000.0	No	No
Boron: B (ug/L) - TW	2018/01/10	<MDL 5.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2018/01/10	<MDL 0.01	5.0	No	No
Chromium: Cr (ug/L) - TW	2018/01/10	<MDL 2.0	50.0	No	No
Mercury: Hg (ug/L) - TW	2018/01/10	<MDL 0.02	1.0	No	No
Selenium: Se (ug/L) - TW	2018/01/10	<MDL 1.0	50.0	No	No
Uranium: U (ug/L) - TW	2018/01/10	<MDL 0.05	20.0	No	No
Additional Inorganics					
Fluoride (mg/L) - TW	2018/12/04	0.4	1.5	No	No
Nitrite (mg/L) - TW	2018/03/06	<MDL 0.1	1.0	No	No
Nitrite (mg/L) - TW	2018/04/10	<MDL 0.1	1.0	No	No
Nitrite (mg/L) - TW	2018/07/11	<MDL 0.1	1.0	No	No
Nitrite (mg/L) - TW	2018/10/09	<MDL 0.1	1.0	No	No
Nitrate (mg/L) - TW	2018/03/06	0.2	10.0	No	No
Nitrate (mg/L) - TW	2018/04/10	0.2	10.0	No	No
Nitrate (mg/L) - TW	2018/07/11	<MDL 0.1	10.0	No	No
Nitrate (mg/L) - TW	2018/10/09	<MDL 0.1	10.0	No	No
Sodium: Na (mg/L) - TW	2015/02/03	4.0	20	No	No

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)	6	6	44	66	N/A	0
pH	6	6	6.95	7.20	N/A	0
Lead (ug/l)	Next sampling in 2019					

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	2018/01/10	<MDL 0.3	5.00	No	No
Azinphos-methyl (ug/L) - TW	2018/01/10	<MDL 1.0	20.00	No	No
Benzene (ug/L) - TW	2018/01/10	<MDL 0.5	1.00	No	No
Benzo(a)pyrene (ug/L) - TW	2018/01/10	<MDL 0.005	0.01	No	No
Bromoxynil (ug/L) - TW	2018/01/10	<MDL 0.3	5.00	No	No
Carbaryl (ug/L) - TW	2018/01/10	<MDL 3.0	90.00	No	No
Carbofuran (ug/L) - TW	2018/01/10	<MDL 1.0	90.00	No	No
Carbon Tetrachloride (ug/L) - TW	2018/01/10	<MDL 0.2	2.00	No	No
Chlorpyrifos (ug/L) - TW	2018/01/10	<MDL 0.5	90.00	No	No
Diazinon (ug/L) - TW	2018/01/10	<MDL 1.0	20.00	No	No
Dicamba (ug/L) - TW	2018/01/10	<MDL 5.0	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW	2018/01/10	<MDL 0.1	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW	2018/01/10	<MDL 0.2	5.00	No	No
1,2-Dichloroethane (ug/L) - TW	2018/01/10	<MDL 0.1	5.00	No	No
1,1-Dichloroethane (ug/L) - TW	2018/01/10	<MDL 0.1	14.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2018/01/10	<MDL 0.3	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW	2018/01/10	<MDL 0.1	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2018/01/10	<MDL 5.0	100.00	No	No
Diclofop-methyl (ug/L) - TW	2018/01/10	<MDL 0.5	9.00	No	No
Dimethoate (ug/L) - TW	2018/01/10	<MDL 1.0	20.00	No	No
Diquat (ug/L) - TW	2018/01/10	<MDL 5.0	70.00	No	No
Diuron (ug/L) - TW	2018/01/10	<MDL 5.0	150.00	No	No
Glyphosate (ug/L) - TW	2018/01/10	<MDL 25.0	280.00	No	No
Malathion (ug/L) - TW	2018/01/10	<MDL 5.0	190.00	No	No

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
2-Methyl-4chlorophenoxyacetic Acid (MCPA) (ug/L)	2018/01/10	<MDL 10	N/A	No	No
Metolachlor (ug/L) - TW	2018/01/10	<MDL 3.0	50.00	No	No
Metribuzin (ug/L) - TW	2018/01/10	<MDL 3.0	80.00	No	No
Paraquat (ug/L) - TW	2018/01/10	<MDL 1.0	10.00	No	No
PCB (ug/L) - TW	2018/01/10	<MDL 0.05	3.00	No	No
Pentachlorophenol (ug/L) - TW	2018/01/10	<MDL 0.1	60.00	No	No
Phorate (ug/L) - TW	2018/01/10	<MDL 0.3	2.00	No	No
Picloram (ug/L) - TW	2018/01/10	<MDL 5.0	190.00	No	No
Prometryne (ug/L) - TW	2018/01/10	<MDL 0.1	1.00	No	No
Simazine (ug/L) - TW	2018/01/10	<MDL 0.5	10.00	No	No
Terbufos (ug/L) - TW	2018/01/10	<MDL 0.3	1.00	No	No
Tetrachloroethylene (ug/L) - TW	2018/01/10	<MDL 0.2	10.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2018/01/10	<MDL 0.1	100.00	No	No
Triallate (ug/L) - TW	2018/01/10	<MDL 10.0	230.00	No	No
Trichloroethylene (ug/L) - TW	2018/01/10	<MDL 0.1	5.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2018/01/10	<MDL 0.1	5.00	No	No
Trifluralin (ug/L) - TW	2018/01/10	<MDL 0.5	45.00	No	No
Vinyl Chloride (ug/L) - TW	2018/01/10	<MDL 0.2	1.00	No	No
Distribution Water					
Trihalomethane: Total (ug/L) Annual Average - DW	2018/01/01	71.625	100.00	No	Yes
HAA Total (ug/L) Annual Average - DW	2018/01/01	77.875	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

Legal Document	Date of Issuance	Parameter	Date Sampled	Result	Unit of measure
Municipal Licence 172-101 Issue 2	March 10, 2016	Suspended Solids (Limit 25 mg/L)	Annual Avg.	24.583	mg/L

Additional Legislated Samples

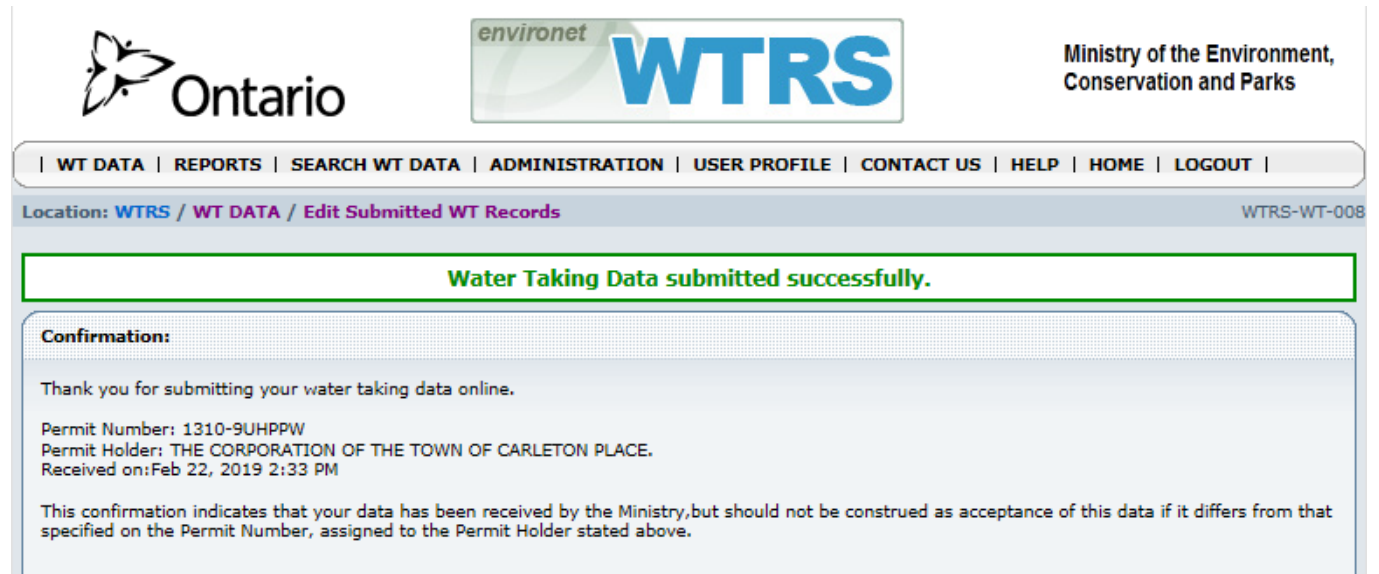
Mississippi Lake developed Blue-Green Algae blooms in 2018. To ensure the drinking water remained unaffected the raw and treated water were sampled weekly for Microcystin during September to November. The raw and treated water results were below the methods detection limit. There were no Microcystin found in either the raw or treated water.

Major Maintenance Summary

WO#	Details
1016211	Capital Fluoride probe, transmitter,reference electrode replacement
1018289	Capital Filter turbidity analyzers alarming
742489	Capital #1 Blanket Items under \$200
980555	Capital filter pressure switches
699805	Capital Facility Roof Work 2018
699933	Capital Turbidity Analyzer Replacement
701848	Capital PLC data loss
701849	Capital SCADA maintenance
701850	Capital Loss of Communication to tower
740357	Capital LED lightning basement
742814	Capital DWQMS 3rd party audit
779839	Capital SCADA system modification
780588	Capital Tower safety inspection and report
898333	Capital SCADA service call coagulant controls
899815	Capital SCADA system work
628576	Capital Chlorine room heater alarm failure
780193	Capital roof top units refurbish
861660	Capital Replacement pH probe
629320	Capital Fluoride Panel Failure
1052248	Capital Coagulant Tank 4 valve
741856	Capital coagulant pump install
782694	Capital Chlorinator parts and service
1015885	Capital Gasket Kit for Tonner Repair
626414	Capital configure chlorine analyzer
701874	Capital rebuild Actiflo pump
1052617	Capital sand recirc pump3 requires seal
861668	Capital Errors on Daily Reports
940404	Capital Filter turbidity analyzer alarms

Appendix A

WTRS Data and Submission Confirmation



The screenshot shows 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 bar with links: WT DATA | REPORTS | SEARCH WT DATA | ADMINISTRATION | USER PROFILE | CONTACT US | HELP | HOME | LOGOUT. Below the navigation bar is a breadcrumb trail: Location: WTRS / WT DATA / Edit Submitted WT Records. On the right side of the breadcrumb trail is the identifier WTRS-WT-008. A green-bordered box contains the message 'Water Taking Data submitted successfully.' Below this box is a 'Confirmation:' section with the following text: 'Thank you for submitting your water taking data online. Permit Number: 1310-9UHPPW Permit Holder: THE CORPORATION OF THE TOWN OF CARLETON PLACE. Received on: Feb 22, 2019 2:33 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.'