

Brechin and Lagoon City Drinking Water System

Waterworks # 210001273
System Category – Large Municipal Residential

Annual Water Report

Prepared For: The Township of Ramara

Reporting Period of January 1st – December 31st, 2021

Issued: February 25, 2022

Revision: 0

Operating Authority:



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Report Availability

This system does not serve more than 10,000 residence and the annual reports will be available to residents at the Township Of Ramara Administration Office and on the Township’s website at www.ramara.ca. Notification that reports are available free of charge will be made on the Township of Ramara website. The Township of Ramara Administration Office is located at 2297 Highway 12, Brechin, ON L0K 1B0.

Compliance Report Card

Drinking Water System Number: 210001273

Drinking Water System Name: Brechin and Lagoon City DWS

Drinking Water System Owner: Township of Ramara

Drinking Water System Category: Large Municipal Residential

Period Being Reported: January 1, 2021 - December 31, 2021

	# of Events	Date	Details
Health & Safety			
Number of Incidents	0		
Drinking Water			
MECP Inspections	1	December 09, 2021	Unannounced – Detailed-Drinking Water Inspection – Final Inspection Rating of 100%
AWQI’s	1	February 24, 2021	Received results of NDOGT (No Data: Overgrown with Non-Target Bacteria) for 1 of 3 distribution water samples
Number of Non-Compliances	0		
Number of Boil Water Advisories	0		

System Process Description

Raw Source

The Brechin and Lagoon City DWS is supplied with surface water from Lake Simcoe.

Treatment

The treatment system is a dual train conventional filtration package plant consisting of the following:

- Raw water is sourced from Lake Simcoe through an intake well with two (2) removable screens further the low lift pumping station consisting of three (3) low lift pumps
- Inlet line connected to sodium hypochlorite and a coagulant feed line diffuser
- Raw water flow meter and turbidity analyzer
- Carbon Dioxide injection system for adjusting pH to optimize coagulation process with a metering panel equipped with actuated control valve and bypass piping, gas feed flowmeter, filter, carbon dioxide gas pressure regulator and isolating manual ball valves
- Coagulant is added to the raw water intake well at the low lift pumping station
- Four (4) spiral flow flocculation tanks allows for floc to settle
- Two (2) filter-absorber units each consisting of granular activated carbon over sand and gravel with three backwash troughs and two surface water agitators and an underdrain
- Continuously monitoring turbidity analyzers on each filter line
- Waste backwash holding tank with discharge to sanitary sewer
- Chlorine injection system
- Single in-ground clearwell with five (5) highlift pumps
- Chlorine residual and pH analyzers prior to distribution connection
- Water tower
- SCADA computer control system
- Standby power generator

Treatment Chemicals used during the reporting year:

Chemical Name	Use	Supplier
Sodium Hypochlorite	Disinfection	Brenntag
Poly-Aluminum Chloride	Flocculation	Brenntag
Carbon Dioxide	pH Optimization	Praxair

Summary of Non-Compliance

Adverse Water Quality Incidents

Date	AWQI #	Location	Problem	Details	Legislation	Corrective Action Taken
February 24, 2021	153622	Distribution Water	Received results of NDOGT (No Data: Overgrown	1 of 3 samples had result of no data-overgrown	O. Reg 170	Operator flushed and collected samples at the same location,

Date	AWQI #	Location	Problem	Details	Legislation	Corrective Action Taken
			with Non-Target Bacteria) on 1 of 3 distribution samples	with bacteria		upstream and downstream from the adverse location. A second set of samples were collected the next day.

Non-Compliance

Legislation	Requirement(s) system failed to meet	Duration of the failure (i.e. date(s))	Corrective Action	Status
There were 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-compliance issues reported during the reporting period.				

Flows

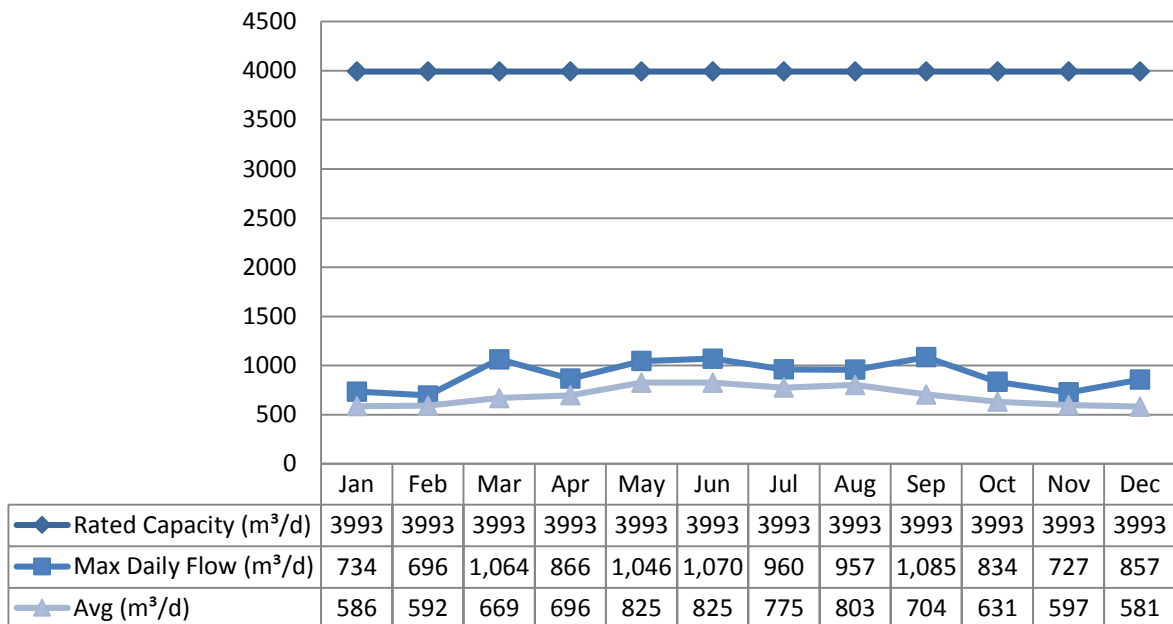
The Brechin and Lagoon City Drinking Water System is operating on average under half the rated capacity.

Raw Water Flows

The Raw Water flows are regulated under the Permit to Take Water. 2021 Raw Flow Data was submitted to the Ministry electronically under permit #0278-AQ4LYS. The confirmation and a copy of the data that was submitted are attached in Appendix A.

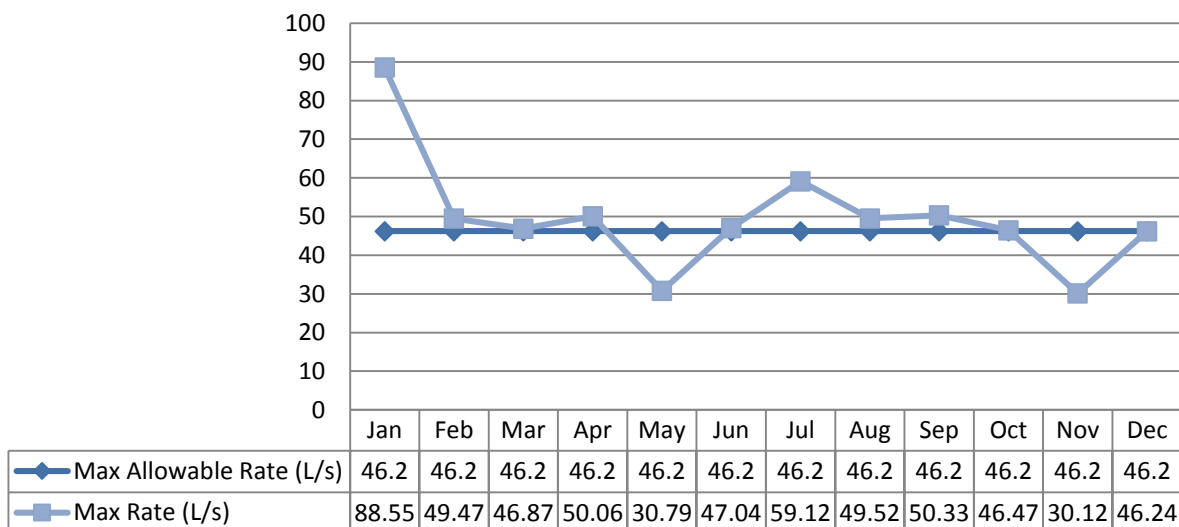
Total Monthly Flows (m³/d)

Max Allowable PTTW –Raw



Monthly Rated Flows (L/s)

Max allowable rate – PTTW –Raw



Note: The above table shows there were exceedances in instantaneous peak flow rate (L/s) caused by a communication blip in the local PLC as well as on pump start-up. The spike in January was due to scheduled Flow Meter calibration. All spikes are reviewed for compliance.

Treated Water Flows

The Treated Water flows are regulated under the Municipal Licence. The average water consumption for the Brechin/Lagoon City Drinking Water System during 2021 was: 684 m³/day.

Brechin Lagoon City Drinking Water System Historical Demands

Year	Number of Connections	Average Daily Demand (m ³)	Maximum Daily Demand (m ³ /day)	Rated Capacity	Per Capita Consumption* (L/p/day)	
					Average	Maximum
2012	1257	732	1247	4000	281	479
2013	1258	770	1411	4000	296	542
2014	1258	783	1239	4000	297	476
2015	1261	781	1670	4000	299	639
2016	1264	837	1546	4000	320	591
2017	1269	699	1207	4000	266	459
2018	1273	870	1829	4000	329	694
2019	1274	893	1798	4000	317	681
2020	1279	676	1333	4000	242	644
2021	1279	684	1090	4000	245	390
3 Year Average/Max		751	316	4000	268	681

*Based on estimated service connections in Lagoon City and Brechin: 1,125 and 154 single family dwellings. The estimated population in Lagoon City: 2,250 (based on a population density of 2.0 persons per dwelling), and the estimated population in Brechin: 400 (based on a population density of 2.6 persons per dwelling). Assumptions made on location of new developments for 2021 connections for population estimation.

Note: Excluding pipe leaks/breaks & system flushing

Note: This calculation was completed based on current connections in the system, growth within the drinking water system has not been considered.

System Reserve Capacity

In accordance with the MECP Procedure D-5-1, the reserve capacity is calculated by the following formula:

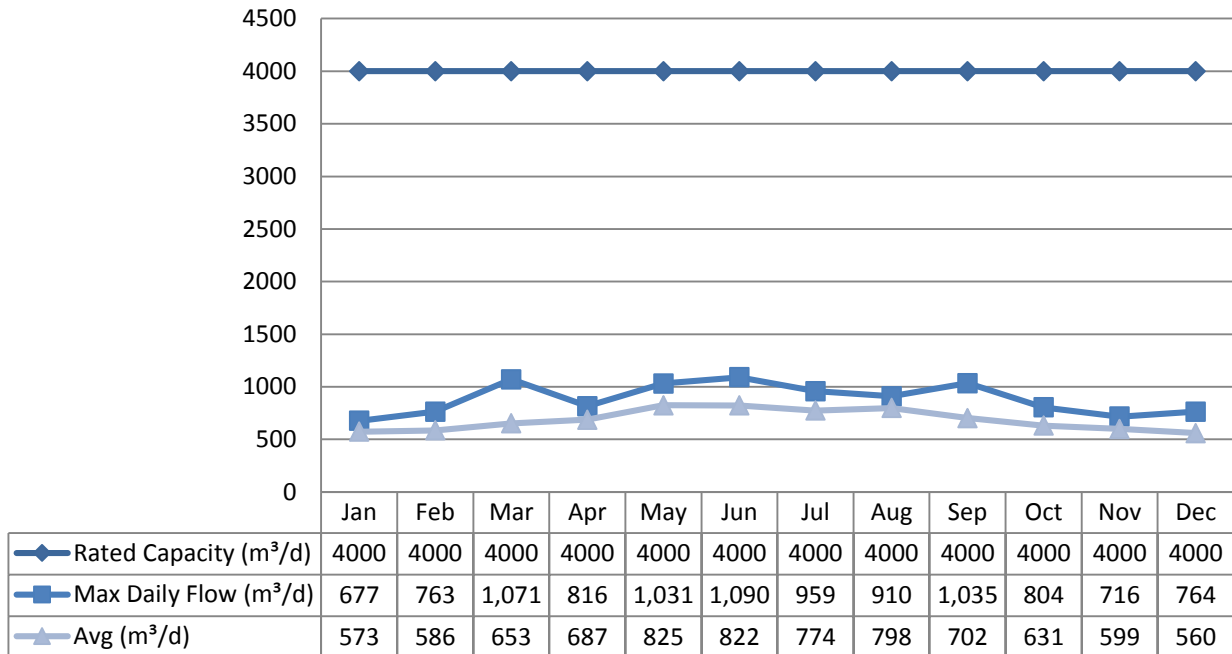
$$\text{Reserve Capacity} = \text{Design Flow} - \text{Committed Flow}$$

Design flow is the maximum permissible flow approved by the MDWL and/or PTTW. Brechin Lagoon City Water Works maximum daily rated capacity is 4000 m³/day.

The committed flow is the total expected water demand from the existing and proposed connections based on the previous three years of data. The committed number of service connections is: 1367. The three-year (2019-2021) maximum per capita water consumption is: 681 L/p/day. At this water consumption rate, the committed flow is: 1805 m³/day.

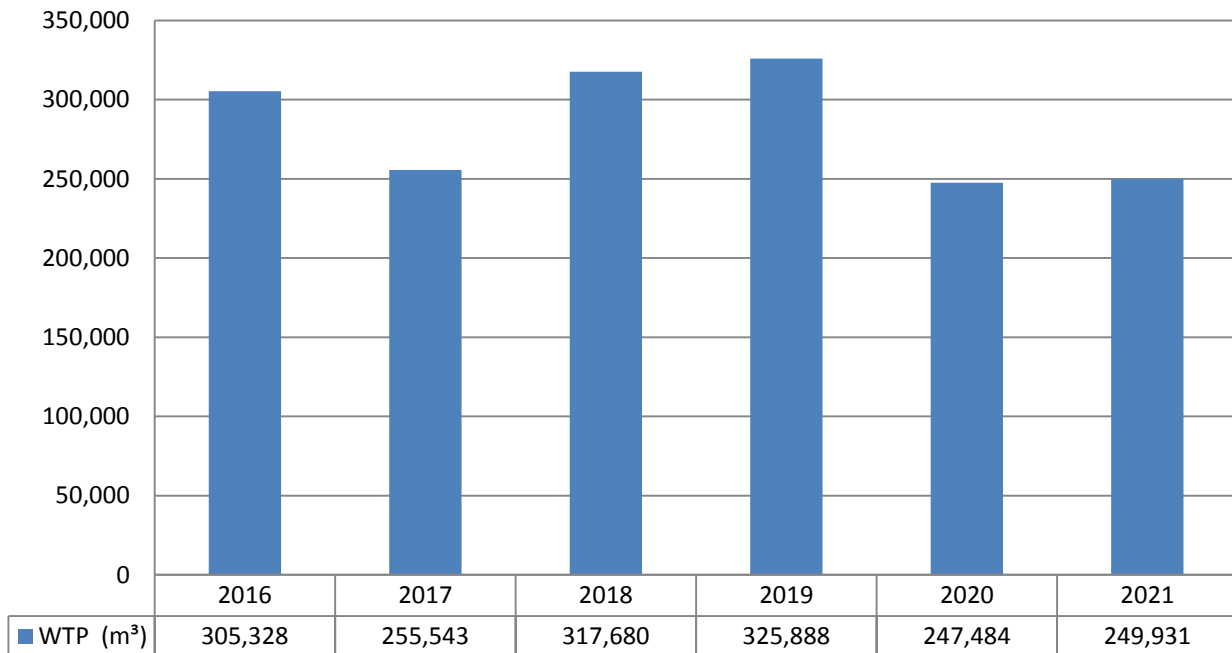
As a result, the calculated reserve capacity is: 2195 m³/day.

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	51	0	20*	0	5000*		
Treated	52	0	0	0	0	0	2
Distribution	161	0	0**	0	0**	0	3

***Note:** One result for raw water resulted in Total Coliform and E. Coli as NDOGT (No Data: Overgrown with Target Bacteria).

****Note:** One result for distribution Total Coliform and E. Coli was reported as NDOGT (No Data: Overgrown with Target Bacteria) and is included in Adverse Water Quality Incidents on page 2, 3.

Operational Testing

	No. of Samples Collected	Range of Results	
		Minimum	Maximum
Turbidity – Filter Line 1 (NTU)	8760	0.00	2.00
Turbidity – Filter Line 2 (NTU)	8760	0.00	2.00
Turbidity-Treated (NTU)	8760	0.00	2.00
Treated Water Chlorine (mg/L)	8760	0.08	4.13
Distribution Water Chlorine (mg/L)	365	0.79	2.25
Fluoride (If the DWS provides fluoridation)	N/A	N/A	N/A

Note: Record the unit of measure if it is **not** milligrams per litre.

Note: For continuous monitors 8760 is used as the number of samples. 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 O. Reg. 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 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.

- MAC = Maximum Allowable Concentration as per O. Reg. 169/03
- MDL = Method Detection Limit

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Exceedances	
				MAC	1/2 MAC
Treated Water					
Antimony: Sb (ug/L) - TW	2021/08/04	0.15	6.0	No	No
Arsenic: As (ug/L) - TW	2021/08/04	0.3	10.0	No	No
Barium: Ba (ug/L) - TW	2021/08/04	28.1	1000.0	No	No
Boron: B (ug/L) - TW	2021/08/04	20.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2021/08/04	<MDL 0.003	5.0	No	No
Chromium: Cr (ug/L) - TW	2021/08/04	0.26	50.0	No	No
Mercury: Hg (ug/L) - TW	2021/08/04	<0.01	1.0	No	No
Selenium: Se (ug/L) - TW	2021/08/04	0.05	50.0	No	No
Uranium: U (ug/L) - TW	2021/08/04	0.259	20.0	No	No
Additional Inorganics					
Fluoride (mg/L) - TW	2017/08/15	0.07	1.5	No	No
Nitrite (mg/L) - TW	2021/02/09	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2021/05/12	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2021/08/04	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2021/11/02	<MDL 0.003	1.0	No	No
Nitrate (mg/L) - TW	2021/02/09	0.131	10.0	No	No
Nitrate (mg/L) - TW	2021/05/12	0.062	10.0	No	No
Nitrate (mg/L) - TW	2021/08/04	0.036	10.0	No	No
Nitrate (mg/L) - TW	2021/11/02	0.048	10.0	No	No
Sodium: Na (mg/L) - TW	2021/08/12	34.8	20*	Yes	Yes
Sodium: Na (mg/L) - TW	2021/08/24	31.5	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 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 reduced sampling. No plumbing samples were collected.

Distribution System	Number of Samples	Range of Results Minimum	Range of Results Maximum	MAC (ug/L)	Number of Exceedances
Alkalinity (mg/L)	4	105	120	N/A	N/A
pH	4	7.4	7.8	N/A	N/A
Lead (ug/l)					

Note: Lead samples were last collected in the distribution system in 2019 as they are only required to be sampled every 36 months. Samples shown above are reflective of the 2021 lead sampling period.

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	2021/08/04	<MDL 0.02	5.00	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2021/08/04	0.01	5.00	No	No
Azinphos-methyl (ug/L) - TW	2021/08/04	<MDL 0.05	20.00	No	No
Benzene (ug/L) - TW	2021/08/04	<MDL 0.32	1.00	No	No
Benzo(a)pyrene (ug/L) - TW	2021/08/04	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW	2021/08/04	<MDL 0.33	5.00	No	No
Carbaryl (ug/L) - TW	2021/08/04	<MDL 0.05	90.00	No	No
Carbofuran (ug/L) - TW	2021/08/04	<MDL 0.01	90.00	No	No
Carbon Tetrachloride (ug/L) - TW	2021/08/04	<MDL 0.17	2.00	No	No
Chlorpyrifos (ug/L) - TW	2021/08/04	<MDL 0.02	90.00	No	No
Diazinon (ug/L) - TW	2021/08/04	<MDL 0.02	20.00	No	No
Dicamba (ug/L) - TW	2021/08/04	<MDL 0.2	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW	2021/08/04	<MDL 0.41	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW	2021/08/04	<MDL 0.36	5.00	No	No
1,2-Dichloroethane (ug/L) - TW	2021/08/04	<MDL 0.35	5.00	No	No
1,1-Dichloroethylene (ug/L) - TW	2021/08/04	<MDL 0.33	14.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2021/08/04	<MDL 0.35	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW	2021/08/04	<MDL 0.15	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2021/08/04	<MDL 0.19	100.00	No	No
Diclofop-methyl (ug/L) - TW	2021/08/04	<MDL 0.4	9.00	No	No
Dimethoate (ug/L) - TW	2021/08/04	<MDL 0.06	20.00	No	No
Diquat (ug/L) - TW	2021/08/04	<MDL 1.0	70.00	No	No
Diuron (ug/L) - TW	2021/08/04	<MDL 0.03	150.00	No	No
Glyphosate (ug/L) - TW	2021/08/04	<MDL 1.0	280.00	No	No
Malathion (ug/L) - TW	2021/08/04	<MDL 0.02	190.00	No	No
2-Methyl-4chlorophenoxyacetic Acid (MCPA) (ug/L)	2021/08/04	<MDL 0.00012	0.1	No	No
Metolachlor (ug/L) - TW	2021/08/04	<MDL 0.01	50.00	No	No

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Metribuzin (ug/L) - TW	2021/08/04	<MDL 0.02	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2021/08/04	<MDL 0.3	80.00	No	No
Paraquat (ug/L) - TW	2021/08/04	<MDL 1.0	10.00	No	No
PCB (ug/L) - TW	2021/08/04	<MDL 0.04	3.00	No	No
Pentachlorophenol (ug/L) - TW	2021/08/04	<MDL 0.15	60.00	No	No
Phorate (ug/L) - TW	2021/08/04	<MDL 0.01	2.00	No	No
Picloram (ug/L) - TW	2021/08/04	<MDL 1.0	190.00	No	No
Prometryne (ug/L) - TW	2021/08/04	<MDL 0.03	1.00	No	No
Simazine (ug/L) - TW	2021/08/04	<MDL 0.01	10.00	No	No
Terbufos (ug/L) - TW	2021/08/04	<MDL 0.01	1.00	No	No
Tetrachloroethylene (ug/L) - TW	2021/08/04	<MDL 0.35	10.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2021/08/04	<MDL 0.2	100.00	No	No
Triallate (ug/L) - TW	2021/08/04	<MDL 0.01	230.00	No	No
Trichloroethylene (ug/L) - TW	2021/08/04	<MDL 0.44	5.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2021/08/04	<MDL 0.25	5.00	No	No
Trifluralin (ug/L) - TW	2021/08/04	<MDL 0.02	45.00	No	No
Vinyl Chloride (ug/L) - TW	2021/08/04	<MDL 0.17	1.00	No	No
Distribution Water					
Trihalomethane: Total (ug/L) Annual Average - DW	2021 Annual Average	86.0	100	No	Yes
HAA Total (ug/L) Annual Average - DW	2021 Annual Average	52.93	80	No	Yes

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

MDL = Method Detection Limit

Additional Legislated Samples

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
No additional legislated samples required.				

Inorganic or Organic Parameter Exceedances

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	Date of Sample
Trihalomethane: Total (ug/L) Annual Average	86.0	ug/L	2021 Annual Average


HAA Total (ug/L) Annual Average	52.93	ug/L	2021 Annual Average
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Major Maintenance Summary incurred to install, repair or replace required equipment.

Item #	Description
1	Furnace installation complete, Turtle Path curb stop, Perry Ave main valve box. Replace backwash timer and start button.
2	Perry Ave Hydrant/ Simcoe Rd hydrant replaced, 1 on Laguna extended for grading, 1 at Lagoon Water plant repaired. New pre chlorine pump.
3	Raise and landscape hydrant at 71 Laguna, repair hydrant at plant, replace CO2 analyser, replace backwash timer.
4	New service installation 2765 Maple, curb stop repair 14 Old Indian Trail, replaced damaged hose on waste tank backwash pump, repair hydrant ridge ave damaged by car.

Appendix A

WTRS Data Submission Confirmation



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: 0278-AQ4LYS
Permit Holder: THE CORPORATION OF THE TOWNSHIP OF RAMARA.
Received on: Feb 17, 2022 3:40 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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