

February 16, 2022

**MUNICIPALITY OF LAKESHORE
LAKESHORE WATER TREATMENT PLANT AND WATER SERVICE AREA
2021 ANNUAL & SUMMARY REPORT
MADE UNDER O.REG. 170/03**

The Municipality of Lakeshore is required to provide an *Annual Report* for each of its Ministry of the Environment Conservation and Parks (MECP) drinking water systems under Drinking Water Systems Regulation *O.Reg. 170/03* in accordance with the *Safe Drinking Water Act* (as amended). This *Annual Report* is due to be posted for public viewing by the end of February of the following year.

Under *Schedule 22 of Ontario Regulation 170/03*, a regulation made under the *Safe Drinking Water Act 2002*, requires that a large municipal residential drinking-water system must provide to its members of municipal council a Summary Report on various aspects of the system before March 31 of the following year. The Lakeshore Water Service Area is classed as a large municipal residential drinking-water system and is therefore subject to Schedule 22. The purpose of this letter and its attachments is to satisfy this requirement and report on dates from January 1, 2021 until December 31, 2021.

The Municipality of Lakeshore owns and operates the four (4) separate drinking water systems under MECP jurisdiction. This letter focusses of the *Lakeshore Water Treatment Plant (WTP) and Water Service Area (WSA)* which is registered having *Drinking Water System #260091507* under *Municipal Drinking Water Licence #031-101*. This drinking water system is deemed to be *Large Municipal Residential* having a mathematically assumed population of 30,061 having 10,736 service connections at the end of 2021.

The *John George* WTP, located in Belle River, utilizes a long multibarrier approach to water treatment. This facility has the following process flow; Seasonally chlorinated and screened intake for zebra muscle control, four (4) raw water clarifiers performing coagulation and flocculation with a seasonal taste and odour control option, conventional filtration using Granular Activated Carbon and Sand, Primary Disinfection via UV disinfection, Gaseous Chlorine injection for disinfection both Primary and Secondary. The chemicals utilized at the Belle River WTP are as follows; Aluminum Sulphate (DELPAC Product), Polyelectrolytes, Powdered and Granular Activated Carbon, Chlorine Gas. The WTP does not include Fluoridation in its processes. The treatment process includes various continuous monitoring equipment for turbidity, chlorine, temperature, pH, UV dose and flows. The WTP's high lift pumps feed the treated water from the *John George* facility to the Belle River Water Tower. The Belle River Water Tower has a maximum operating capacity of 5800 cubic metres and supplies 282 km's of water main under normal operation.

The *John George* WTP is an automated facility that is controlled via a Supervisory Control and Data Acquisition (SCADA) system that has been in place and upgraded since the John George WTP was commissioned in 2009. *O.Reg. 170/03* also specifies the data that is downloaded, stored and at what interval by utilizing the online continuous monitors that allow the plant to be automated and comply with all associated regulations. The results of these online instruments as required in this report are listed below in Table I.

TABLE I
2021 OPERATIONAL TESTING
REGULATION 170/03 DURING 2021

	Number of Grab Samples	Range of Results (min #)-(max #)	Unit of Measure
Turbidity Filter AVG	8760	0.02 – 0.06	NTU
Chlorine	8760	1.10 – 1.50	Free CL mg/l
Distribution Additional Residuals	816	0.22 – 1.63	Free CL mg/l

NTU – Nephelometric Turbidity Units
8760 – Indicates continuous monitoring equipment used
CL – Chlorine
mg/l – milligram per litre

Under *Schedule 10* of *O.Reg. 170/03* the Municipality of Lakeshore is required to complete microbiological testing of its raw intake water, treated water and distribution water. Treated water is sampled immediately prior to the high lift pumps, any sample taken after the high lift pumps is considered distribution. All of these samples is required to be tested by a certified laboratory accredited for drinking water samples. Table II outlines these analytical results.

TABLE II
2021 MICROBIOLOGICAL TESTING DONE UNDER
SCHEDULE 10 OF REGULATION 170/03

	NUMBER OF SAMPLES	RANGE OF E.COLI OR FECAL RESULTS (MIN #)-(MAX #) cfu's	RANGE OF TOTAL COLIFORM RESULTS (MIN #)-(MAX #) cfu's	NUMBER OF HPC SAMPLES	RANGE OF HPC RESULTS (MIN #)-(MAX #) cfu's
Raw	52	2 – 260	2 – 400	0	NA
Treated	106	0 – 0	0 – 1	106	<10 – 20
Distribution	534	0 – 0	0 – 0	260	<10

cfu – colony forming units
HPC – heterotrophic plate count

The Municipality of Lakeshore is also required to take treated and distribution samples for various organic and inorganic parameters under *O.Reg. 170/03 Schedule 23 & 24*. In Table III and Table IV the treated water sample results from this regulatory sampling requirement. No organic or inorganic sample exceeded any regulatory requirement as samples for 2021.

TABLE III
2021 INORGANIC PARAMETERS TESTED
TREATED WATER
REGULATION 170/03

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	Nov 29 th , 2021	0.0001	mg/l	NO
Arsenic	Nov 29 th , 2021	0.0002	mg/l	NO
Barium	Nov 29 th , 2021	0.016	mg/l	NO
Boron	Nov 29 th , 2021	0.020	mg/l	NO
Cadmium	Nov 29 th , 2021	<0.000015	mg/l	NO
Chromium	Nov 29 th , 2021	<0.002	mg/l	NO
Sodium	Nov 29 th , 2021	8.7	mg/l	NO
Mercury	Nov 29 th , 2021	<0.00002	mg/l	NO
Selenium	Nov 29 th , 2021	<0.001	mg/l	NO
Uranium	Nov 29 th , 2021	0.00014	mg/l	NO
Fluoride	Nov 29 th , 2021	<0.1	mg/l	NO
Nitrite	Nov 29 th , 2021	<0.1	mg/l	NO
Nitrate	Nov 29 th , 2021	1.4	mg/l	NO

mg/l – milligram per litre

TABLE IV
2021 ORGANIC PARAMETERS
ANNUAL TREATED WATER REQUIREMENT
REGULATION 170/03

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	Nov. 29 th , 2021	<0.3	ug/l	NO
Atrazine + N-dealkylated metabolites	Nov. 29 th , 2021	<0.5	ug/l	NO
Azinphos-methyl	Nov. 29 th , 2021	<1.0	ug/l	NO
Benzene	Nov. 29 th , 2021	<0.5	ug/l	NO
Benzo(a)pyrene	Nov. 29 th , 2021	<0.006	ug/l	NO
Bromoxynil	Nov. 29 th , 2021	<0.5	ug/l	NO
Carbaryl	Nov. 29 th , 2021	<3.0	ug/l	NO
Carbofuran	Nov. 29 th , 2021	<1.0	ug/l	NO
Carbon Tetrachloride	Nov. 29 th , 2021	<0.2	ug/l	NO
Chlorpyrifos	Nov. 29 th , 2021	<0.5	ug/l	NO
Diazinon	Nov. 29 th , 2021	<1.0	ug/l	NO
1,2-Dichlorobenzene	Nov. 29 th , 2021	<0.5	ug/l	NO

1,4-Dichlorobenzene	Nov. 29 th , 2021	<0.5	ug/l	NO
1,2-Dichloroethane	Nov. 29 th , 2021	<0.5	ug/l	NO
1,1-Dichloroethylene (vinylidene chloride)	Nov. 29 th , 2021	<0.5	ug/l	NO
2-4 Dichlorophenol	Nov. 29 th , 2021	<0.2	ug/l	NO
Diclofop-methyl	Nov. 29 th , 2021	<0.9	ug/l	NO
Dimethoate	Nov. 29 th , 2021	<1.0	ug/l	NO
Diquat	Nov. 29 th , 2021	<5.0	ug/l	NO
Diuron	Nov. 29 th , 2021	<5.0	ug/l	NO
Glyphosate	Nov. 29 th , 2021	<25	ug/l	NO
Malathion	Nov. 29 th , 2021	<5.0	ug/l	NO
Metolachlor	Nov. 29 th , 2021	<3.0	ug/l	NO
Metribuzin	Nov. 29 th , 2021	<3.0	ug/l	NO
Monochlorobenzene	Nov. 29 th , 2021	<0.5	ug/l	NO
Paraquat	Nov. 29 th , 2021	<1.0	ug/l	NO
Pentachlorophenol	Nov. 29 th , 2021	<0.2	ug/l	NO
Phorate	Nov. 29 th , 2021	<0.3	ug/l	NO
Polychlorinated Biphenyls(PCB)	Nov. 29 th , 2021	<0.05	ug/l	NO
Prometryne	Nov. 29 th , 2021	<0.1	ug/l	NO
Simazine	Nov. 29 th , 2021	<0.5	ug/l	NO
Terbufos	Nov. 29 th , 2021	<0.5	ug/l	NO
Tetrachloroethylene	Nov. 29 th , 2021	<0.5	ug/l	NO
2,3,4,6-Tetrachlorophenol	Nov. 29 th , 2021	<0.2	ug/l	NO
Triallate	Nov. 29 th , 2021	<10.0	ug/l	NO
Trichloroethylene	Nov. 29 th , 2021	<0.5	ug/l	NO
2,4,6-Trichlorophenol	Nov. 29 th , 2021	<0.2	ug/l	NO
Trifluralin	Nov. 29 th , 2021	<0.5	ug/l	NO
Vinyl Chloride	Nov. 29 th , 2021	<0.2	ug/l	NO
MCPA	Nov. 29 th , 2021	<10	ug/l	NO
2,4-(2,4-D) Dichlorophenoxy acetic acid,	Nov. 29 th , 2021	<1.0	ug/l	NO
Dicamba	Nov. 29 th , 2021	<1.0	ug/l	NO
Picloram	Nov. 29 th , 2021	<5.0	ug/l	NO

ug/l – microgram per litre

Treated and Distribution water samples are taken for selected organic and inorganic parameter; Trihalomethanes, Haloacetic Acids and Nitrite and Nitrate are sampled quarterly. Lead and alkalinity samples are taken in the distribution system bi-annually. The requirement to take and the amount of samples taken for these parameters falls under O.Reg. 170/03 and is based on population served. In Tables V, VI and VII shows the results satisfying the regulation.

TABLE V

**2021 NITRATE AND NITRITE RESULTS
QUARTERLY TREATED WATER REQUIREMENT
REGULATION 170/03**

Parameter	Date	Result	Unit	Exceedance
Nitrate	March 2, 2021	1.0	mg/L	NO
Nitrate	June 15, 2021	0.4	mg/L	NO
Nitrate	August 31, 2021	0.1	mg/L	NO
Nitrate	December 3, 2021	1.4	mg/L	NO
Nitrite	March 2, 2021	<0.1	mg/L	NO
Nitrite	June 15, 2021	<0.1	mg/L	NO
Nitrite	August 31, 2021	<0.1	mg/L	NO
Nitrite	December 3, 2021	<0.1	mg/L	NO
THM's	March 2, 2021	11	ug/L	NO
THM's	June 15, 2021	11	ug/L	NO
THM's	August 31, 2021	6.3	ug/L	NO
THM's	December 3, 2021	16	ug/L	NO
THM's	RAA	11.08	ug/L	NO

ug/l – microgram per litre

**TABLE VI
2021 TRIHALOMETHANES & HALOACETIC ACIDS RESULTS
QUARTERLY DISTRIBUTION WATER REQUIREMENT
REGULATION 170/03**

Parameter	Sample Schedule	Result	Unit of Measure	Exceedance
THM (Treated Water RAA)	Quarterly	11.08	mg/l	NO
THM (Distribution RAA)	Quarterly	28.75	mg/l	NO
HAA (Distribution RAA)	Quarterly	5.55	mg/l	NO

mg/l – milligram per litre

**TABLE VII
2021 LEAD & ALKALINITY RESULTS
DISTRIBUTION WATER
REGULATION 170/03**

Location Type	Number of Samples	Range of Lead Results (min#) – (max #)	Unit of Measure	Number of Exceedances
Distribution (Lead)	14	0.00006 – 0.00076	mg/l	NONE
Distribution (Alkalinity)	14	68 - 84	mg/l	NA

mg/l – milligram per litre

TABLE VIII

**2021 RESIDUAL MANAGEMENT
TOTAL SUSPENDED SOLIDS
REQUIRED UNDER MUNICIPAL DRINKING WATER LICENCE**

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
May 21, 2021 MDWL 031-101 #4	Total Suspended Solids	RAA	6.55	mg/l

RAA – Running Annual Average (monthly sample averaged)

The water treatment system and service area require extensive maintenance annually. These costs are required to install new equipment and maintain the current assets. A brief description of large priced capital items is listed as part of this letter. Below is Table IX which lists the large expenditures for 2021 within the Lakeshore Water Treatment Plant and Water Service Area.

**TABLE IX
2021 PROJECT COSTS**

Project	Cost Incurred
Ultra Violet Auto Shutdown Valve System	\$45,434.00
Stainless Access Ladders	\$7,688.00
Ultra Violet Flow Meter Replacement	\$16,879.00
New Water Main Project (Railway Ave)	\$748,973.00

Under *O.Reg.170/03* the Municipality is required to report notices submitted in accordance with the *Safe Drinking Water Act*. There were two notices filed and reported to the *Spills Action Centre* and their details can be seen below in Table X.

**Table X
Detail of ADWQI Notice's filed 2021**

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
March 15 th 2021	Total Coliforms	1	cfu's	Re-sample	March 17 th 2021
August 31 st 2021	Free Chlorine Residual	0.04	mg/l	Flush and Re-sample	August 31 st 2021

cfu – colony forming units

As shown above there were two (2) occasions in 2021 when the Lakeshore Water Service Area was not in compliance with the requirements of the *Safe Drinking Water Act 2002*, associated regulations, system approvals, *Drinking Water Works Permit*, *Municipal Drinking Water Licence* and provincial officer orders. In Table XI below the specific legislation requirements and corrective measures are stated.

Table XI
Legislative Requirements & Corrective Actions
ADWQI Notice's Filed

Drinking Water Legislation	Requirement(s) the System Failed to Meet	Specify the Duration of the Failure (i.e. date(s))	Describe the Measures Taken to Correct the Failure	Status (complete or outstanding)
Safe Drinking Water Act	Associated Regulations	See Below	See Below	
Ontario Regulations	O.Reg. 170/03	August 30 th , 2021	Flush and Resample, install new infrastructure	Complete
Ontario Regulations	O.Reg. 169/03	March 15 th , 16 th 2021	Re-sample	Complete
System Approvals	None			
System Drinking Water Works Permit and Municipal Drinking Water Licence	Schd B of DWWP	2021	Training, New paperwork developed	Complete
Provincial Officer's Order	None			

A summary of the quantities and flow rates of water supplied during the period covered by the report, including monthly average flows, maximum daily flows and daily maximum flow rates taken per minute is required reported in the Summary Report.

The Lakeshore Water Service Area operated under the following listed Permits to Take Water and did not exceed its limits in 2021.

(PTTW) Number 3648-B3EQWX issued on August 16, 2018 has the following flow conditions:

- Maximum Allowable Amount Taken per Minute (Litres/Min) **34,722**
- Maximum Allowable Amount Taken Per Day (Litres/Day) **30,000,000**

The maximum amounts of raw water taken during 2021 are as follows:

- Maximum Amount Taken per Minute in 2021 (Litres/Min) **17,256 (June 10, 2021)**

- Maximum Amount Taken Per Day in 2021 (Litres/Day) **16,078 (May 22, 2021)**

The Lakeshore Water Service Area operated under Drinking Water Works Permit #031-201 and Municipal Drinking Water Licence #031-101 during 2021:

The DWWL has the following flow conditions:

- The maximum daily volume of treated water that flows from the treatment subsystem to the distribution subsystem shall not exceed **36,400 m³/day**.
- The maximum daily volume of water pumped into the distribution system in 2021 was **15,757 m³/day**

The following Table XII & XIII give the monthly average and maximum flows for the Lakeshore Water Service Area.

Table XII
2021 Raw Water Flow Data
Lake Water Used

Month	Maximum Allowed Flow Rate (m ³ /Day)	Average Flow (m ³ /Day)	Maximum Flow (m ³ /Day)	Maximum Allowed Flow Rate (Litres/Minute)	Maximum Flow Rate (Litres/Minute)
January	30,000	8,100	8,470	34,722	15,384
February	30,000	8,248	8,803	34,722	10,638
March	30,000	8,401	8,814	34,722	16,440
April	30,000	8,624	9,364	34,722	9,240
May	30,000	11,250	16,078	34,722	17,040
June	30,000	12,116	15,559	34,722	17,256
July	30,000	10,889	14,726	34,722	17,016
August	30,000	11,715	14,408	34,722	17,184
September	30,000	10,678	13,063	34,722	17,178
October	30,000	8,595	9,922	34,722	16,770
November	30,000	8,392	8,950	34,722	15,948
December	30,000	8,487	8,982	34,722	15,942

Table XIII
2021 Treated Water Flow Data
Water Sent to Distribution System

Month	Maximum Allowed Flow Rate (m ³ /Day)	Average Daily Flow (m ³ /Day)	Maximum Daily Flow (m ³ /Day)	Maximum Flow Rate (Litres/Minute)
January	36,400	8,059	8,614	11,655
February	36,400	8,220	8,914	11,621
March	36,400	8,335	8,912	11,733
April	36,400	8,498	9,446	11,632
May	36,400	11,020	15,757	22,050
June	36,400	11,734	14,855	13,140
July	36,400	10,690	14,436	36,000
August	36,400	11,404	13,581	11,677
September	36,400	10,390	12,762	11,655
October	36,400	8,426	9,533	18,742
November	36,400	8,310	8,820	11,880
December	36,400	8,371	8,872	11,700

36,000 - Flow Metre Calibration, not actual effluent max flow

This report is made available to the public for viewing on the Municipalities website at <https://www.lakeshore.ca/en/municipal-services/plans-publications-and-reports.aspx#Drinking-Water-Annual-Reports>. The report is printed and available for viewing at 419 Notre Dame Street (Town Hall) & 492 Lakeview Dr, Belle River, Ontario. Both versions are available after February 28th 2022.