

February 21, 2023

**MUNICIPALITY OF LAKESHORE
LAKESHORE WATER TREATMENT PLANT AND WATER SERVICE AREA
2022 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, 2022 until December 31, 2022.

The Municipality of Lakeshore owns and operates four (4) separate drinking water systems under MECP jurisdiction. This letter focusses on the *Lakeshore Water Treatment Plant (WTP) and Water Service Area (WSA)* which is registered as having *Drinking Water System #260091507* under *Municipal Drinking Water License #031-101*. This drinking water system is deemed to be *Large Municipal Residential* having a mathematically assumed population of 30,634 having 10,940 service connections at the end of 2022.

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 mussel 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: Poly Aluminum Chloride (DELPAC & STERNPAC Products), Polyelectrolytes, Powdered and Granular Activated Carbon, Chlorine Gas. The WTP does not include Fluoridation in its processes.

During the summer of 2022, supply chain issues made the current DELPAC product unavailable. A change to a STERNPAC product that is sourced in Ontario was tested and selected to replace the no longer available coagulant chemical. Extensive internal and external tests were performed on the water quality throughout the treatment process and no reduction in water quality was observed.

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 must be 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
2022 OPERATIONAL TESTING
REGULATION 170/03 DURING 2022

	Number of Grab Samples	Range of Results (min #)-(max #)	Unit of Measure
Turbidity Filter AVG	8760	0.0 – 0.06	NTU
Chlorine	8760	0.77 – 2.28	Free CL mg/l
Distribution Additional Residuals	824	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 are required to be tested by a certified laboratory accredited for drinking water samples. Table II outlines these analytical results.

TABLE II
2022 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 – 100	8 – 370	0	NA
Treated	104	0 – 0	0 – 0	104	<10 – 10
Distribution	572	0 – 0	0 – 0	309	<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*. Table III and Table IV show the treated water sample results from this regulatory sampling requirement. No organic or inorganic sample exceeded any regulatory requirement as samples for 2022.

TABLE III
2022 INORGANIC PARAMETERS TESTED
TREATED WATER
REGULATION 170/03

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	October 26 th , 2022	<0.0001	mg/l	NO
Arsenic	October 26 th , 2022	0.0002	mg/l	NO
Barium	October 26 th , 2022	0.015	mg/l	NO
Boron	October 26 th , 2022	0.013	mg/l	NO
Cadmium	October 26 th , 2022	<0.000010	mg/l	NO
Chromium	October 26 th , 2022	<0.002	mg/l	NO
Sodium	October 26 th , 2022	7.8	mg/l	NO
Mercury	October 26 th , 2022	<0.00002	mg/l	NO
Selenium	October 26 th , 2022	<0.001	mg/l	NO
Uranium	October 26 th , 2022	<0.00005	mg/l	NO
Fluoride	October 26 th , 2022	<0.1	mg/l	NO
Nitrite	October 26 th , 2022	<0.1	mg/l	NO
Nitrate	October 26 th , 2022	0.2	mg/l	NO

mg/l – milligram per litre

TABLE IV
2022 ORGANIC PARAMETERS
ANNUAL TREATED WATER REQUIREMENT
REGULATION 170/03

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	October 26 th , 2022	<0.3	ug/l	NO
Atrazine + N-dealkylated metabolites	October 26 th , 2022	<0.5	ug/l	NO
Azinphos-methyl	October 26 th , 2022	<1.0	ug/l	NO
Benzene	October 26 th , 2022	<0.5	ug/l	NO
Benzo(a)pyrene	October 26 th , 2022	<0.006	ug/l	NO
Bromoxynil	October 26 th , 2022	<0.5	ug/l	NO
Carbaryl	October 26 th , 2022	<3.0	ug/l	NO
Carbofuran	October 26 th , 2022	<1.0	ug/l	NO
Carbon Tetrachloride	October 26 th , 2022	<0.2	ug/l	NO
Chlorpyrifos	October 26 th , 2022	<0.5	ug/l	NO
Diazinon	October 26 th , 2022	<1.0	ug/l	NO
1,2-Dichlorobenzene	October 26 th , 2022	<0.5	ug/l	NO
1,4-Dichlorobenzene	October 26 th , 2022	<0.5	ug/l	NO
1,2-Dichloroethane	October 26 th , 2022	<0.5	ug/l	NO
1,1-Dichloroethylene (vinylidene chloride)	October 26 th , 2022	<0.5	ug/l	NO
2-4 Dichlorophenol	October 26 th , 2022	<0.2	ug/l	NO
Diclofop-methyl	October 26 th , 2022	<0.9	ug/l	NO
Dichloromethane	October 26 th , 2022	<5.0	ug/l	NO
Dimethoate	October 26 th , 2022	<1.0	ug/l	NO
Diquat	October 26 th , 2022	<5.0	ug/l	NO
Diuron	October 26 th , 2022	<5.0	ug/l	NO
Glyphosate	October 26 th , 2022	<25	ug/l	NO
Malathion	October 26 th , 2022	<5.0	ug/l	NO
Metolachlor	October 26 th , 2022	<3.0	ug/l	NO
Metribuzin	October 26 th , 2022	<3.0	ug/l	NO
Monochlorobenzene	October 26 th , 2022	<0.5	ug/l	NO
Paraquat	October 26 th , 2022	<1.0	ug/l	NO
Pentachlorophenol	October 26 th , 2022	<0.2	ug/l	NO
Phorate	October 26 th , 2022	<0.3	ug/l	NO
Polychlorinated Biphenyls(PCB)	October 26 th , 2022	<0.05	ug/l	NO
Prometryne	October 26 th , 2022	<0.1	ug/l	NO
Simazine	October 26 th , 2022	<0.5	ug/l	NO
Terbufos	October 26 th , 2022	<0.5	ug/l	NO
Tetrachloroethylene	October 26 th , 2022	<0.5	ug/l	NO
2,3,4,6-Tetrachlorophenol	October 26 th , 2022	<0.2	ug/l	NO
Triallate	October 26 th , 2022	<10.0	ug/l	NO
Trichloroethylene	October 26 th , 2022	<0.5	ug/l	NO
2,4,6-Trichlorophenol	October 26 th , 2022	<0.2	ug/l	NO
Trifluralin	October 26 th , 2022	<0.5	ug/l	NO
Vinyl Chloride	October 26 th , 2022	<0.2	ug/l	NO
MCPA	October 26 th , 2022	<10	ug/l	NO
2,4-(2,4-D) Dichlorophenoxy acetic acid,	October 26 th , 2022	<1.0	ug/l	NO
Dicamba	October 26 th , 2022	<1.0	ug/l	NO
Picloram	October 26 th , 2022	<5.0	ug/l	NO

ug/l – microgram per litre

Treated and Distribution water samples are taken for selected organic and inorganic parameters. 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. Tables V, VI and VII shows the results satisfying the regulation.

TABLE V
2022 NITRATE AND NITRITE RESULTS
QUARTERLY TREATED WATER REQUIREMENT
REGULATION 170/03

Parameter	Date	Result	Unit	Exceedance
Nitrate	March 1, 2022	0.9	mg/L	NO
	June 14, 2022	0.6	mg/L	NO
	October 11, 2022	<0.1	mg/L	NO
	December 13, 2022	0.4	mg/L	NO
Nitrite	March 1, 2022	<0.1	mg/L	NO
	June 14, 2022	<0.1	mg/L	NO
	October 11, 2022	<0.1	mg/L	NO
	December 13, 2022	<0.1	mg/L	NO
THM's	March 1, 2022	16	ug/L	NO
	June 14, 2022	17	ug/L	NO
	October 11, 2022	7	ug/L	NO
	December 13, 2022	7	ug/L	NO
	RAA	11.77	ug/L	NO

ug/l – microgram per litre

TABLE VI
2022 TRIHALOMETHANES & HALOACETIC ACIDS RESULTS
QUARTERLY DISTRIBUTION WATER REQUIREMENT
REGULATION 170/03

Parameter	Sample Schedule	Result	Unit of Measure	Exceedance
THM (Treated Water RAA)	Quarterly	11.77	mg/l	NO
THM (Distribution RAA)	Quarterly	23.25	mg/l	NO
HAA (Distribution RAA)	Quarterly	6.13	mg/l	NO

mg/l – milligram per litre

TABLE VII
2022 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	0.00008 – 0.00161	mg/l	NONE
Distribution (Alkalinity)	14	66 - 109	mg/l	NA

mg/l – milligram per litre

TABLE VIII
2022 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	6.16	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 2022 within the Lakeshore Water Treatment Plant and Water Service Area.

TABLE IX
2022 PROJECT COSTS

Project	Cost Incurred
New Water Main Project (Strong Rd)	\$610,000
Neptune Water Metre Replacement Program	\$1,871,000

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 2022

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
May 16 th 2022	Sodium	24.4 Treated 20.4 Distribution	mg/l	Re-sample	May 20 th 2022

As shown above there was a single occasion in 2022 when the Lakeshore Water Service Area was not in compliance with the 2 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. 169/03	May 16 th 2022	Flush and Resample	Complete
System Approvals	none			
System Drinking Water Works Permit and Municipal Drinking Water Licence	none			
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 reporting 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 2022.

(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 2022 are as follows:

- Maximum Amount Taken per Minute in 2022 (Litres/Min) **20,928 (June 27, 2022)**
- Maximum Amount Taken Per Day in 2022 (Litres/Day) **160,720 (September 11, 2022)**

The Lakeshore Water Service Area operated under Drinking Water Works Permit #031-201 and Municipal Drinking Water Licence (MDWL) #031-101 during 2022:

The MDWL 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 2022 was **16,266 m³/day**

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

Table XII
2022 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	8,719	9,186	34,722	15,384
February	30,000	8,799	9,194	34,722	9,402
March	30,000	8,704	9,140	34,722	15,294
April	30,000	8,933	9,607	34,722	16,596
May	30,000	10,830	13,765	34,722	16,808
June	30,000	16,600	16,563	34,722	20,298
July	30,000	14,207	16,518	34,722	16,926
August	30,000	13,050	15,255	34,722	17,274
September	30,000	11,952	16,720	34,722	16,998
October	30,000	9,601	11,180	34,722	16,512
November	30,000	8,052	11,320	34,722	15,138
December	30,000	8,181	8,999	34,722	15,306

Table XIII
2022 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	8,625	9,207	11,722
February	36,400	8,638	9,228	15,885
March	36,400	8,580	9,249	11,767
April	36,400	8,764	9,547	11,733
May	36,400	10,637	13,650	15,885
June	36,400	13,209	16,266	36,000
July	36,400	13,895	15,862	22,680
August	36,400	12,721	15,084	18,135
September	36,400	11,588	13,829	24,300
October	36,400	9,468	11,372	12,127
November	36,400	8,047	10,533	17,910
December	36,400	8,123	9,101	18,900

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

This report is made available to the public for viewing on the Municipality's 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, 2023.