



## Lemieux Island Water Purification Plant - 2019 Drinking Water Quality

### Physical, microbiological, chemical, & radiological test results

#### Physical

Test parameter	Units	Treated water results	Drinking water standard*
Colour	TCU	3.3	5 (A)
Turbidity	NTU	0.07	5 (A)
Temperature	°C	0.2 – 27.7	<15 (A)
Conductivity	m-mhos/cm	124	
UV <sub>254</sub> absorbance	abs/cm	0.056	
Total dissolved solids	mg/L	127	500 (A)

#### Microbiological

Test parameter	Units	Treated water results	Drinking water standard*
Total coliforms	cfu/100mL	0 of 1435 tests >0	0
E.coli	cfu/100mL	0 of 1435 tests >0	0
Heterotrophic plate count (HPC)	cfu/mL	range: <10 - 50	500 (O)

#### Chemical – general

Test parameter	Units	Treated water results	Drinking water standard*
pH	log <sub>10</sub>	9.48	<sup>2</sup> 7.0 - 10.5 (O)
Alkalinity	mg/L CaCO <sub>3</sub>	32.3	30 - 500 (O)
Bromate	mg/L	<	0.01
Bromide	mg/L	0.011	
Calcium	mg/L	7.9	
Chlorate	mg/L	0.08	1.0
Chloride	mg/L	5.9	250 (A)
Chlorine (total, as chloramine)	mg/L	1.65	3.0
Chlorite	mg/L	<	1.0
Cyanide	mg/L	<	0.2
Fluoride	mg/L	0.66	1.5
Magnesium	mg/L	2.1	
Potassium	mg/L	0.7	

Test parameter	Units	Treated water results	Drinking water standard*
Silicon	mg/L	2.6	
Sodium	mg/L	17.5	<sup>5</sup> 20, 200 (A)
Sulphate	mg/L	25.5	500 (A)
Total hardness**	mg/L CaCO <sub>3</sub>	28.3	80 - 100 (A)
Calcium hardness**	mg/L CaCO <sub>3</sub>	19.8	
Magnesium hardness**	mg/L CaCO <sub>3</sub>	8.4	
Ammonia	mg/L N	<	
Total Kjeldahl Nitrogen	mg/L N	0.33	
Nitrate	mg/L N	0.18	10
Nitrite	mg/L N	<	1.0
Phosphate	mg/L P	<	
Dissolved organic carbon	mg/L	3.6	5.0 (A)
Langelier's Index**	log <sub>10</sub>	-1.7	
C-T Disinfection**	mg/L-min	165.7	
Log Giardia Disinfection**	log <sub>10</sub>	8.1-log	min 0.5-log
Log Virus Disinfection**	log <sub>10</sub>	>10-log	min 3.0-log

#### Chemical - inorganic metals

Test parameter	Units	Treated water results	Drinking water standard*
Aluminum	mg/L	0.1094	0.1 (O)
Antimony	mg/L	<	0.006
Arsenic	mg/L	<	0.010
Barium	mg/L	0.0133	1.0
Beryllium	mg/L	<	
Bismuth	mg/L	<	
Boron	mg/L	0.0050	5.0
Cadmium	mg/L	<	0.005
Chromium	mg/L	0.0003	0.05
Chromium VI <sup>7</sup>	mg/L	0.00005	
Cobalt	mg/L	<	
Copper	mg/L	0.0016	<sup>2</sup> 2.0, <sup>3</sup> 1.0 (A)
Iron	mg/L	0.0019	0.3 (A)
Lead	mg/L	<	<sup>2</sup> 0.005 / <sup>3</sup> 0.01
Manganese	mg/L	0.0026	<sup>2</sup> 0.12 / <sup>3</sup> 0.05(A)
Mercury	mg/L	<	0.001
Molybdenum	mg/L	<	
Nickel	mg/L	0.0004	

Test parameter	Units	Treated water results	Drinking water standard*
Selenium	mg/L	<	0.05
Silver	mg/L	<	
Strontium	mg/L	0.0393	7.0
Thallium	mg/L	<	
Tin	mg/L	<	
Titanium	mg/L	<	
Tungsten	mg/L	<	
Uranium	mg/L	<	0.02
Vanadium	mg/L	0.0002	
Zinc	mg/L	0.0005	5.0 (A)
Zirconium	mg/L	<	

#### Chemical – organics

Test parameter	Units	Treated water results	Drinking water standard*
1,1,1 -Trichloroethane	µg/L	<	
1,1,1,2-Tetrachloroethane	µg/L	<	
1,1,2 -Trichloroethane	µg/L	<	
1,1,2,2-Tetrachloroethane	µg/L	<	
1,1-Dichloroethane	µg/L	<	
1,1-Dichloroethylene	µg/L	<	14
1,1-Dichloropropene	µg/L	<	
1,2,3-Trichlorobenzene	µg/L	<	
1,2,3-Trichloropropane	µg/L	<	
1,2,4-Trichlorobenzene	µg/L	<	
1,2,4-Trimethylbenzene	µg/L	<	
1,2-Dibromo-3-chloropropane / DBCP	µg/L	<	
1,2-Dichlorobenzene	µg/L	<	200, 3(A)
1,2-Dichloroethane	µg/L	<	5
1,2-Dichloroethylene - cis	µg/L	<	
1,2-Dichloropropane	µg/L	<	
1,2-Dichloroethylene -trans	µg/L	<	
1,3-Dichlorobenzene	µg/L	<	
1,3-Dichloropropene - cis	µg/L	<	
1,3-Dichloropropene - trans	µg/L	<	
1,3-Dichloropropane	µg/L	<	
1,3,5-Trimethylbenzene	µg/L	<	

Test parameter	Units	Treated water results	Drinking water standard*
1,4-Dichlorobenzene	µg/L	<	5, 1(A)
1,4-Dioxane	µg/L	<	
2,2-Dichloropropane	µg/L	<	
2,3,4,6-Tetrachlorophenol	µg/L	<	100, 1(A)
2,4,5-Trichlorophenoxyacetic acid / 2,4,5-T	µg/L	<	
2,4,6-Trichlorophenol	µg/L	<	5, 2(A)
2,4-Dichlorophenol	µg/L	<	900, 0.3(A)
2,4-DDT	µg/L	<	
2,4-Dichlorophenoxyacetic acid (2,4-D )	µg/L	<	100
2-Chlorotoluene	µg/L	<	
2-Hexanone (MPK)	µg/L	<	
2-Methylisoborneol	µg/L	<	
4-Chlorotoluene	µg/L	<	
Acetone	µg/L	<	
Alachlor	µg/L	<	5
Aldicarb	µg/L	<	
Aldrin	µg/L	<	
Aldrin + dieldrin	µg/L	<	
Atrazine	µg/L	<	
Atrazine + N-dealkylated metabolites	µg/L	<	5
Atrazine-desethyl (DEA)	µg/L	<	
Azinphos-methyl	µg/L	<	20
Bendiocarb	µg/L	<	
Benzene	µg/L	<	25.0 / 31.0
Benzo(a)pyrene	µg/L	<	0.01
Bromobenzene	µg/L	<	
Bromoxynil	µg/L	<	5
Carbaryl	µg/L	<	90
Carbofuran	µg/L	<	90
Carbon tetrachloride	µg/L	<	2
Chlorobenzene	µg/L	<	80, 30(A)
Chloroethane	µg/L	<	
Chlorpyrifos	µg/L	<	90
Cyanazine	µg/L	<	
4,4-DDD	µg/L	<	
4,4-DDE	µg/L	<	
4,4-DDT	µg/L	<	
DDT + metabolites	µg/L	<	

Test parameter	Units	Treated water results	Drinking water standard*
Diazinon	µg/L	<	20
Dicamba	µg/L	<	120
Dichlorodifluoromethane / Freon 12	µg/L	<	
Dichloromethane	µg/L	<	50
Diclofop - methyl	µg/L	<	9
Dieldrin	µg/L	<	
Dimethoate	µg/L	<	20
Dinoseb	µg/L	<	
Diquat	µg/L	<	70
Diuron	µg/L	<	150
Ethylbenzene	µg/L	<	140, 1.6 (A)
Ethylene dibromide	µg/L	<	
Geosmin	µg/L	<	
Glyphosate	µg/L	<	280
Heptachlor	µg/L	<	
Heptachlor & heptachlor epoxide	µg/L	<	
Heptachlor epoxide	µg/L	<	
Hexane	µg/L	<	
Isopropylbenzene	µg/L	<	
Lindane	µg/L	<	
Malathion	µg/L	<	190
MCPA	µg/L	<	100
Methoxychlor	µg/L	<	
Methyl ethyl ketone (MEK) (2-Butanone)	µg/L	<	
Methyl isobutyl ketone (MIBK)	µg/L	<	
Methyl tert-butyl ether / MTBE	µg/L	<	15 (A)
Metolachlor	µg/L	<	50
Metribuzin	µg/L	<	80
Microcystin-LR	µg/L	<	1.5
Nitrilotriacetic acid	µg/L	<	400
N - Nitrosodimethylamine (NDMA)	µg/L	0.001	20.040 / 0.009 <sup>3</sup>
n-Butylbenzene	µg/L	<	
n-Propylbenzene	µg/L	<	
Paraquat	µg/L	<	7
Parathion	µg/L	<	
Pentachlorophenol	µg/L	<	60, 30(A)
Phorate	µg/L	<	2
Picloram	µg/L	<	190

Test parameter	Units	Treated water results	Drinking water standard*
p-Isopropyltoluene	µg/L	<	
Polychlorinated biphenyls (PCBs)	µg/L	<	3
Prometryne	µg/L	<	1
sec-Butylbenzene	µg/L	<	
Simazine	µg/L	<	10
Styrene	µg/L	<	
Temephos	µg/L	<	
Terbufos	µg/L	<	1
tert-Butylbenzene	µg/L	<	
Tetrachloroethylene	µg/L	<	10
Toluene	µg/L	<	60, 24 (A)
Total chlordane	µg/L	<	
Triallate	µg/L	<	<sup>3</sup> 230
Trichloroethylene / TCE	µg/L	<	5
Trifluralin	µg/L	<	45
Vinyl chloride	µg/L	<	<sup>2</sup> 2.0 / <sup>3</sup> 1.0
Xylene - meta & para	µg/L	<	
Xylene - ortho	µg/L	<	
Xylenes - total	µg/L	<	90, 20(A)

### Chemical – Dioxins & Furans

Test parameter	Units	Treated water results	Drinking water standard*
2,3,7,8,-Tetra-Dibenzo-p-Dioxin	µg/L	<	
1,2,3,7,8,-Penta-Dibenzo-p-Dioxin	µg/L	<	
1,2,3,4,7,8,-Hexa-Dibenzo-p-Dioxin	µg/L	<	
1,2,3,6,7,8,-Hexa-Dibenzo-p-Dioxin	µg/L	<	
1,2,3,7,8,9-Hexa-Dibenzo-p-Dioxin	µg/L	<	
1,2,3,4,6,7,8,-Hepta-Dibenzo-p-Dioxin	µg/L	<	
2,3,7,8-Tetra-Dibenzofuran	µg/L	<	
1,2,3,7,8,-Penta-Dibenzofuran	µg/L	<	
2,3,4,7,8,-Penta-Dibenzofuran	µg/L	<	
1,2,3,4,7,8,-Hexa-Dibenzofuran	µg/L	<	
1,2,3,6,7,8,-Hexa-Dibenzofuran	µg/L	<	
2,3,4,6,7,8,-Hexa-Dibenzofuran	µg/L	<	
1,2,3,7,8,9,-Hexa-Dibenzofuran	µg/L	<	
1,2,3,4,6,7,8-Hepta-Dibenzofuran	µg/L	<	
1,2,3,4,7,8,9,-Hepta-Dibenzofuran	µg/L	<	

Test parameter	Units	Treated water results	Drinking water standard*
Total Tetrachlorodibenzo-p-Dioxins	µg/L	<	
Total Pentachlorodibenzo-p-Dioxins	µg/L	<	
Total Hexachlorodibenzo-p-Dioxins	µg/L	<	
Total Heptachlorodibenzo-p-Dioxins	µg/L	<	
Total Octachlorodibenzo-p-Dioxins	µg/L	<	
Total Tetrachlorodibenzofurans	µg/L	<	
Total Pentachlorodibenzofurans	µg/L	<	
Total Hexachlorodibenzofurans	µg/L	<	
Total Heptachlorodibenzofurans	µg/L	<	
Total Octachlorodibenzofuran	µg/L	<	
2,3,7,8-TCDD toxicity equivalents	µg/L	<	<sup>3</sup> 0.000015

### Chemical – Perfluorinated Organics

Test parameter	Units	Treated water results	Drinking water standard*
Perfluorobutyrate	µg/L	<	
Perfluoro-n-pentanoic acid	µg/L	<	
Perfluorohexanoic acid	µg/L	<	
Perfluoroheptanoic acid	µg/L	<	
Perfluorooctanoic acid (PFOA)	µg/L	<	0.200
Perfluorononanoic acid	µg/L	<	
Perfluorodecanoic acid	µg/L	<	
Perfluoroundecanoic acid	µg/L	<	
Perfluorododecanoic acid	µg/L	<	
Perfluorotridecanoic acid	µg/L	<	
Perfluorotridecanoate.	µg/L	<	
Perfluorobutane sulfonate.	µg/L	<	
Perfluoropolyethers	µg/L	<	
Perfluorohexane sulfonic acid	µg/L	<	
Perfluoroheptane sulfonate	µg/L	<	
Perfluorooctanesulfonic acid	µg/L	<	
Perfluorononanesulfonate	µg/L	<	
Perfluorodecanesulfonate	µg/L	<	
Perfluorododecanesulfonic acid (PFOS)	µg/L	<	0.600
4:2 fluorotelomer sulfonate	µg/L	<	
6:2 fluorotelomer sulfonate	µg/L	<	
8:2 fluorotelomer sulfonate	µg/L	<	

Test parameter	Units	Treated water results	Drinking water standard*
Perfluorooctanesulfonamide	µg/L	<	
N-Methylperfluorooctanesulfonamide	µg/L	<	
N-ethyl perfluorooctanesulfonamide	µg/L	<	
N-methylperfluoro-1-octanesulfonamidoacetic acid	µg/L	<	
N-ethylperfluoro-1-octanesulfonamidoacetic acid	µg/L	<	
N-Methylperfluorooctanesulfonamidoethanol	µg/L	<	
N-Ethyl Perfluorooctane Sulfonamido Ethanol	µg/L	<	
Hexafluoropropylene oxide dimer acid	µg/L	<	
3H-perfluoro-3-[(3-methoxy-propoxy) propanoic acid]	µg/L	<	
9C1-PF3ONS 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic Acid	µg/L	<	
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	µg/L	<	
total	µg/L	<	0.700

### Chemical - disinfection by-products

Test parameter	Units	Treated water results	Drinking water standard*
Chloroform	µg/L	33.4	
Bromodichloromethane	µg/L	4.1	
Dibromochloromethane	µg/L	0.3	
Bromoform	µg/L	<	
Total trihalomethanes (TTHMs)	µg/L	37.8	
Monochloroacetic acid	µg/L	0.7	
Monobromoacetic acid	µg/L	<	
Dichloroacetic acid	µg/L	14.8	
Dibromoacetic acid	µg/L	<	
Trichloroacetic acid	µg/L	16.0	
Bromochloroacetic acid	µg/L	1.5	
Bromodichloroacetic acid	µg/L	1.9	
Chlorodibromoacetic acid	µg/L	<	
Tribromoacetic acid	µg/L	<	
Total haloacetic acids (HAA5)	µg/L	31.1	
Total haloacetic acids (HAA9)	µg/L	34.4	



Test parameter	Units	Treated water results	Drinking water standard*
Total trihalomethanes (TTHMs) <sup>1</sup> in distribution	µg/L	39.7	100
Total haloacetic acids (HAA5) <sup>1</sup> in distribution	µg/L	33.5	80

#### Chemical – pharmaceuticals & personal care products<sup>6</sup>

Test parameter	Units	Treated water results	Drinking water standard*
1,7-Dimethylxanthine	µg/L	<	
10-Hydroxy-Amitriptyline	µg/L	<	
17a-Dihydroequilin	µg/L	<	
17a-Estradiol	µg/L	<	
17a-Ethinylestradiol	µg/L	<	
17b-Estradiol	µg/L	<	
Acetaminophen	µg/L	<	
Albuterol	µg/L	<	
Amitriptyline	µg/L	<	
Amlodipine	µg/L	<	
Amphetamine	µg/L	<	
Androstenedion	µg/L	<	
Androsterone	µg/L	<	
Atenolol	µg/L	<	
Atorvastatin	µg/L	<	
Azithromycin	µg/L	<	
Benzafibrate	µg/L	<	
Benzoylcegonine	µg/L	<	
Betamethasone	µg/L	<	
Caffeine	µg/L	<	
Carbamazepine	µg/L	<	
Clotrimazole	µg/L	<	
Cotinine	µg/L	<	
Deet	µg/L	<	
Diphenhydramine	µg/L	<	
Enrofloxacin	µg/L	<	
Erythromycin	µg/L	<	
Fluoxetine	µg/L	<	
Indomethacin	µg/L	<	
Ketoprofen	µg/L	<	
Metformin	µg/L	0.020	

Test parameter	Units	Treated water results	Drinking water standard*
Miconazole	µg/L	<	
Norfloxacin	µg/L	<	
Ofloxacin	µg/L	<	
Oxolinic Acid	µg/L	<	
Pentoxifylline	µg/L	<	
Roxithromycin	µg/L	<	
Sulfachloropyridazine	µg/L	<	
Sulfadiazine	µg/L	<	
Sulfadimethoxine	µg/L	<	
Sulfamerazine	µg/L	<	
Sulfamethazine	µg/L	<	
Sulfamethizole	µg/L	<	
Sulfamethoxazole	µg/L	<	
Sulfathiazole	µg/L	<	
Trimethoprim	µg/L	<	

#### Chemical – additional Test parameters\*\*\*\*

Test parameter	Units	Treated water results	Drinking water standard*
Dissolved inorganic carbon	mg/L	10.3	
Total organic carbon	mg/L	2.6	
Phosphorus (total)	mg/L	0.002	
Nitrogen: ammonia + ammonium	mg/L	0.24	
Nitrogen (total)	mg/L	0.7	
1,1-dichloroethene	µg/L	<	
1,2-dibromoethane	µg/L	<	
2,2-dichloropropanoic acid	µg/L	0.30	
Bromochloroacetaldehyde	µg/L	0.4	
Bromochloroacetonitrile	µg/L	0.3	
Chloral Hydrate	µg/L	1.4	
Chloroacetonitrile	µg/L	<	
Dibromoacetaldehyde	µg/L	1.4	
Dibromoacetonitrile	µg/L	0.5	
Dichloroacetonitrile	µg/L	0.7	
Diisopropylether	µg/L	<	
HAN4	µg/L	1.9	
Hexachlorocyclopentadiene	µg/L	0.1	

Test parameter	Units	Treated water results	Drinking water standard*
Iodoacetic acid	µg/L	<	
Perchlorate	µg/L	<	
Trichloroacetoneitrile	µg/L	<	

### Radiological

Test parameter	Units	Treated water results	Drinking water standard*
Gross-Alpha radioactivity	Bq/L	<0.04	<sup>4</sup> 0.5
Gross-Beta radioactivity	Bq/L	<0.1	<sup>4</sup> 1.0
Tritium	Bq/L	2.5	7000

### Glossary and notes:

reported values represent average concentrations measured in treated water

< indicates less than detection limit

mg/L = milligram per Litre = part per million (ppm)

µg/L = microgram per Litre = part per billion (ppb)

cfu = colony forming Units

\*Ontario Drinking Water Standards O.Reg.169/03 and/or Health Canada Guidelines for Canadian Drinking Water Quality

\*Drinking water standards are health-based MAC (Maximum Acceptable Concentration) values, unless otherwise noted

(A) indicates aesthetic objective, not health related but may affect taste, odour, or appearance

(O) indicates an operational guideline, to ensure efficient treatment and distribution system operation

<sup>1</sup>The reported THM and HAA result is an annual average concentration measured in the distribution system.

<sup>2</sup>Health Canada Drinking Water Guideline only

<sup>3</sup>Ontario Drinking Water Quality Standard only

<sup>4</sup>Radioactivity screening values = 0.5 Bq/L for gross alpha and 1.0 Bq/L for gross beta

<sup>5</sup>Sodium health advisory level of 20 mg/L for people on sodium-restricted diets only

<sup>6</sup>Results used from Britannia WPP deemed to be representative of Lemieux Island WPP

<sup>7</sup>Result from 2018

\*\*calculated parameter based on individual analytes

\*\*\*the lead values reported do not include the Ontario Ministry of Environment Community Lead Testing Program results

\*\*\*\*tests performed by Ontario Drinking Water Surveillance Program (DWSP)