

Drinking-Water System Number:	220000460
Drinking-Water System Name:	North Bay Water Drinking Water System
Drinking-Water System Owner:	The Corporation of the City of North Bay
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2021 to December 31, 2021

Complete if your Category is Large Municipal Residential or Small Municipal Residential

Does your Drinking-Water System serve more than 10,000 people? Yes [X] No []

Is your annual report available to the public at no charge on a web site on the Internet?

Yes [X] No []

Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.

The Corporation of the City of North Bay
P.O. Box 360
200 McIntyre Street East
North Bay, ON P1B 8H8

Complete for all other Categories.

Number of Designated Facilities served:

Did you provide a copy of your annual report to all Designated Facilities you serve?

Yes [] No []

Number of Interested Authorities you

report to:

Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?

Yes [] No []

Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
N/A	

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

Yes [] No []

Indicate how you notified system users that your annual report is available and is free of charge.

[X] Public access/notice via the web

[X] Public access/notice via a newspaper

Describe your Drinking-Water System

The City of North Bay water treatment plant (WTP), water distribution facilities and water distribution piping system are owned and operated by the Corporation of the City of North Bay.

The City of North Bay Water Treatment System is classified as a "Large Municipal Residential" Drinking-Water System, Class 3 Water Treatment Plant and Class 4 Water Distribution System with the Drinking-Water System Number: 220000460. The WTP is located at 248 Lakeside Drive in North Bay and treats water from Trout Lake which is part of the Mattawa River watershed. The WTP services a population of approximately 54,000, the permit to take water permits water consumption up to 79,500 cubic meters per day.

The water distribution facilities consist of the following:

Ellendale Reservoir, High lift Pump Station & Re-chlorination Facility;

CFB Standpipe;

Canadore Pumping Station;

Cedar Heights Booster pumping station;

Judge Avenue Valve Chamber;

Birches Road Standpipe and Re-chlorination Station; and

Airport Road Standpipe, Booster Pumping Station and Re-chlorination Facility.

Larocque Rd. Standpipe

The membrane filtration water treatment plant has the design capacity of 79,500 cubic meters per day. The plant is a SCADA controlled membrane filtration system with ultraviolet and chlorine disinfection. The plant also doses fluoride, caustic for pH adjustment and Control Max for corrosion control prior to delivery to the distribution system.

The membrane filtration plant meets the Ontario Drinking Water Standards requirements for the removal/disinfection of 3-log Giardia Lambia, 2-log Cryptosporidium and 4-log Viruses. The membrane filtration Primary Barrier provides a 3- log Giardia removal, 2-log Cryptosporidium removal. The chlorine/UV disinfection Secondary Barrier provides for a 0.5 Giardia removal, 0.5-log Cryptosporidium removal and with chlorine addition gives a 4- log virus removal.

In general the North Bay WTP can be described as follows:

Intake

A 1200mm diameter 45 series polyethylene intake pipe, with a capacity of 80,000 cubic meters per day. The pipe, constructed in 1973, extends approximately 300 meters into Delaney Bay of Trout Lake and includes an intake structure consisting of a steel inlet bell mouth with fiber reinforced plastic (FRP) cage and is in approximately 21.5 meters of water at low water level.

Membrane Feed Pump Well/Prescreening

Two (2) parallel sub-surface well chambers with level monitoring containing, two (2) 6mm mesh manual prescreen in series, five (5) vertical turbine pumps (4 duty and one standby) each rated at 20 m³/d feeding the primary membrane system.

Membrane Feed Strainers

Five (5) 300 micron automatic membranes feed strainers (four duties and one standby).

Treatment Plant Process Areas

A building housing the following process components:

- Primary and secondary membrane filtration system;
- Primary and secondary UV disinfection system;
- Two (2) chlorine contact tanks;
- split high lift pump well
- three (3) chemical storage and delivery rooms housing membrane cleaning and neutralization chemical systems, pre-chlorination system, primary disinfection chemical system, secondary chlorination chemical system, pH adjustment system, fluoride and corrosion control addition system.

Also includes;

- High lift pumping room;
- Generator room;
- Electrical room.
- Compressor/blower room

Administration Area

Two floor administrative area including laboratory/control room, server room, multipurpose training room, offices, washrooms, women's and men's locker rooms, janitor room, building mechanical room and storage room.

Membrane Filtration

Eleven (11) pressurized primary membrane racks treating water from the membrane feed strainers, two(2) pressurized secondary membrane racks treating non-chemical backwash water from the primary membrane racks. The primary racks have a maximum production flow rate of 78.7 MLD based on raw water flow rate of 79.5 MLD, Ancillary systems including backwash pumps, instrument air for operating valves and integrity testing membranes, process blowers, and chemical cleaning and neutralization systems.

UV Disinfection Systems

Three (3) 600mm primary UV reactors (two duty and one standby) treating water from the eleven (11) pressurized primary membrane racks and two (2) secondary membrane racks. Each reactor contains medium pressure high intensity lamps housed in quartz sleeves; units equipped with self-cleaning mechanism and intensity sensors.

Chemical systems for:

Primary disinfection

Secondary (residual) disinfection

Fluoride Dosing

pH Adjustment

Corrosion Control

Membrane cleaning

Membrane cleaning solutions neutralization

Chlorine Contact Tank #1 and #2

Two (2) baffled chlorine contact tanks in series with capacities of 688 cubic meters in (tank #1) and 502 cubic meters (tank #2).

High Lift Pump Well #1 and #2

High lift pump well #1 has a capacity of approximately 240 cubic meters and is equipped with one (1) variable speed and two (2) constant speed vertical turbine high lift pumps each rated at 20 MLD. High lift pump well #2 has a capacity of approximately 240 cubic meters and is equipped with one (1) variable speed and one (1) constant speed vertical turbine high lift pump each rated at 20 MLD.

Generator Room

One (1) dual fuel generator set (NG/Diesel) with a rating of 2050KW, to provide power during peak hours and emergency situations.

Wastewater Disposal System**Primary Membrane Backwash Tank**

Tank with a volume of approximately 310 cubic meters,

Two (2) membranes feed pumps supplying water to the Secondary Membrane System.

Secondary Waste Tank

Tank with a volume of approximately 130 cubic meters,

Two (2) pumps, one duty and one standby, to deliver water to the sanitary sewer.

Neutralization Tank #1 and #2

Two (2) tanks each with a volume of 150 cubic meters, pH and Chlorine Residual analyzers. Designed to dechlorinate and adjust pH to suitable levels for wastewater plant.

Sanitary Sewage Disposal

One sump with two (2) submersible pumps in the Administration Area and two (2) sumps and two (2) submersible pumps in the Process Area discharging to the sanitary sewer along Lakeside Drive

The treated water is pumped to the distribution system.

The water distribution facilities can be described as follows:**Ellendale Reservoir High lift Pumping Station and Re-chlorination Facility**

The facility is a reinforced concrete at-grade, double cell, un-baffled, treated water reservoir, located at

the east end of Ellendale Drive. The reservoir has an approximate capacity of 18,200 cubic meters, with dimensions of 71 meters by 38 meters by 7 meters. The facility is equipped with a sodium hypochlorite re-chlorination system, on-line continuous water quality analyzer for free chlorine. Standby power is available with a generator to operate the facility during power outages.

Birch's Road Standpipe and Re-chlorination Station

The facility consists of one (1) 39 meter high, 19 meter diameter, 11,775 cubic meter capacity with a hydrostatic mixing system, the steel treated water standpipe located near the southwest corner of Birch's Road and Booth Road. The facility is equipped with a sodium hypochlorite re-chlorination system and on-line continuous water quality analyzer for free chlorine. A fixed 7.5kW, 120/240 Volt single phase diesel powered generator to power the re-chlorination and SCADA communications during prolonged power outages.

Larocque Rd. Standpipe

The facility consists of one (1) 22 meter high, 15meter diameter, and 4,000 cubic meter capacity glass fused to steel standpipe with a hydrostatic mixing system. The standpipe is located at the North end of the city on Larocque Rd. to provide water pressure to future development, along with the Canadore College and Nipissing University. There is a 10KW, 120/240V backup generator to maintain communication and SCADA controls during power outages.

Judge Avenue Valve Chamber

The facility consists of a valve and is located near the northeast corner of Judge Avenue and Lakeshore Drive. The facility is equipped with a fixed 7.5kW 120/240 Volt single phase, diesel powered generator to power the valve and SCADA communications during prolonged power outages. Valve control for pressure or tower level integrated with Birches Standpipe. The equipment for a re-chlorination station is located at the facility however not currently in use.

CFB Standpipe

The standpipe is a glass fused to steel un-baffled tank with an electric mixer inside, it is located on the Airport Standpipe property and shares all the buildings resources such as the PLC and standby generator. This Standpipe has a volume of 2,280m³ and supplies water to zone 3 and to the Airport Standpipe. The piping at this facility allows this standpipe to also supply water for zone 5 during emergencies and maintenance activities.

Canadore Pumping Station

The facility is equipped with high lift pumps and pressurized cushion tanks to maintain pressure in the pressurized zone of the distribution system servicing Canadore College and Nipissing University. There is an on-line continuous water quality analyzer to monitor free chlorine residual and a 200kW, 347/600 Volt, 3 phase diesel generator to provide power and SCADA communications during prolonged power outages. Site is offline and on standby now that Cedar Heights is in operation. Cedar Heights Booster Station

This Facility is equipped with two (2) 100 hp high lift pumps responsible for filling the Larocque Rd. Standpipe with a pressurized cushion tank to protect pressure surges in the grid. There is an on-line

continuous water quality analyzer to monitor free chlorine residual and a 357kW, 347/600 Volt, 3 phase diesel generator to provide equipment power and SCADA communications during prolonged power outages.

Airport Standpipe, Booster Pumping Station

This 4,000 cubic meter water storage standpipe, booster pumping station and re-chlorination facility was constructed in 2009. With the standpipe, high lift pumps, pressurized cushion tanks and a 500kW back-up diesel generator. This facility maintains pressure in the pressurized zone of the distribution system servicing the Airport and Carmichael Drive areas. This system consists of a standpipe and a series of pumps to facilitate filling the standpipe and providing pressure to the Airport and Carmichael Dr. area (Zone 5). Filling the standpipe utilizes three booster pumps (2 duty and 1 standby). The standpipe provides suction pressure for four booster pumps (3 duties and 1 standby) and two fire pumps to provide pressure for Zone 5. Zone 5 is equipped with four (4) pneumatic tanks to mitigate minor pressure fluctuations within the distribution system, and to provide some volume of available storage during power interruptions while the standby power system engages.

List all water treatment chemicals used over this reporting period

Sodium Hydroxide
Sodium Hypochlorite
HydroFluorosilicic Acid
Control Max

Were any significant expenses incurred to?

- ☒ [X] Install required equipment
☒ [X] Repair required equipment
☒ [X] Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred treatment and distribution of water to Major repair and replacement to ensure reliable the water system.

The major capital repairs and replacements include:

- Replaced piping and valves for Control max fill line Water Treatment Plant
- Replaced Air Dryer unit for instrument air supply at the Water Treatment Plant
- Replaced many valves and valve actuators on filter racks
- Replaced online fluoride analyzer
- Rover inspection of contact tanks at Water Treatment Plant
- SCADA Upgrade was in progress throughout year
- Maintenance on PRV valves for discharge line at Water Treatment Plant
- Replaced controllers on the chlorine analyzers at the Water Treatment Plant
- Inspection of intake structure by contracted divers at the Water Treatment Plant
- Diving contractors had performed an inspection of the water intake for the WTP
- Replaced controllers for chlorine analyzers on many distributions sites to allow for residual data collection when communications fail.

- Two year warranty inspection for Birch's Standpipe painting, minor repairs made and cathodic system put online
- PRV replaced at Ellendale Reservoir and technician performed maintenance. New valve on order.
- New CFB standpipe was built and commissioned.
- Decommissioned old CFB reservoir.
- Major emergency water main replacement after failure at Airport Standpipe, restoration of drain pond done due to damage from break.
- Maintenance had taken place by contracted divers on cross over gate valve at Ellendale Reservoir
- Both cells drained and cleaned for Ellendale Reservoir
- Concrete repairs made on South Cell for Ellendale Reservoir
- Replaced 30 m of 150mm water main on Frost St.
- Replaced 27 m of 150mm water main on Lindsay St.
- Replaced 320m of 200 mm water main on Lakeshore Dr.
- Replaced 232m of 200mm water main on Third Ave.
- Repair to 24" valve on water line for Ski Club Rd.
- Replaced large diameter valve on water main for Hughes Rd.
- Replaced 118m of 250mm water main on Cassells St. between Olive St. and Hwy.11
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Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
June 22, 2021	Loss of Chlorine Trending	N/A	N/A	Loss of communications due to a UPS failure at Birch's Stand pipe caused a loss of chlorine residual trending at Birch's Stand pipe and Judge Valve chamber from 17:56 to 20:04. Equipment replaced and communications restored. Reported incident to MECP.	June 22, 2021
July 7, 2021	Chlorine Residual	0.03	mg/L	Flushed water main and resampled. Low chlorine not reported until later in day resulting in a non-compliance with reporting immediately. Reported to MOH and SAC as per regulations AWQI # 154557	July 7, 2021
September 15, 2021	Failure to meet Secondary Disinfection	0.04	mg/L	Drained and refilled a third of the tower and resampled getting residual of 0.26mg/L. Put auto flusher back on line. Reported to MOH and SAC as per regulations AWQI # 155496	September 15, 2021
September 20, 2021	Loss of Chlorine Trending	N/A	N/A	Loss of communications at Birch's Stand pipe caused a loss of chlorine residual trending at Birch's Stand pipe and Judge Valve chamber from 05:49 to 09:35. Manual Samples taken until communications restored. Reported incident to MECP.	September 20, 2021
October 5, 2021	Loss of Chlorine Trending	N/A	N/A	Loss of communications due to a repeater site failure. Airport Stand pipe, CFB & Ellendale reservoir had loss of chlorine residual trending from 04:05 to 05:52. Manual Samples taken until communications restored. Reported incident to MECP.	October 5, 2021
October 25, 2021	Loss of Chlorine Trending	N/A	N/A	Loss of communications at Cedar Heights Booster Station caused the loss of chlorine residual trending from 16:23 to 20:59. Staff dispatched and manual Samples taken until communications restored. Reported incident to MECP.	October 25, 2021
October 28, 2021	Loss of Chlorine	N/A	N/A	Loss of communications at Cedar Heights Booster Station	October 28, 2021

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Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
	Trending			caused the loss of chlorine residual trending from 12:15 to 14:46. Staff dispatched and manual Samples taken until communications restored. Reported incident to MECP.	
December 2, 2021	Loss of Chlorine Trending	N/A	N/A	Loss of communications at Airport Stand pipe and Ellendale Reservoir due to UPS failure at repeater site causing the loss of chlorine residual trending from 12:41 to 14:46. Staff. Dispatched and manual Samples taken until communications restored. Reported incident to MECP.	December 2, 2021
December 3, 2021	Water Main Break with Sewage Contamination	N/A	N/A	Category 2 main break had occurred on 100 Patton St.. In the same trench there was a broken sewer line giving the potential for sewage contamination in the water main. Reported incident to MOH and SAC which boil water for homes affected put into place. Isolated main and flushed followed by chlorination of entire affected main. Provided bottle water to affected homes and two bacti samples collected which came back clear. AWQI #157113	December 6, 2021
December 7, 2021	pH	9.38		During routine filter rack maintenance there was a high pressure which shut down the CIP. During the operators attempt to correct issue chemical in rack caused a pH spike in contact tanks which shut plant down. Plant put into recirculation mode to bring up chlorine residual to meet CT and dilute with raw water to bring down ph. Reported to MOH and SAC as per regulations AWQI # 157169	December 7, 2021

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

	Number of Samples	Range of E.coli (#)-(#)	Range of Total Coliform Results (#)-(#)	Number of samples Background Colony Counts	Range of Back-ground Colony Counts	Number of HPC Samples	Range of HPC Results (#)-(#)
Raw	52	0-9	1-88	52	13->200	N/A	N/A
Treated	52	0-0	0-0	52	0-0	52	0-15
Distribution Fixed Sites	364	0-0	0-0	364	0-0	104	0-27
Distribution Random Sites	520	0-0	0-0	520	0-8	156	0-11

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

POE Grab Samples	Number of Grab Samples	Range of Results (min #)-(max #)	ODWQS/Operational Requirement
Turbidity	245	0.058 – 0.284 NTU	1.0 NTU max
Chlorine	253	1.02 – 1.59 mg/L	0.05 mg/L min.
Fluoride (If the DWS provides fluoridation)	172	0.0 – 0.85 mg/L	1.5 mg/L max

Distribution Free Chlorine Grab Samples	Number of Grab Samples	Range of Results (min #)-(max #)	ODWQS Requirement
Chlorine Fixed Sites	3200	0.20 – 2.91 mg/L	0.05mg/L min.
Chlorine Random Sites	520	0.11-2.06 mg/L	0.05 mg/L min.

POE on-line Continuous Analyzers	Number of Grab Samples	Range of Results (min #)-(max #)	ODWQS/Operational Requirement
Turbidity	8760	0.002 – 0.429NTU	5.0 NTU max
Chlorine	8760	0.76 – 3.481 mg/L	0.05 mg/L min.
Fluoride (If the DWS provides fluoridation)	8760	0.0 – 0.998 mg/L	1.5 mg/L max

Summary of Inorganic parameters tested during this reporting period or the most recent sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	19 Jul 21	<0.0005	mg/L	no
Arsenic	19 Jul 21	<0.001	mg/L	no
Barium	19 Jul 21	0.01	mg/L	no

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Boron	19 Jul 21	0.01	mg/L	no
Cadmium	19 Jul 21	<0.0001	mg/L	no
Chromium	19 Jul 21	<0.001	mg/L	no
Mercury	19 Jul 21	<0.0001	mg/L	no
Selenium	19 Jul 21	<0.001	mg/L	no
Uranium	19 Jul 21	<0.001	mg/L	no
Sodium	19 Jul 21	13.0	mg/L	no
Fluoride	19 Jul 21	0.75	mg/L	no
Nitrite	6 Jan 21	<0.05	mg/L	no
	7 Apr 21	<MDL	mg/L	
	7 Jul 21	<MDL	mg/L	
	6 Oct 21	<MDL	mg/L	
Nitrate	6 Jan 21	0.1	mg/L	no
	7 Apr 21	<MDL	mg/L	
	7 Jul 21	<MDL	mg/L	
	6 Oct 21	<MDL	mg/L	

*only for drinking water systems testing under Schedule 15.2; this includes large municipal non-residential systems, small municipal non-residential systems, non-municipal seasonal residential systems, large non-municipal non-residential systems, and small non-municipal non-residential systems

Summary of lead testing under Schedule 15.1 during this reporting period

(Applicable to the following drinking water systems; large municipal residential systems, small Municipal residential systems and non-municipal year-round residential systems)

	Location Type	Number of Samples	Range of Lead Results (min#) – (max #)	Unit of Measure	Number of Exceedances
Round 1 Dec 15 2020 to Apr 15 2021	Plumbing	0	N/A	mg/L	0
	Distribution	0	N/A	mg/L	0
Round 2 June 15 2021 to Oct 15 2021	Plumbing	6	0.0001 – 0.0016	mg/L	0
	Distribution	8	<0.0001 – 0.0018	mg/L	0

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	19 Jul 21	<0.0005	mg/L	no
Atrazine + N-dealkylated metabolites	19 Jul 21	<0.001	mg/L	no
Azinphos-methyl	19 Jul 21	<0.002	mg/L	no
Benzene	19 Jul 21	<0.0005	mg/L	no
Benzo(a)pyrene	19 Jul 21	<0.00001	mg/L	no
Bromoxynil	19 Jul 21	<0.0005	mg/L	no
Carbaryl	19 Jul 21	<0.005	mg/L	no
Carbofuran	19 Jul 21	<0.005	mg/L	no
Carbon Tetrachloride	19 Jul 21	<0.0002	mg/L	no
Chlorpyrifos	19 Jul 21	<0.001	mg/L	no
Diazinon	19 Jul 21	<0.001	mg/L	no
Dicamba	19 Jul 21	<0.001	mg/L	no
1,2-Dichlorobenzene	19 Jul 21	<0.0004	mg/L	no
1,4-Dichlorobenzene	19 Jul 21	<0.0004	mg/L	no
1,2-Dichloroethane	19 Jul 21	<0.0002	mg/L	no
1,1-Dichloroethylene (vinylidene chloride)	19 Jul 21	<0.0005	mg/L	no
Dichloromethane	19 Jul 21	<0.004	mg/L	no
2-4 Dichlorophenol	19 Jul 21	<0.001	mg/L	no
2,4-Dichlorophenoxy acetic acid	19 Jul 21	<0.001	mg/L	no
Diclofop-methyl	19 Jul 21	<0.0009	mg/L	no
Dimethoate	19 Jul 21	<0.0025	mg/L	no
Diquat	19 Jul 21	<0.005	mg/L	no
Diuron	19 Jul 21	<0.01	mg/L	no
Glyphosate	19 Jul 21	<0.01	mg/L	no
Malathion	19 Jul 21	<0.0005	mg/L	no
Metolachlor	19 Jul 21	<0.001	mg/L	no
Metribuzin	19 Jul 21	<0.005	mg/L	no
Monochlorobenzene	19 Jul 21	<0.0005	mg/L	no
Paraquat	19 Jul 21	<0.001	mg/L	no
Pentachlorophenol	19 Jul 21	<0.001	mg/L	no
Phorate	19 Jul 21	<0.0005	mg/L	no
Picloram	19 Jul 21	<0.005	mg/L	no
Polychlorinated Biphenyls(PCB)	19 Jul 21	<0.0001	mg/L	no
Prometryne	19 Jul 21	<0.00025	mg/L	no
Simazine	19 Jul 21	<0.001	mg/L	no
THM (NOTE: show latest annual average)		58.61	ug/L	no
Terbufos	19 Jul 21	<0.0004	mg/L	no

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Tetrachloroethylene	19 Jul 21	<0.0003	mg/L	no
2,3,4,6-Tetrachlorophenol	19 Jul 21	<0.001	mg/L	no
Triallate	19 Jul 21	<0.001	mg/L	no
Trichloroethylene	19 Jul 21	<0.0003	mg/L	no
2,4,6-Trichlorophenol	19 Jul 21	<0.0007	mg/L	no
Trifluralin	19 Jul 21	<0.001	mg/L	no
Vinyl Chloride	19 Jul 21	<0.0002	mg/L	no
2 Methyl-4-Chlorophenoxyacetic acid (MCPA)	19 Jul 21	<0.01	mg/L	no

THM Dist. Sample Location Mid-Canada Line & Pinewood Park Sample Stations	1 st Quarter Result Value	2 nd Quarter Result Value	3 rd Quarter Result Value	4 th Quarter Result Value	Unit of Measure	Exceed- dence
Sample Period	Jan 13 – Mar. 1, 2021	Apr.7 – June. 14, 2021	July 5 – Sept. 13, 2021	Oct. 5 – Nov. 8, 2021	mg/L	
Bromodichloromethane (Average)	0.0040 0.0035	0.0021 0.0014	0.0037 0.0029	0.0030 0.0030	mg/L	
Bromoform(Average)	<0.0005 <0.0005	<0.0005 <0.0005	<0.0005 <0.0005	<0.0005 <0.0005	mg/L	
Chloroform(Average)	0.08700 0.08143	0.07520 0.07418	0.09537 0.07635	0.07733 0.07670	mg/L	
Dibromochloromethane (Average)	<0.0005 <0.0005	<0.0005 <0.0005	<0.0005 0.0006	<0.0005 <0.0005	mg/L	
Total Trihalomethanes	0.08797	0.07601	0.08616	0.08000	mg/L	No
THM All Distribution sites (Averages)	1 st Quarter Result Value	2 nd Quarter Result Value	3 rd Quarter Result Value	4 th Quarter Result Value	Unit of Measure	Exceed- dence
Sample Period	Jan 13 – Mar. 1, 2021	Apr.7 – June. 14, 2021	July 5, - Sep. 13, 2021	Oct. 5 – Dec. 6, 2021	mg/L	
Bromodichloromethane	0.0026	0.0008	0.0021	0.0021	mg/L	
Bromoform	<0.0005	<0.0005	<0.0005	<0.0005	mg/L	
Chloroform	0.06121	0.05414	0.06001	0.05173	mg/L	
Dibromochloromethane	<0.0005	<0.0005	0.0005	<0.0005	mg/L	
Total Trihalomethanes	0.06382	0.05457	0.06218	0.053814	mg/L	

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THM Dist. Sample Location Mid-Canada Line & Pinewood Park Sample Stations	1st Quarter Result Value	2nd Quarter Result Value	3rd Quarter Result Value	4th Quarter Result Value	Unit of Measure	Exceed- dence
Total Trihalomethanes 4 Quarter Running Average (Random & Fixed Sites Included)				0.05861	mg/L	No

HAA Distribution Sample Locations Judge Valve & HLPS (Averages)	1st Quarter Result Value	2nd Quarter Result Value	3rd Quarter Result Value	4th Quarter Result Value	Unit of Measure	Exceed- dence
Sample Period	Jan 1 – Mar. 31, 2021	Apr.1 – June. 30, 2021	July 1, - Sep. 30, 2021	Oct. 1 – Dec. 31, 2021		
(Mono)Bromoacetic Acid	< 0.002 < 0.002	< 0.002 < 0.002	< 0.002 < 0.002	< 0.002 < 0.002	mg/L	
(Mono) Chloroacetic Acid	< 0.002 < 0.002	< 0.002 < 0.002	< 0.002 < 0.002	< 0.002 < 0.002	mg/L	
Dibromoacetic Acid	< 0.002 < 0.002	< 0.002 < 0.002	< 0.002 < 0.002	< 0.002 < 0.002	mg/L	
Dichloroacetic Acid	0.0169 0.0196	0.0324 0.0422	0.0275 0.0384	0.0240 0.0263	mg/L	
Trichloroacetic Acid	0.0178 0.0345	0.0453 0.0613	0.0370 0.0664	0.0411 0.0394	mg/L	
Avg.Total Haloacetic Acids	0.0444	0.0906	0.0848	0.0654	mg/L	
Total Haloacetic Acid Running Quarterly Average				0.0713	mg/L	No

Quarterly PFAS Sample (Range)	1st Quarter Result Value	2nd Quarter Result Value	3rd Quarter Result Value	4th Quarter Result Value	Unit of Measure	Exceed- dence
	N/A	April 13, 2021	July 6, 2021	October 5, 2021	ng/L	
Perfluorodecanoic Acid (PFDA)	N/A	<1.0	<1.0	<1.0	ng/L	

Perfluorododecanoic Acid (PFDODA)	N/A	<1.0	<1.0	<1.0	ng/L	
Perfluorodecane Sulfonic Acid (PFDS)	N/A	<1.0	<1.0	<1.0	ng/L	
Perfluoroheptanoic Acid 3 (PFHPA)	N/A	3.7 – 4.0	3.1 – 3.3	3.5 – 3.7	ng/L	
Perfluorohexanoic Acid (PFHXA)	N/A	6.0 – 7.0	4.8 – 6.2	6.6 – 6.8	ng/L	
Perfluorohexane Sulfonic Acid (PFHXS)	N/A	10.0 - 13.0	10.9 - 11.3	12.6 – 13.1	ng/L	
Perfluorononanoic Acid (PFNA)	N/A	<1.0 – 1.2	<1.0 – 1.0	<1.0 – 1.1	ng/L	
Perfluorooctane Acid (PFOA)	N/A	3.4 – 3.6	3.2 – 3.5	2.9 – 3.5	ng/L	
Perfluorooctane Sulfonic Acid (PFOS)	N/A	25.7 – 30.0	23.0 – 28.0	26.3 – 27.1	ng/L	
Perfluorooctane Sulfonamide (PFOSA)	N/A	<1.0	<1.0	<1.0	ng/L	
Perfluoroundecanoic Acid (PFUNA)	N/A	<1.0	<1.0	<1.0	ng/L	
Total Sum for Quarter	N/A	40.0 – 53.2	46.9 – 50.1	53.6	ng/L	No

*** Sampling program did not begin until second quarter. Used a range for the second and third quarter due to using multiple labs for analysis***

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	½ MAC VALUE	MAC VALUE	Date of Sample
THM	0.0801	mg/L	0.050	0.100	Jan.11,2021
THM	0.0567	mg/L	0.050	0.100	Jan.11,2021
THM	0.0583	mg/L	0.050	0.100	Jan.11,2021
THM	0.0594	mg/L	0.050	0.100	Jan.11,2021
THM	0.0668	mg/L	0.050	0.100	Jan.11,2021
THM	0.0704	mg/L	0.050	0.100	Jan.11,2021
THM	0.0673	mg/L	0.050	0.100	Jan.11,2021
THM	0.0820	mg/L	0.050	0.100	Jan.11,2021
THM	0.0937	mg/L	0.050	0.100	Jan.11,2021
THM	0.0752	mg/L	0.050	0.100	Jan.13,2021
THM	0.0964	mg/L	0.050	0.100	Jan.13,2021

Parameter	Result Value	Unit of Measure	½ MAC VALUE	MAC VALUE	Date of Sample
THM	0.0914	mg/L	0.050	0.100	Jan.13,2021
THM	0.0695	mg/L	0.050	0.100	Feb.1,2021
THM	0.0878	mg/L	0.050	0.100	Feb.1,2021
THM	0.0938	mg/L	0.050	0.100	Feb.1,2021
THM	0.0732	mg/L	0.050	0.100	Feb.1,2021
THM	0.0618	mg/L	0.050	0.100	Feb.1,2021
THM	0.0680	mg/L	0.050	0.100	Feb.1,2021
THM	0.0566	mg/L	0.050	0.100	Feb.1,2021
THM	0.0597	mg/L	0.050	0.100	Feb.1,2021
THM	0.0780	mg/L	0.050	0.100	Feb.1,2021
THM	0.0792	mg/L	0.050	0.100	Feb.1,2021
THM	0.0528	mg/L	0.050	0.100	Mar.1,2021
THM	0.0617	mg/L	0.050	0.100	Mar.1,2021
THM	0.0828	mg/L	0.050	0.100	Mar.1,2021
THM	0.0756	mg/L	0.050	0.100	Mar.1,2021
THM	0.0556	mg/L	0.050	0.100	Mar.1,2021
THM	0.0586	mg/L	0.050	0.100	Mar.1,2021
THM	0.0702	mg/L	0.050	0.100	Mar.1,2021
HAA	0.0541	mg/L	0.040	0.080	Mar.2,2021
THM	0.0530	mg/L	0.050	0.100	Apr.6,2021
THM	0.0656	mg/L	0.050	0.100	Apr.7,2021
THM	0.0663	mg/L	0.050	0.100	Apr.7,2021
PFAS(Raw)	54.7	ng/L	35.00	70.00	Apr.13,2021
PFAS(Treated)	51.9	ng/L	35.00	70.00	Apr.13,2021
PFAS(Raw)	40.0	ng/L	35.00	70.00	Apr.13, 2021
PFAS(Treated)	40.0	ng/L	35.00	70.00	Apr.13, 2021
THM	0.0597	mg/L	0.050	0.100	May 3,2021
THM	0.0570	mg/L	0.050	0.100	May 3,2021
THM	0.0713	mg/L	0.050	0.100	May 3,2021
THM	0.0767	mg/L	0.050	0.100	May 3,2021
THM	0.0551	mg/L	0.050	0.100	May 3,2021
THM	0.0637	mg/L	0.050	0.100	May 3,2021
THM	0.0683	mg/L	0.050	0.100	May 3,2021
THM	0.0615	mg/L	0.050	0.100	May 3,2021
THM	0.0745	mg/L	0.050	0.100	May 3,2021
THM	0.0795	mg/L	0.050	0.100	May 3,2021
THM	0.0758	mg/L	0.050	0.100	May 3,2021
THM	0.0741	mg/L	0.050	0.100	June 7,2021
THM	0.0555	mg/L	0.050	0.100	June 7,2021
THM	0.0602	mg/L	0.050	0.100	June 7,2021
THM	0.0570	mg/L	0.050	0.100	June 7,2021
THM	0.0557	mg/L	0.050	0.100	June 7,2021
THM	0.0551	mg/L	0.050	0.100	June 14,2021

Parameter	Result Value	Unit of Measure	½ MAC VALUE	MAC VALUE	Date of Sample
THM	0.0854	mg/L	0.050	0.100	June 14,2021
THM	0.0892	mg/L	0.050	0.100	June 14,2021
HAA	0.1035	mg/L	0.040	0.080	June 14,2021
HAA	0.0777	mg/L	0.040	0.080	June 7,2021
THM	0.0990	mg/L	0.050	0.100	July 5,2021
THM	0.0538	mg/L	0.050	0.100	July 5,2021
THM	0.0635	mg/L	0.050	0.100	July 5,2021
THM	0.0637	mg/L	0.050	0.100	July 5,2021
THM	0.0543	mg/L	0.050	0.100	July 5,2021
THM	0.0532	mg/L	0.050	0.100	July 5,2021
THM	0.0734	mg/L	0.050	0.100	July 5,2021
THM	0.0869	mg/L	0.050	0.100	July 5,2021
PFAS(Raw)	50.7	ng/L	35.00	70.00	July 6, 2021
PFAS(Treated)	49.4	ng/L	35.00	70.00	July 6, 2021
PFAS(Raw)	49.4	ng/L	35.00	70.00	July 6, 2021
PFAS(Treated)	45.1	ng/L	35.00	70.00	July 6, 2021
THM	0.0627	mg/L	0.050	0.100	July 7,2021
THM	0.0987	mg/L	0.050	0.100	July 7,2021
THM	0.0825	mg/L	0.050	0.100	July 7,2021
THM	0.0961	mg/L	0.050	0.100	Aug.3,2021
THM	0.0638	mg/L	0.050	0.100	Aug.3,2021
THM	0.0589	mg/L	0.050	0.100	Aug.3,2021
THM	0.0620	mg/L	0.050	0.100	Aug.3,2021
THM	0.0500	mg/L	0.050	0.100	Aug.3,2021
THM	0.0786	mg/L	0.050	0.100	Aug.3,2021
THM	0.0714	mg/L	0.050	0.100	Aug.17,2021
THM	0.115	mg/L	0.050	0.100	Aug.17,2021
THM	0.121	mg/L	0.050	0.100	Aug.17,2021
THM	0.0649	mg/L	0.050	0.100	Sep.7,2021
THM	0.0554	mg/L	0.050	0.100	Sep.7,2021
THM	0.0688	mg/L	0.050	0.100	Sep.7,2021
THM	0.0523	mg/L	0.050	0.100	Sep.7,2021
THM	0.0527	mg/L	0.050	0.100	Sep.7,2021
HAA	0.105	mg/L	0.040	0.080	Sep.7,2021
HAA	0.0645	mg/L	0.040	0.080	Sep.7,2021
THM	0.0554	mg/L	0.050	0.100	Sep.13,2021
THM	0.0558	mg/L	0.050	0.100	Sep.13,2021
THM	0.0956	mg/L	0.050	0.100	Sep.13,2021
THM	0.0945	mg/L	0.050	0.100	Sep.13,2021
THM	0.0815	mg/L	0.050	0.100	Oct.5,2021
THM	0.0875	mg/L	0.050	0.100	Oct.5,2021
THM	0.0570	mg/L	0.050	0.100	Oct.5,2021
THM	0.0554	mg/L	0.050	0.100	Oct.5,2021

Parameter	Result Value	Unit of Measure	½ MAC VALUE	MAC VALUE	Date of Sample
PFAS(Raw)	53.2	ng/L	35.00	70.00	Oct.5,2021
PFAS(Treated)	54.0	ng/L	35.00	70.00	Oct.5,2021
THM	0.0527	mg/L	0.050	0.100	Oct.12,2021
THM	0.0840	mg/L	0.050	0.100	Oct.12,2021
THM	0.0834	mg/L	0.050	0.100	Oct.12,2021
THM	0.0736	mg/L	0.050	0.100	Nov. 8,2021
THM	0.0700	mg/L	0.050	0.100	Nov. 8,2021
THM	0.0593	mg/L	0.050	0.100	Nov. 8,2021
THM	0.0653	mg/L	0.050	0.100	Nov. 17,2021
THM	0.0674	mg/L	0.050	0.100	Dec. 6,2021
THM	0.0727	mg/L	0.050	0.100	Dec. 6,2021
HAA	0.0657	mg/L	0.040	0.080	Dec. 6,2021
HAA	0.0651	mg/L	0.040	0.080	Dec. 6,2021

PFAS limits are not regulated at this point, the 70ng/L is a recommended limit by MECP