



Owen Sound Drinking Water System



Annual Report 2019

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Table of Contents

Section 1	Drinking Water System General Information.....	3
Section 1.1	Drinking Water System Description	4
Section 2	Drinking Water Inspections and Audit Summaries.....	6
Section 3	List of Water Treatment Chemicals Used.....	6
Section 4	Significant Costs Incurred.....	7
Section 5	Adverse Water Quality Incidents Reported.....	8
Section 6	Microbiological Testing Results.....	8
Section 7	Operational Testing Results.....	9
Section 8	Summary of Additional Testing.....	10
Section 9	Inorganic and Organic Testing Summary.....	11
Section 10	Summary of Lead Testing.....	13

Section 1 – Drinking Water System General Information

This report has been prepared in accordance with the reporting requirements set out in Ontario Regulation 170/03, Section 11 and as well as Schedule 22.

This report is to be presented to Council by the end of March each year. Copies of the report will be made available free of charge and can be found at the following locations;

- City Hall Clerk’s Office – located temporarily at 945 3rd Avenue East
- City’s website - <https://www.owensound.ca/en/city-hall/waterwastewater.aspx>
- Public Works office – 1900 20th Street East
- Water Treatment Plant – 2600 3rd Avenue East
- Owen Sound & North Grey Union Public Library – 824 1st Avenue West

Drinking Water System #	220001799
Drinking Water System Name	Owen Sound Drinking Water System
Drinking Water System Owner	Corporation of the City of Owen Sound
Drinking Water System Category	Large Municipal Residential
City of Owen Sound Population	22,000
Water Treatment Subsystem	Class 3, Certificate # 20 issued September 15th, 2005
Water Distribution Subsystem	Class 3, Certificate # 2094 issued September 15th, 2005
Drinking Water Works Permit #	092-201 Issue # 4 issued October 6th, 2015
Municipal Drinking Water License	092-101 Issue # 4 issued January 10th, 2017
Permit to Take Water #	3044-8SERHC issued March 23rd, 2012 expires March 15, 2022
Period of Report	January 1, 2019 to December 31st, 2019

Other Drinking Water Systems that receive drinking water from the Owen Sound Drinking Water System are;

<u>Drinking Water System Owner</u>	<u>Drinking Water System #</u>
Municipality of Meaford (Leith)	260065312

A copy of this report will be provided to Meaford by the end of February.

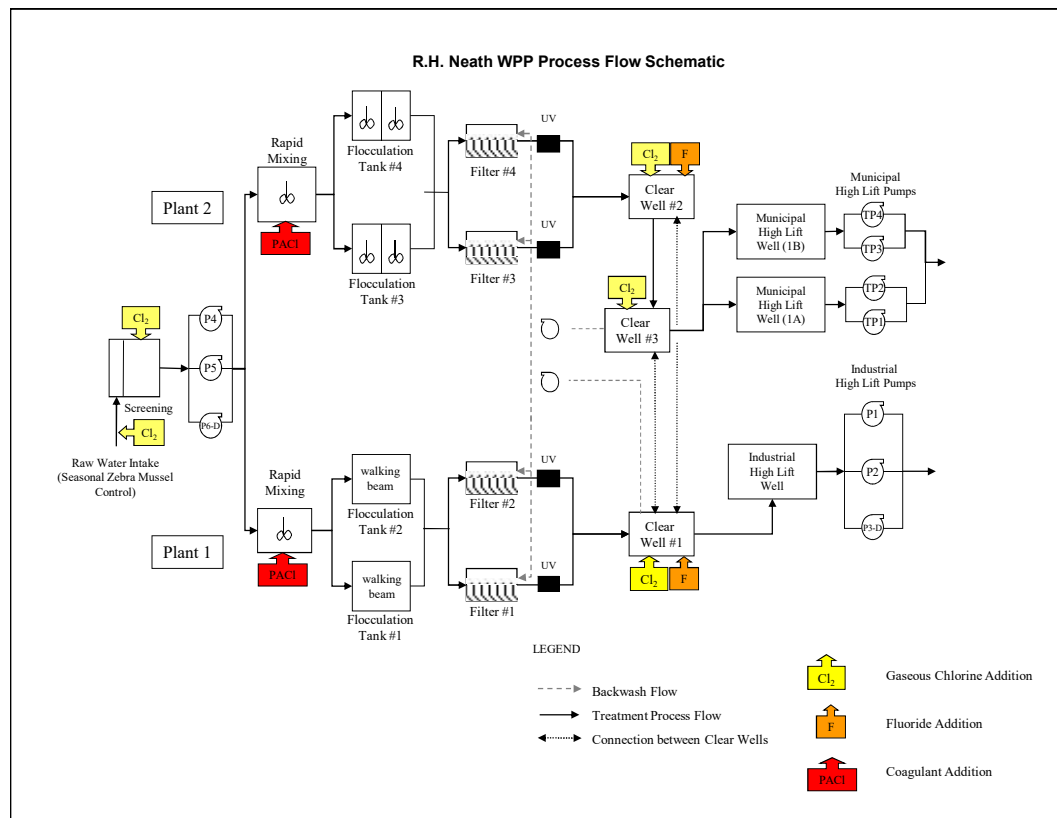
Section 1.1 – Drinking Water System Description

The Richard H. Neath Water Purification plant is a direct filtration surface water treatment plant that draws its water from Georgian Bay. This plant serves a population of approximately 22,000 people.

The Water plant comprises of the following processes;

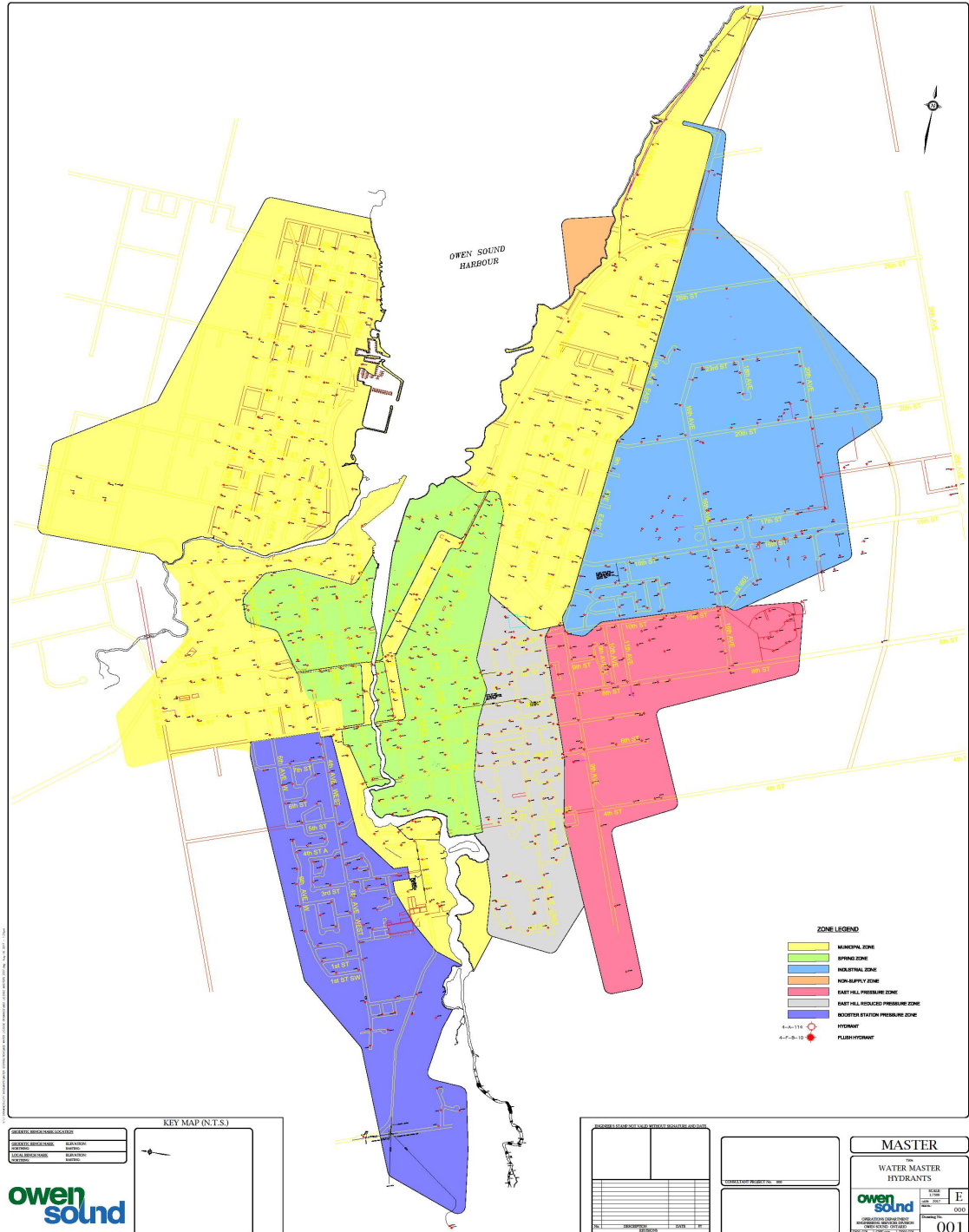
- Raw water screening (removal of larger debris, fish, etc.),
- Prechlorination (initial application of chlorine to the raw water),
- Zebra mussel control (chlorination at Intake during warmer months only, temperature above 10 degrees C),
- Flash mixing (initial addition of coagulant to the raw water through a rapid mixer),
- Coagulation/Flocculation (slower mixing of coagulant in larger tanks),
- UV disinfection (done just prior to water entering treated water wells),
- Post chlorination (adding of additional chlorine for the purpose of meeting CT requirements and having enough chlorine for water in the distribution system),
- Fluoridation (added in the two main treated water wells),
- Residue management tank for treating backwash wastewater. See Figure 1 below for a process schematic.

Figure 1



The City has a 22,000 m³ reservoir, 6 pressure zones (see Figure 2), 156 km of water mains, various pressure reducing valve chambers, 647 City hydrants, 130 private hydrants, and two booster stations that provides addition pressure in the Southeast and southwest portions of the City and outskirts.

Figure 2



The City also has an additional agreement with the Municipality of Meaford to provide potable water to Leith from our boundary point on East Bayshore Rd.

Section 2 – Drinking Water Inspections and Audit Summaries

1. Ministry of the Environment, Conservation and Parks (MECP) Inspection – During 2019, an MECP inspection commenced on December 18th, 2019.

- The City received 100% compliance on this Inspection.

2. Internal Audit/External Audit

Internal Audit – Deb Zehr, an independent auditor evaluated our Drinking Water Quality Management System (DWQMS) in November 2019. This consisted of a two day on-site visit reviewing all 21 elements of the DWQMS, interviewing water staff and testing their knowledge of the system.

No non-conformances were found, however some opportunities for improvement were identified.

Section 3 – List of Water Treatment Chemicals Used:

1. **Chlorine Gas** (68 kg cylinders) – used in pre chlorination (treatment before filtration), and post chlorination (treatment after filtration).
2. **PAX XL-6** – is a coagulant used prior to filtration in the colder months (<10 degrees C). A coagulant's primary objective is to adhere to suspended particulates, make them bigger in size, allowing a higher removal rate of particulates in the filtration process.
3. **PAX XL-1900** – is a coagulant used prior to filtration in the warmer months (>10 degrees C). A coagulant's primary objective is to adhere to suspended particulates, make them bigger in size, so there is a higher removal rate of particulates in the filtration process.
4. **Sodium Bisulphite** – is a chemical used in the process to remove chlorine from water for the purpose of reintroducing water back to the source, Georgian Bay. It is also used when filters are being prepared for use after a backwash called the ripening process.
5. **Polymer** – A polymer is used during a filter backwash to settle suspended particles in the wastewater detention tank, so they can be pumped to the sanitary system to be treated at the waste water plant.

Section 4 – Significant Costs Incurred

Significant costs are costs associated with new equipment purchased, installed, repaired, or replaced;

Item	Description	Cost (\$)
UV Bulbs	UV Lamps for 4 UV reactors. Operating hours are 5,000 hours.	\$10,380
Online Equipment	Two (2) Online turbidimeters	\$12,500
Lab Equipment	New Dual sensor Lab Meter with associated probes	\$4,500
New Generator Set	350 kW Generator was replaced at the East Hill Pump Station	\$150,000
Golden Horseshoe Watermain replacement	Replacement of the existing watermain in the 900 block of 2 nd Avenue West, 900 Block of 3 rd Avenue West and the 200 Block of 9 th Street West as well as the new watermain installation in the 900 Block of 1 st Avenue East.	\$1,600,000
Broken Watermains	Twenty Five (25) broken water mains occurred, estimated repair at \$6,000 each.	\$155,800
Replacement Vehicles	Two vehicles were replaced	\$97,000
Replacement - Large Vehicle	Boom Truck	\$330,000
River Precinct Project	A new watermain was installed between 8 th St East and 9 th St East on 1 st Ave East.	\$143,000

Section 5 – Adverse Water Quality Incidents reported

#	Reporting Date	AWQI #	Adverse Location	Adverse Parameter	Adverse Result	Units	Remedial Action
	NO AWQI during this period						

Section 6 – Microbiological Test Results

Microbiological testing done as required in Ontario Regulation 170/03 Schedule 10;

Location	Number of Samples	Range of E.coli Or Fecal Results (min #)- (max #)	Range of Total Coliform Results (min #)- (max #)	Number of HPC Samples	Range of HPC Results (min #)- (max #)
Raw	53	0-100	3-44,000	n/a	n/a
Treated	53	0-0	0-0	53	<10- NDOGHPC
Distribution	462	0-0	0-0	112	<10- NDOGHPC

*NDOGHPC – No Data overgrown with HPC,

Section 7 – Operational Testing Results

Operational testing done as required in Ontario Regulation 170/03 Schedule 7;

Parameter	Number of Grab Samples	Range of Results (min #) - (max #)
Filter 1 Turbidity	8760	0.02 – 0.78 NTU
Filter 2 Turbidity	8760	0.02 – 0.62 NTU
Filter 3 Turbidity	8760	0.01 – 0.67 NTU
Filter 4 Turbidity	8760	0.02 – 0.83 NTU
Post 1 Chlorine	8760	0.76-3.70
Post 2 Chlorine	8760	0.93-4.05
Municipal Chlorine	8760	1.17 – 2.11
Industrial Chlorine	8760	1.19 – 2.32
Municipal Fluoride	8760	0.31 – 1.01
Industrial Fluoride	8760	0.54 – 0.98

Note: Unit of measurement is in milligrams per litre (mg/L), unless stated otherwise. The number of grab samples is expressed in hours/year, equivalent to continuous monitoring.

Section 8 – Summary of Additional Testing

A summary of additional testing and sampling carried out by an approval, order, or other legal instrument.

Legal Document	Date of Legal Instrument Issued	Parameter	Date Sampled	Result	Unit of Measure
Municipal License # 092-101	January 10th, 2017	Chlorine – Wastewater System	04-Jan	0	mg/L
Municipal License # 092-101	January 10th, 2017	Aluminum	15-Jan	0.0622	mg/L
Municipal License # 092-101	January 10th, 2017	Chlorine – Wastewater System	04-Feb	0	mg/L
Municipal License # 092-101	January 10th, 2017	Total Suspended Solids	01-Feb	6	mg/L
Municipal License # 092-101	January 10th, 2017	Chlorine – Wastewater System	04-Mar	0.00	mg/L
Municipal License # 092-101	January 10th, 2017	Chlorine – Wastewater System	01-Apr	0.20	mg/L
Municipal License # 092-101	January 10th, 2017	Chlorine – Wastewater System	03-Apr	0.00	mg/L
Municipal License # 092-101	January 10th, 2017	Aluminum	15-Apr	0.0710	mg/L
Municipal License # 092-101	January 10th, 2017	Chlorine – Wastewater System	03-May	0.00	mg/L
Municipal License # 092-101	January 10th, 2017	Total Suspended Solids	03-May	2	mg/L
Municipal License # 092-101	January 10th, 2017	Chlorine – Wastewater System	03-May	0.00	mg/L
Municipal License # 092-101	January 10th, 2017	Chlorine – Wastewater System	04-Jun	0.00	mg/L
Municipal License # 092-101	January 10th, 2017	Chlorine – Wastewater System	03-Jul	0.00	mg/L
Municipal License # 092-101	January 10th, 2017	Aluminum	15-Jul	0.175	mg/L
Municipal License # 092-101	January 10th, 2017	Total Suspended Solids	06-Aug	9	mg/L
Municipal License # 092-101	January 10th, 2017	Chlorine – Wastewater System	06-Aug	0.00	mg/L
Municipal License # 092-101	January 10th, 2017	Chlorine – Wastewater System	03-Sep	0.00	mg/L
Municipal License # 092-101	January 10th, 2017	Chlorine – Wastewater System	02-Oct	0.00	mg/L
Municipal License # 092-101	January 10th, 2017	Aluminum	16-Oct	0.0150	mg/L
Municipal License # 092-101	January 10th, 2017	Chlorine – Wastewater System	04-Nov	0.00	mg/L

Legal Document	Date of Legal Instrument Issued	Parameter	Date Sampled	Result	Unit of Measure
Municipal License # 092-101	January 10th, 2017	Total Suspended Solids	08-Nov	7	mg/L
Municipal License # 092-101	January 10th, 2017	Chlorine – Wastewater System	02-Dec	0.00	mg/L

* April 1st Dechlorination feed line plugged, system was shut down to repair.

Section 9 – Inorganic and Organic Testing Summary

Under Ontario Regulation 170/03, Schedule 13, 13-2 and 13-4 are required to be sampled annually.

Inorganic Parameters

Parameter	Sample Date	Result Value	Unit of Measure	MAC Level	1/2 MAC Level	Exceedance
Antimony	15-Jan	0.00011	mg/L	0.006	0.003	No
Arsenic	15-Jan	<0.0002	mg/L	0.025	0.0125	No
Barium	15-Jan	0.0117	mg/L	1.0	0.5	No
Boron	15-Jan	0.011	mg/L	5.0	2.5	No
Cadmium	15-Jan	<0.000003	mg/L	0.005	0.0025	No
Chromium	15-Jan	0.00012	mg/L	0.05	0.025	No
Mercury	15-Jan	<0.00001	mg/L	0.001	0.0005	No
Selenium	15-Jan	0.00006	mg/L	0.01	0.005	No
Sodium	5-Feb-18	5.6	mg/L	>20	>10	No
Uranium	15-Jan	0.000097	mg/L	0.02	0.01	No
Fluoride – Municipal	31-Dec	0.71	mg/L	1.50	n/a	No
Fluoride - Industrial	31-Dec	0.70	mg/L	1.50	n/a	No
Nitrite	16-Oct	<0.003	mg/L	1.0	0.5	No
Nitrate	16-Oct	0.281	mg/L	10.0	5.0	No

Note: Unit of measurement is in milligrams per litre (mg/L), unless stated otherwise.

Organic Parameters

Parameter	Sample Date	Result Value	Unit of Measure	MAC Level	1/2 MAC Level	Over MAC?
Alachlor	15-Jan	<0.00002	mg/L	0.005	0.0025	No
Atrazine + N-dealkylated metabolites	15-Jan	<0.00001	mg/L	0.009	0.0045	No
Azinphos-methyl	15-Jan	<0.00005	mg/L	0.005	0.0025	No
Benzene	15-Jan	<0.00032	mg/L	0.001	0.0005	No
Benzo(a)pyrene	15-Jan	<0.000004	mg/L	0.00001	0.000005	No
Bromoxynil	15-Jan	<0.00033	mg/L	0.005	0.0025	No
Carbaryl	15-Jan	<0.00005	mg/L	0.09	0.045	No
Carbofuran	15-Jan	<0.00001	mg/L	0.09	0.045	No
Carbon Tetrachloride	15-Jan	<0.00016	mg/L	0.002	0.001	No
Chlorpyrifos	15-Jan	<0.00002	mg/L	0.09	0.045	No
Diazinon	15-Jan	<0.00002	mg/L	0.02	0.01	No
Dicamba	15-Jan	<0.0002	mg/L	0.12	0.06	No
1,2-Dichlorobenzene	15-Jan	<0.00041	mg/L	0.2	0.1	No
1,4-Dichlorobenzene	15-Jan	<0.00036	mg/L	0.005	0.0025	No
1,2-Dichloroethane	15-Jan	<0.00035	mg/L	0.005	0.0025	No
1,1-Dichloroethylene (vinylidene chloride)	15-Jan	<0.00033	mg/L	0.014	0.007	No
Dichloromethane	15-Jan	<0.00035	mg/L	0.05	0.025	No
2-4 Dichlorophenol	15-Jan	<0.00015	mg/L	0.9	0.45	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	15-Jan	<0.00019	mg/L	0.1	0.05	No
Diclofop-methyl	15-Jan	<0.0004	mg/L	0.009	0.0045	No
Dimethoate	15-Jan	<0.00006	mg/L	0.02	0.01	No
Diquat	15-Jan	<0.001	mg/L	0.07	0.035	No
Diuron	15-Jan	<0.00003	mg/L	0.15	0.075	No
Glyphosate	15-Jan	<0.001	mg/L	0.28	0.14	No
Malathion	15-Jan	<0.00002	mg/L	0.19	0.095	No
MCPA	15-Jan	<0.00012	mg/L	0.1	0.05	No
Metolachlor	15-Jan	<0.00001	mg/L	0.05	0.025	No
Metribuzin	15-Jan	<0.00002	mg/L	0.08	0.04	No
Monochlorobenzene	15-Jan	<0.0003	mg/L	0.08	0.04	No
Paraquat	15-Jan	<0.001	mg/L	0.01	0.005	No
Pentachlorophenol	15-Jan	<0.00015	mg/L	0.06	0.03	No

Parameter	Sample Date	Result Value	Unit of Measure	MAC Level	1/2 MAC Level	Over MAC?
Phorate	15-Jan	<0.00001	mg/L	0.002	0.001	No
Picloram	15-Jan	<0.001	mg/L	0.19	0.095	No
Polychlorinated Biphenyls(PCB)	15-Jan	<0.00004	mg/L	0.003	0.0015	No
Prometryne	15-Jan	<0.00003	mg/L	0.001	0.0005	No
Simazine	15-Jan	<0.00001	mg/L	0.01	0.005	No
THM (latest annual average)	2019	0.0383	mg/L	0.100	0.05	No
Terbufos	15-Jan	<0.00001	mg/L	0.001	0.0005	No
Tetrachloroethylene	15-Jan	<0.00035	mg/L	0.01	0.005	No
2,3,4,6-Tetrachlorophenol	15-Jan	<0.0002	mg/L	0.10	0.05	No
Triallate	15-Jan	<0.00001	mg/L	0.23	0.115	No
Trichloroethylene	15-Jan	<0.00044	mg/L	0.005	0.0025	No
2,4,6-Trichlorophenol	15-Jan	<0.00025	mg/L	0.005	0.0025	No
Trifluralin	15-Jan	<0.00002	mg/L	0.045	0.0225	No
Vinyl Chloride	15-Jan	<0.00017	mg/L	0.001	0.0005	No

Note: Unit of measurement is in milligrams per litre (mg/L), unless stated otherwise.

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

*Nothing to report at this time.

Section 10 – Summary of Lead Testing

Lead testing is required as per Ontario Regulation 170/03, Schedule 15.1, and requires Municipalities to sample in areas that have a potential for higher lead levels. Since Owen Sound has no known Lead services since 2012, a reduced sampling program has been approved by the MECP, which only requires testing of the distribution system for Lead every third year.

No Lead sampling required during this period.