



## **Owen Sound Drinking Water System**



## **Annual Report 2019**

Prepared by: Troy Pelletier- Water Treatment Superintendent

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

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

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

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

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

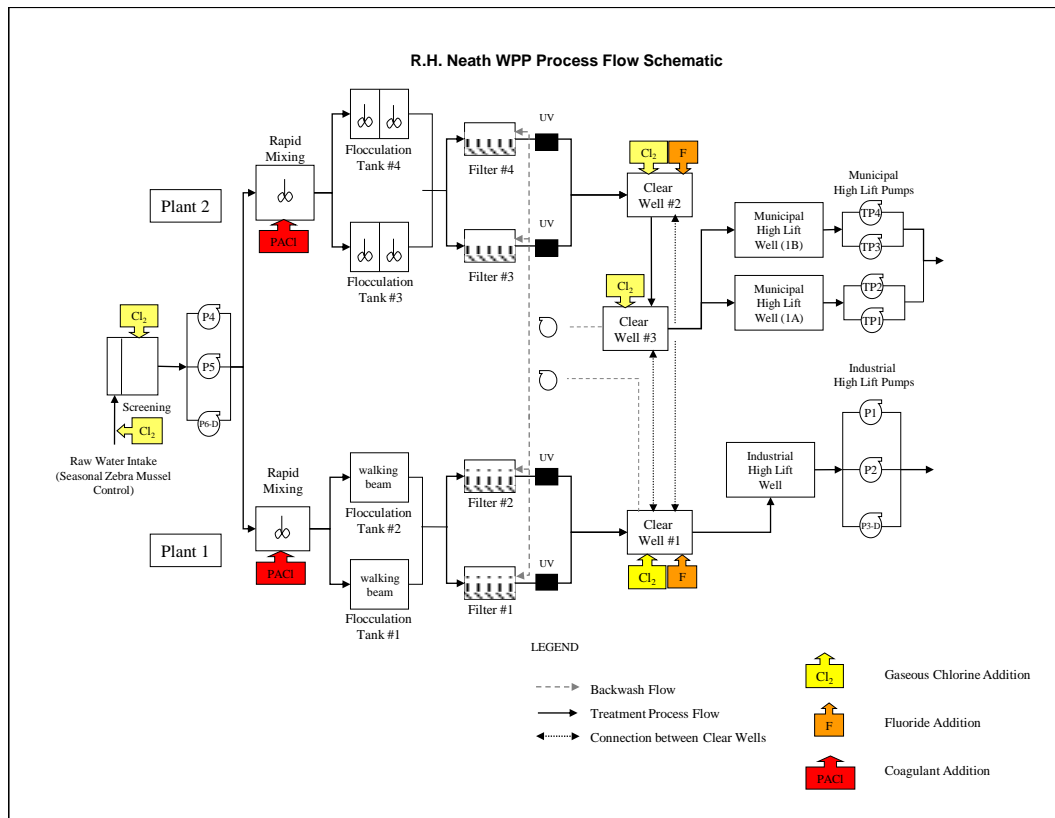
## Section 1.1 – Drinking Water System Description

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;

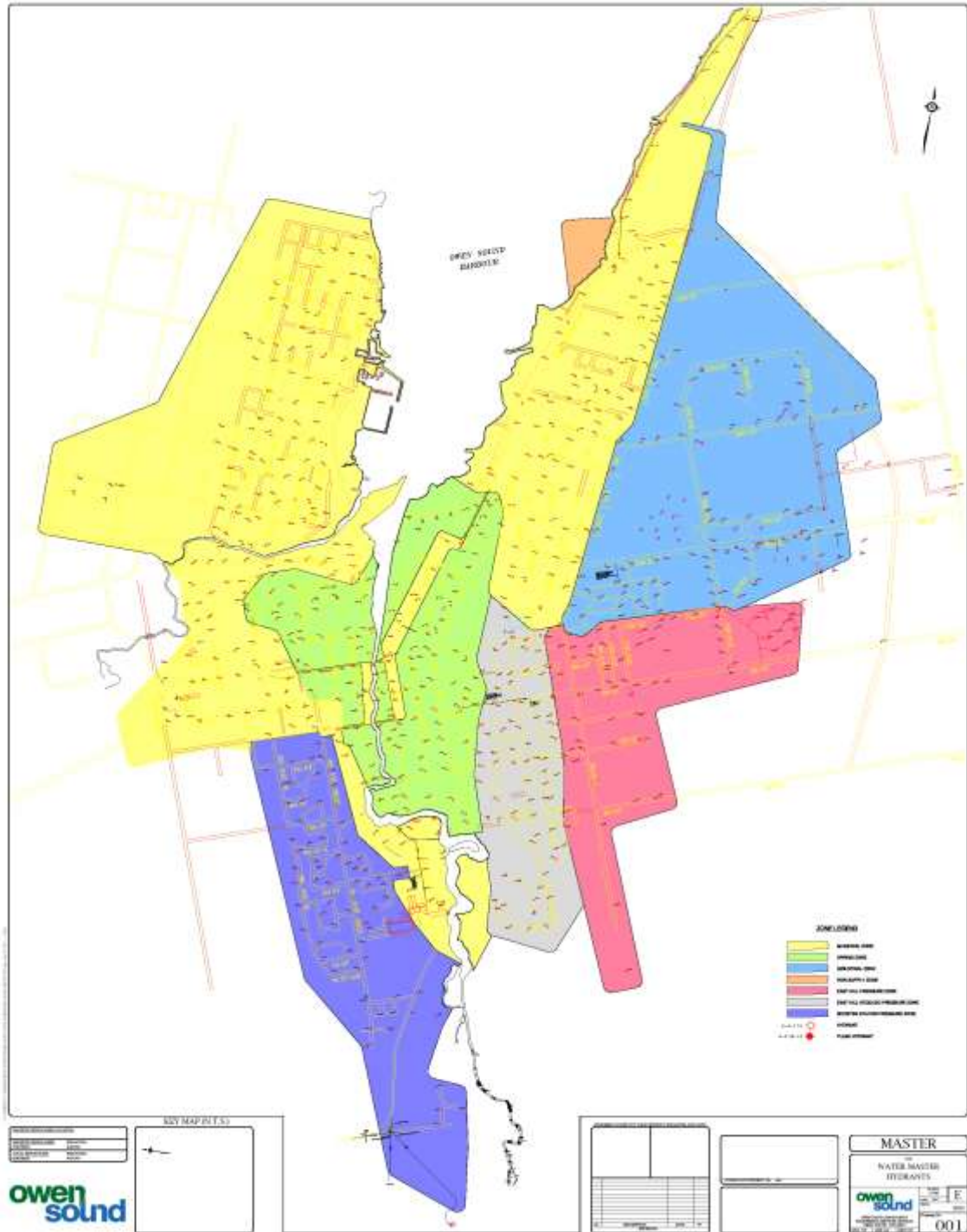
- Raw water screening (removal of larger debris, fish, etc.),
- Prechlorination (initial application of chlorine to the raw water),
- Zebra mussel control (chlorination at Intake during warmer months only, temperature above 10 degrees C),
- Flash mixing (initial addition of coagulant to the raw water 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 m<sup>3</sup> 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 18<sup>th</sup>, 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 coagulants 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 coagulants 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 <sup>nd</sup> Avenue West, 900 Block of 3 <sup>rd</sup> Avenue West and the 200 Block of 9 <sup>th</sup> Street West as well as the new watermain installation in the 900 Block of 1 <sup>st</sup> 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 <sup>th</sup> St East and 9 <sup>th</sup> St East on 1 <sup>st</sup> 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 #)
<b>Raw</b>	53	0-100	3-44,000	n/a	n/a
<b>Treated</b>	53	0-0	0-0	53	<10- NDOGHPC
<b>Distribution</b>	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 #)
<b>Filter 1 Turbidity</b>	8760	<b>0.02 – 0.78 NTU</b>
<b>Filter 2 Turbidity</b>	8760	<b>0.02 – 0.62 NTU</b>
<b>Filter 3 Turbidity</b>	8760	<b>0.01 – 0.67 NTU</b>
<b>Filter 4 Turbidity</b>	8760	<b>0.02 – 0.83 NTU</b>
<b>Post 1 Chlorine</b>	8760	<b>0.76-3.70</b>
<b>Post 2 Chlorine</b>	8760	<b>0.93-4.05</b>
<b>Municipal Chlorine</b>	8760	<b>1.17 – 2.11</b>
<b>Industrial Chlorine</b>	8760	<b>1.19 – 2.32</b>
<b>Municipal Fluoride</b>	8760	<b>0.31 – 1.01</b>
<b>Industrial Fluoride</b>	8760	<b>0.54 – 0.98</b>

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 1<sup>st</sup> 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
<b>Antimony</b>	15-Jan	0.00011	mg/L	<b>0.006</b>	0.003	No
<b>Arsenic</b>	15-Jan	<0.0002	mg/L	<b>0.025</b>	0.0125	No
<b>Barium</b>	15-Jan	0.0117	mg/L	<b>1.0</b>	0.5	No
<b>Boron</b>	15-Jan	0.011	mg/L	<b>5.0</b>	2.5	No
<b>Cadmium</b>	15-Jan	<0.000003	mg/L	<b>0.005</b>	0.0025	No
<b>Chromium</b>	15-Jan	0.00012	mg/L	<b>0.05</b>	0.025	No
<b>Mercury</b>	15-Jan	<0.00001	mg/L	<b>0.001</b>	0.0005	No
<b>Selenium</b>	15-Jan	0.00006	mg/L	<b>0.01</b>	0.005	No
<b>Sodium</b>	5-Feb-18	5.6	mg/L	<b>&gt;20</b>	>10	No
<b>Uranium</b>	15-Jan	0.000097	mg/L	<b>0.02</b>	0.01	No
<b>Fluoride – Municipal</b>	31-Dec	0.71	mg/L	<b>1.50</b>	n/a	No
<b>Fluoride - Industrial</b>	31-Dec	0.70	mg/L	<b>1.50</b>	n/a	No
<b>Nitrite</b>	16-Oct	<0.003	mg/L	<b>1.0</b>	0.5	No
<b>Nitrate</b>	16-Oct	0.281	mg/L	<b>10.0</b>	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?
<b>Alachlor</b>	15-Jan	<0.00002	mg/L	<b>0.005</b>	0.0025	No
<b>Atrazine + N-dealkylated metabolites</b>	15-Jan	<0.00001	mg/L	<b>0.009</b>	0.0045	No
<b>Azinphos-methyl</b>	15-Jan	<0.00005	mg/L	<b>0.005</b>	0.0025	No
<b>Benzene</b>	15-Jan	<0.00032	mg/L	<b>0.001</b>	0.0005	No
<b>Benzo(a)pyrene</b>	15-Jan	<0.000004	mg/L	<b>0.00001</b>	0.000005	No
<b>Bromoxynil</b>	15-Jan	<0.00033	mg/L	<b>0.005</b>	0.0025	No
<b>Carbaryl</b>	15-Jan	<0.00005	mg/L	<b>0.09</b>	0.045	No
<b>Carbofuran</b>	15-Jan	<0.00001	mg/L	<b>0.09</b>	0.045	No
<b>Carbon Tetrachloride</b>	15-Jan	<0.00016	mg/L	<b>0.002</b>	0.001	No
<b>Chlorpyrifos</b>	15-Jan	<0.00002	mg/L	<b>0.09</b>	0.045	No
<b>Diazinon</b>	15-Jan	<0.00002	mg/L	<b>0.02</b>	0.01	No
<b>Dicamba</b>	15-Jan	<0.0002	mg/L	<b>0.12</b>	0.06	No
<b>1,2-Dichlorobenzene</b>	15-Jan	<0.00041	mg/L	<b>0.2</b>	0.1	No
<b>1,4-Dichlorobenzene</b>	15-Jan	<0.00036	mg/L	<b>0.005</b>	0.0025	No
<b>1,2-Dichloroethane</b>	15-Jan	<0.00035	mg/L	<b>0.005</b>	0.0025	No
<b>1,1-Dichloroethylene (vinylidene chloride)</b>	15-Jan	<0.00033	mg/L	<b>0.014</b>	0.007	No
<b>Dichloromethane</b>	15-Jan	<0.00035	mg/L	<b>0.05</b>	0.025	No
<b>2-4 Dichlorophenol</b>	15-Jan	<0.00015	mg/L	<b>0.9</b>	0.45	No
<b>2,4-Dichlorophenoxy acetic acid (2,4-D)</b>	15-Jan	<0.00019	mg/L	<b>0.1</b>	0.05	No
<b>Diclofop-methyl</b>	15-Jan	<0.0004	mg/L	<b>0.009</b>	0.0045	No
<b>Dimethoate</b>	15-Jan	<0.00006	mg/L	<b>0.02</b>	0.01	No
<b>Diquat</b>	15-Jan	<0.001	mg/L	<b>0.07</b>	0.035	No
<b>Diuron</b>	15-Jan	<0.00003	mg/L	<b>0.15</b>	0.075	No
<b>Glyphosate</b>	15-Jan	<0.001	mg/L	<b>0.28</b>	0.14	No
<b>Malathion</b>	15-Jan	<0.00002	mg/L	<b>0.19</b>	0.095	No
<b>MCPA</b>	15-Jan	<0.00012	mg/L	<b>0.1</b>	0.05	No
<b>Metolachlor</b>	15-Jan	<0.00001	mg/L	<b>0.05</b>	0.025	No
<b>Metribuzin</b>	15-Jan	<0.00002	mg/L	<b>0.08</b>	0.04	No
<b>Monochlorobenzene</b>	15-Jan	<0.0003	mg/L	<b>0.08</b>	0.04	No
<b>Paraquat</b>	15-Jan	<0.001	mg/L	<b>0.01</b>	0.005	No
<b>Pentachlorophenol</b>	15-Jan	<0.00015	mg/L	<b>0.06</b>	0.03	No

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