



## Owen Sound Drinking Water System



## Annual Report 2020

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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>092-202 Issue # 5</b> issued October 2nd, 2020
<b>Municipal Drinking Water License</b>	<b>094-101 Issue # 5</b> issued October 2nd, 2020
<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, 2020 to December 31st, 2020</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.

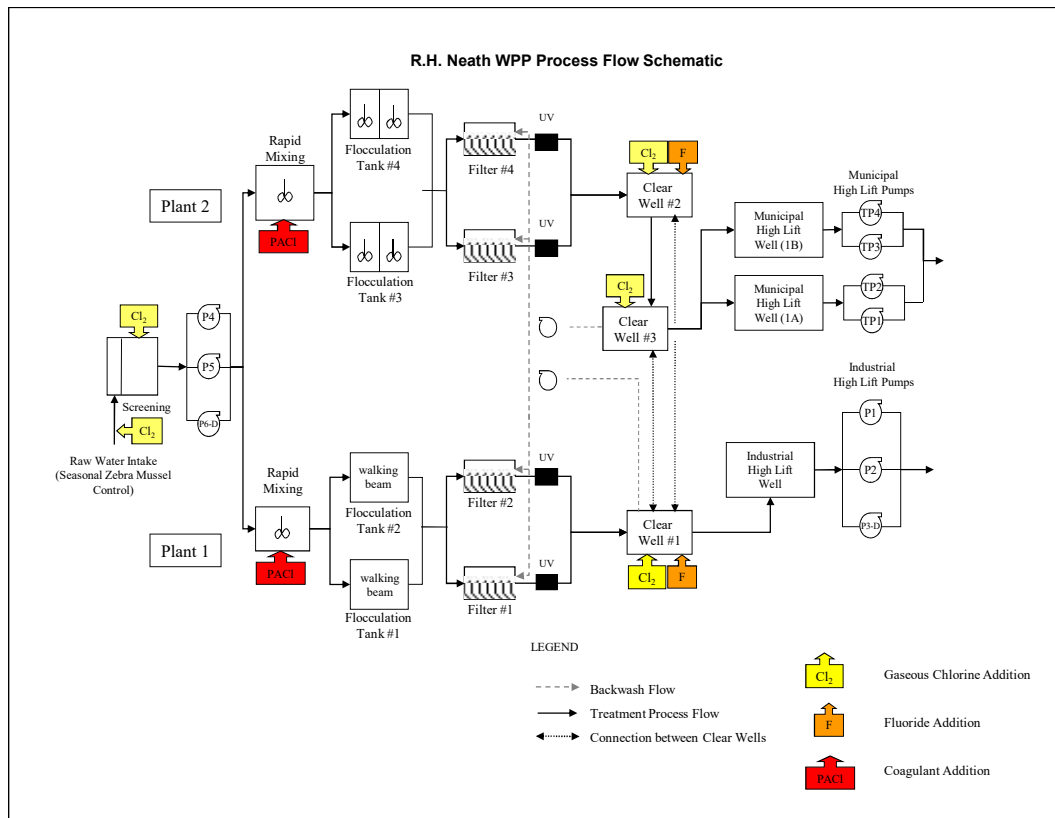
## Section 1.1 – Drinking Water System Description

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;

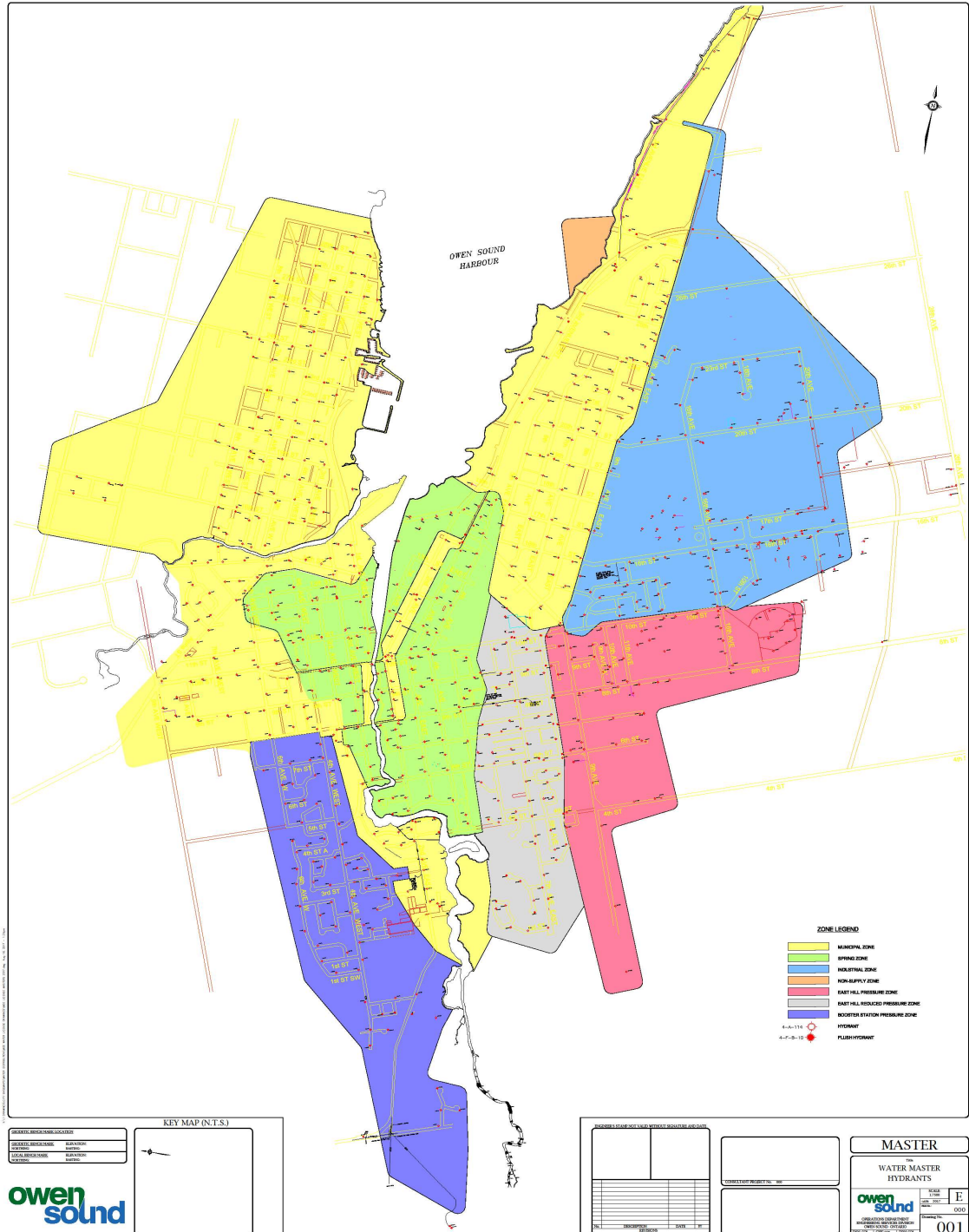
- Raw water screening (removal of larger debris, fish, etc.),
- Prechlorination (initial application of chlorine to the raw water),
- Zebra mussel control (chlorination at Intake during warmer months only, temperature above 10 degrees C),
- Flash mixing (initial addition of coagulant to the raw water 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), 155 km of water mains, various pressure reducing valve chambers, 659 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 2020, there were no inspections completed by a MECP inspection.

### **2. Internal Audit/External Audit**

**Internal Audit** – Deb Zehr, an independent auditor evaluated our Drinking Water Quality Management System (DWQMS) in December 2020. 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, so to allow 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 to allow 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 wastewater plant.

## Section 4 – Significant Costs Incurred

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

### Water Treatment

Item	Description	Cost (\$)
UV Bulbs	UV Lamps for 4 UV reactors.	\$24,000
Online Equipment	Replacement of Fluoride Analyzer Controller	\$4,000
Dehumidifier	Repairs to Dehumidifier	\$6,800
Flash Mixer # 2	Rebuilt Flash Mixer drive	\$6,000
Capital Project – Bar Screen and Plant Piping Replacement	Replacement of original bar screen and some Industrial system piping changeout.	\$682,000
Capital Project- VFD Drive Retrofit	Variable Frequency Drive Replacement for 3 aging drives.	\$85,000
Capital Project – Filter Air Scour Proposals	Propose upgrades to the dual-media filter bed system	\$25,000
Capital Project – Chlorine Monitoring – City Limits	A new Chlorine Analyzer and enclosure were purchased. Installation will be Spring of 2021	\$25,000

### Water Distribution

Item	Description	Cost (\$)
Capital Work - New Watermain – 16 <sup>th</sup> St East	New 10” watermain install on 16 <sup>th</sup> Street East from 12 <sup>th</sup> Ave East – 16 <sup>th</sup> Ave East	\$545,300
Capital Work - New Watermain – 10 <sup>th</sup> St East Bridge	New 24” watermain installed under 10 <sup>th</sup> St Bridge	\$405,000
Capital Work - New Watermain – 10 <sup>th</sup> St West	New 16” watermain installed from 1 <sup>st</sup> Ave West – 2 <sup>nd</sup> Ave West	\$158,500
Capital Work - Cathodic Protection	New cathodic protection installed throughout the City	\$275,000

Capital Project- Hydrant painting	All City hydrants were repainted	\$30,000
Capital Project – watermain modification	Industrial watermain jumper – 16 <sup>th</sup> Ave East/10 <sup>th</sup> St East.	\$68,000
Jubilee Bridge Repair	Watermain under the bridge was repaired due to a leak.	\$90,000
Capital Project – Inglis Falls Road Reconstruction	New watermain and flushing chamber was commissioned on Inglis Falls road.	\$25,000
Capital Project – Decommissioning of watermain	The low pressure watermain that was part of the old river system in front of the old chlorine plant was decommissioned.	\$37,000
Capital Project – Decommissioning of watermain - Bridge	Low pressure watermain decommissioned on 10 <sup>th</sup> St West to 2 <sup>nd</sup> Ave West, and 1 <sup>st</sup> Ave West to 11 <sup>th</sup> St West	\$127,000
Broken Watermains	19 broken water mains occurred, estimated repair at \$6,000 each.	\$114,000

### Section 5 – Adverse Water Quality Incidents reported

#	Reporting Date	AWQI #	Adverse Location	Adverse Parameter	Adverse Result	Units	Remedial Action
	30-Jun	150448	Water Treatment Plant	Coagulant Feed	n/a	n/a	Replaced failed tubing in pump. No feed of coagulant for 4 minutes. This did not affect operations of the filters.

### 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>	52	0-30	0-10,200	n/a	n/a



<b>Treated</b>	52	0-0	0-0	52	<10- 10
<b>Distribution</b>	355	0-0	0-0	90	<10- 40

## 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 NTU – 4.99 NTU</b> * The high value occurred on several occasions, but was caused by cleaning of the particle counter.
<b>Filter 2 Turbidity</b>	8760	<b>0.01 NTU – 5.00 NTU</b> * The high value occurred on several occasions, but was caused by cleaning of the particle counter.
<b>Filter 3 Turbidity</b>	8760	0.02 NTU – 0.84 NTU
<b>Filter 4 Turbidity</b>	8760	<b>0.02NTU – 4.71 NTU</b> * The high value was caused by disruption of the sample line. Over 1 NTU for 5 minutes only.
<b>Post 1 Chlorine</b>	8760	<b>0.00 – 4.65</b> * low occurred on several occasions, in February it was caused by a pump failure on the Cl2 analyzer, the other two were part of the clearwell shutdown during construction in August/September.
<b>Post 2 Chlorine</b>	8760	<b>0.00 – 4.77</b> * low occurred on several occasions, in February it was caused servicing

		the equipment, the other two were part of the clearwell shutdown during construction in August/September.
<b>Municipal Chlorine</b>	8760	1.17 – 2.17
<b>Industrial Chlorine</b>	8760	<b>0.08 – 2.50</b> * Low residual caused by shutdown of Industrial Header pipe for valve install.
<b>Municipal Fluoride</b>	8760	<b>0.00 – 1.09</b> * low residual caused by airlock in Fluoride analyzer cell.
<b>Industrial Fluoride</b>	8760	<b>0.23 – 2.00</b> * High residual was caused by the Industrial Header being shutdown in August causing a false reading.

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 10 <sup>th</sup> , 2017	Chlorine – Wastewater System	06-Jan	0	mg/L
Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Aluminum	15-Jan	0.1050	mg/L
Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Chlorine – Wastewater System	04-Feb	0	mg/L
Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Total Suspended Solids	13-Feb	33	mg/L
Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Chlorine – Wastewater System	03-Mar	0.00	mg/L
Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Chlorine – Wastewater System	02-Apr	0.00	mg/L

Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Chlorine – Wastewater System	11-Apr	0.00	mg/L
Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Aluminum	21-Apr	0.0710	mg/L
Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Chlorine – Wastewater System	03-May	0.00	mg/L
Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Total Suspended Solids	10-May	4	mg/L
Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Chlorine – Wastewater System	03-May	0.00	mg/L
Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Chlorine – Wastewater System	01-Jun	0.00	mg/L
Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Chlorine – Wastewater System	06-Jul	0.00	mg/L
Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Aluminum	13-Jul	0.175	mg/L
Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Total Suspended Solids	14-Aug	2	mg/L
Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Chlorine – Wastewater System	03-Aug	0.00	mg/L
Municipal License # 092-101	January 10 <sup>th</sup> , 2017	Chlorine – Wastewater System	08-Sep	0.00	mg/L
Municipal License # 094-101	October 2 <sup>nd</sup> , 2020	Chlorine – Wastewater System	01-Oct	0.00	mg/L
Municipal License # 094-101	October 2 <sup>nd</sup> , 2020	Aluminum	13 Oct	0.020	mg/L
Municipal License # 094-101	October 2 <sup>nd</sup> , 2020	Chlorine – Wastewater System	10 Nov	0.00	mg/L
Municipal License # 094-101	October 2 <sup>nd</sup> , 2020	Total Suspended Solids	10 Nov	25	mg/L
Municipal License # 094-101	October 2 <sup>nd</sup> , 2020	Chlorine – Wastewater System	2 Dec	0.00	mg/L

## 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>	16-Jan	<0.00009	mg/L	<b>0.006</b>	0.003	No
<b>Arsenic</b>	16-Jan	<0.0002	mg/L	<b>0.025</b>	0.0125	No
<b>Barium</b>	16-Jan	0.0114	mg/L	<b>1.0</b>	0.5	No
<b>Boron</b>	16-Jan	0.011	mg/L	<b>5.0</b>	2.5	No
<b>Cadmium</b>	16-Jan	<0.000003	mg/L	<b>0.005</b>	0.0025	No
<b>Chromium</b>	16-Jan	0.00015	mg/L	<b>0.05</b>	0.025	No
<b>Mercury</b>	16-Jan	<0.00001	mg/L	<b>0.001</b>	0.0005	No

<b>Selenium</b>	16-Jan	0.00009	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>	16-Jan	0.000178	mg/L	<b>0.02</b>	0.01	No
<b>Fluoride – Municipal</b>	31-Dec	0.76	mg/L	<b>1.50</b>	n/a	No
<b>Fluoride - Industrial</b>	31-Dec	0.73	mg/L	<b>1.50</b>	n/a	No
<b>Nitrite</b>	13-Oct	<0.003	mg/L	<b>1.0</b>	0.5	No
<b>Nitrate</b>	13-Oct	0.273	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>	16-Jan	<0.00002	mg/L	<b>0.005</b>	0.0025	No
<b>Atrazine + N-dealkylated metabolites</b>	16-Jan	<0.00001	mg/L	<b>0.009</b>	0.0045	No
<b>Azinphos-methyl</b>	16-Jan	<0.00005	mg/L	<b>0.005</b>	0.0025	No
<b>Benzene</b>	16-Jan	<0.00032	mg/L	<b>0.001</b>	0.0005	No
<b>Benzo(a)pyrene</b>	16-Jan	<0.000004	mg/L	<b>0.00001</b>	0.000005	No
<b>Bromoxynil</b>	16-Jan	<0.00033	mg/L	<b>0.005</b>	0.0025	No
<b>Carbaryl</b>	16-Jan	<0.00005	mg/L	<b>0.09</b>	0.045	No
<b>Carbofuran</b>	16-Jan	<0.00001	mg/L	<b>0.09</b>	0.045	No
<b>Carbon Tetrachloride</b>	16-Jan	<0.00017	mg/L	<b>0.002</b>	0.001	No
<b>Chlorpyrifos</b>	16-Jan	<0.00002	mg/L	<b>0.09</b>	0.045	No
<b>Diazinon</b>	16-Jan	<0.00002	mg/L	<b>0.02</b>	0.01	No
<b>Dicamba</b>	16-Jan	<0.0002	mg/L	<b>0.12</b>	0.06	No
<b>1,2-Dichlorobenzene</b>	16-Jan	<0.00041	mg/L	<b>0.2</b>	0.1	No
<b>1,4-Dichlorobenzene</b>	16-Jan	<0.00036	mg/L	<b>0.005</b>	0.0025	No
<b>1,2-Dichloroethane</b>	16-Jan	<0.00035	mg/L	<b>0.005</b>	0.0025	No
<b>1,1-Dichloroethylene (vinylidene chloride)</b>	16-Jan	<0.00017	mg/L	<b>0.014</b>	0.007	No
<b>Dichloromethane</b>	16-Jan	<0.00035	mg/L	<b>0.05</b>	0.025	No
<b>2-4 Dichlorophenol</b>	16-Jan	<0.00015	mg/L	<b>0.9</b>	0.45	No
<b>2,4-Dichlorophenoxy acetic acid (2,4-D)</b>	16-Jan	<0.00019	mg/L	<b>0.1</b>	0.05	No

<b>Diclofop-methyl</b>	16-Jan	<0.0004	mg/L	<b>0.009</b>	0.0045	No
<b>Dimethoate</b>	16-Jan	<0.00006	mg/L	<b>0.02</b>	0.01	No
<b>Diquat</b>	16-Jan	<0.001	mg/L	<b>0.07</b>	0.035	No
<b>Diuron</b>	16-Jan	<0.00003	mg/L	<b>0.15</b>	0.075	No
<b>Glyphosate</b>	16-Jan	<0.001	mg/L	<b>0.28</b>	0.14	No
<b>Malathion</b>	16-Jan	<0.00002	mg/L	<b>0.19</b>	0.095	No
<b>MCPA</b>	16-Jan	<0.00012	mg/L	<b>0.1</b>	0.05	No
<b>Metolachlor</b>	16-Jan	<0.00001	mg/L	<b>0.05</b>	0.025	No
<b>Metribuzin</b>	16-Jan	<0.00002	mg/L	<b>0.08</b>	0.04	No
<b>Monochlorobenzene</b>	16-Jan	<0.0003	mg/L	<b>0.08</b>	0.04	No
<b>Paraquat</b>	16-Jan	<0.001	mg/L	<b>0.01</b>	0.005	No
<b>Pentachlorophenol</b>	16-Jan	<0.00015	mg/L	<b>0.06</b>	0.03	No
<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>	2020	0.044	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

**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.