



Owen Sound Drinking Water System



Annual Report 2024

Prepared by:
Troy Pelletier- Water Treatment Superintendent
Mark Hill – Water Distribution Superintendent

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	7
Section 3 – List of Water Treatment Chemicals Used:.....	7
Section 4 – Significant Costs Incurred	8
Section 5 – Adverse Water Quality Incidents Reported	11
Section 6 – Microbiological Test Results.....	11
Section 7 – Operational Testing Results.....	11
Section 8 – Summary of Additional Testing	12
Section 9 – Inorganic and Organic Testing Summary	15
Section 10 – Summary of Lead Testing	17

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 - [Water and Wastewater Department | City of Owen Sound](#)
- 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 #	092-202 Issue # 5 issued October 2nd, 2020
Municipal Drinking Water License	094-101 Issue # 5 issued October 2nd, 2020
Permit to Take Water #	P-300-8173611786 Issued May 28 th , 2022, Expires Mar 31 st , 2032
Period of Report	2024

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>
<u>#</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

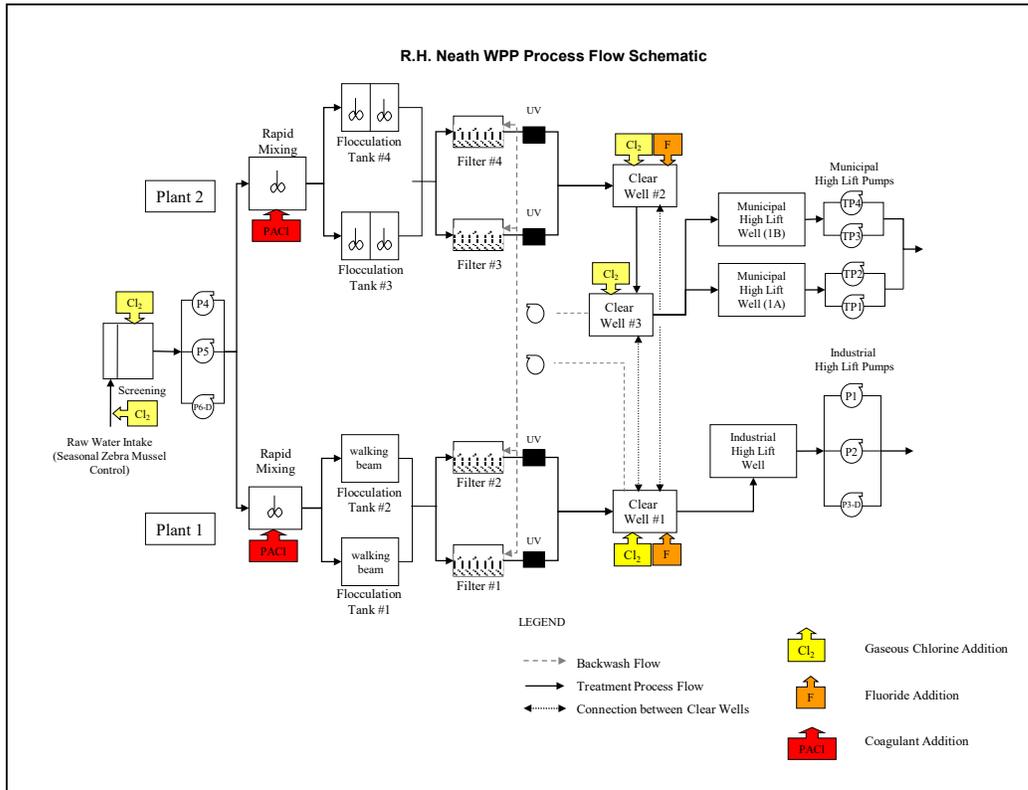
The Richard H. Neath Water Purification plant is a direct filtration surface water treatment plant that draws its water from Georgian Bay. This plant serves a population of approximately 22,000 people.

The Water plant comprises of the following processes;

- Raw water screening (removal of larger debris, fish, etc.),
- Pre chlorination (initial application of chlorine to the raw water),
- Zebra mussel control (chlorination at Intake during warmer months only, raw temperature above 10 °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 in the water throughout the distribution system),
- Fluoridation (added in the two main treated water wells),
- Residue management tank for treating backwash wastewater.

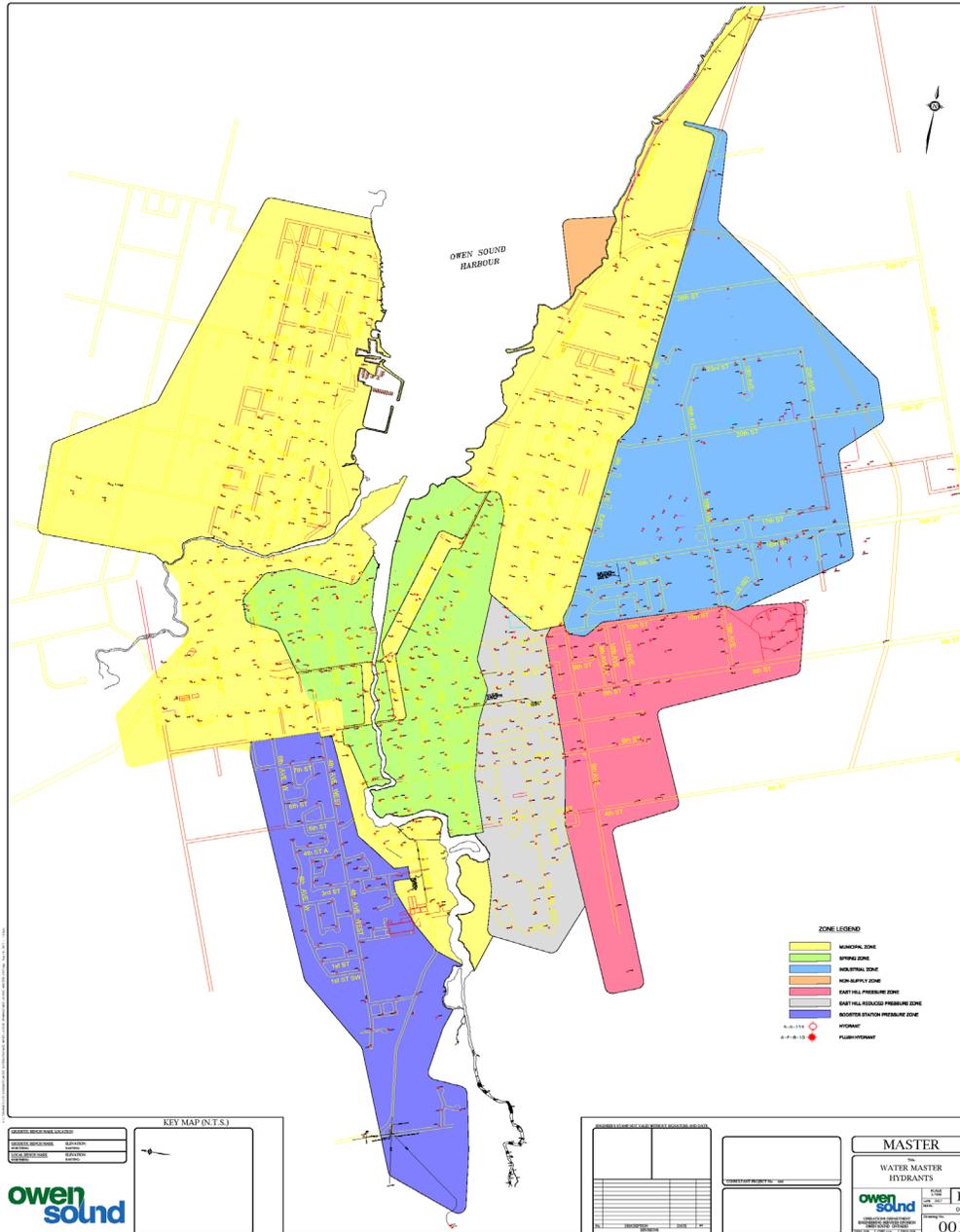
See Figure 1 below for a process schematic.

Figure 1



The City has a 22,000 m³ reservoir, 6 pressure zones (see Figure 2), 160.8 km of water mains, 11 pressure reducing /sustaining chambers, 10 check valve chambers, 678 City hydrants, 130 private hydrants, 61 flush hydrants/blow-offs/auto flushing units, and two booster stations that provides addition pressure in the Southeast and southwest portions of the City and outskirt.

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 2024, there was one MECP inspection completed in February. The City received 96.25% on the Inspection report card.

2. **Internal Audit/External Audit**

Internal Audit—Brigitte Roth, an independent auditor, evaluated our Drinking Water Quality Management System (DWQMS) in November 2024. This consisted of a two-day on-site visit to review all 21 elements of the DWQMS, interview water staff, and test their knowledge of the DWQMS.

No non-conformances were identified, and eight opportunities for improvement (OFIs) were identified in the audit. These opportunities will be reviewed.

External Audit—In April 2024, NSF International performed the external audit and found no major non-conformances, no minor non-conformances, and three OFIs. The OFIs were reviewed, and changes were made.

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. **Fluoride** is used to help prevent dental cavities and improve oral health. The City uses liquid Fluoride called HFS or HydroFluorosilicic Acid, which is added to the water after filtration.
3. **PAX XL-6** – is a coagulant used prior to filtration in the colder months (<10 °C). A coagulant's primary objective is to adhere to suspended particulates and make them bigger in size to allow a higher removal rate of particulates in the filtration process.

4. **PAX XL-1900** – is a coagulant used prior to filtration in the warmer months (>10 °C). A coagulant's 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.
5. **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.
6. **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.	\$15,000
Capital Work – Industrial Pump - Variable Frequency Drive	Purchase and installation on a variable frequency drive (VFD) for Pump 3	\$98,000
Capital Work – Flocculator Repair	Filter 1 Flocculator Failed – Flocculator to be rebuilt	\$137,900
Capital Work – UV System	New UV system ordered – Installation 2024-2025, Total cost of UV system is around \$600,000. This will commence along with Filter Upgrades	\$490,000
Capital Project – Filter Upgrade	Filter Upgrade consisting of new underdrains, air scour technology, new media, new backwash pumps, and some piping upgrades – Multi year project – Completion date Fall 2025, This is a \$4,000,000 project.	\$1,900,000
Sludge Removal	Removal of sludge in coagulant tank	\$17,500
Capital Work – Flocculator Repair	Filter 1 Flocculator Failed – Flocculator rebuilt	\$137,900

Water Distribution

Item	Description	Cost (\$)
Capital Work - New Watermain	Watermain Looping Project – Sturrock 8 th St E to 6 th St E	\$672,000 ±
Capital Work – New Watermain	Alpha St West Full Reconstruction with Water Main	\$5,200,000 ±
Butterfly Valve Repairs	Two Valve Chambers to replace Valving (parts only in 2024)	\$50,000 ±
Capital Work – Cathodic Protection	New cathodic protection installed throughout the City	\$192,000
Capital Work – New Watermain	Watermain Looping 2” PVC from 6 th Ave E to 7 th Ave E for Chlorine Residual Improvement	\$25,000 ±
Broken Watermains	17 Broken watermains occurred, estimated repair of \$10,000 each ±	\$170,000
Capital Work - New Watermain	26 th St West 300 Block (Remove Galvanized Main and replace with 2” PVC)	\$45,000±
Capital Work - New Watermain	Watermain Looping Project – Sturrock 8 th St E to 6 th St E	\$672,000 ±

Section 5 – Adverse Water Quality Incidents Reported

#	Reporting Date	AWQI #	Adverse Location	Adverse Parameter	Adverse Result	Units	Remedial Action
1	23-May	165010	Distribution Sample	Total Coliform	1	cfu/100 ml	Followed Total Coliform procedure as per MECP requirements, and flushed hydrant.
2	12-Sep	166288	Distribution System	Free Cl ₂ Residual	<0.05	mg/L	Flushed hydrant to bring the residual up. Continue to monitor location.
3	25-Sep	166438	Distribution System	Free Cl ₂ Residual	0.04	mg/L	Flushed hydrant to bring the residual up. Increased monitoring of the location. A temporary flushing unit was installed.

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	52	0 - 20	0 - 550	n/a	n/a
Treated	52	0 - 0	0 - 0	n/a	n/a
Distribution	472	0 - 0	0 - 1	108	<10 - 10

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	0.01 NTU – 0.95 NTU
Filter 2 Turbidity	8760	0.01 NTU – 0.78 NTU
Filter 3 Turbidity	8760	0.01 NTU – 4.99 NTU * Spike occurred on April 21 st during a power bump. Only over 1 NTU for 4 min 25 sec.
Filter 4 Turbidity	8760	0.02 NTU – 0.62 NTU
Post 1 Chlorine	8760	0.08 - 3.32* low occurred during a planned complete plant power shutdown.
Post 2 Chlorine	8760	0.03 – 4.71 * The low occurred June 3 rd during servicing of the chlorine analyzer, and the High level occurred the same day when the plant came back online.
Municipal Chlorine	8760	0.44 – 2.21 *Lower residual occurred due to a reduced flow through the analyzer, this was remedied by adjusting the flow.
Industrial Chlorine	8760	1.25 – 2.52
Municipal Fluoride	8760	0.30 – 0.90
Industrial Fluoride	8760	0.14 – 1.00 – Low residual caused by a Fluoride pump wiring issue on July 11 th .

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 # 094-101	October 2 nd , 2020	Chlorine – Wastewater System / Total Suspended Solids	02-Jan	0.00 / 2.0	mg/L
Municipal License # 094-101	October 2 nd , 2020	Aluminum	15-Jan	0.060	mg/L
Municipal License # 094-101	October 2 nd , 2020	Chlorine – Wastewater System	02-Feb	0.00	mg/L
Municipal License # 094-101	October 2 nd , 2020	Chlorine – Wastewater System	04-Mar	0.00	mg/L
Municipal License # 094-101	October 2 nd , 2020	Total Suspended Solids	4-Mar	4.4	mg/L
Municipal License # 094-101	October 2 nd , 2020	Chlorine – Wastewater System	2-Apr	0.0	mg/L
Municipal License # 094-101	October 2 nd , 2020	Aluminum	22-Apr	0.023	mg/L
Municipal License # 094-101	October 2 nd , 2020	Chlorine – Wastewater System	1-May	0.00	mg/L
Municipal License # 094-101	October 2 nd , 2020	Chlorine – Wastewater System	3-Jun	0.00	mg/L
Municipal License # 094-101	October 2 nd , 2020	Total Suspended Solids	3-Jun	4	mg/L
Municipal License # 094-101	October 2 nd , 2020	Chlorine – Wastewater System	2-Jul	0.00	mg/L
Municipal License # 094-101	October 2 nd , 2020	Aluminum	22-Jul	0.031	mg/L
Municipal License # 094-101	October 2 nd , 2020	Chlorine – Wastewater System	06-Aug	0.00	mg/L
Municipal License # 094-101	October 2 nd , 2020	Chlorine – Wastewater System	02-Sep	0.00	mg/L

Municipal License # 094-101	October 2 nd , 2020	Total Suspended Solids	4-Sep	3.2	mg/L
Municipal License # 094-101	October 2 nd , 2020	Chlorine – Wastewater System	2-Oct	0.00	mg/L
Municipal License # 094-101	October 2 nd , 2020	Aluminum	21-Oct	0.0187	mg/L
Municipal License # 094-101	October 2 nd , 2020	Chlorine – Wastewater System	2-Nov	0.00	mg/L
Municipal License # 094-101	October 2 nd , 2020	Chlorine – Wastewater System	3-Dec	0.00	mg/L
Municipal License # 094-101	October 2 nd , 2020	Total Suspended Solids	5-Dec	2.8	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	Exceedance
Antimony	15-Jan	<0.0006	mg/L	0.006	0.003	No
Arsenic	15-Jan	<0.0002	mg/L	0.01	0.005	No
Barium	15-Jan	0.0125	mg/L	1.0	0.5	No
Boron	15-Jan	0.015	mg/L	5.0	2.5	No
Cadmium	15-Jan	0.000004	mg/L	0.005	0.0025	No
Chromium	15-Jan	0.00008	mg/L	0.05	0.025	No
Mercury	15-Jan	<0.00001	mg/L	0.001	0.0005	No
Selenium	15-Jan	0.00012	mg/L	0.05	0.025	No
Sodium	13-Feb-23	9.53	mg/L	>20	>10	No
Uranium	15-Jan	0.000086	mg/L	0.02	0.01	No
Fluoride – Municipal	31-Dec	0.82	mg/L	1.50	n/a	No
Fluoride - Industrial	31-Dec	0.72	mg/L	1.50	n/a	No
Nitrite	21-Oct	<0.003	mg/L	1.0	0.5	No
Nitrate	21-Oct	0.222	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	0.00002	mg/L	0.005	0.0025	No
Azinphos-methyl	15-Jan	<0.00005	mg/L	0.02	0.01	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	<0.00017	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
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 (annual average)	2024	0.0418	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
Haloacetic Acids (latest annual average)	2024	0.0206	mg/L	0.08	.04	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.

The City tested for Lead in 2024, along with pH and alkalinity. The results are shown in the table below. The Maximum Acceptable Concentration (MAC) level for Lead is 0.010 mg/L.

Location Type	# of Samples	Range of Lead Results (min#) – (max #)	# of Exceedances
Plumbing	n/a	n/a	n/a
Distribution	8	<0.00001 – 0.00096	0