



**DORCHESTER
DRINKING WATER
SYSTEM**

**2022
ANNUAL REPORT**

**ONTARIO REGULATION 170/03
Part III Form 2
Section 11**

28 FEBRUARY 2023



ANNUAL REPORT – DORCHESTER DWS

Drinking-Water System Number:	220002146
Drinking-Water System Name:	Dorchester Drinking Water System
Drinking-Water System Owner:	Municipality of Thames Centre
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2022 to December 31, 2022

For Large Municipal Residential Water Systems

Does your Drinking-Water System serve more than 10,000 people?

Yes [] No [X]

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.

- Available by calling Thames Centre water department at (519) 268-7490 or on Thames Centre website at www.thamescentre.on.ca or at the municipal offices at 4305 Hamilton Road, Dorchester, ON N0L 1G3

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
None	N/A

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 Government Office
- [X] Public access/notice via Public Request
- [X] Public access/notice via a Public Library

Describe your Drinking-Water System

The Dorchester Drinking Water System consists of 9 (nine) groundwater wells. The raw water from the production wells passes through a treatment system consisting of clear-wells, a chemical feed system, filtration system, ultraviolet disinfection, storage reservoirs, and high lift pumps. Operation of the treatment system is controlled based upon the liquid level condition within the elevated water storage tank in the village of Dorchester. The SCADA system indicates to the water treatment facility PLC when treated water is required to be pumped into the distribution system. During periods of low demand, the treatment system remains in the ready mode. The distribution system consists of approximately 46.76 km of water main contained within the urban boundaries of the village of Dorchester.

List all water treatment chemicals used over this reporting period

- sodium hypochlorite

Were any significant expenses incurred to?

- Install required equipment
 Repair required equipment
 Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred

- repair baffle walls inside Dorchester WTF Reservoir #2 = \$18,339.90
- Dorchester Well exploration program = \$137,230.36
- Production Well 3PW-2B and 3PW-7 rehabilitation = \$30,255.75

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

Adverse Incident Date	Parameter	Corrective Action Taken	Adverse Water Quality Indicator # (AWQI)	Sample Result(s)	Maximum Allowable Concentration (MAC)
2022 02 15	Haloacetic Acids (HAAs)	report to MECP / MLHU	157950	80.1 µg/L RAA	RAA of <80 µg/L
2022 05 16	Haloacetic Acids (HAAs)	report to MECP / MLHU	159869	82.4 µg/L RAA	RAA of <80 µg/L
2022 08 16	Haloacetic Acids (HAAs)	report to MECP / MLHU	159870	82.6 µg/L RAA	RAA of <80 µg/L
2022 09 22	Total Coliform (TC)	report to MECP / MLHU and resample	160107	1 cfu/100 mL	0 cfu/100 mL
2022 09 24	Total Coliform (TC)	report to MECP / MLHU and resample	160121	2 cfu/100 mL	0 cfu/100 mL
2022 11 15	Haloacetic Acids (HAAs)	report to MECP / MLHU	160813	84.8 µg/L RAA	RAA of <80 µg/L

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

Sample Source	Number of Samples	Range of E.Coli Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)	Number of HPC Samples	Range of HPC Results (min #)-(max #)
Raw Water	368	0 – 0	0 – 6	Not required	Not required
Treated Water	52	0 - 0	0 - 0	52	<10 - 80
Distribution Water	231	0 - 0	0 - 2	87	<10 - NDOGHPC

*NDOGHPC = No Data Overgrown With Heterotrophic Plate Count

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

Sample Analysis / Sample Source	Number of Samples	Range of Results (min #)-(max #)	Average Level recorded
Turbidity / Well 2PW-1 - raw water (RW)	12	0.42 - 4.64	1.20
Turbidity / Well 3PW-1 - raw water (RW))	12	0.23 – 0.53	0.38
Turbidity / Well 3PW-2B - raw water (RW))	11	0.25 – 0.85	0.54
Turbidity / Well 3PW-3 - raw water (RW))	12	0.29 – 0.64	0.43
Turbidity / Well 3PW-4A - raw water (RW))	12	0.32 – 0.85	0.51
Turbidity / Well 3PW-5 - raw water (RW))	12	0.22 – 0.79	0.44
Turbidity / Well 3PW-6 - raw water (RW))	12	0.43 – 0.94	0.72
Turbidity / Well 3PW-7 - raw water (RW))	12	0.21 – 0.77	0.46
Turbidity / Well 3PW-8 - raw water (RW))	12	0.36 – 0.74	0.56
Turbidity / Storage Reservoirs - treated water (TW)	525,408	0.00 – 10.19 ntu	0.06 ntu
Chlorine (free) / Storage Reservoirs – treated water (TW)	525,408	0.00 – 5.00 mg/L	1.55 mg/L
Fluoride (if the DWS provides fluoridation) / Storage Reservoirs – treated water (TW)	<i>Fluoride is not added to this system</i>	Not required	Not required
Chlorine (free) / Hamilton Road – Distribution water (DW)	365	0.34 – 1.86 mg/L	1.18 mg/L

Turbidity levels recorded below 0.03 ntu and above 0.44 ntu were instantaneous results directly caused by composite analyzer failure or maintenance activities and are not indicative of actual water system levels. Chlorine levels recorded in the storage reservoirs below 0.98 mg/L or above 2.60 mg/L were instantaneous results directly caused by composite analyzer or chemical dosing pump maintenance activities and are not indicative of actual water system levels.

Hardness

This is an aesthetic parameter that may affect the appearance of the water but is not related to health. Well water commonly has high levels of hardness and other minerals from being in contact with underground rock formations. Many households have water softeners to help reduce white calcium deposits and improve the efficiency of soaps. This information is included here to help set the water softener at the level recommended by the manufacturer. The most recent Hardness (CaCO₃) sample (February 15th, 2022) returned with a result of 288 mg/L (equivalent to 16.84 grains).

Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
Dorchester Drinking Water System MDWL Issue Number:5 Schedule C, table 5 (2020 11 23)	Trihalomethanes THM	monthly	94.83 (running annual average)	µg/L

Summary of INORGANIC parameters tested during this reporting period or the most recent sample results (required sampling frequency = every 12 months)

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	15 Feb 2022	0.60 <MDL	µg/L	no
Arsenic	15 Feb 2022	0.4	µg/L	no
Barium	15 Feb 2022	85.7	µg/L	no
Boron	15 Feb 2022	15	µg/L	no
Cadmium	15 Feb 2022	0.003 <MDL	µg/L	no
Chromium	15 Feb 2022	0.20	µg/L	no
*Lead	see summary below			
Mercury	15 Feb 2022	0.01 <MDL	µg/L	no
Selenium	15 Feb 2022	0.26	µg/L	no
Sodium (every 5 years)	14 Feb 2020	28.2	mg/L	yes
Uranium	15 Feb 2022	0.821	µg/L	no
Fluoride (every 5 years)	15 Feb 2022	0.14	mg/L	no
Nitrite	15 Feb 2022	0.003 <MDL	mg/L	no
	16 May 2022	0.003 <MDL	mg/L	no
	16 Aug 2022	0.003 <MDL	mg/L	no
	15 Nov 2022	0.003 <MDL	mg/L	no
Nitrate	15 Feb 2022	1.40	mg/L	no
	16 May 2022	1.31	mg/L	no
	16 Aug 2022	1.26	mg/L	no
	15 Nov 2022	1.07	mg/L	no

**Summary of LEAD testing under Schedule 15.1 during this reporting period –
Summer: (June 15/2022 – October 15/2022) Winter: (December 15/2022 – April 15/2023)**

Sampling Period	Residential Samples LEAD range of results (µg/L) acceptable level <10 µg/L	Non-Residential Samples LEAD range of results (µg/L) acceptable level <10 µg/L	Distribution System Samples LEAD range of results (µg/L) acceptable level <10 µg/L	Any Change in Water Chemistry? (ie. variance in Alkalinity sample results)	Distribution System Samples ALKALINITY range of results (mg/L) acceptable level 30-500mg/L
Summer	N/R	N/R	N/R	no	225-228
Winter	N/R	N/R	N/R	no	175-248 ¹

❖ N/R = not required - water system qualified for MECP Reduced Sampling (O.Reg170/03 schedule 15.1-5)

¹ The winter sample taken on December 15/2022 returned a result 175 mg/L which was historically lower than previous samples. A re-sample on January 16/2023 at the same location returned a result of 248 mg/L which aligned with previous samples.

Summary of ORGANIC parameters sampled during this reporting period or the most recent sample results (required sampling frequency = every 12 months)

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	15 Feb 2022	0.020 <MDL	µg/L	no
Atrazine + N-dealkylated metabolites	15 Feb 2022	0.010 <MDL	µg/L	no
Azinphos-methyl	15 Feb 2022	0.050 <MDL	µg/L	no
Benzene	15 Feb 2022	0.320 <MDL	µg/L	no
Benzo(a)pyrene	15 Feb 2022	0.004 <MDL	µg/L	no
Bromoxynil	15 Feb 2022	0.330 <MDL	µg/L	no
Carbaryl	15 Feb 2022	0.050 <MDL	µg/L	no
Carbofuran	15 Feb 2022	0.010 <MDL	µg/L	no
Carbon Tetrachloride	15 Feb 2022	0.170 <MDL	µg/L	no
Chlorpyrifos	15 Feb 2022	0.020 <MDL	µg/L	no
Diazinon	15 Feb 2022	0.020 <MDL	µg/L	no
Dicamba	15 Feb 2022	0.200 <MDL	µg/L	no
1,2-Dichlorobenzene	15 Feb 2022	0.410 <MDL	µg/L	no
1,4-Dichlorobenzene	15 Feb 2022	0.360 <MDL	µg/L	no
1,2-Dichloroethane	15 Feb 2022	0.350 <MDL	µg/L	no
1,1-Dichloroethylene (vinylidene chloride)	15 Feb 2022	0.330 <MDL	µg/L	no
Dichloromethane	15 Feb 2022	0.350 <MDL	µg/L	no
2-4 Dichlorophenol	15 Feb 2022	0.150 <MDL	µg/L	no
2,4-Dichlorophenoxy acetic acid (2,4-D)	15 Feb 2022	0.190 <MDL	µg/L	no
Diclofop-methyl	15 Feb 2022	0.400 <MDL	µg/L	no
Dimethoate	15 Feb 2022	0.060 <MDL	µg/L	no
Diquat	15 Feb 2022	1.000 <MDL	µg/L	no
Diuron	15 Feb 2022	0.030 <MDL	µg/L	no
Glyphosate	15 Feb 2022	1.000 <MDL	µg/L	no
Malathion	15 Feb 2022	0.020 <MDL	µg/L	no
HAA (running annual average)	15 Feb 2022 16 May 2022 16 Aug 2022 15 Nov 2022	84.8	µg/L	yes
Metolachlor	15 Feb 2022	0.010 <MDL	µg/L	no
Metribuzin	15 Feb 2022	0.020 <MDL	µg/L	no
Monochlorobenzene	15 Feb 2022	0.300 <MDL	µg/L	no
Paraquat	15 Feb 2022	1.000 <MDL	µg/L	no
Pentachlorophenol	15 Feb 2022	0.150 <MDL	µg/L	no
Phorate	15 Feb 2022	0.010 <MDL	µg/L	no
Picloram	15 Feb 2022	1.000 <MDL	µg/L	no
Polychlorinated Biphenyls(PCB)	15 Feb 2022	0.040 <MDL	µg/L	no
Prometryne	15 Feb 2022	0.030 <MDL	µg/L	no
Simazine	15 Feb 2022	0.010 <MDL	µg/L	no

THM (running annual average)	17 Jan 2022 19 Feb 2022 15 Mar 2022 14 Apr 2022 16 May 2022 21 Jun 2022 13 July 2022 16 Aug 2022 24 Sep 2022 20 Oct 2022 15 Nov 2022 15 Dec 2022	94.83	µg/L	no
Terbufos	15 Feb 2022	0.010 <MDL	µg/L	no
Tetrachloroethylene	15 Feb 2022	0.350 <MDL	µg/L	no
2,3,4,6-Tetrachlorophenol	15 Feb 2022	0.200 <MDL	µg/L	no
Triallate	15 Feb 2022	0.010 <MDL	µg/L	no
Trichloroethylene	15 Feb 2022	0.440 <MDL	µg/L	no
2,4,6-Trichlorophenol	15 Feb 2022	0.250 <MDL	µg/L	no
Trifluralin	15 Feb 2022	0.020 <MDL	µg/L	no
Vinyl Chloride	15 Feb 2022	0.170 <MDL	µg/L	no

- ❖ MDL = the method detection limit - the minimum concentration of a substance that can be measured and reported with 99% confidence that the concentration is greater than zero.

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

Parameter	Sample Date	Result Value	Unit of Measure	ODWS MAC maximum allowable concentration
Sodium (Na)	14 Feb 2020 (every 60 months)	28.2	mg/L	20 mg/L
Sodium (Na) re-sample	21 Feb 2020	26.6	mg/L	20 mg/L
Trihalomethanes (THM)	running annual average (RAA)	94.83	µg/L	100 µg/L
Haloacetic Acids (HAA)	running annual average (RAA)	84.8	µg/L	80 µg/L

Sodium

Sodium levels in drinking water are every 57 months. The aesthetic objective is 200 mg/L meaning at levels less than this, sodium will not impair the taste of the water. When sodium levels are above 20 mg/L the MECP and MOH are notified. Middlesex London Health Unit (MLHU) provides a “Fact Sheet” on sodium in drinking water which is included annually in January water bills and is available at:

<https://www.thamescentre.on.ca/sites/default/files/2019-05/MLHUSodiumDorchester.pdf>

The most recent sodium sample (February 21st, 2020) returned with a resulting concentration of 26.6 mg/L.

Trihalomethanes (THMs)

A Trihalomethane (THM) sample is required monthly from the distribution system. THMs are a by-product of the disinfection process. Chlorine is used to protect the water supply from microorganisms such as bacteria and viruses. When natural occurring organic material is present, chlorine can produce THMs. The current maximum allowable concentration, as a running annual average, for THMs in a drinking water supply in Ontario is 100 micrograms per litre (µg/L).

Haloacetic Acids (HAA)

A Haloacetic Acid (HAA) sample is required quarterly from the distribution system. HAAs are a recently added sample requirement listed in the MECP Ontario Regulation 169/03 and level exceedances are reportable beginning January 1, 2020. Similar to THMs, HAAs are a by-product of the disinfection process. Chlorine is used to protect the water supply from microorganisms such as bacteria and viruses. When natural occurring organic material is present, chlorine can produce HAAs. The current maximum allowable concentration, as a running annual average, for HAAs in a drinking water supply in Ontario is 80 micrograms per litre ($\mu\text{g/L}$). On October 12, 2022 the Middlesex-London Health Unit issued a public health notice relating to the excess levels of HAAs in the Dorchester water system. The public health notice is available at:

https://www.thamescentre.on.ca/sites/default/files/2022-10/Joint_HaloaceticAcidThamesCentre_erls_FINAL_221006.pdf