The Regional Municipality of Durham

Uxbridge Drinking Water System 2020 Annual Report

Drinking Water System Number: 220000763
Municipal Drinking Water Licence Number: 003-105
Drinking Water System Owner: The Regional Municipality of Durham
Drinking Water System Category: Large Municipal Residential

This Annual Report for the calendar year 2020 is designed to inform you about your drinking water system. This report has been prepared to satisfy Section 11 of Ontario Regulation (O. Reg.) 170/03. O. Reg. 170/03 sets requirements for drinking water systems with regard to sampling and testing, levels of treatment, certification of staff, and notification of authorities and the public about water quality. Hard copies of this report and the Schedule 22 Summary Report are available at the Regional Municipality of Durham Headquarters office that is located at 605 Rossland Road East, Whitby. The annual report is also available on the Region of Durham's website at www.durham.ca. Further information regarding the Drinking Water Regulations can be found on the Ministry of the Environment, Conservation and Parks website at www.ontario.ca/ministry-environment-conservation-parks.

Drinking Water System Process Description

General

The Uxbridge Drinking Water System provides potable water to consumers in the Uxbridge urban area in the Township of Uxbridge. Uxbridge has three municipal wells designated as Well No. 5, Well No. 6 and Well No. 7. Uxbridge is a Class Two Water Distribution and Supply Subystem with an approved combined capacity of 12,182 cubic metres per day (m^3/d). The Uxbridge Drinking Water System feeds a Class One Distribution Subsystem and a Class Two Trunk Distribution Subsystem. The Uxbridge treatment and distribution systems are owned and operated by the Regional Municipality of Durham.

The water supply system includes the following processes:

- Disinfection (sodium hypochlorite, chlorine),
- Iron sequestering (sodium silicate),
- Ultraviolet (UV) disinfection (Well No. 5 and Well No. 7 only), and
- Distribution.

Raw Water Supply

Water is pumped from three municipal wells in Uxbridge. Wells No. 5, 6 and 7 are drilled to depths of 76.5 metres (m), 58.2 m and 66.5 m respectively. Water is delivered to the system by the well pumps.

Disinfection/Iron Sequestering

Sodium silicate is added to the water at each well facility for iron sequestering (control). Sodium hypochlorite is added to provide disinfection in Well No. 6, while Wells No. 5 and No. 7 use chlorine gas. UV treatment provides additional disinfection at Wells No. 5 & Well No. 7. The free chlorine residual and turbidity are monitored continuously by online analyzers. The UV and chlorination systems will shut down the well pumps if an alarm occurs. This ensures the water is properly disinfected.

Distribution System

Treated water is pumped to the distribution system and to the Quaker Hill Reservoir, which has a storage capacity of 2,841 cubic metres. The zone 2 pumping station, located at the Quaker Hill Reservoir, is equipped with four high lift in-line centrifugal pumps, and a sodium hypochlorite disinfection system.

The distribution system delivers the treated water through approximately 60 kilometres of watermains in two pressure zones which includes the Quaker Hill Reservoir and zone 2 pumping station.

Major Monetary Expenses (above $10,000)

Under Section 11 of O. Reg. 170/03, a description of any major expenses incurred during this reporting period to install, repair or replace required equipment must be included in the annual report. The details of major expenses for this drinking water system are as follows:

Uxbridge Well 5 Emergency Repairs - $39,007.24

Tables

For a description of terms and abbreviations in all tables, refer to the glossary at the end of the report.

Uxbridge Drinking Water System (DWS) Table 1

Summary of all Adverse Water Quality Incidents in 2020 Reported to Spills Action Centre in Accordance with Schedule 16-3 and 16-4 of O. Reg. 170/03.

No adverse water quality incidents occurred in 2020.

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
Not Applicable (N/A)	N/A	N/A	N/A	N/A

Uxbridge DWS Table 2

Microbiological Membrane Filtration (MF) Testing Under Schedule 10 of O. Reg. 170/03.

Type of Sample	Number of Samples	Range of Escherichia Coli MF Colony Forming Units per 100 Millilitres	Range of Total Coliforms MF Colony Forming Units per 100 Millilitres
Raw	160	Non-Detect (ND)	ND - 1
Treated	0	Not Applicable (N/A)	N/A
Distribution	13	ND	ND

Uxbridge DWS Table 3

Microbiological Presence Absence (P/A) Testing Under Schedule 10 of O. Reg. 170/03.

Type of Sample	Number of Samples	Escherichia Coli P/A per 100 Millilitres	Total Coliforms P/A per 100 Millilitres
Treated	158	Absence (A)	A
Distribution	247	A	A

Uxbridge DWS Table 4

Microbiological Heterotrophic Plate Count (HPC) Testing Under Schedule 10 of O. Reg. 170/03.

Type of Sample	Number of Samples	Range of HPC Samples Colony Forming Units per Millilitre
Treated	158	Non-Detect (ND) - 150
Distribution	155	ND - 290

Uxbridge DWS Table 5

Operational Testing Done Under Schedule 7 of O. Reg. 170/03.

Test	Number of Samples	Range of Results	Unit of Measure	Parameter Description
Turbidity - Raw Water	156	0.02 - 0.41	Nephelometric Turbidity Units (NTU)	Turbidity is a measure of particles in water.
Free Chlorine - Plant	Continuous	0.50 – 2.00*	Milligram per Litre (mg/L)	Must be sufficient to ensure disinfection has been achieved.
Free Chlorine - Distribution	Continuous	0.63 - 1.67*	mg/L	Recommended level of at least 0.20 mg/L in the distribution system to maintain secondary disinfection, 0.05 mg/L is the minimum required.

*Results include all analyzers and grab samples.

Uxbridge DWS Table 6

Summary of Treated Water Chemical Parameters Tested Under Schedules 13 and 23 of O. Reg. 170/03.

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources[1]
Antimony	11	Non-Detect (ND)	0.006	Milligram per Litre (mg/L)	No	Fire retardants, ceramics, electronics, solder.
Arsenic	11	ND	0.01	mg/L	No	Mining.
Barium	2	0.118 – 0.142	1.0	mg/L	No	Metal refineries, oil drilling.
Boron	2	0.0138-0.017	5.0	mg/L	No	Industrial.
Cadmium	11	ND	0.005	mg/L	No	Industrial.
Chromium	11	ND	0.05	mg/L	No	Industrial.
Total Haloacetic acids - Distribution (annual average)	4	ND	80	Microgram per Litre (ug/L)	No	By-product of chlorination of drinking water.
Mercury	2	ND	0.001	mg/L	No	Industrial.
Selenium	11	ND	0.05	mg/L	No	Refineries, mines, chemical manufacturing.
Sodium	12	5.71 - 13.7	Not Applicable[2]	mg/L	No	Storm water runoff including road salt.
Total Trihalomethanes - Distribution (annual average)	4	10.8	100	ug/L	No	By-product of chlorination of drinking water.
Uranium	2	ND	0.02	mg/L	No	Power generation.
Fluoride	12	0.06 - 0.11	1.5	mg/L	No	Mining.
Nitrite	12	ND	1.0	mg/L	No	Agriculture runoff, landfill leachate and animal waste.
Nitrate	12	ND	10.0	mg/L	No	Fertilizer.

1 Parameters may occur naturally in the environment.

2 Sodium does not have a Maximum Acceptable Concentration (MAC); only an aesthetic objective of 200 mg/L. Sodium results exceeding 20 mg/L are to be reported to the Medical Officer of Health as per Schedule 16-3 (8) of O. Reg. 170/03 if it has not been reported in the preceding 57 months.

Uxbridge DWS Table 7

Summary of Lead Testing Under Schedule 15.1 of O. Reg. 170/03.

No plumbing samples were required to be taken in 2020.

Location Type	Number of Samples	Range of Lead Results Milligram per Litre	MAC	Number of Exceedances	pH	Alkalinity Milligram per Litre
Plumbing	Not Required (N/R)	N/R	0.01	N/R	N/R	N/R
Distribution	8	Non-Detect – 0.0019	0.01	0	7.60 - 7.90	177 - 191

Uxbridge DWS Table 8

Summary of Treated Water Organic Parameters Tested Under Schedule 24 of O. Reg. 170/03.

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Alachlor	2	Non-Detect (ND)	5	Microgram per Litre (ug/L)	No	Agricultural herbicide.
Atrazine + N-dealkylated metabolites	2	ND	5	ug/L	No	Agricultural herbicide.
Azinphos-methyl	2	ND	20	ug/L	No	Insecticide.
Benzene	2	ND	1	ug/L	No	Plastics manufacturing, leaking fuel tanks.
Benzo(a)pyrene	2	ND	0.01	ug/L	No	Formed from the incomplete burning of organic matter.
Bromoxynil	2	ND	5	ug/L	No	Agricultural herbicide.
Carbaryl	2	ND	90	ug/L	No	Agricultural, forestry, household insecticide.

Uxbridge DWS Table 8 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Carbofuran	2	Non-Detect (ND)	90	Microgram per Litre (ug/L)	No	Agricultural insecticide.
Carbon Tetrachloride	2	ND	2	ug/L	No	Chemical and industrial activities.
Chlorpyrifos	2	ND	90	ug/L	No	Agricultural, household insecticide.
Diazinon	2	ND	20	ug/L	No	Agricultural, livestock, operation, residential insecticide.
Dicamba	2	ND	120	ug/L	No	Agricultural herbicide
1,2-Dichlorobenzene	2	ND	200	ug/L	No	Chemical and industrial factories.
1,4-Dichlorobenzene	2	ND	5	ug/L	No	Chemical and industrial factories.
1,2-Dichloroethane	2	ND	5	ug/L	No	Industrial chemical factories.
1,1-Dichloroethylene (vinylidene chloride)	2	ND	14	ug/L	No	Industrial chemical factories.
Dichloromethane	2	ND	50	ug/L	No	Pharmaceutical and chemical factories.
2,4-Dichlorophenol	2	ND	900	ug/L	No	Industrial contamination, reaction with chlorine.
2,4-Dichlorophenoxy acetic acid (2,4-D)	2	ND	100	ug/L	No	Agricultural, residential herbicide.

Uxbridge DWS Table 8 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Diclofop-methyl	2	Non-Detect (ND)	9	Microgram per Litre (ug/L)	No	Agricultural herbicide.
Dimethoate	2	ND	20	ug/L	No	Agricultural, livestock, operation, residential insecticide.
Diquat	2	ND	70	ug/L	No	Agricultural, aquatic herbicide.
Diuron	2	ND	150	ug/L	No	Agricultural, industrial herbicide.
Glyphosate	2	ND	280	ug/L	No	Agricultural, forestry, household herbicide.
Malathion	2	ND	190	ug/L	No	Pest control insecticide.
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	2	ND	100	ug/L	No	Agricultural herbicide.
Metolachlor	2	ND	50	ug/L	No	Agricultural herbicide.
Metribuzin	2	ND	80	ug/L	No	Agricultural herbicide.
Monochlorobenzene	2	ND	80	ug/L	No	Industrial and agricultural chemical factories and dry cleaning facilities.
Paraquat	2	ND	10	ug/L	No	Agricultural, aquatic herbicide.
Pentachlorophenol	2	ND	60	ug/L	No	Pesticide, wood preservative residue.
Phorate	2	ND	2	ug/L	No	Agricultural insecticide.

Uxbridge DWS Table 8 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Picloram	2	Non-Detect (ND)	190	Microgram per Litre (ug/L)	No	Industrial herbicide.
Polychlorinated Biphenyls(PCB)	2	ND	3	ug/L	No	Residue from various industrial uses.
Prometryne	2	ND	1	ug/L	No	Agricultural herbicide.
Simazine	2	ND	10	ug/L	No	Agricultural herbicide.
Terbufos	2	ND	1	ug/L	No	Agricultural insecticide.
Tetrachloroethylene (perchloroethylene)	2	ND	10	ug/L	No	Leaching from PVC pipes; discharge from factories; dry cleaners and auto shops (metal degreaser).
2,3,4,6 - Tetrachlorophenol	2	ND	100	ug/L	No	Wood preservative.
Triallate	2	ND	230	ug/L	No	Agricultural herbicide.
Trichloroethylene	2	ND	5	ug/L	No	Metal degreasing sites and other factories.
2,4,6-Trichlorophenol	2	ND	5	ug/L	No	Pesticide manufacturing.
Trifluralin	2	ND	45	ug/L	No	Agricultural herbicide.
Vinyl Chloride	2	ND	1	ug/L	No	Leaching from PVC pipes; discharge from plastics factories.

Uxbridge DWS Table 9

Inorganic or Organic Parameter(s) that Exceed Half the Standard Prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards.

No inorganic or organic parameters exceeded half the maximum allowable concentration in 2020.

Parameter	Result	Unit of Measure	Date of Sample
Not Applicable (N/A)	N/A	N/A	N/A