The Regional Municipality of Durham

Blackstock Drinking Water System 2020 Annual Report

Drinking Water System Number: 220003751
Municipal Drinking Water Licence Number: 003-101
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 Blackstock Drinking Water System provides potable water to consumers in the Hamlet of Blackstock in the Township of Scugog. Blackstock has two municipal wells designated Well No. 7 and Well No. 8. Well No. 7 is currently not in service. Blackstock is a Class Two Distribution and Supply System with an approved combined capacity of 994 cubic metres per day (m^3/d). The wells feed a Class One Distribution System. The Blackstock 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),
- Iron sequestering (sodium silicate),
- Water storage/pressurization, and
- Distribution.

Raw Water Supply

Well No. 8 is drilled to a depth of 54 metres (m). Well No. 7 is drilled to a depth of 61 m and is not currently in service.

Disinfection/Iron Sequestering
Sodium silicate is added to raw water once it leaves the well for iron sequestering (control). Sodium hypochlorite is added to provide disinfection. The free chlorine residual and turbidity are monitored continuously by online analyzers.

Water Storage/Pressurization
Treated water flows to a 340 cubic metre reservoir after chlorination. It is then pumped to the distribution system by high lift pumps. Pressure tanks are used to assist in maintaining distribution system pressure.

Distribution System
The distribution system delivers the treated water through approximately 6 kilometres of watermains. There is no water storage in the distribution system.

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:

There were no major expenses incurred during this reporting period

Tables

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

Blackstock 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

Blackstock 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	54	Non-Detect (ND)	ND
Treated	Not Required (N/R)	N/R	N/R
Distribution	N/R	N/R	N/R

Blackstock 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	52	Absence (A)	A
Distribution	126	A	A

Blackstock 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	52	Non-Detect (ND)
Distribution	65	ND - 23

Blackstock 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	52	0.05 - 0.30	Nephelometric Turbidity Units (NTU)	Turbidity is a measure of particles in water.
Free Chlorine - Plant	Continuous	1.28 - 1.94*	Milligram per Litre (mg/L)	Must be sufficient to ensure disinfection has been achieved.
Free Chlorine - Distribution	Continuous	0.62- 1.96*	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.

Blackstock 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	5	Non-Detect (ND) - 0.002	0.006	Milligram per Litre (mg/L)	No	Fire retardants, ceramics, electronics, solder.
Arsenic	5	ND	0.01	mg/L	No	Mining.
Barium	1	0.168	1.0	mg/L	No	Metal refineries, oil drilling.
Boron	1	0.0096	5.0	mg/L	No	Industrial.
Cadmium	5	ND	0.005	mg/L	No	Industrial.
Chromium	5	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	1	ND	0.001	mg/L	No	Industrial.
Selenium	5	ND	0.05	mg/L	No	Refineries, mines, chemical manufacturing.
Sodium	4	10.0 – 10.5	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	1	ND	0.02	mg/L	No	Power generation.
Fluoride	4	0.06 – 0.08	1.5	mg/L	No	Mining
Nitrite	4	ND	1.0	mg/L	No	Agriculture runoff, landfill leachate and animal waste.
Nitrate	4	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.

Blackstock DWS Table 7

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

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	4	Non-Detect	0.01	0	7.80 – 7.89	211 - 215

Blackstock DWS Table 8

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

It is a requirement that one water sample be collected every 36 months and tested for the parameters listed in Schedule 24. The next scheduled sample is in 2022.

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Alachlor	Not Required (N/R)	N/R	5	Microgram per Litre (ug/L)	N/R	Agricultural herbicide.
Atrazine + N-dealkylated metabolites	N/R	N/R	5	ug/L	N/R	Agricultural herbicide.
Azinphos-methyl	N/R	N/R	20	ug/L	N/R	Insecticide.
Benzene	N/R	N/R	1	ug/L	N/R	Plastics manufacturing, leaking fuel tanks.
Benzo(a)pyrene	N/R	N/R	0.01	ug/L	N/R	Formed from the incomplete burning of organic matter.
Bromoxynil	N/R	N/R	5	ug/L	N/R	Agricultural herbicide.
Carbaryl	N/R	N/R	90	ug/L	N/R	Agricultural, forestry, household insecticide.

Blackstock DWS Table 8 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Carbofuran	Not Required (N/R)	N/R	90	Microgram per Litre (ug/L)	N/R	Agricultural insecticide.
Carbon Tetrachloride	N/R	N/R	2	ug/L	N/R	Chemical and industrial activities.
Chlorpyrifos	N/R	N/R	90	ug/L	N/R	Agricultural, household insecticide.
Diazinon	N/R	N/R	20	ug/L	N/R	Agricultural, livestock, operation, residential insecticide.
Dicamba	N/R	N/R	120	ug/L	N/R	Agricultural herbicide
1,2-Dichlorobenzene	N/R	N/R	200	ug/L	N/R	Chemical and industrial factories.
1,4-Dichlorobenzene	N/R	N/R	5	ug/L	N/R	Chemical and industrial factories.
1,2-Dichloroethane	N/R	N/R	5	ug/L	N/R	Industrial chemical factories.
1,1-Dichloroethylene (vinylidene chloride)	N/R	N/R	14	ug/L	N/R	Industrial chemical factories.
Dichloromethane	N/R	N/R	50	ug/L	N/R	Pharmaceutical and chemical factories.
2,4-Dichlorophenol	N/R	N/R	900	ug/L	N/R	Industrial contamination, reaction with chlorine.
2,4-Dichlorophenoxy acetic acid (2,4-D)	N/R	N/R	100	ug/L	N/R	Agricultural, residential herbicide.

Blackstock DWS Table 8 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Diclofop-methyl	Not Required (N/R)	N/R	9	Microgram per Litre (ug/L)	N/R	Agricultural herbicide.
Dimethoate	N/R	N/R	20	ug/L	N/R	Agricultural, livestock, operation, residential insecticide.
Diquat	N/R	N/R	70	ug/L	N/R	Agricultural, aquatic herbicide.
Diuron	N/R	N/R	150	ug/L	N/R	Agricultural, industrial herbicide.
Glyphosate	N/R	N/R	280	ug/L	N/R	Agricultural, forestry, household herbicide.
Malathion	N/R	N/R	190	ug/L	N/R	Pest control insecticide.
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	N/R	N/R	100	ug/L	N/R	Agricultural herbicide.
Metolachlor	N/R	N/R	50	ug/L	N/R	Agricultural herbicide.
Metribuzin	N/R	N/R	80	ug/L	N/R	Agricultural herbicide.
Monochlorobenzene	N/R	N/R	80	ug/L	N/R	Industrial and agricultural chemical factories and dry cleaning facilities.
Paraquat	N/R	N/R	10	ug/L	N/R	Agricultural, aquatic herbicide.
Pentachlorophenol	N/R	N/R	60	ug/L	N/R	Pesticide, wood preservative residue.

Blackstock DWS Table 8 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Phorate	Not Required (N/R)	N/R	2	Microgram per Litre (ug/L)	N/R	Agricultural insecticide.
Picloram	N/R	N/R	190	ug/L	N/R	Industrial herbicide.
Polychlorinated Biphenyls(PCB)	N/R	N/R	3	ug/L	N/R	Residue from various industrial uses.
Prometryne	N/R	N/R	1	ug/L	N/R	Agricultural herbicide.
Simazine	N/R	N/R	10	ug/L	N/R	Agricultural herbicide.
Terbufos	N/R	N/R	1	ug/L	N/R	Agricultural insecticide.
Tetrachloroethylene (perchloroethylene)	N/R	N/R	10	ug/L	N/R	Leaching from PVC pipes; discharge from factories; dry cleaners and auto shops (metal degreaser).
2,3,4,6 - Tetrachlorophenol	N/R	N/R	100	ug/L	N/R	Wood preservative.
Triallate	N/R	N/R	230	ug/L	N/R	Agricultural herbicide.
Trichloroethylene	N/R	N/R	5	ug/L	N/R	Metal degreasing sites and other factories.
2,4,6-Trichlorophenol	N/R	N/R	5	ug/L	N/R	Pesticide manufacturing.
Trifluralin	N/R	N/R	45	ug/L	N/R	Agricultural herbicide.
Vinyl Chloride	N/R	N/R	1	ug/L	N/R	Leaching from PVC pipes; discharge from plastics factories.

Blackstock 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