

The Regional Municipality of Durham

Blackstock Drinking Water System 2016 Annual Report

Drinking Water System Number: 220003751

Municipal Drinking Water License 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 2016 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 are available at the Regional Municipality of Durham Headquarters building located at 605 Rossland Road East, Whitby or on the [Region of Durham's website](http://www.durham.ca) at www.durham.ca. Further information on the Drinking Water Regulations can be found on the [Ministry of the Environment and Climate Change's website](http://www.ontario.ca/ministry-environment-and-climate-change) at www.ontario.ca/ministry-environment-and-climate-change.

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 (m³/d). The wells feed a Class One Distribution System. The Blackstock treatment and distribution system are owned and operated by the Regional Municipality of Durham.

The water supply system includes the following four processes:

- Disinfection (sodium hypochlorite),
- Iron sequestering (sodium silicate),
- Water storage/pressurization,
- Distribution.

Raw Water Supply

Water is pumped from one municipal well within Blackstock. 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 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 from Well No. 8 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 6.1 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 (AWQI) in 2016 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 2016.

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

Blackstock DWS Table 2

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	52	Non-Detect (ND)	ND - 1
Treated	2	ND	ND
Distribution	2	ND	ND

Blackstock DWS Table 3

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	154	A	A

Blackstock DWS Table 4

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	54	Non-Detect (ND) - 1
Distribution	74	ND - 4

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	60	0.05 - 0.61	Nephelometric Turbidity Units (NTU)	Turbidity is a measure of particles in water.
Free Chlorine - Plant	Continuous	1.20 - 1.94*	Milligram per Litre (mg/L)	Must be sufficient to ensure disinfection has been achieved.
Free Chlorine - Distribution	Continuous	0.71 - 1.86*	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 Inorganic Parameters Tested Under Schedule 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) - 0.0009	0.006	Milligram per Litre (mg/L)	No	Fire retardants, ceramics, electronics, solder.
Arsenic	5	ND	0.025	mg/L	No	Mining.
Barium	1	0.152	1.0	mg/L	No	Metal refineries, oil drilling.
Boron	1	0.01	5.0	mg/L	No	Industrial.
Cadmium	5	ND	0.005	mg/L	No	Industrial.
Chromium	5	ND	0.05	mg/L	No	Industrial.
Mercury	1	ND	0.001	mg/L	No	Industrial.
Selenium	5	ND	0.01	mg/L	No	Refineries, mines, chemical manufacturing.
Sodium²	4	9.4 - 10.3	20	mg/L	No	Runoff from road salt.
Uranium	1	ND	0.02	mg/L	No	Power generation.
Fluoride	4	0.06 - 0.09	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.

Blackstock 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 2016.

Location Type	Number of Samples	Range of Lead Results Milligram per Litre	MAC	Number of Exceedances	pH	Alkalinity Milligram per Litre
Plumbing	0	N/A	0.01	0	N/A	N/A
Distribution	4	Non-Detect	0.01	0	7.64 - 7.94	214 - 216

Blackstock 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	1	Non-Detect (ND)	5	Microgram per Litre (ug/L)	No	Agricultural herbicide.
Atrazine + N-dealkylated metabolites	1	ND	5	ug/L	No	Agricultural herbicide.
Azinphos-methyl	1	ND	20	ug/L	No	Insecticide.
Benzene	1	ND	5	ug/L	No	Plastics manufacturing, leaking fuel tanks.
Benzo(a)pyrene	1	ND	0.01	ug/L	No	Formed from the incomplete burning of organic matter.
Bromoxynil	1	ND	5	ug/L	No	Agricultural herbicide.
Carbaryl	1	ND	90	ug/L	No	Agricultural, forestry, household insecticide.

Blackstock DWS Table 8 continued

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

Blackstock DWS Table 8 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Diclofop-methyl	1	Non-Detect (ND)	9	Microgram per Litre (ug/L)	No	Agricultural herbicide.
Dimethoate	1	ND	20	ug/L	No	Agricultural, livestock, operation, residential insecticide.
Diquat	1	ND	70	ug/L	No	Agricultural, aquatic herbicide.
Diuron	1	ND	150	ug/L	No	Agricultural, industrial herbicide.
Glyphosate	1	ND	280	ug/L	No	Agricultural, forestry, household herbicide.
Malathion	1	ND	190	ug/L	No	Pest control insecticide.
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	1	ND	100	ug/L	No	Agricultural herbicide.
Metolachlor	1	ND	50	ug/L	No	Agricultural herbicide.
Metribuzin	1	ND	80	ug/L	No	Agricultural herbicide.
Monochlorobenzene	1	ND	80	ug/L	No	Industrial and agricultural chemical factories and dry cleaning facilities.
Paraquat	1	ND	10	ug/L	No	Agricultural, aquatic herbicide.
Pentachlorophenol	1	ND	60	ug/L	No	Pesticide, wood preservative residue.

Blackstock DWS Table 8 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Phorate	1	Non-Detect (ND)	2	Microgram per Litre (ug/L)	No	Agricultural insecticide.
Picloram	1	ND	190	ug/L	No	Industrial herbicide.
Polychlorinated Biphenyls(PCB)	1	ND	3	ug/L	No	Residue from various industrial uses.
Prometryne	1	ND	1	ug/L	No	Agricultural herbicide.
Simazine	1	ND	10	ug/L	No	Agricultural herbicide.
THM - Distribution (annual average)	4	9.8	100	ug/L	No	By-product of chlorination of drinking water.
Terbufos	1	ND	1	ug/L	No	Agricultural insecticide.
Tetrachloroethylene (perchloroethylene)	1	ND	30	ug/L	No	Leaching from PVC pipes; discharge from factories; dry cleaners and auto shops (metal degreaser).
2,3,4,6 - Tetrachlorophenol	1	ND	100	ug/L	No	Wood preservative.
Triallate	1	ND	230	ug/L	No	Agricultural herbicide.
Trichloroethylene	1	ND	5	ug/L	No	Metal degreasing sites and other factories.
2,4,6-Trichlorophenol	1	ND	5	ug/L	No	Pesticide manufacturing.

Blackstock DWS Table 8 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Trifluralin	1	Non-Detect (ND)	45	Microgram per Litre (ug/L)	No	Agricultural herbicide.
Vinyl Chloride	1	ND	2	ug/L	No	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 2016.

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