

The Regional Municipality of Durham

Cannington Drinking Water System 2018 Annual Report

Drinking Water System Number: 220000745

Municipal Drinking Water Licence Number: 003-106

Drinking Water System Owner: The Regional Municipality of Durham

Drinking Water System Category: Large Municipal Residential

This Annual Report for the calendar year 2018 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](http://www.durham.ca) at www.durham.ca. Further information regarding the Drinking Water Regulations can be found on the [Ministry of the Environment, Conservation and Parks website](http://www.ontario.ca/ministry-environment-conservation-parks) at www.ontario.ca/ministry-environment-conservation-parks.

Drinking Water System Process Description

General

The Cannington Drinking Water System provides potable water to consumers in the Community of Cannington in the Township of Brock. Cannington has five municipal wells designated as Well No. 2, Well No. 3, Well No. 4, Well No. 7 and Well No. 8. Well No. 8 in Cannington is classified as groundwater under direct influence of surface water (GUDI) with effective in-situ filtration. Well No. 8 is equipped with an ultraviolet (UV) system to provide the additional disinfection required for a GUDI well. Well No. 4 was taken offline in 2017 due to insufficient contact time. Cannington is a Class One Water Treatment Plant with an approved combined capacity of 2,092 cubic metres per day (m³/d). The Cannington Well Supply System feeds a Class One Distribution System and Class One Trunk Distribution System. The 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),
- Ultraviolet (UV) disinfection (Well No. 8 only),
- Distribution, and
- Water storage.

Raw Water Supply

Water is pumped from five municipal wells. Wells No. 2, 3, 4, 7 and 8 are drilled to depths of 16.76 metre (m), 10.70 m, 21.32 m, 12.2 m and 21.3 m, respectively. Water is delivered to the system by the well pumps.

Disinfection

The raw water is disinfected with sodium hypochlorite. UV treatment provides additional disinfection at Well No. 8. The free chlorine residual, turbidity and ultraviolet transmittance 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 disinfected.

Distribution System

The distribution system delivers treated water through approximately 15 kilometres of watermain and includes a 1,391 cubic metre standpipe for storage and pressure equalization.

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:

Watermain replacement costs (2018 costs) - \$110,000

Tables

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

Cannington Drinking Water System (DWS) Table 1

Summary of all Adverse Water Quality Incidents (AWQI) in 2018 Reported to Spills Action Centre in Accordance with Schedule 16-3 and 16-4 of O. Reg. 170/03.

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
April 10	Lead (Distribution)	0.0146 Milligram per Litre (ug/L)	Flushed, resampled. Results met Ontario Drinking Water Quality Standards.	April 10

Cannington 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	260	Non-Detect (ND) - 12	ND - 500
Treated	4	ND	ND
Distribution	13	ND	ND

Cannington 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	156	Absence (A)	A
Distribution	205	A	A

Cannington 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	160	Non-Detect (ND) - 390
Distribution	116	ND - 32

Cannington 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	260	0.02 - 0.67*	Nephelometric Turbidity Units (NTU)	Turbidity is a measure of particles in water.
Free Chlorine - Plant	Continuous	0.86 - 1.93*	Milligram per Litre (mg/L)	Must be sufficient to ensure disinfection has been achieved.
Free Chlorine - Distribution	Continuous	0.48 - 1.94*	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.

Cannington DWS Table 6

Summary of Additional Testing and Sampling Carried Out in Accordance With the Requirement of an Approval, Order or Other Legal Instrument.

Type of Sample	Parameter	Number of Samples	Result Range	MAC	Unit of Measure
Raw Water	Gross Beta	5	ND	Not Applicable (N/A)	Becquerels per Litre (Bq/L)
Raw Water	Gross Alpha	5	ND - 0.25	N/A	Bq/L
Raw Water	Tritium	5	ND	7,000	Bq/L

Cannington DWS Table 7

Summary of Treated Water Chemical 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	16	Non-Detect (ND) - 0.0006	0.006	Milligram per Litre (mg/L)	No	Fire retardants, ceramics, electronics, solder.
Arsenic	16	ND	0.01	mg/L	No	Mining.
Barium	4	0.029 - 0.058	1.0	mg/L	No	Metal refineries, oil drilling.
Boron	4	0.0091 - 0.0291	5.0	mg/L	No	Industrial.
Cadmium	16	ND	0.005	mg/L	No	Industrial.
Chromium	16	ND	0.05	mg/L	No	Industrial.
Haloacetic acids - Distribution (annual average)	4	ND	80	Microgram per Litre (ug/L)	No	By-product of chlorination of drinking water.
Mercury	4	ND	0.001	mg/L	No	Industrial.
Selenium	16	ND - 0.0006	0.05	mg/L	No	Refineries, mines, chemical manufacturing.
Sodium	12	3.8 - 43.2	Not Applicable ²	mg/L	Yes (7) ³	Storm water runoff including road salt.
Trihalomethane - Distribution (annual average)	4	13.1	100	ug/L	No	By-product of chlorination of drinking water.
Uranium	4	ND - 0.0007	0.02	mg/L	No	Power generation.
Fluoride	12	ND	1.5	mg/L	No	Mining
Nitrite	12	ND	1.0	mg/L	No	Agriculture runoff, landfill leachate and animal waste.
Nitrate	12	1.95 – 3.80	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.

3 Number in parenthesis represents number of exceedance(s). For Sodium, regulations require reporting when results exceed 20 mg/L if it has not been reported in the preceding 57 months.

Cannington DWS Table 8

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

No plumbing samples were required to be taken in 2018.

Location Type	Number of Samples	Range of Lead Results Milligram per Litre	MAC	Number of Exceedences	pH	Alkalinity Milligram per Litre
Plumbing	0	Not Applicable (N/A)	0.01	0	N/A	N/A
Distribution	4	Non-Detect - 0.0146	0.01	1	7.21 - 7.31	222 - 298

Cannington DWS Table 9

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	4	Non-Detect (ND)	5	Microgram per Litre (ug/L)	No	Agricultural herbicide.
Atrazine + N-dealkylated metabolites	4	ND	5	ug/L	No	Agricultural herbicide.
Azinphos-methyl	4	ND	20	ug/L	No	Insecticide.
Benzene	16	ND	1	ug/L	No	Plastics manufacturing, leaking fuel tanks.
Benzo(a)pyrene	4	ND	0.01	ug/L	No	Formed from the incomplete burning of organic matter.
Bromoxynil	4	ND	5	ug/L	No	Agricultural herbicide.
Carbaryl	4	ND	90	ug/L	No	Agricultural, forestry, household insecticide.

Cannington DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Carbofuran	4	Non-Detect (ND)	90	Microgram per Litre (ug/L)	No	Agricultural insecticide.
Carbon Tetrachloride	16	ND	2	ug/L	No	Chemical and industrial activities.
Chlorpyrifos	4	ND	90	ug/L	No	Agricultural, household insecticide.
Diazinon	4	ND	20	ug/L	No	Agricultural, livestock, operation, residential insecticide.
Dicamba	4	ND	120	ug/L	No	Agricultural herbicide
1,2-Dichlorobenzene	16	ND	200	ug/L	No	Chemical and industrial factories.
1,4-Dichlorobenzene	16	ND	5	ug/L	No	Chemical and industrial factories.
1,2-Dichloroethane	16	ND	5	ug/L	No	Industrial chemical factories.
1,1-Dichloroethylene (vinylidene chloride)	16	ND	14	ug/L	No	Industrial chemical factories.
Dichloromethane	16	ND	50	ug/L	No	Pharmaceutical and chemical factories.
2,4-dichlorophenol	4	ND	900	ug/L	No	Industrial contamination, reaction with chlorine.
2,4-Dichlorophenoxy acetic acid (2,4-D)	4	ND	100	ug/L	No	Agricultural, residential herbicide.

Cannington DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Diclofop-methyl	4	Non-Detect (ND)	9	Microgram per Litre (ug/L)	No	Agricultural herbicide.
Dimethoate	4	ND	20	ug/L	No	Agricultural, livestock, operation, residential insecticide.
Diquat	4	ND	70	ug/L	No	Agricultural, aquatic herbicide.
Diuron	4	ND	150	ug/L	No	Agricultural, industrial herbicide.
Glyphosate	4	ND	280	ug/L	No	Agricultural, forestry, household herbicide.
Malathion	4	ND	190	ug/L	No	Pest control insecticide.
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	4	ND	100	ug/L	No	Agricultural herbicide.
Metolachlor	4	ND	50	ug/L	No	Agricultural herbicide.
Metribuzin	4	ND	80	ug/L	No	Agricultural herbicide.
Monochlorobenzene	16	ND	80	ug/L	No	Industrial and agricultural chemical factories and dry cleaning facilities.
Paraquat	4	ND	10	ug/L	No	Agricultural, aquatic herbicide.

Cannington DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Pentachlorophenol	4	Non-Detect (ND)	60	Microgram per Litre (ug/L)	No	Pesticide, wood preservative residue.
Phorate	4	ND	2	ug/L	No	Agricultural insecticide.
Picloram	4	ND	190	ug/L	No	Industrial herbicide.
Polychlorinated Biphenyls(PCB)	4	ND	3	ug/L	No	Residue from various industrial uses.
Prometryne	4	ND	1	ug/L	No	Agricultural herbicide.
Simazine	4	ND	10	ug/L	No	Agricultural herbicide.
Terbufos	4	ND	1	ug/L	No	Agricultural insecticide.
Tetrachloroethylene (perchloroethylene)	16	ND	10	ug/L	No	Leaching from PVC pipes; discharge from factories; dry cleaners and auto shops (metal degreaser).
2,3,4,6 - Tetrachlorophenol	4	ND	100	ug/L	No	Wood preservative.
Triallate	4	ND	230	ug/L	No	Agricultural herbicide.
Trichloroethylene	16	ND - 1.4	5	ug/L	No	Metal degreasing sites and other factories.

Cannington DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
2,4,6-Trichlorophenol	4	Non-Detect (ND)	5	Microgram per Litre (ug/L)	No	Pesticide manufacturing.
Trifluralin	4	ND	45	ug/L	No	Agricultural herbicide.
Vinyl Chloride	16	ND	1	ug/L	No	Leaching from PVC pipes; discharge from plastics factories.

Cannington DWS Table 10

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 2018.

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