



2018 Annual Drinking Water System Report

Waterford Drinking Water System

1. Introduction

The Corporation of Norfolk County has prepared this report to satisfy the requirements of Section 11 of Ontario Regulation (O. Reg.) 170/03. This annual report must be prepared no later than February 28 of each year.

This report covers the period from January 1, 2018 to December 31, 2018, and the information provided complies with the reporting requirements of O. Reg. 170/03 Section 11.

A summary of Waterford's Municipal Drinking Water System is outlined below:

Drinking Water System Number: 220000905

Drinking Water System Name: Waterford Drinking Water System

Drinking Water System Owner: Corporation of Norfolk County

Drinking Water System Category: Large Municipal Residential

2. Reporting Requirements under Section 11 – O. Reg. 170/03

Section 11 requires that the report include the following information relating to the period covered by the report. This includes:

- A statement of where a report prepared under Schedule 22 will be available for inspection by any member of the public during normal business hours without charge.
- A brief description of the drinking water system, including a list of water treatment chemicals used.
- Any major expenses incurred to install, repair or replace required equipment.



- A summary of any reports made to the Ministry of Environment, Conservation and Parks (MECP) for Adverse Water Quality Incidents (AWQI's).
- A summary of the results of tests performed under O. Reg. 170/03, an approval, the municipal drinking water licence or an order, including an Ontario Water Resources Act (OWRA) order.
- To describe any corrective actions taken

3. Evidence of Compliance

Availability of the Annual Report

In accordance with Section 11 O. Reg. 170/03, a copy of the annual report will be posted for each system by the end of February each year on the Norfolk County web site at norfolkcounty.ca. A Summary Report on regulatory compliance is required annually under Schedule 22 of Regulation 170/03 for each municipal drinking water system. This report summarizes any known failures to meet the requirements of the Safe Drinking Water Act, its duration and corrective measures. The reports are presented to Norfolk County Council for acceptance before March 31st each year. The reports are made available to the public in April on the Norfolk County web site noted above or by request from the Environmental Services Department. A copy of the annual report is available to the public, free of charge at the following locations as well:

183 Main Street of Delhi, Delhi, ON

50 Colborne St., Simcoe, ON

185 Robinson St., Simcoe, ON

22 Albert St., Langton, ON

Description of the Municipal Drinking Water System

The Waterford Drinking Water System is a well-based supply consisting of two groundwater well sources, an iron and manganese removal plant, a reservoir and a water standpipe. The water system supplies drinking water to a community of approximately 3,300 residents.



The water distribution system includes a 3,160 m³ water standpipe, which acts as a reservoir when the system requires larger amounts of water than the wells can supply (such as firefighting and peak flows) and also helps to maintain a constant system pressure. There are approximately 170 fire hydrants and approximately 30,200 meters of water main and transmission main ranging in size from 150mm to 300mm in diameter. The piping material consists of Asbestos-Cement, Polyvinyl Chloride (PVC) and Ductile Iron.

Water Treatment Chemicals

The following water treatment chemicals were used during the reporting period:

- Sodium Hypochlorite
- Sodium Permanganate
- Poly Aluminum Chloride

Significant Expenses Incurred

A brief summary of the major expenses incurred during the reporting period to install, repair or replace required equipment, and value of each, is included in Table 1.

Table 1 – Summary of Expenses Incurred

Activity	Cost Incurred (2018)
Well Rehabilitation	\$33,600.00
General Operations Maintenance and Repair in Water Treatment Plants and Distribution System	\$54,000.00

4. Microbiological Testing

E. coli and Total Coliform

As per Schedule 10 of O. Reg. 170/03 – Microbiological Sampling and Testing, bacteriological tests for *E. coli* and total coliforms were performed weekly on the raw and treated water at the facilities and in the distribution system. The results from the 2018 sampling program for the Waterford Drinking Water System are shown in the table below.



Location	Number of Samples	Range of E.coli Or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)
Raw Well No. 3	47	0 – 3	0 - 0
Raw Well No. 4	52	0 – 0	0 - 0
Treated	52	0 – 0	0 - 0
Distribution	167	0 – 0	0 - 0

Heterotrophic Plate Count (HPC)

As per Schedule 10 of O. Reg. 170/03 - Microbiological Sampling and Testing, HPC analyses are required from the treated and distribution water. HPC tests are required weekly for treated water and for twenty five percent of the required distribution system bacteriological samples. Results over 500 colonies per 1 mL may indicate a change in water quality but is not considered an indicator of unsafe drinking water. The results from the 2018 HPC sampling program for the Waterford Drinking Water System are shown in the table below.

Location	Number of Samples	Number of HPC Samples	Range of HPC Results (min #)-(max #)
Treated	52	52	<10 - 70
Distribution	167	55	<10 - 60

5. Chemical Testing

The Safe Drinking Water Act requires periodic testing of the water for sixty different chemical parameters. The latest results for these parameters are provided in Appendix A. The sampling frequency varies for the different types of water systems. If the concentration of the parameter is found to be above half of the Maximum Allowable Concentration (MAC) under the Ontario Drinking Water Quality Standards, an increased testing frequency of once every three months is required by Regulation. No additional testing is required for the Waterford Drinking Water System.



6. Operational Monitoring

Operational checks including raw and treated water turbidity and treated and distribution free chlorine was conducted in accordance with Schedule 7 of Reg. O. 170/03.

Turbidity

The turbidity of the treated water is monitored continuously at each treatment plant; the turbidity of the raw water is checked on a weekly basis. Turbidity is measured in Nephelometric Turbidity Units (NTU). Under O. Reg. 170/03 turbidity in groundwater is not reportable, however at it's desirable to have it <1NTU at the treatment plant and <5NTU in the distribution system. A summary of the 2018 turbidity monitoring results are provided in the table below.

Location	Number of Grab Samples	Range of Results	Unit of Measure
Well #3 Raw	49	0.06 – 0.27	NTU
Well #4 Raw	53	0.06 – 0.26	NTU
Turbidity Filter 1	8760	0.01 – 0.22	NTU
Turbidity Filter 2	8760	0.01 – 0.26	NTU
Turbidity Filter3	8760	0.01 – 0.25	NTU

Chlorine Residual

In accordance with Schedule 7 of O. Reg. 170/03, free chlorine residuals in the treated water are monitored continuously at the point of entry to the distribution system at all water treatment plants and wells. The free chlorine in the water distribution system must be above 0.05 mg/L, if it is below this, it must be reported and corrective actions taken. The results from the 2018 chlorine residual monitoring program for the Waterford Drinking Water System are shown in the table below.

Location	Number of Grab Samples	Range of Results	Unit of Measure
Chlorine at WTP	8760	0.57 – 1.88	mg/L
Chlorine Residual Distribution System	484	0.15 – 1.80	mg/L



7. Adverse Results

In accordance with Schedule 16 – Reporting of Adverse Test Results and Other Problems of O. Reg. 170/03, there was one Adverse Water Quality Incident (AWQI) issued for the Waterford Drinking Water System. The following table describes the date the adverse occurred, the parameter, the result, the corrective action taken and the corrective action date.

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
June 16, 2018	Observation of Adverse	The operator performing weekend rounds at the water treatment plant noticed that the chlorine analyser had been placed on hold since the previous day.	Not Applicable	The ORO directed the operator to check the distribution system residuals and reviewed trends to confirm that chemical had been used and was not under or overdosed in the twenty four hour period. Samples were collected and all samples that were taken met the MECP Guidelines	June 16, 2018



Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
				and no further action was required.	
July 9, 2018	Boil Water Advisory	The contractor broke the watermain while working on the sanitary sewer main on the Temperance St. reconstruction project.	N/A	The MOH issued a boil water advisory and the operators isolated the affected area, flushed the system and chlorine residuals were checked. Samples were taken at the adverse location, and all samples that were taken met the MECP Guidelines and no further action was required.	July 12, 2018



APPENDIX A: SUMMARY OF CHEMICAL RESULTS

UNDERSTANDING CHEMICAL TEST RESULTS

The following tables summarize the laboratory results of the chemical testing Norfolk County is required to complete. Different parameters are required to be tested for at different frequencies as noted below. Results are shown as concentrations with units of either milligrams per litre (mg/L) or micrograms per litre (ug/L). 1 mg/L is equal to 1000 ug/L. The Maximum Acceptable Concentration (MAC) is the highest amount of a parameter that is acceptable in Municipal drinking water and can be found in the MOECC Drinking Water Standards. The Method Detection Limit (MDL) is the lowest amount to which the laboratory can confidently measure. There were no additional testing or sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

The following tables summarize the Inorganic parameters tested for during the reporting period or the most recent sample results for the Waterford Drinking Water System.

Waterford Filtration Plant

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	15/05/2018	0.02	ug/L	No
Arsenic	15/05/2018	0.2<MDL	ug/L	No
Barium	15/05/2018	106	ug/L	No
Boron	15/05/2018	24	ug/L	No
Cadmium	15/05/2018	0.003<MDL	ug/L	No
Chromium	15/05/2018	0.10	ug/L	No
Lead	Exempt			
Mercury	15/05/2018	0.01<MDL	ug/L	No
Selenium	15/05/2018	0.04<MDL	ug/L	No
Sodium	03/06/2015	16.9	mg/L	No
Uranium	03/06/2015	0.464	ug/L	No
Fluoride	15/05/2018	0.14	mg/L	No
Nitrite	16/02/2018	0.003<MDL	mg/L	No
	15/05/2018	0.003<MDL	mg/L	No
	20/08/2018	0.003<MDL	mg/L	No
	14/11/2018	0.003<MDL	mg/L	No



Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Nitrate	16/02/2018	0.160	mg/L	No
	15/05/2018	0.169	mg/L	No
	20/08/2018	0.006<MDL	mg/L	No
	14/11/2018	0.006<MDL	mg/L	No

The following tables summarize the Organic parameters tested for during the reporting period or the most recent sample results for the Waterford Drinking Water System.

Waterford Filtration Plant

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	15/05/2018	0.02<MDL	ug/L	No
Atrazine + N-dealkylated metabolites	15/05/2018	0.01<MDL	ug/L	No
Azinphos-methyl	15/05/2018	0.05<MDL	ug/L	No
Benzene	15/05/2018	0.32<MDL	ug/L	No
Benzo(a)pyrene	15/05/2018	0.004<MDL	ug/L	No
Bromoxynil	15/05/2018	0.33<MDL	ug/L	No
Carbaryl	15/05/2018	0.05<MDL	ug/L	No
Carbofuran	15/05/2018	0.01<MDL	ug/L	No
Carbon Tetrachloride	15/05/2018	0.16<MDL	ug/L	No
Chlorpyrifos	15/05/2018	0.02<MDL	ug/L	No
Diazinon	15/05/2018	0.02<MDL	ug/L	No
Dicamba	15/05/2018	0.20<MDL	ug/L	No
1,2-Dichlorobenzene	15/05/2018	0.41<MDL	ug/L	No
1,4-Dichlorobenzene	15/05/2018	0.36<MDL	ug/L	No
1,2-Dichloroethane	15/05/2018	0.35<MDL	ug/L	No
1,1-Dichloroethylene (vinylidene chloride)	15/05/2018	0.33<MDL		
Dichloromethane	15/05/2018	0.35<MDL	ug/L	No
2,4-Dichlorophenol	15/05/2018	0.15<MDL	ug/L	No
2,4-	15/05/2018	0.19<MDL	ug/L	No



Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Dichlorophenoxy acetic acid (2,4-D)				
Diclofop-methyl	15/05/2018	0.40<MDL	ug/L	No
Dimethoate	15/05/2018	0.03<MDL	ug/L	No
Diquat	15/05/2018	1<MDL	ug/L	No
Diuron	15/05/2018	0.03<MDL	ug/L	No
Glyphosate	15/05/2018	1<MDL	ug/L	No
Malathion	15/05/2018	0.02<MDL	ug/L	No
MCPA	15/05/2018	0.00012<MDL	mg/L	No
Metolachlor	15/05/2018	0.01<MDL	ug/L	No
Metribuzin	15/05/2018	0.02<MDL	ug/L	No
Monochlorobenzene	15/05/2018	0.3<MDL	ug/L	No
Paraquat	15/05/2018	1<MDL	ug/L	No
Pentachlorophenol	15/05/2018	0.15<MDL	ug/L	No
Phorate	15/05/2018	0.01<MDL	ug/L	No
Picloram	15/05/2018	1<MDL	ug/L	No
Polychlorinated Biphenyls(PCB)	15/05/2018	0.04<MDL	ug/L	No
Prometryne	15/05/2018	0.03<MDL	ug/L	No
Simazine	15/05/2018	0.01<MDL	ug/L	No
THM Annual Average 32.3 ug/L	16/02/2018	25	ug/L	No
	15/05/2018	20	ug/L	No
	20/08/2018	40	ug/L	No
	14/11/2018	40	ug/L	No
Terbufos	15/05/2018	0.01<MDL	ug/L	No
Tetrachloroethylene	15/05/2018	0.35<MDL	ug/L	No
2,3,4,6-Tetrachlorophenol	15/05/2018	0.20<MDL	ug/L	No
Triallate	15/05/2018	0.01<MDL	ug/L	No
Trichloroethylene	15/05/2018	0.44<MDL	ug/L	No
2,4,6-Trichlorophenol	15/05/2018	0.25<MDL	ug/L	No
Trifluralin	15/05/2018	0.02<MDL	ug/L	No
Vinyl Chloride	15/05/2018	0.17<MDL	ug/L	No



The following table summarizes the lead testing as set out in Schedule 15.1 of O. Reg. 170/03 during the reporting period.

Location Type	Number of Samples	Range of Lead Results (min#) – (max #)	Number of Exceedances
Plumbing	Exempt		
Distribution	12/03/2018 02/10/2018	0.29 – 0.54 0.37 – 0.69	No No