



Drinking Water Systems Regulation (O. Reg. 170/03)

2018 Annual Report

Drinking-Water System Number: 260002473
Drinking-Water System Name: City of Waterloo Distribution System
Drinking-Water System Owner: City of Waterloo
Drinking-Water System Category: Large Municipal Residential
Period being reported: January 1, 2018 – December 31, 2018

For Large Municipal Residential Systems:

Does your Drinking-Water System serve more than 10,000 people?

Yes [X]

No []

Is your annual report available to the public at no charge on a web site on the Internet?

Yes [X]

No []

Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection:

- Available on the City website at www.waterloo.ca or by calling City Utilities, Customer Service at (519) 886-2310 ext.30239

1. List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
None	N/A

2. Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

Yes [] No [] N/A [X]

3. Indicate how you notified system users that your annual report is available, and is free of charge:

- [X] Public access/notice via the web
- [X] Public access/notice via Government Office
- [X] Public access/notice via a newspaper

4. Describe your Drinking-Water System:

The City of Waterloo owns the water distribution system; City Utilities Division is responsible for the operation of the Class 1 water distribution system, including pipes, valves, and hydrants. The City's water distribution system serves a population of 137,420 people (end of 2017 estimated by the Region of Waterloo). The population figure includes temporary non-resident students (25,940) and is based on the Region of Waterloo's 2017 Year-End Population and Household Estimates report. The water distribution system consists of the following (2017 data):

- 433.97 kilometres of distribution main
- 30,770 water connections (active accounts)
- 2,490 hydrants (not including private hydrants)
- 4,806 valves (not including curbstop service valves, or control valves)

The City of Waterloo's distribution system dates back to 1899; extensive replacement and extension of the distribution system has occurred since that time. The water distribution system watermains range in size from 25 mm to 450 mm in diameter and are constructed of cast iron, ductile iron, asbestos-cement (AC), high-density-polyethylene (HDPE) or polyvinyl chloride (PVC). Any alteration to the City's distribution system requires completion of the Form 1 - Record of Watermains Authorized as a Future Alteration.

There are eight kilometres of dual mains (owned by both the City of Waterloo and the Regional Municipality of Waterloo) that function as both transmission and distribution. The dual mains are shared with the Regional Municipality of Waterloo (RMOW) but are maintained by City of Waterloo, City Utilities. Any alterations to dual mains require completion of the Form 1 under the Drinking Water Works Permit by the initiating municipality, and the Form 1 is to be signed off by both the City of Waterloo and the RMOW. The role of Overall Responsible Operator for dual mains is the responsibility of the City of Waterloo.

The City of Waterloo's distribution system does not provide treatment to the water; therefore, there is no chlorine boosting, ultraviolet (UV) irradiation, secondary disinfection, and pressure boosting or pressure control within the control of the water distribution system. The Region of Waterloo is responsible for the water supply and water treatment. The City shares responsibility with the Region to regularly test water and ensure that the standards set out by the Ontario Ministry of the Environment, Conservation and Parks (MECP) are being met or exceeded.

Scheduled flushing is performed at City's locations identified as possible candidates for experiencing problems with maintaining acceptable chlorine residuals which could result in unsafe drinking water. There are 31 scheduled flushing locations in the distribution system. All of the flushing locations are checked and tested at least once per month; locations where a possible decay in chlorine residuals is suspected are tested two to four times per month.

Drinking Water Systems Regulation (O. Reg. 170/03)

The water distribution system also provides source distribution to neighbourhoods in three adjacent municipalities: the City of Kitchener's community of River Ridge; the Township of Woolwich's commercial development at the St. Jacobs Outlets; and, the Community of St. Agatha within the Wilmot Township. The City of Waterloo does not provide treatment to the water, boost pressure or operate the distribution systems in either of these neighbourhoods.

5. List all water treatment chemicals used over this reporting period:

Water treatment is the responsibility of the Region of Waterloo. The Region of Waterloo reports all the treatment chemicals used via their annual Water Quality Reports for the Integrated Urban System. The City of Waterloo disinfects all parts, material and pipe during new installation and repair work using NSF 60 rated chlorine solution.

6. Were any significant expenses incurred to:

- Install required equipment
- Repair required equipment
- Replace required equipment

7. Please provide a brief description and a breakdown of monetary expenses incurred:

- Repair and maintenance of the distribution system (operating) = \$1,323,557
- Replacement of watermains and valves (capital) = \$1,341,000

8. Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre:

AWQI#	Parameter	Incident Date	Result	Unit of Measure	Corrective Action	Corrective Action Date
138733	Lead - Distribution	February 13, 2018	22.7	µg/L	<ul style="list-style-type: none"> • Flushed main • Resampled 	February 13, 2018
138734	Lead - Distribution	February 13, 2018	41.4	µg/L	<ul style="list-style-type: none"> • Flushed main • Resampled 	February 13, 2018
140413	Total Coliforms	July 11, 2018	P	P ~ A	<ul style="list-style-type: none"> • Flushed site, main, upstream and downstream locations • Re-sampled adverse site • Sampled upstream and downstream locations 	July 13, 2018

Drinking Water Systems Regulation (O. Reg. 170/03)

AWQI#	Parameter	Incident Date	Result	Unit of Measure	Corrective Action	Corrective Action Date
140801	Total Coliforms	July 18, 2018	P	P ~ A	<ul style="list-style-type: none"> Flushed site, main, upstream and downstream locations Re-sampled adverse site Sampled upstream and downstream locations 	July 20, 2018
141468	Chlorine Residuals	August 9, 2018	TCR = 0.21 FCR = 0.02 CCR = 0.19	mg/L	<ul style="list-style-type: none"> Flushed mains Resampled 	August 9, 2018
142090	Total Coliforms in Temporary Watermain	August 23, 2018	P	P ~ A	<ul style="list-style-type: none"> Flushed site, temporary main, upstream and downstream locations Re-sampled adverse site Sampled upstream and downstream locations 	August 24, 2018
142497	Total Coliforms in Temporary Watermain	September 1, 2018	P	P ~ A	<ul style="list-style-type: none"> Flushed site, temporary main and upstream locations Re-sampled adverse site Sampled upstream locations 	September 2, 2018
142579	Total Coliforms in Temporary Watermain	September 6, 2018	P	P ~ A	<ul style="list-style-type: none"> Flushed site, temporary main, upstream and downstream locations Re-sampled adverse site Sampled upstream and downstream locations 	September 7, 2018
142791 142836	Total Coliforms in Temporary Watermain	September 13, 2018 September 14, 2018	P	P ~ A	<ul style="list-style-type: none"> Flushed site, temporary main, upstream and downstream locations Re-sampled adverse site Sampled upstream and downstream locations Achieved two consecutive successful samples 	September 30, 2018

Drinking Water Systems Regulation (O. Reg. 170/03)

AWQI#	Parameter	Incident Date	Result	Unit of Measure	Corrective Action	Corrective Action Date
142863 142871 142887 143042 143145 143155 143208 143267	Total Coliforms in Temporary Watermain	September 15, 2018 September 16, 2018 September 18, 2018 September 20, 2018 September 22, 2018 September 23, 2018 September 25, 2018 September 28, 2018	Ranged from 1-8	CFU/100mL	<ul style="list-style-type: none"> Flushed site, temporary main, upstream and downstream locations Re-sampled adverse site Sampled upstream and downstream locations Achieved two consecutive successful samples 	September 30, 2018
143135 143150	Total Coliforms	September 21, 2018 September 22, 2018	P	P ~ A	<ul style="list-style-type: none"> Flushed site, main, upstream and downstream locations Re-sampled adverse site Sampled upstream and downstream locations 	September 27, 2018
143607	Chlorine Residuals	October 18, 2018	TCR = 0.26 FCR = 0.04 CCR = 0.22	mg/L	<ul style="list-style-type: none"> Flushed mains Resampled 	October 18, 2018

A=Absent
P=Present

TCR=Total Chlorine Residual
FCR=Free Chlorine Residual

CCR=Combine Chlorine Residual

9. Microbiological testing done under the Schedule 10 of Regulation 170/03, during this reporting period:

Sample Source	Number of Samples	Range of E.Coli or Fecal Results (min - max)	Range of Total Coliform Results (min - max)	Number of HPC Samples	Range of HPC Results (min - max)
Distribution	1523	0 and Absent	Absent - Present	507	0 - 501 CFU/mL

CFU=Colony forming units

10. Operational testing done under Schedule 7 of Regulation 170/03 during the period covered by this Annual Report:

Parameter	Number of Grab Samples	Range of Results (min - max)	Unit
Total Chlorine	2838	0.21 - 1.99	mg/L
Free Chlorine	2838	0.00 - 1.37	mg/L

Drinking Water Systems Regulation (O. Reg. 170/03)
11. Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument:

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
N/A				

12. Summary of Inorganic parameters tested during this reporting period or the most recent sample results:

Parameter	Sample Date	Result Value Range (min - max)	Unit of Measure	Number of Exceedances
Alkalinity	89 Samples between January 1 and December 31, 2018	183 - 354	mg/L	0
pH	210 Samples between January 1 and December 31, 2018	7.1 - 7.8	pH	0

13. Summary of lead testing under Schedule 15.1 during this reporting period:

Location Type	Number of Samples	Range of Lead Results (min#) - (max #)	Unit of Measure	Number of Exceedances
Plumbing	240	ND - 41.2	µg/L	2
Distribution	88	ND - 41.4	µg/L	2

14. Summary of Organic parameters sampled during this reporting period or the most recent sample results:

Parameter	Sample Date	Result Value	Unit of Measure	Number of Exceedances
HAA (NOTE: year-end running average)	9 samples between January 9 and October 31, 2018	10.03	µg/L	0
THM (NOTE: year-end running average)	February 6, 2018 May 9, 2018 August 1, 2018 October 25, 2018	12.49	µg/L	0

15. List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards:

Parameter	Result Value	Unit of Measure	Date of Sample
Lead	7.27	µg/L	February 5, 2018
Lead	22.7	µg/L	February 7, 2018
Lead	41.4	µg/L	February 8, 2018