



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

Appendix 'A' – 2021 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, 2021 – December 31, 2021

For Large Municipal Residential Systems:

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

Yes

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

Yes

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?

N/A

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

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

4. Describe your Drinking-Water System:

The City of Waterloo owns the water distribution system; City Utilities is responsible for the operation of the Class 1 water distribution system, including pipes, valves, and hydrants. According to the Region of Waterloo 2020 Year End Population Estimates, the City's water distribution system serves a population of 147,350 people, including temporary non-resident students (30,820). The water distribution system consists of the following (2020 data):

- 436.7 kilometres of distribution main
- 31,362 water connections (active accounts)
- 2,531 hydrants (not including private hydrants)
- 4,947 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 7.9 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 Environment, Conservation and Parks are being met or exceeded.

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 these neighbourhoods.

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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) = \$1,466,269
- Replacement of watermains and valves (capital) = \$3,437,000

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 Resolution Date
153468	Sodium	2021-01-21	52.8	mg/L	• Flush and resample	2021-01-29
154106	Total Coliform	2021-05-20	P	P/A	• Flush temporary main; resample adverse, upstream and downstream sites	2021-05-25
154273	Lead – Private Plumbing	2021-06-07	19.1 747	µg/L	• Notify PHU, resident, provide ROW FAQ letter; resample	2021-06-15
154647	Total Coliform	2021-07-13	P	P/A	• Flush temporary main; resample adverse, upstream and downstream sites	2021-07-16
154777	Total Coliform	2021-07-20	P	P/A	• Flush and resample adverse site; flush nearby hydrant; resample upstream and downstream sites	2021-07-23
154863	Total Coliform	2021-07-27	P	P/A	• Flush temporary main; resample adverse, upstream and downstream sites	2021-07-30

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AWQI#	Parameter	Incident Date	Result	Unit of Measure	Corrective Action	Corrective Action Resolution Date
154909	Chlorine Residual	2021-07-30	TCR=0.12 FCR=0.01 CCR=0.11	mg/L	• Flush and resample adverse site; flush and resample downstream hydrant	2021-07-30
155012	Chlorine Residual	2021-08-10	TCR=0.12 FCR=0.01 CCR=0.12	mg/L	• Flush and resample adverse site; flush and resample downstream hydrant	2021-08-12
155612	Total Coliform	2021-09-22	TCR=0.12 FCR=0.01 CCR=0.13	mg/L	• Flush temporary main; resample adverse and upstream sites (no downstream site available)	2021-09-24
155764	Lead – Private Plumbing	2021-09-28	40.7	µg/L	• Notify PHU, resident, provide ROW FAQ letter; resample	2021-10-06

A=Absent
P=Present

TCR=Total Chlorine Residual
FCR=Free Chlorine Residual

CCR=Combine Chlorine Residual
PHU = Region of Waterloo Public Health Unit

BWA = Boil Water Advisory
SAC = Spills Action Centre

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	1786	Absent 0	Absent - Present 0	486	0 - 500 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	3329	0.12 – 1.99	mg/L
Free Chlorine	3329	0 – 0.45	mg/L
Turbidity	1	2.9	NTU

NTU= Nephelometric Turbidity Units

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
Antimony	1 Sample on January 21, 2021 6 Samples on June 7, 2021	ND - 2.11	µg/L	0
Arsenic	1 Sample on January 21, 2021 6 Samples on June 7, 2021	0.24 – 1.17	µg/L	0
Barium	1 Sample on January 21, 2021 6 Samples on June 7, 2021	0.095 – 0.13	µg/L	0
Cadmium	1 Sample on January 21, 2021 6 Samples on June 7, 2021	ND	µg/L	0
Fluoride	-	-	-	-
Lead – Distribution*	3 samples taken June 7, 2021	0.23 - 9.56	µg/L	0
Lead – Plumbing*	7 samples taken June 7, 2021	0.35 – 747	µg/L	2
Mercury	-	-	-	-
Nitrate	-	-	-	-
Nitrite	-	-	-	-
Selenium	1 Sample on January 21, 2021 6 Samples on June 7, 2021	ND – 0.203	µg/L	0
Sodium	1 Sample on January 21, 2021 1 Sample on January 27, 2021	50.9 – 52.8	mg/L	1
Uranium	1 Sample on January 21, 2021 6 Samples on June 7, 2021	0.88 – 0.96	µg/L	0

* Lead samples taken outside of mandated timeframe as per Schedule 15.1

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***	22	0.27 - 40.7	µg/L	1
Distribution***	24	ND – 2.15	µg/L	0

** Schedule 15.1 samples taken December 15 to April 15 and June 15 to October 15. Lead samples taken outside these mandated timeframes are reported in section 12 above

***Due to the COVID-19 pandemic, regulatory relief from Schedule 15.1 residential sampling requirements was granted by the Ministry of Environment, Conservation and Parks

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)	January 26, 2021 April 27, 2021 July 14, 2021 October 19, 2021	5.0	µg/L	0
THM (NOTE: year-end running average)	January 26, 2021 April 27, 2021 July 27, 2021 October 26, 2021	18.7	µg/L	0
NDMA	May 31, 2021 August 16, 2021 October 26, 2021	0.001 0.001 0.001	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 – Private Plumbing	19.1	µg/L	2021-06-07
Lead – Private Plumbing	747	µg/L	2021-06-07
Lead – Distribution	9.56	µg/L	2021-06-07
Lead – Private Plumbing	5.31	µg/L	2021-09-28
Lead – Private Plumbing	9.8	µg/L	2021-09-28
Lead – Private Plumbing	40.7	µg/L	2021-09-28