



STAFF REPORT
City Utilities

Title: 2023 Drinking Water Annual and Summary Reports
Report Number: IPPW2024-007
Author: Jaclyn Varga
Council Date: February 26, 2024
File: N/A
Attachments: Appendix A: 2023 Annual Report; Appendix B: 2023 Summary Report
Ward No.: All

Recommendations:

1. That Council receives the 2023 Annual and Summary Reports pursuant to Ontario Regulation 170/03 of the *Safe Drinking Water Act, 2002*.
2. That Council approves IPPW2024-007.

A. Executive Summary

The 2023 Annual and Summary Reports have been prepared in accordance with the *Safe Drinking Water Act (2002)* and must be received by Council.

The 2023 Annual Report (Appendix A) must be prepared not later than February 28, 2024 and must include a brief description of the drinking water system, a summary of adverse water quality results, a summary of results of required tests, a description of corrective actions taken, a description of major expenses incurred, and the location of the Summary Report.

In addition to the Annual Report, a Summary Report (Appendix B) must also be prepared and provided to the owner of the drinking water system not later than March 31, 2024. The Summary Report includes information regarding applicable legislation, a statement of compliance, including a summary of latest inspection results, and a summary of water consumption and flow rates.

B. Financial Implications

None

C. Technology Implications

None

D. Link to Strategic Plan

(Strategic Priorities: Reconciliation, Equity, Accessibility, Diversity and Inclusion; Environmental Sustainability and Climate Action; Complete Community; Infrastructure and Transportation Systems; Innovation and Future-Ready)

(Guiding Principles: Equity and Inclusion; Sustainability; Integrity; Workplace Wellbeing; Community-centred; Operational Excellence)

The Annual and Summary Reports provide assurances to the City of Waterloo's owner and its customers that safe, high quality water is being provided; this supports the strategic priorities of Infrastructure and Transportation Systems and the guiding principles of Operational Excellence.

E. Previous Reports on this Topic

A report has been sent to Council every year since 2003; the most recent report is IPPW2023-003.



2023 Drinking Water Annual and Summary Reports IPPW2024-007

2023 Annual Report

The 2023 Annual Report, attached in Appendix A, has been prepared in accordance with the terms and requirements set out in the Safe Drinking Water Act (2002), Ontario Regulation 170/03, Section 11. It covers the period from January 1 to December 31, 2023 and the owner (City of Waterloo Mayor and Council) must ensure that the annual report is prepared no later than February 28, 2024. As per Section 11 of the regulation, the report includes:

- a) Brief Description of the Drinking Water System;
- b) Summary of Adverse Water Quality Results;
- c) Summary of Results of Required Tests;
- d) Description of Corrective Actions Taken;
- e) Description of Major Expenses Incurred; and,
- f) Location of Summary Report.

Copies of the City of Waterloo's Annual Report are available, free of charge, at the Waterloo Service Centre, 265 Lexington Court, by contacting Customer Service at (519) 886-2310, extension 30239. An electronic copy can also be downloaded from the City of Waterloo website at www.waterloo.ca.

2023 Summary Report

In addition to the Annual Report, Ontario Regulation 170/03, Schedule 22 requires large municipal residential systems to complete a Summary Report. The Summary Report, attached in Appendix B, covers the same time period as the annual report and must be prepared and given to the owner of the drinking water system not later than March 31, 2024. The report follows the requirements prescribed in Schedule 22 of the regulation for the purpose of enabling the owner of the system to assess the capability of the system to meet existing and planned uses of the system and includes:

- a) Applicable Legislation;
- b) Statement of Compliance;
- c) Summary of Quantities and Flow Rates; and,
- d) Communication.

Drinking water inspection results are included in the Statement of Compliance of the Summary Report.



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

Appendix ‘A’ – 2023 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, 2023 – December 31, 2023

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 2 water distribution system, including pipes, valves, and hydrants. According to the Region of Waterloo 2022 Year End Population Estimates, the City's water distribution system serves a population of 151,440 people, including temporary non-resident students (31,340). The water distribution system consists of the following (2022 data):

- 440.6 kilometres of distribution main
- 31,493 water connections (active accounts)
- 2,600 hydrants (not including private hydrants)
- 5,056 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.

Drinking Water Systems Regulation (O. Reg. 170/03)
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) = \$1,973,295
- Replacement of watermains and valves (capital) = \$5,101,000

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
161383	Lead - Distribution	2023-02-17	40.9	µg/L	• Flushed and resampled adverse site	2023-03-08
161494	Lead – Distribution	2023-03-15	66.7	µg/L	• Flushed and resampled adverse site	2023-03-22
161508	Lead – Distribution	2023-03-16	11	µg/L	• Flushed and resampled adverse site	2023-03-27
161586	Lead – Distribution	2023-03-17	12.6	µg/L	• Flushed and resampled adverse site	2023-04-03
161721	TC	2023-07-21	P	P/A	• Flushed and resampled adverse site; flushed and sampled downstream, sampled upstream	2023-07-25
163063	TC	2023-08-17	P	P/A	• Flushed and resampled adverse site; flushed and sampled downstream, sampled upstream	2023-08-21
163125	Lead – Private	2023-08-22	12.3 15.8	µg/L	• Resampled adverse site, sampled nearby hydrant • City owned lead service replaced	2023-09-11
N/A	Lead – Private	2023-08-17	11.7	µg/L	• Resident notified, ROW Lead Fact Sheet provided • PHU notified 2023-08-30	N/A
163660	TC	2023-09-28	1	CFU/mL	• Flushed and resampled adverse site; flushed and sampled downstream, sampled upstream	2023-10-03

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

AWQI#	Parameter	Incident Date	Result	Unit of Measure	Corrective Action	Corrective Action Resolution Date
163886	Lead – Distribution	2023-10-11	11.7	µg/L	• Flushed and resampled adverse site	2023-11-01
163886	Chlorine Residual	2023-10-26	TCR = 0.21 FCR = 0.03 CCR = 0.18	mg/L	• Flushed and resampled adverse site • Flushed and sampled upstream site (no downstream site)	2023-10-26

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	1726	Absent 0	Absent - Present 0 - 1	560	0 - 280 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)	Un
Total Chlorine	3840	0.21 – 1.90	mg/
Free Chlorine	3840	0 – 0.25	mg/

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	As a distribution system only testing is not required by the City of Waterloo; see Region of Waterloo Annual Report for source water results.			
Arsenic				
Barium				
Cadmium				
Fluoride				
Lead*	N/A	N/A	N/A	N/A
Mercury	As a distribution system only testing is not required by the City of Waterloo; see Region of Waterloo Annual Report for source water results.			
Nitrate				

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

Parameter	Sample Date	Result Value Range (min - max)	Unit of Measure	Number of Exceedances
Nitrite				
Selenium				
Sodium				
Uranium				

* 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	329	0.2 – 15.8	µg/L	2
Distribution	126	0.2 – 66.7	µg/L	5
Alkalinity	126	129 – 353	mg/L	-
pH	253	6.4 – 8	pH	-

** 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

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)	February 9, 2023 May 11, 2023 August 9, 2023 October 31, 2023	6.5	µg/L	0
THM (NOTE: year-end running average)	January 31, 2023 May 16, 2023 August 9, 2023 November 15, 2023	19.5	µg/L	0
NDMA	February 14, 2023 May 16, 2023 August 9, 2023 November 15, 2023	ND ND ND ND	µg/L	0

ND = Not Detected

Drinking Water Systems Regulation (O. Reg. 170/03)
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 – Distribution	40.9	µg/L	February 17, 2023
Lead – Distribution	5.15	µg/L	February 17, 2023
Lead – Distribution	6.12	µg/L	February 23, 2023
Lead – Distribution	66.7	µg/L	March 6, 2023
Lead – Private Plumbing (at same address)	7.2 5.2	µg/L	March 6, 2023
Lead – Private Plumbing (at same address)	7.38 5.28	µg/L	March 13, 2023
Lead – Distribution	11	µg/L	March 13, 2023
Lead – Private Plumbing	8.55	µg/L	March 15, 2023
Lead – Distribution	12.6	µg/L	March 17, 2023
Lead – Distribution	8.52	µg/L	August 8, 2023
Lead – Private Plumbing (at same address)	5.27 8.07	µg/L	August 8, 2023
Lead – Private Plumbing (at same address)	8.11 12.3 15.8 5.48 5.32 6.82 6.58 7.49	µg/L	August 8, 2023 August 28, 2023
Lead – Private Plumbing (at same address)	5.27 8.07	µg/L	August 9, 2023
Lead – Private Plumbing (at same address)	11.7 5.35	µg/L	August 17, 2023
Lead – Private Plumbing (at same address)	5.67 5.4	µg/L	September 11, 2023
Lead – Private Plumbing	5.61	µg/L	September 21, 2023
Lead – Private Plumbing	5.54	µg/L	October 4, 2023
Lead – Private Plumbing	5.51	µg/L	October 11, 2023
Lead – Distribution	11.7	µg/L	October 11, 2023

Appendix 'B' – 2023 Summary Report for Drinking Water Systems

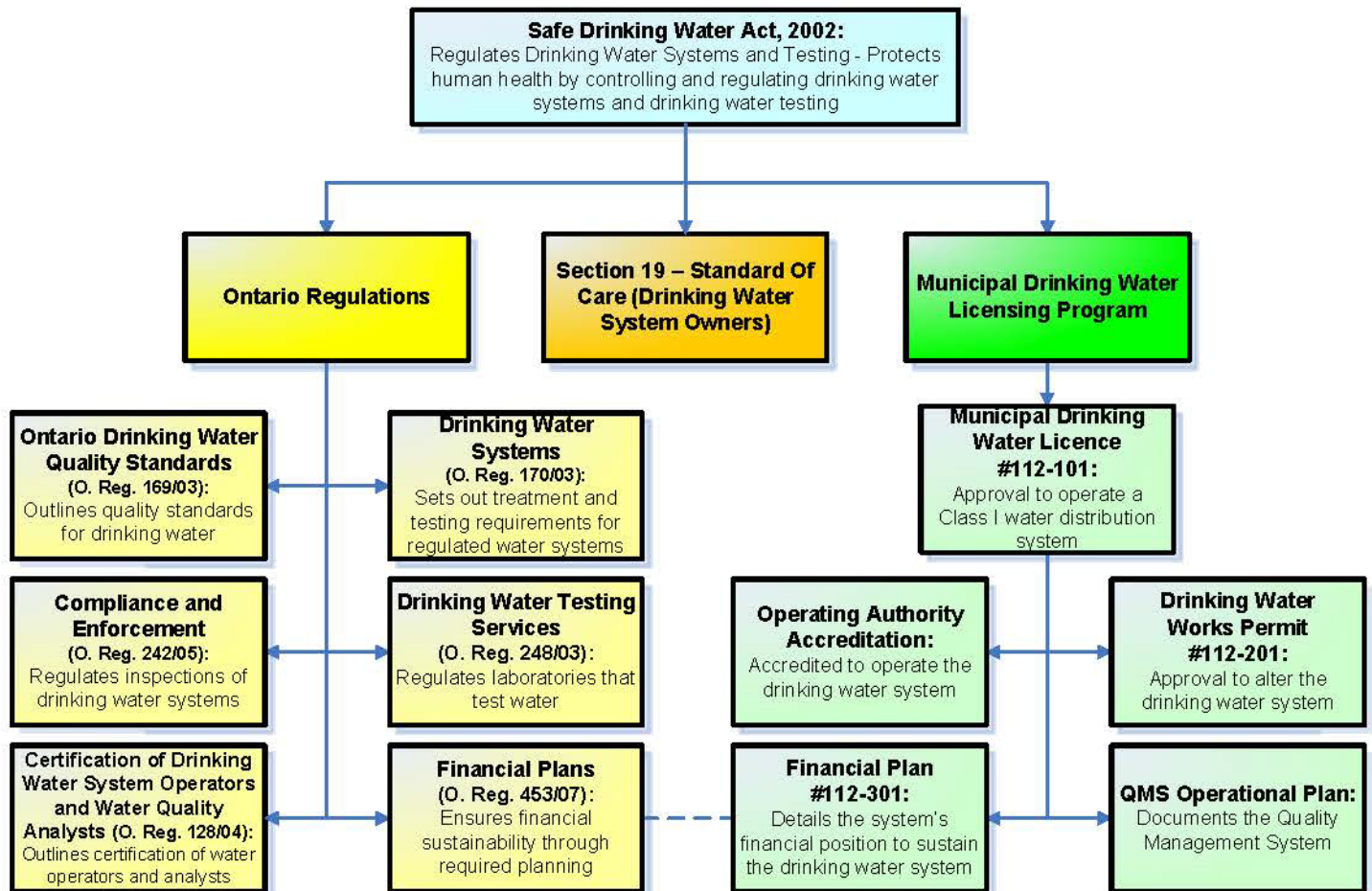
1.0 Introduction

Schedule 22 of Ontario Regulation 170/03 requires, for large municipal residential systems, that a Summary Report be prepared and submitted to members of municipal council by March 31, 2024 for the period of January 1 to December 31, 2023.

2.0 Applicable Legislation

Requirements for owning and operating Waterloo’s drinking water system are identified within the Safe Drinking Water Act, 2002 (SDWA), its applicable regulations and its approval mechanisms, as seen in the figure below.

Figure 1: Applicable Legislation



Ontario maintains the most recent version of the SDWA and its associated regulations on the [e-laws website](#).



3.0 Statement of Compliance

The Ministry of the Environment, Conservation and Parks aims to inspect every drinking water system annually. The MECP conducted a remote inspection of the drinking water distribution system from February 13 to March 28, 2023. The primary focus of this inspection was to confirm compliance with MECP legislation as well as evaluate conformance with ministry drinking water policies and guidelines during the inspection period. The ministry utilizes a comprehensive, multi-barrier approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as management practices. The inspection covered the period of January 1, 2022 to February 1, 2023.

There were no non-compliances with regulatory requirements. Two best practice recommendations were noted during the inspection period; both have been addressed. The City of Waterloo received a final inspection rating of 100%.

The inspection for the 2023 year has not been conducted to date.



4.0 Summary of Water Consumption and Flow Rates

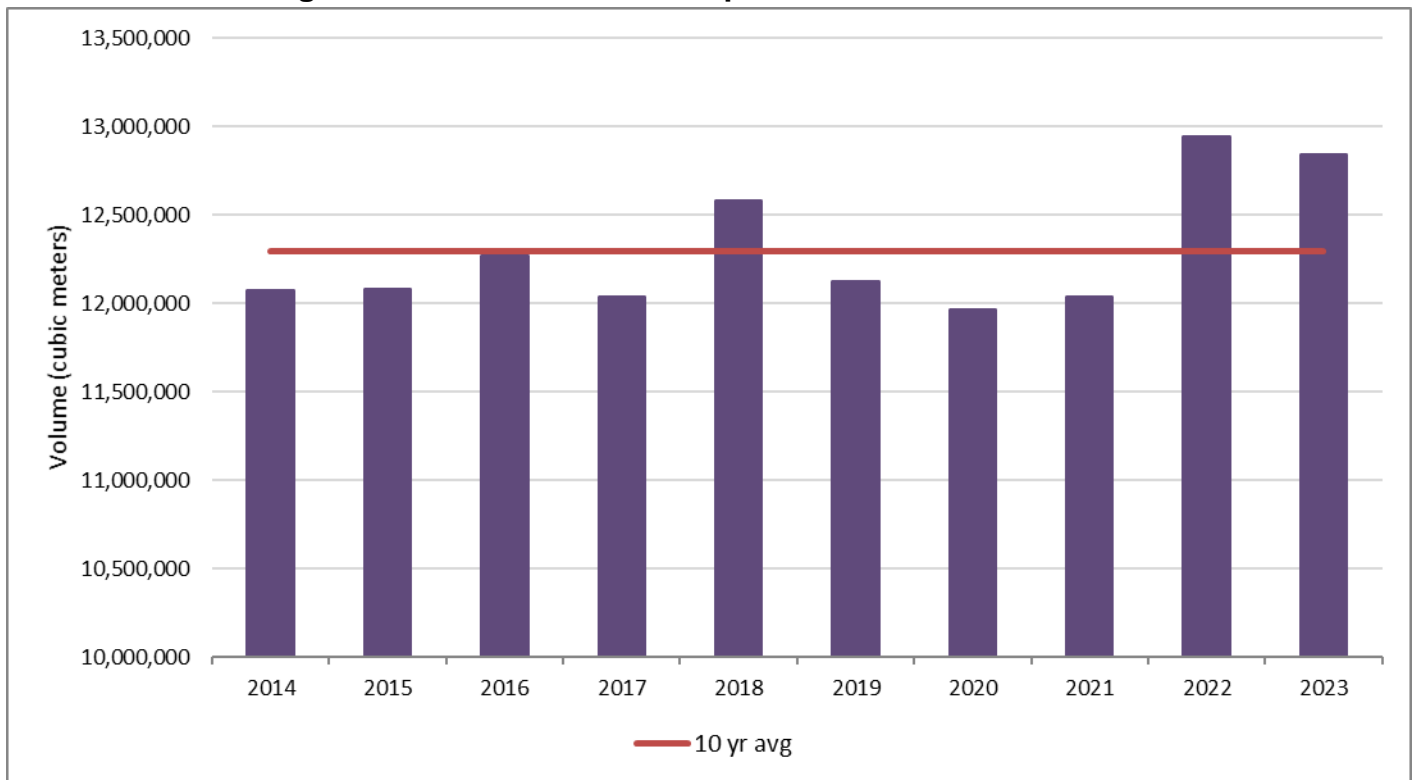
4.1 Water Consumption

Total Water Consumption

From January 1 to December 31, 2023, the City received 12,845,421 cubic meters of water from the Region of Waterloo, a 0.74% decrease from 2022. This is the second highest consumption seen in the last 10 years and the second highest consumption since tracking began in 2005. It was noted last year by the Region of Waterloo that 2023 was on trend for increased water demand after a record high in 2022.

Figure 1 below, depicts the last ten years of total consumption against the average.

Figure 1: Total Water Consumption for the Past Ten Years



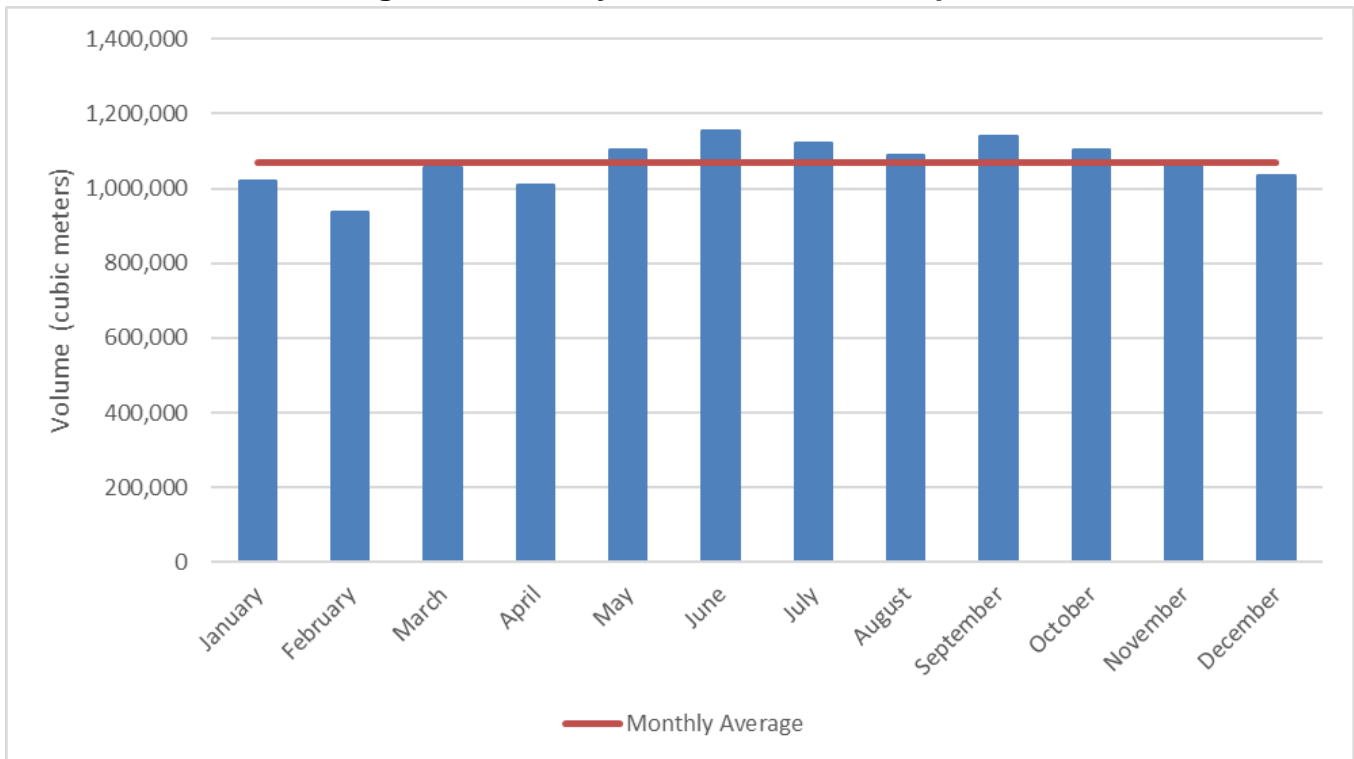


Monthly Water Consumption

The average monthly consumption in 2023 was 1,070,452 cubic meters, a decrease from the monthly average of 1,078,412 cubic meters in 2022. June saw the highest consumption for the year, which was 7.8% above the monthly average. February saw the lowest consumption of 2023; February's consumption was 12.6% below the monthly average.

Figure 2 shows the City's actual water consumption by month.

Figure 2: Monthly Total Water Consumption

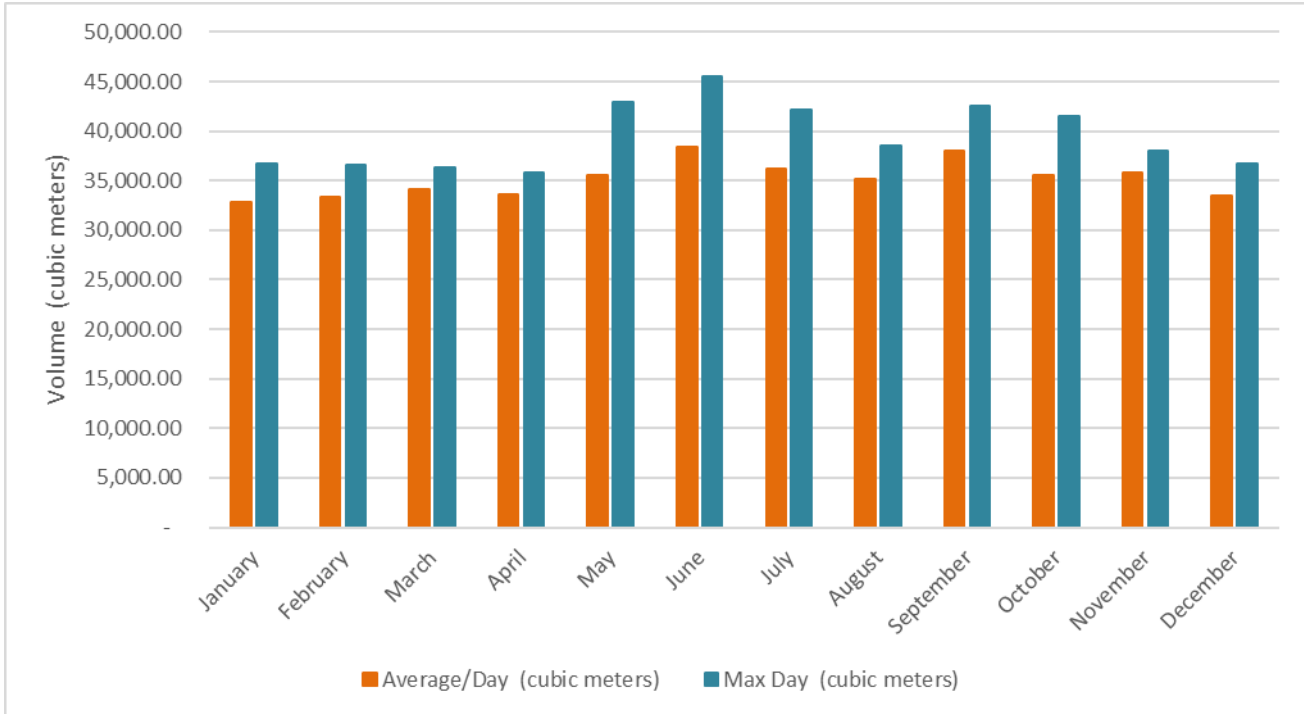




Average Daily and Maximum Daily Usage

Figure 3 shows the average daily and maximum daily usage for each month. June had the highest average day usage, while January had the lowest. June had the highest daily peak (max day), while April had the lowest.

Figure 3: Average Daily and Maximum Daily Usage per Month



4.2 Flow Rates

Rated capacity and flow rates refer to treatment subsystems. The City of Waterloo owns and operates the distribution system; therefore, these parameters do not apply. The Region of Waterloo is required to report on the rated capacity and flow rates of the supply system via the Summary Report to Regional Council. As per the regulation, a copy is provided to the City of Waterloo.

5.0 Communication

Since the City’s distribution system supplies drinking water to portions of the City of Kitchener, the Township of Woolwich and Wilmot Township, each municipality will be provided a copy of the 2023 Summary Report. Additionally, the Region of Waterloo will receive a copy for their records. All copies will be provided by March 31, 2024.