

A large graphic of water being poured from the top, creating a splash and many bubbles that fill the right side of the page. The water is clear and blue, with a white stream falling from the top center. The background is white with blue geometric shapes in the corners.

2024 ANNUAL SUMMARY REPORT

A description of the City of Vaughan's Water Distribution System to fulfill the requirements under Schedule 22 of *Ontario Regulation 170/03 – Drinking Water Systems*

This report is available to the public at no charge on the City of Vaughan's website and upon request.

March 4, 2025



Table of Contents

1.0 Report Overview

1.1 Background	4
1.2 Quality Management System (QMS) Policy.....	4

2.0 Drinking Water System Description

2.1 Drinking Water System Profile	5
---	---

3.0 Legislative Requirements

3.1 Summary of Legislative Requirements	8
3.1.1 <i>Ontario Regulation 170/03 - Drinking Water Systems</i>	8
Schedule 6: Operational Checks, Sampling and Testing – General	9
Schedule 7: Operational Checks	9
Schedule 10: Microbiological Sampling and Testing	9
Schedule 13: Chemical Sampling and Testing	9
Schedule 15.1: Lead Sampling	10
Schedule 16: Reporting Adverse Test Results and Other Problems.....	10
Schedule 17: Corrective Action	12
Schedule 22: Summary Reports for Municipalities, and <i>Section 11 of O. Reg. 170/03 - Drinking Water Systems</i>	12
3.1.2 <i>Ontario Regulation 128/04: Certification of Drinking Water System Operators and Water Quality Analysts</i>	13
3.1.3 <i>Ontario Regulation 169/03: Ontario Drinking Water Quality Standards</i>	13
3.1.4 <i>Ontario Regulation 188/07: Licensing of Municipal Drinking Water Systems</i>	13
3.2 Drinking Water Quality Management Standard (DWQMS).....	13

4.0 Drinking Water System Maintenance Programs

4.1 Watermain Flushing Program	14
4.2 Hydrant Inspection Program	14
4.3 Valve Exercising Program.....	14

5.0 Water Quality

5.1 Water Quality Inquiries	15
-----------------------------------	----

6.0 Water Usage

6.1 Annual Water Taking from York Region	16
--	----

7.0 Associated Water Summary Reports

7.0 Links to Associated Water Summary Reports.....	18
--	----

8.0 Contact Information

8.0 Report Contact Information.....	18
-------------------------------------	----

1.0 Report Overview

1.0 Background

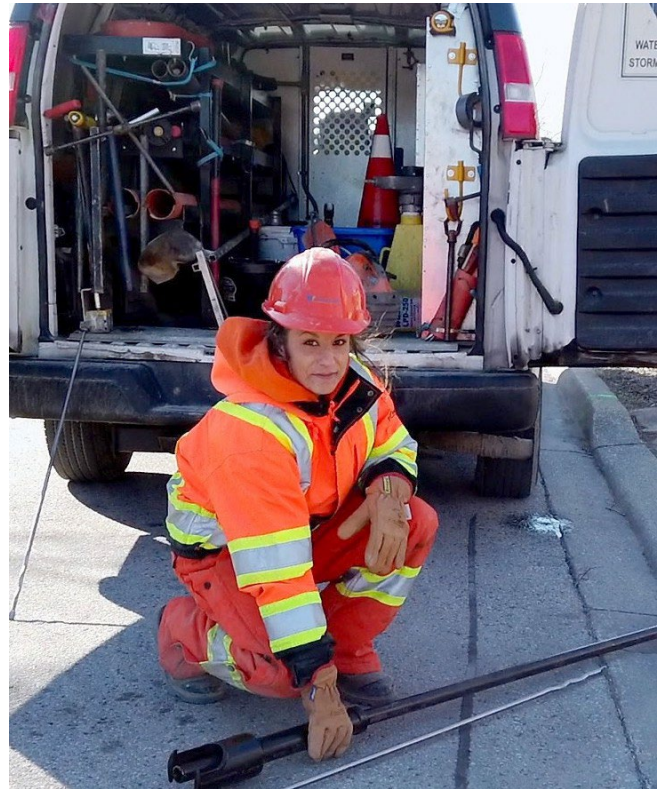
The 2024 Annual Summary Report is intended to provide the Mayor and Members of Council, as Owners of the drinking water system, an understanding of the status of the City of Vaughan's drinking water system for the reporting period of January 1, 2024 to December 31, 2024.

Under the *Safe Drinking Water Act, 2002 (the Act)*, municipalities are required to:

- recognize that the people of Ontario are entitled to expect their drinking water to be safe; and
- provide for the protection of human health and the prevention of drinking water health hazards through the control and regulation of drinking water systems and drinking water testing.

This report has also been prepared to satisfy the requirements of *Schedule 22 of Ontario Regulation 170/03 Drinking Water Systems* (Summary Reports for Municipalities).

For the 2024 reporting period, a separate Annual Report, which contains data related to annual testing and sampling parameters, was prepared to fulfill Section 11 of *Ontario Regulation 170/03 – Drinking Water Systems* and was posted on the City's website by February 28, 2025.



1.1 Quality Management System (QMS) Policy

The Owners and Operators of the City's Water Distribution System are committed to:

- providing safe and clean drinking water to residents and businesses;
- complying with all applicable legislation and regulations related to the provision of safe drinking water; and
- implementing and continually improving the effectiveness of the City's Quality Management System (QMS).

The City's QMS Policy has been developed to enhance and ensure community safety, health and wellness and to maintain asset and infrastructure integrity.

2.0 Drinking System Description

2.1 Drinking Water System Profile

The City's Environmental Services department is responsible for the distribution of safe drinking water throughout Vaughan. In 2024, 44,922,952 cubic metres of water were supplied to residential, industrial, commercial and institutional locations throughout the city.

The City purchases its drinking water from York Region prior to distribution. York Region obtains this water from the City of Toronto and the Region of Peel. The water originates from Lake Ontario and is treated using a process called chloramination, a disinfection method that uses chlorine combined with ammonia to ensure the water remains safe to drink from the time of treatment until it reaches the consumer.

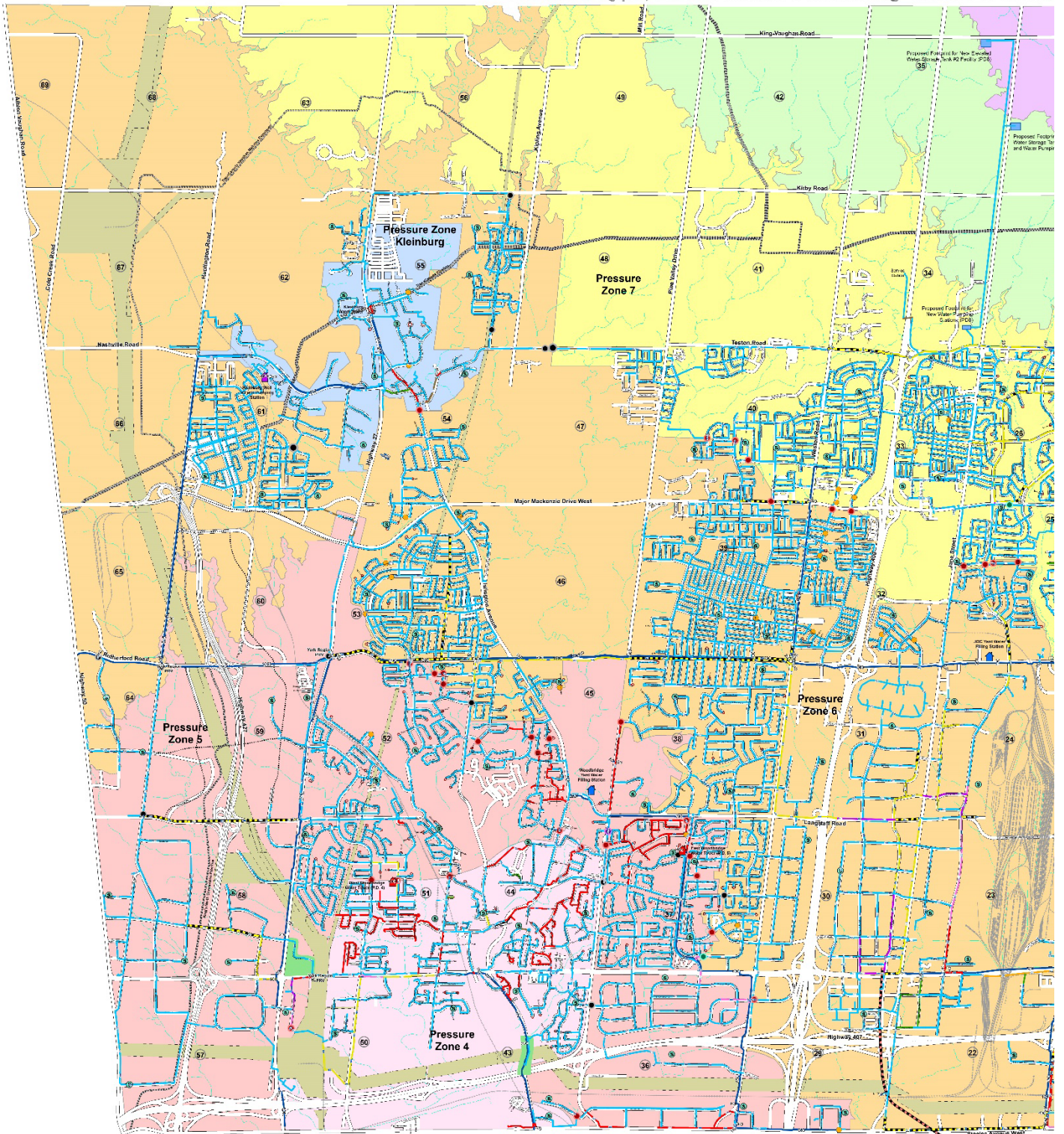
The City's water distribution system includes 1,248 kilometres of active watermains, one booster station and one pressure elevating station. Table 1 below displays the City's water distribution system profile information, including the system number, class of subsystem, Municipal Drinking Water Licence number, Drinking Water Works Permit number and the system classification.

TABLE 1: City of Vaughan Water Distribution System profile information

System Number: 260003097	Class 2 Water Distribution Subsystem
Municipal Drinking Water Licence: 011-101	Drinking Water Works Permit: 011-201
Classification: Large Municipal Residential System	



Water Servicing Infrastructure



3.0 Legislative Requirements

3.1 Summary of Legislative Requirements

The Act and associated Regulations under which the City operates the water distribution system are:

- a) Ontario Regulation 170/03 of the Act
 - Overall legislative framework to operate a drinking water system
- b) Ontario Regulation 128/04 of the Act
 - Certification of the drinking water system operators
- c) Ontario Regulation 169/03 of the Act
 - Water sampling parameters according to the Ontario Drinking Water Quality Standard
- d) Ontario Regulation 188/07 of the Act
 - Licensing requirements for drinking water systems



3.1.1 Ontario Regulation 170/03 - Drinking Water Systems

Ontario Regulation 170/03 – Drinking Water Systems establishes eight categories of drinking water systems, four of which are municipal, and the other four are non-municipal. The City’s drinking water system is a Large Municipal Residential System because it matches the legislative definition of a “municipal drinking water system that serves a major residential development and serves more than 100 private residences.”

Ontario Regulation 170/03 – Drinking Water Systems contains Schedules that address several requirements for a drinking water system.

The following Schedules are applicable to the City’s water distribution system:

- **SCHEDULE 6: Operational Checks, Sampling and Testing - General**
- **SCHEDULE 7: Operational Checks**
- **SCHEDULE 10: Microbiological Sampling and Testing**
- **SCHEDULE 13: Chemical Sampling and Testing**
- **SCHEDULE 15.1: Lead**
- **SCHEDULE 16: Reporting Adverse Test Results and Other Problems**
- **SCHEDULE 17: Corrective Action**
- **SCHEDULE 22: Summary Reports for Municipality**

SCHEDULE 6: Operational Checks, Sampling and Testing – General

This Schedule of the Regulation provides direction on sample frequency, form, handling, monitoring equipment and record keeping and provides the framework for performing drinking water samples as detailed in Schedule 7.

SCHEDULE 7: Operational Checks

This Schedule identifies the responsibility for chlorine, turbidity and fluoride testing and defines tests that are performed by a Certified Water Operator.

As required under this Schedule, the City ensures that drinking water samples from the City's water distribution system are taken and tested for a combined chlorine residual. In 2024, 2,204 samples were taken to measure chlorine residuals.

The City's water distribution system is a standalone system, which means that the received water stays within the City's borders. Primary disinfection, testing for turbidity and fluoride addition is undertaken at water treatment plants that are owned and operated by the City of Toronto and the Region of Peel.

SCHEDULE 10: Microbiological Sampling and Testing

This Schedule identifies the frequency of microbiological sampling for the presence of bacteria and associated testing. The number of required samples is based upon population size. The City was mandated to take a minimum of 135 microbiological samples per month in 2024 for an annual total of 1,620 samples.

The City collected a total of 1,800 microbiological samples for testing in 2024. More than 25 per cent of the 1,800 microbiological samples were tested for Heterotrophic Plate Count (HPC) to satisfy regulatory requirements. HPC measures the overall bacteriological quality of drinking water.

SCHEDULE 13: Chemical Sampling and Testing

This Schedule outlines the requirements for sampling of inorganics, organics, trihalomethanes (THMs), haloacetic acids (HAAs), nitrate and nitrite, sodium, and fluoride.

Though the City is not required to test for inorganics/organics, the City tested for inorganics in 2024 to maintain diligence.

The City also tested for THMs and HAAs (chlorine disinfection byproducts) on a quarterly basis as required under *Schedule 13 of Ontario Regulation 170/03 – Drinking Water Systems*. All test results were within legislative limits.



SCHEDULE 15.1: Lead Sampling

This Schedule applies to sampling for lead and stipulates that there are two annual sampling periods to consider: one between December 15 and April 15 and the other between June 15 and October 15. Prior to 2011, the City was mandated to collect 100 samples from points in plumbing that serve private residences, 10 samples from points in plumbing that do not serve private residences and 20 samples from sampling points in the water distribution system. The City has since received approval from the Ministry of Environment, Conservation, and Parks (MECP) for relief from the regulatory requirements for standard lead sampling. In exchange for the relief granted, the City is required to comply with Schedule 15.1-5 (9) of *Ontario Regulation 170/03 – Drinking Water Systems*, which allowed the City exemption from plumbing sampling. Relief was granted because the City demonstrated that less than 10 per cent of all the samples from plumbing that were tested for lead in two consecutive sampling periods exceeded the standard prescribed for lead.

The City's current lead sampling plan includes 10 distribution samples taken between December 15 and April 15 and 10 distribution samples taken between June 15 and October 15 annually, which are measured for pH, alkalinity and lead. There were no exceedances of the lead limit at any hydrants used for sampling in 2024.

SCHEDULE 16: Reporting Adverse Test Results and Other Problems

This Schedule defines the City's responsibility to report any drinking water test result which exceeds any of the standards outlined in the *Ontario Regulation 169/03 – Ontario Drinking Water Quality Standards*.

The reporting requirement involves immediate oral and written notification to the MECP, Spills Action Centre (SAC), and the Medical Officer of Health at York Region Public Health.

Table 2 below provides a summary of all adverse water quality incidents that occurred in 2024.

The corrective action for each incident is also included in the Table. There were 21 adverse water quality incidents, none of which resulted in an advisory and/or risk to public health. In 2024, there were two sodium adverse water quality incidents. Per *Ontario Regulation 170/03 (Schedule 16)*, operating authorities have a duty to report a result indicating that the concentration of sodium exceeds 20 milligrams per litre in a sample of drinking water, if a report under subsection 18 (1) of the Act has not been made in respect of sodium in the preceding 57 months. The last report was made April 1, 2024, and the City has fulfilled its duty to report under section 18 of the Act and corrective actions taken under *Schedule 17 of Ontario Regulation 170/03*.

SCHEDULE 17: Corrective Action

In conjunction with the requirements of Schedule 16, corrective actions are immediately undertaken to address adverse water quality incidents.

Responses include watermain flushing and resampling of the identified area as well as any additional direction provided by the Medical Officer of Health at York Region Public Health and the MECP Spills Action Centre. The samples are tested for chlorine residuals on-site and sent to the laboratory for further tests that may include microbiological and/or chemical tests. Once complete, results have been received from the laboratory and are within the set regulatory limits, a notice of issue resolution is reported back to both the MECP Spills Action Centre and the Medical Officer of Health at York Region Public Health.

TABLE 2: 2024 Adverse water quality incidents and corrective actions

INCIDENT DESCRIPTION	INCIDENT DATE	ADVERSE TEST RESULT	REGULATORY LIMITS	CORRECTIVE ACTION
Combined Chlorine Residual	2024/05/16	5.10 mg/L	0.25 mg/L (minimum) 3.0 mg/L (maximum)	Flushed and retested.
	2024/05/21	3.06 mg/L	0.25 mg/L (minimum) 3.0 mg/L (maximum)	Flushed and retested.
	2024/08/20	0.19 mg/L	0.25 mg/L (minimum) 3.0 mg/L (maximum)	Flushed and retested.
	2024/08/21	0.23 mg/L	0.25 mg/L (minimum) 3.0 mg/L (maximum)	Flushed and retested.
	2024/09/24	0.00 mg/L	0.25 mg/L (minimum) 3.0 mg/L (maximum)	Flushed and retested.
	2024/09/25	0.00 mg/L	0.25 mg/L (minimum) 3.0 mg/L (maximum)	Flushed and retested.
Total Coliform (TC) Present	2024/01/04	TC - Present	0	Flushed and resampled.
	2024/04/18	TC - Present	0	Flushed and resampled.
	2024/05/22	TC - Present	0	Flushed and resampled.
	2024/05/24	TC - Present	0	Flushed and resampled.
	2024/05/24	TC - Present	0	Flushed and resampled.
	2024/05/26	TC - Present	0	Flushed and resampled.
	2024/06/07	TC - Present	0	Flushed and resampled.
	2024/06/12	TC - Present	0	Flushed and resampled.
	2024/08/11	TC - 4	0	Flushed and resampled.
	2024/08/11	TC - Present	0	Flushed and resampled.
	2024/08/15	TC - 1	0	Flushed and resampled.
2024/09/20	TC - Present	0	Flushed and resampled.	
E. Coli (EC) Present	2024/08/08	TC - Present EC - Present	0	Flushed and resampled.
Sodium	2024/04/01	21 mg/L	20 mg/L	Resampled and tested for sodium.
	2024/04/01	21 mg/L	20 mg/L	Resampled and tested for sodium.

SCHEDULE 22: Summary Reports for Municipalities and Section 11 of Ontario Regulation 170/03 – Drinking Water Systems

Summary Report requirements for Municipalities with Large Municipal Residential Systems are identified within Schedule 22. Annual Report submissions for the previous calendar year must be submitted to the City’s Mayor and Members of Council, as Owners of the system, by March 31 of the following year. The City also posts the report on the City’s external website and copies of the report are available free of charge to the public upon request.

Similarly, Annual Reports, as defined under Section 11 of the Regulation, for the previous calendar year are prepared for submission to the City’s Mayor and Members of Council, as Owners of the system, no later than February 28 of the following year.

Annual Report requirements are defined in the legislation. The City ensures that effective steps are taken to advise users that copies of the report are available, without charge, including the location where copies of the report may be obtained. This report is also made available on the City’s external website.



Ontario Regulation 128/04: Certification of Drinking Water System Operators and Water Quality Analysts

This Regulation establishes the training and certification requirements that must be satisfied by Certified Water Operators.

The City's Water Operations staff operated the City's water distribution System in 2024. Every Operator is required to complete a total of 105 training hours within the three-year Operator certificate renewal period. Operator training consists of 36 hours of Director-approved training or Continuing Education Units and 69 hours of on-the-job practical training.

During the reporting period of January 1, 2024 to December 31, 2024, every Drinking Water Operator at the City held a valid Operator certificate in compliance with *Ontario Regulation 128/04 – Certification of Drinking Water System Operators and Water Quality Analysts* and met provincial training requirements.

Ontario Regulation 169/03: Ontario Drinking Water Quality Standards

Ontario Regulation 169/03 - Ontario Drinking Water Quality Standards identifies the minimum level of drinking water quality acceptable for human consumption.

The City's water sampling and testing program complied with the Standards under the Regulation and ensured appropriate corrective actions were taken when necessary. As this Regulation indicates the minimum standard, exceedance of these values represents the point of which adverse reporting and corrective action is triggered.

Ontario Regulation 188/07 Licensing of Municipal Water Systems

The Act requires Owners and Operating Authorities of municipal residential drinking water systems to have an accredited Operating Authority. To become accredited, an Operating Authority must establish and maintain a Quality Management System (QMS). Minimum requirements for the QMS are specified within the Drinking Water Quality Management Standard (DWQMS). *Ontario Regulation 188/07 – Licensing of Municipal Drinking Water Systems* was established to aid in the licensing of the municipal drinking water system.

3.2 Drinking Water Quality Management Standard (DWQMS)

The DWQMS has 21 elements, which relate to quality management and the risk assessment and risk management of critical control points. The City's Operational Plan documents the processes and procedures that the Owner and Operating Authority have in place to meet the requirements of the DWQMS.

The original full scope DWQMS accreditation certificate was formally issued by the Canadian General Standards Board to the Corporation of the City of Vaughan on July 7, 2009. The City's Drinking Water Works Permits and Municipal Drinking Water Licences were received on July 27, 2009, after obtaining DWQMS accreditation and submitting a Council-approved Financial Plan to the Ministry of Municipal Affairs and Housing, as required under the Sustainable Sewage and Water System Act. The City's DWQMS is re-accredited every three years. The most recent re-accreditation was completed on June 19, 2024.

As participants of the full scope accreditation process for the DWQMS, the City is required to submit system information for an on-site verification audit to maintain accreditation status. The City's water distribution system remains fully accredited.

4.0 Drinking Water System Maintenance Programs

4.1 Watermain Flushing Program

The main objective of the watermain flushing program is to maintain chlorine residual in the water distribution system to meet regulatory requirements and ensure the chlorine residual reflects the water quality in a given area. Flushing also helps clean the watermain by removing mineral deposits from the pipe walls while improving the aesthetics of the water. Flushing is performed at locations that have the potential for stagnant water, such as dead ends, areas of low water consumption (i.e. new subdivisions) and during watermain repairs to remove any debris in the watermain and restore chlorine residuals. Flushing is performed by the City's certified and trained Drinking Water Operators. Chlorine residuals are recorded at each location on completion of watermain flushing. A total of 26 anti-stagnation valves were maintained by the City in 2024.

4.2 Hydrant Inspection Program

An annual inspection of all hydrants in the City is a requirement under *Ontario Regulation 213/07 – Fire Code*. The inspection determines the operational functionality of hydrants and valves to ensure smooth operation for firefighting.

The Hydrant Inspection Program is completed by external contractors. Repair of deficiencies identified through the Hydrant Inspection Program are completed by the City's Drinking Water Operators with the assistance of external contractors, as required.

4.3 Valve Exercising Program

Valves, along with hydrants and water booster stations, are key components of the City's water distribution infrastructure. Valves control and change the direction of the flow of water within the water distribution system and are required to be operated during maintenance activities such as watermain swabbing and watermain flushing. During a watermain break, valves isolate a section of the watermain for repair, which confines the water disruption to a smaller area. Valves are exercised by an external contractor as part of the City's preventative maintenance program. Valve exercising involves turning the valve on and off to prevent the valve from becoming stiff and not functioning properly. In 2024, preventative maintenance programming targeted valves in unassumed new development areas that were in long maintenance programs as well as the assumed City valves.



5.0 Water Quality

5.1 Water Quality Inquiries

Under the current issue of the City's Municipal Drinking Water Licence, the City is required to address water quality inquiries related to the drinking water system. The nature of the inquiry and the appropriate corrective action that was taken must be documented. Table 3 below provides a summary of the water quality inquiries the City addressed in 2024.

Inquiries included questions pertaining to pH, hardness, lead, alkalinity, taste, odour and colour. The City received a total of 111 water quality inquiries in 2024, most of which were classified as water inquiries (i.e. questions pertaining to taste, odour, colour, etc.). The City can address residents' concerns and continually improve the drinking water system by documenting inquiries, tracking inquiries of a similar nature and location, and identifying trends.

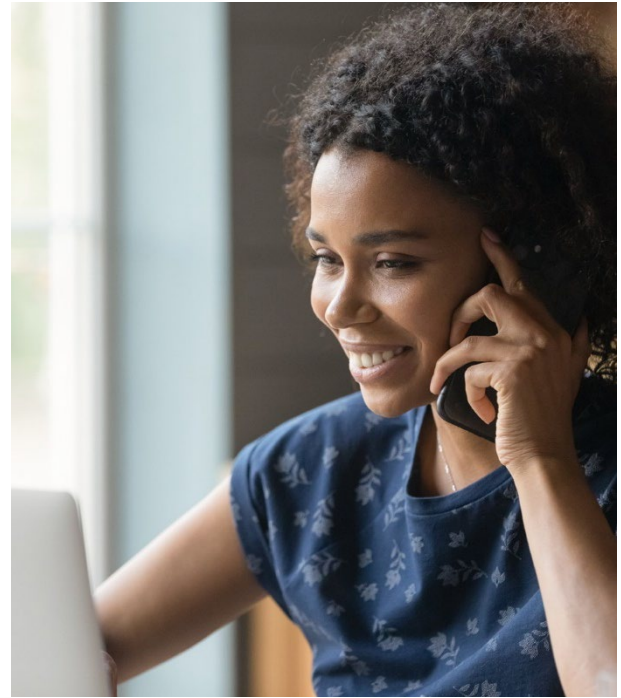


TABLE 3: Water quality inquiries related to the City's drinking water system

TYPE OF INQUIRY	NUMBER OF INQUIRIES	ACTION TAKEN
Taste and odour	29	<ul style="list-style-type: none"> Information provided by phone or email to identify the source of the smell (plumbing versus drinking water) and to flush taps. Site investigation such as testing for chlorine residuals and sampling for microbiological lab test from the nearest hydrant and/or sampling station.
Discoloured water	23	<ul style="list-style-type: none"> Information provided by phone or email to flush taps. Site investigation, such as testing for chlorine residuals and sampling for microbiological lab test from the nearest hydrant and/or sampling station.
General inquiries	59	<ul style="list-style-type: none"> Information provided by phone conversation and/or email correspondence. Provided most recent sample results upon request. Site investigation, such as testing for chlorine residuals and sampling for microbiological lab test from the nearest hydrant and/or sampling station.
TOTAL	111	

6.0 Water Usage

6.1 Annual Water Taking from York Region

York Region receives treated water from the City of Toronto and the Region of Peel and supplies it to the City of Vaughan for distribution. The total volume of water supplied from York Region to the City's water distribution system during the reporting period of January 1, 2024 to December 31, 2024 was 44,922,952 cubic metres.

A comparison of 2022, 2023 and 2024 monthly flows for the City's water distribution system and the monthly average flow are included in Table 4 below. Figure 1 shows a graphical representation of the data from Table 4.

Table 5 shows the City's water distribution system's maximum, minimum and average daily flows during each month of 2024. The highest daily flow (236,678 cubic metres) was recorded on July 24, 2024, and the lowest daily flow (26,705 cubic metres) was recorded on September 23, 2024.

TABLE 4: The City's Water Distribution System's monthly flows during 2022, 2023 and 2024

MONTH	2022 VOLUME (m ³)	2023 VOLUME (m ³)	2024 VOLUME (m ³)
January	3,261,305	3,075,495	3,318,520
February	2,927,218	2,854,806	3,133,763
March	3,273,864	3,243,104	3,367,291
April	3,252,791	3,135,406	3,327,718
May	3,713,184	3,827,994	3,739,902
June	4,348,879	4,249,891	4,258,262
July	4,799,278	4,261,306	4,444,612
August	4,525,906	4,077,271	4,316,168
September	3,983,104	3,881,215	3,949,731
October	3,462,097	3,386,375	3,966,085
November	2,985,305	3,063,987	3,592,966
December	3,009,388	3,054,346	3,507,934
TOTAL:	43,542,318	42,111,196	44,922,952
Monthly Average Flow	3,628,526	3,509,266	3,743,579



FIGURE 1: The City's Water Distribution System's monthly flows during 2022, 2023 and 2024

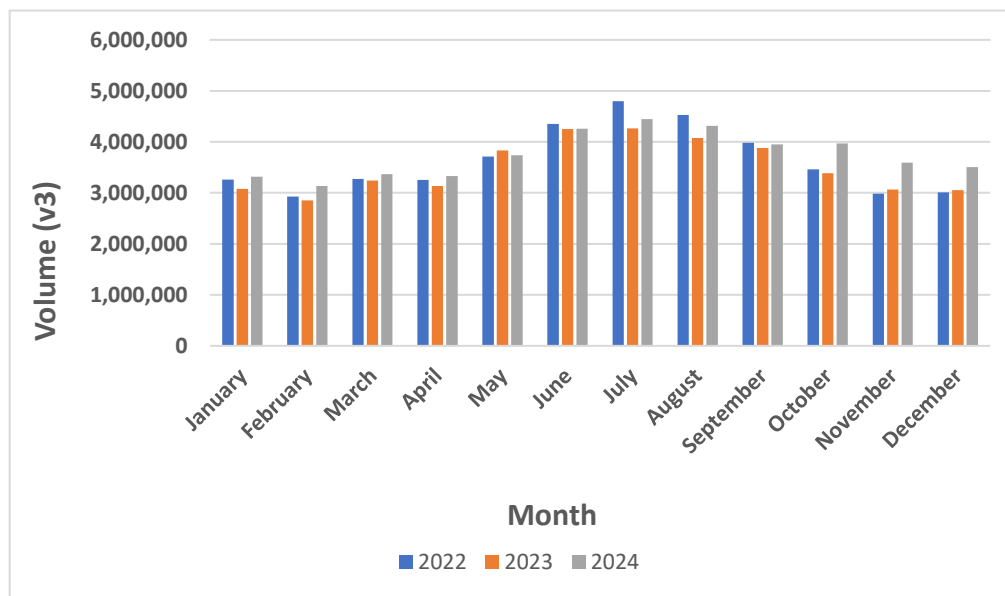


TABLE 5: Maximum, minimum and average daily flows during 2024

MONTH	MAXIMUM DAILY FLOW (m³)	DATE OF MAXIMUM FLOW	MINIMUM DAILY FLOW (m³)	DATE OF MINIMUM FLOW	AVERAGE DAILY FLOW (m³)
January	190,881	4-Jan-24	42,103	2-Jan-24	102,517
February	178,768	3-Feb-24	46,437	6-Feb-24	103,440
March	210,595	18-Mar-24	54,399	19-Mar-24	104,224
April	169,078	28-Apr-24	59,909	3-Apr-24	106,503
May	202,859	11-May-24	64,535	15-May-24	115,215
June	197,949	21-Jun-24	77,762	12-Jun-24	135,053
July	236,678	24-Jul-24	72,681	25-Jul-24	136,258
August	199,111	3-Aug-24	78,424	10-Aug-24	132,458
September	224,011	22-Sep-24	26,705	23-Sep-24	125,962
October	192,221	23-Oct-24	27,849	13-Oct-24	121,754
November	224,196	30-Nov-24	65,094	29-Nov-24	119,866
December	189,771	16-Dec-24	41,712	19-Dec-24	113,175

If a system is receiving all of its water from another system under an Agreement, a comparison of actual flow rates to the flow rates specified in the written Agreement must be provided in accordance with Schedule 22. The City does not currently have a written Agreement under subsection 5 (4) with

the Regional Municipality of York. The City, along with the other nearby municipalities, relies on Sections 11 and 89 (b) of the Municipal Act, 2001 with respect to the supply of water.

7.0 Associated Water Summary Reports

City of Toronto:
Annual Report and Annual Summary Report

Region of Peel:
Annual Report and Annual Summary Report

York Region:
Annual Report and Annual Summary Report

8.0 Contact Information

Emily Fahlgren
Supervisor, Compliance and Training
Environmental Services Department
City of Vaughan

905-832-8585 ext. 6175
emily.fahlgren@vaughan.ca



Environmental Services Public Works

City of Vaughan
2800 Rutherford Rd.
Vaughan, ON L4K 2N9

vaughan.ca

