

## **CITY OF VAUGHAN**

### **EXTRACT FROM COUNCIL MEETING MINUTES OF MARCH 21, 2023**

Item 2, Report No. 11, of the Committee of the Whole, which was adopted without amendment by the Council of the City of Vaughan on March 21, 2023.

---

#### **2. 2022 ANNUAL DRINKING WATER SYSTEM REPORT**

**The Committee of the Whole recommends approval of the recommendation contained in the report of the Deputy City Manager, Public Works, dated February 28, 2023:**

##### **Recommendation**

1. That this Report be received for information.

# Committee of the Whole (1) Report

---

**DATE:** Tuesday, February 28, 2023

**WARD(S):** ALL

**TITLE:** 2022 ANNUAL DRINKING WATER SYSTEM REPORT

**FROM:**

Zoran Postic, Deputy City Manager, Public Works

**ACTION:** FOR INFORMATION

---

## **Purpose**

The purpose of this Report is to provide information regarding the performance of the City's Drinking Water System and associated Operational Plan during 2022 based on the Drinking Water Quality Management Standard (DWQMS). This Report and its attachments support Council, as the System Owner, in meeting its statutory standard of care under the *Safe Drinking Water Act, 2002* by providing information on water quality and the operational performance of the drinking water system. This Report to Council satisfies the annual reporting requirements under *Ontario Regulation 170/03 – Drinking Water Systems*.

## **Report Highlights**

- The City's Drinking Water System achieved a 100% inspection rating in the Ministry of the Environment, Conservation and Parks' (MECP) 2021-2022 Chief Drinking Water Inspector's Report.
- In 2022, 99.1% of the 3,925 annual drinking water samples met regulatory standards. Prompt and decisive action was taken, in collaboration with the MECP and York Region Public Health, to address any Adverse Water Quality Incidents which upheld the City's commitment to ensure public safety and facilitated continuous delivery of safe drinking water throughout 2022.
- The City's Drinking Water System's Quality Management System (QMS) was audited on May 19, 2022.
- Two Management Reviews were completed during 2022 (July 27, 2022 and December 15, 2022) to evaluate the continued suitability, adequacy, and effectiveness of the City's QMS as required under Element 20 of the DWQMS.

## **Recommendation**

1. That this Report be received for information.

## **Background**

**An annual Summary Report on the City's Drinking Water System is required to satisfy the statutory annual reporting requirement under *Ontario Regulation 170/03 – Drinking Water Systems*.**

Drinking water and Drinking Water Systems are regulated by the Province through the Ministry of the Environment, Conservation and Parks (MECP).

The *Safe Drinking Water Act, 2002 (the Act)*, mandates owners and operating authorities of the municipal Drinking Water System to produce an Annual Summary Report containing information on the System's operation, management, sampling, testing, certification of staff, and water quality and quantity. The Summary Report must be completed and made available to the public by March 31<sup>st</sup> of each year and is included in Attachment 1.

**Annual reporting and regular information sharing assists Council in exercising the due diligence required to meet the statutory standard of care under *the Act*.**

*The Act* imposes a standard of care upon individuals with decision making authority over municipal Drinking Water Systems. Council, through its decision-making role, protects the City's residents and businesses by demonstrating diligence and prudent oversight of the supply and distribution of drinking water.

Council's commitment to the provision of safe drinking water ensures responsible action is taken to manage risk and increase efficiency through sustainable financial planning, proactive asset management, and systematic continuous improvement.

**Drinking water protection is a vital responsibility shared by many partners as safe drinking water is one of the key pillars of public health in Ontario.**

York Region's Medical Officer of Health (MOH) has a key role in protecting public health by assessing potential health impacts from adverse water quality test results. The MOH may direct the owner of a Drinking Water System to take corrective actions exceeding regulatory mandates and/or the City's Standard Operating Procedures (SOPs). For the 2022 reporting period, there were no additional corrective actions or restrictions (e.g., boil water or drinking water advisories) imposed on the City by the MOH.

Should an adverse water quality event or water emergency occur, procedures are in place to protect public health by ensuring close communication and cooperation between the MOH, York Region, and the MECP.

**Ontario has an integrated system of procedures, processes, and tools that collectively prevent or reduce the risk of contamination in drinking water to protect public health.**

This multi-faceted approach to protecting drinking water in Ontario was a key recommendation in Justice O'Connor's report on the Walkerton tragedy in 2000.

Elements of this approach include source water protection, health-based standards, regular and reliable testing, strong legislative and regulatory framework, mandatory certification and training of drinking water operators, a Provincial inspection and enforcement program, and implementation of an Operational Plan and QMS based on the DWQMS.

Multiple barriers protect the public and ensure that preventative and corrective actions are taken to address potential risks.

**Drinking Water System Operators play a vital operational role in providing safe drinking water so the Province established requirements for the training and certification of Drinking Water System Operators under *Ontario Regulation 128/04 – Certification of Drinking Water System Operators and Water Quality Analysts*.**

The City continues to participate in high quality Operator training through MECP-approved training providers and training courses. Drinking Water System Operators must complete annual in-class and on-the-job training to maintain certification. All City Operators and contractors responsible for operating any component of City's Drinking Water System are required to hold current MECP issued Drinking Water Certificates.

**Every municipal residential Drinking Water System is inspected at least once a year by the MECP to assess compliance with *the Act*.**

The MECP's Provincial Officers conduct on-site inspections to assess compliance with regulatory requirements including those detailed in the City's Municipal Drinking Water License and Drinking Water Works Permit. Inspections include a review of the Drinking Water System's source, treatment, and distribution components, as well as water quality monitoring results and procedures to evaluate system management and operations.

One inspection is conducted by the MECP annually, including at least one unannounced inspection every three years.

The City participated in one announced MECP inspection on January 5, 2023 covering the August 21, 2021 to December 28, 2022 inspection period. The MECP inspection included a site visit to the Maplewood Booster Station on January 5, 2023 followed by a comprehensive review of the City's operational documents and records. The City is awaiting the Inspection Summary Rating Record from the MECP for the January 5, 2023 inspection.

If Provincial Officers uncover significant findings that may affect public health, System Owners and Operators are informed immediately during the inspection.

**Annual internal and external audits of the City's Operational Plan and Quality Management System are mandated and are used to facilitate continuous improvement.**

The City's DWQMS was re-accredited on June 22, 2021 followed by an external surveillance audit of the City's Operational Plan on May 19, 2022. The audit identified zero instances of non-conformance and three opportunities for improvement (OFI). The OFIs have been reviewed and are being incorporated in the System. Re-accreditation is a requirement under *the Act* for the City to continue to operate the Drinking Water System.

An internal DWQMS audit was completed in October 2022 by a contracted auditing company. The internal audit identified zero instances of non-conformance and five OFIs. The OFIs have been reviewed and will be incorporated into the System, as appropriate.

Two Management Reviews were held to update Top Management, as defined in the DWQMS, on the status of the Drinking Water System, actions taken in the current calendar year, and actions planned for the next calendar year. The Management Reviews took place on July 27, 2022 and December 15, 2022. A summary of the Management Reviews is provided in Attachment 2.

**Previous Reports/Authority**  
[2021 Annual Drinking Water System Report](#)

## **Analysis and Options**

**In 2022, 99.1% of laboratory samples were within regulatory limits which reaffirms the City's commitment to supplying safe drinking water.**

The York-Durham Environmental Laboratory (YEDL), an MECP accredited drinking water laboratory, and the City's certified Drinking Water Operators performed 3,925 water quality tests during 2022. Of these tests, only 36 tested outside of the regulatory limits. These incidents are called Adverse Water Quality Incidents (AWQI).

Staff responded to each AWQI in accordance with City's SOPs, performing corrective actions as required under *Ontario Regulation 170/03 – Drinking Water Systems of the Act* and as directed by York Region's MOH. Prompt and decisive action to address AWQIs and their causes maintained continuous delivery of safe drinking water and ensured public safety.

**MECP inspections show the City is achieving strong and consistent performance levels and also highlight opportunities for the City to improve the Drinking Water System.**

The City is awaiting the final results of the January 5, 2023 announced MECP inspection for the August 21, 2021 to December 28, 2022 inspection period. During the 2022 inspection period, the City identified and reported four instances of non-compliance to the MECP. All four instances were associated with new development sites which were found to be in contravention of the City's Drinking Water Works Permit (#011-201) as contractors had conducted work on the City's distribution system without the presence of a City of Vaughan MECP-certified Drinking Water Operator.

The City's Water By-law 106-2022 regulates private connections to the City's Drinking Water System including practices and actions that put the integrity of Drinking Water System at risk. The City continues to engage the development community throughout the development process to promote and support compliance with Water By-law 106-2022.

**The City received a 100% inspection rating on the MECP's 2021-2022 Chief Drinking Water Inspector's Report.**

Ontario's Chief Drinking Water Inspector releases an Annual Report rating Drinking Water Systems across the Province. The 2021-2022 Chief Drinking Water Inspector's Annual Report includes in-depth information on the performance of Ontario's drinking water systems and licensed laboratories.

The 2021-2022 Chief Drinking Water Inspector Report gave the City the highest possible inspection rating of 100%.

For comparison purposes, eight of the nine local area municipalities in York Region received an inspection rating of 100%, with the remaining one receiving an inspection rating 98.29%. Of the 657 municipal residential Drinking Water Systems in Ontario, 78% received an inspection rating of 100%. This illustrates that the operation and management of the City's Drinking Water System is amongst the best in the Province.

### **Financial Impact**

In May 2019, Council approved the [Long Term Water Financial Plan for 2020 to 2031](#), committing to the long-term financial sustainability of the City's Drinking Water System and ensuring continuous delivery of safe drinking water. The Plan identifies the financial support required to operate, maintain, and perform asset management planning on the Drinking Water System and was a component in the City's Municipal Drinking Water License renewal submission to the MECP.

Under Section 11 of *Ontario Regulation 170/03 – Drinking Water Systems*, Owners are required to describe “any major expenses incurred during the period covered by the report to install, repair or replace required equipment.”

In 2022, the City invested \$18,344,200 to install, repair, and/or replace equipment required to deliver safe drinking water. Costs were funded through the City's water rates, associated reserves, and the approved capital and operating budgets.

### **Broader Regional Impacts/Considerations**

There is no impact to the Region.

### **Conclusion**

This report and its attachments are provided to support Council's statutory standard of care under Provincial drinking water regulations and allows Council to demonstrate its due diligence in performing informed decision making.

The City's Drinking Water System is subject to strict regulations implemented by the Province to keep drinking water safe. The audit and inspection results from both internal and external parties for the 2022 reporting year confirm the City's Drinking Water System is performing well.

These results are attributed to Council's commitment to provide safe drinking water to the City's residents and businesses.

As part of the City's regulatory requirements, links to this report and its attachments will be posted on the City's external website.

**For more information**, please contact:

Emilie Alderman, Director, Environmental Services, ext. 6116.

### **Attachments**

1. 2022 Annual Summary Report.
2. Drinking Water Quality Management Standards – Summary of Management Reviews.

### **Prepared by**

Emilie Alderman, Director, Environmental Services, ext. 6116.

Emily Fahlgren, Acting Supervisor, Compliance and Training, ext. 6175.

### **Approved by**



Zoran Postic, Deputy City Manager,  
Public Works

### **Reviewed by**



Nick Spensieri, City Manager



City of Vaughan  
2800 Rutherford Road  
Vaughan, ON L4K 2N9  
www.vaughan.ca



# CITY OF VAUGHAN

## 2022 ANNUAL SUMMARY REPORT

February 28, 2023

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.

# TABLE OF CONTENTS

1.0 REPORT OVERVIEW	
1.1 BACKGROUND.....	1
1.2 QUALITY MANAGEMENT SYSTEM (QMS) POLICY .....	1
2.0 DRINKING WATER SYSTEM DESCRIPTION	
2.1 DRINKING WATER SYSTEM PROFILE .....	2
3.0 LEGISLATIVE REQUIREMENTS	
3.1 SUMMARY OF LEGISLATIVE REQUIREMENTS .....	3
3.1.1 ONTARIO REGULATION 170/03 - DRINKING WATER SYSTEMS.....	3
SCHEDULE 6 – OPERATIONAL CHECKS, SAMPLING AND TESTING – GENERAL .....	4
SCHEDULE 7 – OPERATIONAL CHECKS.....	4
SCHEDULE 10 – MICROBIOLOGICAL SAMPLING AND TESTING .....	4
SCHEDULE 13 – CHEMICAL SAMPLING AND TESTING .....	4
SCHEDULE 15.1 – LEAD SAMPLING.....	5
SCHEDULE 16 – REPORTING ADVERSE TEST RESULTS AND OTHER PROBLEMS.....	5
SCHEDULE 17 – CORRECTIVE ACTION.....	9
SCHEDULE 22 - SUMMARY REPORTS FOR MUNICIPALITIES, AND SECTION 11 OF O. REG. 170/03 - DRINKING WATER SYSTEMS .....	9
3.1.2 ONTARIO REGULATION 128/04 - CERTIFICATION OF DRINKING WATER SYSTEM OPERATORS AND WATER QUALITY ANALYSTS.....	10
3.1.3 ONTARIO REGULATION 169/03 - ONTARIO DRINKING WATER QUALITY STANDARDS.....	10
3.1.4 ONTARIO REGULATION 188/07 - LICENSING OF MUNICIPAL DRINKING WATER SYSTEMS.....	10
3.2 DRINKING WATER QUALITY MANAGEMENT STANDARD (DWQMS).....	11
4.0 DRINKING WATER SYSTEM MAINTENANCE PROGRAMS	
4.1 WATER MAIN FLUSHING PROGRAM .....	12
4.2 HYDRANT INSPECTION PROGRAM.....	12
4.3 VALVE EXERCISING PROGRAM .....	12
5.0 WATER QUALITY	
5.1 WATER QUALITY INQUIRIES.....	13
6.0 WATER USAGE	
6.1 ANNUAL WATER TAKING FROM YORK REGION .....	14
7.0 ASSOCIATED WATER SUMMARY REPORTS	
7.1 LINKS TO ASSOCIATED WATER SUMMARY REPORTS.....	16
8.0 CONTACT INFORMATION	
8.1 REPORT CONTACT INFORMATION .....	17

# 1.0 REPORT OVERVIEW

## 1.1 BACKGROUND

The 2022 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, 2022 to December 31, 2022.

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 2022 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*. This report will be posted on the City's website by March 31, 2023.

## 1.2 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 as 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 assets and infrastructure integrity.

## 2.0 DRINKING WATER SYSTEM DESCRIPTION

### 2.1 DRINKING WATER SYSTEM PROFILE

The City's Environmental Services Department is responsible for the distribution of safe drinking water throughout the City. In 2022, 43,542,318 m<sup>3</sup> of water was 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 which 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 1,150.9 kilometres of active water mains, 1 booster station and 1 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 (MDWL) number, Drinking Water Works Permit (DWWP) number, and the system classification.

**Table 1** City of Vaughan Water Distribution System profile information.

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

# 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;* and
  - Water sampling parameters according to the Ontario Drinking Water Quality Standards
- (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

## 3.0 LEGISLATIVE REQUIREMENTS

### 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 can be 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 2022, 2,118 samples were taken to measure chlorine residuals.

The City's Water Distribution System is a stand-alone system which means that the received water stays within the City borders. Primary disinfection, testing for turbidity, and fluoride addition is undertaken at wastewater 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 2022 for an annual total of 1,620 samples.

The City collected a total of 1,758 microbiological samples for testing in 2022. Over 25% of the 1,758 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 2022 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.

## 3.0 LEGISLATIVE REQUIREMENTS

### 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 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 not more 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 sample exceedances for lead in 2022.

### 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 Ministry of the Environment, Conservation, and Parks (MECP) Spills Action Centre (SAC), and the Medical Officer of Health at the York Region Public Health Unit.

Table 2 below provides a summary of all adverse water quality incidents that occurred in 2022. The corrective action for each incident is also included in the Table. There were 36 adverse water quality incidents, none of which resulted in a risk to public health.

**Table 2** 2022 Adverse water quality incidents and corrective actions.

Incident Description	Incident Date	Adverse Test Result	Regulatory Limits	Corrective Action
Combined Chlorine Residual	04/06/22	4.11mg/L	0.25 mg/L (Minimum) 3.0 mg/L (Maximum)	Water Operations flushed water main at site and retested.
	04/11/22	3.06mg/L	0.25 mg/L (Minimum) 3.0 mg/L (Maximum)	Water Operations flushed water main at site and retested.
	06/06/22	3.54mg/L	0.25 mg/L (Minimum) 3.0 mg/L (Maximum)	Water Operations flushed water main at site and retested.

## 3.0 LEGISLATIVE REQUIREMENTS

Incident Description	Incident Date	Adverse Test Result	Regulatory Limits	Corrective Action
Combined Chlorine Residual	09/13/22	0.02mg/L	0.25 mg/L (Minimum) 3.0 mg/L (Maximum)	Water Operations flushed water main at site and retested.
	09/27/22	0.00mg/L	0.25 mg/L (Minimum) 3.0 mg/L (Maximum)	Water Operations flushed water main at site and retested.
	10/19/22	0.07mg/L	0.25 mg/L (Minimum) 3.0 mg/L (Maximum)	Water Operations flushed water main at site and retested.
	11/21/22	3.61mg/L	0.25 mg/L (Minimum) 3.0 mg/L (Maximum)	Water Operations flushed water main at site and retested.
Total Coliform (TC) Present	01/08/22	TC - Present	0	Water Operations flushed water main at site and resampled.
	03/23/22	TC - Present	0	Water Operations flushed water main at site and resampled.
	03/25/22	TC - Present	0	Water Operations flushed water main at site and resampled.
	03/26/22	TC - Present	0	Water Operations flushed water main at site and resampled.
	03/27/22	TC - Present	0	Water Operations flushed water main at site and resampled.
	03/27/22	TC - 1	0	Water Operations flushed water main at site and resampled.
	03/29/22	TC- Present	0	Water Operations flushed water main at site and resampled.
	04/09/22	TC- Present	0	Water Operations flushed water main at site and resampled.
	04/09/22	TC- Present	0	Water Operations flushed water main at site and resampled.
	04/24/22	TC- Present	0	Water Operations flushed water main at site and resampled.
	06/01/22	TC- Present	0	Water Operations flushed water main at site and resampled.
	08/03/22	TC- Present	0	Water Operations flushed water main at site and resampled.
	08/17/22	TC- Present	0	Water Operations flushed water main at site and resampled.
10/19/22	TC-Present	0	Water Operations flushed water main at site and resampled.	



## 3.0 LEGISLATIVE REQUIREMENTS

Incident Description	Incident Date	Adverse Test Result	Regulatory Limits	Corrective Action
Total Coliform (TC) Present	11/20/22	TC- Present	0	Water Operations flushed water main at site and resampled.
	11/22/22	TC -1	0	Water Operations flushed water main at site and resampled.
	11/24/22	TC- 11	0	Water Operations flushed water main at site and resampled.
	11/24/22	TC- 1	0	Water Operations flushed water main at site and resampled.
	11/26/22	TC- 3	0	Water Operations flushed water main at site and resampled.
	11/26/22	TC- 12	0	Water Operations flushed water main at site and resampled.
	11/26/22	TC- 3	0	Water Operations flushed water main at site and resampled.
	11/26/22	TC- 3	0	Water Operations flushed water main at site and resampled.
	11/28/22	TC- 2	0	Water Operations flushed water main at site and resampled.
	11/28/22	TC- 6	0	Water Operations flushed water main at site and resampled.
	11/28/22	TC- 1	0	Water Operations flushed water main at site and resampled.
	11/29/22	TC- 5	0	Water Operations flushed water main at site and resampled.
	11/29/22	TC- 4	0	Water Operations flushed water main at site and resampled.
	11/30/22	TC- 4	0	Water Operations flushed water main at site and resampled.
	12/01/22	TC- 3	0	Water Operations flushed water main at site and resampled.

## 3.0 LEGISLATIVE REQUIREMENTS

### 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 water main flushing and resampling of the identified area as well as any additional direction provided by the Medical Officer of Health at the York Region Public Health Unit and MECP Spills Action Centre. The samples are tested for chlorine residuals onsite 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 the York Region Public Health Unit.

### 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<sup>st</sup> of the following year. The City also posts the Report on the City's external website and hard copies of the Report are available free of charge to the public at the City's Joint Operations Centre located at 2800 Rutherford Road.

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<sup>th</sup> 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.

## 3.0 LEGISLATIVE REQUIREMENTS

### 3.1.2 *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 2022. 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 MECP accredited classroom training and 69 hours of on-the-job practical training.

During the reporting period of January 1, 2022 to December 31, 2022, 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.

### 3.1.3 *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 represent the point of which adverse reporting and corrective action is triggered.

### 3.1.4 *ONTARIO REGULATION 188/07 – LICENSING OF MUNICIPAL DRINKING 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 Systems.

## 3.0 LEGISLATIVE REQUIREMENTS

### 3.2 DRINKING WATER QUALITY MANAGEMENT STANDARD (DWQMS)

The Drinking Water Quality Management Standard 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 Licenses 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 was re-accredited on June 22, 2021 followed by a surveillance audit completed on May 19, 2022.

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 WATER MAIN FLUSHING PROGRAM

The main objective of the water main 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 water main 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 water main repairs to remove any debris in the water main 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 water main flushing. A total of 21 anti-stagnation valves were maintained by the City in 2022.

## 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. Repairs for deficiencies identified through the hydrant inspection program are completed by the City's Drinking Water Operators with the assistance of external Contractors, if 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 flow of water within the Water Distribution System and are required to be operated during maintenance activities such as water main swabbing and water main flushing. During a water main break, valves isolate a section of water main for the repair which confined 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 2022, 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 MDWL, 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 2022. Inquiries included questions pertaining to pH, hardness, lead, alkalinity, taste, odour, and colour. The City received a total of 119 water quality inquiries in 2022, most of which were classified as water inquiries (i.e. questions pertaining taste, odour, colour, etc.). The City can address citizens’ concerns and continually improve the Drinking Water System by documenting inquiries, tracking inquiries of a similar nature and location, and identifying trends.

**Table 3** 2022 Water quality inquiries related to the City’s Drinking Water System.

Type of Inquiry	Number of Inquiries	Action Taken
Taste and Odour	33	<ul style="list-style-type: none"> <li>Information provided by phone or email to identify the source of the smell (plumbing vs. drinking water) and to flush taps.</li> <li>Forwarded to Water Operations group for site investigation which may include testing for chlorine residuals and sampling for microbiological lab test.</li> </ul>
Discoloured Water	24	<ul style="list-style-type: none"> <li>Information provided by phone or email to flush taps.</li> <li>Forwarded to Water Operations group for site investigation which may include testing for chlorine residuals and sampling for microbiological lab test.</li> </ul>
General Inquiries	62	<ul style="list-style-type: none"> <li>Information provided by phone conversation and/or email correspondence.</li> <li>Provide most recent sample results upon request.</li> <li>Forwarded to Water Operations group for site investigation which may include testing for chlorine residuals and sampling for microbiological lab test.</li> </ul>
<b>Total</b>	<b>119</b>	

## 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 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, 2022 to December 31, 2022 was 43,542,318 m<sup>3</sup>.

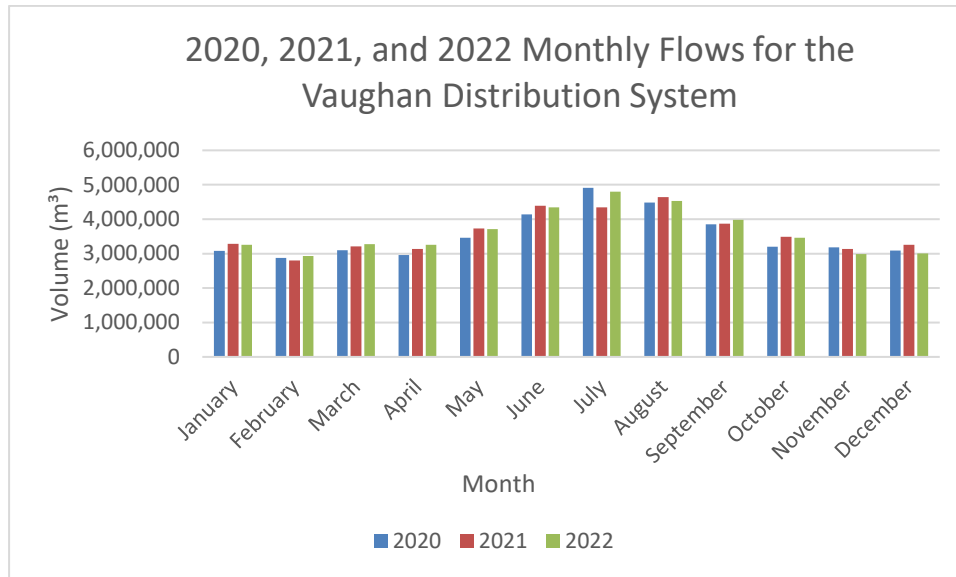
A comparison of 2020, 2021, and 2022 monthly flows for the City's Water Distribution System and the monthly average flow are included in Table 4 below. Figure 1 below shows a graphical representation of the data from Table 4. In 2022, July had the greatest flow and February had the lowest flow.

Table 5 shows the City's Water Distribution System's maximum, minimum, and average daily flows during each month of 2022. The highest daily flow (10,514m<sup>3</sup>) was recorded on September 7, 2022 and the lowest daily flow (-3,146m<sup>3</sup>) was recorded on February 6, 2022.

**Table 4** The City's Water Distribution System's monthly flows during 2019, 2020, and 2021.

Month	2020 Volume (m <sup>3</sup> )	2021 Volume (m <sup>3</sup> )	2022 Volume (m <sup>3</sup> )
January	3,077,774	3,286,583	3,261,305
February	2,878,450	2,799,114	2,927,218
March	3,095,795	3,207,629	3,273,864
April	2,962,290	3,132,150	3,252,791
May	3,457,889	3,729,063	3,713,184
June	4,142,098	4,393,697	4,348,879
July	4,908,594	4,346,091	4,799,278
August	4,482,517	4,645,725	4,525,906
September	3,852,898	3,868,170	3,983,104
October	3,199,023	3,488,178	3,462,097
November	3,186,863	3,132,888	2,985,305
December	3,087,530	3,256,141	3,009,388
<b>Total</b>	<b>42,331,721</b>	<b>43,285,428</b>	<b>43,542,318</b>
<b>Monthly Average Flow</b>	<b>3,527,643</b>	<b>3,607,119</b>	<b>3,628,526</b>

## 6.0 WATER USAGE



**Figure 1** The City’s Water Distribution System’s monthly flows during 2020, 2021, and 2022.

**Table 5** Maximum, minimum, and average daily flows during 2022.

Month	Maximum Daily Flow (m³)	Date of Maximum Flow	Minimum Daily Flow (m³)	Date of Minimum Flow	Average Daily Flow (m³)
January	5,206	24-Jan-22	3,988	01-Jan-22	4,541
February	4,993	02-Feb-22	-3,146	06-Feb-22	127
March	4,692	27-Mar-22	-875	01-Mar-22	1,683
April	4,587	30-Apr-22	-870	25-Apr-22	-11
May	7,461	19-May-22	3,587	02-May-22	5,357
June	9,098	22-Jun-22	4,943	07-Jun-22	7,099
July	8,975	23-Jul-22	5,755	25-Jul-22	7,859
August	9,042	10-Aug-22	5,291	25-Aug-22	7,194
September	10,514	07-Sep-22	988	29-Sep-22	6,174
October	1,553	14-Oct-22	502	20-Oct-22	987
November	293	01-Nov-22	-1,798	23-Nov-22	-128
December	4,186	21-Dec-22	-1,582	02-Dec-22	2,618

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 area municipalities, rely on Sections 11 and 89 (b), of the *Municipal Act, 2001* with respect to the supply of water.



# 7.0 ASSOCIATED WATER SUMMARY REPORTS

## 7.1 LINKS TO 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

### 8.1 REPORT CONTACT INFORMATION

Emily Fahlgren, Acting Supervisor, Compliance and Training  
Environmental Services Department  
City of Vaughan  
(905) 832-8585 ext. 6175  
[emily.fahlgren@vaughan.ca](mailto:emily.fahlgren@vaughan.ca)

## Attachment 2: Drinking Water Quality Management System – Summary of Management Reviews

### Review – 2022 Operational Performance

The purpose of this summary is to provide Council with mandatory updates regarding the City of Vaughan’s drinking water systems performance as mandated through Element 20 of the [Drinking Water Quality Management Standard](#) (DWQMS).

	<b>Element 20 - Management Review Requirements</b>	<b>Achieved?</b>	<b>Conforms to DWQMS?</b>
<b>1</b>	<p>Ensure that a Management Review is conducted at least once every calendar year.</p> <p><b>Completed on July 27, 2022 and December 15, 2022 with Top Management and the Owner representative for the 2022 operational year.</b></p>	<p>Yes</p> <p>✓</p>	<p>Yes</p> <p>✓</p>
<b>2</b>	<p>Consider the results of the Management Review and identify deficiencies and action items to address the deficiencies.</p> <p><b>Completed. See the Management Review Summary below.</b></p>	<p>Yes</p> <p>✓</p>	<p>Yes</p> <p>✓</p>
<b>3</b>	<p>Provide a record of any decisions and action items related to the Management Review including the personnel responsible for delivering the action items and the proposed timelines for their implementation.</p> <p><b>All decisions and action items discussed during the Management Review have been captured through record of minutes. Action follow-up is tracked.</b></p>	<p>Yes</p> <p>✓</p>	<p>Yes</p> <p>✓</p>
<b>4</b>	<p>Report the results of the Management Review, the identified deficiencies, decisions and action items to the Owner (Council).</p> <p><b>Completed through this report, submitted for information on February 28, 2023.</b></p>	<p>Yes</p> <p>✓</p>	<p>Yes</p> <p>✓</p>

## **Management Review Summary**

### **a) Annual Review of QMS 02- Quality Management System (QMS) Policy**

The QMS Policy was reviewed with all attendees.

Action Item: There was one action item identified during 2022. The City's Operational Plan is required to be re-endorsed by Top Management and the Drinking Water System Owner (Council) during each new term of Council. A Report is scheduled to be brought to Committee of the Whole on April 4, 2023 seeking Council endorsement of the Operational Plan and detailing Council's standard of care obligations.

### **b) Incidents of regulatory non-compliance**

During the December 15, 2022 review there were four incidents of regulatory non-compliance identified with respect to the City's Drinking Water Works Permit. All four incidents were associated with new development sites which were found to be in contravention of the City's Drinking Water Works Permit as contractors had conducted work on the City's distribution system without the presence of a City of Vaughan Ministry of the Environment, Conservation and Parks (MECP) certified Drinking Water Operator. All four incidents were reported to the City's MECP drinking water inspector.

Action Item: No action items are pending from the 2022 report.

### **c) Incidents of adverse drinking water tests**

Indicators of adverse water quality are immediately reported to York Region Public Health and the MECP Spills Action Centre and appropriate corrective action is taken. In 2022, there were a total of 36 reportable events, all of which were immediately addressed as required by the regulation. None of these events resulted in the integrity and safety of the drinking water supply being compromised.

Action Item: No action items are pending from the 2022 report.

### **d) Deviations from Critical Control Points (CCPs)**

Critical control limits have been established based on known CCPs identified through Risk Assessment outcomes. The two identified CCPs are related to potential contamination during a watermain break. There was no deviation from the two identified CCPs.

Action Item: No action items are pending from 2022 report.

### **e) The effectiveness of the risk assessment process**

Verification of risks to public health and the drinking water system is conducted at least once every calendar year and assessed at least once every 36 months. The Annual Review of the Risk Assessment was held on March 23, 2022 and resulted in minor wording updates to ensure current procedure titles and revision numbers were captured. No new CCPs were identified and no new potential hazards were identified. The next 36-month Comprehensive Review, including a re-evaluation of the identified risks, will occur during 2023.

Action Item: No action items are pending from 2022 report.

#### **f) Internal and third-party Audit results**

Internal and third-party audits assess how the City meets the requirements of the Drinking Water Quality Management Standard (DWQMS). The 2022 Internal Audit was held October 3 and 4, 2022. Zero instances of non-conformance were identified and five opportunities for improvement were identified and are being implemented. MECP-approved Drinking Water Quality Management System Auditors, SAI Global, performed a surveillance audit on May 19, 2022. Zero instances of non-conformance were identified and three opportunities for improvement have been reviewed and are being incorporated into the system.

Action Item: There are two OFIs to be implemented in 2023.

#### **g) Results of emergency response testing**

Testing of emergency response ensures that staff are prepared for emergency situations and allows the City to identify what could happen in the Drinking Water System to cause an emergency. The DWQMS requires the City to complete emergency response testing at least once every two years. A desktop exercise was conducted for water-related emergencies in Q4 of 2021. The next emergency response testing exercise will be conducted in 2023.

Action Item: No action items are pending from 2022 report.

#### **h) Operational performance**

Annual MECP inspections ensure that the City meets the requirements identified in applicable legislation and regulations. An announced inspection was held on January 5, 2023 covering the August 21, 2021 to December 28, 2022 inspection period. The MECP inspector arrived on-site to conduct a site visit and discuss operational performance. All documents/records requested by the inspector were provided. In the interest of continuous improvement, the MECP recommended the City consider more formal notification of the City's License and Permit to all legal owners (i.e. the developers that own subdivisions that have not yet been assumed by the City). The City is awaiting the Inspection Summary Rating Record for the January 5, 2023 inspection from the MECP.

Action Item: There is one continuous improvement initiative to be implemented in 2023.

#### **i) Raw water supply and drinking water quality trends**

The Annual Water Quality Report and Annual Summary Report provide data on drinking water quality trends within the City's drinking water. The 2022 Annual Water Quality Report and Annual Summary Report will be posted on the City's website prior to February 28, 2023 and March 31, 2023, respectively. The City has an exemption under the Municipal Drinking Water Licence (MDWL) for lead sampling from plumbing systems.

Action Item: No action items are pending from 2022 report.

#### **j) Follow-up on action items from previous management reviews**

The previous Management Review was held on November 17, 2021. There were a total of 19 action items identified, majority of which have been actioned.

Action Item: There are three actions pending including:

- Mapping of water quality inquiries;

- Determining the feasibility of conducting two DWQMS Internal Audits within each calendar year; and
- Determining the feasibility of offering DWQMS awareness training to staff in departments outside of the Environmental Services Department.

**k) The status of management action items identified between reviews**

All actions from the City's Internal Audit of Water, Wastewater, and Stormwater Operations have been completed and implemented.

Action Items: No action items are pending from 2022 report.

**l) Changes that could affect the Quality Management System (QMS)**

The Municipal Drinking Water Licence (MDWL) which authorizes the City of Vaughan to operate the Vaughan Distribution System expires on December 23, 2023. The City's Municipal Drinking Water Licence will be renewed prior to this date. Additional system-specific requirements may be identified through the licence renewal process that the City may be required to comply with such as additional sampling, testing, and monitoring. The outcome of the 36-month Comprehensive Review of the Risk Assessment that will be undertaken in 2023 also has the potential to impact the City's QMS as Top Management will be assessing cyber security as a potential hazard which could result in the identification of additional CCPs.

Action Items: No action items are pending from 2022 report.

**m) Consumer feedback**

Consumer feedback allows the City to identify if the water system is operating effectively. In 2022, there were a total of 119 calls that were received related to water odour, taste, colour, and quality inquiries. All concerns/inquiries were addressed appropriately and in a timely manner. Resolutions included field investigations, testing, and sharing information and laboratory results.

Action Items: No action items are pending from 2022 report.

**n) Resources needed to maintain the QMS**

Adequate resources are in place to maintain the QMS. There is currently one DWQMS Coordinator position that is temporarily vacant. Water Operations staff were trained for DWQMS Awareness in Q4 of 2022.

Action Items: No action items are pending from 2022 report.

**o) The results of the infrastructure review**

Physical condition of water infrastructure is regularly evaluated to maintain a state of good repair. Capital projects were identified by Environmental Services and Infrastructure Delivery via the City's capital budget process. In the 2022, there were 29 watermain breaks. A total of 4.3 km of watermain was added to the system from the last reporting period. Preventative maintenance of the Drinking Water System included the following during 2022: 3,000 valves were visited for preventative maintenance programming by an external contractor; 9,718 hydrants were maintained by an external contractor; 18 anti-stag valves were maintained; and 8 pressure reducing valves were functionally tested.

Action Items: No action items are pending from 2022 report.

**p) Operational Plan currency, contact and updates**

The Operational Plan has been revised to reflect majority of the OFIs from the 2022 External and Internal Audits.

Action Items: The following two OFIs are the only remaining OFIs under review for implementation into the DWQMS Operational Plan:

- QMS-15: Consider updating the 10-year Capital Forecast every calendar year based on the development of the annual budget and three-year forecast.
- QMS-16: Consider incorporating measures to make sample stations less susceptible to environmental contaminants into Tag 32 Sampling or Tag 41 Sample Station Operation and Maintenance.

**q) Staff suggestions**

Water Operations staff continue to provide input and assist in the development of Standard Operating Procedures through the Standard Operating Procedure Review Committee. Water Operations maintains a One Drive folder with meeting minutes which capture staff discussions and suggestions. Appendix Q – New Watermain Commissioning Requirements is under review with multiple stakeholders and final revisions are anticipated during 2023.

Action Items: No action items are pending from 2022 report.

**r) Review of Best Management Practices (BMPs)**

There were zero BMPs identified during the 2022 reporting period and one BMP from 2021 under review: determining the feasibility of conducting two DWQMS internal audits.

Action Items: One action item is pending from 2022 report.

**s) New Business**

None identified.

Action Items: No action items are pending from 2022 report.

**t) Date of Next Meeting**

The DWQMS dictates that the Management Review meeting be held at least once every calendar year.

Action Items: No action items pending from 2022 report.

**Conclusion**

The Management Review is recognized as a best practice for continual improvement for the City's Drinking Water Quality Management System, Drinking Water System, and associated monitoring and maintenance programs.

The on-going maintenance of the Quality Management System and focus on continual improvement provides assurance to Council, as the Owner of the municipal Drinking Water System, that its duties, responsibilities, and standard of care under the Act are being met.