



Report to: General Committee

Meeting Date: March 22, 2021

SUBJECT: Annual Water Quality Report (January-December 2020)
PREPARED BY: Helena Frantzke, Ext 2449
Water Quality Coordinator, Environmental Services

RECOMMENDATION:

1. That the report titled “Annual Water Quality Report (January-December 2020)” as required by Schedule 22 of Ontario Regulation 170/03, under the *Safe Drinking Water Act, 2002*, enclosed herein be received; and
2. That the 2020 Annual Water Quality Report (Attachment “A”), containing information for the Ministry of the Environment, Conservation and Parks (MECP) on water supply and quality as required by Section 11 of Ontario Regulation 170/03, under the *Safe Drinking Water Act, 2002*, be received; and,
3. That Council acknowledge that staff posted the 2020 Annual Water Quality Report on the City’s website and that it has been made available electronically and in hard copy version by February 28, 2021 as per regulations; and further,
4. And That Staff be authorized and directed to do all things necessary to give effect to this resolution.

EXECUTIVE SUMMARY:

As per Provincial Regulation 170/03, under the *Safe Drinking Water Act, 2002*, the City of Markham is mandated to produce the following two reports:

An annual report summarizing water quality information. This report outlines how the City of Markham receives its water, a description of the drinking water system and the water quality results for the period from January 1, 2020 to December 31, 2020. In addition, this report is required to be made available to the public upon request. The annual report has been posted on the Markham website and is available at the Waterworks Department located at 8100 Warden Avenue. The regulatory requirements for such a report are met in this way and a copy of the report has been enclosed as Attachment “A”, for Council reference.

A report prepared for Council is to be submitted by March 31, 2021. This report is to inform Council on any regulatory requirements that have not been met during the period of January 1, 2020 to December 31, 2020. For each requirement not met, Council is to be informed of what corrective actions were taken. In addition, a summary is to be provided of the quantities and flow rates of the water supplied during the same period. This report enclosed herein ensures that Markham has met all regulatory requirements.

Markham's customers consumed 30,820,500 m³ of water over 365 days in 2020. Representative water quality sampling was undertaken throughout the distribution system and analyzed according to O. Reg. 170/03. A total of twelve Adverse Water Quality Incidents (AWQIs) were reported to the MECP. There are two ways that an AWQI can arise, either as a result of sampling or from an on-site observation. Of the 7,222 regulatory samples taken in 2020, eleven samples (0.15%) did not meet regulatory limits outlined in the Ontario's Drinking Water Systems Regulation (O. Reg. 170/03). The remaining one AWQI was reported as an on-site observation during a watermain break repair. For all of the adverse incidents, the City of Markham performed the regulatory notifications and corrective actions to rectify the situation.

PURPOSE:

To inform Council, as owners of the drinking water system, on the quality of drinking water provided to the residents of Markham in 2020 through the water distribution system. By doing so, we are meeting the requirements of Schedule 22 of Ontario Regulation 170/03, under the *Safe Drinking Water Act, 2002*.

To provide Council with a summary on the more detailed & technical annual water quality report (included as Attachment "A"). This annual report has been prepared and made available to the public prior to February 28, 2021 via Markham's website and at the Waterworks Department located at 8100 Warden Avenue. This annual report details the drinking water system, sampling activity, corrective actions and any major monetary expenses incurred in 2020.

BACKGROUND:

In order to meet regulatory requirements and to strengthen customer confidence in the quality of the City of Markham's drinking water supply, Waterworks prepares annual update reports on the status of drinking water quality.

Enclosed, as Attachment "A", is the 2020 Annual Water Quality Report, which is intended to be a standalone document. This detailed, technical and statistical report summarizes the 2020 water distribution system for: results of lab tests and corrective actions taken, and any major expenses incurred. The Regulation also requires that this report be made available to the public, free of charge, and be posted on the City of Markham's website on or before February 28, 2021.

The 2020 Annual Water Quality Report to Council, contained herein, is intended to inform Council on the performance of the water distribution system over the past year and to provide specific information that meets the Ontario Regulation 170/03 requirements concerning Markham's Drinking Water Distribution System.

2020 Drinking Water System Information

The City of Markham's drinking water system is strictly a distribution system. We do not operate any treatment plants and therefore the rated capacity of our system, as requested by the MECP, is not applicable. The Region of York receives treated water from both the City of Toronto and the Region of Peel, stores and distributes it to various Municipalities including Markham, through trunk watermains from York and Toronto.

The City of Markham purchases its water entirely through the Region of York as the wholesaler, and distributes this water to its residents through metered connections.

OPTIONS/ DISCUSSION:

Water Supplied During 2020

The City of Markham customers (including residential, industrial, commercial and institutional) purchased a total of 30,820,500 m³ of water over 365 days in 2020. This amounts to an average of 2,568,375 m³/ month or 84,440 m³/day.

In 2020 a total of twelve (12) Adverse Water Quality Incidents (AWQIs) were reported to the MECP. There was one (1) reported AWQI due to an on-site observation during a watermain break repair and there were eleven (11) reported AWQIs, as a result of the 7,222 samples taken, which did not meet the Ontario's Drinking Water Systems Regulation (O. Reg. 170/03).

2020 On-Site Observation

In 2020 there were one (1) on-site observation incident reported as adverse water quality incidences during a watermain break repair. Waterworks staff immediately notified the MECP & MOH. The watermain break was repaired, the system was then flushed until acceptable chlorine residuals were established and a water sample was taken and tested for microbial contamination following the repair of the break.

Watermain breaks are only to be reported to MECP when it has been observed that contaminated water may have been directed to users. These observations often occur when there is a severe watermain break resulting in the collapse of the pipe wall and entry of dirt in the watermain. Further, following every watermain repair, regardless of its severity, Waterworks initiates a procedure to test a water sample for microbial contamination.

2020 Drinking Water Quality Sampling Results

Ontario's Drinking Water Systems Regulation (O.Reg.170/03) requires all drinking water system owners to collect and test a minimum prescribed number of representative water quality samples for its distribution system. It further requires that drinking water system owners prepare an annual report (in MECP format) on the operation and the quality of drinking water within their jurisdictional boundaries. Markham Waterworks Department has complied with this requirement. For the calendar year January 1, 2020 to December 31, 20; an annual regulatory report was prepared (MECP format) in January 2021 on the Markham Water Distribution System and is enclosed as Attachment "A". This report was posted prior to Feb. 28, 2021 as required by the Regulation.

During the period from January 1, 2020 to December 31, 2020, the total number of water samples collected and tested by Waterworks Operators was 7,222. These samples were tested for the presence of bacteria (*Escheria coli*, Total Coliforms, and Heterotrophic Plate Count), for chemical analysis {Organic parameters, including Trihalomethanes (THM), Haloacetic acids (HAA) and Nitrosodimethylamine (NDMA) and Inorganic

parameters including Lead (Pb), Nitrate (NO³) & Nitrite (NO²) } and all chlorine residuals as required.

Of the 7,222 regulatory samples collected and tested in 2020, eleven samples (0.15%) did not meet regulatory limits outlined in the Ontario's Drinking Water Systems Regulation (O. Reg. 170/03). The table below depicts the total number of AWQIs from all regulatory sampling in 2020.

2020 TOTAL NUMBER OF AWQIs FROM SAMPLING

PARAMETER	# SAMPLES TAKEN (TOTAL 7,222)	REPORTABLE TO MOECC	ADVERSE RESULT (AWQI)
MICROBIOLOGY - Scheduled (Total Coliforms / E. coli)	1,839	Yes	6
MICROBIOLOGY - Scheduled (HPC)	613	Not applicable	Not applicable
MICROBIOLOGY -Unscheduled (Total Coliforms /E. coli /HPC) Watermain Breaks and Adverse Water Quality Incident Resamples	62	Yes	5
CHLORINE	4,554	Yes	0
OTHERS (Organic, Inorganic, Lead, THM, HAA, NO ₂ /NO ₃ , NDMA)	154	Yes	0

1. Adverse Water Quality – Presence of Bacteria

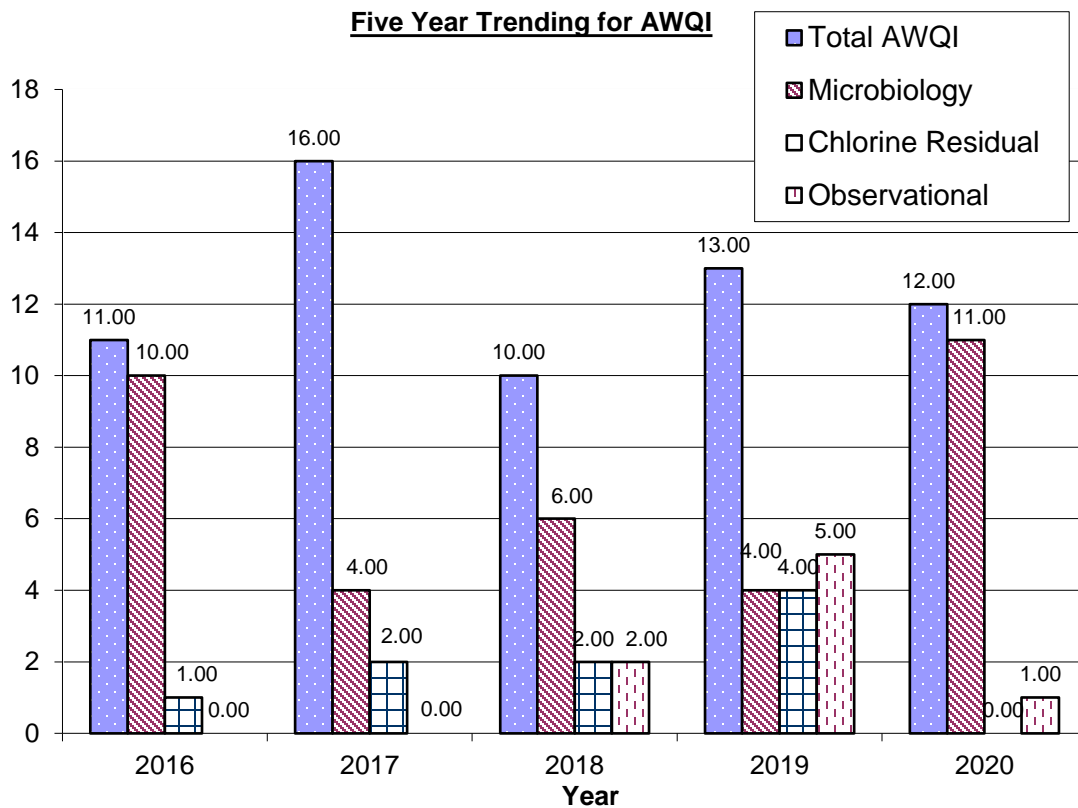
As part of our weekly regular sampling schedule the required number of samples are taken and tested for microbiological parameters. In 2020 as part of our weekly regular scheduled sampling program 1,839 samples were tested for microbiology parameters, of which six (6) tested positive for the presence of total coliforms (one of the samples had a count of total coliforms and two samples had an overgrowth of target bacteria, total coliform). In addition during our unscheduled microbiology sampling five (5) samples detected the presence of total coliforms, one (1) sample taken after a watermain break repair, two (2) were samples taken upon connection of new watermain to our existing distribution system and two (2) as part of our resampling during corrective action in response to an AWQI.

The detection of total coliform in drinking water has had a longstanding history of use as an indicator of drinking water safety. Total coliform bacteria are common in the environment (soil or vegetation) and are generally harmless. Upon being notified by Caduceon Environmental Laboratories that a given sample did not meet the water quality regulations for bacteria, Waterworks staff immediately notified the York Region Medical Officer of Health (MOH) and the MECP Spills Action Centre. Senior staff were informed

of all incidents by email. Immediate and proactive corrective actions were followed as per Standard Operating Procedures for responding to an adverse water quality test result. In such incidents the location which failed is resampled along with one location upstream and one location downstream of the initial location some distance away.

5 Year Trending of Adverse Water Quality Incidents (AWQIs):

The graph below depicts the breakdown of the total number of adverse water quality incidents for the last 5 years (Total AWQIs and the source of the adverse incidents).



Lead Sampling

The City of Markham has no known lead public service lines and the city has not encountered any lead issues in City drinking water. As a result the City of Markham has been granted relief from regulatory requirements outlined in Ontario Regulation 170/03 with respect to lead sampling. This includes no lead testing from plumbing servicing of private residences or non-residential buildings and reduced lead testing from distribution locations (20 per year). This reduced sampling was granted beginning in 2019 and extends until the end of 2021, at which time the MECP will review our program. In 2020 staff received four (4) calls from residents with concerns regarding lead in the drinking water, however since March 25, 2020 Waterworks Operators have not entered private

residences for non-emergency calls. Sampling and testing for lead on private sides is not considered an emergency. Once COVID-19 restrictions are lifted staff will follow up with residents on the list and arrange to sample and test for lead in their homes.

Conclusions:

In 2020, the drinking water distributed to the City of Markham residents continued to be of high quality. During the operation of the water distribution system during 2020, there were few adverse water quality incidents, (0.15% of all system samples undertaken) and corrective actions were taken immediately to resolve each incident. The drinking water system is maintained by Waterworks with continual improvements and programs in place to ensure excellent water quality.

FINANCIAL CONSIDERATIONS

Not Applicable

HUMAN RESOURCES CONSIDERATIONS

Not Applicable

ALIGNMENT WITH STRATEGIC PRIORITIES:

The Annual Water Quality Report (January – December 2020) on the drinking water system meets legislative requirements and is consistent with the City's corporate goals of Safe, Sustainable & Complete Community.

BUSINESS UNITS CONSULTED AND AFFECTED:

Not Applicable

The undersigned represent the Top Management of City of Markham's Drinking Water Distribution System, and by signing below the Top Management of the Operating Authority has reviewed the deficiencies, decisions and action items identified in the Management Review, and hereby communicating these results to the Owner.

RECOMMENDED BY:

Shumin Gao, P. Eng.
Manager - System Engineering, Environmental Services

Eddy Wu, P. Eng.
Acting Director, Environmental Services

Andy Taylor
CAO, City of Markham

ATTACHMENTS:

Annual Water Quality Report (January – December 2020) – Attachment A

The contents of this report include:

1. A description of where the report will be located and made available to the public.
2. A brief description of the drinking water system.
3. A breakdown of major expenses incurred to install, repair or replace required equipment.
4. A summary of adverse water quality reports and corrective actions taken.
5. A summary of water quality testing results for microbiological, inorganic chemical and organic chemical parameters.

The City of Markham has met the Regulation 170/03 submission dates and requirements of reporting for the annual water quality report.