



Report to: General Committee

Date Report Authored: January 7th, 2013

SUBJECT: Annual Water Quality Report (January – December 2013)
PREPARED BY: Stefan Ulman, Ext 2449
Water Quality Coordinator, Waterworks

RECOMMENDATION:

- 1) THAT the report titled “Annual Water Quality Report (January-December 2013)” as required by Schedule 22 of Ontario Regulation 170/03, under the *Safe Drinking Water Act, 2002*, enclosed herein be received;
- 2) THAT the Annual 2013 Regulatory Water Quality Report (Attachment “A”), containing information for the Ministry of the Environment (MOE) on water supply and quality as required by Section 11 of Ontario Regulation 170/03, under the *Safe Drinking Water Act, 2002*, be received;
- 3) THAT Council directs staff to post the Annual 2013 Detailed Regulatory Water Quality Report on the City’s website and that it be made available and provided to residents upon request in hard copy version by February 28, 2014;
- 4) AND FURTHER 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:

- 1) 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, 2013 to December 31, 2013. In addition, this report is required to be made available to the public upon request. The annual report will be posted on the Markham website and will be available at the Contact Centre (Civic Centre) and at the Waterworks Department (8100 Warden Ave.), by February 28, 2014. 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.
- 2) A report prepared for Council is to be submitted by March 31, 2014. This report is to inform Council on any regulatory requirements that have not been met during the period of January 1, 2013 to December 31, 2013. 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 purchased 30,781,405 m³ of water over 365 days in 2013. Representative water quality sampling was undertaken throughout the distribution system and analyzed according to O. Reg 170/03. Of the total 6,615 samples taken in 2013, only 13 samples (0.19%) detected the presence of coliforms which were reported under seven (7) Adverse Water Quality Incidents (AWQIs). The 13 failed samples were for microbiological indicators (tested positive for Total Coliforms). For all of the adverse incidents, the City of Markham performed the required 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 2013 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 will be made available to the public prior to February 28, 2014 via Markham's website, at the Contact Centre and at the Waterworks Department, 8100 Warden Avenue. This annual report details the drinking water system, sampling activity, corrective actions and any major monetary expenses incurred in 2013.

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.

- 1) Enclosed, as Attachment "A", is the 2013 Annual Water Quality Report, which is intended to be a standalone document. This detailed, technical and statistical report summarizes the 2013 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, 2014.
- 2) The 2013 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.

2013 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 MOE, 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 water mains 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.

Water Supplied During 2013

The City of Markham purchased 30,781,405 m³ of water over 365 days in 2013. This amounts to an average of 2,565,117 m³/ month. In Markham, 64.65% (19,899,754.5 m³) of this water was consumed by our 330,000 residents at a rate of 165 L/person/day (0.165 m³/person/day). The remaining 35.35% (10,881,650.5 m³) of water was consumed by our industrial, commercial and institutional clients.

2013 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 MOE format) on the operation and the quality of drinking water within their jurisdictional boundaries. Markham Waterworks Department has complied with this requirement.

During the period from January 1, 2013 to December 31, 2013, the total number of water samples collected and tested by Waterworks Operators was 6,615. These samples were tested for the presence of bacteria (*Escheria coli*, Total Coliforms, and Heterotrophic Plate Count), for chemical analysis (Trihalomethanes (THM), Lead (Pb), Nitrate (NO³⁻) & Nitrite (NO²⁻), Organic and Inorganic chemical scans) and for chlorine residuals as required. Sodium and Fluoride concentrations were not tested in 2013 as this test is required every 5 years and was last tested in 2010.

For the calendar year January 1, 2013 to December 31, 2013; an annual regulatory report was prepared (MOE format) in January 2014 on the Markham Water Distribution System and is enclosed as Attachment "A". This report will be posted prior to Feb. 28, 2014 as required by the Regulation. In this report, we are detailing the seven (7) adverse sampling incidents (13 adverse samples) which are summarized below.

Markham exceeds the required number of samples tested for microbiological parameters every week during our regular sampling process and by taking additional samples following every watermain repair, regardless of severity. These proactive procedures could lead to an increase in the number of reported adverse water quality incidents. However, they are necessary to enable faster response to potential adverse conditions.

In 2013, there were seven (7) reports of adverse water quality incidents comprising of 13 samples (out of 6,615 samples) which did not meet the Ontario's Drinking Water Systems Regulation (O. Reg. 170/03).

Adverse Water Quality – Presence of Bacteria

Of the 1,874 samples tested for microbiology during 2013 on the drinking water system as part of our regular sampling, only thirteen (13) samples detected the presence of coliforms which led to seven (7) separate adverse water quality incidences. The detection of these coliforms in water samples is considered to be an indicator of adverse water

quality. Upon being notified by the York-Durham Regional Environmental Lab (YDREL) that a given sample did not meet the water quality regulations for bacteria, Waterworks operators immediately notified the York Region Medical Officer of Health (MOH) and the MOE Spills Action Centre. Immediate and proactive corrective actions were followed as per Standard Operating Procedure for responding to an adverse water quality test result. Senior staff were informed of the incident by email. Watermains nearest the affected locations were flushed and all resamples passed with no further evidence of adverse water quality, except for one sample (1) AWQI #112508 (July 17, 2013) which resulted in two failed resamples (AWQI #112551 & # 112589) at the Sample Station located at 280 Hillmount Rd. The Region of York Public Health was contacted, and under their direction, the following additional measures were taken:

1. Change operators taking samples
2. Superchlorinate sampling station internal piping (extra disinfectant)

Both sets of resamples passed and the adverse water quality incident was resolved on July 20, 2013.

Markham's past experience has been that the bacterial presence in water samples was a result of external influences rather than being caused by the water supply itself, such as:

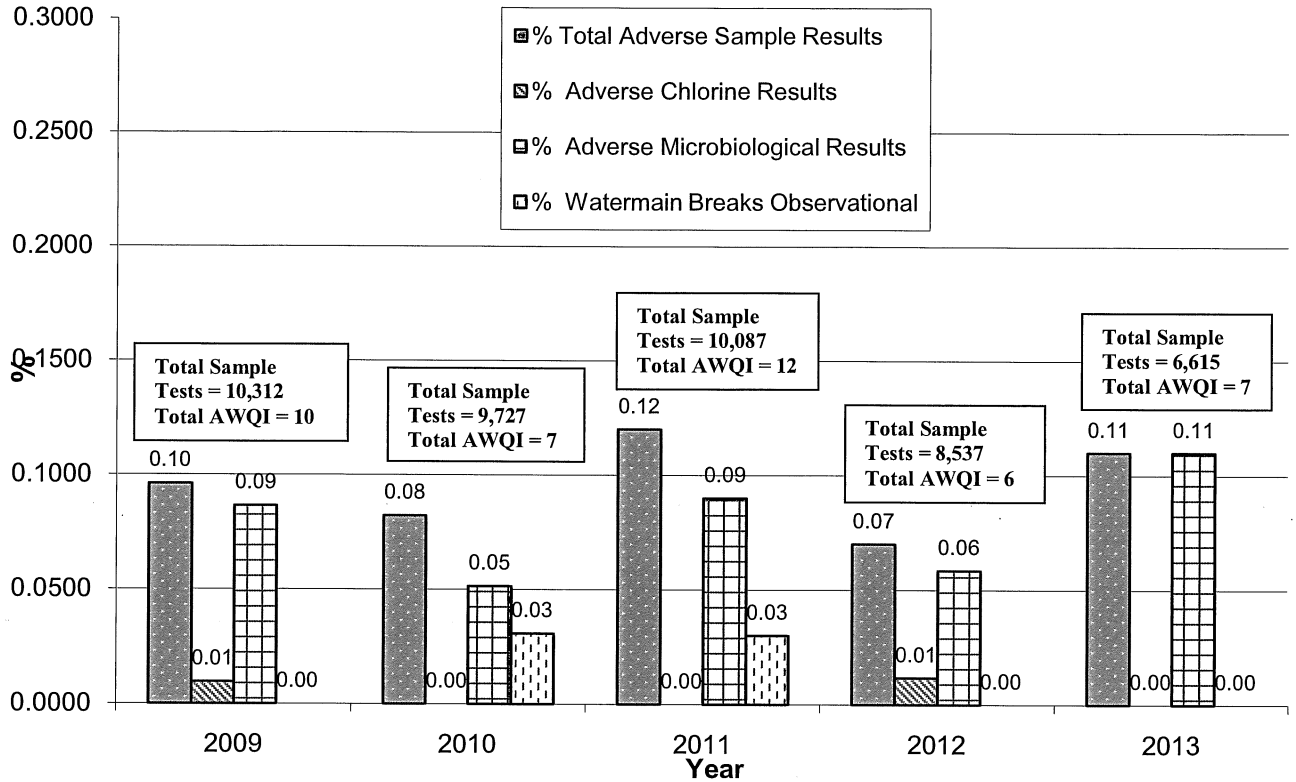
- Sampling Error where contaminants get in the water from outside the tap or from the sampler
- Issues with the sample bottle (broken seal)
- Error at the lab in analyzing the sample

These false positives occur from time to time and are more prevalent during late spring and summer. During these incidents, the chlorine levels measured at the time of taking the samples were of sufficient strength to provide effective, ongoing disinfection, well above the MOE limits as well as our internal threshold limits.

5 Year Trending of Water Sampling:

The graph below (next page) depicts the adverse sample results of the last 5 years (total sample test numbers, % adverse and source of the adverse incident).

Five Year Trending of Water Sampling



Conclusions:

In 2013, the drinking water distributed to the City of Markham residents continued to be of high quality. The total number of samples tested in 2013 decreased significantly compared to previous years, due to a large reduction in lead samples taken under the Community Lead Testing Program. This was as a result of the exemption granted by the Ministry of Environment (MOE) in 2011, for 2012, for such testing and due to a planned reduction approach for microbiological sampling. During the operation of the water distribution system during 2013, there were very few adverse reports (0.11% of all system tests undertaken) and these were immediately resolved. The drinking water system is maintained by Waterworks with continual improvements and programs in place to ensure excellent water quality.

FINANCIAL CONSIDERATIONS AND TEMPLATE: (external link)

Not Applicable

HUMAN RESOURCES CONSIDERATIONS

Not Applicable

ALIGNMENT WITH STRATEGIC PRIORITIES:

The 2013 Annual Water Quality Report on the drinking water system meets legislative requirements and is consistent with the City's corporate goals of Infrastructure Management and Quality Community.

These goals enhance several key Waterworks service delivery components:

- Proactive and preventative strategies to identify and manage risks to public health;
- Continuous Improvement of Waterworks activities and service delivery;

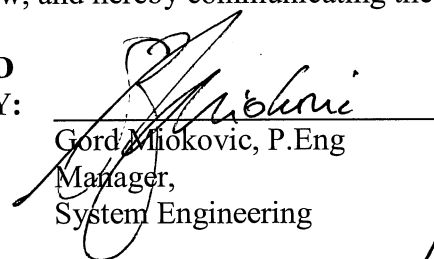
BUSINESS UNITS CONSULTED AND AFFECTED:

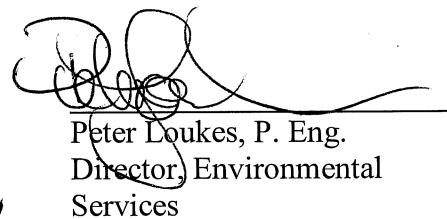
Not Applicable

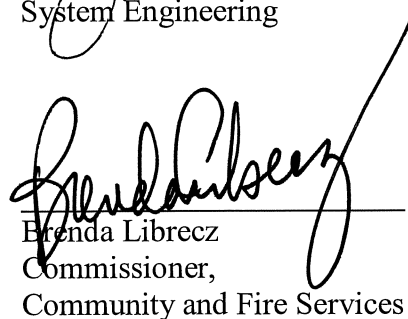
The undersigned represent the Top Management of City of Markham's Drinking Water Distribution System, and by signing below the Top Management of the Operating Authority has reviewed the deficiencies, decisions and action items identified in the Management Review, and hereby communicating these results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

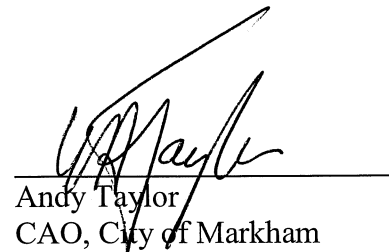
RECOMMENDED

BY:


Gord Mliokovic, P.Eng
Manager,
System Engineering


Peter Loukes, P. Eng.
Director, Environmental
Services


Brenda Librecz
Commissioner,
Community and Fire Services


Andy Taylor
CAO, City of Markham

ATTACHMENTS:

Attachment "A" – 2013 Annual Water Quality Report

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.