**Subject: Drinking Water Quality Management System (DWQMS) 2021 Management Review Report**

**File Number: ACS2022-IWS-WS-0004**

**Report to Standing Committee on Environmental Protection, Water and Waste Management on 21 June 2022**

**and Council 6 July 2022**

**Submitted on May 20, 2022 by Marilyn Journeaux, Director (A), Water Services, Infrastructure and Water Services Department (IWSD)**

**Contact Person: Caroline Lamoureux, Management Systems Coordinator (A), Infrastructure and Water Services Department (IWSD)Choose an item.**

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**Ward: Citywide**

**Objet : Rapport de l'examen de 2021 par la direction, selon la Norme de gestion de la qualité de l'eau potable (NGQEP)**

**Dossier : ACS2022-IWS-WS-0004**

**Rapport au Comité permanent de la protection de l'environnement, de l'eau et de la gestion des déchets**

**le 21 juin 2022**

**et au Conseil le 6 juillet 2022**

**Soumis le 20 mai 2022 par Marilyn Journeaux, Directrice (A), Services d'eau, Direction générale des services d'infrastructure (DGSI)**

**Personne-ressource : Caroline Lamoureux, Coordinatrice des systèmes de gestion (A), Direction générale des services d'infrastructure (DGSI)**

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**Quartier : À l'échelle de la ville**

## REPORT RECOMMENDATIONS

**That the Standing Committee on Environmental Protection, Water and Waste Management recommend that Council receive the 2021 Management Review Report of the Drinking Water Quality Management System.**

## RECOMMANDATIONS DU RAPPORT

**Que le Comité permanent de la protection de l'environnement, de l'eau et de la gestion des déchets recommande que le Conseil municipal prenne connaissance du rapport de 2021 sur l'examen de la gestion du Système de gestion de la qualité de l'eau potable.**

## EXECUTIVE SUMMARY

The Drinking Water Quality Management Standard (DWQMS) was adopted provincially in 2007 and legislated under Ontario Regulation 188/07 under the Safe Water Drinking Act, 2002. A requirement of the DWQMS is to conduct an annual management review on the implementation and performance of the quality management system, and to ensure that the results are communicated to the Owner (Council).

There are 16 topics that must be considered in the annual management review.

The review found that, overall, the Quality Management System (QMS) in place has been successful and effective. Throughout the items discussed, it was observed that staff responded effectively to events and that the safety of the drinking water was assured.

Some points of interest to come out of the 2021 review:

- COVID19 remained a concern but continued use of safety features as well as added mandatory vaccination helped ensure an uninterrupted supply of safe drinking water to residents throughout 2021.
- Eight (8) Ministry of Environment, Conservation and Parks (MECP) inspections were completed in 2021 and the city has received final reports for five (5) of them up until publication date of this report. Four (4) inspections received scores of 100 percent and one received a score of 95.9 percent due to administrative issues. Actions were organized to prevent these issues from arising again.
- Raw water supply monitoring continued for a number of substances, including those of concerns: radiological substances with Chalk River, PFAS at Carp Well Station, nitrates at Shadow Ridge Well Station. In 2021, changes in operations to help address these

issues were either completed (Carp Well System Granular Activated Carbon (GAC) filter installation) or are underway (Shadow Ridge Well System alternative water source project). No significant changes occurred in the raw water quality.

- The Water Loss developed new programs to help identify leaks in the distribution system, with plans to use the data produced to inform future projects.
- While lead sampling was suspended for 2021, the Lead Pipe Replacement Program and low-phosphate treatment project continued making progress in 2021 to lower Ottawa residents' exposure to lead in older homes.
- Work on other projects and programs continued through 2021: Spring Flooding mitigation measures, Lemieux Island WPP intake replacement project, Water Purification Plan Development Plan, Drinking Water Asset Management Plan, Large-Diameter Watermain Condition Assessment Program, Infrastructure Master Plan, etc.
- Some administrative changes were identified as needing evaluations for their impact on the QMS: the 2022 Corporate Restructuring, technological changes for documentation and archiving, and the MECP Potential Hazardous Events list revision.
- The review also went over QMS activities, such as the Internal Audits, the Emergency Exercise and Risk Assessment process; resulting action items are being tracked by the QMS Coordinator.

During the 2021 Management Review, three (3) action items were created. All three action items have been assigned a primary actionee/branch and a target date of completion of 2022. These will be tracked through the CAPA database by the QMS Coordinator.

**RÉSUMÉ**

La Norme de gestion de la qualité de l'eau potable (NGQEP), régie par le Règlement de l'Ontario 188/07 pris en application de la *Loi de 2002 sur la salubrité de l'eau potable*, a été adoptée à l'échelle provinciale en 2007. Elle prévoit entre autres un examen annuel par la direction relativement à la mise en place et au rendement du système de gestion de la qualité, examen dont les résultats doivent être transmis au propriétaire (le Conseil municipal).

Il y a 16 sujets à couvrir dans l'examen annuel.

L'examen a révélé que globalement, le système de gestion de la qualité (SGQ) est fonctionnel et efficace. Pour chaque point discuté, il a été constaté que les interventions du personnel étaient efficaces et que la salubrité de l'eau potable était assurée.

Certains faits qui sont ressortis de l’examen de 2021 :

- La COVID-19 est demeurée un élément préoccupant, mais le maintien des mesures de sécurité ainsi que l’ajout d’une politique de vaccination obligatoire ont permis d’assurer un approvisionnement continu en eau potable tout au long de l’année.

- Huit (8) inspections du ministère de l’Environnement, de la Protection de la nature et des Parcs (MEPP) ont été réalisées en 2021. À la date de publication du présent rapport, la Ville avait reçu les rapports finaux pour cinq (5) d’entre eux. Quatre (4) inspections ont reçu une note de 100 %, et une (1) autre, la note de 95,9 % en raison de problèmes administratifs. Des mesures ont été prises pour éviter que la situation ne se reproduise.

- La présence d’un certain nombre de substances dans l’eau brute est toujours sous surveillance. Il s’agit entre autres des substances radiologiques provenant de Chalk River, des SPFA à la station de pompage de Carp et des nitrates à la station de pompage de Shadow Ridge. En 2021, des changements opérationnels pour résoudre ces problèmes ont été effectués (installation d’un système de filtration sur charbon actif en grain au système de puits de Carp) ou entrepris (remplacement des sources d’eau du système de puits de Shadow Ridge). Aucun changement significatif n’a été observé dans la qualité de l’eau brute.

- De nouveaux programmes de contrôle des pertes en eau ont été mis sur pied pour repérer les fuites dans le système de distribution. Les données recueillies seront mises à profit dans d’autres projets.

- Bien que les analyses de la teneur en plomb aient été suspendues pour 2021, le Programme de remplacement des conduites en plomb et le projet de traitement à faible teneur en phosphate se sont poursuivis pour limiter l’exposition au plomb des occupants de vieilles demeures d’Ottawa.

- D’autres projets et programmes ont été maintenus durant l’année, dont les mesures d’atténuation de la crue printanière, le remplacement des prises d’eau de l’usine de purification de l’île Lemieux, le plan d’aménagement des usines de purification d’eau, le Plan de gestion des infrastructures d’adduction de l’eau potable, le Programme d’évaluation de l’état des conduites d’eau principales de grand diamètre et le Plan directeur de l’infrastructure.

- Une évaluation des conséquences sur le SGQ s’est avérée nécessaire en ce qui concerne certains changements administratifs : la réorganisation municipale de 2022, les nouveautés technologiques en matière de documentation et d’archivage ainsi que la mise à jour de la liste des évènements dangereux potentiels du MEPP.

- L’examen a aussi été l’occasion de passer en revue les activités du SGQ, dont les vérifications internes, l’exercice d’urgence et l’évaluation des risques. Le coordonnateur du SGQ assure le suivi des mesures à prendre qui sont ressorties.

À l’issue de l’examen de 2021, trois (3) mesures à prendre ont été définies. La responsabilité de chacune a été assignée à une personne ou une direction, l’échéance étant 2022. Le coordonnateur du SGQ en effectuera le suivi dans la base répertoriant les mesures correctives et préventives.

**BACKGROUND**

In 2002, Justice Dennis O’Connor published Part Two of the Report of the Walkerton Inquiry, which recommended the adoption of a quality management approach for municipal drinking water systems. The report also recommended that a quality management standard, specifically designed for drinking water systems, be developed and implemented in Ontario; thus, leading to the creation of the Drinking Water Quality Management Standard (DWQMS). The requirement to implement the DWQMS is now mandated through the Safe Drinking Water Act, 2002.

As the Owner of the municipal drinking water systems, Council has a number of duties and responsibilities under the Safe Drinking Water Act, 2002, described in sections 11, 13, 16 and 17 of the Act. The duties of the Owner related to the Standard of Care are described under Section 19 and came into force on December 31, 2012. In order to ensure that City Councillors were made aware of their duties and responsibilities under the Act, staff organized a Technical Briefing of newly elected City Councillors on November 15, 2018.

In his 2002 report, Justice O’Connor further commented that municipalities who had an accredited Operating Authority would be making a significant step in meeting the owner’s due diligence and responsibilities under the Act. One of the primary tools that the Owner has in place to satisfy the Standard of Care under the Act is to have Municipal Drinking Water Licences for all its drinking water systems. The elements of each Licence include:

- A permit to take water;
- A drinking water works permit;
- An operational plan;

- A financial plan; and
- An accredited operating authority.

The City of Ottawa maintains valid licences for all eight of its municipal drinking water systems:

- Central System (Britannia and Lemieux Island Water Purification Plants and central water distribution system)
- Carp Well System
- Kings Park Well System
- Munster Hamlet Well System
- Richmond West Well System (ownership pending final acceptance from a private developer, operated, and maintained by the City of Ottawa)
- Shadow Ridge Well System (owned by a private developer, operated, and maintained by the City of Ottawa)
- Vars Well System

The City of Ottawa received the first phase of DWQMS accreditation effective April 29, 2009 (Limited Scope – Entire DWQMS), with Full Scope accreditation on October 3, 2011. It is subject to a triennial re-accreditation process, with the most recent one occurring in 2020; when it is not a re-accreditation year, the City's Drinking Water QMS undergoes an external surveillance audit on an annual basis.

As described in Element 20, a requirement of the DWQMS is to conduct an annual management review of the QMS and to ensure that the results of this review are communicated to the Owner (Council) by Top Management. Top Management is a term defined in the DWQMS as,

> *"A person, persons or a group of people at the highest management level within an operating authority that makes decisions respecting the QMS and recommendations to the owner respecting the subject system or subject systems."*

This requirement is completed through a series of meetings attended by Operational Top Management and other Operating Authority staff, where specific items help review the QMS's performance during the previous year. The review is documented in a report prepared yearly (see Document 1)

The main purpose of this report is to provide Council, as the Owner of the municipal drinking water systems, with an update on the implementation and the performance of the QMS in 2021.

**DISCUSSION**

In 2021, the third-party accreditation body (NSF International Strategic Registrations (NSF)) conducted their off-site surveillance audit of the City's DWQMS via virtual meetings with City of Ottawa personnel and electronic submission of requested documents and records, due to COVID-19 pandemic restrictions. The results of this audit demonstrated zero findings of non-conformance for the City's drinking water systems.

COVID19 remained a concern but continued use of safety features as well as added mandatory vaccination helped ensure an uninterrupted supply of safe drinking water to residents throughout 2021.

Eight (8) Ministry of Environment, Conservation and Parks (MECP) inspections were completed in 2021 and the city has received final reports for five (5) of them up until publication date of this report. Four (4) inspections received scores of 100 percent and one received a score of 95.9 percent due to administrative issues. Actions were organized to prevent these issues from arising again.

Raw water supply monitoring continued for many water quality parameters, including those of environmental and health concerns:

- With increasing awareness of the Chalk River Laboratories and the proposed Near Surface Disposal Facility, daily/weekly radiological monitoring continued for gross alpha, gross beta, and tritium. Tritium is the most relevant radionuclide, and the average 2021 levels were of 2.5 Becquerel/Liter (Bq/L) (Britannia) and 2.4 Bq/L (Lemieux); the Drinking Water guideline is 7000Bq/L.

- For pharmaceutical substances, two substances are regularly observed but at low and steady levels; these are currently unregulated.

- PFAS are of increasing concerns for the environment and human health. These have been present in the Carp well system in previous years and following the Granular Activated Carbon (GAC) filter system installation in 2021, all PFAS substances were removed except for one (PFPeA).

- Nitrate levels at Shadow Ridge Well Station have plateaued since 2019, with an average 2021 level of 3.36 mg/L; this is within the Ontario DW standard of 10 mg/L as a Maximum Allowable Concentration (MAC).

Work on projects to address some of these raw water issues as well as other issues has continued or been initiated in 2021:

- In efforts to address the nitrate levels issue at Shadow Ridge Well System, a project charter was completed in early 2021 and the undertaking is now with ISD - Design and Construction as an engineering consultant assignment, to examine options for an alternative water supply. Once finished, this project will provide a more secure source of water for the Shadow Ridge water supply.

- With regards to lead, while Health Canada adopted a new stringent guideline of 5ppb for lead as a MAC, the province has not yet adopted it. However, the city has projects underway to help minimize lead exposure. Water Quality tracks the number of lead service line (LSL) homes to evaluate the potential lead exposure for Ottawa residents. For monitoring: due to COVID19 and protecting sampling staff, the city applied for and received regulatory relief for the 2021 winter and summer sessions of lead samplings in the Central Distribution System and the Richmond West Well System. To address the amount of LSL homes: the Lead Pipe Replacement Program (LPRP) was updated in 2020 and 2021, and 30,000 letters were mailed to customers in areas with pre-1955 homes by the end of 2021. Through the LPRP, 89 older homes had their LSL converted to non-LSL service in 2021; about 27,945 LSL homes remain. For treatment options: Ottawa has been using pH adjustments to minimize lead corrosion and leaching in LSL homes, which helped lower the lead levels to below the 10ppb standard value. To lower it below the 5ppb standard, a low-dose phosphate treatment process project was investigated and is currently in the design phase, with expected commissioning in 2022/2023.

- The Water Loss developed new programs to help identify leaks in the distribution system. A proactive data driven approach to identify and reduce system leakage was developed, comparing water meter data to water production data and determining leakage rate in every water pressure zone; this will help in prioritizing water loss and leak detection activities in zones with the highest leakage. Another new experimental approach was developed and tested to identify the amount of leakage and potential unaccounted-for water in unmetered private watermains in the distribution system; this work informed the next project, which focuses on the re-development of bylaws and standards that could impact water loss.

- The spring flooding mitigation measures projects continued in 2021. Flooding contingency plans were developed and supplies were acquired for Lemieux Island and

Britannia WPP sites; training was provided to staff in April 2021. Final design of non-return valves, on several storm outfalls at the WPPs, was completed in 2021 and installation is planned for the summer of 2022. Larger, more permanent mitigation strategies are being investigated, as part of the later described WPP Comprehensive Development Plan undertaking.

- The Lemieux Island intake replacement project for a new, deeper raw water intake nearly completed the design in 2021; the project team continues to work with Quebec and Ontario regulatory approval agencies, prior to starting construction. This project will further mitigate the risk of frazil ice shutting down the Lemieux Island WPP.

- With the 2022 Drinking Water Asset Overall Condition Ratings, the Management Review table comparing past evaluations was updated to compare the 2022 and 2017 ratings. Greater than 90% of drinking water assets were in fair, good or very good conditions; the remaining assets will have a higher priority for future funding needs. Work continued on the Water Purification Plants Development Plan during 2021. As well, the development of the Drinking Water Asset Management Plan continued through 2021, with a first version due to be developed by June 2022, as required.

- With the Large-Diameter Watermain Condition Assessment Program, a total of 11.2 kilometer of large-diameter watermain was inspected for leaks and 3.9 kilometer for structural deficiencies in 2021; 7.5 kilometer were considered fully completed. Due to inspection findings in 2020/2021, several repair and replacements were completed or are underway. Staff also provided an updated status for planned Watermain Renewal Work Undertaken in 2021 as well as proposed Large Watermain Condition Assessment program for the next 3 years. With regards to growth-related infrastructure, the City's 2021 capital budget process identified adjustments to project funding needs based on the progress on several major water supply projects required to support growth, as identified in the 2013 Infrastructure Master Plan (IMP); staff provided the status of several major growth-related water infrastructure projects during 2021. Work is underway to update the IMP.

Some administrative changes that occurred were also evaluated for their impact on the QMS:

- The 2022 Corporate Restructuring led to changes to the branches and services that support the City's Drinking Water Operational Plan/QMS. Work is currently underway to identify and revise any affected sections, one of which is the Corporate Top Management members list.

- Technological changes for documentation and archiving led to the start of projects to update and improve existing business processes. With the transition from shared corporate servers and the Ozone (Stellent) intranet website to the Collaborative

SharePoint websites and the My City (SharePoint) site respectively, projects were initiated to help develop an efficient and documented architecture and ownership of these assets. As well, the planned decommissioning of BIMS in 2022 will lead to changes in the archiving of QMS-required documents and records.

- The Ministry of Environment, Conservation and Parks updated their Potential Hazardous Events list to include a new hazard – Cybersecurity. It is a requirement that the city's DW Risk Assessment process evaluate the hazards identified as such an action item was identified to ensure this activity takes place during this year's Risk Assessment process.

As a result of the 2021 Management Review, three (3) action items were created:

- For Water Production costs, i) investigate possibility of separating water production costs for individual systems (i.e., central vs well systems), and if possible, then ii) report regularly as new KPI for Water Production (quarterly report) iii) add to the Management Review report item g) Water Production KPIs.

- Ensure that the 2022 Risk Assessment exercise addresses the addition of "All systems – Cybersecurity threats" to the MECP Potential Hazardous Events list.

- At the next planned OTM meeting, discuss level of detail to review in item n) of Management Review, with regards to Water Production and Water Distribution projects, condition assessments, funding, etc. Refer to 2021 DWQMS Management Review Report, Table 30 for WD projects, vs lack of similar break down for WP.

All three action items have been assigned a primary actionee/branch and a target date of completion of 2022. These will be tracked through the CAPA database by the QMS Coordinator.

**RURAL IMPLICATIONS**

Residents supplied by the six municipal well systems receive safe drinking water that meets all regulations, standards, inspections, and includes comprehensive management oversight by the DWQMS.

**CONSULTATION**

Ottawa Public Health (OPH) is a key partner in the provision of safe drinking water for Ottawa residents and businesses. To maintain continuity and responsiveness, Water Services and OPH staff meet bi-monthly to review water quality test results, adverse water quality incidents, communication protocols, and potential risks of new and emerging issues in drinking water. In addition, a formal meeting is held each year during Q2 to review the water quality results achieved over the last year.

## COMMENTS BY THE WARD COUNCILLOR(S)

This is a City-wide report.

## ADVISORY COMMITTEE(S) COMMENTS

There was no advisory committee consultation as part of this report.

## LEGAL IMPLICATIONS

There are no legal impediments to Committee and Council's receipt of this report for information.

## RISK MANAGEMENT IMPLICATIONS

All risks associated have been identified and explained in the report and are being mitigated by the appropriate staff.

## ASSET MANAGEMENT IMPLICATIONS

The recommendations documented in this report are consistent with the City's Comprehensive Asset Management (CAM) Program objectives.

The Drinking Water Quality Management System considers asset management system elements that help inform decision making processes necessary to protect Ottawa's drinking water system and reduce public health risks.

## FINANCIAL IMPLICATIONS

There are no 2022 financial implications associated with this report.

## ACCESSIBILITY IMPACTS

There are no accessibility impacts associated with this report.

## CLIMATE IMPLICATIONS

There are no climate implications associated with this report.

## ENVIRONMENTAL IMPLICATIONS

The development of the QMS is provincially legislated under the Safe Drinking Water Act, 2002. The QMS has been reviewed by a third-party accreditation body and the City of Ottawa has obtained its Operating Authority Accreditation. This report also fulfills the

legislative requirement to report on the Annual Management Review of the QMS to the Owner.

## TECHNOLOGY IMPLICATIONS

There are no technology implications to this report.

## TERM OF COUNCIL PRIORITIES

2019-2022 Term of Council Priorities: Indicate the priority or priorities that support your recommendation(s). The seven priorities are: Economic Growth and Diversification; Integrated Transportation; Thriving Communities; Environmental Stewardship; Service Excellence through Innovation; Sustainable Infrastructure and Thriving Workforce.

This project addresses the following Term of Council Priorities:

- ES1 – Support an environmentally sustainable Ottawa.
- GP2 – Advance management oversight through tools and processes that support accountability and transparency.

## SUPPORTING DOCUMENTATION

Document 1 – DWQMS 2021 Management Review Report

## DISPOSITION

Staff will continue to work to provide safe drinking water, following all legislation. Staff will implement any direction received as a result of this report.