

2. 2019 DRINKING WATER QUALITY MANAGEMENT SYSTEM REPORT

**RAPPORT DE L'EXAMEN PAR LA DIRECTION ET PLAN D'EXPLOITATION
EN VERTU DE LA NORME DE GESTION DE LA QUALITÉ DE L'EAU
POTABLE DE 2019**

COMMITTEE RECOMMENDATION

That Council receive the 2019 Management Review Report of the Drinking Water Quality Management System.

RECOMMANDATION DU COMITÉ

Que le Conseil municipal prenne connaissance du rapport de 2019 sur l'examen de la gestion du Système de gestion de la qualité de l'eau potable.

DOCUMENTATION

1. Director's Report, Water Services, Public Works and Environmental Services, dated 3 September 2020 (ACS2020-PWE-WTS-0002).

Rapport de la directrice, Services d'eau, Direction générale des travaux publics et de l'environnement, daté le 3 septembre 2020 (ACS2020-PWE-WTS-0002).

2. Extract of draft Minutes, Standing Committee on Environmental Protection, Water and Waste Management, 15 September 2020.

Extrait de l'ébauche du procès-verbal, Comité permanent de la protection de l'environnement, de l'eau et de la gestion des déchets, le 15 septembre 2020.

**STANDING COMMITTEE ON
ENVIRONMENTAL PROTECTION,
WATER AND WASTE MANAGEMENT**

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**COMITÉ PERMANENT DE LA
PROTECTION DE
L'ENVIRONNEMENT, DE L'EAU ET
DE LA GESTION DES DÉCHETS
RAPPORT 10
LE 23 SEPTEMBRE 2020**

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**Report to
Rapport au:**

**Standing Committee on Environmental Protection, Water and Waste Management
Comité permanent de la protection de l'environnement, de l'eau et de la gestion
des déchets**

15 September 2020 / 15 septembre 2020

**and Council
et au Conseil**

23 September 2020 / 23 septembre 2020

**Submitted on September 3, 2020
Soumis le 3 septembre 2020**

**Submitted by
Soumis par:**

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/ Directrice, Services d'eau, Direction générale des travaux publics et de
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Ward: CITY WIDE / À L'ÉCHELLE DE LA VILLE File Number: ACS2020-PWE-WTS-0002

SUBJECT: 2019 Drinking Water Quality Management System Report

**OBJET: Rapport de l'examen par la direction et plan d'exploitation en vertu
de la Norme de gestion de la qualité de l'eau potable de 2019**

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REPORT RECOMMENDATIONS

That the Standing Committee on Environmental Protection, Water and Waste Management recommend that Council receive the 2019 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 2019 sur l'examen de la gestion du Système de gestion de la qualité de l'eau potable.

EXECUTIVE SUMMARY

The Drinking Water Quality Management System (DWQMS) was adopted provincially in 2006. 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).

Overall, the City has successfully implemented its DWQMS Operational Plan. There are 16 topics that must be considered in the annual management review. During the 2019 Management Review, one (1) new action item was created regarding routine weekly bacteriological testing of source wells:

Action: develop and implement a standard procedure for responding to test samples that occasionally show the presence of coliform bacteria in source wells. These results provide an early indicator to take operational action such as re-sampling and/or chlorination of the specific well.

In 2019, the City commissioned and assumed ownership of a new well system, Richmond West, serving the Western Development Lands in Richmond. As a result of this new drinking water system, efforts have been underway to update documents and records including standard operating procedures, Municipal Drinking Water Licenses and Permits, Source Protection approvals and third-party accreditation.

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As previously reported, the trend for nitrate levels in the Shadow Ridge Well System steadily increased over the first 10 years of operation but has levelled off during 2018 and 2019 with current nitrate levels at 3.4 mg/L, safely within the 10 mg/L Ontario Drinking Water Standard for nitrate. A project is currently underway to test and drill two new deeper source wells for the Shadow Ridge system to resolve the nitrate issue.

Due to increasing concerns about health impacts from lead, on March 8, 2019, Health Canada published a more stringent guideline of 5 parts per billion (ppb) for lead in drinking water compared to the previous guideline of 10 ppb. The Province will likely be adopting the new 5 ppb guideline, although implementation timelines have not been announced. Although Ottawa's tap water is lead free, small amounts of lead can dissolve during transport through lead service pipes and/or household plumbing and tap fixtures. During Fall 2019, there was a sharp increase in customer inquiries and requests for lead testing, due to extensive media coverage of this issue. Between September and October 2019 alone, City staff conducted over 500 in-home tests for lead in tap water, compared to 15-20 typical requests.

During September 2019, briefings were held with Members of Council, Mayor and City Manager's office regarding the lead issue in drinking water. Staff brought forward a Council Report (ACS2019-PWE-GEN-0013) on September 25, 2019 to seek approval for changes to the Lead Pipe Replacement Program and outreach communications to better assist residents wishing to replace their lead service pipes and minimize exposure to lead in tap water. The changes were approved by Council on September 25, 2019 through Council Reports ACS2019-PWE-GEN-0013 and ACS2019-PWE-WTS-0018.

At the same meeting, the 2018 DWQMS Report (ACS2019-PWE-WTS-0018) described a new water treatment strategy, currently in design, which will utilize phosphate addition to further minimize lead levels in older Ottawa homes and comply with the lower Health Canada guideline for lead.

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

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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 (the 'Standard'). The requirement to implement the Standard 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:

- Britannia Water Purification Plant
- Lemieux Island Water Purification Plant
- Carp Well System
- Kings Park (Richmond) Well System
- Munster Hamlet Well System

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- Richmond West (Richmond) Well System
- Shadow Ridge (Greely) Well System
- Vars Drinking Well System

The new Richmond West Well System was commissioned during April 2019. This system underwent a Limited Scope Audit in 2018 and a Full Scope Audit in 2019 to fulfill the DWQMS accreditation requirements. The first Ministry of Environment (MECP) Annual Inspection was carried out for this system on March 4, 2020 and received an Inspection Rating of 100%.

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, then re-accreditation on September 4, 2014 and again on October 2, 2017. Results of the 2017 external audit demonstrated zero findings of non-conformance. The third-party accreditation body conducts their surveillance audits of the City's Quality Management System (QMS) annually between the years when re-accreditation is required. The Richmond West Well System underwent a Limited Scope Audit in 2018 and a Full Scope Audit was completed in early 2019 to fulfill the DWQMS accreditation requirements, both of which resulted in zero findings of non-conformance.

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.”

Thus, Top Management at the City of Ottawa includes the General Manager of Public Works and Environmental Services (PWES) Department, the Director of Water Services and other select Managers within PWES, Water Services, and the Planning, Infrastructure, Economic Development Department. Top Management is responsible to make recommendations to the Owner regarding the drinking water systems and the QMS.

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 2019.

DISCUSSION

The DWQMS is the key tool that supports and assures Council, as the Owner of the drinking water systems, that it is meeting its duties and responsibilities under the Safe Drinking Water Act, 2002 and the Statutory Standard of Care (section 19).

As a requirement of the Operational Plan, a comprehensive review of the QMS must be undertaken annually by Top Management. This requirement is completed as part of the Management Review, which entails a series of meetings attended by Top Management where specific items are reviewed for the past year. This review and any recommendations for improvement are included within the Management Review reports prepared each year.

Overall, the City of Ottawa has successfully implemented its Operational Plan. Some examples that demonstrate this achievement in 2019, as documented in the Management Review report, include:

- City's Water Services has successfully implemented a robust Drinking Water Quality Management System starting in 2008. The program is well established, well managed, with high staff engagement and commitment;
- Continued excellent external audit results have been received since its initial accreditation in 2009. In 2019, the third-party accreditation body conducted their off-site surveillance audit of the City's DWQMS. This audit demonstrated zero findings of non-conformance for Ottawa's drinking water systems.
- As the construction and commissioning of the Richmond West Well System was completed in 2019, the third-party accreditation body completed a full scope on-site audit to fulfill the DWQMS accreditation requirements. This audit also demonstrated zero findings of non-conformances for the new well system, Richmond West.

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- The 2019 external audits marked the 8th year of receiving 0 non-conformances for its DWQMS.
- On June 13, 2019 the City received updated Municipal Drinking Water Licenses (MDWL) and Drinking Water Works Permits (DWWP) for all eight municipal water systems, which are issued by the Ministry for a 5-year period and based on an extensive review and application process.
- In the MDWL for Britannia and Lemieux Island treatment plants, there was a new requirement for the City to develop a Harmful Algal Bloom response plan for Ottawa's surface water treatment plants. The river intakes for both treatment plants are considered low risk for algal bloom events and cyanotoxins, however, an algal bloom risk assessment and response plan was developed and endorsed by Ottawa Public Health (OPH) and the Ministry (MECP). It was implemented as a Standard Operating Procedure (SOP) effective January 1, 2020.
- Despite significant operational challenges during the Ottawa River spring flood event of 2019, an uninterrupted supply of safe drinking water was provided to Ottawa residents throughout the emergency.
- In response to changes in Health Canada's guideline for lead in drinking water, an updated Lead Pipe Replacement Program and new corrosion control strategy were developed to meet changing regulations.
- The Water Production's maintenance teams completed over 95% of planned and preventive maintenance.
- The Large-Diameter Watermain Condition Assessment Program completed 9.7 km in 2019 exceeding the 5 km per-year performance measure detailed in the 2015–2018 Strategic Plan (28-A).
- During 2019, several "issues" of concern were highlighted in the media such as: microplastics, PFAS, pharmaceuticals, cyanobacteria, and radioactivity. In all cases, test results from Ottawa's monitoring program demonstrated the safety of Ottawa's drinking water supply regarding these emerging concerns.

Collectively, these efforts reinforce the fact that the City of Ottawa produces and delivers some of the best quality and safest drinking water in the world.

There are 16 topics that must be considered in the annual management review (Table 1). This report provides an update to only those items that require attention. All other items not discussed in this report have either been reported to Council previously or have been reviewed, and are in compliance with all regulations, or in conformance with the Operational Plan. One (1) new action was developed during the 2019 Management Review regarding routine bacteriological testing of source wells. Each of the source wells in Ottawa's municipal water systems are tested twice weekly for the presence of coliform bacteria, which are sometimes detected in source well water. Consecutive positive results provide an early indicator for taking operational actions (e.g. resample, shock chlorination). The action item is to develop a standard operating procedure for responding to such test results.

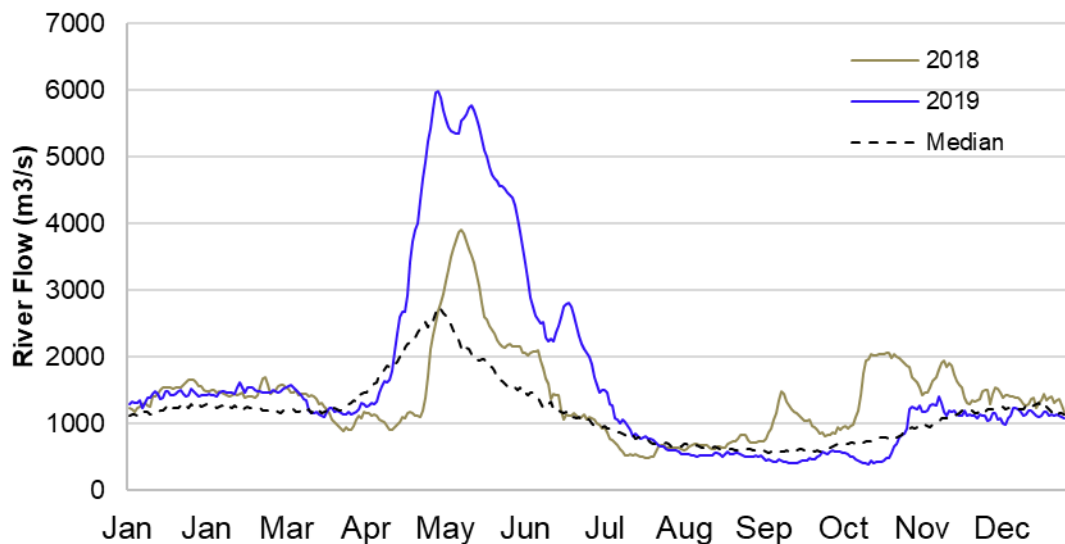
Table 1 - List of Items for Annual Review that will be discussed in this report

Management Review Topic	Summary
Raw water supply and drinking water quality trends	Discussed below
Changes that could affect the QMS	Discussed below
Results of the infrastructure review	Discussed below
Incidents of regulatory non-compliance	Not required this year.
Incidents of adverse drinking water tests	Not required this year.
Deviations from critical control point limits and response actions	Not required this year.
Effectiveness of the risk assessment process	Not required this year.
Results of audits (internal and external)	Not required this year.
Results of relevant emergency response testing	Not required this year.
Operational performance	Not required this year.
Follow-up action items from previous management reviews	Not required this year.
Status of management action items identified between reviews	Not required this year.
Summary of consumer feedback	Not required this year.
Resources needed to maintain the QMS	Not required this year.
Operational plan currency, content and updates	Not required this year.
Summary of staff suggestions	Not required this year.

Raw water supply and drinking water quality trends

Ottawa River flow rates and levels in 2019 were higher than in recent years, owing to the heavy rain and flooding through the spring and early summer period. The maximum daily flow water 5,978 (m³/s) measured on May 1, 2019, created a new 50-year record high flowrate for the month of May (monthly average 5,174 m³/s). The graphs presented below compare the 2019 flow trend compared to 2018 and the long-term median trend. It is important to note that despite these significant flow rates and water levels, source water quality was fairly typical of spring freshet conditions and easily handled by Ottawa's water treatment process. Throughout the 2019 flood event, an uninterrupted supply of safe drinking water was provided to residents.

Figure 1 - Ottawa River flowrates (m³/s) during 2018 vs. 2019 in comparison to long-term median flow trend (1960 – 2018)

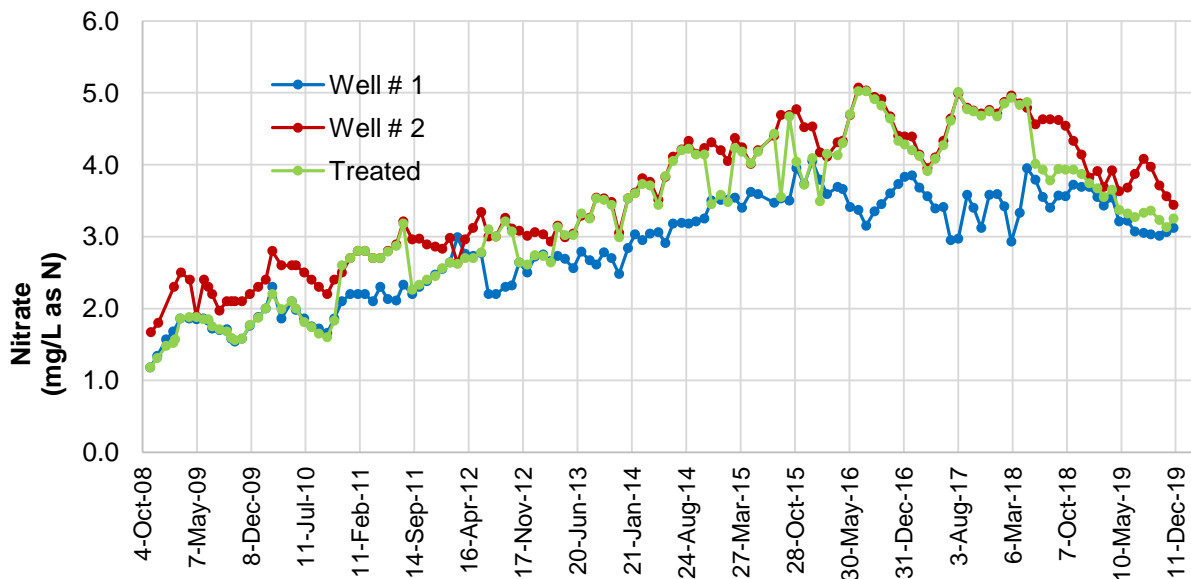


As previously reported, the nitrate concentrations in the Shadow Ridge well system continue to be high (3.4 mg/L) compared to water quality in the other well systems (less than 0.02 mg/L). Nitrate concentrations in the source wells have shown a gradual but steady increase from approximately 1.5 mg/L in 2008 to 4.5 mg/L in 2017 but have since levelled off in the 3 – 4 mg/L range. The 2019 average nitrate concentration in the

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treated water was 3.4 mg/L, which is within the safe drinking water standard of 10 mg/L as a Maximum Allowable Concentration.

Figure 2 - Nitrate level in Shadow Ridge treated water and source wells (2008 – 2019)



In order to provide a long-term solution for the nitrate issue, the City is working on a project to drill new sources wells located deeper into the aquifer. The focus during 2019 was to review the quality of the water from the deeper aquifer to confirm the suitability as the source water to supply Shadow Ridge. Test wells are being drilled on the new property where we expect to construct the new production wells. A functional design and construction activities are expected to continue into 2020.

Changes that could affect the QMS

Lead in drinking water

Due to increasing concerns about health impacts from lead, Health Canada, on March 8, 2019 published a new more stringent guideline of 5 ppb (part per billion) for lead in drinking water, expressed as a Maximum Acceptable Concentration (MAC). The new

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guideline included the provision of ALARA (as low as reasonably achievable) to encourage water providers to make every effort to minimize lead exposure.

The Province is expected to adopt the new 5 ppb standard for lead, although an implementation timeline has not yet been announced. Since 2007, the City has conducted extensive monitoring of tap water lead concentrations as per [O.Reg.170.03 Schedule 15.1](#). Although Ottawa's water supply is lead-free, small amounts of lead can be dissolved during transport through lead service pipes and/or household plumbing and tap fixtures. Approximately 30,000 (pre-1955) older homes in Ottawa are supplied by lead service pipes. Using the current corrosion control method (pH adjustment), the City has passed all 22 rounds of bi-annual testing complying with the previous 10 ppb standard. This strategy, however, will not meet the new 5 ppb standard. During September/October of 2019, City staff responded to more than 500 customer requests for lead testing in older Ottawa homes following media coverage of Health Canada's lower guideline for lead.

In order to minimize the risk of lead exposure in drinking water, the City is currently in design to implement a new water treatment strategy that uses phosphate to reduce lead concentrations in older homes supplied by lead service pipes. In addition, revisions to the Lead Pipe Replacement Program (LPRP) and outreach communications were developed to better assist residents wishing to replace their lead service pipes. During September 2019, these changes were reviewed through in-person meetings with Members of Council, the Mayor, and City Manager's Office. The changes were approved by Council on September 25, 2019 through Council Reports ACS2019-PWE-GEN-0013 and ACS2019-PWE-WTS-0018.

New Municipal Drinking Water Licenses

Municipal Drinking Water Licenses (MDWL) for each municipal water system are issued for a 5-year period and renewed by the Ministry through a comprehensive application and review process every five years. On June 13th, 2019 the City received updated MDWL licenses and DWWP permits for all eight municipal water systems. These were noted in the Drinking Water Summary Report issued to Council on March 31st, 2020.

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All changes and revisions reflected in the new licenses were highlighted and tracked by operational staff through the Drinking Water Quality Management System (DWQMS). Although most of the changes in the new licenses were relatively minor, there was a new requirement for the City to develop a Harmful Algal Bloom response plan for Ottawa's surface water treatment plants – see below.

Harmful Algal Blooms

As required by Schedule 6.0 of the MDWL for both surface water treatment plants (Britannia and Lemieux Island), a Harmful Algal Bloom (HAB) Response Plan was required for implementation by January 1st, 2020. Accordingly, a risk assessment and response plan were developed and endorsed by Ottawa Public Health (OPH) and the Ministry (MECP). The plan involves monthly testing of raw and treated water at both plants, visual shoreline observations, and specific trigger levels and response actions. It is important to note that the river intakes for both treatment plants are considered low risk for algal bloom events, and cyanotoxins have not been detected during routine monthly monitoring in 2016, 2017, 2018, and 2019. The new response plan was implemented as a Standard Operating Procedure (SOP) effective January 1st, 2020.

New Well System – Richmond West

In 2019, the City commissioned and assumed ownership of the new Richmond West well system. As a result of this new drinking water system, efforts have been underway to update and/or obtain documents and records, including SOPs, Municipal Drinking Water Licenses and Permits, Source Protection approvals and third-party accreditation.

Large Diameter Watermain Condition Assessment Program

The 2012 report - [Drinking Water Transmission Main Condition Assessment Program: ACS2012-COS-ESD-0014](#) - recommended that a summary of inspections on critical water transmission mains, including an action plan for correction of pipes identified to be in very poor condition be provided as part of the Drinking Water Quality Management System annual report.

Beginning in the 2013 DWQMS annual report to Council, management has responded with a summary of inspections on critical water transmission mains and an action plan

for the correction of pipes identified to be in poor condition. To date, condition assessment has been carried out for 19% of the total large-diameter watermain pipe in Ottawa, although 70% of the higher risk pipe (installed from about 1972 to 1979) have been assessed as a priority. The program completed 9.7 km in 2019 exceeding the 5 km per-year performance measure detailed in the 2015–2018 Strategic Plan (28-A).

Next Steps

Staff will continue to provide safe drinking water and ensure all legislation is followed under the [Safe Drinking Water Act, 2002](#). Staff will also be implementing the action item identified as part of the 2019 Management Review.

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. As noted previously in the report, the Shadow Ridge well system has experienced steadily increasing levels of nitrate, although current levels remain safely within the Ontario Drinking Water Standard of 10 mg/L and a project is underway to provide new source wells from deeper within the aquifer.

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 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. The joint review meeting for 2019 was held on June 20th at the Britannia Water Purification Plant.

COMMENTS BY THE WARD COUNCILLOR(S)

This is a City-wide report.

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ADVISORY COMMITTEE(S) COMMENTS

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

LEGAL IMPLICATIONS

There are no legal implications associated with receiving this report.

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 financial implications associated with this report.

ACCESSIBILITY IMPACTS

There are no accessibility impacts 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

ES1 – Support an environmentally sustainable Ottawa.

GP2 – Advance management oversight through tools and processes that support accountability and transparency.

SUPPORTING DOCUMENTATION

There is no supporting documentation to this 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.