

CITY OF HAMILTON'S DRINKING WATER SYSTEMS DWQMS SUMMARY REPORT



2020

Safe Drinking Water Act
DWQMS v2.0



DRINKING WATER QUALITY MANAGEMENT SYSTEM POLICY



The City of Hamilton owns, maintains and operates various drinking water systems. The City is committed to:

S

Safe, high quality, consistent supply of drinking water

A

Always improving the Drinking Water Quality Management System

F

Following and complying with applicable legislation

E

Effective and open communication with the community concerning matters of drinking water quality



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1 INTRODUCTION



1.1 Purpose

This Drinking Water Quality Management System (DWQMS) Summary Report is being submitted to the Owner, (Mayor and Council) on behalf of Top Management (General Manager, Public Works and Director of Hamilton Water) of the City’s five drinking water systems (DWS), as shown below.

Drinking Water System
Hamilton DWS (Woodward and Fifty Road Subsystems)
Freelton DWS
Greenville DWS
Carlisle DWS
Lynden DWS

The purpose of this DWQMS Summary Report is to keep the Owner of the City’s DWSs informed about the ongoing performance of the DWQMS, including major milestones achieved in 2020. This report also assists the Owner in meeting their Standard of Care responsibilities under the Safe Drinking Water Act (SDWA).

This DWQMS Summary Report is a key communication tool from Top Management to the Owner as referenced in Element 12 Communications of the DWQMS Standard. This Report also meets the communication requirements of Element 14 Review and Provision of Infrastructure and Element 20 Management Review of the DWQMS Standard as identified in Sections 3 and 5 of this report, respectively.

1.2 Scope

The DWQMS Standard requires that the Operating Authority report on certain aspects of the DWQMS to the Owner, specifically the outcomes of Element 14 Review and Provision of Infrastructure and Element 20 Management Review. This report fulfills the communication requirements of these elements and exceeds the Standard’s requirements by providing information on external and internal DWQMS Audits, Risk Assessment and other major milestones of the DWQMS for 2020.

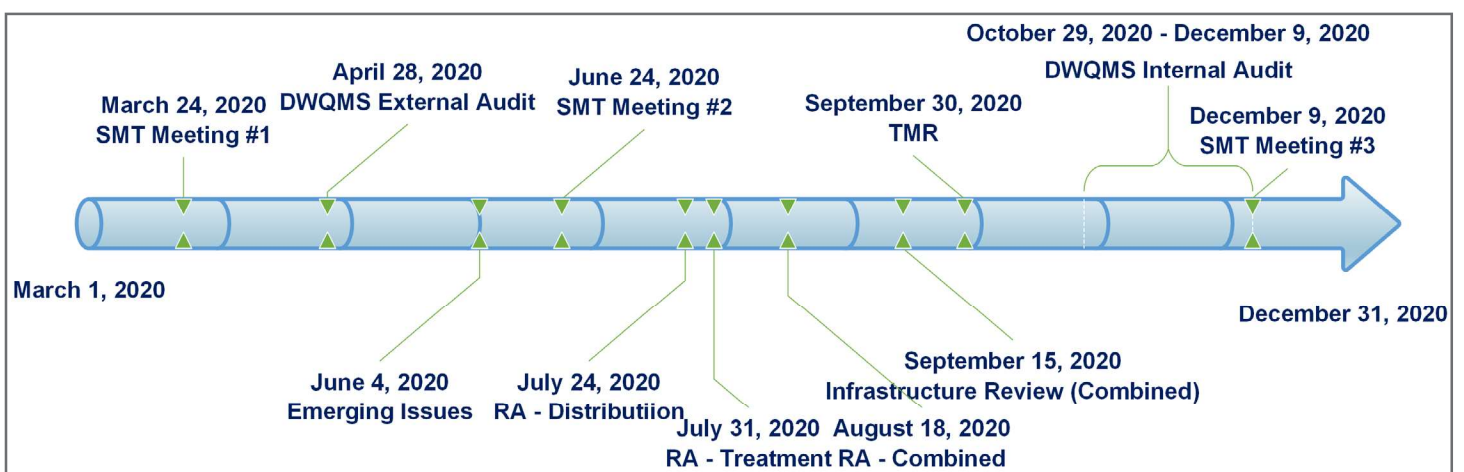
1.3 Overview of Key Milestones

DWQMS milestones related to the accreditation of Hamilton Water, the City’s Operating Authority are:

- **November 2008** – DWQMS Operational Plan endorsed by Owners,
- **April 2009** – Operating Authority achieves Partial Scope; Entire DWQMS accreditation,
- **June 2009** – Operating Authority receives Municipal Drinking Water Licences and Drinking Water Works Permits for all five City DWSs,
- **February 2011** – On-site Verification Audit by Canadian General Standards Board (CGSB),
- **July 2011** – Operating Authority achieves Full Scope; Entire DWQMS accreditation,
- **2012** – Identified QMI - SAI Global as the new Accreditation Body,
- **2012** – Standard of Care Training for Mayor and Council,
- **May 2013** – External Systems Audit (off-site document review),
- **June 2013** – Operating Authority receives reaccreditation,
- **May 2014** – External Systems Audit (off-site document review),
- **June 2014** – Received renewed Municipal Drinking Water System Licences for each of the City’s five DWSs,
- **First quarter 2015** – re-endorsement of the DWQMS Operational Plan by Owners,
- **March (off-site document review) and April (on-site audit) 2015** – re-accreditation of the DWQMS by external registrar, SAI-Global,
- **May 2016** – External Systems Audit (off-site document review),
- **May 2016** – Standard of Care Training for Acting General Manager and new Councillor,
- **May 2017** – External Systems Audit (off-site document review),
- **April (off-site document review) and May (on-site audit) 2018** – re-accreditation of the DWQMS by external registrar, SAI-Global,
- **February to April 2019** - Standard of Care Training for new Councillors and Legal Counsel,
- **May 2019** – Received renewed Municipal Drinking Water System Licences and Permits for each of the City’s five DWSs,
- **May 2019** – re-endorsement of the DWQMS Operational Plan by Owners,
- **May 2019** – External Systems Audit (off-site document review).
- **April 2020** – External Systems Audit (off-site document review).

Figure 1 illustrates key DWQMS milestones which occurred in 2020:

Figure 1: Project Pipeline - 2020



RA: Risk Assessment

TMR: Top Management Review

SMT: Senior Management Team

1.4 DWQMS Operational Summary

Figure 2 illustrates the Plan, Do, Check and Act elements of the DWQMS Standard. In 2018, the Ministry of the Environment and Climate Change revised the Standard and issued V 2.0.

The following sections of this report include an overview of milestones related to the following elements of the DWQMS:

- Section 2 - Element 8 Risk Assessment Outcomes
- Section 3 - Element 14 Review and Provision of Infrastructure
- Section 4 - Element 19 Internal Audits
- Section 5 - Element 20 Management Review

1.5 DWS Licences & Permits Approvals

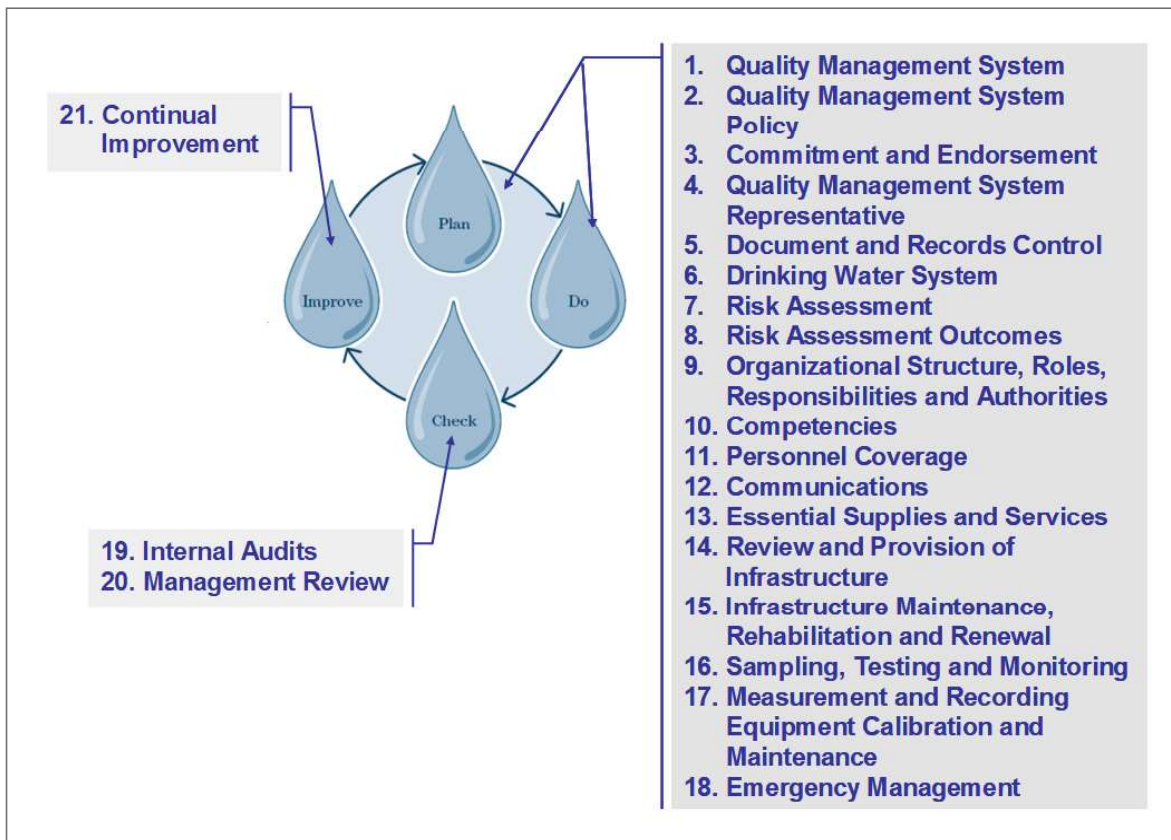
Due to COVID-19 and the requirement for physical distancing, the Municipal Drinking Water Licences (MDWL) for each of our Drinking Water Systems were amended to allow regulatory relief from lead sampling requirements as per O. Reg. 170/03,

Schedule 15.1. Specifically, the City of Hamilton was granted relief from the requirement to collect Plumbing samples for the June 15, 2020 to October 15, 2020 sampling period. Relief is also being sought for the December 15, 2020 to April 15, 2021 sampling period, which is pending approval.

The MDWL for Hamilton Drinking Water System, Woodward Sub-System was also amended to allow regulatory relief for a lower combined chlorine residual in responding to adverse microbial water quality incidents in the distribution system as per O. Reg. 170/03, Schedule 17.6. While the City of Hamilton continues to strive to achieve the required chlorine residual in response to AWQIs, regulatory relief was granted to achieve chlorine residuals of 0.6 mg/L in place of 1.0 mg/L, subject to meeting the applicable conditions of the relief.

In addition, there were 13 approvals for extensions to the distribution system and 9 approvals for like for like infrastructure replacements.

Figure 2: DWQMS Standard Elements



2 RISK ASSESSMENT

2.1 Overview

The DWQMS Standard requires that a Risk Assessment be conducted in its entirety every three years and reviewed on an annual basis, to verify the currency and validity of the information. In 2020 the Risk Assessment was reviewed in its entirety. There will be an interim review in 2021.

Staff from across Hamilton Water collaborated on updating the existing information considering the following key questions:

- Are identified control measures still valid and if so, are they still in place?
- Have additional controls been implemented?
- How has equipment condition, raw water quality, operational controls etc. changed?
- Are any modified “Risk Factors” now considered to be Critical Control Risks?

Similar to previous years, there were no significant risks identified through the 2020 process, which were not already captured through an existing Hamilton Water initiative or project. Our Risk Assessment was updated to reflect the occurrence of a pandemic and potential additional hazards were identified.

2.2 Key Updates

As part of the Risk Assessment, process changes, including capital upgrades in the DWSs, are considered and the associated risk scores (i.e. likelihood of occurrence) are updated as needed. The following includes a list of materials that were considered in the 2020 Risk Assessment:

- Capital Delivery - Water Projects Recently completed and upcoming
- 2020 DWQMS Infrastructure Review outcomes
- Outcomes updated from previous DWQMS Risk Assessment
- Review of Adverse Water Quality Incident Notifications
- BCOS Database Quality Non-conformance Module (audits and inspections)
- 2020 Emerging Issues Meeting outcomes
- Items from recent DWQMS Top Management Review Meeting

In 2021, a review of the Risk Assessment process and outcomes will be completed in accordance with the Standard. Hamilton Water staff continue to work to integrate the DWQMS Risk Assessment with the City’s Asset Management risk assessment in accordance with Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure that came into effect on January 1, 2018. The DWQMS Risk Assessment and Infrastructure Review will be updated to incorporate any new related processes or requirements.



3 REVIEW AND PROVISION OF INFRASTRUCTURE

3.1 Purpose

The Operating Authority must ensure and verify, on an annual basis, the adequacy of water infrastructure. In order to satisfy the requirements of the DWQMS Standard, the Operating Authority conducted a formal review of its vertical (water treatment, storage and pumping) and horizontal (watermains) infrastructure. The scope of the review also considered the operation, maintenance and replacement of existing infrastructure assets as well as new infrastructure planned for the immediate and long-term future. A Coordination Meeting was held with the Management Team of Hamilton Water to discuss the outcomes of both the horizontal

and vertical infrastructure reviews. This DWQMS Summary Report (2020) includes a brief summary of the results of the DWQMS Infrastructure Review.

3.2 Process

Teams were assembled from across relevant sections of Hamilton Water, Engineering Services and Planning and Economic Development (P&ED) to conduct the review of water infrastructure. A Coordination Meeting was held on September 15, 2020 to discuss vertical and horizontal infrastructure.

The teams collected and examined input data related to various asset management, maintenance and capital programs. A summary of the type of “indicator” data examined is provided below:

Table 1: Infrastructure Review Data

Infrastructure Type	Input Data
Horizontal Infrastructure – Maintenance	<ul style="list-style-type: none"> Watermain Repairs Hydrant and Valve Inspections Valve and Meter Replacement Substandard Service Replacement Preventative Maintenance Emergency Repairs Customer Complaints
Horizontal Infrastructure - Large Capital	<ul style="list-style-type: none"> Replaced, Rehabilitated and New Watermains Condition Assessments Capital Upgrades Master Plan Schedule Corrosion Control Program and Corrosion Control Building Asset Management – Critical Watermain Age Profiles and Inspections
Vertical Infrastructure – Maintenance	<ul style="list-style-type: none"> Preventative Maintenance Program Status Breakdowns and Emergency Repairs Capital Upgrades - Coordination and Scheduling Life Cycle Best Practices Critical Projects
Vertical Infrastructure – Large Capital	<ul style="list-style-type: none"> Condition Assessments Master Plan Update Source Water Protection Projects, Well Studies and Investigations Water Capital Projects Lists

3.3 Overview of Results

The outcomes and recommendations from the Infrastructure Review Meeting were documented in meeting minutes for the 2020 review. Attendees at the Infrastructure Review meeting utilized the outcomes from the meeting as input to capital planning and budget preparation. Hamilton Water discussed the 2020 Infrastructure Review at the Top Management Review meeting on September 30, 2020.

The 2020 Infrastructure Review process concluded that our vertical and horizontal infrastructure is generally found to be adequate and available when needed. It was also found, however, that we are not keeping up with required renewals and replacements of our aging infrastructure. This results in an increased demand on maintenance staff and resources as assets remain in operation beyond their intended life cycle.

4 DWQMS AUDITS

The DWQMS accreditation process requires both 3rd party accreditation audits and annual internal audits by the Operating Authority. The cycle of external audits includes an on-site verification audit every 3 years and systems audit or documentation review annually.

4.1 External DWQMS Audits

Hamilton Water utilizes the services of QMI-SAI Global as the accreditation body for the DWQMS. In 2020, QMI-SAI Global conducted an off-site systems audit. There were no non-conformances and one opportunity for improvement. In 2021, QMI-SAI Global will conduct a document review followed by an on-site verification audit in order to recommend the City’s DWQMS to be re-accredited.

4.2 Internal DWQMS Audits

The Operating Authority must conduct internal audits to evaluate the conformity of the DWQMS with the requirements of the DWQMS Standard and its procedures, at least annually.

The internal DWQMS audits conducted in 2020 focused on the following:

- Lead Sampling Program – Oct. 2020
- New Lynden Well System – Oct. 2020
- Sampling Protocols – Nov. 2020
- O.Reg. 170 Annual Reports – Nov. 2020
- Internal Audits & Non-conformances – Nov. 2020
- Water Treatment PACL – Nov. 2020
- Element 1 – Drinking Water Quality Management System – Dec. 2020

The results of the annual DWQMS Internal Audits conducted throughout 2020 demonstrated that the City of Hamilton’s DWQMS is a mature system and that opportunities to improve the DWQMS continue to be identified to ensure that the system is relevant and appropriate for HW. The HW DWQMS contains the required procedures and records to illustrate the establishment and continual improvement of the management system. The 2020 DWQMS audits took place during the COVID-19 pandemic and, as such, were completed virtually.

The audits identified that some findings arose because of the COVID-19 pandemic as training had to be changed from in-person to virtual, which took time to develop into a video format.

In conclusion, with the timely completion of the root causes and corrective/preventive actions issued as a result of this audit, the overall conformance to V2.0 of the DWQMS Standard and the City of Hamilton’s DWQMS will be suitable, adequate, and the implementation and maintenance effective.

2021 DWQMS Audit Plan

The Compliance Support Group of the Compliance & Regulations Section will be developing an Audit Plan for the 2021 DWQMS internal audits. The plan will include a number of process audits throughout 2021. The Audit Plan will be reviewed and approved by the Hamilton Water Senior Management Team prior to implementation.

5 MANAGEMENT REVIEW

The “Plan” component of Element 20 Management Review of the DWQMS Standard requires a documented procedure to describe how the Operating Authority reviews the suitability, adequacy and effectiveness of the DWQMS. The “Check” component of the element requires that Top Management participate in a management review at least once per year to review the DWQMS and consider recommendations for continual improvement. Required outputs of the meeting are:

- Consideration of the results of the management review and identifying deficiencies and action items to address deficiencies,
- Provide a record of decisions and actions items including responsibilities and timelines,

- Report the results of the management review to the Owner.

In 2020, the DWQMS Top Management Review (TMR) was held on September 30th. Attendees included Top Management (General Manager of Public Works and Director of Hamilton Water), Directors, Section Managers, Overall Responsible Operators (OROs) for treatment and distribution, the System Management Representative and staff from the Compliance Support Group.

Overall, Top Management, Directors and Section Managers concluded that the DWQMS is suitable, adequate and effective.

Action items were assigned following the 2020 DWQMS Top Management Review that will result in operational improvements, improved communication and better coordination between Hamilton Water and other City departments.



Financial Plan

The need to prepare a Water Infrastructure Financial Plan is, in part, a regulatory compliance issue specific to the water licensing requirements defined within the DWQMS and more specifically detailed under Regulation 453/07 - Financial Plans made under the Safe Drinking Water Act, 2002. The required Financial Plan for water systems must address a minimum six-year time-frame and be approved by council prior to submission to the Province of Ontario. The resulting plans must also be made freely available to the general public. Water Infrastructure Financial Plans for Hamilton have typically been developed to cover a ten-year period of time in order to reflect consistency with the current rate budget process.

The first Financial Plan was created in 2010 and revised in 2014. The latest revision was approved by Council on July 12, 2018. This most current plan was sent to the Ministry of Municipal Affairs and Housing on November 22, 2018. The next revision of the Financial Plan is due in 2023.

6 CONCLUSIONS

The outcomes from the internal DWQMS audit and the Management Review concluded that the DWQMS is adequate, suitable and effective and conforms to the requirements of the DWQMS Standard. Corrective action plans from the audit and action items from the Management Review will be implemented to ensure continual improvement of the DWQMS.

7 NEXT STEPS – TIMELINE

The management system requires ongoing commitment by staff and management. Maintenance and improvement of the system continues to be a high priority of the Operating Authority. Major next steps related to the maintenance of the DWQMS in 2021 are detailed in Table 2:

Table 2: Major Next Steps

Month of 2021	Scheduled DWQMS Milestones
January to July	Investigate and close internal audit findings from the 2020 DWQMS Internal Audits
February/March	Annual O.Reg. 170 Schedule 22 Report and DWQMS Summary Report to Council
Throughout 2020	DWQMS Internal Audits
March	Hamilton Water - Senior Management Team Meeting #1
April	DWQMS Risk Assessment Meetings
April/May	DWQMS 3rd Party Reaccreditation Audit
May	Infrastructure Review Meetings
June	Hamilton Water - Senior Management Team Meeting # 2
September	DWQMS Top Management Review
December	Hamilton Water - Senior Management Team Meeting # 3