

Municipality of South Huron

Drinking Water Quality Management System

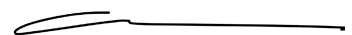
Operational Plan



South Huron Water Distribution System

April 17, 2026 (Revision 20)

QMS Controlled Document

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List of Revisions

Change number	Description	Section(s)	Date of change
20	Updated List of Revisions; distribution list; minor revisions to Section 1, 6, 11 & 13; Updated Figure 2; Minor revisions to Appendix C, E & F; Updated footer on QMS Operational Plan, Appendices and Forms.	Section 1, 6, 11 & 13; Figure 2; Updated Forms, and Appendix A to K.	April 17, 2026
19	<i>Reviewed QMS Operational Plan to meet requirements of the “draft” DWQMS 3.0 (Elements 7, 9, 10, 11, 12, 16, 17, 18, 19, 20, 21)</i> Update List of Revisions; distribution list; minor revisions to Section 11, 12, 13 & 16; Updated Figure 1, 4 & 5; Minor revisions to Appendix C, E & F; Updated footer on QMS Operational Plan, Appendices and Forms.	Section 11, 12, 13 & 16; Figure 1, 4 & 5; Updated Forms, and Appendix A to K	May 30, 2025
18	Update List of Revisions; distribution list; minor revisions to Sections 6, 12, 13, 17; minor revision to Appendix “I”; added Appendix “L” Essential Services and Suppliers List; Update footer on QMS Operational Plan, Appendices and Forms.	Section 6, 12, 13, 17; Forms, and Appendix A to K; added Appendix “L”.	June 26, 2024
17	Update List of Revisions; Update Risk Assessment Outcomes; minor revision to Sections 11,13,14,16,17 &18; Update Figures 1, 2 & 3; Update footer on QMS Operational Plan, Appendices and Forms.	Section 8, 11, 13, 14, 16, 17 & 18; Figures 1, 2, & 3; Forms, and Appendix A to K.	June 6, 2024
16	Update List of Revisions; distribution list; minor revision to Section 6.2; Update Risk Assessment Outcome from ESD Manager review; Updates from Internal Audit, including revisions to Sections 9, 11, 15 & 21; Appendix A, F & J; Update footer on QMS Operational Plan, Appendices and Forms.	Section 6, 8, 9, 11, 15, 21, Forms, and Appendix A to K.	July 14, 2023
15	Update List of Revisions; distribution list; revise Section 2 QMS Policy Statement; revise Section 3 Commitment & Endorsement; Section 4 changed QMS Representative to ESD Manager; revise Section 6 to add Pressure Zone 1A; update Section 8 Risk Assessment Outcomes, revise Section 9 to clarify Top Management/Operating Authority; minor revision to sections 12, 14, 15, 18; update Forms, Figures and Appendices.	Sections 1, 2, 3, 4, 6, 8, 9, 12, 14, 15, 18, Forms, Figure 1, Appendix A to K.	June 24, 2023
14	Update List of Revisions; distribution list;	Sections 6, 9, 11,	November 30, 2022

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	Drinking Water System Description; minor revisions to Sections 9, 11, 12, 13, 14, 15, 16, & 18 (ie. new job titles, new Foreman's job); update Figure 1; minor revisions to Appendix C, E, F, G, I, & K (ie. new job titles, new Foreman's job); update footer on QMS Operational Plan, Appendices and Forms.	12, 13, 14, 15, 16, & 18, Figure 1, Appendix C, E, F, G, I, & K	
13	Update List of Revisions; distribution list; Drinking Water System description; Minor revisions to Section 14, 15 & 16; Figure 2, Update footer on QMS Operational Plan, Appendices and Forms.	Section 1, 15 & 16, Figure 2, Appendix 'H'.	October 15, 2021
12	Update List of Revisions; distribution list; Drinking Water System description; Operational Structure, Roles, Responsibilities and Authorities; Personnel Coverage; Communication; Figure 1, Figure 3 & Figure 4. Add Appendix 'K' – Subject System Description Form 2153E. Update footer on QMS Operational Plan, Appendices and Forms.	Section 2, 6, 9, 11 & 12; Figure 1, 3 & 4; Appendix 'K'.	October 30, 2020
11	Update List of Revisions; update Figure 4 Organizational Chart; distribution list; QMS Policy Statement; Communication and minor revision to Management Review Agenda Items and Appendix B. Update footer on QMS Operational Plan, Appendices and Forms.	Section 9, 12 & 20 Appendix B	December 2, 2019
10	<i>Update QMS Operational Plan to meet requirements of DWQMS 2.0</i> Update List of Revisions; Update distribution list; Introduction; definitions; QMS Policy Statement; Commitment and Endorsement; Update/revise Director and Foreman titles; Risk Assessment; Risk Assessment Outcomes; Operational Structure; Competencies; Personnel Coverage; Communications; Provision of Infrastructure; Infrastructure Maintenance; Sampling & Testing; Calibration of Equipment; Emergency Management and Continual Improvement. Update and minor revisions to Appendices; Update footer on QMS Operational Plan, Appendices and Forms. Add new forms F7, F8, F9, F10 & F11	Section 1, 2, 3, 4, 7, 8, 9, 10 11, 12, 13, 14, 15, 16, 17, 18 & 21; Appendix A, B, C, D, E, F, G, H, I & J; Forms SOP-F1, F3, F4, F5, F6, F7, F8, F9, F10 & F11	November 18, 2019
9	Update List of Revisions; Update distribution list; Update/revise QMS Representative; Operational Challenges; Risk Assessment Outcomes;	Section 4, 6.4, 8, 9, 10 11, 12, 14, 15, 16, 17, 18, 19 &	September 11, 2018

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	Operational Structure; Competencies; Personnel Coverage; Communications; Provision of Infrastructure; Infrastructure Maintenance; Sampling & Testing; Calibration of Equipment; Emergency Management; Internal Audit and Management Review. Update and minor revisions to Appendices; Update footer on QMS Operational Plan, Appendices and Forms.	20; Appendix A, B, C, D, E, F, G, H, I & J; Forms SOP-F1, F3, F4 & F6.	
8	Update List of Revisions; Update distribution list; Update Risk Assessment Outcomes; Revise Personnel Coverage; Revise Communications; Revise Emergency Management; Revise Operational Structure, Roles & Responsibilities; Update Figure 1, Update and minor revisions to Appendices; Update footer on QMS Operational Plan, Appendices and Forms.	Section 8, 11, 12 & 18; Appendix A, B, C, D, E, F, G, H, I & J; Forms SOP-F4 and Figure 1.	August 11, 2017
7	Update List of Revisions; Update distribution list; Update Quality Management System Endorsement; Revise Drinking Water System Description; Revise Operational Structure, Roles & Responsibilities; Update Figures 1 & 4; Update and minor revisions to Appendices; Update footer on QMS Operational Plan, Appendices and Forms.	Section 2, 3, 6.2, 6.4 & 9; Appendix B, C, G & I; and Forms SOP-F4	June 15, 2015
6	Update List of Revisions; Update distribution list; Revise Drinking Water System Description Section 6.2; Update Figures 1, 2 & 3; Update Risk Assessment Outcomes Section 8; Minor revisions to Section 12, 14, 16, 19, 21; Update Appendix C; Minor revisions to Appendix E, F, G & I; Update footer on QMS Operational Plan, Appendices and Forms	Section 6, 8, 12, 14, 16, 19 & 21; Appendix C, E, F, G & I; and Forms SOP-F4	July 31, 2014
5	Update List of Revisions; Revise Table of Contents; Add/revise definitions on Section 1.2; Revise QMS Policy Statement in Section 2; Revise Drinking Water System Description Section 6.3, 6.4, 6.5; Insert new figure 2; Revise Section 7, 8, 10, 11, 12, 13, 14, 15, 16, 18, 21; Revise Appendix A, B, C, D, E, F, G, I, J & K: Delete Appendix H: Re-label former Appendix I, J & K as Appendix H, I & J respectively; Revise Risk Assessment Table; Update footer on QMS Operational Plan, Appendices and Forms	Table of Contents; Section 1, 2, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18 & 21; Appendix A, B, C, D, E, F, G, I, J, K: and Forms SOP-F1, F3, F4, F5 & F6	February 22, 2012
4	Updated the QMS Operational Plan distribution list.	Distribution list.	November 15, 2010

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3	Figure 1 updated; Figure 2 deleted; Source water description revised; Risk Assessment Outcomes revised; Figure 3 updated; Figure 4 updated; Appendix A, B, C, D, E, F, G, H, I & J revised; Forms SOP-F1, SOP-F3, SOP-F4, SOP-F5 revised; form SOP-F2 deleted; form SOP-F6 added.	Table of Contents; Sections 6, 8, 11, Appendix and Forms	November 8, 2010
2	Issued second version – no revisions	N/A	May 28, 2010
1	Appendix ‘C’ revised to “Document & Record Control Table; Risk Assessment Form moved to forms & renamed form “SOP-F3”; Appendix ‘D’ revised to “Hazard Analysis Procedure”; Element 5 & 7 updated with revised appendices & form.	Table of Contents; Element 5; Element 7	October 26, 2009
0	Issued first version of Operational Plan	N/A	March 27, 2009

QMS Operational Plan Distribution List

Copy		Location	Issued To	Date
1	Digital copy (pdf.) and Hard Copy	South Huron Municipal Office 322 Main Street, Exeter (Office of the General Manager of Infrastructure and Development)	GM of Infrastructure & Development	April 22, 2026
2	Digital copy (pdf.) and Hard Copy	Environmental Services Operations Centre 82 Nelson Street, Exeter	Manager of Environmental Services	April 22, 2026
3	Digital copy (pdf.) and Hard Copy	Environmental Services Operations Centre 82 Nelson Street, Exeter	Environmental Services Foreman	April 22, 2026
4-8	Digital copy (pdf.)	Environmental Services Operations Centre 82 Nelson Street, Exeter	Water/Sewer Operators	April 22, 2026
9	Digital copy (pdf.)	South Huron Municipal Office 322 Main Street, Exeter (CAO's Office)	CAO	April 22, 2026
10	Digital copy (pdf.)	South Huron Municipal Office 322 Main Street, Exeter (Clerk's Office)	Clerk	April 22, 2026
11	Digital copy (pdf.)	South Huron Municipal Office 322 Main Street, Exeter (Treasurer's Office)	Treasurer	April 22, 2026

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1. Quality Management System (Element 1)

1.1 Introduction and Overview

The Honourable Justice Dennis R. O'Connor, in Part Two of the Report of the Walkerton Inquiry, recommended incorporating the concepts of quality management systems to drinking water systems. In his words: "The purpose of the quality management approach in the context of drinking water is to protect public health by achieving consistent good practice in managing and operating a water system."

Another recommendation of the Walkerton Inquiry was that a standard, specifically designed for drinking-water systems, be developed and implemented in Ontario - the Drinking Water Quality Management Standard (DWQMS).

The adoption of quality management systems is not new to the drinking water industry; however, the requirement to implement the DWQMS for all drinking water systems in Ontario is now mandated through the *Safe Drinking Water Act* (SDWA).

DWQMS endorses a proactive and preventative approach to assuring drinking water quality and the hallmarks of this approach include:

- the adoption of best practices and continual improvement;
- "real time" process control (e.g. the continuous monitoring of turbidity, chlorine residual, and disinfectant contact time) wherever feasible;
- the effective operation of robust multiple barriers to protect public health;
- preventative rather than strictly reactive strategies to identify and manage risks to public health; and
- effective leadership.

This Operational Plan serves as a Quality Management System guidance document that describes the methods by which the Municipality of South Huron implements Quality Management. The Plan is written to meet or exceed the requirements of the Ministry of the Environment, Conservation and Parks (MECP) prescribed standard and is applicable to the management and operation of those works described in Section 6 of this Plan.

The Operational Plan has been updated to meet the requirements of the Drinking Water Quality Standard 3.0 including the evaluation of the mandatory hazards and hazardous events, risk assessment, risk assessment procedure, long term infrastructure planning,

1.2 Definitions and Abbreviations

Accreditation Body – means a person designated or established as an accreditation body under Part IV of the SDWA.

Applicable Legislative and Regulatory Requirements – the *Safe Drinking Water Act*, 2002 the *Ontario Water Resources Act*, 1990 and all regulations and instruments issued under these Acts which are associated with drinking water.

Audit – a systematic and documented verification process that involves objectively obtaining and evaluating documents and processes to determine whether a Quality Management System conforms to the requirements of the DWQMS.

Authority – official permission or approval to carry out a responsibility or task.

Calendar Year – A period of one year beginning and ending with the dates conventionally accepted as making the beginning and end of a year (January 1st to December 31st).

Competence – the combination of observable and measurable knowledge, skills and abilities which are required for a person to carry out assigned responsibilities.

Compliance – the fulfilment of a regulatory requirement.

Conformance – the fulfilment of a DWQMS requirement.

Consumer – the drinking water end user

Control Measure – includes any processes, physical steps, or other contingencies that have been put in place to prevent or reduce a hazard before it occurs.

Corrective Action – action to eliminate the cause of a detected non-conformity with the QMS, with the requirements of the DWQMS, or other undesirable situation.

Critical Control Limit – the point at which a critical control point response procedure is initiated.

Critical Control Point (CCP) – an essential step or point in the Subject System at which control can be applied by the operating authority to prevent or eliminate a Drinking Water Health Hazard or to reduce it to an acceptable level.

Document – has the same meaning as “document” defined in s. 2(1) of the SDWA. *“Includes a sound recording, video tape, film, photograph, chart, graph, map, plan, survey, book of account, and information recorded or stored by means of any device”*

Director – means the director appointed for the purpose s of s. 15 of the SDWA

Distribution System – has the same meaning as “distribution system” defined in s. 2(1) of the SDWA *“means the part of a drinking water system that is used in the distribution, storage or supply of water and that is not part of a treatment system.”*

Drinking Water Health Hazard – has the same meaning as “drinking water health hazard” defined in s. 2(1) of the SDWA.

“means, in respect of a drinking water system,

- a) a condition of the system or a condition associated with the systems’ waters, including any thing found in the waters,*
 - i) that adversely affects, or is likely to adversely affect, the health of the users of the system,*
 - ii) that deters or hinders, or is likely to deter or hinder, the prevention or suppression of disease, or*
 - iii) that endangers or is likely to endanger public health”*

Drinking Water Quality Management Standard (DWQMS) – has the same meaning as Quality Management Standard for Drinking Water Systems approved under s. 21 of the SDWA.

Drinking Water System – has the same meaning as “drinking water system” defined in s. 2(1) of the SDWA.

“means a system of works, excluding plumbing, that is established for the purposes of providing users of the system with drinking water and includes,

- a) any thing used for the collection, production, treatment, storage, supply or distribution of water,*
- b) any thing related to the management of residue from the treatment process or the management of the discharge of a substance into the natural environment from the treatment system, and*
- c) a well or intake that serves as the source or entry point of raw water supply for the system”*

Emergency – a potential situation or service interruption that may result in the loss of the ability to maintain a supply of safe drinking water to consumers.

Emergency response – the effort to mitigate the impact of an emergency on consumers.

Environmental Bill of Rights Registry – has the same meaning as “Registry” defined in s. 2(1) of the SDWA.

Equipment – Tangible property (other than land or buildings) that is used in the operation of a business. Examples of equipment include devices, machines, tools and vehicles.

Frequency – Means the number of times that a function or event occurs within a given period of time. Frequency of activities in the QMS Operational Plan are as follows:

- a) Daily – Means once every calendar day.
- b) Weekly – Means once every calendar week. A week for the purpose of being tested for a regulatory parameter, is taken at least 5 days and not more than 10 days after a sample was taken for that purpose in the previous week.
- c) Monthly – Means once every calendar month. A month for the purpose of being tested for a regulatory parameter, is taken at least 20 days and not more than 40 days after a sample was taken for that purpose in the previous month.
- d) Three Months – Means once every three (3) calendar months. A three-month period for the purpose of being tested for a regulatory parameter, is taken at least 60 days and not more than 120 days after a sample was taken for that purpose in the previous three-month period.
- e) Six Months – Means once every six (6) calendar months.
- f) Annually – Means once in every calendar year. A 12 month period for the purpose of being tested for a regulatory parameter, is taken at least 30 days before or after the first anniversary of the day a sample was taken for that purpose in the previous 12-month period.
- g) Three Years – Means once in every three (3) calendar years. A 36 month period for the purpose of being tested for a regulatory parameter, is taken not more than 90 days before or after the third anniversary of the day a sample was taken for that purpose in the previous 36-month period.
- h) Five Years – Means once in every five (5) calendar years. A 60 month period for the purpose of being tested for a regulatory parameter, is taken not more than 90 days before or after the fifth anniversary of the day a sample was taken for that purpose in the previous 60-month period.

Hazard – a source of danger or a property that may cause drinking water to be unsafe for human consumption. The hazard may be biological, chemical, physical or radiological in nature.

Hazardous Event – an incident or situation that can lead to the presence of a hazard.

Infrastructure – the set of interconnected structural elements that provide the framework for supporting the operation of the drinking-water system, including

buildings, workspace, process equipment, hardware and software, and supporting services, such as transportation or communication.

Ministry – means the Ministry of the Environment, Conservation and Parks.

Monitoring – includes any checks or systems that are available to detect hazards or the potential for hazards.

Municipal Drinking Water System – has the same meaning as “municipal drinking water system” defined in s. 2(1) of the SDWA.

“means a drinking water system or part of a drinking water system,

(a) that is owned by a municipality or by a municipal service board established under the Municipal Act, 2001 or a city board established under the City of Toronto Act, 2006,

(b) that is owned by a corporation established under sections 9, 10 and 11 of the Municipal Act, 2001 in accordance with section 203 of that Act or under sections 7 and 8 of the City of Toronto Act, 2006 in accordance with sections 148 and 154 of that Act,

(c) from which a municipality obtains or will obtain water under the terms of a contract between the municipality and the owner of the system, or

(d) that is in a prescribed class”

Municipal Residential Drinking Water System – has the same meaning as “large municipal residential system” or small municipal resident system: defined in s. 1(1) of O. Reg. 170/03.

Non-compliance – a failure under the *Safe Drinking Water Act, 2002*, the *Ontario Water Resources Act*, or any regulations or instruments under these Acts which are associated with drinking water.

Non-conformance – the non-fulfilment of a DWQMS requirement.

Operating Authority – means, in respect of a Subject System, the person or entity that is given responsibility by the Owner for the operation, management, maintenance or alteration of the Subject System

Operational Plan – means, in respect of a Subject System, the Operational Plan required by the Director’s Direction.

Operational Subsystem – means a part of a Municipal Residential Drinking Water System operated by a single Operating Authority and designated by the Owner as being an Operational Subsystem.

Owner – has the same meaning as “owner” defined in s. 2(1) of the SDWA.

“includes, in respect of a drinking-water system, every person who is a legal or beneficial owner of all or part of the system, but does not include the Ontario Clean Water Agency or any of its predecessors where the Agency or predecessor is registered on title as the owner of the system.”

Preventative Action – action to prevent the occurrence of nonconformity of the QMS with the requirements of the DWQMS or other undesirable situation.

Primary Disinfection - has the same meaning as “primary disinfection” defined in s. 1(1) of O. Reg. 170/03.

Public – Subject Subsystem consumers and stakeholders.

Quality Management System (QMS) – a system to:

- a) establish policy and objectives, and to achieve those objectives, and
- b) direct and control an organization with regard to quality.

Quality Management System Policy – means the policy described in Element 2 developed for the Subject System or Subject Subsystems

Record – a document stating results achieved or providing proof of activities performed.

Rehabilitation – the process of repairing or refurbishing an infrastructure element.

Renewal – the process of replacing the infrastructure element with new elements.

Retrievable - For documents, “retrievable” means the documents must be readily available for personnel to refer to, especially in emergency situations, or in areas where operational procedures would need to be promptly referenced. For example, sampling procedures should be available for reference where sampling activities are performed. For records, “retrievable” is a slightly more flexible term. Usually, a record is considered to be retrievable if it can be produced on request by the end of the business day.

This definition stems from audits and inspections – if a record can be provided by the end of the audit, it is usually considered to be retrievable.

Risk – the probability of identified hazards causing harm, including the magnitude of that harm or its consequences.

Risk Assessment – an orderly methodology of identifying hazards or hazardous events that may affect the safety of drinking water and evaluating their significance.

Secondary Disinfection - has the same meaning as “secondary disinfection” defined in s. 1(1) of O. Reg. 170/03.

“means a process or series of processes intended to provide and maintain a disinfectant residual in a drinking water system’s distribution system, and in plumbing connected to the distribution system, for the purposes of,
(a) protecting water from microbiological re-contamination,
(b) reducing bacterial regrowth,
(c) controlling biofilm formation, and
(d) serving as an indicator of distribution system integrity,
and includes the use of disinfectant residuals from primary disinfection to provide and maintain a disinfectant residual in a drinking water system’s distribution system for the purposes described in clauses (a) to (d)”

Subject System – means:

- a) a municipal residential drinking water system where the system is operated by one operating authority, or
- b) an operational subsystem where two or more parts of a municipal residential drinking water system are operated by different operating authorities.

Supplier – an organization or person that provides a product or service that affects drinking water quality.

SDWA – means the *Safe Drinking Water Act, 2002, S.O. 2002, c. 32*, as amended.

SOP – means Standard Operating Procedure. A Standard Operating Procedure (SOP) is a set of written instructions that document a routine or repetitive activity followed by an organization.

Top Management – a person, persons or a group of people at the highest management level within an operating authority that makes decisions about the QMS and makes recommendations to the Owner about the Subject System or Subject Systems.

“Treatment System – has the same meaning as “treatment system” defined in s. 2(1) of the SDWA.

“means any part of a drinking water system that is used in relation to the treatment of water and includes,
(a) any thing that conveys or stores water and is part of a treatment process, including any treatment equipment installed in plumbing,
(b) any thing related to the management of residue from the treatment process or the management of the discharge of a substance into the natural environment from the system, and
(c) a well or intake that serves as the source or entry point of raw water supply for the system”

2. Quality Management System Policy (Element 2)

The following QMS Policy Statement was confirmed by South Huron Council Motion **#059-2023** dated February 21, 2023:

“The Municipality of South Huron is committed to providing our consumers with a consistent supply of safe, clean, high quality drinking water that meets or exceeds all regulatory requirements.

Quality of drinking water services are ensured by the Municipality’s commitment to the maintenance and continual improvement of the Quality Management System; and the commitment to comply with all applicable legislation and regulations.

In support of our main policy, the Municipality of South Huron is further committed to participation in water industry organizations and conducting business in an environmentally responsible manner.”

3. Commitment and Endorsement (Element 3)

System owner and operating authority, the Municipality of South Huron, supports the maintenance and continual improvement of a Quality Management System for the South Huron Water Distribution System, as documented in the QMS Operational Plan.

Endorsement by the Owner (represented by the Mayor) reaffirms the commitment to providing the resources needed to maintain and continually improve the Quality Management System.

Endorsement by Top Management (General Manager of Infrastructure and Development) reaffirms the commitment to determining, obtaining and providing the resources needed to maintain and continually improve the Quality Management System.

Endorsement by the Designated QMS Representative, acknowledges the roles and responsibilities of that appointment as defined under Element 4 of the Drinking Water Quality Management Standard, including the responsibility to communicate the Quality Management System.”

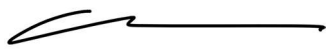
July 14, 2023
Date


Mayor George Finch
(Owner)

July 14, 2023
Date


Don Giberson, GM of Infrastructure and Development
(Top Management)

July 14, 2023
Date


Alyssa Keller, ESD Manager
(QMS Representative)

4. Quality Management System Representative (Element 4)

The Quality Management System Representative under this Operational Plan shall be the Manager of Environmental Services.

Top Management authorizes the Quality Management System Representative, irrespective of other responsibilities, to perform the following duties:

- a) administer the Quality Management System by ensuring that processes and procedures needed for the Quality Management System are established and maintained;
- b) report to Top Management on the performance of the Quality Management System and any need for improvement;
- c) ensure that current versions of documents required by the Quality Management System are being used at all times;
- d) ensure that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the subject system, and;
- e) promote awareness of the Quality Management System throughout the Operating Authority.

5. Document and Records Control (Element 5)

Documents and records required by the Quality Management System are kept current, legible and readily identifiable; are retrievable; are stored, protected, retained and disposed of in accordance with the Document Control Procedure, attached as **Appendix 'A'** and the Record Control Procedure attached as **Appendix 'B'**. A list of controlled documents and records can be found on **Appendix 'C'** - "Document and Record Control Table".

The Quality Management System documentation for the South Huron Water Distribution System includes the following:

- a) the Operational Plan and its associated policies and procedures;
- b) documents and records determined by South Huron as being needed to ensure the effective planning, operation and control of its operations and;
- c) the results of internal and external audits and management reviews.

6. Drinking Water System (Element 6)

6.1 System Overview

The South Huron water distribution system is owned and operated by the Municipality of South Huron. The system services a population of approximately 8,000 people; of which approximately 50% are located in rural areas or small rural communities (Credition, Centralia, Huron Park, Dashwood, Shipka) and approximately 50% are located in an urban area (Exeter). The water distribution system consists of 209 km of distribution piping, booster pumping stations, below ground reservoirs and elevated water towers. Secondary Disinfection is provided in the distribution system at the Huron Park Water Tower and the MacNaughton Drive Booster Pumping Station. The system is continuously monitored by online analysers and a computerized Supervisory, Control and Data Acquisition (SCADA) System.

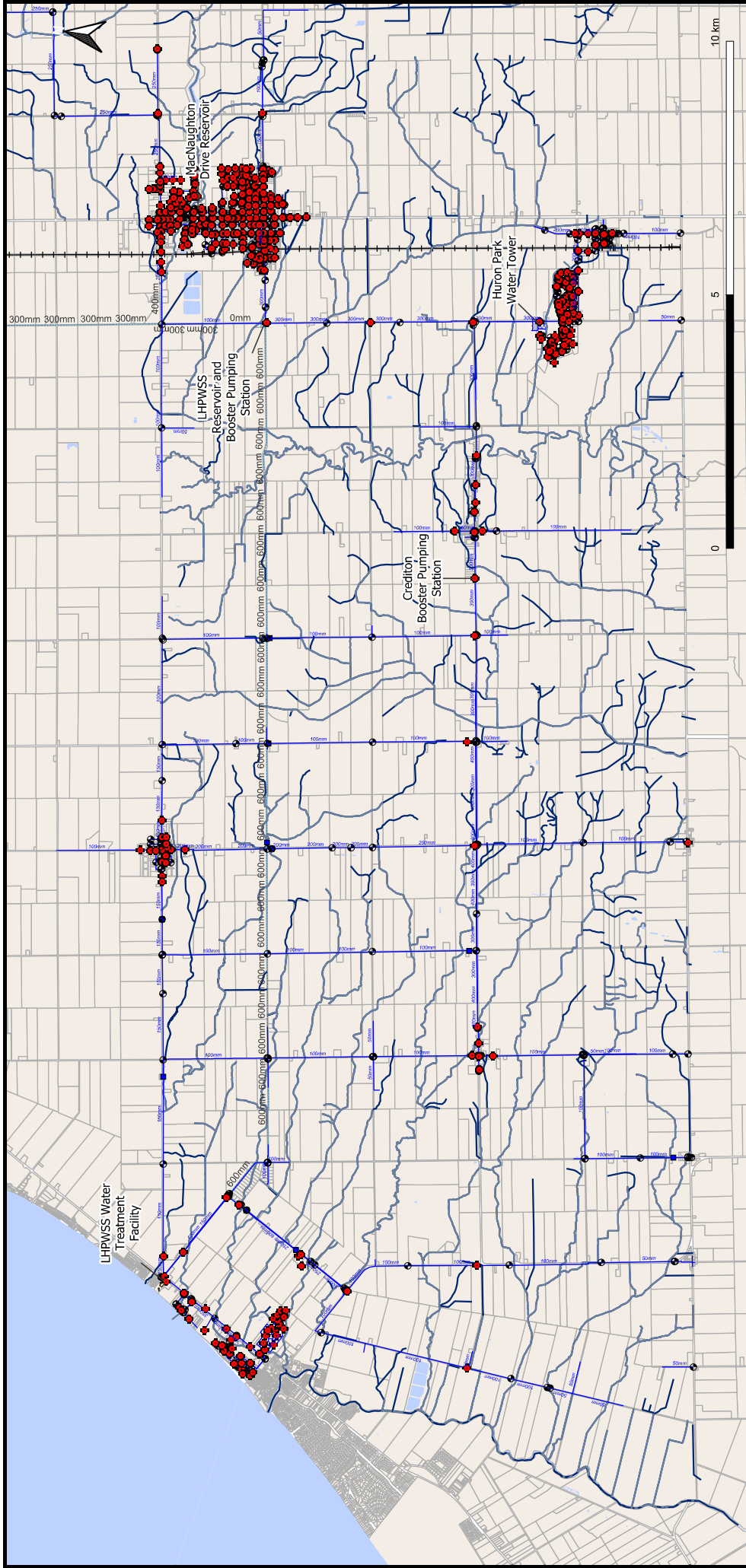
Source of supply is the Lake Huron Primary Water Supply System (LHPWSS). Customers along the south boundary of the municipality are serviced from an adjacent municipal distribution system, which is owned by the Municipality of North Middlesex and operated by OCWA, who also obtain their treated water from the LHPWSS. South Huron supplies customers along the north boundary of the municipality in the Municipality of Bluewater, notably in the village of Dashwood.

6.2 Water Source

The Municipality of South Huron obtains its drinking water supply from the Lake Huron Primary Water Supply System (LHPWSS). The source water already meets the Ontario drinking water standards when it enters the South Huron water distribution system. For specific information related to the general characteristics of the raw water supply, common event-driven fluctuations, and any resulting operational challenges and threats for the LHPWSS source water please reference the LHPWSS Operational Plan and the LHPWSS website at www.watersupply.london.ca.

The LHPWSS Joint Board of Management owns and governs the area water system using the City of London as the Administering Municipality. City of London, Regional Water Supply Division provides all associated administrative and management services on behalf of the Joint Board. The supplying water system is operated and maintained by Ontario Clean Water Agency (OCWA), under contract with LHPWSS Joint Board of Management.

The LHPWSS water treatment plant is located approximately two kilometres north of the village of Grand Bend on Highway 21, has a treatment capacity of 340 million litres per day and supplies water to the Municipalities of Bluewater, South Huron, Lambton Shores, North Middlesex, Lucan-Biddulph, Middlesex Centre, Strathroy-Caradoc and the City of London. The continuous high-pressure flow to London ensures that water entering the South Huron system is fresh and sufficiently chlorinated.



Municipality of South Huron Water Distribution System Stephen Township



SOUTH HURON GIS MAPPING

No.	Revision Date	Revision Description	In-Service Date	Revised By
6	12/31/2023	Highway #21 at LS Boundary - 300mm	2/27/2023	D. Giberson
	12/31/2023	Blackbush Line (Dashedwood Road to south of Huron street) - 100mm	5/30/2023	D. Giberson
7	12/31/2024	Blackbush Line (South of Huron Street to Crediton Road) - 100mm	9/9/2024	A. Keller
	12/31/2024	Bronson Line and Crediton Road - 150mm connections to 400mm	9/30/2024	A. Keller
	12/31/2024	Decommission of 300mm feed on Crediton Road from Shipke Line to Goshen Line	10/3/2024	A. Keller
	12/31/2024	Dearing Drive (Highway #21 to east end) - Sol Haven Subdivision - 200mm & 150mm	12/18/2024	A. Keller
	12/31/2024	Sullivan Street (Dearing Drive to Dearing Drive) - Sol Haven Subdivision - 150mm	12/18/2024	A. Keller

- Water Hydrants
- Water Chambers
- Water Valves
- Watermains
- Watercourses
- Municipal Drains
- Water Buildings
- Water Tower

Figure 1



May, 2025
516062-1
Projection EPSG:3857

This map/report/publication was created using County of Huron Geographic Information System digital data (in addition to any other specific accreditation applicable to the data on 2023-2026). This map/report/publication is a secondary product which has not been verified by the County of Huron.

The community of Exeter and the majority of the rural areas and rural communities of Stephen Ward are serviced by the LHPWSS through connections to the South Huron system. Only a few scattered rural residents remain on private wells. Most residents in Usborne Ward are on private wells and only a few are serviced from the municipal system, where they are in close proximity to the former Exeter well feeds. Water supply connections to LHPWSS transmission mains are at the following locations (more precise locations are shown on a water system schematic):

- B Line Connection at Gore Road
- Shipka connection - Crediton Road, east of Shipka
- Dashwood connection - Bronson Line and Huron Street
- Exeter south connection - Airport Line and Huron Street
- Exeter north connection - Airport Line and Thames Road

6.3 Detailed System Description

6.4.1 Pressure Zones

- **Stephen Pressure Zone 1 (HGL 239m)** - A connection to the LHPWSS transmission main is currently through a pressure reducing valve (PRV) and metering chamber located west of the intersection of B-Line and Gore Road, then through a pressure reducing valve (PRV) metering chamber located southwest of the intersection of Waterworks Road and Highway #21, provides water supply to the Stephen Pressure Zone 1. It is through the B-Line/Gore Road connection via a 400mm watermain on Gore Road that LHPWSS provides water to the Municipality of Bluewater. LHPWSS is responsible for maintaining the water supply to Bluewater, water quality and billings through a deduct meter at the northwest corner of Waterworks Road and Hwy #21.

This connection also provides an emergency backup water supply to the Municipality of Lambton Shores through a normally closed valve in an inter-connect chamber on Highway #21, at the boundary between Lambton Shores and South Huron. There is also an emergency backup supply from the North Middlesex water system through a normally closed valve at Greenway Road and Bullock Line. The North Middlesex water system is owned by the Municipality of North Middlesex; is operated by OCWA; and their source water is the LHPWSS.

Stephen Pressure Zone 1 is separated from Stephen Pressure Zone 2 by a pressure zone control chamber located on County Road #83, immediately west of Shipka Line. This chamber is equipped with a normally closed gate valve with a 19mm bleeder valve to maintain a minimum circulation of water at this location.

If the normal feed to Stephen Pressure Zone 1, from the LHPWSS transmission main connection on B-Line is disrupted, an emergency backup feed can be provided from the Lambton Shores distribution system. The Lambton Shores water system is

owned by the Municipality of Lambton Shores; operated by Jacobs; and their source water for this emergency feed is the Lambton Area Water Supply System (LAWSS). In an emergency the normally closed gate valve in the inter-connect chamber, located on Highway #21 at the Lambton Shores/South Huron boundary, can be opened to feed Stephen Pressure Zone 1 through the 350mm watermain on Highway #21.

- **Stephen Pressure Zone 2 (HGL 263m) (County Rd #10, west of village of Shipka)** - A connection to the LHPWSS transmission main through a pressure reducing valve (PRV) and metering chamber; then through a separate valve chamber, provides water supply to the Stephen pressure Zone 2 including the community of Shipka.

Stephen Pressure Zone 2 is separated from Stephen Pressure Zones 1, 3 and 4 by three pressure zone control chambers. The first chamber is located County Road #83, immediately west of Shipka Line; the second at Blackbush Line, north of Crediton Road; and the third on County Road #83 west of the village of Dashwood. The chambers located at County Road #83/Shipka Line and Blackbush Line/Crediton Road are equipped with a normally closed gate valve with a 19mm bleeder valve to maintain a minimum circulation of water at these locations.

The chamber located on County Road #83 west of the village of Dashwood is equipped with pressure sustaining valve that will sense a pressure drop in Stephen Pressure Zone 2 and automatically open to provide an emergency backup feed from Zone 4 to Stephen Pressure Zone 2.

- **Stephen Pressure Zone 3 (HGL 281m) (County Rd #10, east of village of Shipka)** - A connection to the LHPWSS transmission main through a pressure reducing valve (PRV) and metering chamber provides water supply to the Stephen Pressure Zone 2 between the village of Shipka and Crediton. Some rural areas north and south of this route also receive water directly from the County Road 10 feedermain. There is also an emergency backup supply to the North Middlesex system through a normally closed valve at Bronson Line and Mount Carmel Drive.

Stephen Pressure Zone 3 is separated from Stephen Pressure Zones 2, 3 and 4 by four pressure zone control chambers. The first chamber is located on Blackbush Line, north of Crediton Road; the second at Bronson Line & Huron Street; the third at Goshen Line & Huron Street; and the fourth at Babylon Line & Huron Street.

The chambers located at Blackbush Line/Crediton Road; Goshen Line/Huron Street; and Babylon Line/Huron Street are equipped with a normally closed gate valve with a 19mm bleeder valve to maintain a minimum circulation of water at these locations.

The chamber located on Bronson Line south of Huron Street is equipped with pressure sustaining valve that will sense a pressure drop in Stephen Pressure Zone

3 and automatically open to provide an emergency backup feed from Stephen Pressure Zone 4.

- **Stephen Pressure Zone 4 (HGL 293m) (Dashwood Connection)** - The connection to the LHPWSS Exeter-Hensall transmission main through a pressure reducing valve (PRV) and metering chamber at Bronson Line and Huron Street services the village of Dashwood and the surrounding pressure zone. A series of pressure control zone chambers are installed at the limits of the pressure zone. It is through this pressure zone that a limited emergency backup water supply can be provided to the Municipality of North Middlesex through a normally closed valve at Bronson Line and Mount Carmel Drive.

Stephen Pressure Zone 4 is separated from Stephen Pressure Zones 2 and 3 by four pressure zone control chambers. The first chamber is located on County Road #83, east of the village of Dashwood; the second at Bronson Line & Huron Street; the third at Goshen Line & Huron Street; and the fourth at Babylon Line & Huron Street.

The chambers located at Goshen Line/Huron Street and Babylon Line/Huron Street are equipped with a normally closed gate valve with a 19mm bleeder valve to maintain a minimum circulation of water at these locations.

The chamber located on Bronson Line south of Huron Street is equipped with pressure sustaining valve that will sense a pressure drop in Stephen Pressure Zone 4 and automatically open to provide an emergency backup feed from Stephen Pressure Zone 3.

The chamber located on County Road #83 west of the village of Dashwood is also equipped with pressure sustaining valve that will sense a pressure drop in Stephen Pressure Zone 4 and automatically open to provide an emergency backup feed from Stephen Pressure Zone 2.

- **Stephen Pressure Zone 5 (HGL 307m) (County Rd #10, east of village of Crediton)** - A connection to the LHPWSS transmission main through a pressure reducing valve (PRV) and metering chamber at Shipka that provides water supply to the Stephen Pressure Zone 3, also supplies water to the Stephen Pressure Zone 5 and to Crediton, Huron Park and Centralia. Water is conveyed to Stephen Pressure Zone 5 via a watermain located along County Rd #10 from Shipka to Crediton; where an inline Booster Pumping Station, re-pumps the water on to the Stephen Pressure Zone 5 and to Crediton, Huron Park and Centralia.

Stephen Pressure Zone 5 is separated from Stephen Pressure Zone 3 by check valves located in the Crediton BPS. Stephen Pressure Zone 5 is separated from the Exeter South Pressure Zone by a control chamber located at Airport line and Huron Street. This chamber has a normally closed electrically operated valve that can be

monitored and operated through the SCADA system. In an emergency the electrically operated valve in this chamber can be opened remotely to provide an emergency backup feed from Exeter South Pressure Zone to Stephen Pressure Zone 5.

The Exeter Water Tower HGL can be set to the same elevation as the Huron Park Water Tower and operate as a backup for the Huron Park Water Tower and Stephen Pressure Zone 5 and to varying degrees can provide an emergency backup feed to Stephen Pressure Zones 3, 4, 2 and 1.

- **Exeter North Pressure Zone (HGL 313m)** - Exeter is serviced by two connections; the north connection to the LHPWSS Exeter-Hensall transmission main is through a pressure reducing valve (PRV) and metering chamber at Thames Road West and Airport Line. This connection provides water to the Exeter north pressure zone, north of the Ausable River and is separated from the Exeter South pressure zone by a control zone chamber located at William and Church Street. The chamber has a control valve, check valve and by-pass piping to control the pressure zones and allow feed from the north pressure zone to the south pressure zone to facilitate and an emergency feed in either direction.

The normal operation of the Exeter north pressure zone is a direct feed and with constant pressure provided by the LHPWSS pipeline on Airport Line. System pressure is constantly monitored and controlled through an integrated SCADA system and a by pressure control at the PRV at the north connection point. The backup for the north pressure zone is provided by the reconfigured MacNaughton Drive Booster Pumping Station, controlled by VFD and PRV control of the high lift and fire pump discharges. Additional back up for the north pressure zone is provided by the Exeter south pressure zone and the elevated water tower located within that zone.

- **Exeter South Pressure Zone (HGL 307m)** - Exeter is serviced by two connections; The second connection to the LHPWSS is through a connection at the LHPWSS Exeter-Hensall Booster Pumping Station located at Huron Street and Airport Line. The LHPWSS has a diesel-powered backup emergency generator at this facility. This connection provides water to the Exeter south pressure zone, south of the Ausable River and is separated from the Exeter North pressure zone by a control zone chamber located at William and Church Street. The chamber has a control valve, check valve and by-pass piping to control the pressure zones and allow feed from the north pressure zone to the south pressure zone to facilitate and an emergency feed in either direction.

The normal day time operation of the Exeter south pressure zone is to fill and drain the elevated water tower as required during the day from the Exeter south LHPWSS connection at Huron Street and Airport Line. Water tower levels are constantly monitored and controlled by the South Huron SCADA system and requests for

water are automatically sent to the LHPWSS SCADA system. During the night the in-ground reservoirs at MacNaughton Drive are slowly filled from the Exeter distribution system. Water enters the in-ground concrete storage reservoirs through an inlet control pipe in the MacNaughton Drive Booster Pumping Station. During the early morning hours, water is pumped from the reservoir cells, by pumps located in the MacNaughton Drive BPS, to fill the elevated water tower, as required. This process continues until the reservoirs reach their low-level setting and the system automatically switches over to the normal day time operation (ie. tower filled by the Exeter south LHPWSS connection).

The backup for the south pressure zone is provided by the reconfigured MacNaughton Drive Booster Pumping Station, controlled by VFD and PRV control of the high lift and fire pump discharges. Additional redundancy for the south pressure zone is provided by the Exeter north pressure zone.

6.4.2 Booster Pumping Stations

- **Crediton Booster Pumping Station** – An in-line booster pumping station (BPS) located at the west end of Crediton supplies water to the Stephen Pressure Zone 5, including Crediton, Huron Park and Centralia by pumping water along County Rd #10 and Airport Line to the new Huron Park Water Tower. The Crediton BPS has three pumps with VFD's, control valves and is also equipped with a 100kw diesel powered backup emergency generator. The normal mode of operation of the BPS is that it is controlled by the Huron Park Water Tower levels. When the Huron Park Water Tower is taken out of service, the Crediton BPS is configured so that it can by-pass the Huron Park Water Tower and directly supply the water distribution system in the entire Stephen Pressure Zone 5 by using the VFD's

The Crediton BPS and pipeline on Airport Line is also configured so that it can be used as an emergency backup supply to Exeter, by opening a normally closed electrically operated valve in a chamber at Airport Line and Huron Street. The Crediton BPS is also equipped with a control valve that can be opened in an emergency to back feed the Stephen Pressure Zone 3.

- **MacNaughton Drive Booster Pumping Station** - A booster pumping station (BPS) is located at 63B MacNaughton Drive, Exeter that supplies water to the Exeter North and the Exeter South Pressure Zones, including the Exeter Water Tower, when either pressure zone is not being supplied by the LHPWSS Exeter-Hensall pipeline connections.

The MacNaughton Drive BPS has three vertical turbine pumps with VFD's, including One that is a fire pump; control valves; and is also equipped with a 350kw diesel powered backup emergency generator located in the adjacent Generator Building at

62A MacNaughton Drive. One pump and the fire pump are dedicated to the Exeter North Pressure Zone; one pump is dedicated to the Exeter South Pressure Zone.

The BPS is controlled by the SCADA system and its normal mode of operation is to fill and drain the MacNaughton Drive in-ground reservoirs; and to provide a backup for the Exeter North and South Pressure Zones. See Section 6.4.1 “Exeter North Pressure Zone” and “Exeter South Pressure Zone” for description of the normal mode of operation related to the MacNaughton Drive BPS.

Secondary Disinfection is provided at the MacNaughton Drive BPS. Chlorine residual is continuously monitored at this location by an on-line analyzer on the discharge line. Liquid chlorine (sodium hypochlorite) can be injected in the water at this location to supplement any diminishing chlorine residual from the reservoirs. The Liquid chlorine system includes a 50 liter chemical storage tank with level sensor and level indicating transmitter, secondary containment platform and a vertical turbine chemical metering pump, complete with dosing panel and control panel.

6.4.2 Storage Facilities

- **Huron Park Elevated Water Tower** - Elevated water tower consists of a 2,700 m³ elevated tank located at 69751 Airport Line. The elevated tank provides “floating storage” and pressure regulation for the water distribution system in Stephen Pressure Zone 5, including Crediton, Huron Park and Centralia. Water level in this tank is used to control the pumps at the Crediton Booster Pumping Station. The Water Tower is also equipped with a stand-alone 74kw natural gas-powered backup emergency generator, located adjacent to the tower.

Secondary Disinfection is provided at the Huron Park Water Tower. Chlorine residual is continuously monitored at this location by two on-line analyzers in the mechanical room in the base of the water tower, one analyzer is on the intake line (ie. pre-chlorination) and one analyzer is on the discharge line (ie. post-chlorination). Liquid chlorine (sodium hypochlorite) can be injected in the water at this location to supplement any diminishing chlorine residual from the LHPWSS source water. The liquid chlorine system includes a 50 L chemical storage tank with radar level sensor and level indicating transmitter, secondary containment platform and two chemical metering pumps (duty/standby), complete with dosing panel and control panel.

The Huron Park Water Tower is also equipped with a hydrodynamic (passive) mixing system in the elevated tank to assist with maintaining a good chlorine residual and to prevent freezing.

The Huron Park Water Tower HGL can be set to the same elevation as the Exeter Water Tower and the distribution system is configured so that it can operate as a backup for the Exeter Water Tower and associated pressure zones.

- **Exeter Water Tower** - Elevated water tower consists of a 1,515 m³ elevated tank located at 66 Nelson Street. The elevated tank provides storage and pressure regulation for the Exeter south Pressure Zone and can be used in an emergency, as a backup for the Exeter North Pressure Zone at reduced pressure. Water level in this tank is used to control the source of supply for the Exeter South connection to the LHPWSS at the Exeter-Hensall Booster Pumping Station. The Water Tower is also equipped with a stand-alone 20kw natural gas-powered backup emergency generator, located at the Environmental Services Operations Center, 82 Nelson Street, Exeter.

The Exeter Water Tower is also equipped with a hydrodynamic (passive) mixing system in the elevated tank to assist with maintaining a good chlorine residual and to prevent freezing. Chlorine residual is continuously monitored at this location by an on-line analyzer in the mechanical room in the base of the water tower.

The Exeter Water Tower HGL can be set to the same elevation as the Huron Park Water Tower and the distribution system is configured so that it can operate as a backup for the Huron Park Water Tower and associated pressure zones.

- **MacNaughton Drive Reservoirs** - Additional Storage capacity for the Exeter North and Exeter South Pressure Zones is provided by two in-ground reservoir cells. The original 1,140 m³ single cell in-ground reservoir (with a pump well) is located adjacent to the MacNaughton Drive Booster Pumping Station (BPS) and the 2,490 m³ single cell in-ground reservoir is located in MacNaughton Park, south of the MacNaughton Drive BPS. Both reservoirs normally operate in series as a single reservoir.

Additional storage for the Exeter North and Exeter South Pressure Zones is provided by the LHPWSS 8,000 m³ two cell in-ground reservoir, located adjacent to the LHPWSS BPS at Huron Street and Airport Line. The LHPWSS BPS and reservoir is equipped with a stand-alone diesel powered backup emergency generator.

6.4 Operational Challenges

- Maintaining water quality and minimum chlorine residual is the most common challenge in the South Huron distribution system. Rural dead end water mains and the oversized former well feed from the Morgan Well and Cudmore Well located north east of Exeter, are challenges to maintaining water quality.
- Many rural watermain are small diameter and experience lower pressures at times due to system losses, especially during large commercial/agricultural water takings in some areas. Some rural communities have small diameter feeds, which result in lower pressures during certain peak demand conditions.



- Fire flow cannot be adequately provided to some isolated rural, industrial and residential areas.

6.5 Operational Threats

- The single source of supply from the Lake Huron Primary Water Supply System (LHPWSS) is the most significant threat to the South Huron water distribution system. However, this risk is managed by monitoring (SCADA), redundancy, backup emergency generators and reservoir storage.
- The rural water mains and hydrants located in secluded rural and cottage areas are vulnerable to illegal connections, unauthorized use and potential cross connections.
- Older infrastructure is vulnerable to watermain breaks and potential bacteriological contamination.
- Rural PVC watermains and PE waterservices were originally constructed with lower grade materials and minimum specifications, resulting in a higher frequency of failures and increased risk of bacteriological contamination.

7. Risk Assessment (Element 7)

The procedure entitled Hazard Analysis, attached as **Appendix ‘D’**, describes the method used for considering potential hazardous events and associated hazards, as identified in the Ministry of the Environment, Conservation and Parks (MECP) document titled “Potential Hazardous Events for Municipal Residential Drinking Water Systems” and additional potential hazardous events and associated hazards, ranking hazardous events, identifying critical points and control limits. The procedure consists of four main exercises: hazard identification, hazard ranking, critical control point determination and critical limit identification.

A Risk Assessment Table, attached as form “**SOP-F3**”, was developed to fulfill the requirements under Element 8 and identifies the Risk Assessment process.

8. Risk Assessment Outcomes (Element 8)

The Risk Assessment outcomes tables identify potential hazardous events and associated hazards; assesses risks associated with the occurrence of hazardous events and ranks hazardous events. Control measures to address the potential hazards and hazardous events are identified; critical control points and their respective critical control limits are identified. Procedures and/or processes to monitor the critical control limits; procedures to respond to deviations from the critical control limits, and procedures for reporting and recording deviations from the critical control limits are documented. The Response Procedures, as identified on “Risk Assessment Outcome Tables” are located in the “*South Huron Water Distribution System Contingency Plan*”.

The Risk Assessment outcomes are summarized on the following tables:

RISK ASSESSMENT OUTCOMES (ELEMENT 8)

(Distribution)

Activity or Process Step	Description of Hazardous Event/ Hazard	Control Measures	Likelihood	Consequence	Detectability	CCP?	Critical Control Limits	Monitoring Procedures Processes	Response Procedures Contingency Plan Reference
Distribution	LONG TERM IMPACTS OF CLIMATE CHANGE (intense rain; snow storms; flooding)	* Engineering Standards * Regulatory flood levels * SWM facilities * Reduce greenhouse gas * Sustainable practices	1	1	2	No		SCADA alarms; Routine Inspections	Section 5.2.1 or 5.2.2
					4				
	Water supply shortfall	SCADA alarms; water towers; reservoirs; Water Restriction By-law; Customer calls	3	4	2	Yes	Ex.- Low level alarm (3m) H.P.- Low level alarm (3m) Crediton BPS - Low pressure alarm IN (20 psi) OUT (40 psi)	SCADA alarms; Routine Inspections; Customer calls	Contact operator at LHPWSS Water Treatment Plant; Section 2.1; 5.8
	Extreme weather events (e.g., tornado, ice storm)	SCADA alarms; Emergency generators; Operator Standby; Engineering Standards	1	1	1	No		SCADA alarms; Routine Inspections	Section 5.2.1 or 5.2.2
	Sustained extreme temperatures (e.g., heat wave, deep freeze)	SCADA alarms; Emergency generators; Operator Standby; Engineering Standards	3	2	1	No		SCADA alarms; Routine Inspections	Section 5.2.1 or 5.2.2
	Chemical spill impacting source water	LHPWSS Water Treatment Plant; Isolation valves; water towers, reservoirs; operator standby	1	1	4	No		Operator observation; laboratory testing	Contact LHPWSS WTP; Emergency Response Plan
	Terrorist and vandalism actions	SCADA alarms; Intrusion alarm; Locks on doors/hatches; Operator observations; Customer calls	1	3	3	Yes		SCADA alarms; Intrusion alarm; Routine inspections	Emergency Response Plan; Section 2.5
	Sustained pressure loss	SCADA alarms; PRV control valves; water tower; reservoirs; Operator observations; Customer calls	3	4	1	Yes	Ex.- Low level alarm (3m) H.P.- Low level alarm (3m) Crediton BPS - Low pressure alarm IN (20 psi) OUT (40 psi) Customer Complaints	SCADA alarms	Contact LHPWSS WTP; Section 3.1.2; 5.4.1; 4.5
	Cybersecurity threats	Strong passwords; Cybersecurity software; Cybersecurity training; Multi-factor authentication; Limit access; Off-site digital file backup.	1	1	4	No		SCADA alarms; Routine Inspections; Customer calls	Contact IT Support IMMEDIATELY; contact SCADA Provider. Emergency Response Plan
	Backflow	Routine analysis; Water By-law; BFP testing program; engineering standards; Operator observations; Customer calls	1	3	4	Yes	Ecoli > 0 cfu Total Coliform > 0 cfu < 0.30 mg/l	Routine analysis; BFP inspection / certification; Meter maintenance	Section 3.5 Schedule 17 (17-4) Schedule 16 16-3 (1) 4
	Failure of equipment or process associated with secondary disinfection (e.g., chlorination equipment)	SCADA alarms; online CL2 analyzers; backup CL2 equipment; Operator observations; routine inspections	1	4	1	No	< 0.3 mg/l	SCADA alarms; Routine analysis	Section 2.6.2; 4.4 Schedule 16 16-3 (1) 4

RISK ASSESSMENT OUTCOMES (ELEMENT 8)

(Distribution)

Activity or Process Step	Description of Hazardous Event/ Hazard	Control Measures	Likelihood				CCP?	Critical Control Limits	Monitoring Procedures Processes	Response Procedures Contingency Plan Reference
			2	2	2	2				
	Frozen service		2	2	2	6	No			3.3
	Loss of chlorine Dead End	Operator observation Routine analysis Regular flushing	2	2	3	7	Yes Min CCP	< 0.20 mg/l	Routine flushing	Schedule 16 16-3 (1) 4
	Loss of Chlorine Mains	Operator observations SCADA Alarms	1	4	1	6	No Min CCP	< 0.20 mg/l	Online analyzer	Schedule 16 16-3 (1) 4
	Sediment or slime High turbidity or pathogens	Routine analysis Customer complaints Hydrant maintenance Flushing program	1	4	3	8	Yes	Ecoli > 0 cfu Total Coliform > 0 cfu	Routine analysis Hydrant flushing program	
	Sabotage-addition of harmful chemical or bacteriological pathogens	Operator observations Customer calls Analysis	1	5	3	9	Yes Min CCP	Ecoli > 0 cfu Total Coliform > 0 cfu	Routine analysis	O Reg 170/03
	Unauthorized use of system valves and hydrants	Hydrant guards Operator observations Customer calls	3	2	4	9	Yes		Valve maintenance program Hydrant flushing program Seal broken on hydrant guard	3.4
	Loss of adequate system pressure due to main break.	Operator observations Customer calls Alarms	4	3	2	9	Yes	Ex.-Low pressure alarm (20psi) Stephen Booster-Low Pressure alarm- IN 20 psi -OUT-40 psi Customer complaints about low pressure	SCADA alarms Customer complaints	3.1.2
	Microbiological Analysis indicates contamination	Routine analysis	2	3	3	8	Yes Min CCP	Ecoli > 0 cfu Total Coliform > 0 cfu	Routine analysis	3.5 Schedule 17 (17-4)
	Poor bacteriological results continue	Repeat analysis	1	4	2	7	Yes Min CCP	Ecoli > 0 cfu	Analysis	3.5.2 Schedule 17 (17-4)
	Elevated Bacteriological results at multiple locations	Routine analysis	1	5	2	8	Yes Min CCP	Ecoli > 0 cfu Total Coliform > 0 cfu	Analysis	3.5.3 Schedule 17 (17-4)
	Loss of adequate system pressure due to loss of water tower.	Alarms Operator observation Customer calls	1	4	1	6	No	Ex.-Low pressure alarm (20 psi) Low level alarm (3m) H.P. - Low level alarm- 3m Customer complaints	SCADA alarms Customer complaints	5.4.1
	Loss of adequate system pressure due to BPS failure.	Alarms Operator observation Customer calls	1	1	1	3	No	St. Booster-Low pressure alarm IN (20 psi) OUT (40 psi) Customer complaints about low pressure	SCADA alarms	4.5
	Point of use UV Disinfection Units (Exeter)	Customer calls because of alarms. Routine maintenance Operator observation Customer calls	3	2	2	7	Yes		Routine maintenance Alarms	Operator responds ASAP Repair as required 3.1.1
	Water main breaks (Non-critical)	Operator observation Customer calls Loss of pressure	4	2	2	8	Yes	Customer complaints about water quality	Customer complaints	3.1.2
	Water main breaks (Critical)	Operator observation Customer calls Loss of pressure	3	3	1	7	Yes	Customer complaints about low pressure	Customer complaints	3.1.2
	Hydrant damaged	Operator observations Routine maintenance Customer calls	3	1	3	7	Yes		Hydrant flushing program	3.4

RISK ASSESSMENT OUTCOMES (ELEMENT 8)

(Distribution)

Activity or Process Step	Description of Hazardous Event/ Hazard	Control Measures	Likelihood	Consequence	Detectability	Total	CCP?	Critical Control Limits	Monitoring Procedures Processes	Response Procedures Contingency Plan Reference
	Loss of feed from Lake Huron Primary Water Supply System to entire distribution system	Low water tower; SCADA alarms; Customer calls	4	4	1	9	Yes	Ex.- Low level alarm (3m) H.P.-Low level alarm (3m)Credition BPS - Low pressure alarm IN (20 psi) OUT (40 psi) Customer Complaints	SCADA alarms	Contact operator at LHPWSS WTP to determine duration of interruption.
										Start pumping from LHPWSS Airport Line Reservoir then MacNaughton Dr Reservoirs last.
	Loss of feed from Lake Huron Primary Water Supply System to Stephen System only.	Low water tower; SCADA alarms; Customer calls	4	4	1	9	Yes	H.P. - Low level alarm (3m) St. Booster-Low pressure alarm IN (20 psi) OUT (40 psi) Customer complaints		Open normally closed valve at Airport & Huron St and backfeed from Exeter system.
	Loss of feed from Lake Huron Primary Water Supply System to both Exeter South and Exeter North only.	Low water tower; SCADA alarms; Customer calls	2	3	1	6	No	Ex.- Low level alarm (3m) Low pressure alarm (20 psi) High pressure alarm (90 psi) Low pressure alarm (20 psi)		Open normally closed valve at Airport Line & Huron St and backfeed from Stephen system
	Loss of feed from Lake Huron Primary Water Supply System to Exeter South or Exeter North only.	Low water tower; SCADA alarms; Customer calls	2	2	1	5	No	Ex.-Low level alarm (3m) Pressure alarm (20 psi)		Check William & Church control chamber to confirm automatic switch over.
	Contaminated water coming into the distribution system	Operator observations Customer calls Analysis	1	4	3	8	Yes	Ecoli > 0 cfu Total Coliform > 0 cfu	Routine analysis	3.5 Schedule 17 (17-4)
	Hazards resulting from human error (i.e. improper SCADA control limits set)	Low Reservoir level; SCADA Monitoring; Operator observations	3	3	1	7	Yes	Ex.-High level alarm (6.0m) Low level alarm (3.1m) High Pressure alarm (90 psi) Low pressure alarm (20 psi) H.P. - High level alarm (11.8m) Low level alarm (6m) Credition BPS - Low Pressure alarm IN (20 psi) OUT (40 psi) High pressure alarm- IN (90 psi) Out (99 psi)	Minimum 24 hr SCADA checks; Maximum 72 hr SCADA checks	Restore to normal set points.
	Pandemic / Staff shortage (COVID19)	1. Disperse staff 2. Increased PPE 3. Social Distancing	2	2	1	5	No	Staff Daily Pre-entry COVID19 Screening	Daily Screening	1. COVID19 testing with HPHU 2. Contact Tracing

Mandatory Risks

- 1 Long Term Impacts of Climate Change (intense rain; snow storms; flooding)
- 2 Water supply shortfall
- 3 Extreme weather events (e.g., tornado, ice storm)
- 4 Sustained extreme temperatures (e.g., heat wave, deep freeze)
- 5 Chemical spill impacting source water
- 6 Terrorist and vandalism actions
- 7 Sustained pressure loss
- 8 Cybersecurity threats
- 9 Backflow
- 10 Failure of equipment or process associated with secondary disinfection (e.g., chlorination equipment)

Table 5.1- Hazard Ranking

Description	Likelihood of Hazardous Event Occurring	Rating
Rare	May occur in exceptional circumstances, and has not occurred in past.	1
Unlikely	Could occur at some time, historically has occurred less than once every five or 10 years.	2
Possible	Has occurred or may occur once or more per year.	3
Likely	Has occurred or may occur on a monthly to quarterly basis.	4
Very likely	One or more occurrences on a monthly or more frequent basis.	5
Description	Consequence of Hazardous Event Occurring	Rating
Insignificant	Insignificant impact, little public exposure, little or no health risk.	1
Minor	Limited public exposure, minor health risk.	2
Moderate	Minor public exposure, health impact on small part of the population.	3
Major	Large part of population at risk.	4
Catastrophic	Major impact for large part of the population, complete failure of systems.	5
Description	Detectability of Hazardous Event	Rating
Very Detectable	Easy to detect, on-line monitoring through SCADA.	1
Moderately Detectable	Moderately detectable, alarm present but not in SCADA, may require operator to walk by and notice alarm; problem is indicated promptly by in-house lab test results.	2
Normally Detectable	Normally detectable, visually detectable on rounds or through regular maintenance.	3
Poorly Detectable	Poorly detectable, visually detectable but not inspected on a regular basis; not normally detected before problem becomes evident; lab tests are not done on a regular basis (e.g. quarterly).	4
Undetectable	Cannot be detected.	5

RISK ASSESSMENT OUTCOMES (ELEMENT 8)

(Booster Pumping Stations)

Activity or Process Step	Description of Hazardous Event/ Hazard	Control Measures	Likelihood	Consequence	Detectability	Total	CCP?	Critical Control Limits	Monitoring Procedures Processes	Response Procedures & Contingency Plan Reference
Booster Pumping Stations a) MacNaughton Dr. BPS b) Crediton BPS	LONG TERM IMPACTS OF CLIMATE CHANGE (intense rain; snow storms; flooding)	* Engineering Standards * Regulatory flood levels * SWM facilities * Reduce greenhouse gas * Sustainable practices	4	2	1	7	Yes		SCADA alarms; Routine Inspections	Section 5.2.1 or 5.2.2
	Water supply shortfall	SCADA alarms; water towers; reservoirs; Water Restriction By-law; Customer calls	1	5	1	7	Yes	Ex.- Low level alarm (3m) H.P.-Low level alarm (3m) Crediton BPS - Low pressure alarm IN (20 psi) OUT (40 psi)	SCADA alarms; Routine Inspections; Customer calls	Contact operator at LHPWSS Water Treatment Plant; Section 2.1; 5.8
	Extreme weather events (e.g., tornado, ice storm)	SCADA alarms; Emergency generators; Operator Standby; Engineering Standards	4	2	1	7	Yes		SCADA alarms; Routine Inspections	Section 5.2.1 or 5.2.2
	Sustained extreme temperatures (e.g., heat wave, deep freeze)	SCADA alarms; Emergency generators; Operator Standby; Engineering Standards	3	2	1	6	No		SCADA alarms; Routine Inspections	Section 5.2.1 or 5.2.2
	Chemical spill impacting source water	LHPWSS Water Treatment Plant; isolation valves; water towers, reservoirs; operator standby	1	5	1	7	Yes		Operator observation; laboratory testing	Contact LHPWSS WTP; Emergency Response Plan
	Terrorist and vandalism actions	SCADA alarms; Intrusion alarm; Locks on doors/hatches; Operator observations; Customer calls	1	4	1	6	Yes		SCADA alarms; Intrusion alarm; Routine inspections	Emergency Response Plan; Section 2.5
	Sustained pressure loss	SCADA alarms; PRV control valves; water tower; reservoirs; Operator observations; Customer calls	2	2	1	5	No	Ex.- Low level alarm (3m) H.P.-Low level alarm (3m) Crediton BPS - Low pressure alarm IN (20 psi) OUT (40 psi)	SCADA alarms	Contact LHPWSS WTP; Section 3.1.2; 5.4.1; 4.5
	Cybersecurity threats	Strong passwords; Cybersecurity software; Cybersecurity training; Multi-factor authentication; Limit access; Off-site digital file backup.	1	4	4	9	Yes		SCADA alarms; Routine Inspections; Customer calls	Contact IT Support IMMEDIATELY ; contact SCADA Provider. Emergency Response Plan

RISK ASSESSMENT OUTCOMES (ELEMENT 8)

(Booster Pumping Stations)

Activity or Process Step	Description of Hazardous Event/ Hazard	Control Measures	Likelihood	Consequence	Detectability	Total	CCP?	Critical Control Limits	Monitoring Procedures Processes	Response Procedures & Contingency Plan Reference
	Backflow	Routine analysis; Water By-law; BFP testing program; engineering standards; Operator observations; Customer calls	1	3	4	8	Yes Min CCP	Ecoli > 0 cfu Total Coliform > 0 cfu < 0.20 mg/l	Routine analysis; BFP inspection / certification; Meter maintenance	Section 3.5 Schedule 17 (17-4) Schedule 16 16-3 (1) 4
	Failure of equipment or process associated with secondary disinfection (e.g. chlorination equip)	SCADA alarms; online CL2 analyzers; backup CL2 equipment; Operator observations; routine inspections	3	1	1	5	No	< 0.3 mg/l	SCADA alarms; Routine analysis	Section 2.6.2; 4.4 Schedule 16 3 (1) 4
	Failure of equipment or process associated with secondary disinfection (e.g. High Level chlorine)	SCADA alarms; online CL2 analyzers; backup CL2 equipment; Operator observations; routine inspections	4	5	1	10	Yes	>2.05 mg/l	SCADA alarms; Routine analysis	Section 2.6.2; 4.4 Schedule 16 3 (1) 4
	Equipment/pump failure/communication failure	SCADA alarms; Operator Standby; emergency repair material & equipment; Operator observation; Customer calls	5	1	1	7	Yes Min. CCP	< 0.3 mg/l	Pump failure alarms Routine inspections	Section 2.1.3 Section 2.6
	Pipe Rupture; building flooding	SCADA alarms; Operator Standby; emergency repair material & equipment; Operator observation; Customer calls	1	3	1	5	No		Routine maintenance Routine inspections	Section 4.3
	Blow off CAP Left off-Taken off	Operator observation; Customer calls	1	1	4	6	No		Routine inspections	Determine if its vandalism Replace cap
	Hydro failure	SCADA alarms; Emergency generator; Operator Standby; Operator observation; Customer calls	4	1	1	6	No	Activation of loss of hydro alarm Activation of loss of communication alarm	Routine maintenance procedures SCADA alarms	Section 2.6.3
	Diesel Generator failure	SCADA alarms; Operator Standby; Operator observation; routine maintenance	2	1	1	4	No	Activation of loss of hydro alarm Activation of loss of communication alarm	SCADA alarms Routine maintenance	Section 5.7

RISK ASSESSMENT OUTCOMES (ELEMENT 8)

(Booster Pumping Stations)

Activity or Process Step	Description of Hazardous Event/ Hazard	Control Measures	Likelihood	Consequence	Detectability	Total	CCP?	Critical Control Limits	Monitoring Procedures Processes	Response Procedures & Contingency Plan Reference
	Fuel tank rupture	Operator observation; routine maintenance	1	1	3	5	No		Routine inspections	Section 5.5.2
	Fire or explosion; Structure failure	SCADA alarms; Fire Department; Operator Standby; Operator observation; Customer calls	1	4	1	6	No	Activation of loss of hydro alarm Activation of loss of communication alarm	SCADA alarms	Section 5.1
	Chemical Spill	EMS Dispatch; Fire Department; Operator observation; Customer calls	2	1	2	5	No			Section 5.5.1 or 5.5.2
	Control Valve Failure	SCADA Monitoring; Operator Standby; Operator observation; Daily flow calculations	1	2	1	4	No		Routine inspections Routine maintenance SCADA alarms	Section 2.4.2
	Hazards resulting from human error (i.e. improper SCADA control limits set)	SCADA Monitoring; Operator observations	3	2	2	7	Yes	High level alarm (3.5m) Low level alarm (1m) High pressure alarm (90 psi) Low pressure alarm (20 psi)	Minimum 24 hr SCADA checks Maximum 72 hr SCADA checks	Restore to normal set points.

Mandatory Risks

- 1 Long Term Impacts of Climate Change (intense rain; snow storms; flooding)
- 2 Water supply shortfall
- 3 Extreme weather events (e.g., tornado, ice storm)
- 4 Sustained extreme temperatures (e.g., heat wave, deep freeze)
- 5 Chemical spill impacting source water
- 6 Terrorist and vandalism actions
- 7 Sustained pressure loss
- 8 Cybersecurity threats
- 9 Backflow
- 10 Failure of equipment or process associated with secondary disinfection (e.g., chlorination equipment)

Table 5.1- Hazard Ranking

Description	Likelihood of Hazardous Event Occurring	Rating
Rare	May occur in exceptional circumstances, and has not occurred in past.	1
Unlikely	Could occur at some time, historically has occurred less than once every five or 10 years.	2
Possible	Has occurred or may occur once or more per year.	3
Likely	Has occurred or may occur on a monthly to quarterly basis.	4
Very likely	One or more occurrences on a monthly or more frequent basis.	5
Description	Consequence of Hazardous Event Occurring	Rating
Insignificant	Insignificant impact, little public exposure, little or no health risk.	1
Minor	Limited public exposure, minor health risk.	2
Moderate	Minor public exposure, health impact on small part of the population.	3
Major	Large part of population at risk.	4
Catastrophic	Major impact for large part of the population, complete failure of systems.	5
Description	Detectability of Hazardous Event	Rating
Very Detectable	Easy to detect, on-line monitoring through SCADA.	1
Moderately Detectable	Moderately detectable, alarm present but not in SCADA, may require operator to walk by and notice alarm; problem is indicated promptly by in-house lab test results.	2
Normally Detectable	Normally detectable, visually detectable on rounds or through regular maintenance.	3
Poorly Detectable	Poorly detectable, visually detectable but not inspected on a regular basis; not normally detected before problem becomes evident; lab tests are not done on a regular basis (e.g. quarterly).	4
Undetectable	Cannot be detected.	5

RISK ASSESSMENT OUTCOMES (ELEMENT 8)

(Elevated Storage)

Activity or Process Step	Description of Hazardous Event/ Hazard	Control Measures	Likelihood	Consequence	Detectability	Total	CCP?	Critical Control Limits	Monitoring Procedures Processes	Response Procedures Contingency Plan Reference
Elevated Storage a) Exeter Water Tower b) Huron Park Tower	LONG TERM IMPACTS OF CLIMATE CHANGE (intense rain; snow storms; flooding)	* Engineering Standards * Regulatory flood levels * SWM facilities * Reduce greenhouse gas * Sustainable practices	1	1	1	3	No		SCADA alarms; Routine Inspections	Section 5.2.1 or 5.2.2
	Water supply shortfall	SCADA alarms; water towers; reservoirs; Water Restriction By-law; Customer calls	1	2	1	4	No	Ex - Low level alarm (3m) H.P. - Low level alarm (3m) Crediton BPS - Low pressure alarm IN (20 psi) OUT (40 psi)	SCADA alarms; Routine Inspections; Customer calls	Contact operator at LHPWSS Water Treatment Plant; Section 2.1; 5.8
	Extreme weather events (e.g., tornado, ice storm)	SCADA alarms; Emergency generators; Operator Standby; Engineering Standards	2	3	1	6	No		SCADA alarms; Routine Inspections	Section 5.2.1 or 5.2.2
	Sustained extreme temperatures (e.g., heat wave, deep freeze)	SCADA alarms; Emergency generators; Operator Standby; Engineering Standards	3	2	1	6	No		SCADA alarms; Routine Inspections	Section 5.2.1 or 5.2.2
	Chemical spill impacting source water	LHPWSS Water Treatment Plant; isolation valves; water towers, reservoirs; operator standby	1	4	2	7	Yes		Operator observation; laboratory testing	Contact LHPWSS WTP; Emergency Response Plan
	Terrorist and vandalism actions	SCADA alarms; Intrusion alarm; Locks on doors/hatches; Operator observations; Customer calls	1	3	1	5	No		SCADA alarms; Intrusion alarm; Routine inspections	Emergency Response Plan; Section 2.5
	Sustained pressure loss	SCADA alarms; PRV control valves; water tower; reservoirs; Operator observations; Customer calls	1	2	1	4	No		SCADA alarms	Contact LHPWSS WTP; Section 3.1.2; 5.4.1; 4.5
	Cybersecurity threats	Strong passwords; Cybersecurity software; Cybersecurity training; Multi-factor authentication; Limit access; Off-site digital file backup.	1	4	3	8	Yes		SCADA alarms; Routine Inspections; Customer calls	Contact IT Support IMMEDIATELY ; contact SCADA Provider. Emergency Response Plan

RISK ASSESSMENT OUTCOMES (ELEMENT 8)

(Elevated Storage)

Activity or Process Step	Description of Hazardous Event/ Hazard	Control Measures	Likelihood	Consequence	Detectability	Total	CCP?	Critical Control Limits	Monitoring Procedures Processes	Response Procedures Contingency Plan Reference
	Backflow	Routine analysis; Water By-law; BFP testing program; engineering standards; Operator observations; Customer calls	1	2	5	8	Yes Min CCP	Ecoli > 0 cfu Total Coliform > 0 cfu < 0.20 mg/l	Routine analysis; BFP Inspection / certification; Meter maintenance	Section 3.5 Schedule 17 (17-4) Schedule 16 16-3 (1) 4
	Failure of equipment or process associated with secondary disinfection (e.g., chlorination equipment)	SCADA alarms; online CL2 analyzers; backup CL2 equipment; Operator observations; routine inspections	3	1	1	5	No	< 0.3 mg/l	SCADA alarms; Routine analysis	Section 2.6.2; 4.4 Schedule 16 3 (1) 4
	Failure of equipment or process associated with secondary disinfection (e.g., High Level chlorine)	SCADA alarms; online CL2 analyzers; backup CL2 equipment; Operator observations; routine inspections	4	5	1	10	Yes	> 2.05 mg/l	SCADA alarms; Routine analysis	Section 2.6.2; 4.4 Schedule 16 3 (1) 4
	Over flow Low level	Alarms Operator observation Customer calls	2	2	1	5	No	Ex.-High level alarm (6.0m) Low level alarm (3.1m) H.P.-High Level alarm (11.8m) Low level alarm (6m)	SCADA alarms	4.1
	Breach of security Access doors vandalized	Operator observation Customer calls Weekly inspections	1	4	1	6	Yes		Routine inspections	4.7.1
	Foreign substance in water	Operator observation Customer calls Discolour of water	1	4	2	7	Yes	Ecoli > 0 cfu Total Coliform > 0 cfu	Routine analysis	4.7.2
	Structural cracks (leaks)	Large flow differentials Inspections 5yr. Level indications	1	3	4	8	Yes	Low level alarm (3m)	Routine inspections	5.4.3
	Loss of chlorine Insufficient mixing	Operator observation On-line analyzer	1	2	1	4	No Min. CCP	< 0.30 mg/l	SCADA reports alarms	4.4.1 4.4.2
	Pipe failure Inlet/Outlet Loss of storage	Operator Observations Customer Calls Alarms	1	1	1	3	No	Low level alarm (3m)	SCADA alarms	4.3.2
	Damage due to vandals/vehicle accident Struck by an Airplane	Operator observations Customer calls Navigation lights Customer calls	1	1	2	4	No		Routine inspections	4.7.1
			1	2	1	4	No	Activation of loss of communication alarm	SCADA Alarms	5.3
	Freezing of elevated storage	Operator observations Mixing system (Huron Park)	1	2	2	5	No Cannot be controlled			

RISK ASSESSMENT OUTCOMES (ELEMENT 8)

(Elevated Storage)

Activity or Process Step	Description of Hazardous Event/ Hazard	Control Measures	Likelihood	Consequence	Detectability	Total	CCP?	Critical Control Limits	Monitoring Procedures Processes	Response Procedures Contingency Plan Reference
	Hazards resulting from human error (i.e. improper SCADA control limits set)	Operator observations SCADA Monitoring Operator observation	3	1	1	5	No	Ex.-High level alarm (6.0m) Low level alarm (3.1m) H.P.-High Level alarm (11.8m) Low level alarm (6m)	Minimum 24 hr SCADA checks Maximum 72 hr SCADA checks	Restore to normal set points.
	Chemical Spill (eg. Sodium Hypochlorite at Huron Park Water Tower)	Operator observation; Alarms; Customer calls	4	1	1	6	No	Activation of sodium hypochlorite alarm	Spill containment; SCADA Alarm	Section 5.5.1 or 5.5.2
	Hydro failure	SCADA Alarms Operator observation Customer calls	3	1	1	5	No	Activation of loss of hydro alarm Activation of loss of communication alarm	Routine inspections procedures SCADA alarms	2.6.3

Mandatory Risks

- 1 Long Term Impacts of Climate Change (intense rain; snow storms; flooding)
- 2 Water supply shortfall
- 3 Extreme weather events (e.g., tornado, ice storm)
- 4 Sustained extreme temperatures (e.g., heat wave, deep freeze)
- 5 Chemical spill impacting source water
- 6 Terrorist and vandalism actions
- 7 Sustained pressure loss
- 8 Cybersecurity threats
- 9 Backflow
- 10 Failure of equipment or process associated with secondary disinfection (e.g., chlorination equipment)

Table 5.1- Hazard Ranking

Description	Likelihood of Hazardous Event Occurring	Rating
Rare	May occur in exceptional circumstances, and has not occurred in past.	1
Unlikely	Could occur at some time, historically has occurred less than once every five or 10 years.	2
Possible	Has occurred or may occur once or more per year.	3
Likely	Has occurred or may occur on a monthly to quarterly basis.	4
Very likely	One or more occurrences on a monthly or more frequent basis.	5
Description	Consequence of Hazardous Event Occurring	Rating
Insignificant	Insignificant impact, little public exposure, little or no health risk.	1
Minor	Limited public exposure, minor health risk.	2
Moderate	Minor public exposure, health impact on small part of the population.	3
Major	Large part of population at risk.	4
Catastrophic	Major impact for large part of the population, complete failure of systems.	5
Description	Detectability of Hazardous Event	Rating
Very Detectable	Easy to detect, on-line monitoring through SCADA.	1
Moderately Detectable	Moderately detectable, alarm present but not in SCADA, may require operator to walk by and notice alarm; problem is indicated promptly by in-house lab test results.	2
Normally Detectable	Normally detectable, visually detectable on rounds or through regular maintenance.	3
Poorly Detectable	Poorly detectable, visually detectable but not inspected on a regular basis; not normally detected before problem becomes evident; lab tests are not done on a regular basis (e.g. quarterly).	4
Undetectable	Cannot be detected.	5

RISK ASSESSMENT OUTCOMES (ELEMENT 8)

(Reservoirs)

Activity or Process Step	Description of Hazardous Event/ Hazard	Control Measures	Likelihood	Consequence	Detectability	Total	CCP?	Critical Control Limits	Monitoring Procedures Processes	Response Procedures Contingency Plan Reference
In Ground Reservoirs a) Exeter	LONG TERM IMPACTS OF CLIMATE CHANGE (intense rain; snow storms; flooding)	* Engineering Standards * Regulatory flood levels * SWM facilities * Reduce greenhouse gas * Sustainable practices	1	4	1	6	No		SCADA alarms; Routine Inspections	Section 5.2.1 or 5.2.2
	Water supply shortfall	SCADA alarms; water towers; reservoirs; Water Restriction By-law; Customer calls	2	1	1	4	No	Ex.- Low level alarm (3m) H.P.-Low level alarm (3m) Credition BPS - Low pressure alarm IN (20 psi) OUT (40 psi)	SCADA alarms; Routine Inspections; Customer calls	Contact operator at LHPWSS Water Treatment Plant; Section 2.1; 5.8
	Extreme weather events (e.g., tornado, ice storm)	SCADA alarms; Emergency generators; Operator Standby; Engineering Standards	2	1	1	4	No		SCADA alarms; Routine Inspections	Section 5.2.1 or 5.2.2
	Sustained extreme temperatures (e.g., heat wave, deep freeze)	SCADA alarms; Emergency generators; Operator Standby; Engineering Standards	3	1	1	5	No		SCADA alarms; Routine Inspections	Section 5.2.1 or 5.2.2
	Chemical spill impacting source water	LHPWSS Water Treatment Plant; isolation valves; water towers, reservoirs; operator standby	1	4	2	7	Yes		Operator observation; laboratory testing	Contact LHPWSS WTP; Emergency Response Plan
	Terrorist and vandalism actions	SCADA alarms; Intrusion alarm; Locks on doors/hatches; Operator observations; Customer calls	1	3	1	5	Yes		SCADA alarms; Intrusion alarm; Routine inspections	Emergency Response Plan; Section 2.5
	Sustained pressure loss	SCADA alarms; PRV control valves; water tower; reservoirs; Operator observations; Customer calls	1	1	1	3	No	Ex.- Low level alarm (3m) H.P.-Low level alarm (3m) Credition BPS - Low pressure alarm IN (20 psi) OUT (40 psi) Customer	SCADA alarms	Contact LHPWSS WTP; Section 3.1.2; 5.4.1; 4.5
	Cybersecurity threats	Strong passwords; Cybersecurity software; Cybersecurity training; Multi-factor authentication; Limit access; Off-site digital file backup.	1	2	2	5	No		SCADA alarms; Routine Inspections; Customer calls	Contact IT Support IMMEDIATELY ; contact SCADA Provider. Emergency Response Plan

RISK ASSESSMENT OUTCOMES (ELEMENT 8)

(Reservoirs)

Activity or Process Step	Description of Hazardous Event/ Hazard	Control Measures	Likelihood	Consequence	Detectability	Total	CCP?	Critical Control Limits	Monitoring Procedures Processes	Response Procedures Contingency Plan Reference
	Backflow	Routine analysis; Water By-law; BFP testing program; engineering standards; Operator observations; Customer calls	1	3	4	8	Yes Min CCP	Ecoli > 0 cfu Total Coliform > 0 cfu < 0.20 mg/l	Routine analysis; BFP Inspection / certification; Meter maintenance	Section 3.5 Schedule 17 (17-4) Schedule 16 16-3 (1) 4
	Failure of equipment or process associated with secondary disinfection (e.g., chlorination equipment)	SCADA alarms; online CL2 analyzers; backup CL2 equipment; Operator observations; routine inspections	4	1	1	6	No	< 0.3 mg/l	SCADA alarms; Routine analysis	Section 2.6.2; 4.4 Schedule 16 3 (1) 4
	Collapse of Structure due to wall failure	Alarms Operator observation Customer calls	1	5	2	8	Yes	Low level alarm (1m) Customer complaints	SCADA alarms	2.1 4.1
	Leakage due to corrosion or structural failure	SCADA alarm Operator observations Routine inspections- 5yr.	1	3	4	8	Yes	Low level alarm (1m)	SCADA alarms Routine inspections	4.3 4.3.1
	Loss of storage due to pipe rupture	Alarms Operator observation Customer calls	1	3	2	6	No	Low level alarm (1m)		4.3.2
	Bacteriological Contamination	Weekly sampling	1	3	3	7	Yes	Ecoli > 0 cfu Total Coliform > 0 cfu	Routine analysis	4.2.1
	Breach of security Access hatches or vents vandalized. Damage to monitoring equipment.	Alarm Operator observation Customer calls	1	2	1	4	Yes	Activation of loss of communication alarm	Communication alarms	2.5.2
	Loss of chlorine Insufficient mixing	Operator observation On-line analyzer	1	3	1	5	No Min. CCP	< 0.30 mg/l	SCADA reports alarms	4.4.1 4.4.2
	Hazards resulting from human error (i.e. improper SCADA control limits set)	Operator observations SCADA Monitoring Operator observation	2	1	1	4	No	High level alarm (3.5m) Low level alarm (1.5m)	Minimum 24 hr SCADA checks Maximum 72 hr SCADA checks	Restore to normal set points.
	Hydro failure	SCADA Alarms Operator observation Customer calls	4	1	1	6	No	Activation of auto Gen Set Generator running after 1hr alarm	Routine maintenance procedures SCADA alarms	2.6.3

Mandatory Risks

- 1 Long Term Impacts of Climate Change (intense rain; snow storms; flooding)
- 2 Water supply shortfall
- 3 Extreme weather events (e.g., tornado, ice storm)
- 4 Sustained extreme temperatures (e.g., heat wave, deep freeze)
- 5 Chemical spill impacting source water
- 6 Terrorist and vandalism actions
- 7 Sustained pressure loss
- 8 Cybersecurity threats
- 9 Backflow
- 10 Failure of equipment or process associated with secondary disinfection (e.g., chlorination equipment)

Table 5.1- Hazard Ranking

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Catastrophic	Major impact for large part of the population, complete failure of systems.	5
Description	Detectability of Hazardous Event	Rating
Very Detectable	Easy to detect, on-line monitoring through SCADA.	1
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Normally Detectable	Normally detectable, visually detectable on rounds or through regular maintenance.	3
Poorly Detectable	Poorly detectable, visually detectable but not inspected on a regular basis; not normally detected before problem becomes evident; lab tests are not done on a regular basis (e.g. quarterly).	4
Undetectable	Cannot be detected.	5

RISK ASSESSMENT OUTCOMES (ELEMENT 8)

(Chambers)

Activity or Process Step	Description of Hazardous Event/ Hazard	Control Measures	Likelihood	Consequence	Detectability	Total	CCP?	Critical Control Limits	Monitoring Procedures Processes	Response Procedures Contingency Plan Reference
a) Monitoring/Metering i) Shipka ii) LS/SH Boundary iii) Huron Street West iv) Airport Line at water tower v) Hwy#21 & Waterworks Road	LONG TERM IMPACTS OF CLIMATE CHANGE (intense rain; snow storms; flooding)	* Engineering Standards * Regulatory flood levels * SWM facilities * Reduce greenhouse gas * Sustainable practices * Sustainable practices	4	1	3	8	Yes		SCADA alarms; Routine Inspections	Section 5.2.1 or 5.2.2
		SCADA alarms; water towers; reservoirs; Water Restriction By-law; Customer calls	1	4	1	6	No	Ex.- Low level alarm (3m) H.P.-Low level alarm (3m) Crediton BPS - Low pressure alarm IN (20 psi) OUT (40 psi)	SCADA alarms; Routine Inspections; Customer calls	Contact Operator at LHPWSS Water Treatment Plant; Section 2.1; 5.8
		SCADA alarms; Emergency generators; Operator Standby; Engineering Standards	1	1	3	5	No		SCADA alarms; Routine Inspections	Section 5.2.1 or 5.2.2
		SCADA alarms; Emergency generators; Operator Standby; Engineering Standards	3	1	2	6	No		SCADA alarms; Routine Inspections	Section 5.2.1 or 5.2.2
		LHPWSS Water Treatment Plant; isolation valves; water towers, reservoirs; operator standby	1	2	1	4	No		Operator observation; laboratory testing	Contact LHPWSS WTP; Emergency Response Plan
	Terrorist and vandalism actions	SCADA alarms; Intrusion alarm; Locks on doors/hatches; Operator observations; Customer calls	2	2	3	7	Yes		SCADA alarms; Intrusion alarm; Routine inspections	Emergency Response Plan; Section 2.5
	Sustained pressure loss	SCADA alarms; PRV control valves; water tower; reservoirs; Operator observations; Customer calls	3	2	1	6	No	Ex.- Low level alarm (3m) H.P.-Low level alarm (3m)Crediton BPS - Low pressure alarm IN (20 psi) OUT (40 psi) Customer	SCADA alarms	Contact LHPWSS WTP; Section 3.1.2; 5.4.1; 4.5
	Cybersecurity threats	Strong passwords; Cybersecurity software; Cybersecurity training; Multi-factor authentication; Limit access; Off-site digital file backup.	1	2	1	4	No		SCADA alarms; Routine Inspections; Customer calls	Contact IT Support IMMEDIATELY ; contact SCADA Provider. Emergency Response Plan

RISK ASSESSMENT OUTCOMES (ELEMENT 8)

(Chambers)

Activity or Process Step	Description of Hazardous Event/ Hazard	Control Measures	Likelihood	Consequence	Detectability	Total	CCP?	Critical Control Limits	Monitoring Procedures Processes	Response Procedures Contingency Plan Reference
	Backflow	Routine analysis; Water By-law; BFP testing program; engineering standards; Operator observations; Customer calls	1	1	4	6	No Min CCP	Ecoli > 0 cfu Total Coliform > 0 cfu < 0.20 mg/l	Routine analysis; BFP Inspection / certification; Meter maintenance	Section 3.5 Schedule 17 (17-4) Schedule 16 16-3 (1) 4
	Failure of equipment or process associated with secondary disinfection (e.g., chlorination equipment)	SCADA alarms; online CL2 analyzers; backup CL2 equipment; Operator observations; routine inspections	1	1	1	3	No	< 0.2 mg/l	SCADA alarms; Routine analysis	Section 2.6.2; 4.4 Schedule 16 3 (1) 4
	Pressure control valve failure	Operator observation Customer calls SCADA alarms	2	4	1	7	Yes	Customer complaints	Routine inspections	5,6
	Pipe or valve failure	Operator observation Customer calls	1	3	2	6	No		Routine maintenance	
	Security breach Access hatches or vents vandalized.	Sampling Customer calls Operator observations	1	1	3	5	No		Routine maintenance SCADA alarms	4.7.1
	Bacteriological Contamination (flooding from ground water)	Weekly sampling Operator observations sump pumps	4	1	3	8	Yes	Ecoli > 0 cfu Total Coliform > 0 cfu	Routine analysis	4.2.1
	Loss of chlorine (Huron St Monitoring Chamber)	Operator observation On-line analyzer	1	3	1	5	No Min. CCP	< 0.30 mg/l	SCADA reports alarms	4.4.1 4.4.2
	Hazards resulting from human error (i.e. improper SCADA control limits set)	Operator observations SCADA Monitoring Operator observation	2	2	3	7	Yes	High pressure alarm (90 psi) Low pressure alarm (20 psi)	Minimum 24 hr SCADA checks Maximum 72 hr SCADA checks	Restore to normal set points.
	Hydro failure (Huron St Monitoring Chamber) (Church & William Pressure Control Chamber)	SCADA Alarms Operator observation Customer calls	4	1	1	6	No	Activation of loss of hydro alarm Activation of loss of communication alarm	Routine maintenance procedures SCADA alarms	2.6.3

Mandatory Risks

- 1 Long Term Impacts of Climate Change (intense rain; snow storms; flooding)
- 2 Water supply shortfall
- 3 Extreme weather events (e.g., tornado, ice storm)
- 4 Sustained extreme temperatures (e.g., heat wave, deep freeze)
- 5 Chemical spill impacting source water
- 6 Terrorist and vandalism actions
- 7 Sustained pressure loss
- 8 Cybersecurity threats
- 9 Backflow
- 10 Failure of equipment or process associated with secondary disinfection (e.g., chlorination equipment)

Table 5.1- Hazard Ranking

Description	Likelihood of Hazardous Event Occurring	Rating
Rare	May occur in exceptional circumstances, and has not occurred in past.	1
Unlikely	Could occur at some time, historically has occurred less than once every five or 10 years.	2
Possible	Has occurred or may occur once or more per year.	3
Likely	Has occurred or may occur on a monthly to quarterly basis.	4
Very likely	One or more occurrences on a monthly or more frequent basis.	5
Description	Consequence of Hazardous Event Occurring	Rating
Insignificant	Insignificant impact, little public exposure, little or no health risk.	1
Minor	Limited public exposure, minor health risk.	2
Moderate	Minor public exposure, health impact on small part of the population.	3
Major	Large part of population at risk.	4
Catastrophic	Major impact for large part of the population, complete failure of systems	5
Description	Detectability of Hazardous Event	Rating
Very Detectable	Easy to detect, on-line monitoring through SCADA.	1
Moderately Detectable	Moderately detectable, alarm present but not in SCADA, may require operator to walk by and notice alarm; problem is indicated promptly by in-house lab test results.	2
Normally Detectable	Normally detectable, visually detectable on rounds or through regular maintenance.	3
Poorly Detectable	Poorly detectable, visually detectable but not inspected on a regular basis; not normally detected before problem becomes evident; lab tests are not done on a regular basis (e.g. quarterly).	4
Undetectable	Cannot be detected.	5

9. Operational Structure, Roles, Responsibilities and Authorities (Element 9)

The organizational structure of the Operating Authority is included in the QMS Operational Plan as Figure 4 and the organization structure indicates the respective roles, responsibilities and authorities.

The Chief Administrative Officer (CAO) is the top official in the organizational structure, with the General Manager of Infrastructure and Development reporting to the CAO, the Manager of Environmental Services reporting to the General Manager of Infrastructure and Development, and the Environmental Services Foreman reporting to the Manager of Environmental Services. The Chief Administrative Officer is responsible for maintaining the organizational chart, identifying the respective roles, and keeping the responsibilities and authorities up to date. The QMS Representative is responsible for identifying the QMS relevant positions. The Compliance Coordinator reports to the General Manager of Infrastructure and Development and is responsible for compiling and submitting regulatory compliance reports; perform the Internal Auditor role; report non-compliance issues and monitor corrective actions; and coordinate QMS compliance by ensuring that processes and procedures are maintained.

The persons responsible for undertaking the Management Review are the General Manager of Infrastructure and Development, Manager of Environmental Services, Environmental Services Foreman; Compliance Coordinator and one Member of Council.

For the purpose of the QMS Operational Plan, the General Manager of Infrastructure and Development is the Top Management for the South Huron Drinking Water System.

The Manager of Environmental Services and Environmental Services Foreman are responsible for the overall operation and maintenance of the drinking water system and for the purpose of the QMS Operational Plan are the Operating Authority.

The Owner of the South Huron Drinking Water System is the Municipality of South Huron.

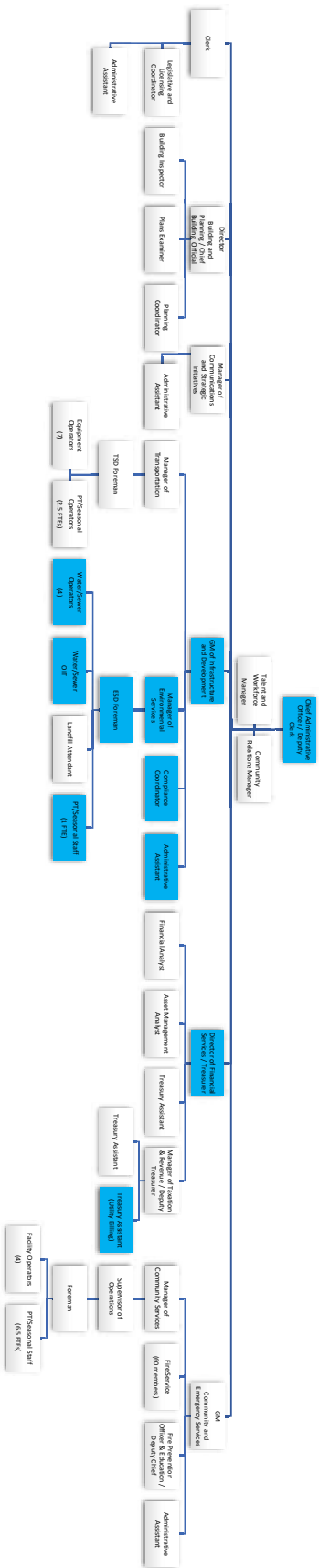
Appendix 'E' identifies in more detail the responsibilities required by Municipality of South Huron staff whose performance may have a direct impact on drinking water quality.

The information regarding Operational Structure, Roles, Responsibilities and Authorities is communicated to Council and Staff when revised or updated.

10. Competencies (Element 10)

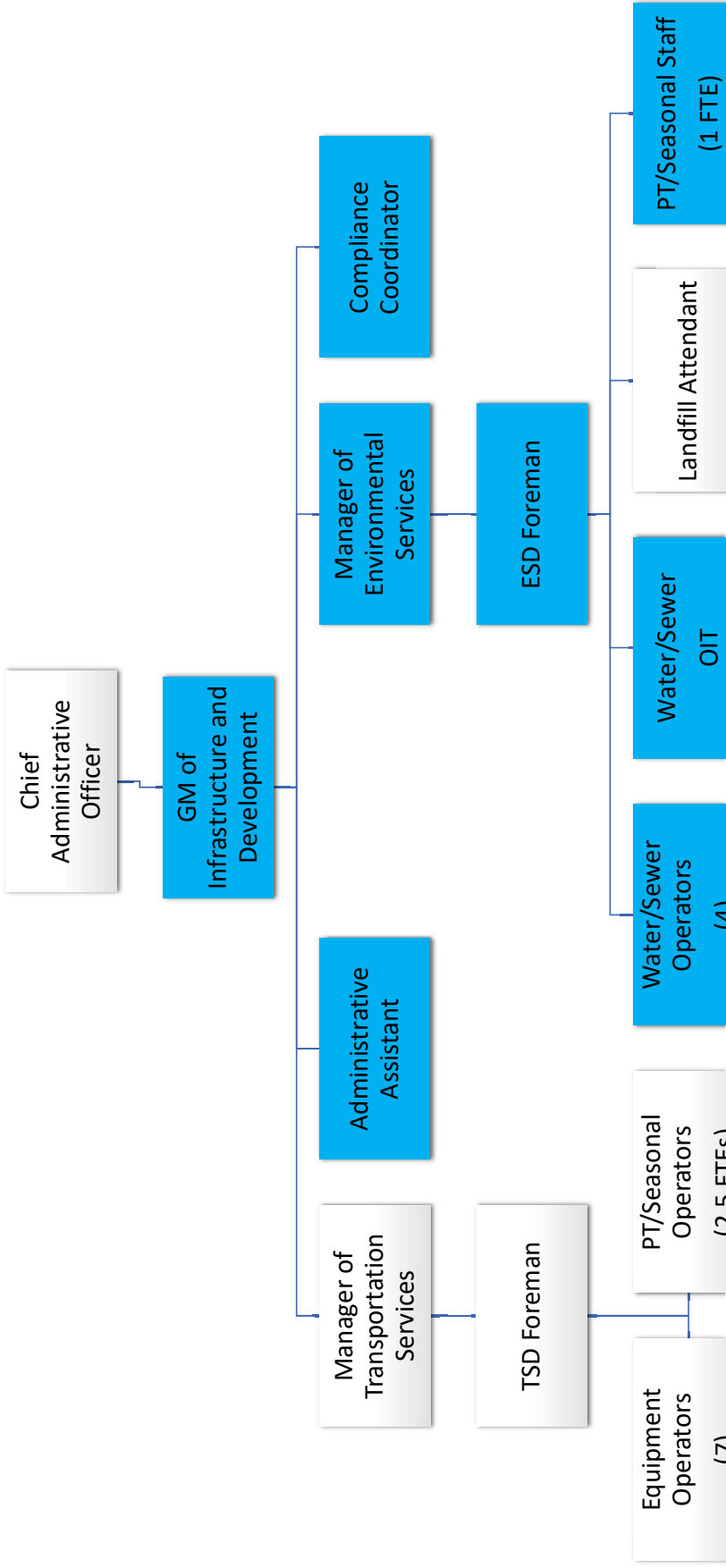
The competencies required by Municipality of South Huron staff whose performance may have a direct impact on drinking water quality are identified in **Appendix 'F'**.

South Huron Organizational Chart May 2025



QMS Relevant Positions Highlighted in blue
Revision Date: May 13, 2025

South Huron Organizational Chart May 2025
Infrastructure and Development



These competencies are provided for by ensuring that all new employees provide evidence of certification and other competency requirements. A copy of Operator certificates are kept on file at the Municipal Office, 322 Main Street, Exeter and are posted at the Environmental Services Operations Centre, 82 Nelson Street, Exeter.

All new employees undergo orientation and training as directed by the appropriate Department Manager or Supervisor. This includes a review of their Job Description and job duties to ensure that each employee is aware of the relevance of their job duties as these relate to provision of safe drinking water and the QMS Operational Plan. Training of new employees in Environmental Services Operations also includes a review of the Maintenance & Operation Manuals; Contingency Plan; Emergency Response Plan; the QMS Operational Plan and on-the-job training.

Licensed Operators are made aware of the relevance of their duties and how they affect safe drinking water through the training they receive as part of their Ministry Operator Certification. All licensed Operators receive training which meets or exceeds the requirements of Ontario Regulation 128/04. Records of training are maintained at the Municipal Office as proof that the required training has been provided. Summary of annual training is recorded in a format as indicated in **Appendix 'G'**. The Manager of Environmental Services is responsible for ensuring that all identified training is completed, and that training is in compliance with Ontario Regulation 128.

Other personnel are made aware of the relevance of their duties and how they affect safe drinking water through the annual update of the QMS Operational Plan, Management Review, Drinking Water System Annual Report to Council, MECP Water System Inspection Reports to Council and the Annual Operating & Capital Budget process. Records of these activities are maintained by the Clerk, as part of the Council Agendas and Minutes.

11. Personnel Coverage (Element 11)

On-site Coverage

The Environmental Services Department is staffed by Ministry Certified Operators Monday through Friday, 7:00 am to 3:30 pm. During the regular weekly shift the Operators carry out normal routine duties related to the maintenance and operation of the water distribution system. Duties include the inspection, maintenance and repairs of pumping stations, reservoirs, mains, services, meters, hydrants, valves and control chambers. Operators carry out bacteriological, residual and lead sampling in the distribution system; and respond to a variety of customer complaints and water quality issues.

The Environmental Services Foreman is the Water Distribution System ORO and the back-up ORO are the Water/Sewer Operators, who are certified to the level of the Water Distribution System. All ORO and OIC appointments are recorded in a logbook. If the Water Distribution System ORO is not available to perform the ORO duties an acting ORO

is appointed. Acting appointments are documented on the employees' time sheet and filed in the financial system.

Regular shift Emergency Coverag

During the regular weekly shift, the on-duty operators respond to emergencies. Emergency phone calls received by the Environmental Services Department office staff are immediately forwarded to the Manager of Environmental Services, who in turn responds to the emergency. Office staff documents the call on a customer complaint form and follows up with the issuance of a work order to the Manager of Environmental Services.

Emergency alarms are also received automatically from remote facilities, which are monitored by a Supervisory, Controls and Data Acquisition (SCADA) system. Alarms from these facilities are sent to the PC at the Environmental Services Operations Centre, 82 Nelson Street, Exeter, through the SCADA system, and alarm (audible and visual) on the SCADA PC. At the same time, Win911 calls Answerplus™, a 24/7 communications centre in London. Upon receipt of the alarm message, Answerplus™ will send a text message containing the alarm to all operators. As a redundancy to the alarming system, Win911 also sends alarms to the Win911 mobile app on the operator's smart phone. The operator closest to that facility responds to the alarm.

The operator responds by sending a text message to Answerplus™ confirming receipt of the text message and also calls the auto dialler (ie. Win911) or uses the Win911 app to acknowledge the alarm. As a safeguard, if the alarm is not acknowledged, or the alarm situation has not returned to normal; on the third time alarming, Answerplus™ will call the operator. The Win911 app will alarm three times within five minutes and if the alarm is not acknowledged, it will call the Environmental Services Foreman and Manager of Environmental Services. Response time is to be within 30 minutes.

After-hours/Weekend/Statutory Holiday Coverage

All after hours, weekend and holiday emergencies are responded to by the "on-call" operator. An annual "On Call Schedule" is maintained by the Environmental Services Foreman and all certified operators rotate on a weekly basis to provide after hours, weekend and holiday coverage for emergencies.

Emergency phone calls, received by the Environmental Services Department after hours, are automatically forwarded to the 24/7 communications centre, Answerplus™ in London, Ontario. Answerplus™ sends out a text message to the smart phone of the "on-call" operator. Response time for the Standby Operator to be on site is within 60 minutes.

The response process is the same as emergencies during the regular shift, except the operator is responding from home. For after-hours auto-dialled alarms, the process and response is the same as during the regular shift, except the operator is responding remotely from home. The Standby Operator responds to alarms from the SCADA system within minutes of notification and is required to acknowledge the alarm to the after-hours

operator at Answerplus™. If the Standby Operator cannot resolve a SCADA alarm remotely, they are required to be on site within 60 minutes.

If circumstances arise where additional staff is required, the on-call operator can request the assistance of any of the other off-duty licensed operators. Contact information for all operators is documented on the on-call list, which is readily accessible to the on-call operator.

Potential Staff Shortages

South Huron is non-union, so a labour disruption is not an issue. However, during times of potential staff shortages, such as emergencies and peak summer vacation season, a summer student (with an OIT licence) in Environmental Services Department can be utilized to perform work on the drinking water system. Local contractors can also provide additional labour and equipment during emergencies and peak holiday seasons to perform non-licensed work on the drinking water system.

12. Communications (Element 12)

The purpose of this communication procedure is to establish guidelines to facilitate communications that are coordinated and consistent as well as open and responsive for communicating the relevant aspects of the Quality Management System between Top Management and:

- a) the Owner,
- b) Operating Authority Personnel,
- c) Suppliers that have been identified as essential under Element 13 of the QMS Operational Plan, and
- d) the Public.

Municipality of South Huron's QMS Operational Plan.

References: The Drinking Water Quality Management Standard Guidance Document (Version 3.0 Updated March 31, 2026) and the *Safe Drinking Water Act, 2002*

Guidelines: Information on the Municipality's policies, programs and services are generally made available to the public in a variety of formats, subject to the Municipality of South Huron's Personnel Policy guidelines.

The following forms of communications are noted in the personnel policy:

- Written Communications
- E-mail Communications
- Telephone Communications
- Internet Communications

Scope: This plan will describe how the Municipality of South Huron's QMS and associated policies, procedures and related documents are communicated to:

- Elected Officials (Drinking Water System Owner)
- Top Management
- Operational Authority Personnel
- Consumers / Public
- Essential Suppliers
- External Stakeholders

Procedures: Elected Officials (Drinking Water System Owner)

The effectiveness and performance of the QMS is communicated to Council and the Public through Departmental Reports to Council. Meeting Minutes are maintained in accordance with the Municipality's policies, procedures and by-laws; and filed by the Manager of Corporate and Legislative Services/Clerk.

Top Management/Operational Authority Personnel

New policies/procedures or substantial changes to existing policies / procedures are communicated to Top Management and to Operational Authority Personnel through information meetings.

Current copies of the QMS Operational Plan and associated policies/procedures are located in areas which make them easily available to Operational Authority Personnel.

Consumers / Public

Consumer water complaints may be reported verbally to Water/Sewer Operators or through the Infrastructure and Development Department located at the Municipal Office, 322 Main Street South, Exeter. A log is kept of any water complaints and actions that are taken to resolve any problems. A Work Order may also be issued through the CityWide digital work order system (CMMS) to respond to customer complaints / concerns and document actions taken to resolve.

The QMS Operational Plan is also available for public viewing on the Municipal Web Site and at the Municipal office, 322 Main Street South, Exeter.

Essential Suppliers

Communication with Suppliers that have been identified as essential under Element 13 of the QMS Operational Plan is the responsibility of the Manager of Environmental Services.

Essential suppliers and service providers are listed in Appendix “L”. An information package was provided to Essential Suppliers by the Compliance Coordinator with a letter introducing the QMS and policy statement, as well as details of the Operational Plan which are relevant to the relationship between the supplier and the Municipality of South Huron. Any new Essential Suppliers and Services added to the list will be provided an information package with details of the Quality Management Standard. Follow up notification to Essential Suppliers are made to advise of any relevant changes to the QMS Operational Plan that may affect the service they provide.

Essential Suppliers are contacted when changes are made, by phone and/or email by the Compliance Coordinator to confirm/update their contact information.

External Stakeholders

According to the Municipality’s Personnel Policy, only the Chief Administrative Officer, or an approved alternate, may authorize corporate communications including: media releases, communications and advertising.

The media plays an important role in providing information to the public on matters of civic interest. Any media contact will be directed to the Chief Administrative Officer or Designate.

Information pertaining to the Municipality of South Huron Drinking Water Quality Management System is posted on the Municipal website at www.southhuron.ca

Emergency: In an emergency situation, coordinated communication must be used to maintain or restore public confidence. When an event or situation that may attract widespread interest from the media occurs, the General Manager of Infrastructure and Development must immediately advise the Chief Administrative Officer or Designate.

The Municipality of South Huron Emergency Response Plan details the protocol for Emergency Media communications.

The General Manager of Infrastructure and Development is a member of the Emergency Management “Community Control Group” and the Manager of Environmental Services is an Alternate. As members of the Community

Control Group, the GM of Infrastructure and Development and/or Manager of Environmental Services are responsible for communicating information regarding the drinking water system during an emergency.

13. Essential Supplies and Services (Element 13)

The quality of essential supplies and services is achieved through documentation of applicable accreditation, licences and certifications. Where applicable, supplies must meet AWWA and ANSI standards. Supplies are verified against the order requisition when received. South Huron requires suppliers of process chemicals to verify the quality of each product through documented certification of chemical analysis.

To ensure the quality of laboratory services, Laboratories that provide microbiological, chemical and lead testing of drinking water are required to be accredited and licensed as per Section 64 of the Safe Drinking Water Act. A laboratory must be accredited to perform specific tests under ISO//IEC 17025:2005 and licenced by the Ministry of the Environment, Conservation and Parks (MECP).

A list of suppliers and contractors has been developed, and a copy is included in the QMS Operational Plan as Appendix “L”. The list includes suppliers/service providers for each essential supply/service. This list is reviewed by the Compliance Coordinator as part of the QMS Operational Plan update to ensure that it is up to date.

Procurement of essential supplies and services are in accordance with the Procurement of Goods and Services By-law #09-2021 (as amended).

14. Review and Provision of Infrastructure (Element 14)

The Municipality of South Huron examines its infrastructure by reviewing what is in place and what is needed to operate the drinking-water system safely and effectively. All infrastructure including buildings, workspace, associated utilities, equipment, vehicles and supporting services are examined annually, as part of the budget process to determine if additional or modified infrastructure elements are needed.

Risk Assessment outcomes are reviewed and considered annually as part of the annual budget process by the General Manager of Infrastructure and Development and Manager of Environmental Services. Risk management outcomes are also reviewed and considered as part of the Master Planning process.

A Master Plan of the South Huron water distribution system is carried out that provides an overall framework and a long-range plan for core infrastructure upgrades and renewal. The Master Plan was prepared by an Engineering Consultant specializing in water infrastructure, with input from the Water/Sewer Operators, Environmental Services Foreman, Manager of Environmental Services and General Manager of Infrastructure and Development. The Master Plan is reviewed by the Chief Administrative Officer and

Treasurer; and presented to Council. The Master Plan is reviewed annually by the General Manager of Infrastructure and Development, and Manager of Environmental Services, and updated approximately every five (5) years.

Based on the Master Plan, the General Manager of Infrastructure and Development prepares a five-year plan, with associated costs, and presents to Council as part of the annual budget process. This five-year plan is updated annually as part of the budget process and extended by one more year after each update.

In addition to the master planning, infrastructure condition information is gathered by the Operators, Environmental Services Foreman, and Manager of Environmental Services during the course of routine maintenance and emergency repairs. This information is documented on departmental forms and is summarized, by the Manager of Environmental Services, in an annual Water Distribution System Report. This report is reviewed by the General Manager of Infrastructure and Development and Chief Administrative Officer; communicated to Council and documented in the official Council Minutes.

Significant emergency repairs, and associated infrastructure impacts, are communicated to the Chief Administrative officer and Council at the time of the event by a Staff Report to Council. Maintenance and repair information is reviewed by the General Manager of Infrastructure and Development and Manager of Environmental Services and incorporated into the annual budget process.

Supporting infrastructure, such as vehicles, equipment, software and computers are on a life cycle replacement schedule in accordance Asset Management Plan and Council approved life cycles. Life cycle replacements are reviewed annually by the General Manager of Infrastructure and Development and Manager of Environmental Services, as part of the annual budget process.

15. Infrastructure Maintenance, Rehabilitation and Renewal (Element 15)

Routine planned maintenance is carried out on the South Huron water distribution system in accordance with the Operations and Maintenance Manual, such as valve inspection/exercising; hydrant flushing; annual hydrant inspection; winter frost checks; inspection of reservoirs and water towers; as well as the activities required for maintaining the booster stations.

Records are maintained at the Environmental Services Operations Centre using the appropriate forms and the CityWide electronic work order system. All planned maintenance is scheduled and communicated to staff by the Manager of Environmental Services

Long term forecast of major maintenance, rehabilitation and renewal activities are included in the Master Planning process and the annual budget process, including the five-year capital budget forecast. Major maintenance, rehabilitation and renewal activities are

reviewed annually as part of the budget process and as part of the Master planning process by the Operators, Environmental Services Foreman, Manager of Environmental Services and General Manager of Infrastructure and Development.

Evaluation of watermain or other equipment replacement is carried out on an as-needed basis.

Unplanned maintenance is conducted as required. All unplanned maintenance activities are authorized by the Standby Operator, OIC, Environmental Services Foreman, or Manager of Environmental Services, as appropriate. All records are retained at the Environmental Services Operations Centre.

A Council report is prepared annually by the Manager of Environmental Services that summarizes the infrastructure maintenance activities and reports the unplanned maintenance work. This report is reviewed by the General Manager of Infrastructure and Development and Chief Administrative Officer; communicated to Council and documented in the Council Minutes.

Budgets are reviewed by Chief Administrative Officer and Treasurer; approved by Council and documented in the Council Minutes. After Council approval of the annual Operating and Capital budgets, infrastructure maintenance and upgrades are carried out. The status of these activities is reported to Council through Reports to Council and documented in the Council Minutes.

16. Sampling, Testing and Monitoring (Element 16)

South Huron purchases all treated water from the Lake Huron Primary Water Supply System (LHPWSS). Treated water is of consistent quality; accordingly, no challenging sampling, testing, or monitoring of water quality exists.

All sampling, testing, and monitoring of the treated water produced at the LHPWSS water treatment plant (WTP) is carried out by the contract plant operator, Ontario Clean Water Agency (OCWA), as required by the Safe Drinking Water Act before it enters the South Huron drinking water system.

The LHPWSS ensures that the water supplied to South Huron meets the Ontario Drinking Quality Standards (ODWQS) and has a minimum free chlorine residual of at least 0.50 mg/L.

Chlorine residual in water supplied to South Huron by the LHPWSS is typically around 1.0 mg/L. LHPWSS has on-line chlorine residual analyzers on the treated water leaving the WTP and at the E-H BPS at the point of connection to the South Huron distribution system.

Adverse sample results from the LHPWSS system are communicated immediately to the General Manager of Infrastructure and Development, Manager of Environmental Services,

and Environmental Services Foreman (Over-all-Responsible Operator). Annually the LHPWSS provides a summary of sample results to the Municipality of South Huron by way of an Annual Compliance Report. The LHPWSS also provides a copy of the annual MECP Drinking Water System Report to the Clerk. Copies of these LHPWSS reports are provided to the Municipal Council and System Owner by including the reports in the Council Meeting Agendas.

Sampling and testing for South Huron is carried out in the distribution system as required by Ontario Regulation 170/03 and in accordance with the Municipal Drinking Water Licence and Drinking Water Works Permit.

Any changes to sampling, testing and monitoring of distribution systems in O.Reg 170/03, MDWL or DWWP are communicated to the ORO and implemented as prescribed. The QMS Operational Plan is updated accordingly, when sampling, testing and monitoring of distribution systems in O.Reg 170/03, MDWL or DWWP are changed.

On-line chlorine analyzers are located on the distribution system at the Huron Park Water Tower, Exeter Water Tower, MacNaughton BPS, Huron Street monitoring chamber and the Crediton Booster Pumping Station. On-line chlorine analyzers are maintained/checked weekly and re-calibrated monthly by the Operators. On-line chlorine analyzers also receive an annual maintenance check and re-calibration by a specialized outside contractor.

All Operators are equipped with portable chlorine analyzers and gas detectors.

Sample bottles are received from the laboratories and operators are trained in the proper procedures for collecting the samples in the distribution system in accordance with the Laboratory Service Branch of the Ministry of the Environment Procedure PIBS 4464e01 *“Practices for the Collection and Handling of Drinking Water Samples – Version 2.0”* dated April 1, 2009.

Free chlorine residuals and water samples are collected from various locations throughout the Municipality per the sampling plan included in the Operations Manual. These samples are tested for E. Coli, total coliform and heterotrophic plate count (HPC) bacteria. Chlorine residuals are also tested by the operator at the same time that the microbiological samples are taken.

Lead sampling is carried out in accordance with Ontario Regulation 170/03. Lab test results are reviewed by a certified operator and uploaded to the main server. All chlorine residual results taken at the time of bacteriological sampling are recorded by the certified operator at the time of testing on the laboratory chain of custody form. These chlorine residual tests are uploaded to the main server when the bacteriological sample results are uploaded by the laboratory.

The laboratory provides immediate oral notification to the Over-All-Responsible Operator (ORO), or designate, of any adverse readings defined by Schedule 16 of O. Reg. 170/03.

In turn, the ORO, or designate, provides immediate oral notification to the local Medical Officer of Health (MOH) and the Ministry of Environment, Conservation and Parks (MECP) Spills Action Centre per Schedule 16 of Ontario Regulation 170/03. All records are maintained in the Environmental Services Operations Center logbook. Any free chlorine residual test below 0.05 mg/L is reported to the MECP, SAC in accordance with Schedule 16 of Ontario Regulation 170/03.

Within twenty-four hours, the Lab sends Section 1 of Notice of Adverse Test Results to the ORO. The ORO, or designate, completes Section 2 (a) indicating the corrective action to be taken by the Municipality. Forms are submitted to the MOH and MECP Spills Action Centre.

Once the corrective action has been taken as required by Schedule 17 of Ontario Regulation 170/03, Section 2 (b) is completed and sent to the MOH and the MECP SAC in accordance with Schedule 16 of Ontario Regulation 170/03.

All laboratory results are filed electronically on the SGS Laboratory database and on the South Huron main server under the Environmental Services folder for Water Distribution sample results.

All documentation is filed in the appropriate folder in a file cabinet at the Environmental Services Operations Centre and retained in accordance with Ontario Regulation 170/03. The annual water distribution system report summarizes all sample test results, adverse samples and corrective action. The report is provided to the owner and is made available to the public.

A summary of all sampling and testing is included in an annual water distribution system report. This report is reviewed by the General Manager of Infrastructure and Development; communicated to Council; and documented in the official Council Minutes.

17. Measurement and Recording Equipment Calibration, Verification and Maintenance (Element 17)

Online chlorine analyzers are calibrated monthly in-house by the Water/Sewer Operators and calibrated annually by a specialized outside contractor. Flow meters are calibrated annually by an outside contractor according to the manufacturers' recommended procedure. Contractors used to perform calibrations are listed on the Essential Suppliers and Services list.

Portable gas detectors are calibrated before use in-house by the Water/Sewer Operators.

Portable chlorine residual analyzers are referenced monthly in-house by the Water/Sewer Operators and calibrated on an annual basis, or as recommended by the manufacturer, by an outside contractor according to the manufacturers' recommended procedure.

Contractors used to perform these calibrations are listed on the Essential Suppliers and Services list.

All calibrations are recorded and filed at the Environmental Services Operations Centre and on the main server.

18. Emergency Management (Element 18)

The Water Distribution System Contingency Plan outlines the emergency responses to all drinking water emergencies. Emergency situations and service interruptions that could occur include loss of power, contamination, transmission main breaks, service leaks and interruptions in pressure. The Risk Assessment Outcomes in **Section 8** can be referenced for emergency procedures or contingency plan responses. The emergency contacts and essential suppliers and services list is kept current by the Compliance Coordinator.

If a water emergency occurs after hours, the customer will call the municipal office phone number and the afterhours telephone operator will handle the call. The complaint will be directed to the standby operator and the matter will be investigated promptly. The Manager of Environmental Services maintains a 24hour 7day a week emergency on-call list, including contact list for all personnel that can respond to a water emergency.

All water department staff shall review the Water Distribution System Contingency Plan and the Emergency Response Plan annually. All new employees are trained on the Water Distribution System Contingency Plan and the Emergency Response Plan, as part of the new employee orientation training.

A test of the Water Distribution System Contingency Plan is carried out annually by the Manager of Environmental Services and includes the Environmental Services Foreman and Water/Sewer Operators. This annual test is a desk top exercise and shall include a relevant drinking water emergency and a debrief at the end of the test to review procedures to make sure that they make sense.

In addition to the Water Distribution System Contingency Plan, the Municipality of South Huron also has an Emergency Response Plan as required by the *“Emergency Management and Civil Protection Act RSO 1990 CE.9”*. This Emergency Response Plan is updated annually by the CEMC, including testing/training in accordance with the Emergency Management and Civil Protection Act.

A copy is available at the Municipal Office and at the Environmental Services Operations Centre. A list of emergency contacts and essential suppliers and services is included in the emergency plan. The Emergency Response Plan is more generic in nature and is intended as a response to all types of public health and natural disasters. The Emergency Response Plan sets out the process for emergency response/recovery; defines the roles of the Owner (Municipal Council) and the Operating Authority responsibilities during emergencies; and includes the emergency communication protocol.

The General Manager of Infrastructure and Development is a member of the Emergency Management “Community Control Group” and the Manager of Environmental Services is an Alternate. As a members of the Community Control Group, the General Manager of Infrastructure and Development and Manager of Environmental Services are responsible for communicating information regarding the drinking water system during an emergency.

19. Internal Audit (Element 19)

The South Huron Operational Plan will be subject to an internal audit at least once annually. The purpose of the internal audit is to verify conformity of the QMS with the requirements of the DWQMS and considers previous internal and external audit results.

Appendix ‘H’ outlines the procedure for internal audits, identifies internal audit criteria, frequency, scope, methodology, record-keeping requirements and describes how Quality Management System corrective actions are identified and initiated. The procedure sets out what needs to be corrected, and how the correction is initiated when something is found during the internal audit.

Results of the Internal Audit are reported to the Owner by a Staff Report to Council within 90 days following the Internal Audit.

20. Management Review (Element 20)

A Management Review will be carried out annually with Top Management and the Owner that evaluates the continuing suitability, adequacy and effectiveness of the Quality Management System. This Management Review ensures Top Management and the Owners involvement in the QMS cycle. Top Management shall ensure the review is performed, identifies deficiencies and action items to address deficiencies, record of decisions, timelines for implementation and to report results to the Owner.

Organizational Structure, Roles, Responsibilities and Authorities (Element 9), identifies the individuals within the management structure that are responsible for undertaking the management review.

Appendix ‘I’ outlines the procedure for the Management Review and includes a number of issues such as a review of compliance issues, risk assessments, audits, emergency response, consumer issues, performance, infrastructure review and Operational Plan updates.

21. Continual Improvement (Element 21)

The Municipality of South Huron shall track, measure and strive to continually improve the effectiveness of its Quality Management System by reviewing and considering applicable

best management practices, including any published by the Ministry of the Environment, Conservation and Parks (MECP), available at www.ontario.ca/drinkingwater at least once every thirty-six months. Continual improvement will also be achieved through the use of corrective actions and preventive actions to eliminate the occurrence of potential issues of non-compliance or non-conformity to the QMS.

South Huron will use the DWQMS corrective action and preventive action process to identify, document and make these improvements. The Municipality of South Huron commits to:

- reviewing and considering applicable best management practices, including any published by the Ministry of the Environment, Conservation and Parks (MECP) at least once every six months.
- Keeping QMS documentation current.
- Reviewing any changes in staffing, sources of purchased supplies and services, and changes/upgrades in equipment and technology that may affect the QMS.
- Ensuring that new employees and new suppliers are advised of their responsibilities under the QMS.
- Maintaining the internal audit program and responding in a timely manner to all findings, including opportunities for improvement.
- Continuing to conduct meaningful management reviews.
- Closing the loop on all corrective actions.
- Initiating continual improvement projects.

Appendix 'J' outlines the procedure for the Continuous Improvement Process.

SOP-F6 (Corrective Action / Preventative Action Form) documents the process for identifying and implementing Corrective / Preventive Actions to eliminate the occurrence of potential non-conformities in the Quality Management System, including documenting the outcome of the review, action taken, follow up review to verify that actions have been implemented and are effective in preventing a reoccurrence.

Appendicies

Municipality of South Huron Water Distribution System	
QMS Operational Plan	
PROCEDURE TITLE: Document Control	QMS REFERENCE: SOP – P1
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

Appendix 'A' - Document Control

1.0 Procedure Description

This procedure outlines the methods used by the Municipality of South Huron employees to control the creation, approval, distribution, and revision of all documents related to the Quality Management System (QMS).

2.0 Reason for Procedure

Consistent control ensures the currency, accuracy, and ease of retrieval of each QMS document. Proper maintenance of documents is critical for conformance with the Drinking Water Quality Management Standard (DWQMS), and for compliance with drinking water legislation.

3.0 Responsibility

The designated QMS Representative, (or an alternate designated by the QMS Representative), shall be responsible for the control of all QMS documents. All documents must meet the approval of the QMS Representative before initial or revision issuance.

4.0 Procedure

4.1 Documents requiring control by the QMS include:

- Internal Documents
 - Operations Manual/Contingency Plan
 - Operational Plan
 - Procedures
 - Instructions
 - Forms (excluding work orders)
 - Applicable Municipal Bylaws
- External Documents
 - System Certifications/License
 - Operator licenses
 - Certificate of Approvals
 - Applicable Drinking Water Regulations
 - Applicable Industry Standards
 - Equipment Manuals

The methods by which control over records will be exercised are described in the Record Control Procedure (SOP-P2).

4.2 The QMS Representative shall maintain a current list of all internal and external documents. This list consists of the document title, QMS reference and date of last

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revision for each document. QMS documents will be located at the South Huron Municipal Office, 322 Main Street South, Exeter and at the South Huron Operations Centre at 82 Nelson Street, Exeter. Revisions to all QMS documents will be made at the South Huron Municipal Office and included in annual Management Review.

4.3 Internal Documents

4.3.1 All QMS internal documents shall have a standard header that contains the name of the department and the title of the document. The QMS Operational Plan shall have a standard header that includes the title of the document. The QMS Operational Plan Appendices shall have the title of the document; QMS reference; indication of revision frequency; and the name of the Department.

4.3.2 A standard footer shall identify all QMS internal documents. This footer contains the name of the document author; date of last revision; revision number; file path/file name for ease of retrieval and the number of pages & page number (if more than one page).

4.3.3 All original QMS internal documentations shall be stored at the South Huron Municipal Office, 322 Main Street South, Exeter, on the central computer and in hard copy. The electronic version is protected as access to the Environmental Services files on the M:Drive are restricted to the Compliance Coordinator, Manager of Environmental Services and General Manager of Infrastructure and Development. The hard copy shall display the original signature of approval.

4.3.4 The currency of each internal document is ensured by comparison of the revision date in the document footer to that of the original stored at the South Huron Municipal Office, 322 Main Street South, Exeter.

4.3.5 A document change request form shall be used at any time changes to internal documents are required. A change request is permitted to be initiated by the General Manager of Infrastructure and Development, Manager of Environmental Services, Water/Sewer Operators, and the Compliance Officer.

4.3.6 New or changed internal documents will be presented to all affected employees.

4.4 External Documents

4.4.1 Each external document affected by the QMS shall be clearly marked as “QMS Controlled Copy” and signed and dated by the QMS Representative.

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4.4.2 All controlled copies of external QMS documents shall be stored at the South Huron Municipal Office, 322 Main Street South, Exeter.

4.4.3 Current equipment manuals shall be indicated on the Equipment Inventory List located in the equipment files at the South Huron Municipal Office, 322 Main Street South, Exeter. Operations and Maintenance manuals for equipment are located at South Huron Operations Centre at 82 Nelson Street, Exeter.

4.5 Obsolete internal and external QMS documents are promptly removed from use.

4.6 Internal and external documents shall be reviewed at least annually, prior to the annual internal audit and management review for the prior year. A review may also take place when a significant change occurs in operations, such as a change in the type of process chemical or a change of equipment.

5.0 Associated Documents

- ☐ *Document Change Request Form SOP-F1*
- ☐ *Municipality of South Huron Records Management By-law No. 61-2015*

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Appendix ‘B’ - Record Control

1.0 Procedure Description

This procedure provides guidance for the identification, use, retention, storage and protection of all records that are related to the Quality Management System (QMS).

2.0 Reason for Procedure

Consistent control ensures the ease of retrieval of each record generated by Municipality of South Huron employees. Proper maintenance of records is critical for conformance with the Drinking Water Quality Management Standard (DWQMS) and for compliance with drinking water legislation and regulations.

3.0 Responsibility

The designated QMS Representative, (or an alternate designated by the QMS Representative), shall be responsible for ensuring that an effective method for controlling all QMS records exists.

4.0 Procedure

4.1 Records may be retained electronically and/or in hard copy.

The following QMS records are controlled under this procedure:

Records

- Completed forms and checklists
- On site sampling and test results
- Equipment calibration records
- Logbooks
- Government compliance reports
- Completed operational work orders
- Training records and certificates
- Audit results
- Newly commissioned watermain “as recorded” drawings
- Communication records
- External laboratory test results
- Meeting minutes
- Management Review
- Other records as identified

4.2 Minimum retention times for all Ministry of the Environment, Conservation and Parks (MECP) required records shall be maintained as per the relevant regulations.

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The following are the minimum legislated retention times for MECP records:

Record	Retention Time	Legislation
Operator training records	7 years	O. Reg. 128/04 under SDWA, 2002
Annual Reports and Summary Reports prepared by the owner	7 years	O. Reg. 170/03 under SDWA, 2002
Logbooks and other record-keeping mechanisms	7 years	O. Reg. 128/04 under SDWA, 2002
Lab analyses of water samples for chemical tests	15 years	O. Reg. 170/03 under SDWA, 2002
Lab analysis of water samples for microbiological, chlorine and turbidity tests, and fluoride tests where fluoridation is provided	7 years	O. Reg. 170/03 under SDWA, 2002
Form 1 – Record of Watermains Authorized as a Future Alteration”	10 years	O. Reg. 170/03 under SDWA, 2002
Form 2 – Record of Minor Modifications or Replacements to the Drinking Water System.	10 years	O. Reg. 170/03 under SDWA, 2002
Form 3 – Record of Addition, Modification or Replacement of Equipment Discharging a Contaminant of Concern to the Atmosphere	10 years	O. Reg. 170/03 under SDWA, 2002

Minimum retention times for all other records shall be in accordance with the Retention By-law #61-2015.

4.3 Filing and storage of paper records shall be such that they are protected from damage and are readily retrievable. Records from the current year and the previous year are kept in filing cabinets at the South Huron Municipal Office, 322 Main Street South, Exeter and at the South Huron Water/ Sewer Operations Centre, 82 Nelson Street, Exeter.

4.4 Older paper records are stored in banker boxes, clearly marked with the dates and types of records contained within. Each box is assigned the next available box number. That box number and a list of box contents are added to the Environmental Services Document Archive Record spread sheet found on the Environmental Services “M Drive”. Archived boxes are stored in a locked room in the basement of the new library, attached to the South Huron Municipal Office, 322 Main Street South, Exeter.

4.5 Paper records can be retrieved from the basement archives by the following process. Locate the record by querying the “Document Archives (new basement)” data base located on the M-Drive in the Environmental Services electronic files. Request the specific document from the Compliance Coordinator. The Compliance Coordinator will arrange for the corresponding archive box to be retrieved from the basement archive and will ensure that the archive sign out sheet is completed. The box number, file name, person signing out a file, date file signed out and date file returned, shall be recorded. The sign out sheet shall be maintained by the Compliance Coordinator in a clearly labeled binder in the South Huron Municipal Office, 322 Main Street South, Exeter.

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4.6 Electronic records are stored on the Server located Municipal Office, 322 Main Street South, Exeter. Electronic records are backed up daily to a remote site, using a Web based automated process.

4.7 Supervisory, Control and Data Acquisition (SCADA) electronic records are stored on a dedicated server at the Main Municipal Office. The server is in a locked, secure, climate-controlled facility and access is restricted to authorized personnel only.

SCADA electronic records are managed by Historian software and data is stored on a dedicated server at the Municipal Office and backed up continuously on the dedicated server. Further protection of data is achieved as the main server at the Municipal Office is backed up off site on a virtual server.

4.8 Records shall be made available to the public where required by legislation and in accordance with Municipal Policy.

4.9 General Manager of Infrastructure and Development or Designate shall be responsible for all records control.

5.0 Associated Documents

- ☐ *Ontario Regulation 169/03 Last amendment O. Reg. 457/16*
- ☐ *Ontario Regulation 170/03 Last amendment O. Reg. 269/22*
- ☐ *Ontario Regulation 128/04 Last amendment O. Reg. 819/21*
- ☐ *Document Control Procedure SOP-P1*
- ☐ *Municipality of South Huron Records Management By-law No. 61-2015*

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PROCEDURE TITLE: Document and Record Control Table	QMS REFERENCE: SOP – P3	
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APPENDIX 'C' - Document and Record Control Table

Date Last Updated: April 17, 2026		Document Requirements				Record Requirements			N/R = not required N/A = not applicable
Document or Record	Type of Document	File Location (of Master)	Location Printed Documents	Authorized Editor	Reviewers / Approvers	File Location	Retention Time	Disposal Method	
D	QMS Operational Plan	M:/ESD/Water Works/DWQMS	Main Municipal Office, ESD Operations Centre	GM of Infrastructure & Development, QMS Representative, ESD Manager, Compliance Coordinator	CAO, General Managers, Council Managers, Council	Main Municipal Office	10 yrs	shred	
D	Water Distribution System Operations Manual	M:/ESD/Water Works/DWQMS	Main Municipal Office, ESD Operations Centre	GM of Infrastructure & Development, QMS Representative, ESD Manager, Compliance Coordinator	CAO, General Managers, Council Managers, Council	N/R	N/R	N/R	
D	Water Distribution System Contingency Plan	M:/ESD/Water Works/Contingency Plan	Main Municipal Office, ESD Operations Centre	GM of Infrastructure & Development, QMS Representative, ESD Manager, Compliance Coordinator	CAO, General Managers, Council Managers, Council	N/R	N/R	N/R	
D	Emergency Response Plan	C:/FIRE DEPT	Main Municipal Office, ESD Operations Centre	Huron County CEMC	CAO, General Managers, Council Managers, Council	N/R	N/R	N/R	
D	Health & Safety Policies and Procedures Manual	M:/Clerk Dept/ Corporate Health & Safety/H&S Policies & Procedures Manual	Main Municipal Office, ESD Operations Centre	HR Coordinator	CAO, General Managers, Council Managers, Council	N/R	N/R	N/R	

D	Management Review	M:/ESD/Wtrwks/DWQMS/Management Reviews	Main Municipal Office, ESD Operations Centre	QMS Representative, ESD Manager, Compliance Coordinator	General Manager, ESD Manager, Council	N/R	N/R	N/R
D	NSF External Audit	M:/ESD/Wtrwks/DWQMS/Audit-NSF	Main Municipal Office, ESD Operations Centre	External Auditor	General Manager, ESD Manager, Council	N/R	N/R	N/R
D	CGSB External Audit (2011)	M:/ESD/Wtrwks/DWQMS/Audit-CGSB	Main Municipal Office, ESD	External Auditor	ESD Director, Council	N/R	N/R	N/R
D	South Huron Distribution System Annual Report to Council	M:/ESD/Wtrwks/Annual Wtr Reports-Council	Main Municipal Office, ESD Operations Centre	General Manager & ESD Manager	CAO, General Manager, ESD Manager, Council	N/R	N/R	N/R
D	Exeter Annual Report to Council	M:/ESD/Wtrwks/Annual Wtr Reports-Council	Main Municipal Office, ESD Operations Centre	ESD Director	ESD Director, Council	N/R	N/R	N/R
D	Huron Park-Stephen Annual Report to Council	M:/ESD/Wtrwks/Annual Wtr Reports-Council	Main Municipal Office, ESD Operations Centre	ESD Director	ESD Director, Council	N/R	N/R	N/R
D	2002 Annual Compliance Report to Council (Huron Park)	N/A	Main Municipal Office, ESD Operations Centre	OCWA	ESD Director, Council	N/R	N/R	N/R
D	South Huron Distribution System Annual MOE Compliance Report	M:/ESD/Wtrwks/MOE Compliance Reports	Main Municipal Office, ESD Operations Centre	Manager of Environmental Services	General Manager, ESD Manager, Council	N/R	N/R	N/R
D	Exeter Annual MOE Compliance Report	M:/ESD/Wtrwks/MOE Compliance Reports	Main Municipal Office, ESD Operations Centre	W/S Foreman	ESD Director, Council	N/R	N/R	N/R
D	Huron Park Annual MOE Compliance Report	M:/ESD/Wtrwks/MOE Compliance Reports	Main Municipal Office, ESD Operations Centre	W/S Foreman	ESD Director, Council	N/R	N/R	N/R
D	SH Lake Huron (AWS) Annual MOE Compliance Report	M:/ESD/Wtrwks/MOE Compliance Reports	Main Municipal Office, ESD Operations Centre	W/S Foreman	ESD Director, Council	N/R	N/R	N/R
D	Dashwood EX/ST Annual MOE Compliance Report	M:/ESD/Wtrwks/MOE Compliance Reports	Main Municipal Office, ESD Operations Centre	W/S Foreman	ESD Director, Council	N/R	N/R	N/R

D	2004 Kirkton-Woodham Community Center Annual MOE Compliance Report	M:/ESD/Wtrwks/MOE Compliance Reports	Main Municipal Office, ESD Operations Centre	W/S Foreman	ESD Director, Council	N/R	N/R	N/R
D	South Huron 1st, 2nd, 3rd & 4th Quarter Reports	M:/ESD/Wtrwks/MOE Compliance Reports	Main Municipal Office, ESD Operations Centre	W/S Foreman	ESD Director, Council	N/R	N/R	N/R
D	2002 Huron Park, Stephen, Dashwood 1st, 2nd, 3rd & 4th Quarter Reports	N/A	Main Municipal Office, ESD Operations Centre	OCWA	ESD Director, Council	N/R	N/R	N/R
D	Municipality of South Huron Exeter Waterworks - Engineers Report	N/A	Main Municipal Office, ESD Operations Centre	BM Ross	ESD Director, Foreman, Council	N/R	N/R	N/R
D	LHPWSS Annual Report to LHPWSS Joint Board of Management	N/A	Main Municipal Office, ESD Operations Centre	LHPWSS Staff	General Manager, ESD Manager, Council	N/R	N/R	N/R
D	LHPWSS Annual MOE Compliance Report	N/A	Main Municipal Office, ESD Operations Centre	LHPWSS Staff	General Manager, ESD Manager, Council	N/R	N/R	N/R
D	Library of AWWA Standard Specifications	N/R	Main Municipal Office	N/R	N/R	N/R	N/R	N/R
D	List of forms book	M:/ESD/Administration/FORMS	Main Municipal Office	General Manager, Compliance Coordinator	General Manager, ESD Manager, Council	N/R	N/R	N/R
R	Annual Operator training records	M:/ESD/Wtr/Training Records Operators	Main Municipal Office	ESD Manager, Compliance Coordinator	General Manager, ESD Manager, Compliance Coordinator	Main Municipal Office	Indefinitely	N/A
R	Log books & other record keeping mechanisms	N/R	N/R	W/S Operators	ESD Manager, ESD Foreman	ESD Ops Centre	7	shred
R	Lab analyses of water samples (chemical tests)	M:/ESD/Environmental Monitoring/Water/Laboratory Sampling	N/R	N/R	N/R	ESD Ops Centre	15 years	shred
R	Lab analyses of water samples (microbiological, chlorine residual)	M:/ESD/Environmental Monitoring/Water/Laboratory Sampling	N/R	N/R	N/R	ESD Ops Centre	7	shred
R	Archives - sign in/out book	N/R	N/R	N/R	N/R	Main Municipal Office	Indefinitely	N/A

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Appendix ‘D’ – Hazard Analysis Procedure

7.1 Purpose

This *procedure defines the* method used for considering potential hazardous events and associated hazards, as identified in the Ministry of the Environment document titled “Potential Hazardous Events for Municipal Residential Drinking Water Systems” and additional potential hazardous events and associated hazards, ranking hazardous events, identifying critical points and control limits. The outcome of this task is presented in the Operational Plan and the associated CCP procedures.

7.2 Scope

This procedure is applicable to all water facilities in the Municipality of South Huron.

7.3 References

“Drinking Water Quality Management Standard Final – Version 2.0 February 2017 elements 7 and 8; the Drinking Water Quality Management Standard Guidance Document and MECP document “Potential Hazardous Events for Municipal Residential Drinking Water Systems”, dated February 2017, as it may be amended.

7.4 Definitions

Critical Control Point (CCP)

A step or point in a drinking water system at which control can be applied by the operating authority and is essential to prevent or eliminate a drinking water health hazard or reduce it to an acceptable level.

Hazard

A source of danger or a property that may cause drinking water to be unsafe for human consumption. A drinking water hazard is a biological, chemical, physical, or radiological agent that has the potential to cause harm.

Hazardous Event

An incident or situation that can lead to the presence of a hazard.

Hazards and hazardous events can result from natural or technological causes, or from human activity.

Risk Assessment

An orderly methodology of identifying hazards or hazardous events that may affect the safety of drinking water and evaluating their significance.

Risk

The probability of identified hazards causing harm, including the magnitude of that harm or the consequences.

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7.5 Hazard Analysis Procedure

The Municipality of South Huron Environmental Services Department shall consider potential hazardous events and associated hazards, as identified in the Ministry of the Environment document titled “Potential Hazardous Events for Municipal Residential Drinking Water Systems” and identify additional potential hazardous events and associated hazards, rank them according to risk, determine CCPs and critical limits, and outline procedures/processes for monitoring, controlling and responding to deviations from the control limits.

- 7.5.1 A Risk Assessment team shall be assembled consisting of the Environmental Services Manager and Water/Sewer Operators.
- 7.5.2 The Risk Assessment team shall become familiar with the four types of hazards; biological, chemical, physical, and radiological.
- 7.5.3 The team shall identify potential hazards or hazardous events for each process area, Booster Pump Houses, Main Pump Houses, Water Storage- reservoirs and towers, Distribution Chambers and Distribution System.
- 7.5.4 For each hazard/hazardous event the Likelihood of Occurrence, Consequence on the water supply safety, and Detectability of Occurrence shall be determined and ranked on a scale of 1 to 5 as per Table 5.1. The rankings shall be added to provide a total CCP threshold ranking for each hazard.
- 7.5.5 Determine a threshold value for high risk events which must be considered further. The threshold should be set to capture all events which are sufficiently severe to require that they be “managed”.

Table 5.1- Hazard Ranking

Description	Likelihood of Hazardous Event Occurring	Rating
Rare	May occur in exceptional circumstances, and has not occurred in past.	1
Unlikely	Could occur at some time, historically has occurred less than once every five or 10 years.	2
Possible	Has occurred or may occur once or more per year.	3
Likely	Has occurred or may occur on a monthly to quarterly basis.	4
Very likely	One or more occurrences on a monthly or more frequent basis.	5
Description	Consequence of Hazardous Event Occurring	Rating
Insignificant	Insignificant impact, little public exposure, little or no health risk.	1
Minor	Limited public exposure, minor health risk.	2
Moderate	Minor public exposure, health impact on small part of the population.	3
Major	Large part of population at risk.	4
Catastrophic	Major impact for large part of the population, complete failure of systems.	5
Description	Detectability of Hazardous Event	Rating
Very Detectable	Easy to detect, on-line monitoring through SCADA.	1

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Moderately Detectable	Moderately detectable, alarm present but not in SCADA, may require operator to walk by and notice alarm; problem is indicated promptly by in-house lab test results.	2
Normally Detectable	Normally detectable, visually detectable on rounds or through regular maintenance.	3
Poorly Detectable	Poorly detectable, visually detectable but not inspected on a regular basis; not normally detected before problem becomes evident; lab tests are not done on a regular basis (e.g. quarterly).	4
Undetectable	Cannot be detected.	5

7.6 Critical Control Point Evaluation

- 7.6.1 For each of the events the existing hazard monitoring and control measures shall be identified.
- 7.6.2 For each of the events potential recommended Additional Monitoring and Control Measures shall be identified.
- 7.6.3 Based on the threshold calculation and the evaluation of existing control measures available, hazards will be identified as being CCPs or not. If the calculated Total CCP threshold = 7 or more, or is one of the MECP “recommended minimum CCPs”, then the hazardous event is considered to be a Critical Control Point. If the hazardous event cannot be controlled it is not a CCP.

A Risk Assessment Table form **SOP-F3** was developed to fulfill the requirements under Element 8 and identifies how the Risk Assessment process is to be completed.

7.7 Response Procedure

- 7.7.1 Response procedures are defined in the Municipality of South Huron’s Contingency Plan.

7.8 Risk Assessment Review

- 7.8.1 Once a year, prior to the Management Review, a review shall be carried out by the QMS Representative or designate to confirm the currency of the information and validity of the assumptions used in the Risk Assessment.
- 7.8.2 Once every thirty six months a risk assessment shall be carried out in accordance with this procedure; and consider the reliability and redundancy of equipment.

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Appendix 'E' - Identifying Responsibilities

The following identifies the responsibilities required by Municipality of South Huron staff whose performance may have a direct impact on drinking water quality.

Role	Responsibilities	Authority Requirements
Mayor and Council (<i>Owner</i>)	- Governance role with authority to enact By-laws, approve budgets and serve as the owner of drinking water system. - Ensure that the Municipality of South Huron Environmental Services Department meets all legislative and regulatory requirements. - Allocate necessary resources for safe operation of the water system based upon recommendations of the General Manager of Infrastructure and Development	Allocate the necessary resources for the safe operation of water and wastewater operations based upon recommendations of the Chief Administrative Officer and the General Manager of Infrastructure and Development
Chief Administrative Officer/Deputy Clerk	- Overall responsibility for municipal operations and reports directly to Council. - Council authorizes the budget and gives direction through the CAO. Council authorizes the budget and gives direction through the CAO. - Performs duties of the Clerk if the Clerk is not available to perform these duties as set out in the job description. - General Manager reports to CAO and provides advice to CAO on budget, operational and policy matters	- Purchase authority based on the Procurement By-Law #09-2021 (as amended) - Perform responsibilities as per job description. - Participate in the Management Review.
General Manager of Infrastructure and Development (<i>Top Management</i>)	- Manage Environmental Services Operations, Transportation Services Operations, and Development Services. - Prepare, review, update and monitor municipal environmental services, transportation services and development services policies and develop and implement business processes. - Develop and implement short term and long-term strategies. - Monitor legislative and regulatory compliance with Ministry of Environment, Conservation and Parks directives. - Liaise with government agencies and act as the	- Perform responsibilities including retaining contractors and consultants to carry out necessary works - Purchase authority based on the Procurement By-Law #09-2021 (as amended) - Perform responsibilities as per job description - Participate in the Management Review.

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QMS Operational Plan

PROCEDURE TITLE: Role Responsibilities

QMS REFERENCE: SOP- P5

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Role	Responsibilities	Authority Requirements
	primary liaison between the Infrastructure and Development Department and Council • Provide advice and direction on environmental services. • Prepare and manage Environmental Services, Transportation Services Departments Operational and Infrastructure related Capital budget • Plan capital projects, review engineering drawings and documents, tender and recommend projects, manage projects and monitor job costs • Recruit, hire, supervise and provide direction to the Environmental Services Manager, Transportation Services Manager, Compliance Coordinator and Transportation Services Administrative Assistant. • Manage and coordinate professional services procured by the Infrastructure and Development Department. • Understand and ensure compliance of the Occupational Health and Safety Act and Regulations and the Municipality's Health and Safety policies and procedures	
Manager of Environmental Services (Designated QMS Representative)	• Provides leadership, direction, vision and overall supervision of Environmental Services Operations (water, sewer, landfill) • Accountable for implementation and monitoring of the department's strategies in alignment with the organization's strategic direction and legislative requirements • Preparation and submission of annual reports • Assists in the preparation of annual operating and capital budgets and identifies long range goals for the department • Develops a culture of continuous improvement and looks for ways to manage assets to reduce future liabilities. • Represents the Environmental Services Department at senior management meetings, Council meetings and external meetings.	• Purchase authority based on the Procurement By-Law #09-2021 (as amended) • Perform responsibilities as per job description • Participate in the Management Review. • Conduct the Internal Audit

Author: Don Giberson

Date Revised: April 17, 2026

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QMS Operational Plan

PROCEDURE TITLE: Role Responsibilities

QMS REFERENCE: SOP- P5

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Role	Responsibilities	Authority Requirements
	- Provides advice to the General Manager on the Municipality's infrastructure maintenance needs. - Responsible to ensure municipal water distribution system, wastewater treatment and collection and landfill infrastructure are maintained within proper standards for all classifications as per Provincial and Federal legislation. - Monitor water and wastewater systems in accordance with provincial Ministry standards. - Oversight responsibility for all Federal and Provincial Regulatory reporting for drinking water, wastewater, and landfill sites - Oversight responsibility for Operators' Annual Water and Wastewater training to ensure compliance. - Coordinate with Ministry of Environment, Conservation and Parks for water, wastewater, landfill inspections - Liaise with government Ministries and agencies, Lake Huron Water Supply System operator and staff, the local Health Unit, neighbouring municipalities, ratepayers, and other Departments. - Creates and maintains a customer-friendly atmosphere and sets high expectations for staff to deliver superior customer satisfaction. - Recruit, hire, supervise and provide direction to the ESD Foreman, Water & Sewer Operators - Ensure compliance of the Occupational Health and Safety Act and the Municipality's Health and Safety policies and procedures - Responsible for conducting the Risk Assessment Review as per Appendix "D" in the QMS Operational Plan - Responsible for conducting the Test of the Emergency Response Plan in accordance with the QMS Operational Plan. - Designated as the QMS Representative in the QMS Operational Plan. - Responsible for conducting the Management	

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Role	Responsibilities	Authority Requirements
	Review as per Appendix “J” in the QMS Operational Plan. Communicate QMS information to staff, as well as liaise with relevant organizations.	
Environmental Services Foreman	- Supervise day-to-day operations for Environmental Services and Water/Sewer Operators, and Landfill Attendant. - Monitor water and wastewater systems in accordance with provincial Ministry standards - Act as Overall Responsible Operator (ORO) for a Class III water distribution system, Class II wastewater treatment facility and Class II wastewater collection system. - Liaise on water and wastewater matters - Monitor system performance to ensure regulatory compliance - Monitor Operators’ Annual Water and Wastewater training to ensure regulatory compliance. - Coordinate with Ministry of Environment, Conservation and Parks (MECP) inspections for water, wastewater, and landfill. - Monitor system performance, testing and troubleshooting operational problems - Assist in preparation and management of the operational budget - Respond and resolve public inquiries - Assist in recruiting, hiring, supervision and provide direction to the Water & Sewer Operators and Landfill Attendant. - Oversee contractors on job sites - Works overtime as necessary to respond to water and wastewater emergencies - Ensure compliance of the Occupational Health and Safety Act and the Municipality’s Health and Safety policies and procedures - Responsible for participating in the Management Review per Appendix “J” of QMS Operational Plan	- Purchase authority based on the Procurement By-Law #09-2021 (as amended) - Perform responsibilities as per job description - Act as Overall Responsible Operator (ORO) - Participate in the Management Review.

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PROCEDURE TITLE: Role Responsibilities

QMS REFERENCE: SOP- P5

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Role	Responsibilities	Authority Requirements
Water/Sewer Operator	- Assist in day-to-day operations for water and wastewater services - Monitor compliance to provincial standards - Provide water and wastewater system maintenance - Operate departmental equipment - Undertake minor and routine repairs to equipment - Calibrate instruments - Conduct valve exercising, and hydrant flushing, flow testing and servicing on a regular basis - Act as Overall Responsible Operator (ORO) of water and wastewater systems, as assigned - Perform standby duties and work overtime as necessary to respond to water and wastewater emergencies. - Ensure compliance of the Occupational Health and Safety Act and the Municipality's Health and Safety policies and procedures	- Purchase authority based on the Procurement By-Law #09-2021 (as amended) - Perform responsibilities as per job description
Water/Sewer Operator-in-Training (OIT)	- Assist in day-to-day operations for water and wastewater services - Monitor compliance to provincial standards - Provide water and wastewater system maintenance - Operate departmental equipment - Undertake minor and routine repairs to equipment - Calibrate instruments - Conduct valve exercising, and hydrant flushing, flow testing and servicing on a regular basis - Perform standby duties and work overtime as necessary to respond to water and wastewater emergencies. - Ensure compliance of the Occupational Health and Safety Act and the Municipality's Health and Safety policies and procedures	- Purchase authority based on the Procurement By-Law #09-2021 (as amended) - Perform responsibilities as per job description
Compliance Coordinator	- Provide administrative support for Environmental services operations and related customer service - Issue work orders related to environmental services. - Assist in monitoring, review changes to related	- Perform responsibilities as per job description - Participate in the Management Review. - Conduct the Internal Audit

Author: Don Giberson

Date Revised: April 17, 2026

Revision No. 20

M:\ENVIRONMENTAL SERVICES DEPARTMENT\E Environmental Services\E08 Water Works\DWQMS\QMS OPERATIONAL PLAN\Version #20 DWQMS Operational Plan - 2026-04-17\Appendices\Appendix 'E' (Roles Responsibilities & Authorities).docx

Municipality of South Huron Water Distribution System

QMS Operational Plan

PROCEDURE TITLE: Role Responsibilities

QMS REFERENCE: SOP- P5

TO BE REVISED: Annually or when QMS changes

SECTION: Environmental Services Department

Role	Responsibilities	Authority Requirements
	Federal, Provincial or Municipal legislation. - Report any non-compliance issues and monitor corrective actions. - Assist in the review and evaluation of Municipal Drinking Water Licenses, Drinking Water Works Permits and Environmental Compliance Approvals - Perform the role of Auditor for the Internal Audit. - Provide information and assist in MECP inspections and DWQMS auditing processes. - Organize records for preparation of Ministry compliance reports. - Track operator and facility licenses, maintain training records. - Coordinate QMS compliance by ensuring that processes and procedures are maintained. - Assist in the preparation, review and implementation of all standard operating procedures, contingency and emergency plans. - File correspondence and reports for Environmental Services Department. - Responsible for participating in the Management Review per Appendix "J" of QMS Operational Plan	
PT/Seasonal Staff (ie. Student)	- Assist in day-to-day operations for water and wastewater services - Monitor compliance to provincial standards - Provide water and wastewater system maintenance - Operate departmental equipment - Undertake minor and routine repairs to equipment - Calibrate instruments - Conduct valve exercising, and hydrant flushing, flow testing and servicing on a regular basis - Ensure compliance of the Occupational Health and Safety Act and the Municipality's Health and Safety policies and procedures	Perform responsibilities as per job description
Utility Billing Clerk	- Coordinate accounting and administrative functions for water, sewer, garbage and recycling billings and accounts receivables. - Prepare and issue water, sewer, garbage and	Perform responsibilities as per job description

Author: Don Giberson

Date Revised: April 17, 2026

Revision No. 20

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Municipality of South Huron Water Distribution System

QMS Operational Plan

PROCEDURE TITLE: Role Responsibilities

QMS REFERENCE: SOP- P5

TO BE REVISED: Annually or when QMS changes

SECTION: Environmental Services Department

Role	Responsibilities	Authority Requirements
	recycling billings. • Issue Work Orders for meter issues, high water consumption and any other related billing issue. • Maintain water and sewer account data base. • Prepare and distributes consumption data • Provide customer service related to water, sewer, garbage and recycling billings.	
Clerk	• Statutory role of Clerk and responsible for Corporate records management. • Manage Clerks Department including corporate / public information and corporate records.	• Perform responsibilities as per job description
Director of Financial Services/ Treasurer	• Statutory role of Treasurer • Prepare and manage the operating and capital budgets in conjunction with the department heads. • Develop financial policies and business processes for all departments. • Coordinate the asset management program	• Purchase authority based on the Procurement By-Law #03-2024 (as amended) • Perform responsibilities as per job description
Community Emergency Management Co-ordinator (CEMC)	• Huron County Community Emergency Management Co-ordinator acts as South Huron's Community Emergency Management Coordinator.	• Perform responsibilities as per job description

Municipality of South Huron Water Distribution System QMS Operational Plan	
PROCEDURE TITLE: Competencies	QMS REFERENCE: SOP – P6
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

Appendix 'F' - Identifying Competencies

The following identifies the competencies required by Municipality of South Huron staff whose performance may have a direct impact on drinking water quality.

Role	Required Competencies	Desired Competencies
Chief Administrative Officer/Deputy Clerk	- Diploma or degree in public administration, law, business administration or related field - Minimum of 7 years' experience in a municipal setting - Knowledge of the Municipal Act and other relevant provincial and federal legislation - Designation as a Certified Municipal Officer or AMCT - Supervision and administration of all staff within the Corporation - Effective inter-personal, administrative, management, written and oral communication skills - Basic personal computer skills	
General Manager of Infrastructure and Development	- Designation as a Civil Engineer or Civil Engineering Technologist or equivalent - Minimum of 7 years' experience - Knowledge of the Municipal Act and other relevant provincial and federal legislation - Thorough working knowledge of water and sewer construction processes - Effective inter-personal, management and written and oral communication skills - Basic personal computer skills	
Manager of Environmental Services	- Post-secondary education in civil engineering technology or a related discipline - Ministry Operator Certification as appropriate to direct operators in a Water Distribution system, Wastewater Treatment and Wastewater Collection system. - Minimum of 7 years' experience in water / wastewater operations - Extensive knowledge of Ministry of Environment regulations and provincial drinking water	

Municipality of South Huron Water Distribution System
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PROCEDURE TITLE: Competencies	QMS REFERENCE: SOP – P6
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

Role	Required Competencies	Desired Competencies
	standards • First Aid/CPR, WHIMIS and CSE training • Experience in writing and implementing financial policies and developing sound business processes. • Excellent interpersonal, project/time/records management, organizational, analytical, research, communication, presentation, problem-solving, and staff leadership and supervisory skills. • Ability to think and act strategically and appropriately in a political and community service environment; to build strong and enthusiastic staff teams and external alliances/partnerships; to align departmental programs/services with corporate goals/objectives; and to foster a positive, productive, and healthy/safe work environment that is committed to service excellence. • Thorough working knowledge of municipal government, Federal and Provincial legislation/regulations/standards • Valid 'G' Drivers' License • Extensive knowledge of Provincial/Federal Ministry of Environment, Conservation and Parks (MECP) regulations and provincial drinking water standards, as well as provincial occupational health and safety standards and labour laws • Thorough working knowledge of water and sewer construction processes • Effective inter-personal, management, and written and oral communication skills including conflict resolution skills • Strong organization skills to effectively complete/deliver and prioritize assigned tasks and responsibilities within established timelines • Proper operation and care of a personal computer and other resources of the Environmental Services Department • Establish and assign priorities, work programs and tasks for department staff and contracted professional services and ensure that the tasks	

Municipality of South Huron Water Distribution System
QMS Operational Plan

PROCEDURE TITLE: Competencies	QMS REFERENCE: SOP – P6
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

Role	Required Competencies	Desired Competencies
	are completed in a timely and efficient manner, to meet Council established service levels and deadlines Working knowledge of standard office software, work order software and specialized software (SCADA)	
Environmental Services Foreman	- Completion of Grade 12 in Ontario or equivalent education and experience. College diploma in environmental or civil engineering an asset - Ministry Operator Certification, Water Distribution Class III, Wastewater Treatment Class II and Wastewater Collection Class II - Minimum of 7 years' experience as a water / wastewater operator - Valid 'G' Drivers' License - Extensive knowledge of Ministry of Environment regulations and provincial drinking water standards - First Aid/CPR, WHIMIS and CSE training - Thorough working knowledge of water and sewer construction processes - Effective inter-personal, management, and written and oral communication skills - Strong organization skills to effectively complete/deliver and prioritize assigned tasks and responsibilities within established timelines - Proper operation and care of a personal computer and other resources of the Environmental Services Department - Establish and assign priorities, work programs and tasks for department staff and contracted professional services and ensure that the tasks are completed in a timely and efficient manner, to meet Council established service levels and deadlines - Working knowledge of standard office software, work order software and specialized software (SCADA)	Designation as Overall Responsible Operator (ORO) for water distribution and wastewater collection and treatment.

Municipality of South Huron Water Distribution System QMS Operational Plan	
PROCEDURE TITLE: Competencies	QMS REFERENCE: SOP – P6
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

Role	Required Competencies	Desired Competencies
Compliance Coordinator	- College diploma in Environmental Technology or a related discipline or equivalent technical experience, training, education, and experience. - Minimum two years' experience with compliance, development, implementation of QMS. - Experience with DWQMS management systems. - Working knowledge of the applicable Acts/Legislation/Regulations. - Valid Class "G" Driver's License - Use of general office equipment - Customer service skills - Inter-personal and organizational skills	- Internal Audit Certificate - MECP Operators Licence would be an asset. - Operator experience or knowledge of plumbing would be an asset.
Water/Sewer Operator	- Grade 12 diploma or equivalent - Ministry Operator Certification, Water Distribution Class I, Wastewater Treatment Class I and Wastewater Collection Class I. - A valid 'G' Drivers' License - Knowledge of Ministry of Environment regulations and standards - Knowledge of water and wastewater construction and maintenance processes - Proper operation and care of departmental equipment - First Aid/CPR, WHIMIS and CSE training	- Ministry Operator Certification, Water Distribution Class II to perform "Acting ORO" - Experience as an equipment operator - A valid 'DZ' Drivers' License desirable
Water/Sewer Operator-in-Training.	- Grade 12 diploma or equivalent - Ministry Operator Certification, Water Distribution OIT, Wastewater Treatment OIT and Wastewater Collection OIT. - Within one year of appointment, required to pass Ministry exams for Water Distribution Class I, Wastewater Treatment Class I and Wastewater Collection Class I. - A valid 'G' Drivers' License - Working knowledge of Ministry of Environment regulations and standards - Working knowledge of water and wastewater construction and maintenance processes - Proper operation and care of departmental equipment	- Experience as an equipment operator - A valid 'DZ' Drivers' License desirable

Municipality of South Huron Water Distribution System
QMS Operational Plan

PROCEDURE TITLE: Competencies	QMS REFERENCE: SOP – P6
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

Role	Required Competencies	Desired Competencies
	• First Aid/CPR, WHIMIS and CSE training	
PT/Seasonal Staff (ie. Student)	• Grade 12 diploma or equivalent • Completion or working towards University degree/College diploma in Environmental Technician – Water & Wastewater System Operations or equivalent. • MECP Operator-in-Training Certification, Water Distribution, Water Treatment, Wastewater Treatment and Wastewater Collection. • A valid 'G' Drivers' License • Knowledge of Ministry of Environment regulations and standards • Working knowledge of standards office software and specialized software (SCADA) • Proper operation and care of departmental equipment	• First Aid/CPR, WHIMIS and CSE training an asset. • Confined Space Entry Certification (CSE) an asset.
Utility Billing Clerk	• Diploma or Community College Degree in accounting or business administration or equivalent • 2 years related experience in a utility billing • Use of computers • Cost accounting, utility billing software, GIS tools, and report writing tools • Customer service skills • Inter-personal and organizational skills	• Municipal Experience an asset.
Clerk	• Diploma or degree • 5 years in a mid-senior position in a Clerk's or CAO's Department • Knowledge of the Municipal Act and other relevant provincial and federal legislation • Knowledge and skills regarding information technology, automation and corporate records management systems • Strong interpersonal, leadership, administrative, supervisory, analytical, problem solving and time management skills • Effective inter-personal, management, and written and oral communication skills	

Municipality of South Huron Water Distribution System QMS Operational Plan	
PROCEDURE TITLE: Competencies	QMS REFERENCE: SOP – P6
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

Role	Required Competencies	Desired Competencies
Director of Financial Services / Treasurer	- Accounting designation or an equivalent combination of education, training and experience 5 years in middle to senior position in a Treasury Department. - Knowledge of the Municipal Act and other relevant provincial and federal legislation - Write and implement financial policies - Effective inter-personal, management, and written and oral communication skills	
Community Emergency Management Coordinator (CEMC)	- Certification as a Community Emergency Management Coordinator - Minimum of 5 years' experience - Experience in scheduling, planning and developing accurate training materials	



APPENDIX G - ELEMENT 10

SUMMARY OF ANNUAL WATER & SEWER TRAINING

NAME: John Doe

Employee No: W0013

License: WD III - Sept. 30/2028
WWT II - Feb. 28/2027
WWC II - Dec. 31/2027

DATE	WATER HOURS	WATER C.E.U.	SEWER HOURS	CERTIFICATE	LOCATION	TRAINER'S NAME	TRAINING METHOD	DESCRIPTION OF TRAINING & LEARNING OBJECTIVES
Jan 24/25	2		2		Water/Sewer Operations Centre	Alyssa Keller	On-the-job-training	Contingency Plan Review
Feb 11/25	2		2		Water/Sewer Operations Centre	Alyssa Keller	On-the-job-training	DWQMS Review
Mar 2-3/25	14		14		Windsor	WCA	On-the-job-training	Vendor Demo Days
May 6-8/25		0.6	6	✓	"Virtual"	OWWA	Conference	OWWA Conference
May 31/25		0.5	5	✓	"On-Line"	OWWA	Workshop	OWWA Continuing Education workshop
June 11/25			5	✓	Water/Sewer Operations Centre	WCWC	Lecture/Workshop	WCWC- Wastewater Education and Industry Forum
Sept 20/25		0.6	6	✓	"On-Line"	OWWA	Lecture/Workshop	OWWA- Fall Distribution Workshop-Internal Corrosion Control & Water Quality Compliance
Oct 27/25	7		7		London	OWWA	Lecture/Workshop	Municipal Drinking Water Licensing Program Workshop for Owners and Operating Authorities
Nov 15/25	2		2		Water/Sewer Operations Centre	Jason McBride	On-the-job-training	Health & Safety Training

Municipality of South Huron Water Distribution System	
QMS Operational Plan	
PROCEDURE TITLE: Internal Audit	QMS REFERENCE: SOP – P8
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

Appendix 'H' - Internal Audit

1.0 Procedure Description

This procedure defines the process used by the Municipality of South Huron to conduct internal audits of the Quality Management System (QMS) for the South Huron Water Distribution System.

2.0 Reason for Procedure

Internal audits are conducted to confirm that the QMS is effectively implemented and meets or exceeds the requirements of the Ministry of the Environment's Drinking Water Quality Management Standard (DWQMS).

3.0 Responsibility

Internal audits shall only be conducted by persons approved by the QMS Representative and having the following qualifications:

- South Huron employees who have completed internal audit training.
- Other qualified people who have completed internal audit training and have participated in a minimum of one internal audit of a quality management system.

4.0 Procedure

4.1 This procedure is applicable to South Huron water distribution system operations that fall under the scope of the QMS.

4.2 Internal audits are conducted at least once annually.

4.3 Internal auditors will be selected by the QMS Representative.

4.4 Internal auditors shall review the DWQMS and previous internal and third-party audit reports in preparation for the audit.

4.5 The audit checklist created and maintained by the QMS Representative shall be used by the internal auditor as a guideline and for record-keeping purposes for conducting the interviews and document review during the audit.

4.6 The audit report shall be in the form of a summary of comments, opportunities for improvement and non-conformances.

Municipality of South Huron Water Distribution System	
QMS Operational Plan	
PROCEDURE TITLE: Internal Audit	QMS REFERENCE: SOP – P8
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

4.7 Where a non-conformance to the DWQMS is found during the internal audit, this shall be communicated within the audit report by attaching a Corrective Action Record form. It is the responsibility of the QMS Representative to ensure that all Corrective Action Records are followed up and responses to the Corrective Action Records are provided to the internal auditor within 45 days of the internal audit.

4.8 When all Corrective Action Records have been responded to, the internal audit report and response to Corrective Action Records are submitted to the QMS Representative. The internal audit shall be considered closed when all areas of the form have been filled in.

5.0 Associated Documents

- ☐ *Internal Audit Schedule (SOP-F4)*
- ☐ *Internal Audit Checklist (SOP-F5)*
- ☐ *Management Review Procedure (SOP-P9)*
- ☐ *Drinking Water Quality Management Standard – Version 3.0*
- ☐ *Corrective Action Record*

Municipality of South Huron Water Distribution System	
QMS Operational Plan	
PROCEDURE TITLE: Management Review	QMS REFERENCE: SOP – P9
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

Appendix 'I' - Management Review

1.0 Procedure Description

This procedure defines the process for the review of the effectiveness of the Quality Management System (QMS).

2.0 Reason for Procedure

Management reviews are conducted to assess and ensure the continuing suitability, adequacy, and effectiveness of the QMS.

3.0 Responsibility

Management reviews is to be conducted during a meeting of the following participants:

- A representative of Council
- Chief Administrative Officer (Optional)
- General Manager of Infrastructure and Development
- Manager of Environmental Services
- Compliance Coordinator
- Environmental Services Foreman

Manager of Environmental Services is responsible for conducting the Management Review.

Other participants may be added at the discretion of the South Huron Council. The meeting is chaired by Manager of Environmental Services.

4.0 Procedure

4.1 This procedure is applicable to South Huron management and water distribution operations activities that fall under the scope of the QMS.

4.2 A management review shall be conducted at least once annually following the completion and documentation of an internal audit and prior to the next scheduled third-party audit if scheduling permits.

4.3 Prior to the Management Review Meeting, the Compliance Coordinator shall provide a meeting agenda and summaries of the following information to the Management Review participants:

- Follow-up on action items from previous management reviews,

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PROCEDURE TITLE: Management Review	QMS REFERENCE: SOP – P9
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

- Incidents of regulatory non-compliance,
- Incidents of adverse drinking-water tests,
- Deviations from critical control-point limits and response actions,
- The efficacy of the risk assessment process,
- Internal and third-party audit results,
- Results of emergency response testing,
- Operational performance,
- Raw water supply and drinking water quality trends,
- The status of management action items identified between reviews,
- Changes that could affect the QMS,
- Consumer feedback,
- The resources needed to maintain the QMS,
- The results of the infrastructure review,
- Operational plan currency, content and updates, and
- Staff suggestions.

4.4 Management Review participants shall review and discuss all information presented. Management Review participants shall make recommendations and initiate an action plan, as appropriate, to improve the content and implementation of the Operational Plan and related procedures, and to ensure the provision of adequate resources. The action plan will outline the personnel responsible for delivering the action items and the proposed timelines for the implementation.

4.5 Minutes of management review meetings shall be maintained by the Compliance Coordinator. The minutes shall document all new and outstanding action items as well as any decisions made by the Management Review participants.

4.6 The General Manager of Infrastructure and Development shall be responsible for communication and implementation of the management review action items. The General Manager of Infrastructure and Development will provide the minutes of management review meetings to the Chief Administrative Officer and the water system Owner within two months of the Management Review.

5.0 Associated Documents

- ☐ *Communications Procedure*
- ☐ *Internal Audit Procedure SOP-P8*
- ☐ *Drinking Water Quality Management Standard – Version 3.0*

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PROCEDURE TITLE: Continual Improvement Procedure	QMS REFERENCE: SOP – P10
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

Appendix ‘J’ - Continual Improvement Procedure

1.0 Procedure Description

This procedure describes how continual improvement actions to the Quality Management System (QMS) are to be initiated, tracked, and evaluated.

2.0 Reason for Procedure

To describe the procedure for tracking and measuring continual improvement of the effectiveness of the Quality Management System (QMS) and the Drinking Water System (DWS) by:

- a) reviewing and considering applicable best management practices, including any published by the Ministry of the Environment , Conservation and Parks (MECP) [when published], available at www.ontario.ca/drinkingwater at least once every thirty-six months;
- b) documenting a process for identification and management of corrective actions; and
- c) documenting a process for identifying and implementing preventative actions to eliminate the occurrence of potential issues of non-compliance or non-conformity to the QMS.

3.0 Responsibility

Continual Improvement initiatives are the responsibility of every person, entity, company or organization whose performance may have a direct impact on drinking water quality.

4.0 Procedure

4.1 This procedure is applicable to South Huron management and water distribution operations activities that fall under the scope of the QMS.

4.2 The Manager of Environmental Services will “**review and consider applicable Best Management Practices**” (BMPs) at least once every thirty-six months. This could include:

- a) considering any BMPs [when] published by the MECP;
- b) attending the annual DWQMS workshop facilitated by the Walkerton Clean Water Centre,
- c) when feasible, to consider any BMPs from other Industry Associations, Federal and Provincial Governments, Agencies and other Municipalities;
- d) communicating with peers about BMPs through reviewing and contributing to discussions on the Municipal Water Wastewater Regulatory Committee (MWWRC) online forum at <http://municipaldrinkingwater.ning.com>

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- e) any other means (e.g. manufacturer recommendations, staff suggestions, etc.).

Any best management practices identified through one of the above methods will be added to the Continual Improvement spreadsheet.

4.3 Issues of “**corrective action**” such as non-compliance, non-conformance, and opportunities for improvement could be presented through:

- a) MECP Compliance Inspections
- b) Adverse Water Quality Incidents
- c) External DWQMS Accreditation Audits
- d) Internal Audits
- e) Management Review
- f) Staff Suggestions (presented verbally, in writing, through audits, etc.)
- g) Customer Calls (as recorded on Community Concern/Inquiry Form #ADM007)
- h) Actions requiring longer-term projects
- i) Best Management Practices review
- j) Other means (e.g. near-misses, historical or other utilities’ noncompliance/non-conformance)

All instances of non-compliance, non-conformance or an opportunity for continual improvement presented as per above, will be inputted into the Continual Improvement spreadsheet.

4.4 Issues of “**preventative action**” to eliminate the occurrence of potential issues of non-compliance or non-conformity to the QMS could be presented through:

- a) MECP Compliance Inspections
- b) External DWQMS Accreditation Audits
- c) Internal Audits
- d) Management Review
- e) Staff Suggestions (presented verbally, in writing, through audits, etc.)
- f) Customer Calls (as recorded on Community Concern/Inquiry Form #ADM007)
- g) Actions requiring longer-term projects
- h) Best Management Practices review
- i) Other means (e.g. near-misses, historical or other utilities’ noncompliance/non-conformance)

All instances of preventative action presented as per above, will be inputted into the Continual Improvement spreadsheet.

4.5 Any issues of non-compliance, non-conformance, or any other major issues, as deemed by the management team, will undergo a root-cause analysis by the Manager of Environmental Services, along with top management and the appropriate staff.

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4.6 All current Continual Improvement ideas/suggestions that result from corrective actions, preventive actions and/or staff recommendations shall be considered during management review activities.

4.7 When accepted, each Improvement idea/suggestion is assigned to the Manager of Environmental Services during the Management Review meeting. Additional support will be made available as required and will include the suggestion originator if possible.

4.8 Manager of Environmental Services will complete a Corrective Action / Preventative Action Request Form for the proposed improvement.

- Identify and record the purpose and the scope of the improvement initiative
- Identify and record the desired improvement being aimed for (objectives and targets): (e.g. reduce response time to consumer inquiries by 50%)
- Identify and record the time frame to make the improvement. Procedures performed to complete the improvement should be documented.
- Identify and record resources that will be required; including additional support from other South Huron Departments.

4.9 The completed Corrective Action / Preventative Action Record Form will be forwarded to the Chief Administrative Officer for review and approval. Any changes that are requested will be reflected on the Form.

4.10 The Compliance Coordinator will assign a Corrective Action / Preventative Action Record number to the form. A project file will be started and the original signed form will be kept in the project file.

4.11 Manager of Environmental Services will report on the progress of the Improvement Project on a frequency decided by the Chief Administrative Officer.

4.12 The results of completed Corrective Action / Preventative Action shall be measured and compared to initial objective and targets stated on the Form to measure the degree of success.

4.13 The status of Improvement Projects, or results if completed, shall be reported as input to the Management Review process.

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PROCEDURE TITLE: Continual Improvement Procedure	QMS REFERENCE: SOP – P10
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

5.0 Associated Documents

- ☐ *Corrective Action Form*
- ☐ *Management Review Procedure SOP-P6*
- ☐ *Drinking Water Quality Management Standard – Version 3.0*

Municipality of South Huron Water Distribution System QMS Operational Plan	
PROCEDURE TITLE: Document and Record Control Table	QMS REFERENCE: SOP – P3
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

APPENDIX 'L' - Essential Suppliers and Services

Company	Essential Supplies and Services	Contact Name	Phone	Cell	Email
Jutzi	Liquid Chlorine		519-841-9238		
Eramosa	Controls (SCADA)	Andy Pope	519-226-6994	226-343-1675	Andy.Pope@eramosa.com
Pierce Solutions	Chlorine Analyzers	Greg Pierce		519-820-4853	gpierce@pierceservices.ca
GenCare	Emergency Generators	Darcy Brintnell	519-659-7118	519-671-0219	info@gencare.com
Doug Upshall	Excavation	Doug		519-808-7636	dougupeexcavating@hay.net
Quality Underground Solutions	Hydro-vac Excavation		519-524-1205	519-955-2651	gundergroundsol@hurontel.on.ca
SGS Lakefield	Laboratories	Angela Stott	519-672-4500		angela.stott@sgs.com

Forms

Municipality of South Huron Water Distribution System QMS Operational Plan	
TITLE: Document Change Request Form	QMS REFERENCE: SOP – F1
TO BE REVISED: When QMS changes	SECTION: Environmental Services Department

DOCUMENT CHANGE REQUEST FORM

Name of individual requesting change: _____

Date of change request: _____

Change requested: _____

Document: _____

Section: _____

Pages: _____

Comments (attach additional page if required):

Other documents that will be affected by this change:

This change should be reviewed by: _____

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TITLE: Document Change Request Form	QMS REFERENCE: SOP – F1
TO BE REVISED: When QMS changes	SECTION: Environmental Services Department

For document manager use only:

Change request reviewed by: _____

Date: _____

Change number assigned: _____

- ☐ Change completed
- ☐ Master document has been updated
 - ☐ Active copies of the QMS Operational plan have been updated

OR

- ☐ Change rejected (summary of reasons is attached and has been forwarded to change requester)

Municipality of South Huron Water Distribution System QMS Operational Plan		
PROCEDURE TITLE: Risk Assessment Table	QMS REFERENCE: SOP – F3	
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department	

RISK ASSESSMENT TABLE

Activity or Process Step	Description of Hazardous Event/ Hazard	Control Measures	Likelihood	Consequence	Detectability	Total	CCP?	Critical Control Limits	Monitoring Procedures Processes	Response Procedures Contingency Plan Reference

Municipality of South Huron Water Distribution System QMS Operational Plan	
PROCEDURE TITLE: Internal Audit Schedule	QMS REFERENCE: SOP – F4
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

INTERNAL AUDIT SCHEDULE

Date	Process	DWQMS Element	Auditor(s)
June 2009	Distribution	All DWQMS elements (except Management Review)	Patricia Skopelianos
March 2011	Distribution	All DWQMS elements (except Management Review)	Peter Harrison and Don Giberson
March 2012	Distribution	All DWQMS elements	Don Giberson
March 2013	Distribution	All DWQMS elements	Don Giberson
March 2014	Distribution	All DWQMS elements	Don Giberson
March 2015	Distribution	All DWQMS elements	Don Giberson
March 2016	Distribution	All DWQMS elements	Don Giberson
March 2017	Distribution	All DWQMS elements	Don Giberson
March 2018	Distribution	All DWQMS elements	Don Giberson
June 2019	Distribution	All DWQMS elements	Don Giberson
November 2020	Distribution	All DWQMS elements	Don Giberson
October 2021	Distribution	All DWQMS elements	Don Giberson
November 2022	Distribution	All DWQMS elements	Don Giberson
July 2023	Distribution	All DWQMS elements	Alyssa Keller and Ange Barnes
June 2024	Distribution	All DWQMS elements	Alyssa Keller and Ange Barnes
May 2025	Distribution	All DWQMS elements	Alyssa Keller and Ange Barnes
March 2026	Distribution	All DWQMS elements	Alyssa Keller and Ange Barnes

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PROCEDURE TITLE: Internal Audit Checklist	QMS REFERENCE: SOP – F5
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

INTERNAL AUDIT CHECKLIST

DATE OF INTERNAL AUDIT:

AUDITOR NAMES:

AREAS VISITED:

PEOPLE INTERVIEWED:

DOCUMENTS VIEWED:

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INTERNAL AUDIT CHECKLIST

DWQMS Requirement	Notes	Method in Place?	Documented?	Gap?
1. Quality Management System PLAN – The Operational Plan shall document a Quality Management System that meets the requirements of this Standard.		PL		
DO – The Operating Authority shall establish and maintain the Quality Management System in accordance with the requirements of this Standard and the policies and procedures documented in the Operational Plan.		DO		
2. Quality Management System Policy PLAN – The Operational Plan shall document a Quality Management System Policy that provides the foundation for the Quality Management System, and: a) includes a commitment to the maintenance and continual improvement of the Quality Management System, b) includes a commitment to the consumer to provide safe drinking water, c) includes a commitment to comply with applicable legislation and regulations, and d) is in a form that provides for ready communication to all Operating Authority personnel, the Owner and the public.		PL		
		a)		
		b)		
		c)		
		d)		
DO – The Operating Authority shall establish and maintain a Quality Management System that is consistent with the Policy.		DO		
3. Commitment and Endorsement PLAN – The Operational Plan shall contain a written endorsement of its contents by Top Management and the Owner.		PL		

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DWQMS Requirement	Notes	Method in Place?	Documented?	Gap?
DO – Top Management shall provide evidence of its commitment to an effective Quality Management System by: a) ensuring that a Quality Management System is in place that meets the requirements of this Standard, b) ensuring that the Operating Authority is aware of all applicable legislative and regulatory requirements, c) communicating the Quality Management System according to the procedure for communications d) determining, obtaining or providing the resources needed to maintain and continually improve the Quality Management System.		DO		
		a)		
		b)		
		c)		
		d)		
4. Quality Management System Representative PLAN – The Operational Plan shall identify a Quality Management System representative.		PL		
DO – Top Management shall appoint, and authorize a Quality Management System representative who, irrespective of other responsibilities, shall: a) administer the Quality Management System by ensuring that processes and procedures needed for the Quality Management System are established and maintained, b) report to Top Management on the performance of the Quality Management System and any need for improvement, c) ensure that current versions of documents required by the Quality Management System are being used at all times, d) ensure that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the subject system, and		DO		
		a)		
		b)		
		c)		
		d)		

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DWQMS Requirement	Notes	Method in Place?	Documented?	Gap?
e) promote awareness of the Quality Management System throughout the Operating Authority.		e)		
5. Document and Records Control PLAN – The Operational Plan shall document a procedure for document and records control that describes how:		PL		
a) documents required by the Quality Management System are:		a)i.		
i. kept current, legible and readily identifiable		a)ii.		
ii. retrievable		a)iii.		
iii. stored, protected, retained and disposed of, and		b)i.		
b) records required by the Quality Management System are:		b)ii.		
i. kept legible, and readily identifiable		b)iii.		
ii. retrievable				
iii. stored, protected, retained and disposed of.				
DO – The Operating Authority shall implement and conform to the procedure for document and records control and shall ensure that the Quality Management System documentation for the subject system includes:		DO		
a) the Operational Plan and its associated policies and procedures,		a)		
b) Documents and Records determined by the Operating Authority as being needed to ensure the effective planning, operation and control of its operations, and		b)		
c) the results of internal and external Audits and management reviews.		c)		
6. Drinking Water System PLAN – The Operational Plan shall document, as applicable:		PL		

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DWQMS Requirement	Notes	Method in Place?	Documented?	Gap?
a) for the Subject System: i. the name of the Owner and Operating Authority, ii. if the system includes equipment that provides Primary Disinfection and/or Secondary Disinfection: A. a description of the system including all applicable Treatment System processes and Distribution System components, B. a Treatment System process flow chart, C. a description of the water source, including: I. general characteristics of the raw water supply, II. common event-driven fluctuations, and III. any resulting operational challenges and threats. iii. if the system does not include equipment that provides Primary Disinfection or Secondary Disinfection: A. a description of the system including all Distribution System components, and B. a description of any procedures that are in place to maintain disinfection residuals. b) if the Subject System is an Operational Subsystem, a summary description of the Municipal Residential Drinking Water System it is a part of including the name of the Operating Authority(ies) for the other Operational Subsystems. c) if the Subject System is connected to one or more other Drinking Water Systems owned by different Owners, a summary description of those systems which:		i.		
		ii.		
		A		
		B		
		C		
		I.		
		II.		
		III.		
		iii.		
		A		
		B		
		b)		
		c)		

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DWQMS Requirement	Notes	Method in Place?	Documented?	Gap?
i. indicates whether the Subject System obtains water from or supplies water to those systems, ii. names the Owner and Operating Authority(ies) of those systems, and iii. identifies which, if any, of those systems that the Subject System obtains water from are relied upon to ensure the provision of safe drinking water.		i.		
		ii.		
		iii.		
DO – The Operating Authority shall ensure that the description of the Drinking Water System is kept current.		DO		
7. Risk Assessment PLAN – The Operational Plan shall document a risk assessment process that: a) Considers potential hazardous events and associated hazards, as identified in the Ministry of the Environment and Climate Change document titled Potential Hazardous Events for Municipal Residential Drinking Water Systems, dated February 2017 as it may be amended. A copy of this document is available at www.ontario.ca/drinkingwater . b) identifies potential hazardous events and associated hazards, c) assesses the risks associated with the occurrence of hazardous events, d) ranks the hazardous events according to the associated risk, e) identifies control measures to address the potential hazards and hazardous events, f) identifies critical control points, g) identifies a method to verify at least once a year, the currency of the information and the validity of the assumptions used in the risk		PL		
		a)		
		b)		
		c)		
		d)		
		e)		
		f)		

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DWQMS Requirement	Notes	Method in Place?	Documented?	Gap?
assessment, h) ensures that a risk assessment is conducted at least once every thirty-six months, and i) considers the reliability and redundancy of equipment.		g)		
		h)		
DO – The Operating Authority shall perform a risk assessment consistent with the documented process.		DO		
8. Risk Assessment Outcomes PLAN – The Operational Plan shall document: a) the identified potential hazardous events and associated hazards, b) the assessed risks associated with the occurrence of hazardous events, c) the ranked hazardous events, d) the identified control measures to address the potential hazards and hazardous events, e) the identified Critical Control Points and their respective critical control limits, f) procedures and/or processes to monitor the Critical Control Limits, g) procedures to respond to deviations from the Critical Control Limits, and h) procedures for reporting and recording deviations from the Critical Control Limits.		PL		
		a)		
		b)		
		c)		
		d)		
		e)		
		f)		
		g)		
		h)		
DO – The Operating Authority shall implement and conform to the procedures.		DO		
9. Organizational Structure, Roles, Responsibilities and Authorities PLAN – The Operational Plan shall: a) describe the organizational structure of the Operating Authority including respective roles, responsibilities and authorities,		PL		
		a)		

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DWQMS Requirement	Notes	Method in Place?	Documented?	Gap?
b) delineate corporate oversight roles, responsibilities and authorities in the case where the Operating Authority operates multiple Subject Systems, c) identify the person, persons or group of people within the management structure of the organization responsible for undertaking the Management Review described in Element 20, d) identify the person, persons or group of people, having Top Management responsibilities required by this Standard, along with their responsibilities, and e) identify the Owner of the Subject System.		b)		
		c)		
		d)		
		e)		
DO – The Operating Authority shall keep current the description of the organizational structure including respective roles, responsibilities and authorities, and shall communicate this information to Operating Authority personnel and the Owner.		DO		
10. Competencies PLAN – The Operational Plan shall document: a) competencies required for personnel performing duties directly affecting drinking water quality, b) activities to develop and/or maintain competencies for personnel performing duties directly affecting drinking water quality, and c) activities to ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water.		PL		
		a)		
		b)		
		c)		
DO – The Operating Authority shall undertake activities to: a) meet and maintain competencies for personnel directly affecting drinking water quality and shall maintain records of these activities, and		DO		
		a)		

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DWQMS Requirement	Notes	Method in Place?	Documented?	Gap?
b) ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water, and shall maintain records of these activities.		b)		
11. Personnel Coverage PLAN – The Operational Plan shall document a procedure to ensure that sufficient personnel meeting identified competencies are available for duties that directly affect drinking water quality.		PL		
DO – The Operating Authority shall implement and conform to the procedure.		DO		
12. Communications PLAN – The Operational Plan shall document a procedure for communications that describes how the relevant aspects of the Quality Management System are communicated between Top Management and: a) the Owner, b) Operating Authority personnel, c) Suppliers that have been identified as essential under Plan (a) of Element 13 of this Standard, and d) the Public.		PL		
		a)		
		b)		
		c)		
		d)		
DO – The Operating Authority shall implement and conform to the procedure.		DO		
13. Essential Supplies and Services PLAN – The Operational Plan shall: a) identify all supplies and services essential for the delivery of safe drinking water and shall state, for each supply or service, the means to ensure its procurement, and b) include a procedure by which the Operating Authority ensures the quality of essential supplies and services, in as much as they may affect drinking water quality.		PL		
		a)		
		b)		

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DWQMS Requirement	Notes	Method in Place?	Documented?	Gap?
DO – The Operating Authority shall implement the procedure.		DO		
14. Review and Provision of Infrastructure PLAN – The Operational Plan shall document a procedure for the annual review of the adequacy of the infrastructure necessary to operate and maintain the Subject System that: a) Considers the outcomes of the risk assessment documented under Element 8, and b) Ensures that the adequacy of the infrastructure necessary to operate and maintain the Subject System is reviewed at least once every Calendar Year.		PL		
		a)		
		b)		
DO – The Operating Authority shall implement and conform to the procedure and communicate the findings of the review to the Owner.		DO		
15. Infrastructure Maintenance, Rehabilitation and Renewal PLAN – The Operational Plan shall document a summary of the Operating Authority's infrastructure maintenance, rehabilitation and renewal programs for the subject system. a) a summary of the Operating Authority's infrastructure maintenance, rehabilitation and renewal programs for the Subject System, and b) a long term forecast of major infrastructure maintenance, rehabilitation and renewal activities.		PL		
		a)		
		b)		
DO – The Operating Authority shall: a) keep the summary of the infrastructure maintenance, rehabilitation and renewal programs current,		DO		
		a)		

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QMS Operational Plan

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QMS REFERENCE: SOP – F5

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DWQMS Requirement	Notes	Method in Place?	Documented?	Gap?
b) ensure that the long term forecast is reviewed at least once every Calendar Year,		b)		
c) communicate the programs to the Owner, and		c)		
d) monitor the effectiveness of the maintenance program.		d)		
16. Sampling, Testing and Monitoring		PL		
PLAN – The Operational Plan shall document:				
a) a sampling, testing and monitoring procedure for process control and finished drinking water quality including requirements for sampling, testing and monitoring at the conditions most challenging to the Subject System,		a)		
b) a description of relevant sampling, testing or monitoring activities if any, that take place upstream of the Subject System, and		b)		
c) a procedure that describes how sampling, testing and monitoring results are recorded and shared between the Operating Authority and the Owner, where applicable.		c)		
DO – The Operating Authority shall implement and conform to the procedures.		DO		
17. Measurement and Recording Equipment Calibration and Maintenance		PL		
PLAN – The Operational Plan shall document a procedure for the calibration and maintenance of measurement and recording equipment.				
DO – The Operating Authority shall implement and conform to the procedure.		DO		

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DWQMS Requirement	Notes	Method in Place?	Documented?	Gap?
18. Emergency Management PLAN – The Operational Plan shall document a procedure to maintain a state of emergency preparedness that includes: a) a list of potential emergency situations or service interruptions, b) processes for emergency response and recovery, c) emergency response training and testing requirements, d) Owner and Operating Authority responsibilities during emergency situations, e) references to municipal emergency planning measures as appropriate, and f) an emergency communication protocol and an up-to-date list of emergency contacts.		PL		
		a)		
		b)		
		c)		
		d)		
		e)		
		f)		
DO – The Operating Authority shall implement and conform to the procedure.		DO		
19. Internal Audits PLAN – The Operational Plan shall document a procedure for internal audits that: a) evaluates conformity of the Quality Management System with the requirements of this Standard, b) identifies internal Audit criteria, frequency, scope, methodology and record-keeping requirements, c) considers previous internal and external audit results, and d) describes how Quality Management System Corrective Actions are identified and initiated.		PL		
		a)		
		b)		
		c)		
		d)		
DO – The Operating Authority shall implement and conform to the procedure and shall ensure that internal audits are conducted at least once every Calendar Year.		DO		

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DWQMS Requirement	Notes	Method in Place?	Documented?	Gap?
20. Management Review PLAN - The Operational Plan shall document a procedure for management review that evaluates the continuing suitability, adequacy and effectiveness of the Quality Management System and that includes consideration of: a) incidents of regulatory non-compliance, b) incidents of adverse drinking-water tests, c) deviations from Critical Control Point limits and response actions, d) the effectiveness of the risk assessment process, e) internal and third-party Audit results, f) results of emergency response testing, g) operational performance, h) raw water supply and drinking water quality trends, i) follow-up on action items from previous management reviews, j) the status of management action items identified between reviews, k) changes that could affect the Quality Management System, l) Consumer feedback, m) the resources needed to maintain the Quality Management System, n) the results of the infrastructure review, o) Operational Plan currency, content and updates, and p) staff suggestions.		PL		
		a)		
		b)		
		c)		
		d)		
		e)		
		f)		
		g)		
		h)		
		i)		
		j)		
		k)		
		l)		
		m)		
		n)		
		o)		
		p)		
DO – Top Management shall implement and conform to the procedure and shall: a) ensure that a management review is conducted at least once every Calendar Year,		DO		
		a)		

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DWQMS Requirement	Notes	Method in Place?	Documented?	Gap?
b) consider the results of the management review and identify deficiencies and actions items to address the deficiencies, c) provide a record of any decisions and action items related to the management review including the personnel responsible for delivering the action items and the proposed timelines for their implementation, d) report the results of the management review, the identified deficiencies, decisions and action items to the Owner.		b)		
		c)		
		d)		
21. Continual Improvement PLAN – The Operating Authority shall develop a procedure for tracking and measuring continual improvement of its Quality Management System by:		PL		
a) reviewing and considering applicable best management practices, including any published by the Ministry of the Environment and Climate Change and available on www.ontario.ca/drinkingwater , at least once every thirty-six months;		a)		
b) documenting a process for identification and management of Quality Management System Corrective Actions that includes:		b)		
i. investigating the cause(s) of an identified non-conformity,		i.		
ii. documenting the action(s) that will be taken to correct the non-conformity and prevent the non-conformity from re-occurring, and		ii.		
iii. reviewing the action(s) taken to correct the non-conformity, verifying that they are		iii.		

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DWQMS Requirement	Notes	Method in Place?	Documented?	Gap?
implemented and are effective in correcting and preventing the re-occurrence of the non-conformity.				
c) documenting a process for identifying and implementing Preventive Actions to eliminate the occurrence of potential non-conformities in the Quality Management System that includes:		c)		
i. reviewing potential non-conformities that are identified to determine if preventive actions may be necessary,		i.		
ii. documenting the outcome of the review, including the action(s), if any, that will be taken to prevent a non-conformity from occurring, and		ii.		
iii. reviewing the action(s) taken to prevent a non-conformity, verifying that they are implemented and are effective in preventing the occurrence of the non-conformity.		iii.		
DO – The Operating Authority shall strive to continually improve the effectiveness of its Quality Management System by implementing and conforming to the procedure.		DO		

Municipality of South Huron Water Distribution System QMS Operational Plan	
PROCEDURE TITLE: Corrective / Preventative Action Form	QMS REFERENCE: SOP – F6
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

CORRECTIVE / PREVENTIVE ACTION RECORD

CPAR # _____

PART “A”
Date: _____ ☐ Corrective ☐ Preventative Issued by: _____

Source
☐ Opportunity for Improvement Report # _____ ☐ Internal Audit ☐ Employee Observation
☐ Management Review Meeting - Date: _____ ☐ Other

PART “B”
Description of the issue/concern:

Assigned to: _____ Date Due: _____

What is the root cause of the problem or potential problem:

Describe action to be taken:

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PROCEDURE TITLE: Corrective / Preventative Action Form	QMS REFERENCE: SOP – F6
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How will effectiveness of action be measured:

Follow up date: _____ **Assigned to:** _____

Which documents need to be changed?

PART “C “
Was action effective?

Document Change Complete ☐ Yes ☐ Not applicable

Is CPAR Complete

(Signature and title)

Date:

Corrective Action / Preventative Effective after 90 days:

Corrective Action / Preventative Effective after one year:

Municipality of South Huron Water Distribution System QMS Operational Plan	
TITLE: Trip Report	QMS REFERENCE: SOP – F7
TO BE REVISED: When QMS changes	SECTION: Environmental Services Department

TRIP REPORT

Who Attended: Participants Name(s): _____

Event Name: _____

Event Date(s): _____

Event Location: _____

Trip Highlights:

“Describe trip highlight, including a summary of interesting exhibitors or/and interesting presentations. If possible, request copies of materials from exhibitors and/or presenters and include as part of this memo (or provide links to them).”

Recommendations to consider:

“Describe any recommendations you have for our organization to consider to implement (eg. Best Practices, New Technologies, etc.)”

Municipality of South Huron Water Distribution System QMS Operational Plan	
PROCEDURE TITLE: Opportunity for Improvement (OFI) Form	QMS REFERENCE: SOP – F8
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

OPPORTUNITY FOR IMPROVEMENT (OFI) FORM

PART A - To be completed by employee

Date:	OFI (assigned by Compliance Coordinator)
Initiator: (name, work location)	
Problem or Improvement is related to: ☐ Environment ☐ Health & Safety ☐ Quality	
Source: () Employee Suggestion () Safety Concern () Supplier Non-conformance - specify Supplier _____ () Inspection () Best management Practice () Audit - ☐ Internal ☐ External () Other - please specify _____	
Describe the problem or opportunity for improvement and any action you can suggest (Additional sheet can be attached if more space is provided)	

PART B - To be completed by Manager

Describe the action taken in response to Part A	
Is corrective action required? () No () Yes If yes a CAR is required to be initiated. Record the CAR number below. CAR -	
Opportunity For Improvement Form Complete () Yes Manager Signature	Date:
() Copy of form to DWQMS file () Copy of Form to Initiator	

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 (Opportunity for Impr

INSTRUCTIONS

Any employee can initiate an opportunity for Improvement (OFI) form because of a non-conformance, problem, supplier problem, suggestion, safety concern, etc.

Employee:

1. The employee completes Part A of the OFI Form. Additional sheets may be attached if more space is required. If a field on the form does not apply then write N/A
2. Please include your name so that a copy of the response may be sent back to you. If your name is not included the problem will still be addressed but you may not get a response.
3. After completing Part A of the OFI Form submit it to the Manager for a response and forward a copy to the Compliance Coordinator for tracking and filing.
4. You may check the status of your OFI by contacting the Compliance Coordinator or by checking the DWQMS files on the main server.

Manager:

The Manager then completes Part B of the OFI by recording their response to the situation described in Part A and if any further action is required, Part B is completed in full, signed and copies are provided to the Compliance Coordinator.

Compliance Coordinator:

1. The Compliance Coordinator tracks the OFI by numbering the form with the next OFI number and entering the information in the DWQMS file on the main server.
2. When the completed form is received from the Manager the Compliance Coordinator will update the OFI file and send a copy of the completed OFI to the initiator (if a name was provided).

Municipality of South Huron Water Distribution System QMS Operational Plan	
PROCEDURE TITLE: Action Item Request	QMS REFERENCE: SOP – F9
TO BE REVISED: Annually or when QMS changes	SECTION: Environmental Services Department

ACTION ITEM REQUEST

PART A - Identification and Initiation of Action item (Completed by Initiator)

AIR Number (yr-#):	Date Action Item initiated:	PRIORITY:
AIR Number (yr-#):	Date Action Item initiated:	PRIORITY:
Source: ☐ Internal Audit OFI ☐ Management Review ☐ Infrastructure Review ☐ BMP ☐ Other:	Source: ☐ Corrective Action Compliance ☐ Corrective Action Conformance ☐ Opportunity for Improvement (OFI) ☐ Best Management Practice (BMP) ☐ Preventative Action	Email Completed AIR to: DWQMS Representative
Describe the OFI/Deficiency (describe the cause of the identified issue):		
Describe the Required Action (if applicable):		
Action Item Assigned to:	Estimated Due Date:	

PART B - Action Item Resolution (Completed by personnel assigned in Part A)

Completed By: ☐ Corrective Action ☐ Preventative Action ☐ Other
Resolution:
Location of supporting information (ie. drawings, meeting minutes, emails, document of form changes):
Completion Date:

Upon completion, return or email to DWQMS Representative

PART C - Action Item Follow Up (Completed by QMS Rep or QMS Rep Alternate)

☐ Action Item Complete	Required Information Provided: ☐ Yes ☐ No ☐ N/A	
Does this AIR prompt a new Action Item:	☐ Yes ☐ No	New AIR number:
Is an Effectiveness Assessment required:	☐ Yes ☐ No	Due date:
AIR Verified and Closed: ☐ Yes ☐ No (complete Parts D and E)		
QMS Rep or QMS Rep Alternate Signature:		Date:

PART D - Effectiveness Assessment (Completed by person assigned AIR in Part A)

Criteria	Effectiveness	Justification
a. Does the resolution address the OFI/deficiency?	☐ Yes ☐ No ☐ Partially ☐ N/A	
b. Does the resolution prevent recurrence of a similar issues due to similar causes?	☐ Yes ☐ No ☐ Partially ☐ N/A	
c. Has the resolution been implemented as intended?	☐ Yes ☐ No ☐ Partially ☐ N/A	
d. Does the resolution demonstrate endurance and sustainability?	☐ Yes ☐ No ☐ Partially ☐ N/A	
e. Has the resolution introduced negative unintended consequences?	☐ Yes ☐ No ☐ Partially ☐ N/A	
f. Has the resolution improved the program / process / procedure performnce?	☐ Yes ☐ No ☐ Partially ☐ N/A	
Reasons for unacceptable outcome and next steps:		
Assignee's Signature:		Date:

Upon completion, return or email to DWQMS Representative

PART E - Effectiveness Assessment Review - Verification and Closing of Action Item

(Completed by QMS Rep or QMS Rep Alternate)

Effectiveness Review (Measures taken to ensure that the resolution (from Part B) has been fully implemented and the actions attempted to correct the identified issue were determined to be effective):		
☐ New/revised document implemented/reviewed	☐ Additional follow-up required	
☐ New/revised data (query) completed	☐ No followup needed/required	
☐ Training completed/implemented	☐ Other:	
☐ New/revised process implemented/reviewed		
☐ Staff interview		
Required Information Provided: ☐ Yes ☐ No ☐ N/A		
Additional Comments:		
Effectiveness Assessment Verification Completed: ☐ Yes ☐ No ☐ N/A		
AIR Closed: ☐ Yes ☐ No	Reissued: ☐ Yes ☐ No	New AIR number:
QMS Rep. or QMS Rep. Alternate Signature:		Date:

