ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

The Municipality of Temagami

MULTI-FACILITY OPERATIONAL PLAN

for the *Temagami North & South Drinking Water Systems*

Updated: September 15, 2025

This Operational Plan is designed for the exclusive use of the system(s) specified in this Operational Plan.

This Operational Plan has been developed with OCWA's operating practices in mind and utilizing OCWA personnel to implement it.

Any use which a third party makes of this Operational Plan, or any part thereof, or any reliance on or decisions made based on information within it, is the responsibility of such third parties. OCWA accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this Operational Plan or any part thereof.

QEMS

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1. Purpose

To document OCWA's Quality & Environmental Management System (QEMS). This Operational Plan defines and documents the QEMS for the Temagami Drinking Water Systems operated by the Ontario Clean Water Agency (OCWA). It sets out OCWA's policies and procedures with respect to quality and environmental management in accordance with the requirements of the Province of Ontario's Drinking Water Quality Management Standard (DWQMS) version 2.0.

2. Definitions

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

Operational Plan – means the operational plan required by the Director's Direction.

Quality & Environmental Management System (QEMS) – a system to:
a) Establish policy and objectives, and to achieve those objectives; and
b) Direct and control an organization with regard to quality.

Ministry - means the Ontario government ministry responsible for the administration of the SDWA.

3. Procedure

3.1 The Temagami Drinking Water Systems are owned by the Municipality of Temagami. OCWA is the contracted Operating Authority for the Temagami Drinking Water Systems, which includes following facilities:

Temagami North Drinking Water System
- Temagami North water treatment plant
- Temagami North distribution system and standpipe (North Tower)

Temagami South Drinking Water System
- Temagami South water treatment plant
- Temagami South distribution system and standpipe (South Tower)

3.2 OCWA's Quality & Environmental Management System (QEMS) is structured and documented with the purpose of:

1. Establishing policy and objectives with respect to the effective management and operation of water facilities;
2. Understanding and controlling the risks associated with the facility's activities and processes;
3. Achieving continual improvement of the QEMS and the facility's performance.

3.3 The Operational Plan for the facility listed above fulfils the requirements of the Ministry's DWQMS (version 2.0). The 21 QEMS Procedures within this Operational Plan align with the 21 elements of the DWQMS.

4. Related Documents

Ontario's Drinking Water Quality Management Standard, as amended from time to time
All QEMS Procedures and Documents referenced in this Operational Plan.

5. Revision History

Date	Revision #	Reason for Revision
2019-05-27	0	Procedure issued – Information within OP-01 was originally set out in the main body of the Temagami Drinking Water Systems Operational Plan (revision 7, dated June 19, 2017). New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Addition of new wording (s. 3.3) to clarify that the Operational Plan now aligns with the 21 elements of the DWQMS.
2023-10-10	1	Changed MOECC to Ministry in Step 3.3.
2024-08-27	2	Procedure updated definition of DWQMS, added definition of Ministry as the Ontario government ministry responsible for drinking water and environmental legislation to alleviate need for future revisions if/when the Ministry experiences name changes, added "as amended from time to time directly following reference to Ontario's DWQMS to point to the most current version of the document. Added the standpipes as facilities operated by OCWA. Removed watermark.

QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) POLICY

Reviewed by: I. Bruneau, QEMS Representative	Approved by: B. Logan, Sr. Operations Manager

1. Purpose

To document a QEMS Policy that provides the foundation for OCWA's Quality & Environmental Management System.

2. Definitions

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

3. Procedure

3.1 The Ontario Clean Water Agency, its Board of Directors, Officers and entire staff are committed to the principles and objectives set out in our QEMS Policy.

OCWA's Policy is to:

- Deliver safe water and wastewater services that protect public health, the environment, and the sustainability of communities.
- Comply with applicable legislation and regulations.
- Promote client, consumer and stakeholder confidence through service excellence, effective communications and reporting.
- Train staff on their QEMS responsibilities.
- Maintain and continually improve the QEMS.

Originally issued as Environmental Policy on June 8, 1995
Last revised, approved by OCWA's Board of Directors on April 4, 2024
(This policy is annually reviewed)

3.2 Our Board of Directors, Officers and entire staff will act to ensure the implementation of this Policy and will monitor progress of the Quality & Environmental Management System (QEMS).

3.3 OCWA's QEMS Policy is readily communicated and available to all OCWA personnel, through OCWA's intranet (Sharepoint). The Owner and member the public can access the policy through OCWA's public website (www.ocwa.com). A hardcopy of the QEMS Policy is posted as specified in the OP-05 Document and Records Control procedure.

3.4 Essential suppliers and service providers are advised of OCWA's QEMS Policy as per the OP-13 Essential Supplies and Services procedure.

3.5 Corporate Compliance coordinates the annual review and approval of the QEMS Policy by the Board of Directors and communicates the approval to all OCWA employees via an electronic communication.

3.6 The current version of the policy indicates the date of the last revision and that the policy is annually reviewed. Electronic and hard-copy documents that include the QEMS Policy will only be required to be updated in years when the Policy has been revised. A complete review/revision history of the QEMS Policy (documenting the annual policy review and/or revision approval date) is accessible to all staff on OCWA's intranet and is available upon request for external stakeholders.

4. Related Documents

Current QEMS Policy (Posted on OCWA's intranet and internet)
QEMS Policy Revision History (Posted on OCWA's intranet)
OP-05 Document and Records Control
OP-13 Essential Supplies and Services

5. Revision History

Date	Revision #	Reason for Revision
2019-05-27	0	Procedure issued – Section 3.4, 3.5 and 3.6 were added to the information originally set out in the main body of the Temagami Drinking Water Systems Operational Plan (revision 7, dated June 19, 2017). New sections: Purpose, Definitions, Procedure, Related Documents and a separate Revision History. Minor revisions to wording in s. 3.3 to reference location of posted copy of the policy. Added sections on how annual policy review is conducted (s. 3.5 and s. 3.6) and reference to OP-13 ESS (s. 3.4). The full revision history for the QEMS policy is available on OCWA's intranet.
2023-10-10	1	Revised Step 3.1 to change "last revised" from the statement "Last revised, approved by OCWA's Board of Directors on April 6, 2016" to reviewed and approved". Reviews and approvals of the policy are conducted by the board every year. Revisions are done as needed.
2024-08-27	2	The first bullet of the QEMS Policy (approved in 2016) was revised to align with OCWA's updated Mission statement. Sections 3.3 and 3.6 were modified to add information/clarify how to access the QEMS Policy and the Policy revision history document. Removed watermark.
2025-09-15	3	Clarified OCWA's intranet as Sharepoint to find OCWA's QEMS policy.

COMMITMENT AND ENDORSEMENT

Reviewed by: I. Bruneau, QEMS Representative	Approved by: B. Logan, Sr. Operations Manager

1. Purpose

To document the endorsement of the Operational Plan for the Temagami Drinking Water Systems by OCWA Top Management and the Municipality of Temagami (Owner) and to set out when re-endorsement would be required.

2. Definitions

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

3. Procedure

3.1 The Operational Plan is provided to OCWA Top Management and to the Owner for endorsement. The signed written endorsement is presented in Appendix OP-03A. At a minimum, two members of Top Management must endorse the Operational Plan; however, the Operational Plan is made available to all members of Top Management in the specified document control location (refer to OP-05 Document and Records Control). Endorsement by OCWA's Top Management is represented by Senior Operations Manager and the Safety Process and Compliance Manager or the Regional Hub Manager.

Endorsement by the Owner is represented by the Mayor and CAO/Treasurer.

3.2 Any major revision of the operational plan will be re-endorsed by OCWA Top Management and the Owner. Major revisions include:

1. A revision to OCWA's QEMS Policy;
2. A change to both representatives of the facility's Top Management and/or both of the Owner's representatives that endorsed the Operational Plan;
3. A modification to the drinking water system processes/components that would require a major change to the description in OP-06 Drinking Water System;
4. The addition of a drinking water subsystem owned by the same Owner to this operational plan.

Any other changes would be considered a minor change and would not require the Operational Plan to be re-endorsed.

4. Related Documents

OP-03A Signed Commitment and Endorsement
OP-05 Document and Records Control
OP-06 Drinking Water System

5. Revision History

Date	Revision #	Reason for Revision
2019-05-27	0	Procedure issued – Information within OP-03 was originally set out in the main body of the Temagami Drinking Water System Operational Plans (revision 7, dated June 19, 2017). Procedure provides information on who from Top Management endorses the Operational Plan (s. 3.1); when owner re-endorsement is sought and 'criteria' as to what is considered a major revision to the Plan (s. 3.2). Appendix OP-03A includes the Owner and Top Management sign-off section.
2023-10-10	1	Updated step 3.1 to include representatives of the Owner who are responsible for re-endorsement of the Operational Plan.
2024-08-27	2	Updated step 3.1 to include the Safety Process and Compliance Manager as a member of Top Management that can endorse the plan.

QEMS Ontario Clean Water Agency	**OPERATIONAL PLAN** Temagami North and South Drinking Water Systems	QEMS Doc: OP-03A Rev Date: 2024-08-27 Rev No: 1 Pages: 1 of 1

SIGNED COMMITMENT AND ENDORSEMENT

This Operational Plan sets out the framework for OCWA's Quality & Environmental Management System (QEMS) that is specific and relevant to your drinking water system(s) and supports the overall goal of OCWA and the Municipality of Temagami (Owner) to provide safe, cost-effective drinking water through sustained cooperation. OCWA will be responsible for developing, implementing, maintaining and continually improving its QEMS with respect to the operation and maintenance of the Temagami Drinking Water Systems and will do so in a manner that ensures compliance with applicable legislative and regulatory requirements.

Through the endorsement of this Operational Plan, the Owner commits to work with OCWA to facilitate this goal.

OCWA Top Management Endorsement

Bryce Logan
Senior Operations Manager, OCWA
Temiskaming Shores Cluster

Sept 17/2024
Date

Eric Nielson
Regional Hub Manager, OCWA,
Northeastern Ontario Regional Hub

Sept 24/24
Date

Owner Endorsement

Laala Jahanshahloo
CAO/Treasurer

Sep-13-2024
Date

Dan O'Mara
Mayor

Sep-13-2024
Date

QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) REPRESENTATIVE

Reviewed by: R. Marshall, QEMS Representative | Approved by: Y. Rondeau, SPC Manager

1. Purpose

To identify and describe the specific roles and responsibilities of the QEMS Representative(s) for the Temagami Drinking Water Systems.

2. Definitions

None

3. Procedure

3.1 The role of QEMS Representative for the Temagami Drinking Water Systems is the Process and Compliance Technician (PCT). The Safety, Process and Compliance Manager (or alternate PCT) will act as an alternate QEMS Representative when required.

3.2 The QEMS Representative is responsible for:

- Administering the QEMS for the Temagami Drinking Water Systems by ensuring that processes and procedures needed for the facility's QEMS are established and maintained;
- Reporting to Top Management on the facility's QEMS performance and identifying opportunities for improvement;
- Ensuring that current versions of documents related to the QEMS are in use;
- Promoting awareness of the QEMS to all operations personnel; and
- In conjunction with Top Management, ensuring that operations personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the system.

4. Related Documents

None

5. Revision History

Date	Revision #	Reason for Revision
2019-05-27	0	Procedure issued – Information within OP-04 was originally set out in the main body of the Temagami Drinking Water System Operational Plan (revision 7, dated June 19, 2017). New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Change to responsibilities: Operations Manager no longer considered QEMS Representative and SPC Manager to act as alternate as required (s. 3.1); added wording to clarify shared responsibilities for Top Management and QEMS Representative to ensure operations personnel are aware of applicable legislative and regulatory requirements (s. 3.2).

DOCUMENT AND RECORDS CONTROL

Reviewed by: I. Bruneau, QEMS Representative	Approved by: B. Logan, Sr. Operations Manager

1. Purpose

To describe how OCWA's QEMS documents are kept current and how QEMS documents and records are kept legible, readily identifiable, retrievable, stored, protected, retained and disposed of. Applies to QEMS Documents and QEMS records pertaining to the Temagami Drinking Water Systems as identified in this procedure.

2. Definitions

Document – 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

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

QEMS Document – any document required by OCWA's QEMS as identified in this procedure

QEMS Record – any record required by OCWA's QEMS as identified in this procedure

Controlled – managed as per the conditions of this procedure

Retention Period – length of time that a document or record must be kept; starts from the date of issue for QEMS records or from the point of time when a QEMS document is replaced by a new or amended document

3. Procedure

3.1 Documents and records required by OCWA's QEMS and their locations are listed in Appendix OP-05A Document and Records Control Locations.

3.2 Internally developed QEMS documents and QEMS records (whenever possible) are generated electronically to ensure legibility and are identified through a header/title and revision date. Handwritten records must be legible and permanently rendered in ink or non-erasable marker.

3.3 Controls for the Operational Plan include the use of an authorized approval and a header on every page that includes a title, alpha-numeric procedure code, revision date, revision number and page numbers. A revision history is also included in the body of each procedure.

The authorized personnel responsible for the review and approval of this Operational Plan are:

Review: QEMS Representative, Operations Supervisor or Overall Responsible Operator (ORO)

Approval: Safety Process and Compliance (SPC) Manager or Senior Operations Manager

The QEMS Representative ensures that updated documents are provided to the above authorized personnel for review or approval prior to issuance. Authorized personnel authenticate their review/approval of this Operational Plan via email

3.4 The QEMS Representative is responsible for ensuring that current versions of QEMS documents are being used at all times. Current QEMS documents and records are readily accessible to operations personnel and to internal and external auditors/inspectors at established document control locations. The currency of internal documents is ensured by comparing the date on the document to that of the master hardcopy and/or electronic copy residing in the designated document control location(s) specified in Appendix OP-05A.

Document control locations are established in areas that provide adequate protection to prevent unauthorized use/access, damage, deterioration or loss of QEMS documents and records. Copies of QEMS documents and records located outside of designated control locations are considered uncontrolled.

3.5 Access to OCWA's computer network infrastructure is restricted through use of individually-assigned usernames and passwords and local area servers. Network security is maintained by OCWA's Information Technology department through a number of established mechanisms and practices such as daily back-up of files stored on servers, password expiry, limitations on login attempts, multi-factor authentication and policies outlining specific conditions of use.

Access to facility QEMS records contained within internal electronic databases and applications (e.g., Wonderware, OPEX, PDM, WMS) is administered by designated application managers/trustees, requires the permission of Operations Management and is restricted through use of usernames and passwords. Records are protected by means of regular network back-ups of electronic files stored on servers and/or within databases.

Plant SCADA records are maintained as per Appendix OP-05A and are accessible when required. SCADA records are stored on a redundant hard drive. Data can be retrieved from reports generated by the SCADA computer which is password protected. Data can also be retrieved from E&H data loggers.

The SCADA systems are located in secured, locked buildings with limited authorized access. The buildings are equipped with alarm systems.

3.6 Any employee of the drinking water system may request, verbally or in writing, to the QEMS Representative, a revision be made to improve an existing internal QEMS document or the preparation of a new document. Requests should indicate the reason for the requested change. The need for new or updated documents may also be identified through the Management Review or system audits.

The QEMS Representative communicates any changes made to QEMS documents to relevant operations personnel and coordinates related training (as required). Changes to corporately controlled QEMS documents are communicated and distributed to facility

QEMS Representatives by OCWA's Corporate Compliance Group through e-mails, memos and/or provincial, regional hub/cluster or facility-level training sessions.

3.7 When a QEMS document is superseded, the hardcopy and the electronic copy of the document (as applicable) are promptly removed from the applicable designated document control locations specified in OP-05A. The QEMS Representative ensures that the hardcopy and electronic copy are disposed of or retained (as appropriate).

3.8 The authorized method for disposal of hardcopy documents and records after the specified retention requirements have been met is shredding. The QEMS Representative or delegate is authorized to shred the old version of the hardcopy document.

The authorized method for electronic documents and records are to re-locate them to an obsolete folder and mark them "superseded". They may be deleted after specified retention requirements have been met. The QEMS Representative is authorized to supersede the electronic document and locate it in the obsolete folder.

3.9 QEMS documents and records are retained in accordance with applicable regulations and legal instruments. Relevant regulatory and corporate minimum retention periods are as follows:

Type of Document/Record	Minimum Retention Time	Requirement Reference
Operational Plan (OP-01 to OP-21 and appendices, including Schedule "C" – Subject System Description Form) Facility Emergency Plan (FEP) Long term forecast of major infrastructure maintenance, rehabilitation and renewal activities Sampling plan/schedule	10 years	Director's Direction under SDWA
Internal QEMS Audit Results	10 years	OCWA Requirement
External QEMS Audit Results	10 years	OCWA Requirement
Management Review Documentation	10 years	OCWA Requirement
Documents/records required to demonstrate conformance with the DWQMS (specifically documents/records listed in OP-05A)	3 years* if no specified legislative requirement identified in this table or in the facility's legal instruments	OCWA Requirement
Log Books or other record-keeping mechanisms	5 years	O. Reg. 128/04
Training Records for water operators and water quality analysts	5 years	O. Reg. 128/04

Type of Document/Record	Minimum Retention Time	Requirement Reference
Operational checks, sampling and testing (e.g., chlorine residuals, turbidity, fluoride, sampling records), microbiological sampling and testing and chain of custodies	2 years	O. Reg. 170/03
Schedule 23 & 24 sampling, chain of custodies and test results	6 years LMR 15 years SMR	O. Reg. 170/03
THM, HAA, nitrates, nitrites and lead program (including pH and alkalinity) sampling, chain of custodies, and test results, Section 11 Annual Reports and Schedule 22 Summary Reports	6 years	O. Reg. 170/03
Sodium sampling, chain of custody and test results and related corrective action records/reports, 60 month fluoride sampling, chain of custody and test results (if the system doesn't fluoridate), Engineering Reports, GUDI/Non-GUDI Reports	15 years	O. Reg. 170/03
Corrective action records/reports for E. Coli, Total Coliforms and bacterial species	2 years	O. Reg. 170/03
Corrective action records/reports for chemical and radiological parameters under SDWA O. Reg. 169/03, pesticides not listed under O. Reg. 169/03 and health-related parameters in an order or approval	6 years (LMR) 15 years (SMR)	O. Reg. 170/03
Flow Meter Calibration Records, Analyzer Calibration Reports Maintenance Records/Work Orders	2 years	O. Reg. 170/03
Records by or created in accordance with the Municipal Drinking Water Licence (MDWL) or Drinking Water Works Permit (DWWP). Except records specifically referenced in O. Reg. 170/03 or otherwise specified in the MDWL or DWWP.	5 years	MDWL
Ministry forms referenced in the DWWP, including Form 1, Form 2, Form 3 and Director Notifications (applies to forms that have been completed by OCWA as the authorized by the owner)	10 years	DWWP

3.10 The Operational Plan is reviewed for currency by the QEMS Representative during internal/external audit and Management Review processes. Other QEMS-related documents are reviewed as per the frequencies set out in this Operational Plan or as significant changes (e.g., changes in regulatory requirements, corporate policies or

operational processes and/or equipment, etc.) occur. QEMS documents and records are reviewed for evidence of control during each internal system audit as per OP-19 Internal QEMS Audits.

4. Related Documents

OP-05A Document and Records Control Locations
OP-19 Internal QEMS Audits
OP-20 Management Review Minutes

5. Revision History

Date	Revision	Reason for Revision
2009-08-31	0	Procedure issued
2011-09-07	1	Correction of Process Compliance Manager's title; clarification of responsibility and method of maintaining currency of documents (5.4); description of how network security is maintained (5.5); clarification of retention times (5.9); inclusion of the operation plan review (5.10)
2013-03-13	2	Revised position titles; Operations Manager has been changed to Senior Operations Manager, Cluster Manager has been changed to Operations Manager, Operator has been changed to Operator, and Process Compliance Manager has been removed as the position was discontinued. Removed references to certificate of approval.
2013-06-24	3	Added second location for public access of the Operational Plan, AWWA Standard location, and lead notification form; grouped documents together that are found in the same location; on-call schedule is found on the Shared Outlook Calendar.
2013-10-29	4	Changed the name of the system to Temagami Drinking Water Systems to include the distribution system, added location of distribution system maps and QEMS – Summary of Findings
2015-02-05	5	Added Monthly Operational Reports to Internal QEMS Documents
2017-06-19	6	Changed Monthly report to Quarterly, removed Operations Manager. Changed location of operator certificates from at the Temagami WTP's to the Haileybury WTP. Changed WMS from Hansen to Maximo. Changed location of WMS Reports to Maximo

Date	Revision	Reason for Revision
2019-05-27	7	QP-01 procedure renamed OP-05. Removed Scope and Responsibilities sections. Moved the former Table 1 (Designated location for documents and records required by OCWA's QEMS) to its own appendix (OP-05A). Assigned responsibility for ensuring current versions of QEMS documents are being used to the QEMS Representative (s. 3.4). Clarified that requests for revisions/new QEMS documents are made to the QEMS Representative (s. 3.6). Moved the former Table 2 (Relevant regulatory and corporate minimum retention periods) to be part of s. 3.9 and expanded on the minimum retention times for documents and records required to demonstrate compliance with legislation. Other minor wording changes.
2022-07-13	8	Procedure updated - Added: clarity to version control requirements to align with the Director's Directions dated May 2021, detail to the approval process for Operational Plan, clarity on how electronic documents are handled and [the process for verifying secure shredding of documents and records]; Updated: the table in section 3.9 (clarified minimum retention time requirements for documents/records required to demonstrate conformance with the DWQMS, added forms required by the MDWL and DWWP, including their minimum retention times and requirement reference)].
2023-10-10	9	Changed position of Team Lead to Operations Supervisor in Step 3.3
2024-08-27	10	Procedure updated to add multi factor authentication and a description of how SCADA records are maintained to Step 3.5. Table in Step 3.9 revised to include Schedule 23 & 24 records retention times for Large Municipal Residential (LMR) and Small Municipal Resident (SMR) systems, added chain of custody as record for retention for various sampling requirements, lead program clarified to include pH and alkalinity; added GUDI/Non-GUDI Reports. Removed watermark.

DOCUMENT AND RECORDS CONTROL LOCATIONS

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Designated locations for documents and records required by OCWA's QEMS

Type of Document/Record	Designated Document Control Location (HC = Hardcopy, E = Electronic)
Internal QEMS Documents	
Confined Space Programs	HC - Haileybury Water Treatment Plant
Corporate Emergency Response Plan (CERP)	EC - OCWA's Sharepoint site
Facility Emergency Plan (FEP) Binder (includes Emergency Contact List, Essential Supplies and Services List, OCWA's Emergency Communications Protocol, Contingency Plans, Site Specific Emergency Procedures and OCWA's Emergency Management Program)	HC - Temagami North & South Water Treatment Plant
OCWA's Health & Safety Management System	EC - OCWA's Sharepoint Site
On-call Schedule	EC - Microsoft Outlook Shared Calendar
Operational Plan (OP-01 to OP-21 and appendices, including Schedule "C" – Subject System Description Form)	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems EC - Municipal Website HC - Haileybury Water Treatment Plant
ORO Letter and Procedure for the Designation of OICs in the Temiskaming Shores Cluster	EC - \\ocwfilereg\NEO Collab\NEO DWQMS
QEMS Policy	EC - OCWA's public website www.ocwa.com & OCWA's Sharepoint Site HC - Haileybury Water Treatment Plant
Sampling Schedules	E- Maintained on \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems HC – Temagami North & South Water Treatment Plant
Vacation Calendar	EC - Microsoft Outlook Shared Calendar
Internal QEMS Forms (blank)	
Analysis and Action Plan (AAP) Form	EC - \\ocwfilereg\NEO Collab\NEO DWQMS
Community Complaint Form	
Contingency Plan Review/Test Summary Form	
Distribution Maintenance and Repair Form	
Environmental Incident Report Form	
Facility Rounds Sheets	
Incidents of Non-Compliance Form	
Instrumentation Calibration/Maintenance Report Form	
Laboratory Chain of Custody Forms	
Loss of Pressure Incident Form	
QEMS – Summary of Findings Spreadsheet	
Tailgate Meeting Form	

DOCUMENT AND RECORDS CONTROL LOCATIONS

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Type of Document/Record	Designated Document Control Location (HC = Hardcopy, E = Electronic)
Watermain Commissioning Form	
External QEMS Documents	
American Water Works Association (AWWA) Standards (as referenced in the DWWP) & Ontario's Watermain Disinfection Procedure	EC - \\ocwfilereg\NEO Collab\NEO DWQMS
ANSI/NSF product registration documentation for Chemicals/Materials Used	EC - Internet
Applicable Federal and Provincial Legislation	EC - Internet
DWQMS Standard	EC - Internet
Engineering schematics/plans/drawings	HC – Temagami North & South Water Treatment Plants
Equipment Operation/Maintenance Manuals	HC - Temagami North & South Water Treatment Plants EC - Internet
Legal Instruments: Municipal Drinking Water Licence (MDWL) / Drinking Water Works Permit (DWWP) / Permit to Take Water (PTTW)	HC -Temagami North & South Water Treatment Plant EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Ministry Inspection Reports	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Municipal By-laws	Municipal Office
Operations Manual (including standard operating procedures)	HC – Temagami North & South Water Treatment Plants
Operator Certificates	HC – Haileybury Water Treatment Plant
External QEMS Forms (blank)	
Adverse Water Quality Incident (AWQI) Form	EC - \\ocwfilereg\NEO Collab\NEO DWQMS
Ministry forms referenced in the Drinking Water Works Permit, including Form 1, Form 2, Form 3 and Director Notifications	EC - \\ocwfilereg\NEO Collab\NEO DWQMS
QEMS Records	
Adverse Water Quality Incident (AWQI) Reports	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Analysis and Action Plan (AAP) Report	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Annual Compliance / Summary Reports for Municipalities	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Audit Reports - External	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Audit Reports - Internal	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Call Back Reports	EC - Workplace Management System (Maximo)
Confined Space Records (Entry Permits/Co-ordination Documents)	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\NEO - Health and Safety
Community Complaint Records	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems

DOCUMENT AND RECORDS CONTROL LOCATIONS

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Type of Document/Record	Designated Document Control Location (HC = Hardcopy, E = Electronic)
Contingency Plan Review/Test Results	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temiskaming Shores Cluster - Common
Distribution Maintenance and Repair Records	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Environmental Incident Reports	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Facility Logbooks	HC - Temagami North & South Water Treatment Plants (old versions)
Facility E-Logbooks	EC - https://ocwa.eriscloud.com/ EC - eRIS Application (mobile or tablet device)
Facility Visitor Logbook	HC - Temagami North & South Water Treatment Plants
Facility Rounds Sheets	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems HC - Haileybury Water Treatment Plant
Generator Maintenance Sheets (annual sheet)	HC - Haileybury Water Treatment Plant
Incidents of Non-Compliance Records	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Infrastructure Review (Capital Letter & Capital/Major Maintenance Recommendations)	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Laboratory Analytical Reports and completed Chain of Custody Forms	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Loss of Pressure Incident Reports	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Maintenance & Calibration Records (completed WMS work orders)	EC - Workplace Management System (WMS)
Management Review Documentation	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Ministry Forms (Form 1, Form 2, Form 3 and Director Notifications)	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Operator Training Records	EC - OCWA's Training Summary Database
QEMS Communications - External (including essential suppliers and service providers)	EC - Microsoft Outlook E-mail EC - Maintained on \\ocwfilereg\NEO Collab
QEMS Communications - Internal	EC - Microsoft Outlook E-mail
QEMS – Summary of Findings (Preventive/Corrective) Records	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
Quarterly Operations Reports (to the Owner)	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems
SCADA Records (Wonderware, OCWA)	EC - maintained through Wonderware
SCADA Records (Plant SCADA, Client Owned)	EC - maintained through SCADA network
Tailgate Records	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\NEO - Health and Safety
Watermain Commissioning Records	EC - \\ocwfilereg\NEO Collab\NEO DWQMS\DWQMS - Temagami Drinking Water Systems

Revision History

Date	Revision #	Reason for Revision
2019-05-27	0	Appendix issued; Table was originally included within the Document and Records Control Procedure (QP-01) (revision 6, dated June 19, 2017). Added section for blank external QEMS forms, changed location for Confined Space Program and Operational Plan and changed name of OCWA's Safety Manual to OCWA's Health and Safety Management System and its location.
2022-07-13	1	Updated link to public drive and added new link to electronic facility log book. Updated MOECC to MECP. Added HC location of the Operational Plan to the Haileybury WTP Added: exact location of documents/records, clarity on which documents are included under the Operational Plan, new documents/records (Watermain Disinfection Procedure results of emergency test exercises/emergency response debriefs and Ministry forms referenced in the Drinking Water Works Permit) and clarity to external communications and inspection reports; Removed: reference to QEMS Reference Manual and OCWA's intranet (replaced with OCWA's Sharepoint site). Added row to header to show who reviewed and approved the document.
2023-10-10	2	Updated table to include confined space program, included section for QEMS Internal blank forms, and External QEMS blank forms. Changed location of the Operational Plan from the Municipal Office to the Municipal website.
2024-03-28	3	Changed the link for the Municipal Website.
2024-08-27	4	Updated Corporate Emergency Plan (CERP) name and change MECP to Ministry. Updated Call-in Reports to Call Back Reports to reflect reports in Maximo. Added Watermain Commissioning form and records to the table. Removed watermark.
2025-09-15	5	Removed links for OCWA's Sharepoint, the municipal website, Federal and Provincial legislation and ANSI/NSF standards for chemicals as some were broken. Included the procedure for the Designation of OICs in the Temiskaming Shores Cluster as a controlled document under the QEMS.

1. Purpose

To document the following for the Temagami Drinking Waters Systems:

- The name of the Owner and Operating Authority; and
- Provide a description of the system, including all applicable water sources, treatment system processes and distribution system components.

2. Definitions

Distribution System - 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.

Primary Disinfection - means a process or series of processes intended to remove or inactivate human pathogens such as viruses, bacteria and protozoa in water.

Secondary Disinfection - 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;
(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).

Treatment System - 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;

3. Procedure

3.1 Refer to OP-6A for a description of the facilities in the Temagami North Drinking Water System.

3.2 Refer to OP-6B for a description of the facilities in the Temagami South Drinking Water System.

3 Related Documents

None

4 Revision History

Date	Revision #	Reason for Revision
2019-05-27	0	Procedure issued – Information within OP-06 (s. 3) was originally set out in main body of the Temagami Drinking Water Systems Operational Plan (revision 7, dated June 19, 2017). New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections.

1.0 Temagami North Drinking Water System Overview

1.1 Owner / Operating Authority

The Temagami North Drinking Water System is owned by the Corporation of the Municipality of Temagami and consists of a Class 2 water treatment subsystem and a Class 1 water distribution subsystem. The Ontario Clean Water Agency (OCWA) is the accredited operating authority and is designated as the Overall Responsible Operator for both the water treatment and water distribution facilities.

1.2 Source Water

Raw Water Supply

The water treatment plant is located at 5 Cedar Avenue South and obtains its raw water from Net Lake. The intake pipe for the plant is located approximately 165 m off the west shore of the lake at 10 m below the low water level of the lake. The raw water is directed by gravity via a 222 m long, 250 mm diameter intake pipe to a low lift pumping station consisting of a wet well and two submersible low lift pumps, each rated at 3.8 L/s (328 m3/day). These pumps are controlled by the system PLC (programmable logic controller) and discharge to the two BCA Pre-Fabricated package treatment plants.

A magnetic flow meter is located in the water treatment plant to monitor raw water flows. The raw water is also continuously monitored for pH, turbidity and temperature.

General Characteristics

The water from Net Lake is typically low in turbidity, fairly neutral pH and stable, but low in alkalinity. Temperature fluctuates significantly through the seasons ranging from approximately 0.01 ºC in the winter to as high as 28 ºC during the summer. Bacteriological analysis of the raw water indicates a source of relatively good quality. The results of chemical analyses are consistently below the Ontario Drinking Water Quality Standards.

Net Lake: *Raw Water Characteristics*

Characteristics	2020		2021		2022		2023		2024	
	Min-Max	Mean	Min-Max	Mean	Min-Max	Mean	Min-Max	Mean	Min-Max	Mean
E. coli (CFU/100 mL)	0 - 5	2.1	0 - 5	2.6	<2 -15	2.9	<2 - 5	2.5	0 - <20	2.3
Total Coliforms (CFU/100 mL)	0 - 270	56	0 - 480	73	<2 - 115	18.8	<2 - 250	44.1	0 - 452	79.4
Turbidity (NTU)	0 - 10	1.1	0.9 - 10	2.5	0 - 10	2.3	0 - 10	4.0	0 – 10	4.4
pH	3.7 - 11	6.6	3.9 - 11	6.6	3.3 – 11	6.2	3.0 - 11	6.2	3.7 - 11	6.2
Alkalinity (mg/L)	20 - 25	22.3	18 - 30	22	7 - 25	20	12 - 29	22	14 - 33	23
Colour (TCU)	5 - 5	5	5 - 5	5	5 - 5	5	5 - 5	5	5 - 5	5

* Notes:
< = less than the laboratory's method detection limit
> = greater than the laboratory's method detection limit

Common Fluctuations

Raw water turbidity increases during spring runoff and significant rainfall events. As well, water temperature changes significantly from winter to summer. Warm summer temperatures may result in an increase of taste and odour concerns. Aluminum sulphate and polymer are adjusted accordingly to assist with sedimentation and filtration.

Threats

Potential sources of raw water contamination include fuel spills from recreational water crafts, beaver activity, train derailment, and a major surcharge of effluent from the Temagami North Lagoon.

Operational Challenges

Spring and fall turnover is the greatest operational challenge for the Temagami North DWS. The turnover creates higher demands on process operations. It can affect the source waters alkalinity, pH, temperature and turbidity. These changes can occur quickly and require adjustments to chemical dosages.

1.3 Treatment System Description

Water Treatment

The BCA plants each consist of 2 flash mixing chambers, 2 flocculation tanks, two clarification chambers, and two deep dual media filters (sand/anthracite). Aluminum sulphate and polymer are added for the coagulation/flocculation process, sodium carbonate for pH adjustment and sodium hypochlorite for disinfection. All chemicals are added using metering pumps. The plant is equipped with an automated monitoring system that records various components of the process including system flows and chemical dosages.

Filter backwashes are initiated by head loss, turbidity levels, and time or manually by the operator. The backwash wastewater and sedimentation sludge is directed to a drainage system that leads to the Municipal sanitary sewer system for disposal.

Water Storage

The treated water is directed to three clearwells, which have a combined capacity of 268.9 m3 at a depth of 2.9 meters. The two high lift pumps, each rated at 828 m^3/d at 46m TDH, direct the treated water into the distribution system, which is equipped with a standpipe that helps to maintain water pressure within the system. The water leaving the plant is continuously monitored for flow, pH, temperature, turbidity and free chlorine residual to ensure the water is of acceptable quality before entering the distribution system.

Control System

Control System Supervisory Control and Data Acquisition (SCADA) is the method of control implemented for the Temagami North Water Treatment System. All analyzing, monitoring and control module equipment information is routed through the SCADA system for operator monitoring and control. Control of equipment can be accomplished locally using the SCADA computer located at the Temagami North water treatment plant or remotely using operator computers or cell phones. Alarm capability and set point adjustment are available through SCADA and trend monitoring via data logger.

Emergency Power

A 80 kW diesel generator with automatic start and a fuel tank volume of 620 L is located adjacent to the water treatment plant in a nearby sewage pumping station. It is available to provide emergency power for the entire facility in the event of a power interruption.

Treatment System Process Flow Diagram

Refer to Figure 1 on page 6

1.4 Description of the Distribution System Components

The Temagami North Drinking Water System is classified as a Large Municipal Residential Drinking Water System which serves an estimated population of 300 residents. It is a standalone system not connected to another drinking water system.

The system is equipped with a standpipe known as the "North Tower" which has a storage capacity of 732 m^3 and assists with maintaining water pressure in system.

The distribution system consists of 189 service connections, 20 fire hydrants, and 7 dead end locations. The watermains are mostly made of cast iron material and range in size from 6” to 8”. A small section on Spruce Drive consists of PVC pipe. There is one bleeder in the trailer park and one bleeder on Spruce Drive. Only the Spruce Drive bleeder runs full time to maintain water quality. The bleeder in the trailer park is for prevention of freezing in the winter months.

To maintain disinfection residuals in the distribution system, the following processes are in place:

- The Temagami North distribution system will be, at all times; operated by a person(s) holding a valid operator’s certificate.
- All maintenance or repairs conducted in the distribution system will be communicated, in advance to the ORO to ensure disinfection is maintained and that all maintenance and repairs are supervised by certified operator.

- Regular flushing of the distribution system will be performed.
- The system will be monitored and sampled as required by legislative requirements and any adverse results will be resampled and reported in accordance with the Safe Drinking Water Act and its regulations.
- OCWA, as the operating authority for the distribution system will ensure that treatment equipment that provides secondary disinfection is operated such that, at all times and at all locations in the receiving distribution system, the free chlorine residuals are never less than 0.05 mg/L.
- A free chlorine residual below 0.2 mg/L in the distribution will initiate corrective actions to prevent an adverse water quality incident.

Distribution System Map

Refer to Figure 2 on page 7

Revision History

Date	Revision #	Reason for Revision
2019-05-27	0	Procedure issued – Information within OP-06 (s. 3) was originally set out in main body of the Temagami Drinking Water Systems Operational Plan (revision 7, dated June 19, 2017). New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Updates based on revisions to DWQMS (e.g. removal of critical upstream or downstream processes, separation of systems that provide primary and/or secondary disinfection and systems that do not, for systems that are connected to another system with different owners, must now include which system is relied upon to ensure the provision of safe drinking water). Moved order of system description to follow the process (e.g., source water first, then treatment, then distribution). Updated the Raw Water Characteristics table with more current data.
2022-07-19	1	Updated Raw Water Characteristics chart. Added number of service connections and bleeder in the distribution system. Updated/replaced distribution map.
2023-10-10	2	Updated the Raw Water Characteristics table in Section 1.2 to include data from 2018 and 2022. Added the classification of the treatment and distribution subsystems to step 1.1 and added a description the system's control system in step 1.3. Updated the components of the distribution system and included a description of how disinfection residuals are maintained throughout the distribution system in Step 1.4.

Date	Revision #	Reason for Revision
2024-03-28	3	Included the address of the water treatment plant and added continuous monitoring of flow and other parameters for the raw water in Section 1.2. Updated clearwell description and included flow, pH and temperature monitoring for the treated water in Section 1.3. Updated information for emergency power. Added a chlorine residual trigger to initiate corrective actions in Step 1.4. Updated plant schematic to correct clearwell numbering.
2025-09-15	4	Included the rated capacity of the 2 high lift pumps in Section 1.3. Corrected number of service connection, fire hydrants and dead ends in Section 1.4. Updated Section 1.2; the Raw Water Characteristics table with more current data (2023 & 2024),

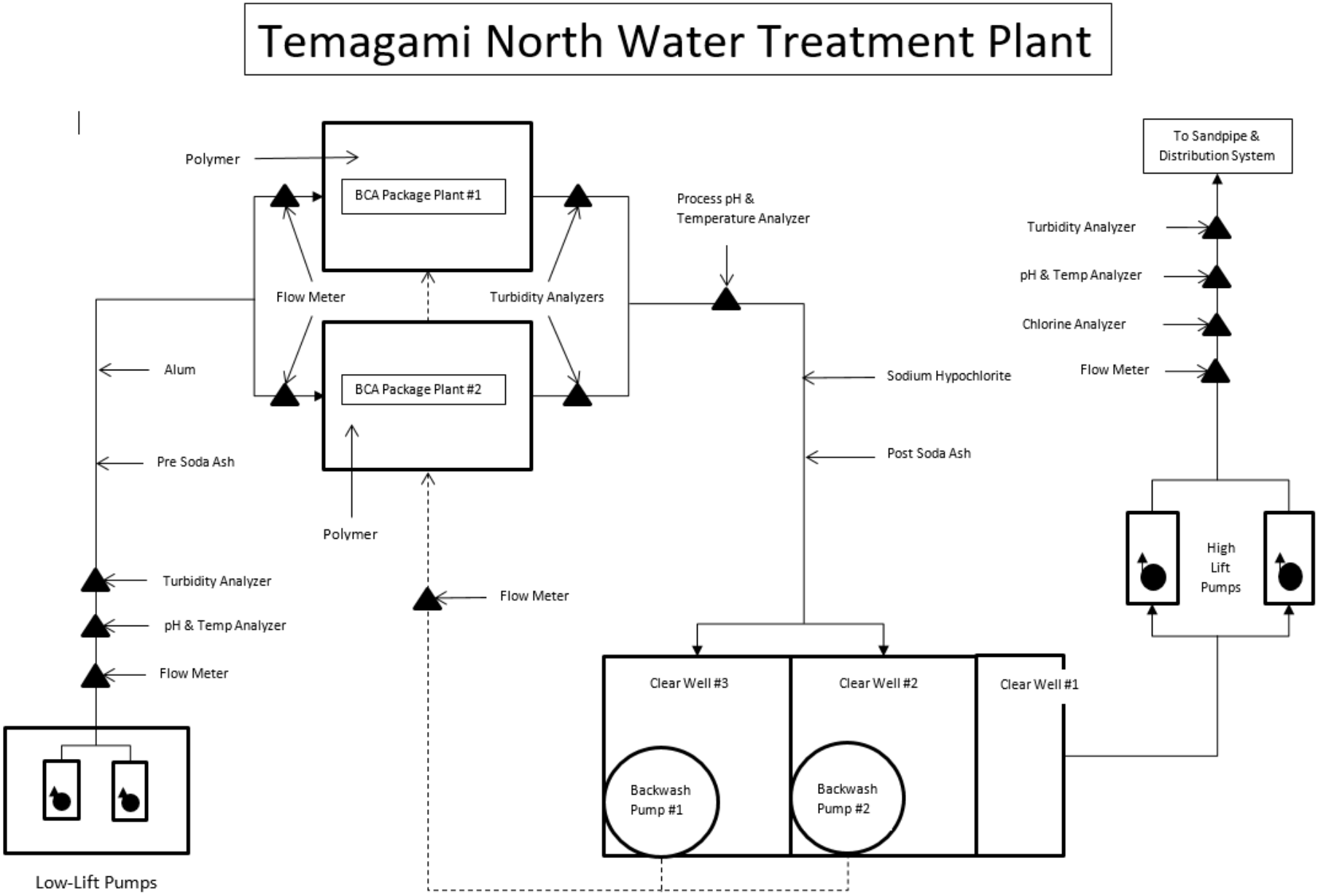

Figure 1 - Temagami North Water Treatment Plant - Process Flow Diagram (Updated September 25, 2024)

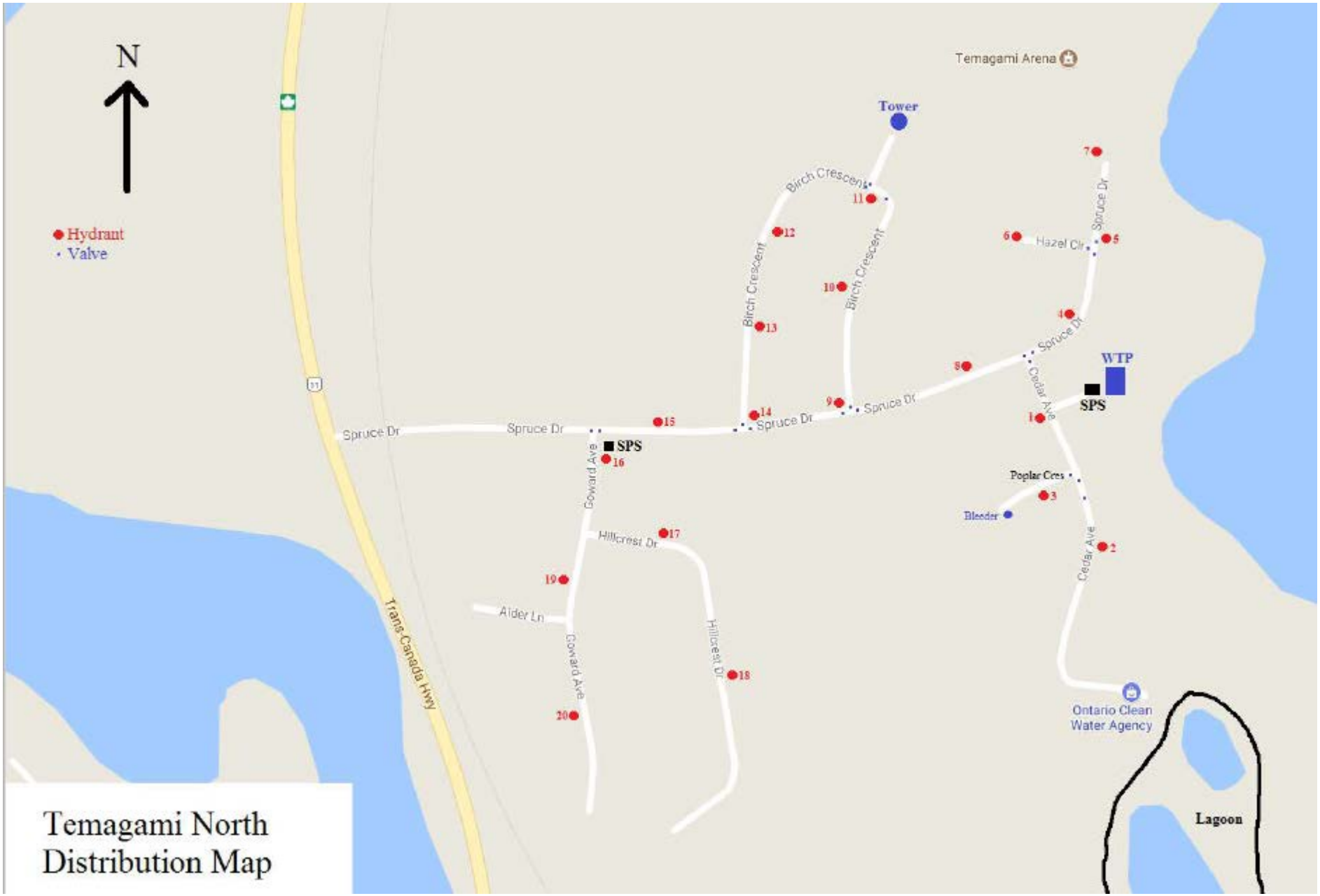

Figure 2 - Temagami North Distribution System Map

1.0 Temagami South Drinking Water System Overview

1.1 Owner / Operating Authority

The Temagami South Drinking Water System is owned by the Corporation of the Municipality of Temagami and consists of a Class 2 water treatment subsystem and a Class 1 water distribution subsystem. The Ontario Clean Water Agency (OCWA) is the accredited operating authority and is designated as the Overall Responsible Operator for both the water treatment and water distribution facilities.

1.2 Source Water

Raw Water Supply

The water treatment plant is located at 39 Lake Shore Drive and obtains its raw water from Lake Temagami. The water is drawn through a 20 m long, 200 mm diameter intake pipe that extends from a submerged intake structure 5.7 m below the average water level. The intake pipe directs water by gravity to a low lift pumping station consisting of a wet well and two submersible low lift pumps, each rated at 11 L/s (950 m3/day). These pumps are controlled by the treatment systems' programmable logic controller (PLC) and discharge to the two package plants located with the water plant.

A magnetic flow meter is located in the water treatment plant to monitor raw water flows. The raw water is also continuously monitored for pH, turbidity and temperature.

General Characteristics

The water from Lake Temagami is typically low in turbidity with a neutral pH and stable, but low alkalinity. Temperature fluctuates significantly through the seasons ranging from approximately 2.5 ºC in the winter to as high as 27 ºC during the summer. Bacteriological analysis of the raw water indicates a source of relatively good quality. The results of chemical analysis are consistently below the Ontario Drinking Water Quality Standards.

Lake Temagami: Raw Water Characteristics

Characteristics	2020		2021		2022		2023		2024	
	Min - Max	Mean	Min - Max	Mean	Min - Max	Mean	Min - Max	Mean	Min-Max	Mean
E. coli (CFU/100 mL)	0 - 85	5	2 - 160	6	<2 - 24	3.2	<2 - 30	4.1	0 - 38	3.5
Total Coliforms (CFU/100 mL)	2 - 1000	92	2 - 905	167	< 2 - 210	40	<2 - >400	47.8	2 - 120	43.6
Turbidity (NTU)	0 - 10	1.7	0 - 10	2.9	0 - 10	2.1	0 - 10	1.3	0 - 10	1.4
pH	3.8 - 11	7.2	3.9 - 11.5	7.0	3.4 - 11.5	7.5	3.2 – 11	7.3	3.3 - 11	7.1
Alkalinity (mg/L)	16 - 32	24	18 0 -31	23	17 - 33	23	5 - 35	26	20 - 31	25
Colour (TCU)	1 - 5	4.9	5 - 5	5	5 - 5	5	1 - 5	4.9	5 - 5	5

* Notes:
< = less than the laboratory's method detection limit
> = greater than the laboratory's method detection limit

Common Fluctuations

Raw water turbidity increases during spring runoff and significant rainfall events. As well, water temperature changes significantly from winter to summer. Warm summer temperatures may result in an increase of taste and odour concerns. Aluminum sulphate and polymer are adjusted accordingly to assist with sedimentation and filtration.

Threats

Potential sources of raw water contamination include fuel spills from boats, planes or highway traffic. Other sources would be the heavy recreational use, beaver activity, and train derailment.

Operational Challenges

Spring and fall turnover is the greatest operational challenge for the Temagami South DWS. The turnover creates higher demands on process operations. It can affect the source waters alkalinity, pH, temperature and turbidity. These changes can occur quickly and require adjustments to chemical dosages.

1.3 Treatment System Description

Water Treatment

The treatment systems are two different package plants. One is a BCA Pre-Fabricated package treatment plant which operates automatically and the other is a Neptune Microfloc “Trident” package treatment plant which is currently off-line, but can be operated manually if needed. Each plant provides chemically assisted filtration through coagulation, flocculation, sedimentation and filtration operations. Aluminum sulphate and polymer are added to the raw water upstream of the static mixer for the coagulation/flocculation process. Sodium carbonate is injected for pH adjustment and sodium hypochlorite is used for disinfection. All chemicals are added using metering pumps. The plant is equipped with an automated monitoring system that records various components of the process.

Filter backwashes are initiated by head loss, turbidity levels, and timer or manually by the operator. Filter backwash and clarifier waste are stored in a wastewater holding tank before being pumped to the Municipal sewer system for disposal.

Water Storage

The filtered water is then directed to two clearwells having a total capacity of 280.6 m^3. Two high lift pumps rated at 916 m3/day direct finished water to the distribution system and an elevated tower, which maintains pressure to the distribution system. The water leaving the plant is continuously monitored for flow, pH, temperature, turbidity and free chlorine residual to ensure the water is of acceptable quality before entering the distribution system.

Control System

Control System Supervisory Control and Data Acquisition (SCADA) is the method of control implemented for the Temagami North Water Treatment System. All analyzing, monitoring and control module equipment information is routed through the SCADA system for operator monitoring and control. Control of equipment can be accomplished locally using the SCADA computer located at the Temagami North water treatment plant or remotely using operator computers or cell phones. Alarm capability and set point adjustment are available through SCADA and trend monitoring via data logger.

Emergency Power

For emergency purposes, a 100 kW diesel generator with a fuel tank capacity of 900 L is located outside the water treatment plant and is available to provide emergency power to the entire facility in the event of a power outage.

Treatment System Process Flow Diagram

Refer to Figure 1 on page 6

1.4 Description of the Distribution System Components

The Temagami South Drinking Water System is classified as a Large Municipal Residential Drinking Water System which serves an estimated population of 350 residents. It is a standalone system not connected to another drinking water system.

The system is equipped with a standpipe known as the "South Tower" which has a storage capacity of 570 m^3 and assists with maintaining water pressure in system

The distribution system consists of 182 service connections and approximately 21 hydrants for fire. The watermains are made of cast iron and some PVC material that range in size from 6” to 8”.

To maintain disinfection residuals in the distribution system, the following processes are in place:

- The Temagami South distribution system will be, at all times; operated by a person(s) holding a valid operator’s certificate.
- All maintenance or repairs conducted in the distribution system will be communicated, in advance to the ORO to ensure disinfection is maintained and that all maintenance and repairs are supervised by a certified operator.
- Regular flushing of the distribution system will be performed.

- The system will be monitored and sampled as required by legislative requirements and any adverse results will be resampled and reported in accordance with the Safe Drinking Water Act and its regulations.

- OCWA, as the operating authority for the distribution system will ensure that treatment equipment that provides secondary disinfection is operated such that, at all times and at all locations in the receiving distribution system, the free chlorine residuals are never less than 0.05 mg/L.

- A free chlorine residual below 0.2 mg/L in the distribution will initiate corrective actions to prevent an adverse water quality incident.

Distribution System Map

Refer to Figure 2 on page 7

Revision History

Date	Revision #	Reason for Revision
2019-05-27	0	Procedure issued – Information within OP-06 (s. 3) was originally set out in main body of the Temagami Drinking Water Systems Operational Plan (revision 7, dated June 19, 2017). New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Updates based on revisions to DWQMS (e.g. removal of critical upstream or downstream processes, separation of systems that provide primary and/or secondary disinfection and systems that do not, for systems that are connected to another system with different owners, must now include which system is relied upon to ensure the provision of safe drinking water). Moved order of system description to follow the process (e.g., source water first, then treatment, then distribution). Updated the Raw Water Characteristics table with more current data.
2022-07-19	1	Updated Raw water characteristics table.
2023-10-10	2	Updated the Raw Water Characteristics table in section 1.2 to include data from 2018 and 2022. Added the classification of the treatment and distribution subsystems to step 1.1 and added a description the system's control system in step 1.3. Updated the components of the distribution system and included a description of how disinfection residuals are maintained throughout the distribution system in Step 1.4.

Date	Revision #	Reason for Revision
2024-03-28	3	Included the address of the water treatment plant, added continuous monitoring of flow and other parameters for the raw water and in Step 1.2. Corrected the clearwell capacity as per the DWWP, included flow, pH and temperature monitoring for the treated water and included a description of the filter backwash process in Step 1.3. Updated information for emergency power. Corrected the number of hydrants and added a chlorine residual trigger to initiate corrective actions in Step 1.4.
2024-08-27	4	Removed statement regarding interconnection to other systems in Step 1.1 and moved information for filter backwashes from *Water Storage* to *Water Treatment*.
2025-09-15	5	Updated Section 1.2; the Raw Water Characteristics table with more current data (2023 & 2024).

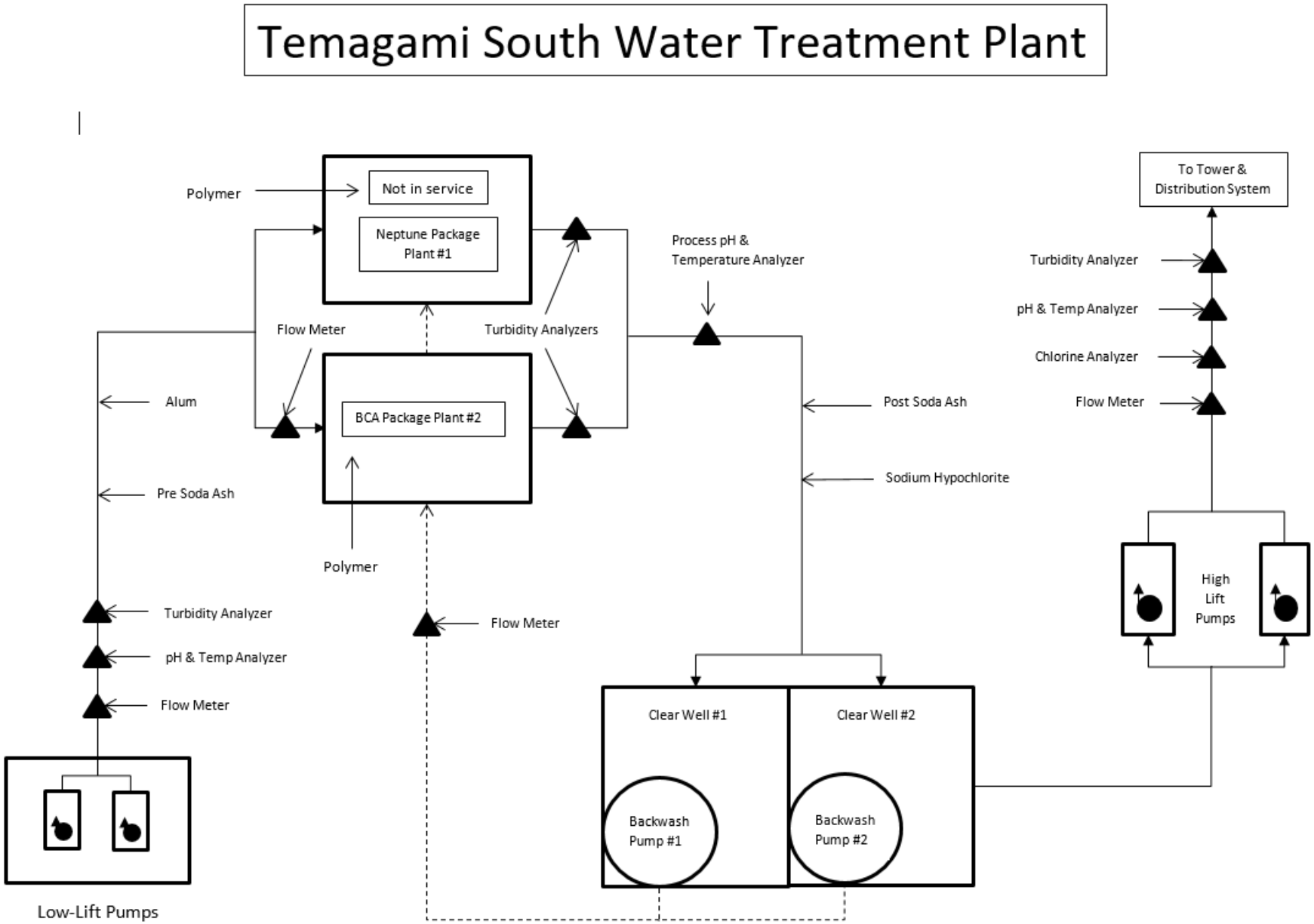

Figure 1 – Temagami South Water Treatment Plant - Process Flow Chart (July 27, 2023)

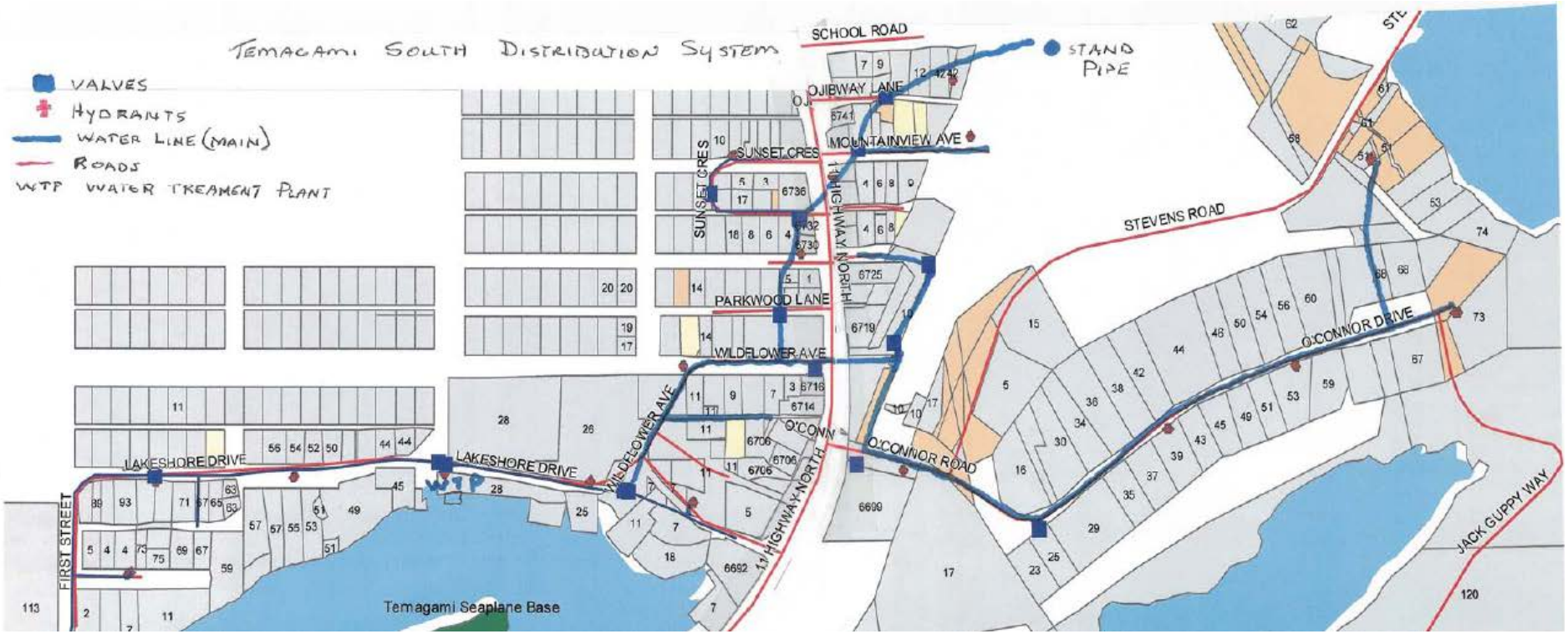

Figure 2 - Temagami South Distribution System Map. Larger scale version available at the Temagami Public Works office

1. Purpose

To document the process for conducting a risk assessment to identify and assess potential hazardous events and associated hazards that could affect drinking water safety.

2. Definitions

Consequence – the potential impact to public health and/or operation of the drinking water system if a hazard/hazardous event is not controlled

Control Measure – includes any processes, physical steps or other practices that have been put in place at a drinking water system to prevent or reduce a hazard before it occurs

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 reduce it to an acceptable level

Drinking Water Health Hazard – means, in respect of a drinking water system,

a) a condition of the system or a condition associated with the system's waters, including anything 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,
b) a prescribed condition of the drinking water system, or
c) a prescribed condition associated with the system's waters or the presence of a prescribed thing in the waters

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

Hazard – a biological, chemical, physical or radiological agent that has the potential to cause harm

Likelihood – the probability of a hazard or hazardous event occurring

3. Procedure

3.1 Operations Management ensures that operations personnel are assigned to conduct a risk assessment at least once every thirty-six months. At a minimum, the Risk Assessment Team must include the QEMS Representative, at least one Operator for the system and at least one member of Operations Management.

3.2 The QEMS Representative is responsible for coordinating the risk assessment and ensuring that documents and records related to the risk assessment activities are maintained.

3.3 The Risk Assessment Team performs the risk assessment as follows:

3.3.1 OP-07 Risk Assessment and OP-08 Risk Assessment Outcomes are reviewed.

3.3.2 For each of the system's activities/process steps, potential hazardous events and associated hazards (possible outcomes) that could impact the system's ability to deliver safe drinking water are identified. At a minimum, potential hazardous events and associated hazard as identified in the most current version of the Ministry's document titled "Potential Hazardous Events for Municipal Residential Drinking Water Systems" (as applicable to the system type) must be considered.

3.3.3 For each of the hazardous events, control measures currently in place at the system to eliminate the hazard or prevent it from becoming a threat to public health are specified. Control measures may include alarms, monitoring procedures, standard operating procedures/emergency procedures/contingency plans, preventive maintenance activities, backup equipment, engineering controls, etc.

3.3.4 To ensure that potential drinking water health hazards are addressed and minimum treatment requirements as regulated by SDWA O. Reg. 170/03 and the Ministry's "Procedure for Disinfection of Drinking Water in Ontario" (as amended) are met, OCWA has established mandatory Critical Control Points (CCPs).

<u>As a minimum, the following must be included as CCPs (as applicable):</u>

- Equipment or processes required to achieve primary disinfection (e.g., chemical and/or UV disinfection system, coagulant dosing system, filters, etc.)
- Equipment or processes necessary for maintaining secondary disinfection in the distribution system
- Fluoridation system

3.3.5 Additional CCPs for the system are determined by evaluating and ranking the hazardous events for the remaining activities/process steps (i.e., those <u>not</u> included as OCWA's minimum CCPs).

3.3.6 Taking into consideration existing control measures (including the reliability and redundancy of equipment), each hazardous event is assigned a value for the likelihood and a value for the consequence of that event occurring based on the following criteria:

Value	Likelihood of Hazardous Event Occurring
1	**Rare** – Estimated to occur every 50 years or more (usually no documented occurrence at site)
2	**Unlikely** – Estimated to occur in the range of 10 – 49 years
3	**Possible** – Estimated to occur in the range of 1 – 9 years
4	**Likely** – Occurs monthly to annually
5	**Certain** – Occurs monthly or more frequently

Value	Consequence of Hazardous Event Occurring
1	**Insignificant** – Little or no disruption to normal operations, no impact on public health
2	**Minor** – Significant modification to normal operations but manageable, no impact on public health
3	**Moderate** – Potentially reportable, corrective action required, potential public health impact, disruption to operations is manageable
4	**Major** – Reportable, system significantly compromised and abnormal operations if at all, high level of monitoring and corrective action required, threat to public health
5	**Catastrophic** – Complete failure of system, water unsuitable for consumption

The likelihood and consequence values are multiplied to determine the risk value (ranking) of each hazardous event. Hazardous events with a ranking of 12 or greater are considered high risk.

3.3.7 Hazardous events and rankings are reviewed and any activity/process step is identified as an additional CCP if <u>all</u> of the following criteria are met:

- ✓ The associated hazardous event has a ranking of 12 or greater;
- ✓ The associated hazardous event can be controlled through control measure(s);
- ✓ Operation of the control measures can be monitored and corrective actions can be applied in a timely fashion;
- ✓ Specific control limits can be established for the control measure(s); and
- ✓ Failure of the control measures would lead to immediate notification to the Medical Officer of Health (MOH) and/or Ministry.

3.4 The outcomes of the risk assessment are documented as per OP-08 Risk Assessment Outcomes.

3.5 At least once every calendar year, the QEMS Representative facilitates the verification of the currency of the information and the validity of the assumptions used in the risk

assessment in preparation for the Management Review (OP-20). When performing this review, the following may be considered:

- Process/equipment changes
- Reliability and redundancy of equipment
- Emergency situations/service interruptions
- CCP deviations
- Audit/inspection results
- Changes to the Ministry document "Potential Hazardous Events for Municipal Residential Drinking Water Systems" (as amended)

4. Related Documents

Ministry's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" (as amended)
Ministry's "Procedure for Disinfection of Drinking Water in Ontario" (as amended)
OP-08 Risk Assessment Outcomes
OP-20 Management Review

5. Revision History

Date	Revision #	Reason for Revision
2019-05-28	0	Procedure issued – Information within OP-08 was originally set out in the QEMS Procedure QP-02 Risk Assessment and Risk Assessment Outcomes (revision 3, dated October 29, 2013). Clarified role of QEMS Representative in updating the information in OP-08A and OP-08B. Summary of Risk Assessment Outcomes. Included requirements for how to document the risk assessment outcomes using the tables in OP-08A&B. Clarified responsibility of Operations Management to ensure Critical Control Limits are set and related procedures are developed. Included reference to OP-14 Review and Provision of Infrastructure to emphasize the need for Operations Management to review the risk assessment outcomes during the infrastructure review.
2019-09-19	1	Removed **Note (applicable for 36 month Risk Assessments conducted after the issuance of this procedure): from 3.2*
2022-07-13	2	Procedure updated - Replaced MOECC with Ministry (Ministry refers to the Ontario government ministry responsible for drinking water and environmental legislation); Added "(as amended)" directly following any references to Ministry documents to refer to the most current version of the document and added the Ministry document "Potential Hazardous Events for Municipal Residential Drinking Water Systems" (as amended) to the list of items that may be considered when performing the annual verification of the currency of the information in the risk assessment)].

1. Purpose

To document the outcomes of the risk assessment conducted as per OP-07 Risk Assessment.

2. Definitions

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 reduce it to an acceptable level

Critical Control Limit (CCL) – The point at which a Critical Control Point response procedure is initiated

3. Procedure

3.1 The QEMS Representative is responsible for updating the information in OP-08A Summary of Risk Assessment Outcomes for the Temagami North DWS and OP-08B for the Temagami South DWS as required.

3.2 The results of the risk assessment conducted as per OP-07 are documented in Table 1 of OP-08A and OP-08B. This includes:

- Identified potential hazardous events and associated hazards (possible outcomes) for each of the system's activities/process steps;
  Note: Hazards listed in the Ministry's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" (as amended) are indicated in the appropriate column using the reference numbers in Table 4 of OP-08A.
- Identified control measures to address the potential hazards and hazardous events; and
- Assigned rankings for the hazardous events (likelihood x consequence = risk value) and whether the hazardous event is a Critical Control Point (CCP) (mandatory or additional).
  Note: If the hazardous event is ranked as 12 or higher and it is <u>not</u> being identified as a CCP, provide rationale as to why it does not meet the criteria set out in section 3.3.7 of OP-07).

3.3 Operations Management is responsible for ensuring that for each CCP:

- Critical Control Limits (CCLs) are set;
- Procedures and processes to monitor the CCLs are established; and
- Procedures to respond to, report and record deviations from the CCLs are implemented.

The identified CCPs, their respective CCLs and associated procedures are documented in Table 2 of OP-08A and OP-08B.

3.4 A summary of the results of the annual review/36-month risk assessment is recorded in Table 3 of OP-08A and OP-08B.

3.5 Operations Management considers the risk assessment outcomes during the review of the adequacy of the infrastructure (Refer to OP-14 Review and Provision of Infrastructure).

4. Related Documents

OP-07 Risk Assessment
OP-08A Summary of Risk Assessment Outcomes
OP-14 Review and Provision of Infrastructure
Ministry's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" (as amended)

5. Revision History

Date	Revision #	Reason for Revision
2019-05-28	0	Procedure issued – Information within OP-08 was originally set out in the QEMS Procedure QP-02 Risk Assessment and Risk Assessment Outcomes (revision 3, dated October 29, 2013). Clarified role of QEMS Representative in updating the information in OP-08A and OP-08B. Summary of Risk Assessment Outcomes. Included requirements for how to document the risk assessment outcomes using the tables in OP-08A&B. Clarified responsibility of Operations Management to ensure Critical Control Limits are set and related procedures are developed. Included reference to OP-14 Review and Provision of Infrastructure to emphasize the need for Operations Management to review the risk assessment outcomes during the infrastructure review.
2019-09-19	1	Removed **Note (applicable for 36 month Risk Assessments conducted after the issuance of this procedure): from 3.2*
2022-07-13	2	Procedure updated - Replaced MOECC with Ministry (Ministry refers to the Ontario government ministry responsible for drinking water and environmental legislation); Added "(as amended)" directly following references to the Ministry's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" to refer to the most current version of the document)].
2024-08-27	3	Included OP-08B for the Temagami South DWS in Steps 3.1, 3.2, 3.3 and 3.4.

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Table 1 - Risk Assessment Table

Note: Processes referred to in OP-07 Risk Assessment and OP-08 Risk Assessment Outcomes must be identified as mandatory Critical Control Points (CCPs) as applicable for all OCWA-operated facilities. Mandatory CCPs are not required to be ranked.

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Source/Intake	2, 5, 6, 9	Spill of biological or chemical material into Net Lake accidentally or intentionally (Railway, beaver, activity, water crafts, or lagoon surcharge, vandalism)	Contamination of source water	No method of control until contaminant has been identified – response may include: - shutting down intake, - Approx. 5 days supply from the tower, - Town ordered water conservation or ban (supply alternate source of drinking water), Monitor and sample, On-line raw water pH, turbidity and temperature, EEP for Off-site Chemical/Fuel Spill, EEP for Contaminated Raw Water, EEP for Water Supply Shortage, CP for Spill Response, CP for Unsafe Water.	2	3	6	**NO**
Source/Intake	1, 2, 3, 4, 6, 7	Breakage/blockage of intake pipe due to natural disaster, freezing, accident or vandalism/terrorism	Loss of water supply	Approx. 5 days supply from the tower, Water ban and alternate source of water, Intake Inspection (~~2017~~ 2025), EEP for Water Supply Shortage.	2	4	8	**NO**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Source/Intake	9	Spring/fall turnover	Increased demand on process operations such as chemical optimization for changes in pH, alkalinity, temperature and turbidity.	Appropriate operational adjustments, chemical optimization for changes in colour, odour, alkalinity, pH, temperature and turbidity, Raw water on-line turbidity monitoring, Filter water turbidity monitoring and alarms.	4	2	8	**NO**
Source/Intake	1, 2, 4, 12	Harmful Algal Blooms	Biological contamination of raw water source	Weekly visual checks during the HAB season, SOP/Plan for Monitoring, Sampling and Reporting a Harmful Blue-Green Algae Bloom, Notifications from MOH, MECP and Public.	2	3	6	**NO**
Low Lift Pumps	2, 7	Low lift pump failures	Loss of water supply	Redundancy (2 pumps), Scheduled maintenance activities, Back-up generator for loss of power situations, Alarms for BCA and low clearwell level, Alarms for power loss EEP for Low Lift Pump Failure.	3	1	3	**NO**
Filtration Process **(includes flocculation, coagulation, dual media gravity filters)** (primary disinfection)	2, 10	Aluminum Sulphate feed pump failure	Increased turbidity, Ineffective removal of pathogens (minimum treatment requirements not met)	Redundancy (1 back-up pump) with automatic switchover, Operator inspections (tank levels, dosage calculations), Scheduled maintenance activities,				**YES – Mandatory CCP**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
			Potential AWQI	Continuous monitoring of filter effluent turbidity, Chemical pump failure alarm when both pumps fail, Plant shutdown when both pumps fail, EEP for Chemical Pump Failure, EEP for High Turbidity, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				
Filtration Process (primary disinfection)	10	Soda Ash feed pump failure (pre and post treatment)	Lowered pH and alkalinity, Ineffective coagulation process, Potential for increased turbidity and/or AWQI	Redundancy (1 back-up pump) with automatic switchover, Operator inspections (tank levels, dosage calculations), Scheduled maintenance activities, Chemical pump failure alarm, Plant shutdown when both pumps fail, EEP for Chemical Pump Failure, EEP for High Turbidity, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				**YES – Mandatory CCP**
Filtration Process (primary disinfection)	2, 10	Polymer feed pump failure	Increased turbidity, Ineffective removal of pathogens, Potential AWQI	Redundancy (1 back-up pump) with automatic switchover, Operator inspections (tank levels, dosage calculations),				**YES – Mandatory CCP**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				Scheduled maintenance activities, Chemical pump failure alarm, Plant shutdown when both pumps fail, EEP for Chemical Pump Failure, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				
Filtration Process (primary disinfection)	2, 10	Filter breakthrough	Increased turbidity, Ineffective removal of pathogens, Potential AWQI	Continuous on-line monitoring of filter effluent turbidity, Alarm on high turbidity, Redundancy (2 filters), Regular automated backwashes, Filter shut-down on high turbidity, Scheduled maintenance activities, Visual inspection of media, EEP for High Turbidity, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				**YES – Mandatory CCP**
Filtration Process (primary disinfection)	10	Backwash system failure	Increased turbidity, Ineffective removal of pathogens, Potential for loss of treated water supply, Potential AWQI	Pump failure alarms, Two backwash pumps (redundancy), On-line monitoring, Filter shut-down on high turbidity, Scheduled maintenance activities, Alternate system for backwashing (manual), BCA alarm,				**YES – Mandatory CCP**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				EEP for Backwash Failure, EEP for High Turbidity EEP for Reporting Adverse Water Quality, EEP for Water Supply Shortage, CP for Unsafe Water.				
Filtration Process (primary disinfection)	10	Blower Failure	Backwash system failure and increased turbidity, Potential AWQI	Back up blower available, Maintenance activities, Plant shuts down on blower failure, EEP for High Turbidity EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				**YES – Mandatory CCP**
Filtration Process (primary disinfection)	10	Turbidity analyzer failure	Unknown turbidity levels, Potential for AWQI	Filter redundancy (take filter out of service until analyzer replaced/ repaired), Scheduled maintenance activities, Operator checks and inspections, Analyzer fault alarm and filter lock out, Manual readings every 15 minutes if analyzer fails, Back-up analyzer available within region, EEP for Turbidity Analyzer Failure, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				**YES – Mandatory CCP**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Filtration Process (primary disinfection)	10	De-sludge valve failure	Plugged filter and potentially high turbidity, Potential AWQI	Manually open valve, Continuous turbidity monitoring, High turbidity alarm, Maintenance activities, ~~valve checked weekly,~~ Manual backwash available, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				**YES – Mandatory CCP**
Filtration Process (primary disinfection)	10	Backwash, effluent and filter to waste filter valve failures	Backwash failure, Loss of water, Inability to filter to waste, Potential AWQI	Filter redundancy (2 filters), Regular maintenance activities, Turbidity monitoring, Alarms, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				**YES – Mandatory CCP**
Clearwells (primary disinfection)	2, 10	Low level	Inadequate contact time for primary disinfection, Inadequate treated water supply, Potential AWQI	Redundancy (3 clearwells), Scheduled maintenance and inspection activities, Low level clearwell alarm, Town ordered water conservation or ban, EEP for Clearwell – Low Level, EEP for Water Supply Shortage, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				**YES – Mandatory CCP**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Clearwells (primary disinfection)	10	Clearwell out of service for repair, maintenance	Inadequate contact time for primary disinfection, Potential AWQI	Three-celled clearwell with isolation valves, Increase chlorine dosage into clearwell to maintain CT, Schedule controlled maintenance plan, Tower has 5 day supply to allow for repairs or maintenance on clearwell, SOP for Clearwell Isolation.				**YES – Mandatory CCP**
Clearwells (primary disinfection)	2, 10	Compromised structural integrity	Loss of water supply, Inadequate CT for primary disinfection, Inadequate fire protection. Infiltration, Potential AWQI	Tower has approximately 5 day supply to allow for repairs, Maintenance and inspection activities, Low clearwell level alarm, Town ordered water conservation or ban, EEP for Water Supply Shortage, EEP for Reporting Adverse Water Quality, CP for Loss of Service CP for Unsafe Water.				**YES – Mandatory CCP**
Sodium Hypochlorite System (primary disinfection)	10	Sodium Hypochlorite feed pump failure	Loss of disinfection, Low chlorine residual, Inadequate inactivation of pathogens, Potential for AWQI	Redundancy (1 duty and 1 back-up pump), On-line monitoring with alarms, In-house residual testing and dosage calculations,				**YES – Mandatory CCP**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				Scheduled maintenance activities, Spare pumps are also available within the Region, EEP for Sodium Hypochlorite Pump Failure, EEP for Low or High Chlorine Residual in Treated Water, Site specific Standard Operating Procedure (SOP) for CT, CT spreadsheet, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				
Sodium Hypochlorite System (primary disinfection)	10	Chlorine analyzer failure	Unknown chlorine residual levels, Potential for AWQI	Low chlorine residual alarm, In-house residual testing (5 minutes), Scheduled maintenance activities, Back-up analyzers available in the Region, Plant shuts down if analyzer fails, SOP for CT, CT spreadsheet, EEP for Free Chlorine Analyzer Failure, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				**YES – Mandatory CCP**
Sodium Hypochlorite System	2, 3, 10	Low supply of sodium hypochlorite	Inadequate disinfection,	Operator checks, Chemical available within Region,				**YES – Mandatory CCP**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
(primary disinfection)			Potential for AWQI	Low chlorine residual alarm, SOP for CT, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				
High Lift Pumps	2, 7	High lift pump failures	Low pressure/supply in distribution system, Possible contamination due to infiltration	Redundancy (2 pumps), Scheduled maintenance activities, Operational control, On-line monitoring of discharge pressure, Alarms for low pressure, Tower provides pressure and supply when high lifts are off, EEP for High Lift Pump Failure, EEP for Low or Loss of Pressure, Events in the Distribution System, EEP for Water Supply Shortage.	2	4	8	**NO**
Tower	2	Tower out of service for repair or maintenance	Lowered firefighting capability	Supply water from clearwells, Scheduled controlled maintenance plan, EEP for Tower Low Level, EEP for Water Supply Shortage.	2	3	6	**NO**
Tower	2	Loss of structural integrity due to collapse, break, leak	Contamination, Loss of pressure to the distribution, Loss of treated water supply,	Low level alarm, Regular on-site checks by operational staff, Bypass Tower to supply Town, Town ordered water conservation or ban (alternate source of water),	1	4	4	**NO**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
			Inadequate fire protection	EEP for Water Supply Shortage.				
Water Treatment System/Plant	2, 3, 6, 7, 10, 11	Fire in Plant or at Tower (accidentally or intentionally)	Partial or full shutdown, Loss of service and water supply, Damage to SCADA and critical equipment	Regular operator visits, Alarms, EEP for Fire in Facilities, EEP for Water Supply Shortage.	1	5	5	**NO**
Water Treatment System/Plant	1, 2, 3, 4, 6, 10	Power failure	Loss of treated water supply, Potential loss of equipment	Back-up diesel generator, Scheduled maintenance activities for back-up generator, Power failure alarm, Low pressure alarm, EEP for Hydro Interruption, EEP for Power Failure of Long Duration.	4	2	8	**NO**
Water Treatment System/Plant	1, 2, 3, 4, 6, 10	Standby power failure (accidentally or vandalism/terrorism)	Loss of treated water supply, Potential loss of equipment	Power failure alarm, Scheduled maintenance activities for generator, Portable generator available within the NEO Region (within 4-8 hours), Tower (Back up supply), EEP for Standby Power Failure, CP for Loss of Service.	2	4	8	**NO**
Water Treatment System	2, 6, 10, 11	SCADA/PLC failure (accident or vandalism/terrorism)	Loss of automatic process control, Interruption or loss of data and trending,	Loss of communication alarm, Spare I/O cards, Spare power supplies available in the cluster, SCADA system password protected,	3	3	9	**NO**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
			Loss of process visibility for operators	Multi-level protection, Data is backed-up on an external storage devices, Data also backed-up on BTP/ Wonderware, Facility locked when no personnel on site, Qualified personnel (Instrumentation Technician) available.				
Water Treatment System/Plant	6, 10, 11	Vandalism/terrorism at Water Treatment Plant or Tower	Contamination of the water supply, Damage to critical equipment	Locked (water plant, tower), Security alarm at water plant, Appropriate signage and lighting, Regular visits by operational staff, Water conservation or ban (alternate source of drinking water), EEP for Vandalism or Suspected Unauthorized Entry, EEP for Contamination of Treated Water, EEP for Water Supply Shortage, CP for Spill, Response, CP for Loss of Service, CP for Security Breach.	2	4	8	**NO**
Water Treatment System/Plant	1	Pandemic	Shortage of staff, Supply shortages, Loss of sample locations	OCWA's Emergency Operations Center/Action Group (EOC), Staff training and PPE, Staff isolation, staff rescheduling, modifications to work rounds, remote work done where possible,	2	4	8	**NO**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				Alternate suppliers available, refer to Essential Services and Suppliers List, EEP – Temporary Relief during Emergencies, CP for Critical Shortage of Staff.				
Water Treatment System/Plant	6, 10, 11	Cybersecurity threats, (PDM, WMS, SCADA, Wonderware, e-logbook)	Loss of system process visibility for operators (e.g., unable to monitor treatment processes), Interruption of data recording leading to a loss of critical/ compliance data, Inability to remotely control processes and/or loss of automatic control, Installation of malicious programs like ransomware which can disable business enterprise until money is paid, Loss of data (stolen or maliciously deleted)	Embedded system security include: Implementing Identity and Access Management throughout the account management lifecycle. Privileges are granted to users with two principles – need to know and least privileges. Users are assigned only the privileges they need to perform their job. Employing default to fail secure. The application or system failure will cause little or no harm to other systems. Data will not fall into the wrong hands. Applying multiple layers of defense including: o Multi-factor authentication o Intrusion detection systems constantly monitoring traffic flow (borders) o Firewalls that provide real-time filtering and blocking (walls) o Cryptography and layered authentication (zones)	2	4	8	**NO**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				o Certified professionals ensuring system integrity (gatekeepers) Constant monitoring and tracking for quick and effective response to attacks Perform routine vulnerability scans and threat assessments, Carry out periodic cyber security audits and risk compliance checks.				
Water Treatment System/Plant	1, 2, 3, 4, 9, 10, 11	Natural Disasters (ice storm, wind storm, flooding, forest fire, lightning strikes)	Loss of supply, Loss of communication, Loss of power, Potential loss of equipment, Potential contamination	Contingency Plans, Emergency Procedures, OCWA's Emergency Response Plan, Municipality's Emergency Response Plan, Staff training.	2	4	8	**NO**
Distribution System (secondary disinfection)	11	Loss of residual in distribution system	Failure to control biofilm and pathogens (long term), Potential AWQI	Continuous on-line monitoring of chlorine residual into the distribution system, Distribution chlorine residual testing as per O. Reg. 170/03, Regulatory scheduled maintenance, Alarms for low/high chlorine residual in water entering distribution system with plant shut down on a pre-selected low chlorine level. SOP for Secondary Disinfection Critical Control (CCL) Response,				**YES – Mandatory CCP**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				
Distribution System (system pressure)	1, 3, 4, 11	Adverse Water Quality Result as described in O. Reg. 170/03. (eg. Bacteriological, THMs, HAAs)	Potential for unsafe drinking water	Site specific Sampling Schedule, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.	3	4	12	**NO** – does not meet all criteria in step 3.3.7 of OP-07. No control of the hazard.
Distribution System	1, 2, 3, 4, 6, 7	Major Fire (accidentally or intentionally)	Contamination, Loss of pressure, Potential AWQI	Emergency management, Communication with fire department, Monitoring of flows, pressure, and tower levels, Tower (water supply), EEP Fire in Town, EEP for Low or Loss of Pressure, EEP for Water Supply Shortage, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.	3	3	9	**NO**
Distribution System (watermains)	1, 2, 3, 4, 6, 7, 8	Structural failure/breaks (accidently, weather, age or intentionally)	Contamination, loss of pressure, Loss of pressure/supply, Road damage, Potential AWQI	Notification/complaints from consumers, Routine monitoring of flows, clearwell and tower levels, Alarms (high flows, low pressure, low clearwell or tower), Maintenance program,	3	3	9	**NO**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				AWWA Standards and Ministry's Watermain Disinfection Procedure, EEP for Low or Loss of Pressure, EEP for Water Supply Shortage, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				
Distribution System (hydrants) .	1, 2, 3, 4, 6, 7, 8	Structural failure due to accident, weather, age, vandalism	Contamination, Loss of pressure, Loss of supply, Inadequate fire protection, Road damage, Potential AWQI	Consumer notification/complaints, Routine monitoring of flows, clearwell and tower levels, Alarms (high flows, low pressure, low clearwell, low tower), Inspection and maintenance program, Isolate, AWWA Standards and MECP's Watermain Disinfection Procedure, EEP for Low or Loss of Pressure, EEP for Vandalism, EEP for Water Supply Shortage EEP for Reporting Adverse Water Quality, CP for Unsafe Water.	3	2	6	**NO**
Distribution System (valves)	1, 2, 3, 4, 6, 7, 8	Structural failure due to accident, weather, age, vandalism	Loss of control, Contamination, Loss of pressure, Potential AWQI	Consumer notification/complaints, Routine monitoring of flows, pressure, clearwell and tower levels, Alarms (high flows, low pressure, low clearwell or tower),	3	2	6	**NO**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				Maintenance program - valve cycling, AWWA Standards and Ministry's Watermain Disinfection Procedure, EEP for Low or Loss of Pressure, EEP for Vandalism, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				
Distribution System (service connections)	8	Cross-connection, backflow, siphonage	Contamination, Potential AWQI	Consumer notification/complaints, Distribution system microbiological testing, Municipal by-law, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.	1	4	4	**NO**
Distribution System (service connections)	1, 2, 3, 4, 6, 7, 8	Structural failure/breaks due to accident, weather, age, vandalism	Contamination, Loss of pressure or supply to affected users, Potential AWQI	Consumer notification/complaints, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.	3	3	9	**NO**
Distribution System Flushing (clean piping, remove accumulation)	11	Failure to flush	Contamination, Potential AWQI	Maintenance program (bi-annual flushing, Procedures for flushing, Staff training, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.	2	2	4	**NO**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Distribution System (new construction)	11 7, 8	Sub-standard construction and/or commissioning	Contamination, Loss of Pressure, Potential AWQI	AWWA guidelines, Ministry's Watermain Disinfection Procedure, Provincial Standards Staff training, Sampling and testing, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.	1	4	4	**NO**
Distribution System (temporary water distribution system put in place during construction)	11, 7, 8	Infiltration	Contamination, Potential AWQI	AWWA guidelines, Ministry's Watermain Disinfection Procedure, Provincial Standards, Staff training, Sampling and testing, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.	1	4	4	**NO**

Table 2 - Identified Critical Control Points (CCPs)

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

CCP	Critical Control Limits	Monitoring Procedures	Response, Reporting and Recording Procedures
Filtration Process (Primary Disinfection)	**Filter Effluent Turbidity Alarms (Filters 1-2)** High set point = 0.9 NTU High high set point = 1.0 NTU (filter shut-down) Automatic backwash initiated at 0.5 NTU **Alum, Soda Ash and Polymer Feed Systems** If both pumps fail an alarm is initiated and plant shuts down.	• SCADA (continuous online analyzers) • Operator checks including dosage calculations • Redundancy (2 filters) • Trend review and sign-off as per O. Reg. 170/03	Refer to: • EEP for High Turbidity, • EEP for Turbidity Analyzer Failure, • EEP for Chemical Pump Failure, • EEP for Backwash Failure (Filters) • EEP for Reporting Adverse Water Quality • CP for Unsafe Water
Sodium Hypochlorite System (Primary Disinfection)	**Free Chlorine Residual Alarms - Treated Alarms** Low set point ≥ 0.95 mg/L High set point = 3.50 mg/L	• SCADA (continuous online analyzers) • Daily operator checks including dosage calculations • Trend review and sign-off as per O. Reg. 170/03	Refer to: • SOP for CT (Chlorine Concentration x Time) • CT Spreadsheet to calculate CT • EEP for Sodium Hypochlorite Pump Failure • EEP for Free Chlorine Analyzer Failure • EEP for Low or High Chlorine Residual in Treated Water • EEP for Reporting Adverse Water Quality • CP for Unsafe Water

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative

Approved by: B. Logan, Senior Operations Manager

CCP	Critical Control Limits	Monitoring Procedures	Response, Reporting and Recording Procedures
Clearwell (Primary Disinfection)	**Clearwell Level Alarms – Plant** Clearwell No. 2 and 3: Low set point = 1.75 m	• SCADA (continuous online analyzers) • Daily operator checks • Trend review and sign-off as per O. Reg. 170/03	• SOP for CT (Chlorine Concentration x Time) • CT Spreadsheet to calculate CT • EEP for Water Supply Shortage • EEP for Clearwell – Low Level • EEP for Reporting Adverse Water Quality • CP for Unsafe Water
Secondary Disinfection	**Free Chlorine Residual - Distribution** Low = 0.2 mg/L High = 4.0 mg/L	• Distribution chlorine residuals monitored as per O. Reg. 170/03	Refer to: • SOP for Secondary Disinfection Critical Control (CCL) Response, • EEP for Reporting Adverse Water Quality, • CP for Unsafe Water

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Table 3: Potential Hazardous Event/Hazard Reference Numbers (based on the Ministry's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" dated April 2022). If the hazardous event/hazard is not applicable to this drinking water system (DWS), it will be noted in the first column of this table.

System Type (indicate all that apply to this DWS)		Reference Number	Description of Hazardous Event/Hazard
X	All Systems	1	Long Term Impacts of Climate Change
X	All Systems	2	Water supply shortfall
X	All Systems	3	Extreme weather events (e.g., tornado, ice storm)
X	All Systems	4	Sustained extreme temperatures (e.g., heat wave, deep freeze)
X	All Systems	5	Chemical spill impacting source water
X	All Systems	6	Terrorist and vandalism actions
X	Distribution Systems	7	Sustained pressure loss
X	Distribution Systems	8	Backflow
X	Treatment Systems	9	Sudden changes to raw water characteristics (e.g., turbidity, pH)
X	Treatment Systems	10	Failure of equipment or process associated with primary disinfection (e.g., coagulant dosing system, filters, UV system, chlorination system)
X	Treatment Systems and Distribution Systems providing secondary disinfection	11	Failure of equipment or process associated with secondary disinfection (e.g., chlorination equipment, chloramination equipment)
X	Treatment Systems using Surface Water	12	Algal blooms
X	All Systems	13	Cybersecurity threats

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Table 4 - Record of Annual Review/36-Month Risk Assessment

The Drinking Water Quality Management Standard (DWQMS) requires that the currency of the information and the validity of the assumptions used in the risk assessment be verified at least once a year. In addition, the risk assessment must be conducted at least once every thirty-six months. Refer to OP-07 and OP-08.

Date of Activity	Type of Activity	Participants	Summary of Results
2009-08-11	Risk Assessment	Amanda Dubuc (PCT), Ilona Bruneau (PCT), Michael Del Monte (Operations Manager), Ed Hillman (ORO)	Conducted initial risk assessment.
2009-08-31	Review	Amanda Dubuc (PCT)	Desktop review prior to submission of Partial Accreditation application. No changes.
2010-07-14	Review	Amanda Dubuc (PCT), Eric Nielson (Senior Operations Manager)	Review during Internal Audit. No changes.
2010-10-14	Review	Amanda Dubuc (PCT), Eric Nielson (Senior Operations Manager), Michael Del Monte (Operations Manager), Tony Janssen (Senior Operations Manager)	Review during management review meeting. No changes.
2011-09-15	Review	Amanda Dubuc (PCT), Ilona Bruneau (PCT), Eric Nielson (Senior Operations Manager), Michael Del Monte (Operations Manager), Tony Janssen (Senior Operations Manager), Claude Mongrain (ORO)	Review during Internal Audit. No changes.
2011-12-20	Review	Amanda Dubuc (PCT), Eric Nielson (Senior Operations Manager), Michael Del Monte (Operations Manager), Tony Janssen (Senior Operations Manager)	Review during management review meeting. No changes.
2012-08-30	Risk Assessment	Amanda Dubuc (PCT), Claude Mongrain (ORO)	Conducted risk assessment. Several changes; see revision history.
2012-12-04	Review	Amanda Dubuc (PCT), Eric Nielson (Senior Operations Manager), Michael Del Monte (Operations Manager), Tony Janssen (Senior Operations Manager)	Review during management review meeting. No changes.

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Date of Activity	Type of Activity	Participants	Summary of Results
2013-09-26	Review	Amanda Dubuc (PCT), Patrick Dinel (Operator)	Review during Internal Audit. Changes to Table 2.
2013-10-29	Risk Assessment	Amanda Dubuc (PCT), Claude Mongrain (ORO)	Conducted risk assessment. Several changes; see revision history.
2014-11- 27	Review	Ilona Bruneau (PCT), Rebecca Marshall (PCT), Claude Mongrain (ORO)	Reviewed during Internal Audit.
2015-09-30	Review	Rebecca Marshall (PCT), Claude Mongrain (ORO)	Reviewed during Internal Audit – no changes/updates
2016-09-20	Risk Assessment Re-Do & Review	Rebecca Marshall (PCT), Claude Mongrain (ORO), Pat Dinel, Chris Barkhouse, Ed Hillman, Rico Guindon	Conducted risk assessment during the internal audit. See revision history for changes
2017-10-23	Review	Rebecca Marshall (PCT), Claude Mongrain (ORO)	Reviewed. No changes.
2018-10-31	Review	Joshua Gravelle (PCT), Bryce Logan (ORO)	Reviewed. See revision history for changes.
2019-09-11	Risk Assessment Re-Do & Review	Rebecca Marshall (PCT), Bryce Logan (ORO) & Vic Legault (Sr Ops Manager)	Conducted risk assessment. See revision history for changes
2020-12-01	Annual Review	Rebecca Marshall (PCT)	Reviewed. No changes.
2021-11-26	Annual Review	Rebecca Marshall (PCT), Bryce Logan (ORO)	Reviewed. No changes.
2022-12-12	Risk Assessment	April Swanson (PCT), Bryce Logan (ORO) & Vic Legault (Sr Ops Manager)	Conducted risk assessment. See revision history for changes
2023-06-14	Annual Review	Ilona Bruneau (PCT)	Table 1– changed Adverse Reporting Procedures to new updated procedure that captures all adverse water quality incidents. Added procedures and contingency plans to selected hazards, added clearwell and tower integrity as a potential hazard. Added fire in the plant as a potential hazard and cross-connection, backflow and siphonage as potential hazards with service connections. Updated distribution system hazards and made minor formatting changes. Table 2 – Updated CCLs for turbidity and added filter and plant shutdown feature. Updated Response, Reporting and Recording

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Date of Activity	Type of Activity	Participants	Summary of Results
			procedures for the filtration process, sodium hypochlorite system and clearwells.
2023-06-28	Annual Review of Critical Control Points	Cassandra Legros (Operator), Matt Del Monte (Operator)	Table 2 - Updated critical control limits as per review during internal audit. Added shutdown feature for filtration process and added high turbidity alarm at 0.8 NTU.
2023-12-15	Reviewed during Management Review	Ilona Bruneau (PCT/QEMs Representative), Bryce Logan (ORO), Bryce Logan (SOM/ORO), Jeremy Galda (SPCM) , Cassie Legros (Electronics Technician/operator)	Table 2 - Updated critical control limits as per review during Management Review. Removed Clearwell No. 1 level as it is not used in CT calculation for primary disinfection.
2024-08-26	Annual Review	Ilona Bruneau (PCT/QEMs Representative)	Table 1 – added weekly visual checks as a control measure to the Algae Bloom hazard, changed the word chlorine to sodium hypochlorite under the primary disinfection process, added the EEP for Water Supply Shortage to the Intake Breakage/Blockage and the Fire in Plant hazard and added the EEP for Fire in Municipality To the Major Fire hazard. Table 2 – change the low CCL for secondary disinfection (distribution chlorine residuals) from 0.05 mg/L to 0.2 mg/L and identified an SOP for Secondary Disinfection Critical Control Limit (CCL) Response
September 10, 2025	36 month Risk Assessment	Ilona Bruneau (PCT/QEMs Representative), Trevor Legault (Operator), Bryce Logan (Sr. Operations Manager)	Table 1 – Included SCADA/PLC failure and natural disasters as potential hazardous events. Added accidentally or intentionally to several hazards where appropriate. Added additional information to the description of the hazard where needed. Reviewed control measures and updated with additional operational tasks, procedures, alarms, plant features where needed. Added new EEP for Temporary Relief during Emergencies to the Pandemic hazard.

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Date of Activity	Type of Activity	Participants	Summary of Results
			Reviewed and updated selected possible outcomes. Removed failure of the catch-all distribution components as they are captured individually. Reviewed rankings and made changes to selected hazards. Table 2 – Filtration Process: added set point when a backwash is initiated. Sodium Hypochlorite System: changed low set point to ≥0.95 mg/L to reflect the new requirement in the MDWL. Clearwell: removed high set point.

Revision History

Date	Revision	Description of Revision
2009-08-11	0	Initial risk assessment conducted
2011-09-07	1	Template revised to include 'Record of Annual Review/36-Month Risk Assessment' (Table 3)
2012-10-30	2	Added 'BCA alarm' control measure to low lift pumps, removed 'note' under polymer feed pump, added 'visual inspection of media' control measure to filter breakthrough, added 'BCA alarm' control measure to backwash system failure, added 'desludge valve failure' as a hazardous event with the filtration process step, fixed a typo under clearwell hazardous event, re-ranked the likelihood and consequence for tower out of service, added 'tower provides pressure and supply when high lifts off' control measure to high lift failure, removed 'low fuel level alarm' and re-ranked the likelihood and consequence for power failure, added 'standby power failure' as a hazardous event with the water treatment system process step, added 'Soda Ash and Polymer Feed' in Table 2 as part of the filtration process CCP, and changed Operations Manager title to Senior Operations Manager and Cluster Manager title to Operations Manager in Table 3.
2013-06-24	3	Added review during management review meeting in Table 3.
2013-08-09	4	Updated the CCP set points in Table 2 to reflect the actual set points at the water treatment plant and in response to the non-conformance item from the onsite external audit.
2013-10-29	5	Added risk assessment processes for the distribution system, as the two systems (treatment and distribution) are under one operating authority. Changed the system name to Temagami Drinking Water System.

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Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Senior Operations Manager

Date	Revision	Description of Revision
2017-06-19	6	Added Blower failure as a hazardous event under filtration. Added spare pumps as a control measure to chlorine feed failure. Changed chlorine low set point to ≥0.85 from 0.82
2018-10-31	7	Updated clear wells to a critical control point and updated table 2 to include clearwell and relevant EEP/SOPs with alarm set points.
2019-09-19	8	Added Table 3 and column to indicate which of the MOECCs Potential Hazardous Events have been considered for each event. Decreased risk value for the following events: Spill at Intake, low lift pump failure, high lift pump failure, power failure, stand by power failure and watermain structural failure. The risk value for Major fire was increased. Added regular inspections as a control measure for Breakage of intake pipe, removed 2 backwash pumps as a control measure for blower failure, added back up meter for turbidity meter failure, added CW Isolation SOP as control measure for CW out of Service, added plant shut down to chlorine analyzer failure, added Genset low fuel alarm to Power Failure, added tower to Stand by Power Failure, added valve cycling as control measure for valve failure, added redundancy (2 HL pumps) and tower to Major Fire added WM disinfection SOP and training for Sub-standard New Connections. Added section for backwash, effluent and filter to waste valve failure under filtration. Added Chemical adjustments to control measures for spring/fall turnover. Added Plant shut down if blower fails to control measures for blower failure. Added Plant shuts down if analyzer fails to sodium hypo analyzer failure.
2020-12-01	9	Updated Table 4
2021-11-26	10	Updated Table 4
2022-07-13	11	Added: cybersecurity threats" to Table 4 (new Ministry requirement), Replaced: MOECC with Ministry (Ministry refers to the Ontario government ministry responsible for drinking water and environmental legislation); Updated revision date of Ministry's document "Potential Hazardous Events for Municipal Residential Drinking Water Systems" to April 2022 (previously February 2017); updated table 1 to include cybersecurity threats. Added possible outcomes and existing control measures. Added Pandemic and possible outcomes and existing control measures.
2022-12-12	12	Because there have not been any significant upgrades to the plant, only minor changes to the likelihood and consequence were made.
2023-10-10	13	Revised summary based on results of the June 14th and June 28th, 2023 reviews.
2024-03-28	14	Revised summary based on results of the December 15, 2023 review.
2024-08-27	15	Revised summary based on results of the August 26, 2024 review.
2025-09-15	16	Revised summary based on the results of the 36 monthly risk assessment performed in September 2025.

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Table 1 - Risk Assessment Table

Note: Processes referred to in OP-07 Risk Assessment and OP-08 Risk Assessment Outcomes must be identified as mandatory Critical Control Points (CCPs) as applicable for all OCWA-operated facilities. Mandatory CCPs are not required to be ranked.

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Source/Intake	2, 5, 6, 9	Spill of biological or chemical material into Lake Temagami accidentally or intentionally (Railway, highway, planes, water crafts, vandalism)	Contamination of source water	No method of control until contaminant has been identified – response may include: - shutting down intake, - Approx. 3 days supply from the tower, - Town ordered water conservation or ban (supply alternate source of drinking water), Monitor and sample, On-line raw water pH, turbidity and temperature, EEP for Off-site Chemical/Fuel Spill, EEP for Contaminated Raw Water, EEP for Water Supply Shortage, CP for Spill Response, CP for Unsafe Water	3	3	9	**NO**
Source/Intake	1, 2, 3, 4, 6, 7	Breakage/blockage of intake pipe due to natural disaster, freezing, accident or vandalism/terrorism	Loss of water supply	Approx. 3 days supply from the tower, Water ban and alternate source of water, Intake Inspection (2025), EEP for Water Supply Shortage.	2	4	8	**NO**

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Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Source/Intake	9	Spring/fall turnover	Increased demand on process operations such as chemical optimization for changes in pH, alkalinity, temperature and turbidity.	Appropriate operational adjustments, chemical optimization for changes in colour, odour, alkalinity, pH, temperature and turbidity, Raw water on-line turbidity monitoring, Filter water turbidity monitoring and alarms.	4	2	8	**NO**
Source/Intake	1, 3, 4, 12	Harmful Algal Bloom	Biological contamination of raw water source	Weekly visual inspections during the HAB season, SOP/Plan for Monitoring, Sampling and Reporting a Harmful Blue-Green Algae Bloom, Notifications from MOH, MECP and Public.	2	3	6	**NO**
Low Lift Pumps	2, 7	Low lift pump failures	Loss of water supply	Redundancy (2 pumps), Scheduled maintenance activities, Back-up generator for loss of power situations, Alarms for BCA and low clearwell level, Alarms for power loss EEP for Low Lift Pump Failure	3	1	3	**NO**
Filtration Process **(includes flocculation, coagulation, dual media gravity filters)** (primary disinfection)	2, 10	Aluminum Sulphate feed pump failure	Increased turbidity, Ineffective removal of pathogens (minimum treatment requirements not met)	Redundancy (1 back-up pump) with automatic switchover, Operator inspections (tank levels, dosage calculations), Scheduled maintenance activities,				**YES – Mandatory CCP**

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Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
			Potential AWQI	Continuous monitoring of filter effluent turbidity; Chemical pump failure alarm when both pumps fail, Plant shutdown when both pumps fail, EEP for Chemical Pump Failure, EEP for High Turbidity, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				
Filtration Process (primary disinfection)	10	Soda Ash feed pump failure (pre and post treatment)	Lowered pH and alkalinity, Ineffective coagulation process, Potential for increased turbidity and/or AWQI	Redundancy (1 back-up pump) with automatic switchover, Operator inspections (tank levels, dosage calculations), Scheduled maintenance activities, Chemical pump failure alarm, Plant shutdown when both pumps fail, EEP for Chemical Pump Failure, EEP for High Turbidity, EEP for Reporting Adverse Water Quality, CP for Unsafe Water				**YES – Mandatory CCP**
Filtration Process (primary disinfection)	2, 10	Polymer feed pump failure	Increased turbidity, Ineffective removal of pathogens, Potential AWQI	Redundancy (1 back-up pump) with automatic switchover, Operator inspections (tank levels, calculate dosage),				**YES – Mandatory CCP**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				Scheduled maintenance activities, Chemical pump failure alarm, Plant shutdown when both pumps fail, EEP for Chemical Pump Failure, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				
Filtration Process (primary disinfection)	2, 10	Filter breakthrough	Increased turbidity, Ineffective removal of pathogens, potential for AWQI	On-line monitoring of filter effluent turbidity, Alarm on high turbidity, Regular backwashes, Scheduled maintenance activities, Filter shut-down on high turbidity, Visual inspection of media, EEP for High Turbidity, EEP for Reporting Adverse Water Quality, CP for Unsafe Water				**YES – Mandatory CCP**
Filtration Process (primary disinfection)	10	Backwash system failure	Increased turbidity, Ineffective removal of pathogens, Potential for loss of treated water supply, Potential AWQI	Pump failure alarms, Back up pump available, On-line monitoring, Filter shut-down on high turbidity, Scheduled maintenance activities, Alternate system for backwashing (manual), BCA alarm, EEP for Backwash Failure,				**YES – Mandatory CCP**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				EEP for High Turbidity EEP for Reporting Adverse Water Quality, EEP for Water Supply Shortage, CP for Unsafe Water.				
Filtration Process (primary disinfection)	10	Blower Failure	Backwash system failure and increased turbidity, Potential AWQI	Back up blower available, Maintenance activities, Plant shuts down on blower failure, EEP for High Turbidity EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				**YES – Mandatory CCP**
Filtration Process (primary disinfection)	10	Turbidity analyzer failure	Unknown turbidity levels, Potential for AWQI	Scheduled maintenance activities, Operator inspections, Analyzer fault alarm and filter lock out, Manual readings every 15 minutes if analyzer fails, Back-up analyzer available within region, EEP for Turbidity Analyzer Failure, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				**YES – Mandatory CCP**
Filtration Process (primary disinfection)	10	De-sludge valve failure	Plugged filter and potentially high turbidity, Potential AWQI	Manually open valve, Continuous turbidity monitoring, High turbidity alarm,				**YES – Mandatory CCP**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				Maintenance activities, ~~valve checked weekly,~~ Manual backwash available, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				
Filtration Process (primary disinfection)	10	Backwash, effluent and filter to waste filter valve failures	Backwash failure, Loss of water, Inability to filter to waste, Potential AWQI	Regular maintenance activities, Turbidity monitoring, Alarms, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				**YES – Mandatory CCP**
Clearwells (primary disinfection)	2, 10	Low level	Inadequate contact time for primary disinfection Inadequate treated water supply, Potential AWQI	Redundancy (2 clearwells), Schedule maintenance and inspection activities, Low level clearwell alarm, Town ordered water conservation or ban, EEP for Clearwell – Low Level, EEP for Water Supply Shortage, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				**YES – Mandatory CCP**
Clearwells (primary disinfection)	10	Clearwell out of service for repair, maintenance	Inadequate contact time for primary disinfection, Potential AWQI	Two-celled clearwell with isolation valves, Increase chlorine dosage into clearwell,				**YES – Mandatory CCP**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				Schedule controlled maintenance plan, SOP for Clearwell Isolation, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				
Clearwells (primary disinfection)	2, 10	Compromised, loss of structural integrity	Loss of water supply, Inadequate CT for primary disinfection, Inadequate fire protection. Infiltration, Potential AWQI	Tower has approximately 3 days supply to allow for repairs, Maintenance and inspection activities, Low clearwell level alarm, Town ordered water conservation or ban, EEP for Water Supply Shortage, EEP for Reporting Adverse Water Quality, CP for Loss of Service CP for Unsafe Water.				**YES – Mandatory CCP**
Sodium Hypochlorite System (primary disinfection)	10	Sodium Hypochlorite feed pump failure	Loss of disinfection, Low chlorine residual, Inadequate inactivation of pathogens, Potential for AWQI	Redundancy (1 duty and 1 back-up pump), On-line monitoring with alarms, In-house residual testing and dosage calculations, Scheduled maintenance activities, Spare pumps are also available within the Region, EEP for Sodium Hypochlorite Pump Failure,				**YES – Mandatory CCP**

SUMMARY OF RISK ASSESSMENT OUTCOMES

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Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				EEP for Low or High Chlorine Residual in Treated Water, Site specific Standard Operating Procedure (SOP) for CT, CT spreadsheet, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				
Sodium Hypochlorite System (primary disinfection)	10	Chlorine analyzer failure	Unknown chlorine residual levels, Potential for AWQI	Low chlorine residual alarm, In-house residual testing (5 minutes), Scheduled maintenance activities, Back-up analyzers available in the Region, Plant shuts down if analyzer fails, SOP for CT, CT spreadsheet EEP for Free Chlorine Analyzer Failure EEP for Reporting Adverse Water Quality, CP for Unsafe Water				**YES – Mandatory CCP**
Sodium Hypochlorite System (primary disinfection)	2, 3, 10	Low supply of sodium hypochlorite	Inadequate disinfection, Potential for AWQI	Operator checks, Chemical available within Region, Low chlorine residual alarm, SOP for CT, EEP for Reporting Adverse Water Quality, CP for Unsafe Water				**YES – Mandatory CCP**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
High Lift Pumps	2, 7	High lift pump failures	Low pressure/supply in distribution system, Possible contamination due to infiltration	Redundancy (2 pumps), Scheduled maintenance activities, Operational control, On-line monitoring of discharge pressure, Alarms for low pressure, Tower provides pressure and supply when high lifts are off, EEP for High Lift Pump Failure, EEP for Low or Loss of Pressure Events in the Distribution System, EEP for Water Supply Shortage.	2	4	8	**NO**
Tower	2	Tower out of service for repair or maintenance	Lowered firefighting capability	Supply water from clearwells, Scheduled controlled maintenance plan, EEP for Tower Low Level, EEP for Water Supply Shortage.	2	3	6	**NO**
Tower	2	Loss of structural Integrity due to collapse, break, leak	Contamination, Loss of pressure to the distribution, Loss of treated water supply, Inadequate fire protection	Alarms - low level Regular on-site checks by operational staff, Bypass Tower to supply Town, Town ordered water conservation or ban (alternate source of water), EEP for Water Supply Shortage	1	4	4	**NO**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Water Treatment System/Plant	2, 3, 6, 7, 10, 11	Fire in Plant or at Tower (accidentally or intentionally)	Partial or full shutdown, Loss of service and water supply, Damage to SCADA and critical equipment	Regular operator visits, Alarms, EEP for Fire in Facilities, EEP for Water Supply Shortage.	1	5	5	**NO**
Water Treatment System/Plant	1, 2, 3, 4, 6, 10	Power failure	Loss of treated water supply, Potential loss of equipment	Back-up diesel generator, Scheduled maintenance activities for back-up generator Power failure alarm, Low pressure alarm, EEP for Hydro Interruption, EEP for Power Failure of Long Duration	4	2	8	**NO**
Water Treatment System/Plant	1, 2, 3, 4, 6, 10	Standby power failure (accidentally or vandalism/terrorism)	Loss of treated water supply, Potential loss of equipment	Power failure alarm, Scheduled maintenance activities for generator, Portable generator available within the NEO Region (within 4-8 hours), Tower (Back up supply), EEP for Standby Power Failure, CP for Loss of Service	2	4	8	**NO**
Water Treatment System	2, 6, 10, 11	SCADA/PLC failure (accident or vandalism/terrorism)	Loss of automatic process control, Interruption or loss of data and trending, Loss of process visibility for operators	Loss of communication alarm, Spare I/O cards, Spare power supplies available in the cluster, SCADA system password protected, Multi-level protection,	2	3	6	**NO**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				Data is backed-up on an external storage devices, Data also backed-up on BTP/ Wonderware, Facility locked when no personnel on site, Qualified personnel (Instrumentation Technician) available.				
Water Treatment System/Plant	6, 10, 11	Vandalism/terrorism at Water Treatment Plant or Tower	Contamination of the water supply, Damage to critical equipment	Locked (water plant, tower), Security alarm at water plant, Appropriate signage and lighting, Regular visits by operational staff, Water conservation or ban (alternate source of drinking water), EEP for Vandalism or Suspected Unauthorized Entry, EEP for Contamination of Treated Water, EEP for Water Supply Shortage, CP for Spill, Response, CP for Loss of Service, CP for Security Breach	2	4	8	**NO**
Water Treatment System/Plant	1	Pandemic	Shortage of staff, Supply shortages, Loss of sample locations	Staff training and PPE, OCWA's Emergency Operations Center/Action Group (EOC), Staff isolation, staff rescheduling, modifications to work rounds, remote work done where possible, Alternate suppliers available, refer	2	4	8	**NO**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				to Essential Services & Suppliers List, EEP – Temporary Relief during Emergencies, CP for Critical Shortage of Staff				
Water Treatment System/Plant	13	Cybersecurity threats (PDM, WMS, SCADA, Wonderware, e-logbook)	Loss of system process visibility for operators (e.g., unable to monitor treatment processes), Interruption of data recording leading to a loss of critical/ compliance data, Inability to remotely control processes and/or loss of automatic control, Installation of malicious programs like ransomware which can disable business enterprise until money is paid, Loss of data (stolen or maliciously deleted)	Embedded system security include: Implementing Identity and Access Management throughout the account management lifecycle. Privileges are granted to users with two principles – need to know and least privileges. Users are assigned only the privileges they need to perform their job. Employing default to fail secure. The application or system failure will cause little or no harm to other systems. Data will not fall into the wrong hands. Applying multiple layers of defense including: o Multi factor authentication o Intrusion detection systems constantly monitoring traffic flow (borders) o Firewalls that provide real-time filtering and blocking (walls) o Cryptography and layered authentication (zones) o Certified professionals ensuring system integrity (gatekeepers)	2	4	8	**NO**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				Constant monitoring and tracking for quick and effective response to attacks, Perform routine vulnerability scans and threat assessments, Carry out periodic cyber security audits and risk compliance checks				
Water Treatment System/Plant	1, 2, 3, 4, 9, 10, 11	Natural Disasters (ice storm, wind storm, flooding, forest fire, lightning strikes)	Loss of supply, Loss of communication, Loss of power, Potential contamination	Contingency Plans, Emergency Procedures, OCWA's Emergency Response Plan, Municipality's Emergency Response Plan, Staff training.	2	4	8	**NO**
Distribution System (secondary disinfection)	11	Loss of residual in distribution	Failure to control biofilm and pathogens (long term), Potential AWQI	Continuous on-line monitoring of chlorine residual into the distribution system, Distribution chlorine residual testing as per O. Reg. 170/03, Regulatory scheduled maintenance, Alarms for low/high chlorine residual in water entering distribution system with plant shut down on a pre-selected low chlorine level, SOP for Secondary Disinfection Critical Control (CCL) Response, EEP for Reporting Adverse Water Quality, CP for Unsafe Water				**YES – Mandatory CCP**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Distribution System	1, 3, 4, 11	Adverse Water Quality Result as described in O. Reg. 170/03 (eg. Bacteriological, THMs, HAAs)	Potential for unsafe drinking water	Site specific Sampling Schedule, EEP for Reporting Adverse Water Quality, CP for Unsafe Water	3	4	12	**NO** – does not meet all criteria in step 3.3.7 of OP-07. No control of the hazard
Distribution System (system pressure)	1, 2, 3, 4, 6, 7	Major fire (accidentally or intentionally)	Contamination, Loss of pressure, Potential AWQI	Emergency management, Notification /communication with fire department, Redundancy; 2 high lift pumps, Monitoring of flows, pressure, and clearwell and tower levels, Tower (water supply), EEP Fire in Municipality, EEP for Low or Loss of Pressure, EEP for Water Supply Shortage, EEP for Reporting Adverse Water Quality, CP for Unsafe Water	3	3	9	**NO**
Distribution System (watermains)	1, 2, 3, 4, 6, 7, 8	Structural failure/breaks (accidently, weather, age or intentionally)	Contamination, loss of pressure, Loss of pressure/supply, Road damage, Potential AWQI	Notification/complaints from consumers, Routine monitoring of flows, clearwell and tower levels, Alarms (high flows, low pressure, low clearwell or tower), Maintenance program, AWWA Standards and Ministry's Watermain Disinfection Procedure,	3	3	9	**NO**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				EEP for Low or Loss of Pressure, EEP for Water Supply Shortage, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				
Distribution System (hydrants) .	1, 2, 3, 4, 6, 7, 8	Structural failure/ component failure, due to accident, weather, age, vandalism	Contamination, Loss of pressure, Loss of supply, Inadequate fire protection, Road damage, Potential AWQI	Customer notification/complaints, Routine monitoring of flows, clearwell and tower levels, Alarms (high flows, low pressure, low clearwell, low tower), Inspection and maintenance program, AWWA Standards and MECP's Watermain Disinfection Procedure, EEP for Low or Loss of Pressure, EEP for Vandalism, EEP for Water Supply Shortage, EEP for Reporting Adverse Water Quality, CP for Unsafe Water	3	2	6	**NO**
Distribution System (valves)	1, 2, 3, 4, 6, 7, 8	Structural failure due to accident, weather or age, vandalism	Loss of control, Contamination, Loss of pressure, Potential AWQI	Consumer notification/complaints, Routine monitoring of flows, pressure, clearwell and tower levels, Alarms (high flows, low pressure, low clearwell or tower), Maintenance program - valve cycling, AWWA Standards and Ministry's Watermain Disinfection Procedure,	3	2	6	**NO**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				EEP for Low or Loss of Pressure, EEP for Vandalism, EEP for Reporting Adverse Water Quality, CP for Unsafe Water				
Distribution System (service connections)	8	Cross-connection, backflow, siphonage	Contamination, Potential AWQI	Consumer notification/complaints, Distribution system microbiological testing, Municipal by-law, EEP for Reporting Adverse Water Quality, CP for Unsafe Water	1	4	4	**NO**
Distribution System (service connections)	1, 2, 3, 4, 6, 7, 8	Structural failure/breaks due to accident, weather, age, vandalism	Contamination, Loss of pressure or supply to affected users, Potential AWQI	Consumer notification/complaints, EEP for Reporting Adverse Water Quality, CP for Unsafe Water	3	3	9	**NO**
Distribution System Flushing (clean piping, remove accumulation)	11	Failure to flush	Contamination, Potential AWQI	Maintenance program (bi-annual flushing, Procedures for flushing, Staff training, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.	2	2	4	**NO**
Distribution System (new construction)	11	Sub-standard construction and/or commissioning	Contamination, Loss of Pressure, Potential AWQI	AWWA guidelines, Ministry's Watermain Disinfection Procedure, Provincial Standards Staff training,	1	4	4	**NO**

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 3)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				Sampling and testing, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.				
Distribution System (temporary water distribution system put in place during construction)	11	Infiltration	Contamination, Potential AWQI	AWWA guidelines, Ministry's Watermain Disinfection Procedure, Provincial Standards Staff training, Sampling and testing, EEP for Reporting Adverse Water Quality, CP for Unsafe Water.	2	4	8	**NO**

Table 2 - Identified Critical Control Points (CCPs)

CCP	Critical Control Limits	Monitoring Procedures	Response, Reporting and Recording Procedures
Filtration Process (primary disinfection)	**Filter Effluent Turbidity Alarms (Filters 1-2)** High set point = 0.8 NTU High high set point = 1.0 NTU (filter shut-down) Automatic backwash initiated at 0.5 NTU **Alum, Soda Ash and Polymer Feed System** If both pumps fail an alarm is initiated and plant shuts down	• SCADA (continuous online analyzers) • Daily operator checks including dosage calculations • Redundancy (2 filters) • Trend review and sign-off as per O. Reg. 170/03	Refer to: • EEP for High Turbidity, • EEP for Turbidity Analyzer Failure, • EEP for Chemical Pump Failure, • EEP for Backwash Failure (Filters) • EEP for Reporting Adverse Water Quality • CP for Unsafe Water
Sodium Hypochlorite System (primary disinfection)	**Free Chlorine Residual Alarms - Treated Alarms** Low set point ≥1.1 mg/L High set point = 3.50 mg/L	• SCADA (continuous online analyzers) • Daily operator checks including dosage calculations • Trend review and sign-off as per O. Reg. 170/03	Refer to: • SOP for CT (Chlorine Concentration x Time) • CT Spreadsheet to calculate CT • EEP for Sodium Hypochlorite Pump Failure • EEP for Free Chlorine Analyzer Failure • EEP for Low or High Chlorine Residual in Treated Water • EEP for Reporting Adverse Water Quality • CP for Unsafe Water
Clearwell (primary disinfection)	**Clearwell Level Alarms – Plant** Clearwell No. 1+2: Low set point = 2.20 m	• SCADA (continuous online analyzers) • Daily operator checks	• SOP for CT (Chlorine Concentration x Time) • CT Spreadsheet to calculate CT

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

CCP	Critical Control Limits	Monitoring Procedures	Response, Reporting and Recording Procedures
		• Trend review and sign-off as per O. Reg. 170/03	• EEP for Water Supply Shortage • EEP for Clearwell – Low Level • EEP for Reporting Adverse Water Quality • CP for Unsafe Water
Secondary Disinfection	**Free Chlorine Residual - Distribution** Low = 0.2 mg/L High = 4.0 mg/L	• Distribution chlorine residuals monitored as per O. Reg. 170/03	Refer to: • SOP for Secondary Disinfection Critical Control (CCL) Response, • EEP for Reporting Adverse Water Quality, • CP for Unsafe Water

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Table 3: Potential Hazardous Event/Hazard Reference Numbers (based on the Ministry's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" dated April 2022). If the hazardous event/hazard is not applicable to this drinking water system (DWS), it will be noted in the first column of this table.

System Type (indicate all that apply to this DWS)		Reference Number	Description of Hazardous Event/Hazard
X	All Systems	1	Long Term Impacts of Climate Change
X	All Systems	2	Water supply shortfall
X	All Systems	3	Extreme weather events (e.g., tornado, ice storm)
X	All Systems	4	Sustained extreme temperatures (e.g., heat wave, deep freeze)
X	All Systems	5	Chemical spill impacting source water
X	All Systems	6	Terrorist and vandalism actions
X	Distribution Systems	7	Sustained pressure loss
X	Distribution Systems	8	Backflow
X	Treatment Systems	9	Sudden changes to raw water characteristics (e.g., turbidity, pH)
X	Treatment Systems	10	Failure of equipment or process associated with primary disinfection (e.g., coagulant dosing system, filters, UV system, chlorination system)
X	Treatment Systems and Distribution Systems providing secondary disinfection	11	Failure of equipment or process associated with secondary disinfection (e.g., chlorination equipment, chloramination equipment)
X	Treatment Systems using Surface Water	12	Algal blooms
X	All Systems	13	Cybersecurity threats

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Table 4 - Record of Annual Review/36-Month Risk Assessment

The Drinking Water Quality Management Standard (DWQMS) requires that the currency of the information and the validity of the assumptions used in the risk assessment be verified at least once a year. In addition, the risk assessment must be conducted at least once every thirty-six months. Refer to OP-07 and OP-08.

Date of Activity	Type of Activity	Participants	Summary of Results
2009-08-11	Risk Assessment	Amanda Dubuc (PCT), Ilona Bruneau (PCT), Michael Del Monte (Operations Manager), Ed Hillman (ORO)	Conducted initial risk assessment.
2009-08-31	Review	Amanda Dubuc (PCT)	Desktop review prior to submission of Partial Accreditation application. No changes.
2010-07-13	Review	Amanda Dubuc (PCT), Eric Nielson (Senior Operations Manager)	Review during Internal Audit. No changes.
2010-10-14	Review	Amanda Dubuc (PCT), Eric Nielson (Senior Operations Manager), Michael Del Monte (Operations Manager), Tony Janssen (Senior Operations Manager)	Review during management review meeting. No changes.
2011-09-15	Review	Amanda Dubuc (PCT), Ilona Bruneau (PCT), Eric Nielson (Senior Operations Manager), Michael Del Monte (Operations Manager), Tony Janssen (Senior Operations Manager), Claude Mongrain (ORO)	Review during Internal Audit. No changes.
2011-12-20	Review	Amanda Dubuc (PCT), Eric Nielson (Senior Operations Manager), Michael Del Monte (Operations Manager), Tony Janssen (Senior Operations Manager)	Review during management review meeting. No changes.
2012-08-30	Risk Assessment	Amanda Dubuc (PCT), Claude Mongrain (ORO)	Conducted risk assessment. Several changes; see revision history.
2012-12-04	Review	Amanda Dubuc (PCT), Eric Nielson (Senior Operations Manager), Michael Del Monte (Operations Manager), Tony Janssen (Senior Operations Manager)	Review during management review meeting. No changes.
2013-09-26	Review	Amanda Dubuc (PCT), Patrick Dinel (Operator)	Review during Internal Audit. Changes to Table 2.

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Date of Activity	Type of Activity	Participants	Summary of Results
2013-10-29	Risk Assessment	Amanda Dubuc (PCT), Claude Mongrain (ORO)	Conducted risk assessment. Several changes; see revision history.
2014-11- 27	Review	Ilona Bruneau (PCT), Rebecca Marshall (PCT), Claude Mongrain (ORO)	Reviewed during Internal Audit. No changes
2015-09-30	Review	Rebecca Marshall (PCT), Claude Mongrain (ORO)	Reviewed during Internal Audit – no changes/updates
2016-09-20	Risk Assessment Re-Do & Review	Rebecca Marshall (PCT), Claude Mongrain (ORO), Pat Dinel, Chris Barkhouse, Ed Hillman, Rico Guindon	Conducted risk assessment during the internal audit. See revision history for changes
2017-09-19	Review	Rebecca Marshall (PCT), Claude Mongrain (ORO)	Reviewed. No changes.
2018-10-31	Review	Joshua Gravelle (PCT), Bryce Logan (ORO)	Reviewed. No changes.
2019-09-11	Risk Assessment Re-Do & Review	Rebecca Marshall (PCT), Bryce Logan (ORO) & Vic Legault (Sr Ops Manager)	Conducted risk assessment. See revision history for changes
2020-12-01	Review	Rebecca Marshall (PCT)	Reviewed. No changes.
2021-11-26	Annual Review	Rebecca Marshall (PCT), Bryce Logan (ORO)	Reviewed. No changes.
2022-12-12	Risk Assessment	April Swanson (PCT), Bryce Logan (ORO) & Vic Legault (Sr Ops Manager)	Conducted risk assessment. See revision history for changes
2023-06-14	Annual Review	Ilona Bruneau (PCT)	Table 1– changed Adverse Reporting Procedures to new updated procedure that captures all adverse water quality incidents. Added procedures and contingency plans to selected hazards, added clearwell and tower integrity as a potential hazard. Added fire in the plant as a potential hazard and cross-connection, backflow and siphonage as potential hazards with service connections. Updated distribution system hazards and made minor formatting changes. Table 2 – Updated CCLs for turbidity and added filter and plant shutdown feature. Updated Response, Reporting

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Date of Activity	Type of Activity	Participants	Summary of Results
			and Recording procedures for the filtration process, sodium hypochlorite system and clearwells.
2023-06-28	Annual Review of Critical Control Points	Cassandra Legros (Operator), Matt Del Monte (Operator)	Table 2 - Updated critical control limits as per review during internal audit. Added shutdown feature for filtration process and added high turbidity alarm at 0.9 NTU.
2024-08-26	Annual Review	Ilona Bruneau (PCT/QEMs Representative), B. Logan (SOM/ORO)	Table 1 – added weekly visual checks as a control measure to the Algae Bloom hazard, changed the word chlorine to sodium hypochlorite under the primary disinfection procedure, added the EEP for Water Supply Shortage to the Intake Breakage/Blockage and Fire in Plant hazard and added the EEP for Fire in Municipality To the Major Fire hazard. Table 2 – change the low CCL for secondary disinfection (distribution chlorine residuals) from 0.05 mg/L to 0.2 mg/L and identified an SOP for Secondary Disinfection Critical Control Limit (CCL) Response
September 10, 2025	36 month Risk Assessment	Ilona Bruneau (PCT/QEMs Representative), Cassie Legros (Operator/Electronic Technician), Bryce Logan (Sr. Operations Manager)	Table 1 – Included SCADA/PLC failure and natural disasters as potential hazardous events. Added accidentally or intentionally to several hazards where appropriate. Added additional information to the description of the hazard where needed. Reviewed control measures and updated with additional operational tasks, procedures, alarms, plant features where needed. Added new EEP for Temporary Relief during Emergencies to the Pandemic hazard. Reviewed and updated selected possible outcomes. Removed failure of the catch-all distribution components as they are captured individually. Reviewed rankings and made changes to selected hazards.

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Date of Activity	Type of Activity	Participants	Summary of Results
			Table 2 – Filtration Process: added set point when a backwash is initiated. Sodium Hypochlorite System: changed low set point to ≥1.1 mg/L to reflect the new requirement in the MDWL. Clearwell: removed high set point.

Revision History

Date	Revision	Description of Revision
2009-08-11	0	Initial risk assessment conducted
2011-09-07	1	Template revised to include 'Record of Annual Review/36-Month Risk Assessment' (Table 3)
2012-10-30	2	Removed 'beaver activity/lagoon surcharge' and added 'online pH, temperature and turbidity monitoring' in the source/intake process step, removed 'note' under polymer feed pump, added 'visual inspection of media, second filter has to be run in manual' control measure to filter breakthrough, added 'BCA alarm' control measure to backwash system failure, added 'desludge valve failure' as a hazardous event with the filtration process step, changed clearwell redundancy from 3 to '2', fixed a typo under clearwell hazardous event, added 'reporting procedures' control measure to the sodium hypochlorite process step, re-ranked the likelihood and consequence for tower out of service, added 'tower provides pressure and supply when high lifts off' control measure to high lift failure, removed 'low fuel level alarm' and re-ranked the likelihood and consequence for power failure, added 'standby power failure' as a hazardous event with the water treatment system process step, added 'Soda Ash and Polymer Feed' in Table 2 as part of the filtration process CCP, and changed Operations Manager title to Senior Operations Manager and Cluster Manager title to Operations Manager in Table 3.
2013-06-24	3	Added review during management review meeting to Table 3.
2013-08-09	4	Updated the CCP set points in Table 2 to reflect the actual set points at the water treatment plant and in response to the non-conformance item from the onsite external audit.
2013-10-29	5	Added risk assessment processes for the distribution system, as the two systems (treatment and distribution) are under one operating authority. Changed the system name to Temagami Drinking Water System.
2017-06-19	6	Added Blower failure as a hazardous event under filtration. Added spare pumps as a control measure to chlorine feed failure. Changed chlorine low set point to ≥1.0 from 0.92.

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: I. Bruneau, QEMS Representative	Approved by: B. Logan, Sr. Operations Manager

Date	Revision	Description of Revision
2018-10-31	7	Updated clearwells to a critical control point and updated table 2 to include clearwell and relevant EEP/SOPs with alarm set points.
2019-09-19	8	Added Table 3 and column to indicate which of the MOECCs Potential Hazardous Events have been considered for each event. Decreased risk value for the following events: Spill at Intake, low lift pump failure, high lift pump failure, power failure, stand by power failure and watermain structural failure. The risk value for Major fire was increased. Added Vandalism & Terrorism under Water Treatment System. Added regular inspections as a control measure for Breakage of intake pipe, removed 2 backwash pumps as a control measure for blower failure, added back up meter for turbidity meter failure, added CW Isolation SOP as control measure for CW out of Service, added plant shut down to chlorine analyzer failure, added Genset low fuel alarm to Power Failure, added tower to Stand by Power Failure, added valve cycling as control measure for valve failure, added redundancy (2 HL pumps) and tower to Major Fire added WM disinfection SOP and training for Sub-standard New Connections. Added section for backwash, effluent and filter to waste valve failure under filtration. Added Chemical adjustments to control measures for spring/fall turnover. Added Plant shut down if blower fails to control measures for blower failure. Added Valve checked weekly & Manual backwash available to desludge valve failure under filtration. Added Plant shuts down if analyzer fails to sodium hypo analyzer failure.
2020-12-01	9	Updated Table 4.
2021-11-26	10	Updated Table 4
2022-07-13	11	Added: cybersecurity threats" to Table 4 (new Ministry requirement), Replaced: MOECC with Ministry (Ministry refers to the Ontario government ministry responsible for drinking water and environmental legislation); Updated revision date of Ministry's document "Potential Hazardous Events for Municipal Residential Drinking Water Systems" to April 2022 (previously February 2017); updated table 1 to include cybersecurity threats. Added possible outcomes and existing control measures. Added Pandemic and possible outcomes and existing control measures.
2022-12-12	12	Removed "redundancy" and back up filter as Existing Control Measures" because the second plant can no longer be run. Some minor changes to the likelihood and consequence were made.
2023-10-10	13	Revised summary based on results of the June 14th and June 28th, 2023 reviews.
2024-08-27	14	Revised summary based on results of the August 26, 2024 review.
2025-09-15	15	Revised summary based on the results of the 36 monthly risk assessment performed in September 2025.

ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

Reviewed by: I. Bruneau, QEMS Representative	Approved by: B. Logan, Sr. Operations Manager

1. Purpose

To document the following for the Temagami Drinking Water Systems:

- Owner;
- Organizational structure of the Operating Authority;
- QEMS roles, responsibilities and authorities of staff, Top Management and individuals/groups that provide corporate oversight; and
- Responsibilities for conducting the Management Review

2. Definitions

Operations Management – refers to the Senior Operations Manager and/or Operations Manager that directly oversees a facility's operations

Senior Leadership Team (SLT) – members include President and CEO, Executive Vice President and General Counsel, Vice Presidents of OCWA's business units and Regional Hub Managers

Top Management – a person, persons or a group of people at the highest management level within an operating authority that makes decisions respecting the QMS and recommendations to the owner respecting the subject system or subject systems

Operations Personnel – Employees of the drinking water system who perform various activities related to the compliance, operations and maintenance of the drinking water system that may directly affect drinking water quality

3. Procedure

3.1 Organizational Structure

The Temagami Drinking Water Systems are owned by the Corporation of the Municipality of Temagami, represented by the Mayor, CAO/Treasurer and Council.

The organizational structure of OCWA, the Operating Authority, is outlined in appendix OP-09A: Organizational Structure.

3.2 Top Management

Top Management for the Temagami Drinking Water Systems consists of:

- Operations Management – Temiskaming Shores Cluster
- Regional Hub Manager – Northeastern Ontario Regional Hub
- Operations Management, Capital Projects – Northeastern Ontario Regional Hub
- Safety, Process & Compliance Manager – Northeastern Ontario Regional Hub

Irrespective of other duties (see Table 9-2 below), Top Management's responsibilities and authorities include:

- Endorsing the Operational Plan as per the Commitment and Endorsement procedure (OP-03);
- Ensuring that the QEMS meets the requirements of the DWQMS;
- Ensuring staff are aware of the applicable legislative and regulatory requirements;
- Communicating the QEMS according to the Communications procedure (OP-12);
- Providing resources needed to maintain and continually improve the QEMS;
- Appointing and authorizing a QEMS Representative (OP-04); and
- Undertaking Management Reviews as per the Management Review procedure (OP-20).

Note: Specific responsibilities of the individual members of Top Management are identified in the referenced procedures.

3.3 Corporate Oversight

Roles, responsibilities and authorities for individuals/groups providing corporate oversight of OCWA's QEMS are summarized in Table 9-1 below.

Table 9-1: Corporate QEMS Roles, Responsibilities and Authorities

Role	Responsibilities and Authorities
Board of Directors	• Set the Agency's strategic direction, monitor overall performance and ensure appropriate systems and controls are in place in accordance with the Agency's governing documents • Review and approve the QEMS Policy
Senior Leadership Team (SLT)	• Establish the Agency's organizational structure and governing documents and ensure resources are in place to support strategic initiatives • Monitor and report on OCWA's operational and business performance to the Board of Directors • Review the QEMS Policy and recommend its approval to the Board • Approve corporate QEMS programs and procedures
Corporate Compliance	• Manage the QEMS Policy and corporate QEMS programs and procedures • Provide support for the local implementation of the QEMS • Monitor and report on QEMS performance and any need for improvement to SLT • Consult with the MOECC and other regulators and provide compliance support/guidance on applicable legislative, regulatory and policy requirements • Manage contract with OCWA's DWQMS accreditation body

3.4 Regional Hub Roles, Responsibilities and Authorities

QEMS roles, responsibilities and authorities of Northeastern Ontario Regional Hub personnel are summarized in Table 9-2 below. This information is kept current as per the Document and Records Control procedure (OP-05) and is communicated to staff as per the Communications procedure (OP-12).

Additional duties of employees are detailed in their job specifications and in the various QEMS programs and procedures that form, or are referenced in, this Operational Plan.

Table 9-2: QEMS Roles, Responsibilities and Authorities for the Regional Hub

Role/Position	Responsibilities and Authorities
All Operations Personnel	• Perform duties in compliance with applicable legislative and regulatory requirements • Be familiar with the QEMS Policy and work in accordance with QEMS programs and procedures • Maintain operator certification (as required) • Attend/participate in training relevant to their duties under the QEMS • Document all operational activities • Identify potential hazards at their facility that could affect the environmental and/or public health and report to Operations Management • Report and act on all operational incidents • Recommend changes to improve the QEMS
Regional Hub Manager (Top Management)	• Oversee the administration and delivery of contractual water/wastewater services on a Regional Hub level • Fulfill role of Top Management • Ensure corporate QEMS programs and procedures are implemented consistently throughout the Regional Hub • Manages the planning of training programs for Regional Hub • Report to VP of Operations/SLT on the regional performance of the QEMS and any need for Agency-wide improvement
Operations Management, Capital Projects (Top Management)	• Provide support to the regional operations teams related to planning and execution of capital projects. • Develop standard processes to provide efficiency when providing capital project related support to clients (internal/external) • Report to the Regional Hub Manager on regional capital project status' • Prepare and manage project budgets, ensuring cost-effectiveness • Develop detailed project plans, including timelines, budgets and resource allocation.
Operations Management (Top Management)	• Manage the day-to-day operations and maintenance of his/her assigned facilities and supervise facility operational staff • Fulfill role of Top Management

ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Role/Position	Responsibilities and Authorities
	• Ensure corporate and site-specific QEMS programs and procedures are implemented at his/her assigned facilities • Determine necessary action and assign resources in response to operational issues • Report to the Regional Hub Manager on facility operational performance • Ensure operational training is provided for the cluster (in consultation with the SPC Manager as required) • May act as Overall Responsible Operator (ORO) when required if holds appropriate certification – same class or higher than the class of the water treatment or water distribution subsystem • May act as alternate ORO if the designated ORO is unable to act when required, if holds applicable certification or if the certification is not more than one class lower than the class of the subsystem and for not more than 150 days in any 12 month period. • Refer to ORO Letter
Safety, Process & Compliance (SPC) Manager (Top Management)	• Supervise facility compliance staff and provide technical and program support to the Regional Hub related to process control and compliant operations • Fulfill role of Top Management • Ensure corporate/regional QEMS programs and procedures are implemented consistently throughout the Regional Hub • Assist in the development of site-specific operational procedures as required • Ensure training on applicable legislative and regulatory requirements and the QEMS is provided for the Regional Hub (in consultation with Operations Management as required) • Monitor and report to the Regional Hub Manager and Operations Management on the compliance status and QEMS performance within his/her Regional Hub and any need for improvement • Act as alternate QEMS Representative (when required)
Process & Compliance Technician - PCT (QEMS Representative)	• Implement, monitor and support corporate programs relating to environmental compliance and support management by evaluating and implementing process control systems at his/her assigned facilities • Fulfill role of QEMS Representative (OP-04) • Monitor, evaluate and report on compliance/quality status of his/her assigned facilities • Implement facility-specific QEMS programs and procedures consistently at his/her assigned facilities • Participate in audits and inspections and assist in developing, implementing and monitoring action items to respond to findings • Report to the SPC Manager on QEMS implementation and identify the need for additional/improved processes and procedures at the

Role/Position	Responsibilities and Authorities
	regional/cluster/facility level (in consultation with the Operations Management as required) • Communicates to Owners on facility compliance and DWQMS accreditation as directed • Deliver/participate in/coordinate training including applicable legislative and regulatory requirements and the QEMS • May fulfil role of Certified Operator when required (based on certification) • May act as Operator-in-Charge (OIC) if holds a Class I or higher certification for a water treatment or water distribution subsystem • May act as Overall Responsible Operator (ORO) if holds appropriate certification – same class or higher than the class of the water treatment or water distribution subsystem • May act as alternate ORO if the designated ORO is unable to act when required, if holds applicable certification or if the certification is not more than one class lower than the class of the subsystem and for not more than 150 days in any 12 month period. • Refer to ORO Letter
Operations Supervisor Water & Wastewater	• Perform duties as assigned by Operations Management • Leads daily plant operations and maintenance activities by assigning and monitoring work and resolving issues • Directly supervises projects, provides direction and supervision to operations/mechanical staff, contractors and consultants • Participate as a technical advisor to staff and management and provide specialized training on technical issues • Oversee maintenance activities on equipment and process in order to maintain compliance with applicable legislation, regulations, approvals, and established procedures • Identifies asset management needs and assist management by providing recommendations for annual capital forecasts and • Gathers information for operational and regulatory reports as required • Monitors and reviews water quality test results • Assist in the preparation of facility manuals and documenting operating processes and procedures for staff • Assist in the procurement, RFQ and RFP process • Act for management during vacations or periodic absences • Perform duties of Operator/Mechanic as required • May act as Operator-in-Charge (OIC) if holds a Class I or higher certification for a water treatment or water distribution subsystem • May act as Overall Responsible Operator (ORO) if holds appropriate certification – same class or higher than the class of the water treatment or water distribution subsystem • May act as Overall Responsible Operator (ORO) if holds appropriate certification – same class or higher than the class of the water treatment or water distribution subsystem

Role/Position	Responsibilities and Authorities
	• May act as alternate ORO if the designated ORO is unable to act when required, if holds applicable certification or if the certification is not more than one class lower than the class of the subsystem and for not more than 150 days in any 12 month period • Refer to ORO Letter
Certified Operator Includes the following positions: • Senior Water & Wastewater Operator • Water & Wastewater Operator • Water & Wastewater Operator-In-Training (OIT)	• Perform duties as assigned by Operations Management or Supervisor • Monitor, maintain and operate facilities in accordance with applicable regulations, approvals and established operating procedures • Collect samples and perform laboratory tests and equipment calibrations as required • Regularly inspect operating equipment, perform routine preventive maintenance and repairs and prepare and complete work orders as assigned • Assist management in providing recommendations for annual capital forecasts and gathering information for operational reports as required • Assist in the review and preparation of facility manuals and operating procedures • Ensure records of adjustments made to the process under their responsibility, equipment operating status during their shifts and any departures from normal operations observed and actions taken are maintained within facility logs/record keeping mechanisms (as per O. Reg. 128) • Participate in facility inspections and audits • May act as Operator-in-Charge (OIC) if holds a Class I or higher certification for a water treatment or water distribution subsystem • May act as Overall Responsible Operator (ORO) if holds appropriate certification – same class or higher than the class of the water treatment or water distribution subsystem • May act as alternate ORO if the designated ORO is unable to act when required, if holds applicable certification or if the certification is not more than one class lower than the class of the subsystem and for not more than 150 days in any 12 month period. • Refer to ORO Letter **NOTE:** OITs cannot act as OIC and/or ORO. OITs perform the above duties under the direction of the OIC/ORO and as assigned by Operations Management or designate.
Instrumentation Technician (UPIT)/SCADA Support/Operator	• Provide advice and technical expertise on the services required for process control and automation systems • Discuss and advise on detailed system and programming requirements, modify existing and new software in response to plant requests, analyze and resolve problems/error conditions, document changes/modifications and configure, install and support related software, hardware and network for such systems

Role/Position	Responsibilities and Authorities
	• Perform repairs, inspections, calibrations, preventive maintenance and/or scheduled maintenance on electrical systems, equipment, components and devices in accordance with established procedures and record the maintenance data • Monitor facility processes through visual inspection, the SCADA system or by taking readings from the process control equipment • Operate and adjust equipment/processes to maintain compliance with applicable legislation, regulations, approvals and established operating procedures • Install and commission new electrical/electronic equipment and automation systems • Performs duties as described under “Certified Operator” • May act as Operator-in-Charge (OIC) if holds a Class I or higher certification for a water treatment or water distribution subsystem • May act as Overall Responsible Operator (ORO) if holds appropriate certification – same class or higher than the class of the water treatment or water distribution subsystem • May act as alternate ORO if the designated ORO is unable to act when required if holds applicable certification or if the certification is not more than one class lower than the class of the subsystem and for not more than 150 days in any 12 month period. • Refer to ORO Letter
Electronics Technician/Operator	• Perform repairs, inspections, calibrations, preventive maintenance and/or scheduled maintenance on electrical systems, equipment, components and devices in accordance with established procedures and record the maintenance data • Monitor facility processes through visual inspection, the SCADA system or by taking readings from the process control equipment • Operate and adjust equipment/processes to maintain compliance with applicable legislation, regulations, approvals and established operating procedures • Performs duties as described under “Certified Operator” • May act as Operator-in-Charge (OIC) if holds a Class I or higher certification for a water treatment or water distribution subsystem • May act as Overall Responsible Operator (ORO) if holds appropriate certification – same class or higher than the class of the water treatment or water distribution subsystem • May act as alternate ORO if the designated ORO is unable to act when required if holds applicable certification or if the certification is not more than one class lower than the class of the subsystem and for not more than 150 days in any 12 month period • Refer to ORO Letter
Asset Maintenance	• Perform duties as assigned by Operations Management

Role/Position	Responsibilities and Authorities
	• Maintain and update the Computerized Maintenance Management System (CMMS) database • Conduct field asset data collection • Develop maintenance plans • Analyze and research maintenance practices, procedures and implement findings • Conduct research and evaluations into emerging technologies, equipment and maintenance methodologies • Provide on-going support and advice to staff on maintenance and maintenance issues • Assist the Capital Manager in the co-ordination and oversight of major maintenance and capital projects
Administrative Support Includes the following: • Regional Hub Business Manager • Administrative Assistants	• Support the administrative functions of the Regional Hub/cluster/facility including coordinating delivery of training as required • Assist with entering operational training records into the appropriate database as directed

4. Related Documents

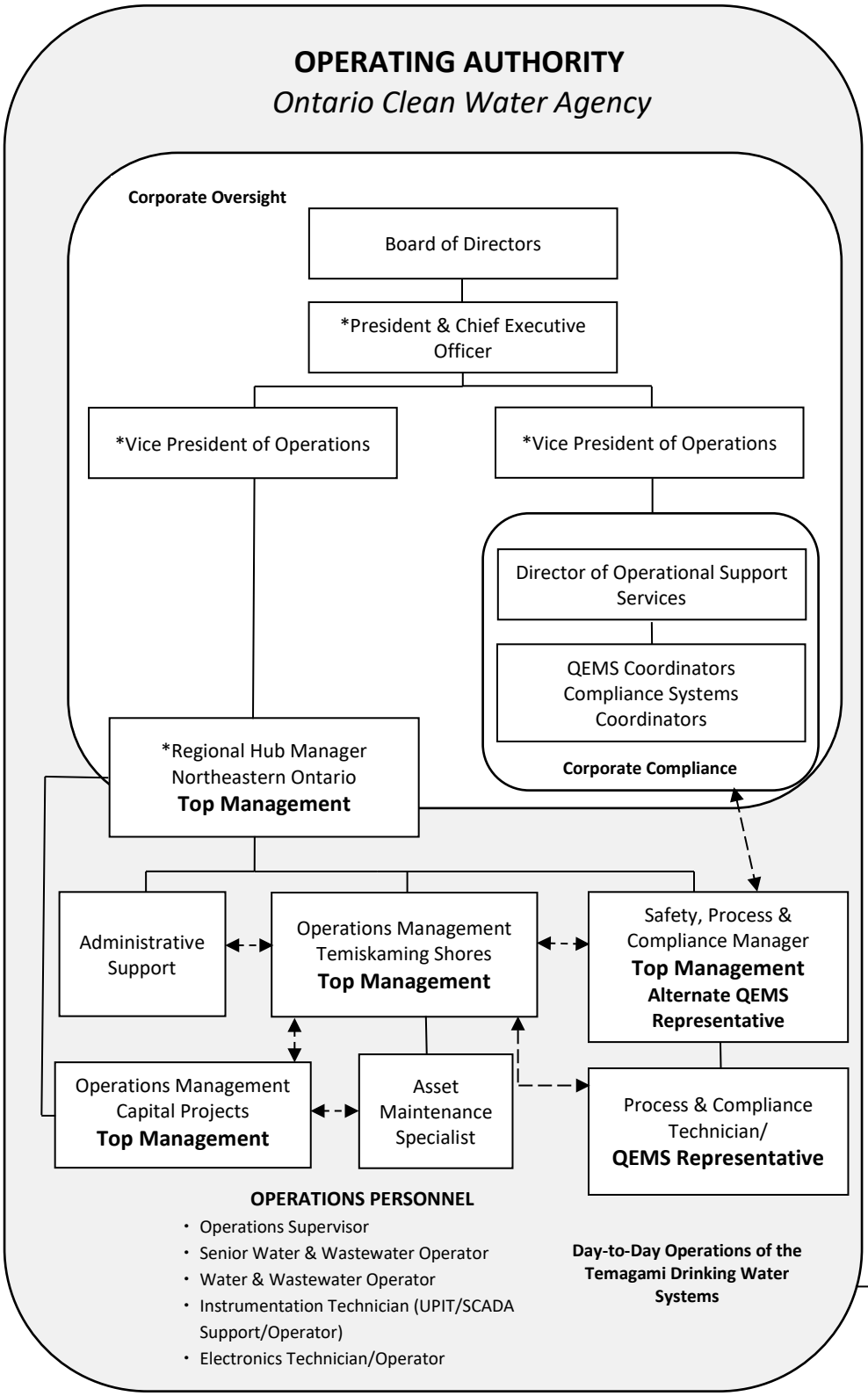
OP-03 Commitment and Endorsement
OP-04 QEMS Representative
OP-05 Document and Records Control
OP-09A Organizational Structure
OP-12 Communications
OP-20 Management Review

5. Revision History

Date	Revision #	Reason for Revision
2019-07-10	0	Procedure issued – Information within OP-09 (s. 3) was originally set out in main body of the Temagami Drinking Water Systems Operational Plan (revision 7, dated June 19, 2017). New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Added definitions for Operations Management and Operations Personnel and throughout procedure replaced 'Senior Operations Manager' references with 'Operations Management'. Incorporated OCWA's new org structure, including SPC Manager. Removed two levels of Top Management (e.g. Facility Level and Corporate level), instead Top Management is only at the facility level and corporate has been moved to Corporate oversight. Re-worded QEMS Roles, Responsibilities and Authorities for each position. Removed foreman and added O&M and capital Team Lead positions
2023-10-10	1	Added responsibilities and authorities for Operations Supervisor, Senior Operator and removed positions of Team Lead - Capital and Team Lead - Operations and Maintenance as these positions have been replaced by Operations Supervisor. Removed position of Overall Responsible Operator (ORO) as this position can be the responsibility of any position listed in the table. Updated responsibilities for UPITs.
2024-03-28	2	Updated procedure to clarify certification requirements when selected personal can act has OIC, ORO or alternate ORO.
2024-08-27	3	Procedure updated with revisions to Table 9-2 as follows: Role/Position updated to clarify roles are performed by multiple positions, position titles updated, note added regarding OITs operating limitations. Added Administrative Support. Removed watermark.
2025-09-15	4	Updated PCT Role to include ORO and added position of Asset Maintenance Specialist.

ORGANIZATIONAL STRUCTURE

Reviewed by: I. Bruneau, QEMS Representative	Approved by: B. Logan, Operations Management



**NOTE: Members of OCWA's Senior Leadership Team (SLT) include*:

- President and CEO & Executive Vice President and General Counsel
- Vice Presidents of OCWA's business units (includes VPs of Operations)
- Regional Hub Managers

OWNER
Municipality of Temagami

Revision History

Date	Revision #	Reason for Revision
Date	**Revision #**	**Reason for Revision**
2010-05-01	0	Organizational Chart issued.
2012-02-23	1	Added media spokesperson .
2013-02-21	2	Removed position of Process and Compliance Manager, changed Operations Manager to Senior Operations Manager, changed Cluster Manager to Operations Manager.
2013-05-24	3	Added Team Lead position.
2014-05-30	4	Changed Director of Risk, Compliance & Training to Director of Operational Services.
2016-09-15	5	Removed Team Lead and added position of Senior Operator.
2017-09-21	6	Added Safety Process and Compliance Manager Position and changed media spokesperson from Senior Operations Manager to Regional Hub Manager.
2019-05-28	7	Appendix issued - Organizational Chart previously contained as Appendix C of the Operational Plan. Moved to a new Appendix. Changed senior operator to Team Lead.
2023-10-10	8	Updated chart to include Operational Supervisor, Senior Operator, and Electronics Technician. Changed Vice President of Engineering, Capital & Support Services to Vice President of Operations.
2024-08-27	9	Revised to include Senior Leadership Team (SLT) in reporting structure and identify members, added Compliance System Coordinators, updated Operations Personnel position titles, added Capital Projects Manager and Administrative Support. Removed watermark.
2025-09-15	10	Added position of Asset Maintenance Specialist.

1. Purpose

To document a procedure that describes:

- the competencies required for personnel performing duties directly affecting drinking water quality;
- the activities to develop and/or maintain those competencies; and
- the activities to ensure personnel are aware of the relevance of their duties and how they affect safe drinking water.

2. Definitions

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

Operations Management – refers to the Senior Operations Manager and/or Operations Manager that directly oversees a facility's operations

Operations Personnel – employees of the drinking water system who perform various activities related to the compliance, operations and maintenance of the drinking water system that may directly affect drinking water quality

Top Management – a person, persons or a group of people at the highest management level within an operating authority that makes decisions respecting the QMS and recommendations to the Owner respecting the subject system or subject systems

3. Procedure

3.1 The following table presents the minimum competencies required by operations personnel.

Role/Position	Required Minimum Competencies
Operations Management (Top Management)	• Valid operator certification required to fulfil certified operator duties (if assigned). • Experience and/or training in managing/supervising drinking water system operations, maintenance, financial planning and administration • Training and/or experience related to drinking water system processes, principles and technologies • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures • Experience using computers and operational computerized systems

COMPETENCIES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Role/Position	Required Minimum Competencies
Safety, Process & Compliance (SPC) Manager (Top Management) (May also fulfill the role of Alternate QEMS Representative)	• Valid operator certification; if required to act as Overall Responsible Operator (ORO), certification must be at the level of the facility or higher • Experience in providing technical support and leading/managing programs related to process control and compliant operations • Experience and/or training in conducting compliance audits, and management system audits • Experience and/or training in preparing and presenting informational and training material • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures • Experience using computers and operational computerized systems
Process & Compliance Technician (PCT) (QEMS Representative)	• Valid operator certification required to fulfil certified operator duties (if assigned) • If required to act as ORO, certification must be at the level of the facility or higher • If required to act as Operator-in-Charge (OIC), certification must be level 1 or higher • Experience and/or training in resolving/addressing compliance issues for drinking water systems • Experience and/or training in monitoring, assessing and reporting on facility performance against legal requirements and corporate goals • Experience and/or training in preparing and presenting informational and training material • Experience in conducting management system audits or internal auditor education/training • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures • Experience using computers and operational computerized systems
Operations Supervisor Water & Wastewater	• Valid operator certification; if required to act as Overall Responsible Operator (ORO), certification must be at the level of the facility or higher Experience and/or training in managing and planning multiple projects, assessing priorities and effectively coordinating operation and maintenance programs • Experience leading/directing operations personnel, and providing technical guidance to resolve operational issues • Training and/or experience related to operations and maintenance of drinking water system processes, principles and technologies

COMPETENCIES

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Role/Position	Required Minimum Competencies
	• Experience and/or training in financial planning and administration • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures • Experience using computers and operational computerized systems
Certified Operator Includes the following: • Senior Water & Wastewater Operator • Water & Wastewater Operator • Water & Wastewater Operator-in-Training	• Valid operator certification • If required to act as ORO, certification must be at the level of the facility or higher • If required to act as Operator-in-Charge (OIC), certification must be level 1 or higher • Training and/or experience in inspecting and monitoring drinking water system processes and performing/planning maintenance activities, • Performs maintenance activities, including preventative, emergency and capital works • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures • Experience using computers and operational computerized systems
Instrumentation Technician (UPIT)/SCADA Support/Operator or Electronics Technician/Operator	• Valid operator certification required to fulfil certified operator duties (if assigned) • If required to act as ORO, certification must be at the level of the facility or higher • If required to act as Operator-in-Charge (OIC), certification must be level 1 or higher • Electrical Engineering diploma and/or Instrumentation Technology diploma • Experience and/or training in monitoring, programming, installing and troubleshooting network, hardware, software and instrumentation • Experience in performing maintenance and repair of electrical and electronic equipment • Experience and/or training in drinking water system processes design, instrumentation, process control and automation systems • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures • Experience using computers and operational computerized systems
Asset Maintenance Specialist	• Valid operator certification • Knowledge of OCWA's QEMS and the DWQMS

Role/Position	Required Minimum Competencies
	• Knowledge of relevant legislation, regulations, codes, policies, guidelines and procedures • Knowledge and application of asset management and project management principles and practices • Knowledge of water treatment maintenance operations and administration • Experience using computers and operational computerized systems (CMMS and WMS)
Administrative Support Includes the following: Regional Business Hub Manager, Administrative Assistants	• Experience and/or training related to procurement and business administration practices • Knowledge of OCWA's QEMS and the DWQMS • Knowledge of relevant legislation, regulations, codes, policies, guidelines and procedures • Experience using computers

3.2 OCWA's recruiting and hiring practices follow those of the Ontario Public Service (OPS). As part of the OPS, minimum competencies, which include education, skills, knowledge and experience requirements, are established when designing the job description for a particular position. As part of the recruitment process, competencies are then evaluated against the job description. Based on this evaluation, the hiring manager selects and assigns personnel for specific duties.

3.3 OCWA's Operational Training Program aims to:

- Develop the skills and increase the knowledge of staff and management;
- Provide staff with information and access to resources that can assist them in performing their duties; and
- Assist OCWA certified operators in meeting the legislative and regulatory requirements with respect to training.

3.4 The Program consists of Director Approved, continuing education and on-the-job training and is delivered using a combination of methods (e.g., traditional classroom courses, e-learning/webinars and custom/program-based courses/sessions). A formal evaluation process is in place for all sessions under the Operational Training Program and is a critical part of the Program's continual improvement.

3.5 Awareness of OCWA's QEMS is promoted during the orientation of new staff, at facility/cluster/regional hub level training sessions and meetings and through OCWA's Environmental Compliance 101 (EC 101) course. All new staff are required to complete the EC 101 course within their first year of joining OCWA. The purpose of the EC 101 course is to ensure staff are aware of applicable legislative and regulatory requirements, to promote awareness of OCWA's QEMS and to reinforce their roles and responsibilities under OCWA's QEMS.

3.6 Staff are also required to complete the training listed in OCWA's Mandatory Training Requirements procedure, based on their position and/or the duties they perform. This list includes mandatory environmental and health and safety compliance training, as well as the training deemed mandatory by OCWA corporate and Ontario Public Service (OPS) policies and is available on OCWA's intranet (sharepoint site).

3.7 Operations personnel also receive site-specific training/instruction on relevant operational and emergency response procedures to ensure effective operational control of processes and equipment which may impact the safety and quality of drinking water.

3.8 As part of OCWA's annual Performance Planning and Review (PPR) process, employee performance is evaluated against their job expectations. Professional development opportunities and training needs (which could include formalized courses as well as site-specific on-the-job training or job shadowing/mentoring) are identified as part of this process (and on an ongoing basis). In addition to this process, OCWA employees may at any time request training from either internal or external providers by obtaining approval from their Manager.

3.9 Certified drinking water operators are responsible for completing the required number of training hours in order to renew their certificates based on the highest class of drinking water subsystem they operate. They are also responsible for completing mandatory courses required by *Safe Drinking Water Act* (SDWA) O. Reg. 128/04 Certification of Drinking Water System Operators and Water Quality Analysts. The Operations Management takes reasonable steps to ensure that every operator has the opportunity to attend training to meet the requirements.

3.10 It is the responsibility of operations personnel to ensure Operations Management are aware of any change to the status/classification of their drinking water operator certificate(s), the validity of their driver's licence (required to hold at a minimum a Class G license which is initially verified upon hire) and/or the validity of any other required certificates/qualifications.

3.11 Individual OCWA employee training records are maintained and tracked using a computerized system, the Training Summary database, which is administrated by OCWA's Learning and Development Department.

4. Related Documents

OCWA's Learning and Development Resources (OCWA Intranet/sharepoint)
OCWA's Mandatory Training Requirements (OCWA intranet/sharepoint)
OCWA's Training Summary Database
Performance Planning and Review (PPR) Database
OP-5 Document and Records Control

5. Revision History

Date	Revision #	Reason for Revision
2019-05-28	0	Procedure issued – Information within OP-10 (s. 3) was originally set out in main body of the Temagami Drinking Water Systems Operational Plan (revision 7, dated June 19, 2017). New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Added definitions for Operations Management and Operations Personnel and throughout procedure replaced 'Senior Operations Manager' references with 'Operations Management'. Modified table in procedure (s. 3.1 and s. 3.2): removed/revised non-measurable competencies, added the word 'minimum' to competencies; removed 'Valid Class G Driver's License' listed under individual positions and referenced in s. 3.11; added competencies for SPC Manager and Data Clerk and merged competencies for Senior Operations Manager and Operations Manager under Operations Management. Updated training sections (s. 3.4 to s. 3.7) to reference new Environmental 101 course, Mandatory Compliance Training list and removed specific references to Orientation Training Program. Added s. 3.11 related to ensuring operators make Operations Management aware of changes to operator certification and other certificates/licenses. Other minor changes to wording. Removed Administration staff.
2023-10-10	1	Added competencies for Operations Supervisor and Senior Operator. Removed position of Team Lead as this position has been replaced by Operations Supervisor. Removed Overall Responsible Operator (ORO) as this position can be the responsibility of any position listed in the table. Updated competencies for UPITs.
2024-03-28	2	Updated procedure to include a statement regarding certification requirements when selected personal can act has OIC, ORO or alternate ORO.
2024-08-27	3	Procedure updated with revisions to table in 3.1 Role/Position updated to clarify roles are performed by multiple positions, updated position titles and added Administrative Support. Updated Procedure to reflect changes to title and content of OCWA's Mandatory Training Requirements Document and added sharepoint. Removed watermark.
2025-09-15	4	Updated PCT Role to include ORO and added position of Asset Maintenance Specialist.

PERSONNEL COVERAGE

1. Purpose

To describe the procedure for ensuring that sufficient and competent personnel are available for duties that directly affect drinking water quality at the Temagami Drinking Water Systems.

2. Definitions

Competency – an integrated set of requisite skills and knowledge that enables an individual to effectively perform the activities of a given occupation *

Essential Services – services that are necessary to enable the employer to prevent,

(a) danger to life, health or safety,
(b) the destruction or serious deterioration of machinery, equipment or premises,
(c) serious environmental damage, or
(d) disruption of the administration of the courts or of legislative drafting.

(*Crown Employees Collective Bargaining Act*, 1993)

3. Procedure

3.1 Operations Management ensures that personnel meeting the competencies identified in OP-10 Competencies are available for duties that directly affect drinking water quality.

3.2 The Temagami Drinking Water Systems are considered un-manned facilities. OCWA certified operations personnel routinely visit the systems at least twice per week between the hours of 0730 and 1600 hours. The facilities are monitored daily using OCWA's remote monitoring SCADA system. OCWA operators are available 24 hours a day, 7 days a week by an alarm system and cell phone.

The Municipality of Temagami Public Works staff conduct visual checks of the distribution system and inform OCWA operations of any problems.

3.3 Operations personnel are assigned to act as and fulfill the duties of Overall Responsible Operator (ORO) and Operator-in-Charge (OIC) in accordance with SDWA O. Reg. 128/04.

Refer to the ORO Letter for current and alternate OROs and to the procedure for the Designation of OICs in the Temiskaming Shores Cluster for a list of OICs. The designated OIC for each shift is recorded in the facility logbook.

3.4 The Senior Operations Manager and/or designate assigns an on-call operator for the time that the facility is un-staffed (i.e.: evenings, weekends and Statutory Holidays). The on-call shift rotates every Monday morning at 0730 hours, unless Monday is a

* Based on the *2005 National Occupational Guidelines for Canadian Water and Wastewater Operators* and International Board of Standards for Training, Performance and Instruction

statutory holiday in which case the change is on Tuesday morning at 0730 hours. The on-call schedule is maintained by the Senior Operations Manager and is available to operators in the Microsoft Outlook shared calendar.

The on-call operator is responsible for responding to the alarm monitoring service within a reasonable time frame. Details of the call-ins are maintained electronically in OCWA Workplace Management System (WMS).

3.5 The alarm system auto dialer is programmed to contact the operator on-call. The operator on-call is responsible for responding to the alarm within a reasonable timeframe. If the nature of the alarm requires additional staff, the on-call operator can request assistance from any of the other certified operators. The on-call operator ensures details of the call-in are documented in the facility logbook. OCWA operators also record details in OCWA's Workplace Management System (WMS/Maximo).

3.6 The Senior Operations Manager and/or designate is responsible for approving vacation time for staff in a manner which ensures sufficient personnel are available for the performance of normal operating duties.

1.1 OCWA's Operations staff are represented by the Ontario Public Service Employees Union (OPSEU). In the event of a labour disruption, the Operations Manager, together with the union, identifies "essential services" required to operate the facility so that the quality of drinking water is not compromised in any way.

1.2 A contingency plan for Critical Shortage of Staff is included in the Facility Emergency Plan. This plan provides direction to staff in the event that there is a severe shortage of staff due to sickness (e.g., pandemic flu) or other unusual situations where personnel might not be available.

2. Related Documents

Call-In Reports (WMS)
Critical Shortage of Staff Contingency Plan (Facility Emergency Plan)
Facility Logbook
Facility Round Sheets
On-Call Schedule
ORO Letter
Vacation Schedule
OP-10 Competencies

3. Revision History

Date	Revision	Reason for Revision
2009-08-31	0	Procedure issued

PERSONNEL COVERAGE

Reviewed by: I. Bruneau, QEMS Representative | Approved by: B. Logan, Sr. Operations Manager

Date	Revision	Reason for Revision
2011-09-07	1	Procedure 5.9 was added to reference contingency planning for Critical Shortage of Staff.
2013-03-13	2	Revised position titles; Operations Manager has been changed to Senior Operations Manager, Cluster Manager has been changed to Operations Manager, Operator has been changed to Operator, and Process Compliance Manager has been removed as the position was discontinued. Changed the coverage start time from 08:00 to 07:30.
2013-10-29	3	Changed name of system to Temagami Drinking Water System to include the distribution system. Added details about the role of the Municipality of Temagami Public Works staff to section 5.2.
2019-05-28	4	QP-03 procedure renamed OP-11. Removed Scope and Responsibilities sections. Other minor edits in wording.
2023-10-10	5	Revised Step 3.2 to include a timeframe for routine visits. Changed the location of the on-call schedule from a paper calendar to an on-line calendar in Step 3.4 and updated how call-outs are documented in step 3.5.
2024-03-28	6	Revised Step 3.2 to reference the procedure for the Designation of OICs.
2024-08-27	7	Changed Operations Supervisor to Operations Manager in Step 3.4. Removed watermark.

COMMUNICATIONS

Reviewed by: I. Bruneau, QEMS Representative	Approved by: B. Logan, Sr. Operations Manager

1. Purpose

To describe the procedure for facility level internal and external QEMS-related communications between Top Management and:

- OCWA staff;
- the Owner;
- essential suppliers and service providers (as identified in OP-13); and
- the public.

2. Definitions

Operations Management – refers to the Senior Operations Manager and/or Operations Manager that directly oversees a facility's operations

Operations Personnel – employees of the drinking water system who perform various activities related to the compliance, operations and maintenance of the drinking water system that may directly affect drinking water quality.

3. Procedure

3.1 Operations Management and the QEMS Representative are responsible for identifying and coordinating any site-specific communications in relation to the status/ development of the facility's QEMS.

3.2 Internal and external communication responsibilities and reporting requirements for emergency situations are set out under OCWA's Emergency Management Program (i.e., Facility Emergency Plan and OCWA's Corporate Emergency Response Plan). Refer to OP-18 Emergency Management for more information.

3.3 Communication with OCWA staff:

3.3.1 Within the first year of hire, all staff are required to complete the Environmental Compliance 101 (EC101) course. The objective of the EC 101 course is to ensure that staff are aware of applicable legislative and regulatory requirements and of OCWA's QEMS and to reinforce their roles and responsibilities under OCWA's QEMS.

3.3.2 Operations Management are responsible for ensuring operations personnel receive site-specific training on the Operational Plan, the organizational structure for the facility including the roles and responsibilities and authorities (outlined in OP-09 Organizational Structure, Roles, Responsibilities and Authorities), QEMS Procedures and other related operating instructions and procedures as part of the orientation process and on an on-going basis as required.

3.3.3 The Safety, Process and Compliance (SPC) Manager is responsible for ensuring training is provided for the Regional Hub (in consultation with Operations Management as required) on applicable legislative and regulatory requirements and the QEMS.

3.3.4 The QEMS Representative assists Operations Management and/or the SPC Manager in the coordination/delivery of training as required.

3.3.5 Revisions to the QEMS and associated documentation are communicated as per OP-05 Document and Records Control.

3.3.6 The QEMS Policy is available to all OCWA personnel through OCWA's intranet and as outlined in 3.6.2 of this procedure.

3.3.7 Operations personnel are responsible for identifying potential hazards at the facility that could affect the environmental and/or public health, and communicating these to Operations Management. They may also recommend changes be made to improve the facility's QEMS by making a request to the QEMS Representative (as per OP-05).

3.3.8 The QEMS Representative is responsible for ensuring that the Operations Management and the SPC Manager are informed regarding the compliance/quality status of the facility and QEMS implementation and any need for improved processes/procedures at the cluster/facility level.

3.3.9 The SPC Manager reports to the Regional Hub Manager on the compliance status, the QEMS performance and effectiveness, any need for improvement and on issues that may have Agency-wide significance. Operations Management reports to the Regional Hub Manager on facility operational performance.

3.4 Communication with the Owner:

3.4.1 The Regional Hub Manager, Operations Management and SPC Manager ensures that the Owner is provided with QEMS updates and that they are kept informed of the status of the facility's operational and compliance performance during regularly scheduled meetings and/or through electronic and/or verbal communications. The QEMS Representative assists in the coordination of these meetings and with communicating the updates as directed.

3.4.2 The continuing suitability, adequacy and effectiveness of OCWA's QEMS are communicated to the Owner as part of the Management Review process (refer to OP-20 Management Review).

3.5 Communications with Essential Suppliers and Service Providers:

3.5.1 Communication requirements to ensure essential suppliers and service providers understand the relevant OCWA QEMS policies, procedures and expectations are described in OP-13 Essential Supplies and Services.

3.6 Communication with the Public:

3.6.1 Media enquiries must be directed to the facility's designated media spokesperson as identified in the Facility Emergency Plan. The media spokesperson coordinates with local and corporate personnel (as appropriate) and the Owner in responding to media enquiries.

3.6.2 OCWA's QEMS and QEMS Policy are communicated to the public through OCWA's public website (*www.ocwa.com*). The QEMS Policy is also posted at the Haileybury Water Treatment Plant.

3.6.3 Facility tours of interested parties must be approved in advance by the Owner. A record of any tour is made in the facility logbook.

3.6.4 All complaints, whether received from the consumer, the community or other interested parties, are documented on a Community Complaint form. As appropriate, Operations Management or the ORO ensures that the Owner is informed of the complaint and/or an action is developed to address the issue in a timely manner. The QEMS Representative ensures that consumer feedback is included for discussion at the Management Review.

4. Related Documents

Community Complaint Form
Emergency Response Plan
Facility Emergency Plan
OP-05 Document and Records Control
OP-09 Organizational Structure, Roles, Responsibilities and Authorities
OP-13 Essential Supplies and Services
OP-18 Emergency Management
OP-20 Management Review

5. Revision History

Date	Revision	Reason for Revision
2009-08-31	0	Procedure issued
2011-09-07	1	Correction of some employee titles and update to Procedure 5.2 to include information how revisions are communicated

Date	Revision	Reason for Revision
2013-03-13	2	Revised position titles; Operations Manager has been changed to Senior Operations Manager, Cluster Manager has been changed to Operations Manager, Operator has been changed to Operator, and Process Compliance Manager has been removed as the position was discontinued
2013-10-29	3	Changed name of system to Temagami Drinking Water Systems to include the distribution system
2017-06-19	4	Added quarterly operations report to Related Documents
2019-05-28	5	QP-04 procedure renamed OP-12. Removed Scope and Responsibilities sections. Added definitions for Operations Management and Operations Personnel. Reordered and created separate sections to clarify communications to each of the 4 parties. Clarified suppliers were those listed as essential as per Element 13 (as per DWQMS v. 2.0) and replaced references to Senior Operations Manager with 'Operations Management'. Updated training sections for OCWA personnel (s. 3.3.1 to s. 3.3.4) to reference new Environmental Compliance 101 course completed within first year of hire and to outline how training is coordinated between SPC Manager/Operations Management, and QEMS Representative. Included sections on R&Rs for performance reporting within OCWA (s. 3.3.7 to s. 3.3.9) and to Client (3.4.1). Replaced identification of media spokesperson (s. 3.6.1) with 'as identified in Facility Emergency Plan'. Added reference to site-specific records/documents used for recording tours (s. 3.6.3). Other minor edits.
2024-08-27	6	Procedure revised to reference updated title of Corporate Emergency Response Plan, to add the link to OCWA's public website and to correct the location of the posted QEMS policy. Removed watermark.

ESSENTIAL SUPPLIES AND SERVICES

1. Purpose

To describe OCWA's procedures for procurement and for ensuring the quality of essential supplies and services.

2. Definitions

Essential Supplies and Services – supplies and services deemed to be critical to the delivery of safe drinking water

3. Procedure

3.1 Essential supplies and services for the Temagami Drinking Water Systems are contained in the Facility Emergency Plan on the Essential Supplies and Services List. The list is reviewed at least once every calendar year by the QEMS Representative and/or designate and updated as required.

3.2 Purchasing is conducted in accordance with OCWA's Corporate Procurement and Administration policies, procedures and guidelines, which are adopted from those of the Ontario Public Service.

Purchases of capital equipment are subject to formal approval by the facility's owner.

Sole sourced purchases are made through vendors that have been researched by OCWA's procurement department and are capable of delivering the required product or service when needed.

3.3 As part of the corporate procurement process, potential suppliers/service providers are informed of relevant aspects of OCWA's QEMS through the tendering process and through specific terms and conditions set out in our agreements and purchase orders. Essential suppliers and service providers (including those contracted locally) are sent a letter that provides an overview of the relevant aspects of the QEMS.

3.4 Contractors are selected based on their qualifications and ability to meet the facility's needs without compromising operational performance and compliance with applicable legislation and regulations.

Contracted personnel including suppliers may be requested or required to participate in additional relevant training/orientation activities to ensure conformance with facility procedures and to become familiar with OCWA workplaces.

If necessary, appropriate control measures are implemented while contracted work is being carried out and communicated to all relevant parties to minimize the risk to the integrity of the drinking water system and the environment.

3.5 All third-party drinking water testing services are provided by accredited and licensed laboratories. The Ministry has an agreement with The Canadian Association for Laboratory Accreditation (CALA) for accreditation of laboratories testing drinking water. The QEMS Representative is responsible for notifying the Ministry of any change to the drinking water testing services being utilized.

3.6 Internal verification and calibration activities (e.g. chlorine analyzer, turbidimeter, flowmeters, etc.) are conducted by operations personnel in accordance with equipment manuals and/or procedures (Refer to OP-17 Measurement Recording Equipment Calibration and Maintenance).

3.7 External calibration activities, if required are conducted by qualified third-party providers. Qualifications of the service provider are verified during the procurement process. The service provider is responsible for providing a record/certificate of all calibrations conducted.

3.8 Chemicals purchased for use in the drinking water treatment process must meet AWWA Standards and be ANSI/NSF certified as per the Municipal Drinking Water Licence (MDWL).

3.9 The facility orders and receives ongoing deliveries of chemicals to satisfy current short-term needs based on processing volumes and storage capacities. Incoming chemical orders are verified by reviewing the manifest or invoice in order to confirm that the product received is the product ordered.

3.10 Process components/equipment provided by the supplier must meet applicable regulatory requirements and industry standards for use in drinking water systems prior to their installation.

3.11 To ensure the safe delivery of drinking water, the Municipality maintains an inventory of critical repair components. The Municipality orders these distribution components through reliable suppliers that provide parts with applicable certification and standards. Components are verified by the Public Works Department to ensure the correct product was received.

4. Related Documents

ANSI/NSF Documentation
AWWA Standards
Calibration Certificates/Records
Essential Supplies and Services List
Municipal Drinking Water Licence (MDWL)
OP-17 Measurement Recording Equipment Calibration and Maintenance

5. Revision History

Date	Revision	Reason for Revision
2009-08-31	0	Procedure issued
2011-09-07	1	Addition of Procedure 5.3 clarifying how suppliers are informed of relevant aspects of OCWA's QEMS
2013-03-13	2	Revised position titles; Operations Manager has been changed to Senior Operations Manager, Cluster Manager has been changed to Operations Manager, Operator has been changed to Operator, and Process Compliance Manager has been removed as the position was discontinued.
2013-06-20	3	Added statement to ensure that received product and services are verified upon receipt and prior to use, see procedure 5.9.
2013-10-29	4	Changed name of system to Temagami Drinking Water Systems to include the distribution system
2019-05-28	5	QP-05 procedure renamed OP-13. Removed Scope and Responsibilities sections. Changes to wording to provide clarification on ensuring quality of essential supplies and services (s. 3.5, 3.6, 3.7 and 3.9).
2023-10-10	6	Step 3.2 was revised to include a statement regarding sole sourced purchases. Added step 3.11 to describe the municipality's purchasing and receiving process for distribution components.
2025-09-15	7	Updated Step 3.1 to include a designate approved to review the Essential Supplies and Services List.

REVIEW AND PROVISION OF INFRASTRUCTURE

Reviewed by: I. Bruneau, QEMS Representative	Approved by: B. Logan, Sr. Operations Manager

1. Purpose

To describe OCWA's procedure for reviewing the adequacy of infrastructure necessary to operate and maintain the Temagami Drinking Water Systems.

2. Definitions

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, software and supporting services, such as transport or communication

3. Procedure

3.1 At least once every calendar year, Operations Management in conjunction with operations personnel conducts a review of the drinking water system's infrastructure to assess its adequacy for the operation and maintenance of the system. Operations personnel assist with identifying the need for infrastructure repairs, replacements or alterations and with prioritizing each identified item. Documents and records that are reviewed may include:

- Maintenance records
- Call-in reports
- Adverse Water Quality Incidents (AWQIs) or other incidents
- Health & Safety Inspections
- Ministry Inspection Reports
- QEMS Audit Reports

3.2 The outcomes of the risk assessment documented as per OP-08 are considered as part of this review.

3.3 The output of the review is a minimum 5 year rolling Recommended Capital and Major Maintenance Report to assist the Owner and OCWA with planning infrastructure needs for the short and long-term. A letter, summarizing capital works recommendations and estimated expenditures for the upcoming year, is submitted to the Owner for review and approval. A capital letter is submitted, at least once every calendar year by Operations Management.

3.4 The final approved capital items form the long term forecast for any major infrastructure maintenance, rehabilitation and renewal activities as per OP-15.

3.5 Operations Management ensures that results of this review are considered during the Management Review process (OP-20).

4. Related Documents

Capital and Major Maintenance Recommendations Report
Capital Letter & Acknowledgement/Approval from the Owner
Management Review Minutes
OP-08 Risk Assessment Outcomes
OP-15 Infrastructure Maintenance, Rehabilitation and Renewal
OP-20 Management Review

5. Revision History

Date	Revision	Reason for Revision
2009-08-31	0	Procedure issued
2011-09-07	1	Revised to include the position of Process Compliance Manager
2013-03-13	2	Revised position titles; Operations Manager has been changed to Senior Operations Manager, Cluster Manager has been changed to Operations Manager, Operator has been changed to Operator, and Process Compliance Manager has been removed as the position was discontinued.
2013-10-29	3	Changed name of system to Temagami Drinking Water Systems to include the distribution systems.
2019-05-28	4	QP-06 procedure renamed OP-14. Removed Scope and Responsibilities sections. Replaced ‘once every 12 months’ with ‘once every calendar year’ (s. 3.1) to reflect wording in DWQMS v. 2.0. Added s. 3.2 to consider the outcomes of the risk assessment under Element 8 during the review to reflect wording in DWQMS v. 2.0. Changes to wording to provide clarification on who is required to attend the review and what documents and records may be considered during the review (s. 3.1). Linked the procedure with OP-15 in terms of documenting a long-term forecast (s. 3.3 and s. 3.4).
2024-08-27	5	Added the word “minimum” prior the statement; 5 year rolling Recommended Capital and Major Maintenance Report in Step 3.1 as additional years can be forecasted. Removed watermark.

INFRASTRUCTURE MAINTENANCE, REHABILITATION AND RENEWAL

1. Purpose

To describe OCWA's infrastructure maintenance, rehabilitation and renewal program for the Temagami Drinking Water Systems.

2. Definitions

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, software and supporting services, such as transport or communication

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

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

3. Procedure

3.1 OCWA, under contract with the Owner, maintains a computerized Work Management System (WMS) to manage maintenance, rehabilitation and renewal of infrastructure for which it is operationally responsible. The major components of the WMS consist of planned maintenance, unplanned maintenance, rehabilitation, renewal and program monitoring and reporting.

3.1.1 Planned Maintenance

Routine planned maintenance activities include:

- Inspect, adjust and calibrate process control equipment to ensure proper operation of water systems, pumps, chemical feeders, and all other equipment installed at the facilities.
- Inspect reservoirs and towers.
- Perform routine maintenance duties to equipment including checking machinery and electrical equipment when required.
- Perform routine maintenance of the distribution system (flushing and valve cycling)
- Maintain an inventory of all equipment
- Maintain accurate records of work conducted, activities, and achievements.

Planned maintenance activities are scheduled in the WMS that allows the user to:

- Enter detailed asset information;
- Generate and process work orders;
- Access maintenance and inspection procedures;
- Plan preventive maintenance and inspection work;
- Plan, schedule and document all asset related tasks and activities; and

- Access maintenance records and asset histories.

Planned maintenance activities are communicated to the person responsible for completing the task through the issuance of WMS work orders. Work orders are automatically generated on a daily, weekly, monthly, quarterly and annual schedule as determined based on manufacturer's recommendations and site specific operational and maintenance needs and are assigned directly to the appropriate operations personnel. This schedule is set up by the Senior Operations Manager or designate. Work orders are completed and electronically entered into WMS by the person responsible for completing the task. Records of these activities are maintained as per OP-05 Document and Records Control.

The Senior Operations Manager or designate maintain the inventory of equipment in WMS and ensures that appropriate maintenance plans are in place. Maintenance plans are developed according to the manufacturer's instructions, regulatory requirements, industry standards, and/or client service requirements. Equipment Operation and Maintenance (O&M) manuals are accessible to operations personnel at the locations specified in OP-05 Document and Records Control.

3.1.2 Unplanned Maintenance

Unplanned maintenance is conducted as required. All unplanned maintenance activities are authorized by Operations Management. Management authorizes the purchase of in-stock spare parts, equipment and preventative maintenance kits for minor unplanned repairs which are performed by operations as needed without authorization. Major unplanned repairs that incur a cost must be approved by management.

Unplanned maintenance activities are recorded in the facility's logbook and as corrective/emergency work order and are entered into WMS by the person responsible for completing the unplanned maintenance activity.

3.1.3 Rehabilitation and Renewal

Rehabilitation and renewal activities including capital upgrades (major infrastructure maintenance) are determined at least once every calendar year in consultation with Operations Management and the Owner A list of required replacement or desired new equipment is compiled and prioritized by Operations Management in conjunction with operations personnel and is presented to the Owner for review and comment. All major expenditures require the approval of the Owner. In addition to the short-term facility needs (i.e. current year), the Capital and Major Maintenance Recommendations Report also provides a long-term (i.e. rolling 5-year) list of major maintenance recommendations. (Refer to OP-14 Review and Provision of Infrastructure).

3.1.4 Program Monitoring and Reporting

Maintenance needs for the facility are determined through review of manufacturer's instructions, regulatory requirements, industry standards, and/or client service requirements and are communicated by means of work orders. Additionally, Operations Management and operations personnel conduct a review of the drinking water system's infrastructure to assess its adequacy for the operation and maintenance of the system. (Refer to OP-14 Review and Provision of Infrastructure).

To assist in monitoring the effectiveness of the program, Operations Management (or designate) can review the WMS dashboard for a quick visualization of work order status and they generate summary reports as needed.

3.2 OCWA's infrastructure maintenance, rehabilitation and renewal program is initially communicated to the Owner through the operating agreement. OCWA's program is communicated to the Owner on an on-going basis through quarterly reports and at a minimum once every calendar year through submission of the capital letter and the results of the Management Review.

4. Related Documents

Capital and Major Maintenance Recommendations Report
Capital Letter & Acknowledgement/Approval from the Owner
Minutes of Management Review
OP-05 Document and Records Control
OP-14 Review and Provision of Infrastructure

5. Revision History

Date	Revision #	Reason for Revision
2019-05-28	0	Procedure issued – Information within OP-15 (s. 3) was originally set out in main body of the Temagami Drinking Water System Operational Plan (last revision 7, dated June 19, 2017). New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Added the requirement to ensure the long term forecast is reviewed at once every calendar year and to document a long term forecast (s. 3.1.3) to reflect in DWQMS v. 2.0. Minor wording updates to reflect OCWA's current WMS.
2023-10-10	1	Added the inspection of the towers to Step 3.1.1. Changed Team Lead to Operations Supervisor and added Instrumentation Technician in Step 3.1.1 and updated step 3.1.4 to include the WMS dashboard as a means of monitoring the effectiveness of the program.

Date	Revision #	Reason for Revision
2024-08-27	2	Revised Step 3.1.1 to remove Operations Supervisor and Instrumentation Technician and to add the Operations Manager or designate as personnel responsible for maintaining the WMS. Removed watermark.
2025-09-15	3	Updated Step 3.1.2 to clarify that minor unplanned repairs can be performed without Management authorization. Changed Operations Manager to Senior Operations Manager

SAMPLING, TESTING AND MONITORING

1. Purpose

To describe the procedure for sampling, testing and monitoring for process control and finished drinking water quality.

2. Definitions

Challenging Conditions – any existing characteristic of the water source or event-driven fluctuations that impact the operational process as identified and listed under OP-06A and OP-06B Drinking Water System

3. Procedure

3.1 All sampling, monitoring and testing is conducted at a minimum in accordance with SDWA O. Reg. 170/03 and the facility's Municipal Drinking Water License (MDWL).

3.2 Sampling requirements for the facility are defined in the facility's sampling schedule which is available to operations personnel, at the location(s) noted in OP-05 Document and Records Control. The sampling schedule is maintained by the PCT and is updated as required.

3.3 Samples that are required to be tested by an accredited and licensed laboratory, are collected, handled and submitted according to the directions provided by the licensed laboratory(ies) that conducts the analysis. The laboratory(ies) used for this facility are listed in the Essential Supplies and Services List (within the Facility Emergency Plan (FEP)).

Electronic and/or hardcopy reports received from the laboratory are maintained as per OP-05 Document and Records Control. Analytical results from laboratory reports are uploaded into OCWA's Process Data Management system (PDM).

3.4 Continuous monitoring equipment is used to sample and test for the following parameters related to process control and finished drinking water quality:

<u>Temagami North DWS</u>

- Temperature – raw water, process water and treated water
- Turbidity – raw water, filter 1 & 2 effluent and treated water
- Free chlorine residual – treated water
- pH – raw water, process water and treated water
- Discharge pressure – treated/distribution water (point of entry)
- Flow rates – raw water, filter 1 & 2 effluent, backwash and treated water
- Levels – clearwell 1, 2 & 3 and tower

Temagami South DWS

- Temperature – raw water, process water and treated water
- Turbidity – raw water, filter 2 effluent and treated water
- Free chlorine residual – treated water
- pH – raw water, process water and treated water
- Discharge pressure – treated/distribution water (point of entry)
- Flow rates – raw water, filter 2 effluent, backwash and treated water
- Levels – clearwell 1 & 2, sump, waste pit and tower

Test results from continuous monitoring equipment are captured by OCWA's SCADA system and are reviewed by a certified operator in accordance with the requirements of SDWA O. Reg. 170/03.

3.5 Adverse water quality results/incidents are responded to and reported as per Environmental Emergency Procedures (EEPs) found in the Facility Emergency Plan Binder.

3.6 In-house process control activities are conducted at each water treatment plant on a regular basis by the certified operator(s) on duty and at a minimum are conducted as follows:

Operational Parameter	Location	Frequency
pH	Process water	Grab weekly
Temperature	Treated water	Grab weekly
Aluminum Residual	Treated water	Grab weekly
Colour	Raw water Treated water	Grab weekly
Free Chlorine Residual	Treated water	Grab weekly
	Distribution water (various locations)	Grab weekly (4 one day & 3 on a second day)
Alkalinity	Raw water Process water	Grab monthly
Turbidity	Process water	Grab monthly
Aluminum Sulphate Usage	Chemical room	Bi-weekly reading
Sodium Hypochlorite Usage	Chemical room	Bi-weekly reading
Soda Ash Usage	Chemical room	Bi-weekly reading
Polymer Usage	Chemical room	Bi-weekly reading

In-house samples are analyzed following approved laboratory procedures. The sampling results are recorded on a facility round sheet and are entered into the PDM system. Any required operational process adjustments are recorded in the facility log book.

3.7 Additional sampling, testing and monitoring activities related to the facility's most challenging conditions are captured in the existing in-house program as described above.

Monitoring/sampling for harmful algal blooms (HABs) is conducted during the HAB season (the warm seasonal period at a minimum starting on June 1st and continuing until October 31st each year) based on the drinking water systems HAB Monitoring, Reporting and Sampling Plan.

3.8 There are no relevant upstream sampling, testing and monitoring activities that take place for the Temagami Drinking Water Systems.

3.9 Sampling, testing and monitoring results are readily accessible to the Owner at the Haileybury Water Treatment Plant or electronically at the municipal office and on OCWA's public drive (NEO COLLAB/NEO DWQMS).

The owner is provided a Quarterly Operations Reports which discusses regulatory results and operational issues. Owners are also provided with an annual summary of sampling, testing and monitoring results through the SDWA O. Reg. 170/03 Section 11 - Annual Report, Schedule 22 - Municipal Summary Report and through the Management Review process outlined in OP-20 Management Review.

In addition, updates regarding sampling, testing and monitoring activities are provided as per the operating agreement and during regular client meetings.

4. Related Documents

Annual Report (O. Reg. 170 Section 11)
Continuous Monitoring of Operational Parameters for Drinking Water Systems SOP
Data Review Protocol
Emergency Contact List/Essential Supplies & Services List (Contacts section of FEP)
Facility Emergency Plan (FEP) Binder
Facility Logbook
Facility Round Sheets
HAB Monitoring, Reporting and Sampling Plan
Laboratory Analysis Reports
Laboratory Chain of Custody Forms
Municipal Summary Report (O. Reg. 170 Schedule 22)
Process Data Management System (PDM)
Quarterly Operations Reports
Reporting Adverse Water Quality (EEP)
Sampling Schedules
SCADA Records
WMS Records
OP-05 Document and Records Control
OP-06 Drinking Water System
OP-20 Management Review

5. Revision History

Date	Revision	Reason for Revision
2009-08-31	0	Procedure issued
2011-09-07	1	Addition of Process and Compliance Manager (3.0 Responsibility) and clarification of sampling under 5.0 Procedure
2013-03-13	2	Revised position titles; Operations Manager has been changed to Senior Operations Manager, Cluster Manager has been changed to Operations Manager, Operator has been changed to Operator, and Process Compliance Manager has been removed as the position was discontinued.
2013-10-29	3	Updated the name of the system to Temagami Drinking Water System to include the distribution systems.
2015-02-05	4	Added Monthly Reports as a means of communicating to the client and included them as a Related Document.
2017-06-19	5	References made to PDC have been replaced with the new program WISKI, Changed Monthly Report to Client Report.
2019-06-10	6	QP-07 procedure renamed OP-16. Removed Scope and Responsibilities sections. Updated s. 3.1 to reference Municipal Drinking Water License and s. 3.2 to reference sampling calendar/plan and removed sampling table. Expanded information related to accredited and licensed laboratories (s. 3.3). Removed pumping and static levels. Reordered some sections and other minor edits.
2023-10-10	7	Updated Step 3.4 to include process and treated water temperature, treated water turbidity and process pH to both the north and South plants. Updated table in Step 3.6 to include process water pH, treated water temperature, raw water colour and polymer usage. Changed alkalinity testing from weekly to monthly and clarified the frequency for distribution chlorine residual sampling. Updated location of results in Step 3.9.
2024-08-27	8	Modified section 3.6 to clarify that the frequency of in-house process control activities is at a ‘minimum’ frequency which will allow for flexibility if additional sampling conducted beyond that referenced in table/sampling schedule. Added reference to the HAB Plan under Step 3.7 and updated Section. 4 – Related Documents. Removed watermark.
25-09-15	9	Updated Table in Step 3.6 to clarify the frequency of the distribution chlorine residuals. Revised Step 3.9 to add that results are also stored electronically.

SAMPLING, TESTING AND MONITORING

1. Purpose

To describe the procedure for sampling, testing and monitoring for process control and finished drinking water quality.

2. Definitions

Challenging Conditions – any existing characteristic of the water source or event-driven fluctuations that impact the operational process as identified and listed under OP-06A and OP-06B Drinking Water System

3. Procedure

3.1 All sampling, monitoring and testing is conducted at a minimum in accordance with SDWA O. Reg. 170/03 and the facility's Municipal Drinking Water License (MDWL).

3.2 Sampling requirements for the facility are defined in the facility's sampling schedule which is available to operations personnel, at the location(s) noted in OP-05 Document and Records Control. The sampling schedule is maintained by the PCT and is updated as required.

3.3 Samples that are required to be tested by an accredited and licensed laboratory, are collected, handled and submitted according to the directions provided by the licensed laboratory(ies) that conducts the analysis. The laboratory(ies) used for this facility are listed in the Essential Supplies and Services List (within the Facility Emergency Plan (FEP)).

Electronic and/or hardcopy reports received from the laboratory are maintained as per OP-05 Document and Records Control. Analytical results from laboratory reports are uploaded into OCWA's Process Data Management system (PDM).

3.4 Continuous monitoring equipment is used to sample and test for the following parameters related to process control and finished drinking water quality:

<u>Temagami North DWS</u>

- Temperature – raw water, process water and treated water
- Turbidity – raw water, filter 1 & 2 effluent and treated water
- Free chlorine residual – treated water
- pH – raw water, process water and treated water
- Discharge pressure – treated/distribution water (point of entry)
- Flow rates – raw water, filter 1 & 2 effluent, backwash and treated water
- Levels – clearwell 1, 2 & 3 and tower

compromised by the malfunctioning device. For failures of continuous monitoring equipment used for filter effluent turbidity, primary disinfection or distribution residuals, adequate steps must be taken to ensure regulatory minimum testing and recording frequencies are met and documented. Any actions taken as a result of the failure are recorded in the facility logbook and/or WMS work order. Operations Management or the PCT ensures that any notifications required by applicable legislation are completed and documented within the specified time period.

3.7 Calibration and maintenance records and maintenance/equipment manuals are maintained as per OP-05 Document and Records Control.

4. Related Documents

Calibration/Maintenance Records
Facility Logbook
Maintenance/Equipment Manuals
WMS Records
OP-05 Document and Records Control
OP-13 Essential Supplies and Services
OP-15 Infrastructure Maintenance, Rehabilitation and Renewal

5. Revision History

Date	Revision	Reason for Revision
2009-08-31	0	Procedure issued
2011-09-07	1	Revised to include proper title for Process Compliance Manager
2013-03-13	2	Revised position titles; Operations Manager has been changed to Senior Operations Manager, Cluster Manager has been changed to Operations Manager, Operator has been changed to Operator, and Process Compliance Manager has been removed as the position was discontinued.
2013-10-29	3	Updated system name to Temagami Drinking Water Systems to include the distribution systems
2019-06-10	4	QP-08 procedure renamed OP-17. Removed Scope and Responsibilities sections. Added s. 3.3 to clarify how calibration and/or verification activities are documented. Added s. 3.5 to include how standards, reagents and/or chemicals are verified before use to ensure they are not expired. Other minor edits.
2024-08-27	5	Updated Step 3.2 to clarify SuperUser and 3.6 to change location of recording equipment failures. Removed watermark.
2025-09-15	6	Step 3.4 updated to include reference to the conditions listed in MDWL Schedule C s.3.0 Calibration of Flow Measuring Devices and s.4.0 Calibration of CT Monitoring System. Added in 3.6 the requirement to ensure minimum testing and recording frequencies are met for failures of continuous monitoring equipment used for filter

Date	Revision	Reason for Revision
		effluent turbidity, primary disinfection or distribution residuals monitoring. Added Municipal Drinking Water Licence (MDWL) to Related Documents.

1. Purpose

To describe the procedure for maintaining a state of emergency preparedness at the facility level under OCWA's Emergency Management Program.

2. Definitions

Corporate Emergency Response Plan (ERP) – a corporate-level emergency preparedness plan for responding to and supporting serious (Level 3) operations emergencies

Facility Emergency Plan (FEP) – a facility-level emergency preparedness plan for responding to and recovering from operations emergencies

Operations Management – refers to the Senior Operations Manager and/or Operations Manager that directly oversees a facility's operations

3. Procedure

3.1 The Facility Emergency Plan (FEP) is the corporate standard for emergency management at OCWA-operated facilities. The FEP supports the facility-level response to and recovery from Level 1, 2 and 3 events related to water and wastewater operations and directly links to the Corporate Emergency Response Plan (CERP) for management of Level 3 events that require corporate support. Operations Management is responsible for establishing a site-specific FEP that meets the corporate standard for these drinking water systems.

3.2 OCWA recognizes three levels of events:

Level 1 is an event that can be handled entirely by plant staff and regular contractors. The event and the actions taken to resolve it (and to prevent a reoccurrence, if possible) are then included in regular reporting (both internally and externally). Examples may include response to an operational alarm, first aid incident, small on-site spill, or a process upset that can be easily brought under control.

Level 2 is an event that is more serious and requires immediate notification of others (regulator, owner). Examples may include minor basement flooding, injury to staff that requires medical attention, or a spill that causes or is likely to cause localized, off-site adverse effects. If the event reaches this level, the instructions indicate the need to contact the Safety, Process and Compliance Manager and/or Regional Hub Manager.

Level 3 is an actual or potential situation that will likely require significant additional resources and/or threatens continued operations. It may require corporate-level support including activation of the OCWA Action Group and opening of an Emergency Operations Centre (EOC) as described in the corporate ERP. Level 3 events usually

involve intervention from outside organizations (client, emergency responders, Ministry, media, etc.). Examples may include:

- Disruption of service/inability to meet demand;
- Critical injury including loss of life;
- Breach of security that is a threat to public health;
- Intense media attention;
- Community emergency affecting water supply/treatment;
- Declared pandemic; or
- Catastrophic failure that could impact public health or the environment or cause significant property damage.

3.3 Potential emergency situations or service interruptions identified for the Temagami Drinking Water Systems include:

- Unsafe Water
- Spill Response
- Critical Injury
- Critical Shortage of Staff
- Loss of Service
- Security Breach

3.4 The processes for responding to and recovering from each potential emergency situation/service disruption are documented within a contingency plan (CP). The CPs and related site specific environmental emergency procedures (EEPs) are contained within the FEP. To better support management and operational staff when dealing with emergency situations, the CPs are linked to related EEPs.

3.5 OCWA's training requirements related to the FEP are as follows:

Training Topic	Training Provider	Type of Training	Frequency	Required For
Establishing and maintaining a FEP that meets the corporate standard	Safety, Process and Compliance Manager and/or Corporate Compliance (as required)	On-the-Job Practical	Upon hire and when changes are made to the corporate standard*	PCTs (or others identified by the Operations Management)
Contents of the site-specific FEP	Facility Level (coordinated by QEMS Representative)	On-the-Job Practical	Upon hire and when changes to the FEP are made*	All operations personnel with responsibilities for responding to an emergency

*Note: Changes to the corporate standard or site-specific FEP may only require the change to be communicated to Operations for implementation. Therefore, not all changes will require training.

3.6 At least one CP must be tested each calendar year and each CP must be reviewed at least once in a five-calendar year period. The reviews and tests are recorded on the FEP-01 Contingency Plan Review/Test Summary Form. This record includes the

outcomes of the review/test, and identifies any opportunities for improvement and actions taken. A scheduled test of a CP may be regarded as a review of that particular CP as long as the outcomes are evaluated using the FEP-01 form. A CP-related response to an actual event may also be considered a review or a test. A review of the incident including lessons learned should be recorded on FEP-01 following the resolution of the actual event, along with any opportunities for improvement/actions identified.

3.7 Revisions to the CPs, EEPs and other FEP documents are made (as necessary) following a review, test, actual event or other significant change (e.g., changes in regulatory requirements, corporate policy or operational processes and/or equipment, etc.). Results of the emergency response testing and any opportunities for improvement/actions identified are considered during the Management Review (OP-20).

3.8 Roles and responsibilities for emergency management at OCWA-operated facilities are set out in the FEP. Specific roles and responsibilities related to a particular emergency situation or service interruption (including those of the Owner where applicable) are set out in the relevant site-specific CP. A general description of the respective responsibilities of the Owner and the operating authority in the event an emergency occurs is included in the service agreement with the Owner (as required by the *Safe Drinking Water Act*).

3.9 Where they exist, any relevant sections of the Municipal Emergency Response Plan (MERP) are included or referenced in the appendices section of the FEP. Measures specified in the MERP are incorporated into CPs where appropriate.

3.10 An emergency contact list in conjunction with the essential supplies and services list is contained within the FEP and is reviewed/updated at least once per calendar year. An emergency communications protocol is contained within the FEP. Specific notification requirements during emergency situations or service interruptions are set out in the individual CPs and in the ERP.

4. Related Documents

Corporate Emergency Response Plan
Emergency Contact List/Essential Supplies & Services List (Contacts section of FEP)
Facility Emergency Plan
FEP-01 Contingency Plan Review/Test Summary Form
Municipal Emergency Response Plan (as applicable)
WMS
OP-20 Management Review

5. Revision History

Date	Revision	Reason for Revision
2009-08-31	0	Procedure issued
2011-09-07	1	Corrected Process Compliance Manager's title
2013-03-13	2	Revised position titles; Operations Manager has been changed to Senior Operations Manager, Cluster Manager has been changed to Operations Manager, Operator has been changed to Operator, and Process Compliance Manager has been removed as the position was discontinued.
2013-06-24	3	Revised step 5.3 to state that all contingency plans must be tested over a 3 year period.
2013-10-29	4	Updated name of system to Temagami Drinking Water System to include the distribution systems.
2015-02-05	5	Updated procedure as per OCWA's revised corporate template which; reflects updates to OCWA's improved Facility Emergency Plan; References the three levels of operations-related events, OCWA's Emergency Management Program and OCWA's Emergency Communications Protocol; Clarifies training requirements in step 5.5; Updates reviewing frequencies of CPs in step 5.6; Describes when revision changes to procedures are required in step 5.7
2019-06-10	6	QP-09 procedure renamed OP-18. Removed Scope and Responsibilities sections and reordered some sections. Added definition 'Operations Management'. Throughout procedure replaced 'Senior Operations Manager' references with 'Operations Management'. Removed references to *'OCWA's Approach to Facility Emergency Planning'* document throughout procedure and referenced FEP instead. Aligned wording for level 1, 2 & 3 events (s. 3.2) with wording in '*OCWA's Emergency Response Plan*'. Updated training section to include role of SPC Manager (s. 3.5) and expanded testing/review section specifically to clarify how an actual test is documented (s. 3.6). Other minor edits.
2023-10-10	7	Updated Ministry of the Environment and Climate Change to Ministry of the Environment, Conservation and Parks in step 3.2. Changed SOPs to EEPs to reflect the procedures in the FEP binder. Updated Step 3.4 to indicate the link between the CPs to the EEPs.
2024-08-27	8	Ministry of Environment and Climate Change revised to Ministry. Modified references to Emergency Response Plan to indicate it is now referred to as Corporate Emergency Response Plan (CERP). Removed watermark.

INTERNAL QEMS AUDITS

1. Purpose

To describe the procedure for conducting internal audits at the facility level that evaluate the conformance of OCWA's Quality & Environmental Management System (QEMS) to the requirements of the Drinking Water Quality Management Standard (DWQMS).

This procedure applies to Internal QEMS Audits conducted at the Temagami Drinking Water Systems for the purpose of meeting the DWQMS requirements for internal audits.

Note**:** This procedure does not apply to internal compliance audits conducted in accordance with OCWA's Internal Audit Program.

2. Definitions

Audit Team – one or more Internal Auditors conducting an audit

Internal Auditor – an individual selected to conduct an Internal QEMS Audit

Internal QEMS Audit – a systematic and documented internal 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

Lead Auditor – Internal Auditor responsible for leading an Audit Team

Non-conformance – non-fulfillment of a DWQMS requirement

Objective Evidence – verifiable information, records or statements of facts. Audit evidence is typically based on interviews, examination of documents, observations of activities and conditions, reviewing results of measurements and tests or other means. Information gathered through interviews should be verified by acquiring supporting information from independent sources

Opportunity for Improvement (OFI) – an observation about the QEMS that may, in the opinion of the Internal Auditor, offer an opportunity to improve the effectiveness of the system or prevent future problems; implementation of an OFI is optional

3. Procedure

3.1 Audit Objectives, Scope and Criteria

3.1.1 In general, the objectives of an internal QEMS audit are:

- To evaluate conformance of the implemented QEMS to the requirements of the DWQMS;
- To identify non-conformances with the documented QEMS;
- To identify areas for improvement to enhance the QEMS; and

- To assess the effectiveness of the QEMS and assist in its continual improvement.

3.1.2 The scope of an internal QEMS audit includes activities and processes related to the QEMS as documented in the Operational Plan.

3.1.3 The criteria covered by an internal QEMS audit include:
- Drinking Water Quality Management Standard (DWQMS)
- Current Operational Plan
- QEMS-related documents and records

3.1.4 The audit scope and criteria may be customized as necessary to focus on a particular process/critical control point and/or any elements of the DWQMS which may warrant specific attention. The results of previous internal and external audits should also be considered.

3.2 Audit Frequency

3.2.1 Internal QEMS audits may be scheduled and conducted once every calendar year or may be separated into smaller audit sessions scheduled at various intervals throughout the calendar year. However, all elements of the DWQMS must be audited at least once every calendar year.

3.2.2 The QEMS Representative is responsible for maintaining the internal QEMS audit schedule. The audit schedule may be modified based on previous audit results.

3.3 Internal Auditor Qualifications

3.3.1 Internal QEMS audits shall only be conducted by persons approved by the QEMS Representative and having the following minimum qualifications:
- Internal auditor training or experience in conducting management system audits; and
- Familiarity with the DWQMS requirements.

3.3.2 Internal Auditors that do not meet the qualifications in s.3.3.1 may form part of the Audit Team for training purposes, but cannot act as Lead Auditor.

3.3.3 Internal Auditors must remain objective and, where practical, be independent of the areas/activities being audited. It may not be possible for internal auditors to be fully independent of the activity being audited, but every effort should be made to remove bias and encourage objectivity. Auditors should maintain objectivity throughout the audit process to ensure that the audit findings and conclusions are based only on the audit evidence. Objectivity can be demonstrated by obtaining sufficient appropriate evidence to provide a reasonable basis for the

audit findings.

3.4 Audit Preparation

3.4.1 The Lead Auditor:

- Establishes the audit objectives, scope and criteria;
- Confirms the audit logistics (locations, dates, expected time and duration of audit activities, any health and safety considerations, availability of key personnel, audit team assignments, etc.).

3.4.2 Each Internal Auditor is responsible for:

- Reviewing documentation to prepare for their audit assignments including:
  - the Operational Plan and related procedures;
  - results of previous internal and external QEMS audits;
  - the status and effectiveness of corrective and preventive actions implemented;
  - the results of the management review;
  - the status/consideration of OFIs identified in previous audits; and
  - other relevant documentation.
- Preparing work documents (e.g., checklists, forms, etc.) for reference purposes and for recording objective evidence collected during the audit

3.5 Conducting the Audit

3.5.1 Opening and closing meetings are not required, but may be conducted at the discretion of the QEMS Representative and the Lead Auditor taking into account expectations of Top Management.

3.5.2 The Audit Team gathers and records objective evidence by engaging in activities that may include conducting interviews with Operations Management and staff (in person, over the phone and/or through e-mail), observing operational activities and reviewing documents and records.

3.5.3 The Audit Team generates the audit findings by evaluating the objective evidence against the audit criteria (s. 3.1.3). In addition to indicating conformance or non-conformance, the audit findings may also lead to the identification of opportunities for improvement (OFIs). The Lead Auditor is responsible for resolving any differences of opinion among Audit Team members with respect to the audit findings and conclusions.

3.6 Reporting the Results

3.6.1 The Lead Auditor reviews the audit findings and conclusions with the QEMS Representative (if different from Lead Auditor) and Top Management. Other audit participants may also take part in this review as appropriate. This review

may take place in person (e.g., during a closing meeting) or through other means (phone call, email, etc.). Any diverging opinions regarding the audit findings and conclusions should be discussed and, if possible, resolved. If not resolved, this should be noted by the Lead Auditor.

3.6.2 The Lead Auditor prepares a written report and/or completed work documents. The report/documents are submitted to the QEMS Representative (if different from Lead Audito). The submitted documentation must identify (at a minimum):

- Audit objectives, scope and criteria;
- Audit Team member(s) and audit participants;
- Date(s) and location(s) where audit activities where conducted;
- Audit findings including:
    - Related objective evidence for each element;
    - Any non-conformance identified referencing the requirement that was not met; and
    - OFIs or other observations.
- Audit conclusions.

3.6.3 The QEMS Representative distributes the audit results to Top Management and others as appropriate.

3.6.4 The QEMS Representative ensures that results of internal QEMS audits are included as inputs to the Management Review as per OP-20 Management Review.

3.7 Corrective Actions and Opportunities for Improvement (OFIs)

3.7.1 Corrective actions are initiated when non-conformances are identified through internal QEMS audits and are documented and monitored as per OP-21 Continual Improvement.

3.7.2 OFIs are considered, and preventive actions initiated, documented and monitored as per OP-21 Continual Improvement.

3.8 Record-Keeping

3.8.1 Internal QEMS audit records are filed by the QEMS Representative and retained as per OP-05 Document and Records Control.

4. Related Documents

Internal Audit Records (checklists, forms, reports, etc.)
QEMS – Summary of Findings Spreadsheet
OP-05 Document and Records Control
OP-20 Management Review

OP-21 Continual Improvement

5. Revision History

Date	Revision #	Reason for Revision
2009-08-31	0	Procedure issued
2011-09-07	1	Clarification of time frames in Procedure 5.1; corrected Process Compliance Manager's title; updated the development of audit protocol in Procedure 5.2
2013-03-13	2	Revised position titles; Operations Manager has been changed to Senior Operations Manager, Cluster Manager has been changed to Operations Manager, and Process Compliance Manager has been removed as the position was discontinued.
2013-10-29	3	Updated name of system to Temagami Drinking Water System to include the distribution system. Updated step 5.5 to include the review of opportunities for improvements (OFIs); revised step 5.6 to indicate the development of action plans for significant OFIs and the use of the QEMS–Summary of Findings form; Updated section 6.0 by removing Action Plans and adding the QEMS-Summary of Findings form
2017-06-19	4	Major revisions throughout procedure to clarify requirements for conducting internal QEMS audits, reporting results and dealing with corrective actions
2019-06-10	5	QP-10 procedure renamed OP-19. Removed Scope and Responsibilities sections and moved scope wording to purpose section. Added definition 'Objective Evidence' and modified 'non-conformance' definition. Replaced 'audit evidence' with 'objective evidence', and 'conformity' with 'conformance' throughout procedure. Replaced 'once every 12 months' with 'once every calendar year' (s. 3.2.1, s. 3.2.3 and s. 3.4.1) to reflect wording in DWQMS v. 2.0. Added s. 3.2.3 (and modified s. 3.4.1) to describe the frequency for auditing all DWSs covered in multi-facility Operational Plans. Changed s. 3.4.2 to include preventive actions, the results of the management review and the status/consideration of OFIs. Included wording 'for each element', and 'identified referencing the requirement that was not met' to s. 3.6.2. Moved description of process for corrective actions from QP-10 s. 5.7 and OFIs from QP-10 s. 5.8 to OP-21. Added s. 3.7 to refer to OP-21.
2023-10-10	6	Updated Step 3.1.1 to include the identification of areas for improvement to enhance the QEMS.
2024-08-27	7	Procedure updated to describe and document how objectivity is maintained when an internal auditor is not fully independent of the activity being audited with additions to s. 3.3.3. Removed watermark.

MANAGEMENT REVIEW

Reviewed by: R. Marshall, QEMS Representative | Approved by: Y. Rondeau, SPC Manager

1. Purpose

To describe the procedure for conducting a Management Review of the Quality & Environmental Management System (QEMS) at the facility level.

2. Definitions

Management Review – a formal (documented) meeting conducted at least once every calendar year by Top Management to evaluate the continuing suitability, adequacy and effectiveness of OCWA's Quality & Environmental Management System (QEMS)

Operations Management – refers to the Senior Operations Manager and/or Operations Manager that directly oversees a facility's operations

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

OCWA has defined Top Management for the Temagami Drinking Water Systems as:

- Operations Management – Temiskaming Shores Cluster
- Regional Hub Manager – Northeastern Ontario Regional Hub
- Safety, Process & Compliance (SPC) Manager – Northeastern Ontario Regional Hub

3. Procedure

3.1 Top Management ensures that a Management Review is conducted at least once every calendar year.

Management Reviews for more than one drinking water system may be conducted at the same meeting provided the systems belong to the same owner and the considerations listed in section 3.4 below are taken into account for each individual system and documented in the Management Review meeting minutes.

3.2 At a minimum, the QEMS Representative, at least one member of Top Management and at least one facility operator must attend the Management Review meeting. Other members of Top Management may participate though their attendance is optional.

3.3 Other staff may be invited to attend the Management Review meeting or to assist with presenting information or in reviewing the information presented, where they offer additional expertise regarding the subject matter.

3.4 The standing agenda for Management Review meetings is as follows:

a) Incidents of regulatory non-compliance;
b) Incidents of adverse drinking water tests;
c) Deviations from critical control limits and response actions;

d) The effectiveness of the risk assessment process;
e) Internal and third-party audit results (including any preventive actions implemented to address Opportunities for Improvement (OFI) or rationale as to why OFIs were not implemented);
f) Results of emergency response testing (including any OFIs identified);
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 QEMS;
l) Consumer feedback;
m) The resources needed to maintain the QEMS;
n) The results of the infrastructure review;
o) Operational Plan currency, content and updates;
p) Staff suggestions; and
q) Consideration of applicable Best Management Practices (BMPs).

3.5 In relation to standing agenda item q), applicable BMPs, if any, to address drinking water system risks discussed during other agenda items, are identified and documented in the Management Review minutes. Review and possible adoption of applicable BMPs are revisited during subsequent Management Reviews and are incorporated into preventive and/or corrective actions as per OP-21 as appropriate.

3.6 The SPC Manager coordinates the Management Review and distributes the agenda with identified responsibilities to participants in advance of the Management Review meeting along with any related reference materials.

3.7 The Management Review participants review the data presented and make recommendations and/or initiate action to address identified deficiencies as appropriate as per OP-21.

3.8 The QEMS Representative ensures that minutes of and actions resulting from the Management Review meeting are prepared and distributed to the appropriate OCWA Top Management, personnel and the Owner.

3.9 The QEMS Representative monitors the progress and documents the completion of actions resulting from the Management Review.

4. Related Documents

Management Review Reference Materials
Minutes and actions resulting from the Management Review (QEMS Summary of Findings)
OP-21 Continual Improvement

5. Revision History

Date	Revision #	Reason for Revision
2009-08-31	0	Procedure issued
2011-09-07	1	Corrected Process Compliance Manager's title
2013-03-13	2	Revised position titles; Operations Manager has been changed to Senior Operations Manager, Cluster Manager has been changed to Operations Manager, and Process Compliance Manager has been removed as the position was discontinued.
2013-10-29	3	Updated name of system to Temagami Drinking Water Systems to include the distribution system
2019-06-10	4	Removed Scope and Responsibilities sections. Added definitions for Top Management and Operations Management. Revisions based on new requirements of the Standard; at least once every 12 months changed to once every calendar year (s. 3.1) and efficacy changed to effectiveness (s. 3.4). Added s. 3.2 and s. 3.3 to describe who is participating in the Management Review process. Added clarification on including any preventive actions implemented to address Opportunities for Improvement (OFI) or rationale as to why OFIs were not implemented when reviewing audit results (s. 3.4.e). Added Best Management Practices (BMPs) as a standing agenda item (s. 3.4.q). Added s. 3.5 to include consideration of BMPs and link OP-20 to OP-21 Continual Improvement.

CONTINUAL IMPROVEMENT

Reviewed by: I. Bruneau, QEMS Representative	Approved by: B. Logan, Sr. Operations Manager

1. Purpose

To describe the procedure for tracking and measuring continual improvement of the Quality & Environmental Management System (QEMS) for the Temagami Drinking Water Systems.

2. Definitions

Continual Improvement - recurring activity to enhance performance *(ISO 14001:2014)*

Corrective Action – action to eliminate the cause of detected nonconformity of the QMS with the requirements of the DWQMS or other undesirable situation

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

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

3. Procedure

3.1 OCWA strives to continually improve the effectiveness of its QEMS for this drinking water system(s) through the identification and implementation of corrective/preventive actions and, as appropriate, through review and consideration of applicable Best Management Practices (BMPs).

3.2 Corrective Actions

3.2.1 Non-conformances may be identified through an internal or external QEMS audit(s) conducted for these drinking water systems. They may also be identified as a result of other events such as:

- an incident/emergency;
- community/Owner complaint;
- other reviews; and
- operational checks, inspections or audits.

3.2.2 The QEMS Representative (in consultation with Operations Management and/or the SPC Manager) investigates the need for a corrective action to eliminate the root cause(s) so as to prevent the non-conformance from recurring. The investigation may also include input from the operators and other stakeholders and the consideration of BMPs as appropriate.

3.2.3 The QEMS Representative determines the corrective action needed based on this consultation. The Operations Management (or designate) assigns responsibility and a target date for resolution.

3.2.4 The QEMS Representative ensures corrective actions are documented using the QEMS - Summary of Findings spreadsheet. The QEMS Representative monitors the progress of corrective action(s) and provides status updates to Top Management.

3.2.5 The implementation and effectiveness of corrective actions are verified during subsequent internal QEMS audits and are considered during the Management Review. If there is evidence that the action taken was not effective, the Operations Management (or designate) initiates further corrective action and assigns resources as appropriate until the non-conformance is fully resolved.

3.3 Preventive Actions

3.3.1 Potential preventive actions may be identified through an internal or external QEMS audit as Opportunities For Improvement (OFIs), during the Management Review or through other means such as:

- staff/Owner suggestions;
- regulator observations;
- evaluation of incidents/emergency response/tests;
- the analysis of facility/Regional Hub or OCWA-wide data/trends;
- non-conformances identified at other drinking water systems; or
- a result of considering a BMP.

3.3.2 The QEMS Representative (in consultation with Operations Management and/or the SPC Manager) considers whether a preventive action is necessary. The review may also include input from the operators and other stakeholders and the consideration of BMPs as appropriate.

3.3.3 If it is decided that a preventive action is necessary, the QEMS Representative determines the action to be taken based on this consultation and the Operations Management (or designate) assigns responsibility and a target date for implementation.

3.3.4 The implementation of preventive actions are tracked by the QEMS Representative using the QEMS - Summary of Findings spreadsheet.

3.3.5 The implementation and effectiveness of preventive actions are verified during subsequent internal QEMS audits and are considered during the Management Review. If there is evidence that the action taken was not effective, the Operations Management (or designate) may consider further preventive actions and assigns resources as appropriate.

3.4 The QEMS Rep. and Operations Management monitor corrective/preventive actions on an ongoing basis and review the status and effectiveness of the actions during

subsequent Management Review meetings.

3.5 Best Management Practices (BMPs)

3.5.1 The QEMS Representative and/or Operations Management in consultation with the SPC Manager will review and consider applicable internal and/or external BMPs identified by internal and/or external sources as part of the Management Review (OP-20) and in the corrective and preventive action processes described above.

3.5.2 BMPs may include, but are not limited to:

- Facility/Regional Hub practices developed and adopted as a result of changes to legislative or regulatory requirements, trends from audit findings or drinking water system performance trends;
- OCWA-wide BMPs/guidance or recommended actions;
- Drinking water industry based standards/BMPs or recommendations; or
- Those published by the Ministry

3.5.3 At a minimum, applicable BMPs must be reviewed and considered once every 36 months.

4. Related Documents

Internal Audit Records
QEMS - Summary of Findings Spreadsheet
OP-05 Document and Records Control
OP-20 Management Review

5. Revision History

Date	Revision #	Reason for Revision
2019-06-10	0	Procedure issued – The original information within the main body of the Temagami Drinking Water System Operational Plan (revision 7, dated June 19, 2017) was not used in OP-21 as it did meet the requirements of the new DWQMS v. 2.0. Information from QP-10 Internal Audit (s. 5.7 and s. 5.8) was incorporated into s. 3.2 and s. 3.3 of OP-21 but was modified to address non-conformances identified from additional inputs other than internal audits and preventive actions resulting from means other than OFIs from internal audits. In addition R&Rs were revised to include the SPC Manager, and to clarify the role of the QEMS Representative in investigating and determining corrective and preventive actions needed. A section on Best Management Practices (s. 3.5) was added to meet the new requirements of DWQMS v. 2.0.
2023-10-10	1	Updated Ministry of the Environment and Climate Change to Ministry of the Environment, Conservation and Parks in step 3.5.2.

Date	Revision #	Reason for Revision
2024-08-27	2	Updated Ministry of the Environment, Conservation and Parks to Ministry in step 3.5.2.

Ontario

Ministry of the Environment, Conservation and Parks

Print Form

Schedule C – Director's Directions for Operational Plans (Subject System Description Form)

Municipal Residential Drinking Water System

Fields marked with an asterisk (*) are mandatory.

Owner of Municipal Residential Drinking Water System *

The Corporation of the Municipality of Temagami

Subject Systems

	Name of Drinking Water System (DWS) *	Licence Number *	Name of Operating Subsystems (if applicable)	Name of Operating Authority *	DWS Number(s) *	
1.	Temagami South Drinking Water System	201-101		Ontario Clean Water Agency	220000424	-
2.	Temagami North Drinking Water System	201-102		Ontario Clean Water Agency	220000433	-

Add item (+)

Contact Information for Questions Regarding the Operational Plan

i

Primary Contact

Last Name *	First Name *	Middle Initial
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