

OPERATIONAL PLAN

For the *Echo Bay Water Treatment Facility and Distribution System*



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.

Any documents developed and owned by OCWA which are referred to in this Operational Plan (including, but not limited to, OCWA's QEMS documents, Standard Operating Procedures, policies and Facility Emergency Plans) remain the property of OCWA. Accordingly, these documents shall not be considered to form part of the Operational Plan belonging to the owner of a drinking-water system under Section 17 of the *Safe Drinking Water Act, 2002*.



OPERATIONAL PLAN
Echo Bay Drinking Water System

QEMS Doc: OP-ToC
Issue Date: 26-Sep-18
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Reviewed by: PCT

Approved by: Operations Management

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Echo Bay Drinking Water System

QEMS Proc.: OP-01
Rev Date: 26-Sep-18
Rev No: 0
Pages: 1 of 2

QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS)

Reviewed by: PCT

Approved by: Operations Management

1. Purpose

To document OCWA's Quality & Environmental Management System (QEMS). This Operational Plan defines and documents the QEMS for the *Echo Bay Water Treatment Facility & Distribution System* 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).

2. Definitions

Drinking Water Quality Management Standard (DWQMS) – means the quality management standard approved by the Minister in accordance with section 21 of the SDWA.

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

Quality & Environmental Management System (QEMS) – is a system to:

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

3. Procedure

3.1 The *Echo Bay Drinking Water System* is owned by *The Corporation of the Township of MacDonald, Meredith & Aberdeen Additional*. OCWA is the contracted operating authority for the *Echo Bay Water Treatment Facility & Distribution System*.

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/wastewater 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 MOECC's DWQMS. The 21 QEMS procedures within this Operational Plan align with the 21 elements of the DWQMS.

4. Related Documents

All QEMS Procedures and Documents Referenced in this Operational Plan
MOECC's Drinking Water Quality Management Standard



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QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS)

Reviewed by: PCT

Approved by: Operations Management

5. Revision History

Date	Revision #	Reason for Revision
26-Sep-18	0	Procedure issued – Information within OP-01 was originally set out in the Main body of OCWA's Operational Plan (last revision # 1 dated 09-Feb-18). New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Addition of new wording (s. 3.3) to clarify that the OCWA's Operational Plan now aligns with the 21 elements of the DWQMS.



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QEMS Proc.: OP-02
Rev Date: 26-Sep-18
Rev No: 0
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QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) POLICY

Reviewed by: PCT

Approved by: Operations Management

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, reliable and cost-effective clean water services that protect public health and the environment.
- 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 6, 2016

(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, the owner and the public through OCWA's intranet and public websites. 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.



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QEMS Proc.: OP-02
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QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) POLICY

Reviewed by: PCT

Approved by: Operations Management

- 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 maintained on OCWA's intranet.

4. Related Documents

- Current QEMS Policy
- QEMS Policy Revision History
- OP-05 Document and Records Control
- OP-13 Essential Supplies and Services

5. Revision History

Date	Revision #	Reason for Revision
26-Sep-18	0	Procedure issued – Section 3.4, 3.5 and 3.6 were added to the information originally set out in the main body of OCWA's Operational Plan (last revision # 1 dated 09-Feb-18). 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.



Ontario Clean Water Agency

OPERATIONAL PLAN

Echo Bay Drinking Water System

QEMS Proc.: OP-03
Rev Date: 26-Sep-18
Rev No: 0
Pages: 1 of 2

COMMITMENT AND ENDORSEMENT

Reviewed by: PCT

Approved by: Operations Management

1. Purpose

To document the endorsement of the Operational Plan for the *Echo Bay Water Treatment Facility & Distribution System* by OCWA's top management and *The Corporation of the Township of MacDonald, Meredith & Aberdeen Additional* (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 the senior operations manager and the regional hub manager.

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 owner representatives who endorsed the Operational Plan;
3. following a municipal election cycle

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



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OPERATIONAL PLAN

Echo Bay Drinking Water System

QEMS Proc.: OP-03
Rev Date: 26-Sep-18
Rev No: 0
Pages: 2 of 2

COMMITMENT AND ENDORSEMENT

Reviewed by: PCT

Approved by: Operations Management

5. Revision History

Date	Revision #	Reason for Revision
26-Sep-18	0	Procedure issued – Information within OP-03 was originally set out in the main body of OCWA’s Operational Plan (last revision 1 dated 09-Feb-18). 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). Element 3 of main body of OCWA’s corporate template Operational Plan (last revised on 2011-12-13) was incorporated into Appendix OP-03A which also includes the Owner and Top Management sign-off section.



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OPERATIONAL PLAN

Echo Bay Drinking Water System

QEMS Doc: OP-03A
Rev Date: 03-Jan-19
Rev No: 1
Pages: 1 of 1


SIGNED COMMITMENT AND ENDORSEMENT

This Operational Plan sets out the framework for OCWA' 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 Corporation of the Township of MacDonald, Meredith & Aberdeen Additional* (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 *Echo Bay Water Treatment Facility & Distribution System* 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



Patti O'Handley
Senior Operations Manager

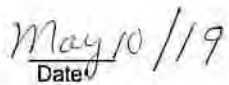

Jeff St. Pierre
Northwestern Regional Hub Manager

Owner Endorsement


Lynn Watson
Mayor


Date


Lynne Duguay
Clerk/Treasurer


Date

The endorsement above is based on the Operational Plan that was current as of the revision date of this document (OP-03A).

Revision History

Date	Revision #	Reason for Revision
04-Apr-17	0	New endorsement sought. OCWA: Jeff St.Pierre – NWO Regional Manager & Patti O'Handley – Sr. Ops. Manager. OWNER: Lynn Watson – Mayor & Lynne Duguay – Clerk/Treasurer.
03-Jan-19	1	Major updates made to the operational plan. New endorsements sought: OCWA: Jeff St.Pierre – NWO Regional Manager & Patti O'Handley – Sr. Ops. Manager. OWNER: Lynn Watson – Mayor & Lynne Duguay – Clerk/Treasurer.



Ontario Clean Water Agency

OPERATIONAL PLAN

Echo Bay Drinking Water System

QEMS Proc.: OP-04
Rev Date: 27-Sep-18
Rev No: 0
Pages: 1 of 2

QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) REPRESENTATIVE

Reviewed by: PCT

Approved by: Operations Management

1. Purpose

To identify and describe the specific roles and responsibilities of the QEMS representative(s) for the *Echo Bay Water Treatment Facility & Distribution System*.

2. Definitions

None

3. Procedure

3.1 The role of QEMS rep. for the *Echo Bay Drinking Water System* is shared between the process and compliance technician (PCT) and the facility's operations management. The safety, process and compliance (SPC) manager will act as an alternate QEMS rep. when required.

3.2 Operations management is ultimately responsible for activities related to the operation of the drinking water system and for establishing and maintaining processes and procedures required for the overall administration of the facility's QEMS.

3.3 The QEMS Rep. is responsible for:

- administering the QEMS for the *Echo Bay Drinking Water System* 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.

3.4 A signed letter of appointment can be found in Appendices OP-04A and OP-04B

4. Related Documents

OP-04A Signed Letter of Appointment – Operations Management

OP-04B Signed Letter of Appointment – PCT



Ontario Clean Water Agency

OPERATIONAL PLAN

Echo Bay Drinking Water System

QEMS Proc.: OP-04
Rev Date: 27-Sep-18
Rev No: 0
Pages: 2 of 2

QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) REPRESENTATIVE

Reviewed by: PCT

Approved by: Operations Management

5. Revision History

Date	Revision #	Reason for Revision
27-Sep-18	0	Procedure issued – Information within OP-04 was originally set out in the main body of OCWA’s Operational Plan (last revision 1 dated 09-Feb-18). New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Change to responsibilities: 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).



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OPERATIONAL PLAN

QEMS Proc.: OP-04A
Rev Date: 05-Mar-21
Rev No: 1
Pages: 1 of 2

QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) REPRESENTATIVE

Reviewed by: PCT

Approved by: Sr. Operations Management

Quality Management System Representative

Letter of Appointment

The role of QEMS Representative is shared between the Senior Operations Manager and the Process & Compliance Technician (PCT).

The Manager's duties are specified as the following:

- Administer the QEMS by ensuring that processes and procedures needed for the facility's QEMS are established and maintained;
- Report to top management on the facility's QEMS performance and identify opportunities for improvement;
- Ensure that current versions of documents related to the QEMS are in use;
- Promote awareness of the QEMS to all operations personnel
- Ensure that operations personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the system.
- Determine necessary action and assign resources in response to operational issues
- Ensure corporate and site-specific QEMS programs and procedures are implemented at his/her assigned facilities
- Ensure operational training is provided for their staff (in consultation with the SPC manager as required)
- Fulfill role of top management
- Manage the day-to-day operations and maintenance of his/her assigned facilities and supervise facility operational staff
- Report to the regional hub manager on facility operational performance

The Manager has been made aware of their role as a QEMS Representative within the DWQMS.

Keith Stringer – Senior Operations Manager

March 5, 2021

Date

Kevin Spec – Senior Operations Manager

March 5, 2021

Date



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Appointment of QEMS Rep
Revision 1, 05-Mar-21



Ontario Clean Water Agency

OPERATIONAL PLAN

QEMS Proc.: OP-04A
Rev Date: 05-Mar-21
Rev No: 1
Pages: 2 of 2

QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) REPRESENTATIVE

Reviewed by: PCT

Approved by: Sr. Operations Management

Date	Revision #	Reason for Revision
06-Jan-17	0	Document issued
05-Mar-21	1	Updated bullet points to match new roles listed elsewhere in the operational plan; added header; a few minor editing changes to fit wording on a single page.



Ontario Clean Water Agency

OPERATIONAL PLAN *PCT*

QEMS Proc.: OP-04B
Rev Date: 05-Mar-21
Rev No: 1
Pages: 1 of 2

QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) REPRESENTATIVE

Reviewed by: PCT

Approved by: Sr. Operations Management

Quality Management System Representative

Letter of Appointment

The role of QEMS Representative is shared between the Senior Operations Manager and the Process & Compliance Technician (PCT).

The PCT's duties are specified as the following:

- Administer the QEMS by ensuring that processes and procedures needed for the facility's QEMS are established and maintained;
- Report to top management on the facility's QEMS performance and identify opportunities for improvement;
- Ensure that current versions of documents related to the QEMS are in use;
- Promote awareness of the QEMS to all operations personnel
- Ensure that operations personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the system.
- 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
- Implement facility-specific QEMS programs and procedures consistently at his/her assigned facilities
- 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
- Monitor, evaluate and report on compliance/quality status of 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 regional/cluster/facility level



Ontario Clean Water Agency

OPERATIONAL PLAN *PCT*

QEMS Proc.: OP-04B
Rev Date: 05-Mar-21
Rev No: 1
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QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) REPRESENTATIVE

Reviewed by: PCT

Approved by: Sr. Operations Management

The PCT has been made aware of their role as a QEMS Representative within the DWQMS.

Natalie Wagar – Process & Compliance Technician

March 5, 2021

Date

Sarah Beaulieu – Process & Compliance Technician

March 8, 2021

Date

Date	Revision #	Reason for Revision
06-Jan-17	0	Document issued
05-Mar-21	1	Updated bullet points to match new roles listed elsewhere in the operational plan; added header; a few minor editing changes to match layout to rest of OP



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Appointment of QEMS Rep
Revision 1, 05-Mar-21

This document is considered uncontrolled when found outside designated document control locations



OPERATIONAL PLAN

Echo Bay Drinking Water System

QEMS Proc.: OP-05
Rev Date: 27-Sep-18
Rev No: 1
Pages: 1 of 4

DOCUMENT AND RECORDS CONTROL

Reviewed by: PCT

Approved by: Operations Management

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 *Echo Bay Water Treatment Facility & Distribution System*, 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 issue 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 authorized approval, alpha-numeric procedure code, issue date, page numbers on every page, revision number and revision history.

Authorized personnel for review and approval of this Operational Plan are:

Review	QEMS Rep.
Approval	Operations Management, SPC Manager



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Echo Bay Drinking Water System

QEMS Proc.: OP-05
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DOCUMENT AND RECORDS CONTROL

Reviewed by: PCT

Approved by: Operations Management

- 3.4 Changes to formatting, grammar, or spelling may be made without updating the revision date or revision number.
- 3.5 The QEMS rep. 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.

- 3.6 Electronic documents maintained on the Hub Shared Server are made available to operations personnel in PDF formats within the folder entitled @ Operator's Folder. Original documents in word format are kept in a separate folder and are edited by QEMS reps.
- 3.7 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 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.

SCADA (not connected to OCWA's network) records are maintained as per Appendix OP-05A and are accessible to all staff when required.

- 3.8 Any employee of the drinking water system may request, in writing, to the QEMS rep., a revision be made to improve an existing internal QEMS document or the preparation of a new document. Written 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 rep. 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 rep. by OCWA's Corporate Compliance group through e-mails, memos and/or provincial, regional hub/cluster or facility-level training sessions.



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QEMS Proc.: OP-05
Rev Date: 27-Sep-18
Rev No: 1
Pages: 3 of 4

DOCUMENT AND RECORDS CONTROL

Reviewed by: PCT

Approved by: Operations Management

3.9 When a QEMS document is superseded, the hardcopy of the document is promptly removed from its location and disposed of by operations personnel. Electronic documents are superseded by moving PDF versions to the #Obsolete folders and deleting the Word version.

3.10 The authorized method for disposal of hardcopy documents and records after the specified retention requirements have been met is shredding.

3.11 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
DWQMS operational plan	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 all the documents/records listed in Table 1)	3 years*if no specified legislative requirement below*	OCWA Requirement
Logbooks 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
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 (LMR) and THM, HAA, nitrates, nitrites and lead program sampling and testing, Section 11 Annual Reports and Schedule 22 Summary Reports	6 years	O. Reg. 170/03
Sodium test results and related corrective action records/reports, 60 month fluoride test results (if the system doesn't fluoridate), engineering Reports	15 years	O. Reg. 170/03
Lead samples, correction 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



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DOCUMENT AND RECORDS CONTROL

Reviewed by: PCT

Approved by: Operations Management

3.12 The Operational Plan is reviewed for currency by the QEMS rep. 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 policy 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
27-Sep-18	8	QP-01 procedure renamed OP-05. (last revision # 0 dated 01-Mar-17) 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. 3.5). Clarified that requests for revisions/new QEMS documents are made to the QEMS Representative (s. 3.8). Moved the former Table 2 (Relevant regulatory and corporate minimum retention periods) to be part of s. 3.11 and expanded on the minimum retention times for documents and records required to demonstrate compliance with legislation. Other minor wording changes.



Ontario
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OPERATIONAL PLAN

Echo Bay Drinking Water System

QEMS Doc: OP-05A
Rev Date: 14-May-19
Rev No: 1
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DOCUMENT AND RECORDS CONTROL LOCATIONS

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	
Contingency Plans	EC – S:\@ Operator's Folder
Facility Emergency Plans <ul style="list-style-type: none"> • Emergency Contact List • Essential Supplies & Services List • Municipal Emergency Response Plan (Relevant Portion) 	HC – Maintained in Facility EC – S:\@ Operator's Folder
OCWA's Corporate Procurement and Administration Policies	EC – OCWA's intranet
OCWA's Emergency Response Plan (Corporate)	EC – OCWA's intranet
OCWA's Mandatory Compliance Training List	EC – OCWA's intranet
On-call Schedule	EC – Maintained in Outlook
Operational Plan (Includes QEMS Procedures)	E-version maintained at Municipal office EC – Hub Shared Server
QEMS Policy	HC – Posted at Facility EC – OCWA's intranet and public website
QEMS Policy Revision History	EC – OCWA's intranet
Sampling Schedule - Calendar	EC – Maintained in Outlook
Sampling Schedule – Cover Page & Calendar	EC – S:\@ Operator's Folder
Standard Operating Procedures	EC – S:\@ Operator's Folder
Internal QEMS Documents (Blank)	
Action Items Spreadsheet	EC – S:\DWQMS Supporting Docs\DWQMS documents
Calibration / Verification Form	EC – S:\# PCT folder\Calibration Records
Chain of Custody Forms	EC – S:\@ Operator's Folder
Community Complaint Records	EC – S:\@ Operator's Folder
Contingency Plan Review / Test Summary Form	EC – S:\# FEP Binders\Contingencies
Distribution & Valve Service Forms	EC - S:\Distribution Information
Internal Audit Hub Protocol	EC – S:\DWQMS Supporting Docs\DWQMS documents
Internal Audit Report	EC – S:\DWQMS Supporting Docs\DWQMS documents
Management Review Minutes	EC – S:\DWQMS Supporting Docs\DWQMS documents
Operator Training Form	EC – OCWA's intranet
Round Sheet / In-House Labs	EC – S:\@ Operator's Folder
QEMS Records	
Action Items Spreadsheet	EC – S:\DWQMS-Espanola Hub
Annotation Reports	EC - Wonderware
Annual Performance Planning and Review (PPR)	EC – Maintained in OPEX
Annual Reports & Summary Reports	EC – S:\# PCT folder\Reporting\Annual and Summary Reports
AWQI Reports	EC – S:\# PCT folder\Non-Compliances & AWQIs
Call In Reports	EC – Maintained Through WMS
Calibration / Verification for Flow Meters	EC – S:\# PCT folder\Calibration Records
Capital Report	EC – S:\DWQMS-Espanola Hub\Echo Bay\Annual Capital Forecast



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DOCUMENT AND RECORDS CONTROL LOCATIONS

Type of Document/Record	Designated Document Control Location (HC = Hardcopy, E = Electronic)
	EC – Maintained Through WMS
Community Complaint Records	EC – Maintained in OPEX
Contingency Plan Review / Test Summary Form (FEP-01)	EC - S:\@ Operator's Folder
Distribution & Valve Service Forms	EC - S:\Distribution Information
DWWP's Form 1, 2, 3 & Director's Notification	EC – S:\#All facilities
External QEMS Audit Documents <ul style="list-style-type: none"> • Audit Reports • NC Reports 	EC – S:\DWQMS-Espanola Hub\Echo Bay\External Audit Reports
Facility Logbook(s)	HC – Maintained at Facility
In-House Lab Results	HC – Maintained at Facility EC – Maintained Through PDM
Internal QEMS Audit Documents <ul style="list-style-type: none"> • Internal Audit Protocol • Audit Reports 	EC – S:\DWQMS-Espanola Hub\Echo Bay\Internal Audit Reports
Laboratory Analysis Reports	EC – S:\# PCT folder\Lab Results EC – Maintained Through PDM
Laboratory Chain of Custodies	HC – Maintained at Facility
Laboratory Service Notification (LSN)	EC - S:\# PCT folder\Lab Results\LSN documents
Management Review Documentation <ul style="list-style-type: none"> • Management Review Minutes 	EC – S:\DWQMS-Espanola Hub\Echo Bay\Management Review
Operator Training Records	EC – Maintained Through Database
Rounds Sheets	HC – Maintained at Facility
SCADA Records (Plant SCADA, Client Owned)	EC – Maintained at Facility
SCADA Records (Wonderware, OCWA)	EC – Maintained at Facility
Work Order Records	EC – Maintained Through WMS
External QEMS Documents	
ANSI/NSF Product Registration Documentation for Chemicals / Materials Used	HC – Maintained at Facility EC – Online (http://info.nsf.org/Certified/PwsChemicals/)
Applicable Federal and Provincial Legislation and Municipal by-laws	EC – Online (www.e-laws.gov.on.ca)
AWWA Standards	EC – S:\@ Operator's Folder\AWWA
Calibration Certificates / Records (Third Party for Handheld Devices)	EC - S:\# PCT folder\Calibration Records\Handheld Units
Drinking Water Works Permit	HC – Maintained at Facility HC – Maintained at Town Office EC – S:\#All facilities
DWQMS Standard	E – https://www.ontario.ca
DWWP's Form 1, 2, 3 & Director's Notification (Blank)	EC – S:\@ Operator's Folder
Engineering Schematics / Plans / Drawings	HC – Maintained at Facility
Laboratory Accreditation Certification	EC – CALA Website (www.cala.ca)
Laboratory Service Notification (LSN) (Blank)	EC – Online EC – Accredited Laboratory
Maintenance / Equipment Manuals	HC – Maintained at Facility EC – Online



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DOCUMENT AND RECORDS CONTROL LOCATIONS

Type of Document/Record	Designated Document Control Location (HC = Hardcopy, E = Electronic)
MOECC Inspection Reports	EC – S:\# PCT folder\Inspections
MOECC's "Potential Hazardous Events for Municipal Residential Drinking Water Systems"	EC – https://www.ontario.ca
MOECC's "Procedure for Disinfection of Drinking Water in Ontario"	EC - S:\#@ Operator's Folder\Supporting Policies and Procedures
MSDS / SDS	HC – Maintained at Facility
Municipal Drinking Water Licence	HC – Maintained at Facility HC – Maintained at Town Office EC – S:\#All facilities
Operator Certificates	HC – Posted at Facility
Permit to Take Water	HC – Maintained at Facility HC – Maintained at Town Office EC – S:\#All facilities

Revision History

Date	Revision #	Reason for Revision
02-Oct-18	0	Procedure issued – Document and Records Control Locations were originally included in former QP-01 as Table 1 (last revised on 2011-12-13). Added additional types of documents and records that require document control.
14-May-19	1	Moved calibration/verification for flow meters under the 'QEMS Records'; changed location from HC to E-version for municipal FEP location; changed the name of the action and analysis spreadsheet to action items spreadsheet in 2 locations; Included in-house labs next to round sheets under 'internal QEMS Documents (BLANK)'; added specification that third party calibration certificates are for handheld devices and changed the location to EC; changed the location where the 'procedure for disinfection' is maintained; added online address for location of NSF documents; added distribution and valve service forms to internal QEMS (Blank) and QEMS records; changed the formatting of the table size



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Echo Bay Drinking Water System

QEMS Proc.: OP-06
Rev Date: 21-Apr-20
Rev No: 1
Pages: 1 of 6

DRINKING WATER SYSTEM

Reviewed by: PCT

Approved by: Operations Management

1. Purpose

To document the following for the *Echo Bay Drinking Water System*:

- 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 Drinking Water System Overview – Treatment and Distribution

- Owner: *The Corporation of the Township of MacDonald, Meredith & Aberdeen Additional*
- Operating Authority: Ontario Clean Water Agency

The water treatment facility is located at 3121 Highway 17B



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DRINKING WATER SYSTEM

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Approved by: Operations Management

3.2 Source Water

The raw water source for the treatment plant is Lake George.

General Characteristics

The shoreline of Lake George adjacent to the plant is shallow and covered in Marsh vegetation. The water quality in Lake George is generally good; however Lake George has been designated under the St. Mary's River Area Remedial Action Plan (RAP) as an area of concern, primarily due to the presence of contaminated sediment. Although the water entering the St. Mary's River from Lake Superior is of good quality, industrial and municipal discharges from Sault Ste. Marie have led to some degradation of the water quality, along with the deposition of contaminated sediment, and impacts on the biota. The concentration of many of the contaminants in the sediment, however, have decreased in recent years.

Raw Water Characteristics at Intake

Parameters	Years				
	2018	2021	2024	2027	2030
pH					
Alkalinity (mg/L as CaCO ₃)	39				
Conductivity (uS/cm)	129				
Total Dissolved Solids (mg/L)	89				
Hardness (mg/L as CaCO ₃)	44.0				
Langelier's Index (@20°C)					
Aluminum (mg/L)	42.6				
Arsenic (ug/L)	0.2				
Barium (ug/L)	11.8				
Beryllium (ug/L)	0.007				
Boron (ug/L)	61				
Bismuth (ug/L)	0.007				
Calcium (mg/L)	13.4				
Cadmium (ug/L)	0.005				
Cobalt (ug/L)	0.007				
Chromium (ug/L)	0.21				



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Copper (ug/L)	0.90				
Iron (ug/L)	7				
Sodium (mg/L)	4.87				
Magnesium (mg/L)	2.57				
Manganese (ug/L)	0.26				
Molybdenum (ug/L)	5.45				
Nickel (ug/L)	0.2				
Lithium (ug/L)	0.369				
Potassium (mg/L)	0.648				
Lead (ug/L)	0.14				
Silicon (ug/L)	954				
Antimony (ug/L)	0.10				
Selenium (ug/L)	0.08				
Strontium (ug/L)	22.3				
Titanium (ug/L)	0.05				
Thallium (ug/L)	0.005				
Uranium (ug/L)	0.008				
Tin (ug/L)	0.02				
Vanadium (ug/L)	0.24				
Tungsten (ug/L)	2.29				
Yttrium (ug/L)	0.002				
Zinc (ug/L)	3				

	E.coli			Total Coliform			Turbidity			Temperature			pH		
	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max
2017	0	2.8	23	0	21.7	81	0.01	3.2	30.5	N/A	N/A	N/A	7.13	7.47	7.51
2018															
2019															
2020															
2021															
2022															
2023															
2024															

Above table updated every 3 years following raw water characteristic sampling



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Common Fluctuations

The George is highly susceptible to wind action due to its shallow depth, and during windy days sediments can become re-suspended within the water. This trait, along with heavy run-off during rain events or snow melt will fluctuate the incoming water (turbidity and micro), as well as spring and fall turnover events due to water temperature.

Threats

Lake George has been designated under the St. Mary's River Area Remedial Action Plan (RAP) as an area of concern, primarily due to the presence of contaminated sediment. In the area of Lake George adjacent to the Village of Echo Bay, the primary concern is related to the presence of sediments contaminated with Polycyclic Aromatic Hydrocarbons (PAH).

Operational Challenges

The community consists of residential and small commercial zoning, with wastewater from the community being treated and discharged back into Lake George downstream of the water intake. Upstream is the twin cities of Sault Ste. Marie (Ontario and Michigan), which poses the potential risks of water contamination due to municipal and industrial activity. Also there is commercial shipping in the St. Mary's River.

3.3 Treatment System Description

Treatment System

Raw water is processed into potable water by the package water treatment plant through coagulation, flocculation, sedimentation, and filtration. Alum is used to assist the clarification process, chlorination is used for disinfection purposes, and Sodium Hydroxide (Caustic) is used for pH adjustment. The granular activated carbon filters are used primarily as a safeguard against the presence of organics in the supply water, as well as to prevent possible taste and odor problems.

The treatment plant has a design capacity of 1345 m³/day (20 yr. max. day demand). The plant consists of an intake structure, an intake pipeline, a coarse raw water screen, three (3) low lift pumps, two (2) Napier Reid package water treatment plants, and two granular activated carbon filters. Treated water is pumped from the underground reservoirs to the distribution and an elevated tank by four (4) high lift pumps.

Residue Management

Backwash water is also processed into clean effluent through settling. The discharge header from the treatment plant is connected to a 250mm trunk water main, which extends to the elevated storage tower.

DRINKING WATER SYSTEM

Reviewed by: PCT

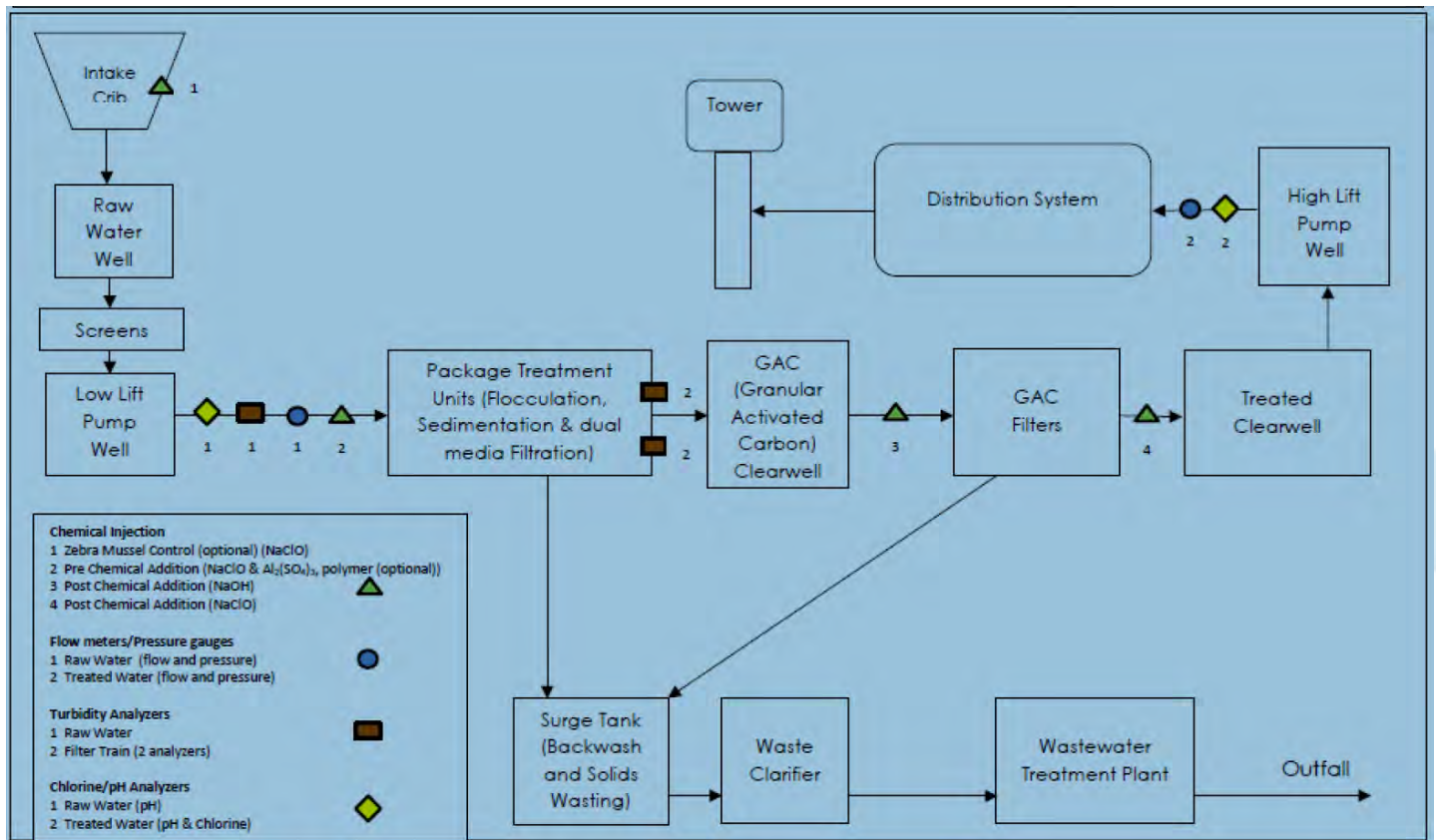
Approved by: Operations Management

Standby Power Supply

Standby power is provided by a standby diesel generator to the continuous duty pump, the chemical feed system, the flow meter and designated light fixtures and heaters. The 180 kW unit is complete with controller, battery charger, diesel fuel storage and an automatic transfer switch.

3.4 Treatment System Process Flow Chart

Water Treatment Plant





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3.5 Description of the Distribution System Components

In the Village of Echo Bay, an underground reservoir and an elevated tower are provided to store treated water for reserve capacity. The Echo Bay Water System is equipped with a 682 m³ (150,000 gal) elevated steel water tower that serves to supplement the storage capacity of the underground reservoirs. The water storage system performs a variety of functions including equalizing supply and demand, leveling out pumping requirements, and providing water to meet fire demands. The tower's operating storage "floats" on the distribution system so the tank fills when demand is low and empties when demand exceeds the supply rate.

The Echo Bay distribution system is comprised of 150 mm diameter to 250 mm diameter PVC water mains installed between 1996 and 1997. Over 8300 metres of water mains have been installed. Service connections to existing domestic consumers are generally 19 mm diameter copper pipe.

There are approximately 200 connections in the system servicing a population of 500.

4. Related Documents

Drinking Water Works Permit (DWWP)
DWWP's Form 1, 2, 3 and Director's Notification

5. Revision History

Date	Revision #	Reason for Revision
15-Jan-19	0	Procedure issued – Information within OP-06 was originally set out in the Main body of OCWA's Operational Plan. New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Source description updated. Raw water source parameter data tables updated to new layout. Added lack of water tower as possible operational challenge. Added new raw water sampling data. Added information to the 'threat' section relating to the RAP.
21-Apr-20	1	Added comment relating to raw water sampling data tables being updated every 3 years;



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Rev No: 0
Pages: 1 of 4

RISK ASSESSMENT

Reviewed by: PCT

Approved by: Operations Management

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 any thing found in the waters,
 - i. that adversely affects, or is likely to adversely affect, the health of the users of the system,
 - ii. that deters or hinders, or is likely to deter or hinder, the prevention or suppression of disease, or
 - iii. that endangers or is likely to endanger public health,
- 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 conducts a risk assessment at least once every thirty-six months with support from operational personnel. Work orders are assigned directly to operations management through OCWA's Work Management System (WMS).
- 3.2 The QEMS rep. is responsible for 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:



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RISK ASSESSMENT

Reviewed by: PCT

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- 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 of the Environment and Climate Change (MOECC) 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, SOPs/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 MOECC’s “Procedure for Disinfection of Drinking Water in Ontario” are met, OCWA has established mandatory Critical Control Points (CCPs).

As a minimum, the following must be included as CCPs (as applicable):

- 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 not 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



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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 all 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 of Medical Officer of Health (MOH) or MOECC or both.

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 rep. 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



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4. Related Documents

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

5. Revision History

Date	Revision #	Reason for Revision
27-Sep-18	0	Procedure issued – Information within OP-07 was originally set out in the QEMS Procedure QP-02 Risk Assessment and Risk Assessment Outcomes (last revision # 1 dated 18-Jul-17). Revised Purpose to reflect element 7 requirements only. Clarified role of QEMS Representative in coordinating the risk assessment and maintaining documents and records. Re-worded procedure for performing the risk assessment (process itself remains essentially unchanged). Removed requirements for documenting the outcomes of the risk assessment (now covered in OP-08).



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QEMS Proc.: OP-08
Rev Date: 27-Sep-18
Rev No: 0
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RISK ASSESSMENT OUTCOMES

Reviewed by: PCT

Approved by: Operations Management

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 rep. is responsible for updating the information in OP-08A Summary of Risk Assessment Outcomes as required.

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

- identified potential hazardous events and associated hazards (possible outcomes) for each of the system's activities/process steps;
- 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 CCP (mandatory or additional).
Note: If the hazardous event is ranked as 12 or higher and it is not 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:

- 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.

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



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RISK ASSESSMENT OUTCOMES

Reviewed by: PCT

Approved by: Operations Management

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

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

5. Revision History

Date	Revision #	Reason for Revision
27-Sep-18	0	Procedure issued – Information within OP-08 was originally set out in the QEMS Procedure QP-02 Risk Assessment and Risk Assessment Outcomes (last revision # 1 dated 18-Jul-17). Clarified role of QEMS Representative in updating the information in OP-08A Summary of Risk Assessment Outcomes. Included requirements for how to document the risk assessment outcomes using the tables in OP-08A. 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.

Summary of Risk Assessment Outcomes Echo Bay Water Supply

Table 1: Risk Assessment Table - Echo Bay WTP

Activity / Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Source / Intake	Spill - chemical or biological	Contamination of source water Operational challenges Economic impact	>In house raw water monitoring >Production of water would cease immediately until safe production can be resumed. SOP: Provision of Alternate Water Source; Notification of Adverse Water Contingency Plans: Loss of Service; Unsafe Water; Spill Response	5	2	10	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Sudden changes to raw water	Process upset Increased chlorine demand Increased turbidity Ineffective removal of pathogens - CT not met	>In house raw water monitoring >Continuous online monitoring with alarms >Remote monitoring via Wonderware >Routine sampling >Manual CT calculations >Regular onsite visits SOP: Continuous Monitoring Data Review; CT Requirement for facility; Notification of Adverse Water Contingency Plans: Unsafe Water	4	2	8	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Algal bloom	Contamination of source water Loss of water supply	>Complaint process from residents >Weekly sampling from June to October (annually) once blue green algae is confirmed in source water >Remote monitoring via Wonderware >Manual CT calculations >Regular onsite visits >GAC filters SOP: Blue Green Algae; Provision of Alternate Water Source; Community Complaint; Notification of Adverse Water; CT Requirement for facility Contingency Plans: Unsafe Water	1	2	2	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Water supply shortfall	Loss of water supply Decreased fire protection	>Water use restrictions >Increase in monitoring SOP: Provision of Alternate Water Source; Contingency Plans: Loss of Service;	1	3	3	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Refer to OP-07 Risk Assessment and OP-08 Risk Assessment Outcomes for instructions on how to complete this summary

This document is considered uncontrolled when found outside designated document control locations

Summary of Risk Assessment Outcomes Echo Bay Water Supply

Activity / Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
	Breakage / blockage of single intake pipe	Loss of water supply Low / loss of distribution pressure	>Remote monitoring via Wonderware >Periodic inspections by certified divers. >Continuous online monitoring of raw flows with alarms >Regular onsite visits >Complaint process from residents SOP: Provision of Alternate Water Source; Community Complaint; Notification of Adverse Water; Continuous Monitoring Data Review; Contingency Plans: Loss of Service;	1	2	2	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Agricultural run-off	Contamination of source water	>Routine sampling >Regular onsite visits SOP: Provision of Alternate Water Source; Notification of Adverse Water; Above Grade Inspection of Well Components at the Facility; Below Grade Inspection of Well Components at the Facility Contingency Plans: Unsafe Water; Loss of Service;	2	2	4	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Zebra mussel pump failure (System currently not in use)	Loss of zebra mussel control Process changes for CT	>Remote monitoring via Wonderware >Continuous online monitoring SOP: Continuous Monitoring Data Review; Chlorination Contact Time (CT) Contingency Plans: Loss of Service;	0	0	0	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Low Lift Station	Low lift pump failure	Loss of water supply	>Redundancy (3 pumps) >Scheduled maintenance activities >Backup generator for loss of power situations >Continuous online monitoring of raw flows with alarms >Remote monitoring via Wonderware SOP: Provision of Alternate Water Source; Notification of Adverse Water; Continuous Monitoring Data Review; Contingency Plans: Loss of Service;	3	1	3	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Primary Disinfection - Sodium Hypochlorite	Feed pump failure	Low chlorine residual Inadequate inactivation of pathogens - CT not met	>Continuous online monitoring of chlorine with alarms >Dosage calculations >Scheduled maintenance activities, >Manual CT calculations >Remote monitoring via Wonderware >Regular onsite visits SOP: Notification of Adverse Water; Continuous Monitoring Data Review; CT Requirement for facility Contingency Plans: Unsafe Water				<input checked="" type="checkbox"/> Yes – Mandatory CCP

Refer to OP-07 Risk Assessment and OP-08 Risk Assessment Outcomes for instructions on how to complete this summary

Summary of Risk Assessment Outcomes Echo Bay Water Supply

Activity / Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
	Analyzer failure	Unknown chlorine residual levels Potential for inadequate inactivation of pathogens - CT not met	>Continuous online monitoring of chlorine with alarms >Handheld readings every 5 minutes upon failure >Scheduled maintenance activities, >Remote monitoring via Wonderware >Regular onsite visits SOP: Notification of Adverse Water; Continuous Monitoring Data Review; Reporting a Non-Compliance; CT Requirement for facility Contingency Plans: Unsafe Water				<input checked="" type="checkbox"/> Yes – Mandatory CCP
	Low supply of sodium hypochlorite	Low chlorine residual Inadequate inactivation of pathogens - CT not met	>Operator inspections. >Chemical available from other hub facilities >Continuous online monitoring of chlorine with alarms >Essential supplies from other distributors >Manual CT calculations >Remote monitoring via Wonderware >Regular onsite visits SOP: Notification of Adverse Water; Continuous Monitoring Data Review; CT Requirement for facility Contingency Plans: Unsafe Water				<input checked="" type="checkbox"/> Yes – Mandatory CCP
Filtration Process (Includes coagulation, flocculation & rapid sand filters)	Coagulant feed pump failure	Ineffective removal of pathogens (minimum treatment requirements not met) Filter efficiency failure	>Operator inspections (tank levels, calculate dosage) >Scheduled maintenance activities >Alarm on high turbidity >Continuous online monitoring of turbidity with alarms >Redundancy (back-up pump) SOP: Filter Efficiency Reports; Notification of Adverse Water; Continuous Monitoring Data Review Contingency Plans: Unsafe Water				<input checked="" type="checkbox"/> Yes – Mandatory CCP
	Turbidimeter failure	Unknown turbidity levels Failure to prove filter efficiency	>Alarms and auto shutdown >Operator inspections. >Handheld readings every 15 minutes upon failure >Continuous online monitoring of turbidity with alarms >Regular onsite visits >Scheduled maintenance activities, >Remote monitoring via Wonderware SOP: Filter Efficiency Reports; Notification of Adverse Water; Continuous Monitoring Data Review Contingency Plans: Unsafe Water				<input checked="" type="checkbox"/> Yes – Mandatory CCP

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Summary of Risk Assessment Outcomes Echo Bay Water Supply

Activity / Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
	Filter clogging (tube - honeycomb - cartridge)	Increased turbidity Decreased filtering Inadequate inactivation of pathogens	>Continuous monitoring of filter pressures >Continuous online monitoring of turbidity with alarms >Regular onsite visits >Remote monitoring of process via Wonderware >Scheduled maintenance activities, >Redundancy (2 filters) SOP: Notification of Adverse Water; Continuous Monitoring Data Review; Contingency Plans: Unsafe Water				<input checked="" type="checkbox"/> Yes – Mandatory CCP
	Coagulant - Low supply of chemical	Increased turbidity Ineffective removal of pathogens Inadequate inactivation of pathogens - CT not met	>Operator inspections >Chemical available from other hub facilities >Continuous online monitoring of chlorine with alarms >Essential supplies from other distributors >Manual CT calculations >Remote monitoring via Wonderware >Regular onsite visits SOP: Notification of Adverse Water; Continuous Monitoring Data Review; Contingency Plans: Unsafe Water				<input checked="" type="checkbox"/> Yes – Mandatory CCP
Clearwell	Clearwell out of service	Potential for not meeting CT	>Increase chlorine dosage >Continuous online monitoring of chlorine with alarms >Remote monitoring via Wonderware >Regular onsite visits >Continuous online monitoring of flows with alarms >Manual CT calculations SOP: Notification of Adverse Water; Continuous Monitoring Data Review; CT Requirement for facility Contingency Plans: Unsafe Water	1	2	2	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Clearwell low level	Potential for not meeting CT	>Alarm setpoints above critical CT range >Manual CT calculations >Remote monitoring via Wonderware >Regular onsite visits >Continuous online monitoring of chlorine with alarms SOP: Notification of Adverse Water; Continuous Monitoring Data Review; CT Requirement for facility Contingency Plans: Unsafe Water	1	2	2	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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Summary of Risk Assessment Outcomes Echo Bay Water Supply

Activity / Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
High Lift Station	High lift pump failure for extended period	No pressure in distribution system Possible biological contamination due to infiltration	>Redundancy (4 pumps) >On-line pressure monitoring and alarms >Backup generator for loss of power >Complaint process from residents SOP: Provision of Alternate Water Source; Notification of Adverse Water; Community Complaints Contingency Plans: Loss of Service; Unsafe Water;	1	1	1	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Distribution	Loss of residual	Failure to control biofilm Failure to control pathogens	>Increase disinfection >System wide residual testing >Annual scheduled flushing >Emergency flushing when required SOP: Notification of Adverse Water; Contingency Plans: Unsafe Water;				<input checked="" type="checkbox"/> Yes – Mandatory CCP
	Sustained pressure Loss	Loss of secondary disinfection residual Possible biological contamination due to infiltration Inability to meet fire protection needs	>On-line pressure monitoring and alarms >Public health advisories: BWA/DWA >Alternate water supplies >Remote monitoring via Wonderware >Complaint process from residents >Tower to maintain pressure SOP: Provision of Alternate Water Source; Notification of Adverse Water; Community Complaints Contingency Plans: Loss of Service;	1	2	2	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Backflow	Possible biological/chemical contamination Damage to infrastructure Decrease of water supply	>System wide residual testing >Annual scheduled flushing >Emergency flushing when required >Backflow preventer at Arena SOP: Provision of Alternate Water Source; Notification of Adverse Water; Community Complaints Contingency Plans: Unsafe Water; Loss of Service	1	3	3	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Main/pipe break	Reduced flow/inability to meet demand No or low pressure Possible biological contamination	>Municipal capital program for watermain replacement >Complaint process from residents >Pressure alarms >Low clearwell alarms SOP: Notification of Adverse Water; Community Complaints; Provision of Alternate Water Source; Watermain Disinfection Procedure Contingency Plans: Unsafe Water;	1	3	3	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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Summary of Risk Assessment Outcomes Echo Bay Water Supply

Activity / Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
	Major municipal fire	Low clear well Low / no pressure in sections of the distribution Inability to meet demand, Potential for not meeting CT Coloured water in distribution	>Manual CT calculations >Online monitoring of all regulatory parameters >Remote monitoring via Wonderware >On-line pressure monitoring and alarms >Complaint process from residents SOP: Notification of Adverse Water; Community Complaints; Provision of Alternate Water Source; CT Requirement for facility Contingency Plans: Unsafe Water; Loss of Service	2	2	4	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Water Tower	Maintenance of water tower Tower not available	Loss of pressure Inability to meet demand	>Remote monitoring via Wonderware >On-line pressure monitoring and alarms >Public health advisories: BWA/DWA >Alternate water supplies SOP: Notification of Adverse Water; Community Complaints Contingency Plans: Unsafe Water; Loss of Service	2	2	4	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Low tower level	Inability to meet demand No pressure in distribution system Possible biological contamination due to infiltration	>Low tower alarm >Town ordered water conservation measures SOP: Provision of Alternate Water Source; Notification of Adverse Water; Contingency Plans: Loss of Service; Unsafe Water;	1	3	3	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Generator	Fail to start	No water production or supply	>Alarm on generator fault >Monthly generator inspection and run test under load >Remote monitoring via Wonderware >Complaint process from residents >On-line pressure monitoring and alarms SOP: Notification of Adverse Water; Community Complaints; Provision of Alternate Water Source Contingency Plans: Loss of Service	1	3	3	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Transfer fail	No power to plant Possible biological contamination due to infiltration	>Complaint process from residents >Monthly generator inspection and run test under load >Manual transfer >Generator fault alarm >On-line pressure monitoring and alarms SOP: Notification of Adverse Water; Community Complaints; Provision of Alternate Water Source Contingency Plans: Loss of Service	1	3	3	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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Summary of Risk Assessment Outcomes Echo Bay Water Supply

Activity / Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
	Fuel spill	Contamination of clearwell	>Spill containment chamber >Regular onsite visits >Generator fault alarm SOP: Reporting Spills and Other Discharges Contingency Plans: Spill Response	2	2	4	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Low fuel	No power to plant	>Emergency fuel delivery >Regular onsite visits >Monthly generator inspection SOP: Notification of Adverse Water; Community Complaints; Provision of Alternate Water Source Contingency Plans: Loss of Service	2	2	4	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Water Treatment System	Extreme weather event - Lightning storm	Loss of power to plant Damage to equipment Unknown treatment levels Unable to meet CT Damage to building	>Generator for power outage >Remote monitoring via Wonderware >Municipal and Corporate emergency plans >Spare parts onsite >UPS surge protection >Manual control of operations >Manual CT calculations >Chemicals available in other hub locations >Working alone policy SOP: Notification of Adverse Water; Provision of Alternate Water Source; Working Alone; CT Requirement for Facility Contingency Plans: Loss of Service; Unsafe Water	1	2	2	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Extreme weather event - Ice storm	Loss of power to plant Damage to equipment Unknown treatment levels Unable to meet CT Damage to building	>Generator for power outage >Remote monitoring via Wonderware >Municipal and Corporate emergency plans >Spare parts onsite >UPS surge protection >Manual control of operations >Manual CT calculations >Chemicals available in other hub locations >Working alone policy >Winter driving guidelines SOP: Notification of Adverse Water; Provision of Alternate Water Source; Working Alone; CT Requirement for Facility Contingency Plans: Loss of Service; Unsafe Water	3	2	6	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Refer to OP-07 Risk Assessment and OP-08 Risk Assessment Outcomes for instructions on how to complete this summary

Summary of Risk Assessment Outcomes Echo Bay Water Supply

Activity / Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
	Extreme weather event - Wind storm	Loss of power to plant Damage to equipment Unknown treatment levels Unable to meet CT Damage to building	>Generator for power outage >Remote monitoring via Wonderware >Municipal and Corporate emergency plans >Spare parts onsite >UPS surge protection >Manual control of operations >Manual CT calculations >Chemicals available in other hub locations >Working alone policy SOP: Notification of Adverse Water; Provision of Alternate Water Source; Working Alone; CT Requirement for Facility Contingency Plans: Loss of Service; Unsafe Water	2	2	4	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Extreme weather event - Winter storm	Loss of power to plant Damage to equipment Unknown treatment levels Unable to meet CT Damage to building	>Generator for power outage >Remote monitoring via Wonderware >Municipal and Corporate emergency plans >Spare parts onsite >UPS surge protection >Manual control of operations >Manual CT calculations >Chemicals available in other hub locations >Working alone policy >Winter driving guidelines SOP: Notification of Adverse Water; Provision of Alternate Water Source; Working Alone; CT Requirement for Facility Contingency Plans: Loss of Service; Unsafe Water	4	2	4	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Sustained extreme temperatures - Heat wave	Increased water demand Drought Inability to maintain chlorine residual	>Municipal and Corporate emergency plans >Water use restrictions >Increase in monitoring >Public outreach/education >Continuous online monitoring with alarms >Remote monitoring via Wonderware SOP: Provision of Alternate Water Source; CT Requirement for Facility Contingency Plans: Loss of Service; Unsafe Water	2	2	4	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Refer to OP-07 Risk Assessment and OP-08 Risk Assessment Outcomes for instructions on how to complete this summary

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Summary of Risk Assessment Outcomes Echo Bay Water Supply

Activity / Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
	Sustained extreme temperatures - Deep freeze	Frozen water tower Frozen watermains Increased main breaks Low/no pressure in distribution	>Continuous online monitoring with alarms >Remote monitoring via Wonderware >Annual scheduled flushing >Emergency flushing when required SOP: Provision of Alternate Water Source; Contingency Plans: Loss of Service; Unsafe Water	2	4	8	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Vandalism	Damage to building Damage to equipment Unknown treatment Contamination of source water Contamination of treated water	>Police Response >Continuous online monitoring with alarms >Remote monitoring via Wonderware >Alarm for entry >Additional sampling SOP: Provision of Alternate Water Source; CT Requirement for Facility; Notification of Adverse Water; Contingency Plans: Security Breach; Loss of Service; Unsafe Water	4	2	8	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Terrorist threat (physical & cyber)	Damage to building Damage to equipment Unknown treatment Contamination of source water Contamination of treated water Loss of SCADA	>Police Response >Continuous online monitoring with alarms >Remote monitoring via Wonderware >Alarm for entry >Additional sampling >Electronic security measures SOP: Provision of Alternate Water Source; CT Requirement for Facility; Notification of Adverse Water; Contingency Plans: Security Breach; Loss of Service; Unsafe Water	1	4	4	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Long term impacts of climate change - Increase/decrease of water levels	Change in raw water characteristics Loss of water supply	>Continuous online monitoring with alarms >Remote monitoring via Wonderware >Regular onsite visits >Water use restrictions SOP: Provision of Alternate Water Source; Contingency Plans: Loss of Service; Unsafe Water	1	3	3	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Long term impacts of climate change - Flooding in or around treatment facility	No power to plant Unsafe working conditions Damage to building Damage to equipment Contamination of treated water	>Remote monitoring via Wonderware >Generator manual transfer >Municipal and Corporate emergency plans SOP: Notification of Adverse Water; Provision of Alternate Water Source; Working Alone Contingency Plans: Loss of Service	1	4	4	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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Summary of Risk Assessment Outcomes Echo Bay Water Supply

Activity / Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
	Long term impacts of climate change - Flooding throughout city	Unsafe working conditions No services (lab, chemical) or deliveries No power to plant Contamination of source water	>Remote monitoring via Wonderware >Municipal and Corporate emergency plans >Generator manual transfer SOP: Notification of Adverse Water; Provision of Alternate Water Source; Working Alone Contingency Plans: Loss of Service	3	3	9	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Long term impacts of climate change - Forest fires	No power to plant Unsafe working conditions No services (lab, chemical) or deliveries Lightning Storm	>Remote monitoring via Wonderware >Generator manual transfer >Municipal and Corporate emergency plans >Chemicals available in other hub locations SOP: Notification of Adverse Water; Provision of Alternate Water Source; Working Alone Contingency Plans: Loss of Service	1	3	3	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	Long term impacts of climate change - Increase/decrease in population	Decrease in water demand - process changes required Increase in water demand - (see water supply shortfall)	>Municipal capital program >Long term forecasting of capital projects >Continuous process monitoring SOP: Provision of Alternate Water Source; Contingency Plans: Loss of Service;	1	2	2	<input type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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Summary of Risk Assessment Outcomes Echo Bay Water Supply

Table 2: Critical Control Limits

CCP	Critical Control Limits	Monitoring Procedures	Response, Reporting and Recording Procedures
Filtration Process	Turbidity Alarm (each filter): High alarm setpoint range 0.1 to 0.3 NTU	Operational system checks Continuous turbidity monitoring Filter Efficiency is monitored to ensure 0.30 NTU 95% of the time on a monthly basis.	<i>Adverse Water Quality Reporting SOP</i> <i>Corrective Action SOP</i> Exceedances during scheduled hours recorded in facility logbooks Call outs reported in WMS Filter turbidity reported in PDM <i>Contingency for unsafe water</i>
Sodium Hypochlorite System	Free chlorine residual: Low Alarm setpoint range: 0.7 - 1.0 mg/L High alarm setpoint range: 1.5 - 2.0 mg/L	Operational system checks Handheld residuals taken by operator Continuous monitoring	<i>Adverse Water Quality Reporting SOP</i> <i>Corrective Action SOP</i> Increase disinfection Plant shutdown low alarm Call outs recorded in WMS. Exceedances during scheduled hours recorded in facility logbooks Chlorine residual reported in PDM <i>Contingency for unsafe water</i>
Secondary Disinfection	Free chlorine residual minimum - 0.05mg/L	Distribution chlorine residuals monitored as per O. Reg. 170/03	<i>Adverse Water Quality Reporting SOP</i> <i>Corrective Action SOP</i> Increase disinfection Flushing system Call outs recorded in WMS. Exceedances during scheduled hours recorded in facility logbooks Chlorine residual reported in PDM <i>Contingency for unsafe water</i>

Refer to OP-07 Risk Assessment and OP-08 Risk Assessment Outcomes for instructions on how to complete this summary

Summary of Risk Assessment Outcomes Echo Bay Water Supply

Table 3: Record of Annual Review

Participants	Date of Review	Reason for Review (e.g. management review, annual review, etc.)
Natalie Wagar - PCT Charles O'Kane - Operator Ryan Harmar - Operator in Training	12-Jul-17	Initial Risk Assessment Conducted
Natalie Wagar - PCT	08-Aug-18	Annual review
Natalie Wagar, PCT Patti O'Handley, Operations Management Keith Stringer, Operations Management	10-Jan-19	36 month re-write
Natalie Wagar, PCT Sarah Beaulieu, PCT	28-Aug-19	Annual review during internal audit
Natalie Wagar, PCT	28-Apr-20	Annual Review - no changes

Refer to OP-07 Risk Assessment and OP-08 Risk Assessment Outcomes for instructions on how to complete this summary

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Summary of Risk Assessment Outcomes

Echo Bay Water Supply

Revision History

Revision Date	Revision #	Reason for Revision
14-Jul-17	0	Initial risk assessment conducted
09-Aug-18	1	Changed zebra mussel pump failure to 0 & 0 since the system is not currently being used; changed likelihood of heat wave from 1 to 2;
24-Jan-19	2	Removed reference to old procedures QP-02; added QEMS document number; made minor formatting changes to page layout, margins and headers. Changes made through the rewrite include: Removed reference to the low pressure SOP; added comments to 'zebra mussel pump failure' hazard; added SOP watermain disinfection to 'main pipe break' hazard; removed reference to alum and replaced with coagulant for 'coagulant –low supply of chemical' hazard;
25-Oct-19	3	Removed spare pump under coagulant feed pump failure; removed reference to clearwell redundancy; added corrective action SOP to table 2: response, reporting, & recording procedures

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Ontario Clean Water Agency

OPERATIONAL PLAN

Echo Bay Drinking Water System

QEMS Proc.: OP-09
Rev Date: 06-Feb-20
Rev No: 1
Pages: 1 of 8

ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

Reviewed by: PCT

Approved by: Operations Management

1. Purpose

To document the following for the *Echo Bay Drinking Water System*:

- 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 general manager, 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 *Echo Bay Drinking Water System* is owned by *The Corporation of the Township of MacDonald, Meredith & Aberdeen Additional* and is represented by the *Mayor and Clerk/Treasurer*.

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

3.2 Top Management

Top management for the *Echo Bay Drinking Water System* consists of:

- Sr. Operations Management – *North Shore Area*
- Regional Hub Manager – *Northwestern Ontario, Espanola*
- Safety, Process & Compliance Manager – *Northwestern Ontario, Espanola*



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Reviewed by: PCT

Approved by: Operations Management

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 Rep. (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	<ul style="list-style-type: none"> • Review and approve the QEMS Policy • 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
Senior Leadership Team (SLT)	<ul style="list-style-type: none"> • Approve corporate QEMS programs and procedures • 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
Corporate Compliance	<ul style="list-style-type: none"> • 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 • Manage the QEMS Policy and corporate QEMS programs and procedures • Monitor and report on QEMS performance and any need for improvement to SLT • Provide support for the local implementation of the QEMS



Ontario Clean Water Agency

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Echo Bay Drinking Water System

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ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

Reviewed by: PCT

Approved by: Operations Management

3.4 Regional Hub Roles, Responsibilities and Authorities

QEMS roles, responsibilities and authorities of 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 Northwestern Ontario – Espanola Hub

Role	Responsibilities and Authorities
All Operations Personnel	<ul style="list-style-type: none"> Attend/participate in training relevant to their duties under the QEMS Be aware of environmental and public health risks at the facility Be familiar with the QEMS policy and work in accordance with QEMS programs and procedures Document all operational activities Identify potential hazards at their facility that could affect the environmental and/or public health and report to operations management Maintain operator certification (as required) Perform duties in compliance with applicable legislative and regulatory requirements Recommend changes to improve the QEMS Report and act on all operational incidents
Regional Hub Manager (Top Management)	<ul style="list-style-type: none"> Ensure corporate QEMS programs and procedures are implemented consistently throughout the regional hub Fulfill role of top management Oversee the administration and delivery of contractual water/wastewater services on a regional hub level Report to VP of operations/SLT on the regional performance of the QEMS and any need for Agency-wide improvement
Operations Management (Top Management & QEMS Rep.)	<ul style="list-style-type: none"> Act as Overall Responsible Operator (ORO) when required. Refer to Overall Responsible Operator (ORO) SOP. Determine necessary action and assign resources in response to operational issues Ensure corporate and site-specific QEMS programs and procedures are implemented at his/her assigned facilities



Ontario Clean Water Agency

OPERATIONAL PLAN

Echo Bay Drinking Water System

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ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

Reviewed by: PCT

Approved by: Operations Management

Role	Responsibilities and Authorities
	<ul style="list-style-type: none"> • Ensure operational training is provided for their staff (in consultation with the SPC manager as required) • Fulfill role of top management • Manage the day-to-day operations and maintenance of his/her assigned facilities and supervise facility operational staff • Report to the regional hub manager on facility operational performance
<p>Safety, Process & Compliance (SPC) Manager (Top Management)</p>	<ul style="list-style-type: none"> • Act as alternate QEMS Rep. (when required) • Assist in the development of site-specific operational procedures as required • Ensure corporate/regional QEMS programs and procedures are implemented consistently throughout the regional hub • Ensure training on applicable legislative and regulatory requirements and the QEMS is provided for the regional hub (in consultation with operations management as required) • Fulfill role of top management • 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 • Supervise facility compliance staff and provide technical and program support to the regional hub related to process control and compliant operations
<p>Process & Compliance Technician (PCT) (QEMS Rep.)</p>	<ul style="list-style-type: none"> • 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 • Fulfill role of QEMS Rep. (OP-04) • Implement facility-specific QEMS programs and procedures consistently at his/her assigned facilities • 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 • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to Overall Responsible Operator (ORO) SOP. • Monitor, evaluate and report on compliance/quality status of 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 regional/cluster/facility level (in consultation with the operations management as required)



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ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

Reviewed by: PCT

Approved by: Operations Management

Role	Responsibilities and Authorities
Maintenance Team Lead	<ul style="list-style-type: none"> Act as lead with other staff on extensive maintenance/repair projects Assist in the preparation of facility manuals and documenting operating processes and procedures for staff Assist management in developing annual O&M budgets and provide recommendations relating to potential O&M expenditures Assist management in providing recommendations for annual capital forecasts and gathering information for operational reports as required. Develop and provide O&M reports to management and recommend changes in operating procedures/processes to improve facility operations Oversee maintenance activities on equipment and process in order to maintain compliance with applicable legislation, regulations, approvals and established operating procedures Participate as a technical advisor to staff and management and provide specialized training on technical or other issues. Perform duties as assigned by operations management
Maintenance Electrician	<ul style="list-style-type: none"> Actively participate in the development and maintenance of facility emergency plans and assist with emergencies as required. Assist in the preparation of facility manuals and documenting operating processes and procedures for staff Assist management in developing annual O&M budgets and provide recommendations relating to potential O&M expenditures Assist management in providing recommendations for annual capital forecasts and gathering information for operational reports as required Install and commission new electrical/electronic equipment and automation systems Perform duties as assigned by operations management Perform repairs, inspections, preventive maintenance and/or scheduled maintenance on electrical systems, equipment, components and devices in accordance with established procedures and record the maintenance data
Distribution Team Lead	<ul style="list-style-type: none"> Actively participate in the development and maintenance of facility emergency plans and assist with emergencies as required. Assist in the preparation of facility manuals and documenting operating processes and procedures for staff Assist management in developing annual O&M budgets and provide recommendations relating to potential O&M expenditures Assist management in providing recommendations for annual capital forecasts and gathering information for operational reports as required Oversee maintenance activities on equipment and process in



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ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

Reviewed by: PCT

Approved by: Operations Management

Role	Responsibilities and Authorities
	<p>order to maintain compliance with applicable legislation, regulations, approvals and established operating procedures</p> <ul style="list-style-type: none"> • Participate as a technical advisor to staff and management and provide specialized training on technical or other issues • Perform duties as assigned by operations management • Perform duties of operator/mechanic as required • Perform repairs, inspections, preventive maintenance and/or scheduled maintenance on electrical systems, equipment, components and devices in accordance with established procedures and record the maintenance data • Prepare and/or coordinate staff work assignments and follow up to ensure completion.
Operations Team Lead	<ul style="list-style-type: none"> • Act as lead with other staff on extensive maintenance/repair projects • Act for management during vacations or periodic absences. • Actively participate in the development and maintenance of facility emergency plans and assist with emergencies as required. • Assist in the preparation of facility manuals and documenting operating processes and procedures for staff • Assist management in providing recommendation for annual capital forecasts and gathering information for operational reports as required • Develop and provide O&M reports to management and recommend changes in operating procedures/processes to improve facility operations • Maintain the facility log book according to regulatory requirements • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to Overall Responsible Operator (ORO) SOP. • Participate as a technical advisor to staff and management and provide specialized training on technical or other issues. • Perform duties as assigned by operations management • Perform duties of operator/mechanic as required • Prepare and/or coordinate operational staff work assignments and follow up to ensure completion • Regularly inspect operating equipment, perform routine preventive maintenance and repairs and prepare and complete work orders as assigned
Senior Operator/Mechanic	<ul style="list-style-type: none"> • Act for management during vacations or periodic absences. • Actively participate in the development and maintenance of facility emergency plans and assist with emergencies as required. • Assist in the preparation of facility manuals and documenting operating processes and procedures for staff • Assist management in providing recommendations for annual



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Reviewed by: PCT

Approved by: Operations Management

Role	Responsibilities and Authorities
	<ul style="list-style-type: none"> capital forecasts and gathering information for operational reports as required • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to Overall Responsible Operator (ORO) SOP. • Participate as a technical advisor to staff and management and provide specialized training on technical or other issues. • Perform duties as assigned by operations management • Perform duties of operator/mechanic as required • Prepare and/or coordinate operational staff work assignments and follow up to ensure completion
Operator/Mechanic	<ul style="list-style-type: none"> • Collect samples and perform laboratory tests and equipment calibrations as required • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to Overall Responsible Operator (ORO) SOP. • Monitor, maintain and operate facilities in accordance with applicable regulations, approvals and established operating procedures • Participate in facility inspections and audits • Perform duties as assigned by operations management or designate • Regularly inspect operating equipment, perform routine preventive maintenance and repairs and prepare and complete work orders as assigned
Mechanic/Operator	<ul style="list-style-type: none"> • Act as lead with other staff on extensive maintenance/repair projects • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to Overall Responsible Operator (ORO) SOP. • Perform duties as assigned by operations management or designate • Perform duties of operator/mechanic as required • Regularly inspect operating equipment, perform routine preventive maintenance and repairs • Schedule and perform maintenance on equipment and processes in accordance with established procedures and record the maintenance data
Operator In Training (OIT)	<ul style="list-style-type: none"> • Perform duties as assigned by operations management or designate • Perform duties of operator/mechanic as required, with OIC oversight • Regularly inspect operating equipment, perform routine preventive



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Reviewed by: PCT

Approved by: Operations Management

Role	Responsibilities and Authorities
	<p>maintenance and repairs, with OIC oversight</p> <ul style="list-style-type: none"> • Perform maintenance on equipment and processes in accordance with established procedures and record the maintenance data, with OIC oversight • Actively participate in DWQMS training • Attain level 1 licencing
Administrative Assistant/Project Clerk	<ul style="list-style-type: none"> • Support the administrative functions of the regional hub/cluster/facility

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
02-Oct-18	0	Procedure issued – Information within OP-09 was originally set out in the main body of OCWA’s Operational Plan (last revision # 1 dated 09-Feb-18). 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’. Added QEMS Roles, Responsibilities and Authorities for Administrative Assistant/Project Clerk, Team Leads, Electricians and Mechanics. Added role of Maximo Primary.
06-Feb-20	1	Added OIT as a role



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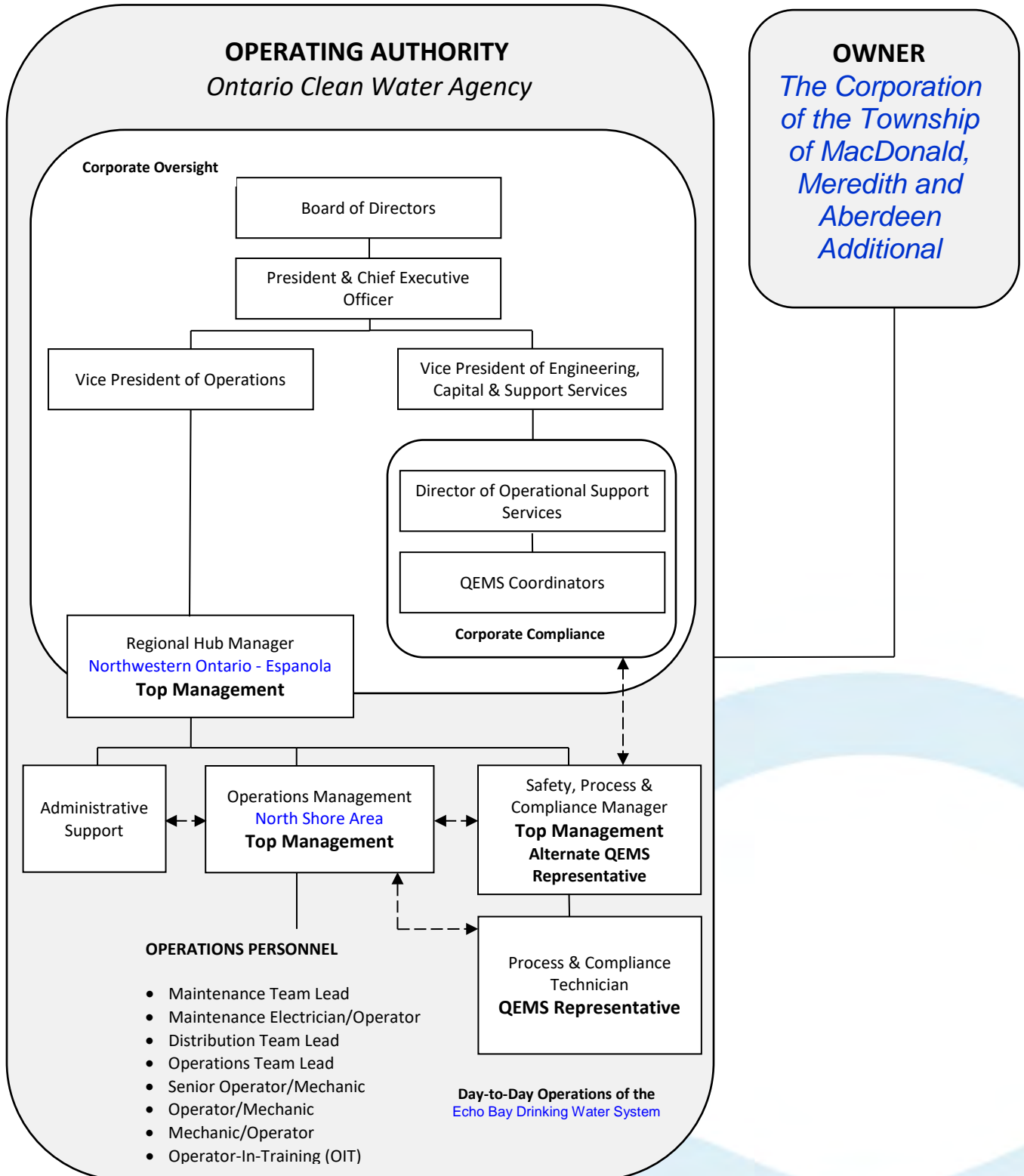
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ORGANIZATIONAL STRUCTURE

Reviewed by: PCT

Approved by: Operations Management





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ORGANIZATIONAL STRUCTURE

Reviewed by: PCT

Approved by: Operations Management

Revision History

Date	Revision #	Reason for Revision
27-Feb-17	0	Chart issued
18-Jul-17	1	Added position to Facility Staff section
01-Oct-18	2	Appendix issued - Organizational Chart previously contained as Appendix C of the Operational Plan. Moved to a new Appendix 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. Added Administrative Support.
21-Apr-20	3	Added OIT to the list of operations personnel



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COMPETENCIES

Reviewed by: PCT

Approved by: Operations Management

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 general manager, 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.

Position	Required Minimum Competencies
Operations Management	<ul style="list-style-type: none"> • Valid operator certification; minimum 2 if required to act as ORO • Experience and/or training in managing/supervising drinking water system operations, maintenance, financial planning and administration • Experience using computers and operational computerized systems • 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



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Position	Required Minimum Competencies
Safety, Process & Compliance (SPC) Manager	<ul style="list-style-type: none"> • Experience and/or training in conducting compliance audits, and management system audits • Experience and/or training in preparing and presenting informational and training material • Experience in providing technical support and leading/managing programs related to process control and compliant operations • Experience using computers and operational computerized systems • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures
Process & Compliance Technician	<ul style="list-style-type: none"> • Valid operator certification; minimum OIT or minimum 2 if required to act as ORO • 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 and/or training in resolving/addressing compliance issues for drinking water systems • Experience in conducting management system audits or internal auditor education/training • Experience using computers and operational computerized systems • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures
Maintenance Team Lead	<ul style="list-style-type: none"> • Valid operator certification; minimum OIT or minimum 2 if required to act as ORO • Ability to work from plans and schematic diagrams • Experience and/or training in managing and planning multiple projects, assessing priorities and effectively coordinating operation and maintenance programs • Experience in maintaining and repairing equipment and structures and in planning and scheduling maintenance and repair tasks • Experience using computers and operational computerized systems • One of: Electrical/Electronic/Instrumentation Technician or Technologist Diploma; Mechanical Millwright; Certified Engineering Technician/Technologist designation, or; a valid Engineering or Environmental Technician diploma • Training and/or experience related to operations and maintenance of 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
Maintenance Electrician	<ul style="list-style-type: none"> • Ability to work from plans and schematic diagrams • Completion of any electrical or electronic training program certified by the Ministry of Advanced Education and Skills Development



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Position	Required Minimum Competencies
	<p>(formerly the Ministry of Training, Colleges and Universities)</p> <ul style="list-style-type: none"> • 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 using computers and operational computerized systems • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures
Distribution Team Lead	<ul style="list-style-type: none"> • Valid operator certification; minimum OIT or minimum 2 if required to act as ORO • Ability to work from plans and schematic diagrams • 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 using computers and operational computerized systems • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures
Operations Team Lead	<ul style="list-style-type: none"> • Valid operator certification; minimum OIT or minimum 2 if required to act as ORO • Experience and/or training in managing and planning multiple projects, assessing priorities and effectively coordinating operation and maintenance programs • Experience and/or training in leading/directing operations personnel, and providing technical guidance to resolve operational issues • Experience using computers and operational computerized systems • Training and/or experience related to operations and maintenance of 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
Senior Operator/Mechanic & Operator/Mechanic	<ul style="list-style-type: none"> • Valid operator certification; minimum OIT or minimum 2 if required to act as ORO • Basic mathematical and chemistry knowledge • Experience using computers and operational computerized systems • Knowledge to use and understand operating and maintenance manuals, blueprints and other technical specifications • Training and experience in inspecting and monitoring drinking water system processes and performing/planning maintenance activities • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures

COMPETENCIES

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Approved by: Operations Management

Position	Required Minimum Competencies
Mechanic/Operator	<ul style="list-style-type: none"> Valid operator certification; minimum OIT or minimum 2 if required to act as ORO Experience in maintaining and repairing equipment and structures and in planning and scheduling maintenance and repair tasks Experience using computers and operational computerized systems Millwright and/or other trades certificates Training and/or experience related to drinking water system processes Training on OCWA's QEMS and the DWQMS Training on relevant legislation, regulations, codes, policies, guidelines and procedures

3.2 The following table presents the minimum competencies required by staff that provides administrative support to operations personnel.

Position	Required Minimum Competencies
Administrative Assistant/Project Clerk	<ul style="list-style-type: none"> Experience and/or training related to procurement and business administration practices Experience using computers and operational computerized systems Training on OCWA's QEMS and the DWQMS Training on relevant legislation, regulations, codes, policies, guidelines and procedures

3.3 Municipal Staff may assist in the maintenance activities in the distribution system. The municipal staff may not perform duties that require a certified operator as per the MOE guidance unless being directly supervised by a certified operator. The municipal staff will have training in the operation of valves and hydrants and training records provided to the operating authority.

3.4 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.

3.5 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.



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- 3.6 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.
- 3.7 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. It is recommended that the EC 101 course is taken within their first year of joining OCWA. The purpose of the EC 101 course is to ensure staff is 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.
- 3.8 Staff is also required to complete the mandatory environmental and health and safety compliance training listed in OCWA's Mandatory Compliance Training Requirements document, based on their position and/or the duties they perform.
- 3.9 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.
- 3.10 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.
- 3.11 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.
- 3.12 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.



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3.13 Individual OCWA employee training records are tracked using a computerized system.

3.14 Training records are maintained and controlled as per OP-05 Document and Records Control.

4. Related Documents

- OCWA's Mandatory Compliance Training List
- Operations Personnel Licence Certificates
- Performance Planning and Review Database
- Training Records
- OP-5 Document and Records Control
- OCWA Training Summary Database

5. Revision History

Date	Revision #	Reason for Revision
04-Oct-18	0	Procedure issued – Information within OP-10 was originally set out in the main body of OCWA's Operational Plan (last revision # 1 dated 09-Feb-18). 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 Managers and Admin Assistants 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.
20-Jan-20	1	Added section 3.3 to address municipal staff working in the distribution



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PERSONNEL COVERAGE

Reviewed by: PCT

Approved by: Operations Management

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 *Echo Bay Drinking Water System*.

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.

The *Echo Bay Drinking Water System* is staffed by OCWA personnel as per the operational schedule.

3.2 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.

Operations management will designate the ORO and the information is recorded in the facility's logbook.

The designated OIC for each shift is recorded in the facility logbook.

3.3 Operations management assigns an on-call operator for the time that the facility is un-staffed (i.e., evenings, weekends and statutory holidays).

3.4 The schedule consists of a weekly rotation with a shift change occurring each **Monday**. The on-call schedule is posted on outlook at least 3 months in advance.

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



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PERSONNEL COVERAGE

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- 3.5 The on call operator responds to facility alarms after hours, on weekends and statutory holidays. Details of alarm responses are documented in the call in report.
- 3.6 The [Auto Dialer](#) is programmed to contact the on call operator’s cell phone whenever there is an alarm condition. If the nature of the alarm requires additional staff, the on-call operator can request assistance from any of the other certified operators.
- 3.7 Each manager (e.g. operations management/SPC manager) is responsible for approving vacation time for their staff in a manner which ensures sufficient personnel are available for the performance of normal operating duties.
- 3.8 OCWA’s operations personnel are represented by the Ontario Public Service Employees Union (OPSEU). In the event of a labour disruption, operations management, together with the union, identifies operations personnel to provide “essential services” required to operate the facility so that the quality of drinking water is not compromised in any way.
- 3.9 A contingency plan for Critical Shortage of Staff provides direction in the event that there is a severe shortage of operations personnel due to sickness (e.g., pandemic flu) or other unusual situations.

4. Related Documents

Call-In Reports
 Critical Shortage of Staff Contingency Plan
 On-Call Schedule
 OP-10 Competencies

5. Revision History

Date	Revision #	Reason for Revision
01-Mar-17	0	Procedure issued
01-Oct-18	1	QP-03 procedure renamed OP-11. Removed Scope and Responsibilities sections. Removed specific hours of personnel coverage and reworded ORO designation. Other minor edits in wording.



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QEMS Proc.: OP-12
Rev Date: 01-Oct-18
Rev No: 1
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COMMUNICATIONS

Reviewed by: PCT

Approved by: Operations Management

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 general manager, 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 rep. 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. Refer to OP-18 Emergency Management for more information.
- 3.3 Communication with OCWA staff:
 - 3.3.1 Within the first year of hire, staff is scheduled to attend the Environmental Compliance 101 (EC101) course. The objective of the EC 101 course is to ensure that staff is 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 SPC manager is responsible for ensuring training is provided for the regional hub (in consultation with operations management as required) on applicable



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legislative and regulatory requirements and the QEMS.

3.3.4 The QEMS rep. 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 rep. (as per OP-05).

3.3.8 The QEMS rep. 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 facility level.

3.3.9 The SPC manager reports to the regional hub manager on the conformance 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 the 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 conformance performance during regularly scheduled meetings and/or through electronic and/or verbal communications. The QEMS rep. 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.



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OPERATIONAL PLAN

Echo Bay Drinking Water System

QEMS Proc.: OP-12
Rev Date: 01-Oct-18
Rev No: 1
Pages: 3 of 3

COMMUNICATIONS

Reviewed by: PCT

Approved by: Operations Management

3.6 Communication with the Public:

- 3.6.1 Media enquiries must be directed to the facility's designated media spokesperson, operations management. 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. The QEMS policy is also posted at the [Echo Bay WTP](#).
- 3.6.3 All complaints, whether received from the consumer, the community or other interested parties, are documented in the OPEX database. As appropriate, the operations management 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 rep. ensures that consumer feedback is included for discussion at the management review.

4. Related Documents

- Community Complaint Records
- Emergency Response 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
27-Feb-17	0	Procedure issued
01-Oct-18	1	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'. 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. Removed reference to facility tours.



OPERATIONAL PLAN
Echo Bay Drinking Water System

QEMS Proc.: OP-13
Rev Date: 30-Jan-19
Rev No: 2
Pages: 1 of 2

ESSENTIAL SUPPLIES AND SERVICES

Reviewed by: PCT

Approved by: Operations Management

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 *Echo Bay Drinking Water System* are detailed within the facility's emergency contact list. The list is reviewed and updated at least once every calendar year by the facility staff.

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.

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.

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 of the Environment and Climate Change (MOECC) has an agreement with The Canadian Association for Laboratory Accreditation (CALA) for accreditation of laboratories testing drinking water. The QEMS rep. is responsible for notifying the MOECC of any change to the drinking water testing services being utilized.



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ESSENTIAL SUPPLIES AND SERVICES

Reviewed by: PCT

Approved by: Operations Management

- 3.6 Internal verification and calibration activities (e.g. chlorine analyzer, turbidimeter, flow meters, 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 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 within the drinking water system and distribution 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, used within the drinking water system and distribution, must meet applicable regulatory requirements and industry standards for use in drinking water systems prior to their installation.

4. Related Documents

ANSI/NSF Documentation
 AWWA Standards
 Calibration Certificates/Records
 Emergency Contact/Essential Supplies and Services List
 OCWA's Corporate Procurement and Administration Policies
 MDWL
 OP-17 Measurement Recording Equipment Calibration and Maintenance

5. Revision History

Date	Revision #	Reason for Revision
27-Feb-17	0	Procedure issued
10-Oct-18	1	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).
29-Jan-19	5	Updated chemical and process equipment to include distribution requirements (s. 3.8. and 3.10)



OPERATIONAL PLAN

Echo Bay Drinking Water System

QEMS Proc.: OP-14
Rev Date: 24-Mar-21
Rev No: 4
Pages: 1 of 2

REVIEW AND PROVISION OF INFRASTRUCTURE

Reviewed by: PCT

Approved by: Operations Management

1. Purpose

To describe OCWA's procedure for reviewing the adequacy of infrastructure necessary to operate and maintain the *Echo Bay Water Treatment and Distribution System*.

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
- MOECC Inspection 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 Capital Report to assist the owner and OCWA with planning infrastructure needs for the short and long-term. This report is submitted to the owner for review and approval at least once every calendar year by operations management. With the owner, operations management determines and documents timelines and responsibilities for implementation of priority items.

3.4 The Capital Report forms the long term forecast for any major infrastructure maintenance, rehabilitation and renewal activities as per OP-15. Major distribution infrastructure renewal projects are scheduled as per the municipal asset management plan (subject to funding availability) and managed by the municipality due to the dependence on the renewal of the associated municipal infrastructure (sewer, storm water and road revitalization). The municipality will communicate the status of these projects with operations management.

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



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REVIEW AND PROVISION OF INFRASTRUCTURE

Reviewed by: PCT

Approved by: Operations Management

4. Related Documents

Capital Report
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
27-Feb-17	0	Procedure issued
18-Jul-17	1	Added section 5.2; changed working from annual to every calendar year in section 5.1
01-Oct-18	2	QP-06 procedure renamed OP-14. Removed Scope and Responsibilities sections. 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).
20-Jan-20	3	Updated section 3.5 to include direction on distribution work planning
24-Mar-21	4	Removed section 3.4 which related to maintaining work orders in Client status (in WMS); removed WMS work orders from Section 4



OPERATIONAL PLAN

Echo Bay Drinking Water System

QEMS Proc.: OP-15
Rev Date: 10-May-19
Rev No: 1
Pages: 1 of 3

INFRASTRUCTURE MAINTENANCE, REHABILITATION AND RENEWAL

Reviewed by: PCT

Approved by: Operations Management

1. Purpose

To describe OCWA's infrastructure maintenance, rehabilitation and renewal program for the *Echo Bay Drinking Water System*.

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 process control equipment to ensure proper operation of disinfection system, filtration systems, pumps, chemicals systems, online monitors and standby power;*
- *check filters and backwashing on a routine basis;*
- *check low lift pumping station to ensure that everything is in order;*
- *flush the distribution system;*
- *open, exercise and flush hydrants as well as winterize;*
- *exercise the main distribution shut-off valves;*
- *carry out a routine maintenance program including greasing and oiling as specified in the lubrication schedule;*
- *maintain an inventory of all equipment and tools; and*
- *maintain accurate records of work conducted, activities and achievements*



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INFRASTRUCTURE MAINTENANCE, REHABILITATION AND RENEWAL

Reviewed by: PCT

Approved by: Operations Management

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 maintenance schedule is overseen by operations management. 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 facility operator is responsible for ensuring the inventory of equipment is current and that appropriate maintenance plans are in place. The primary user is responsible for entering information into WMS as provided by the facility operator.

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 the operations management. Unplanned maintenance activities are recorded on corrective work orders 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



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INFRASTRUCTURE MAINTENANCE, REHABILITATION AND RENEWAL

Reviewed by: PCT

Approved by: Operations Management

the owner.

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 and regional hub managers are able to generate monthly summary reports for each facility. In addition, OCWA’s executive management team is provided with hub and regional reports on an ongoing basis.

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 through [monthly reporting](#). At a minimum, the owner is informed of the program through the submission of the Capital Report and through the results of the management review at least once every calendar year.

4. Related Documents

- Minutes of Management Review
- Capital Report
- WMS Work Orders
- WMS Reports
- OP-05 Document and Records Control
- OP-14 Review and Provision of Infrastructure

5. Revision History

Date	Revision #	Reason for Revision
01-Oct-18	0	Procedure issued – Information within OP-15 was originally set out in the Main body of OCWA’s Operational Plan (last revision 1 dated 09-Feb-18. New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Added the requirement to ensure the long term forecast is reviewed once every calendar year and to document a long term forecast to reflect in DWQMS v. 2.0. Minor wording updates to reflect OCWA’s current WMS.
10-May-19	1	Removed gender reference in section 3.1.1 when referencing the Maximo Primary.



OPERATIONAL PLAN

Echo Bay Drinking Water System

QEMS Proc.: OP-16
Rev Date: 01-Oct-18
Rev No: 1
Pages: 1 of 3

SAMPLING, TESTING AND MONITORING

Reviewed by: PCT

Approved by: Operations Management

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-06 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 plan which is available to operations personnel, at the location(s) noted in OP-05 Document and Records Control. The sampling plan 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 laboratories that conduct the analysis. The laboratories used for this facility are listed in the essential supplies and services list at the location noted in OP-05 Document and Records Control.

Electronic 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 Test results from continuous monitoring equipment are captured by the SCADA system and are reviewed by a certified operator in accordance with the requirements of SDWA O. Reg. 170/03. Continuous monitoring equipment is used to sample and test for:

- filter effluent turbidity
- treated free chlorine residual
- distribution free chlorine residual

The SCADA system also collects and records information on the following parameters related to process control and finished drinking water quality:

- Raw and treated water flows
- Filter flows
- Pre-chlorine (free) residual



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SAMPLING, TESTING AND MONITORING

Reviewed by: PCT

Approved by: Operations Management

- Treated water pH
- Clearwell levels
- Raw turbidity
- Tower Level
- System pressures

3.5 The facility is equipped with offsite monitoring capabilities. Operations personnel are capable of viewing current data as well as past trending through OCWA's Wonderware program. Offsite reviews are logged through annotations within the program or in facility logbooks. Annotation reports are available via email upon request.

3.6 Adverse water quality incidents are responded to and reported as per ([Sault St. Marie](#)) Notification of Adverse Water SOP.

3.7 In-house process control activities are conducted on a regular basis by the certified operator(s) on duty as per the [Echo Bay](#) WTP round sheets.

In-house samples are analyzed following approved laboratory procedures. The sampling results are recorded on the [Echo Bay](#) WTP round sheets and are entered into PDM.

Any required operational process adjustments are recorded in the facility log book.

3.8 Additional monitoring activities related to the facility's most challenging conditions are summarized as follows:

- additional flow monitoring is to ensure the facility's rated capacity is not exceeded during summer months

3.9 No upstream or downstream sampling is deemed necessary at this time.

3.10 Sampling, testing and monitoring results are readily accessible to the owner at the [Echo Bay Water Treatment Facility](#) and are available via email upon request. External sampling results are directly emailed to the owner and operating authority by the laboratory.

At a minimum, owners are provided with an annual summary of sampling, testing and monitoring results through the SDWA O. Reg. 170/03 Section 11 Annual Report, the 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.



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SAMPLING, TESTING AND MONITORING

Reviewed by: PCT

Approved by: Operations Management

4. Related Documents

- Annotation Reports
- Annual Report (O. Reg. 170 Section 11)
- Emergency Contact List and Essential Supplies & Services List
- Facility Logbook
- [Echo Bay](#) WTP Round Sheets
- Laboratory Analysis Reports
- Laboratory Chain of Custody Forms
- Municipal Summary Report (O. Reg. 170 Schedule 22)
- Process Data Management System (PDM)
- Sampling Plan
- SCADA Records
- SOP - ([Sault St. Marie](#)) Notification of Adverse Water
- OP-05 Document and Records Control
- OP-06 Drinking Water System
- OP-20 Management Review

5. Revision History

Date	Revision #	Reason for Revision
02-Mar-10	0	Procedure issued
01-Oct-18	1	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. Expanded information related to accredited and licensed laboratories (s. 3.3). Reordered some sections and other minor edits. Removed in house processing table and referenced round sheets instead. Added information relating to offsite monitoring.



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QEMS Proc.: OP-17
Rev Date: 02-Oct-18
Rev No: 2
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MEASUREMENT AND RECORDING EQUIPMENT CALIBRATION AND MAINTENANCE

Reviewed by: PCT

Approved by: Operations Management

1. Purpose

To describe the procedure for the calibration and/or verification and maintenance of measurement and recording equipment at the *Echo Bay Drinking Water System*.

2. Definitions

None

3. Procedure

- 3.1 All measurement and recording equipment calibration and maintenance activities must be performed by appropriately trained and qualified personnel or by a qualified third-party calibration service provider (refer to OP-13 Essential Supplies and Services).
- 3.2 The facility's operations personnel is responsible for establishing and maintaining a list of measurement and recording devices and associated calibration and/or verification schedules using the automated Work Management System (WMS). When a new device is installed, it is the responsibility of the facility's operations personnel to provide the information to the WMS primary that enters the information into WMS. The new device is tagged with a unique identification number and the maintenance schedule is set up. Work orders are then automatically generated as per the schedule (refer to OP-15 Infrastructure Maintenance, Rehabilitation and Renewal).
- 3.3 Details regarding the results of the calibration and/or verification are recorded within each individual work order generated by the WMS.
- 3.4 Calibration and maintenance activities are carried out in accordance with procedures specified in the manufacturer's manual, instructions specified in WMS.
- 3.5 Standards, reagents and/or chemicals that may be utilized during calibration and/or verification and/or maintenance activities are verified before use to ensure they are not expired. Any expired standards, reagents and/or chemicals are appropriately disposed of and are replaced with new standards, reagents and/or chemicals as applicable.
- 3.6 Any measurement device which does not meet its specified performance requirements during calibration and/or verification must be removed from service (if practical) until repaired, replaced or successfully calibrated. The failure must be reported to the operations management and PCT, as soon as possible, so that immediate measures can be taken to ensure that drinking water quality has not been compromised by the malfunctioning device. Any actions taken as a result of the failure are recorded in the facility logbook and through appropriate WMS work orders. The PCT ensures that any notifications required by applicable legislation are completed and documented within the specified time period.



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MEASUREMENT AND RECORDING EQUIPMENT CALIBRATION AND MAINTENANCE

Reviewed by: PCT

Approved by: Operations Management

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
27-Feb-17	0	Procedure issued
18-Jul-17	1	Added section 5.6 referring to long term forecasting
02-Oct-18	2	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.



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QEMS Proc.: OP-18
Rev Date: 02-Oct-18
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EMERGENCY MANAGEMENT

Reviewed by: PCT

Approved by: Operations Management

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

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 general manager, 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-level Emergency Response Plan (ERP) 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 this drinking water system.

3.2 OCWA recognizes three levels of events:

Level 1 is an event that can be handled entirely by operations personnel 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.

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 (owner, emergency responders, Ministry of the Environment and Climate Change, media, etc.). Examples may include:



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EMERGENCY MANAGEMENT

Reviewed by: PCT

Approved by: Operations Management

- 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 *Echo Bay Drinking Water System* 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 site-specific contingency plan (CP). The CPs and related standard operating procedures (SOPs) are contained within the FEP.

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 an 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 recorded on the FEP-01 Contingency Plan Review/Test Summary Form and in WMS as appropriate. This record includes the outcomes of the test and identifies any opportunities for improvement and actions taken. A CP-related response to an actual event may also be considered 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.



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EMERGENCY MANAGEMENT

Reviewed by: PCT

Approved by: Operations Management

- 3.7 Contingencies are tested at hub level and may not include the facility's operations personnel or be conducted at this specific facility.
- 3.8 Each CP must be reviewed at least once in a five-calendar year period. Operations personnel review site specific contingencies and record the review through WMS. Required updates are provided to the QEMS rep. for implementation.
- 3.9 Revisions to the CPs, SOPs 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).
- 3.10 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*).
- 3.11 Where they exist, any relevant sections of the Municipal Emergency Response Plan (MERP) are included or referenced in the FEP. Measures specified in the MERP are incorporated into CPs where appropriate.
- 3.12 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
Contingency Plans
Emergency Contact List/Essential Supplies & Services List
Facility Emergency Plan
FEP-01 Contingency Plan Test Summary Form
Municipal Emergency Response Plan (as applicable)
WMS Work Orders
OP-20 Management Review



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EMERGENCY MANAGEMENT

Reviewed by: PCT

Approved by: Operations Management

5. Revision History

Date	Revision #	Reason for Revision
27-Feb-17	0	Procedure issued
02-Oct-18	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 and review is performed and documented. Other minor edits.



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QEMS Proc.: OP-19
Rev Date: 15-May-19
Rev No: 3
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INTERNAL QEMS AUDITS

Reviewed by: PCT

Approved by: Operations Management

1. Purpose

To describe the procedure for conducting internal audits at the facility level to 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 *Echo Bay Drinking Water System* 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; and
- to assess the effectiveness of the QEMS and assist in its continual improvement.



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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.

3.3 Internal Auditor Qualifications

3.3.1 Internal QEMS audits shall only be conducted by persons approved by the QEMS rep. 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.

3.4 Audit Preparation

3.4.1 Together, the QEMS rep. and the lead auditor:

- establish the audit objectives, scope and criteria; and
- confirm 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.).



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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 rep. 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. 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 rep. 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 submits a written report and/or completed work documents to the QEMS rep. 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;



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- audit findings including:
 - any non-conformance identified referencing the requirement that was not met; and
 - OFIs or other observations.
- audit conclusions.

3.6.3 The QEMS rep. distributes the audit results to top management and others as appropriate.

3.6.4 The QEMS rep. 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 rep. and retained as per OP-05 Document and Records Control.

4. Related Documents

Internal Audit Records (checklists, forms, reports, etc.)

Internal Audit Report

[Echo Bay](#) Action Items Spreadsheet

OP-05 Document and Records Control

OP-20 Management Review

OP-21 Continual Improvement

5. Revision History

Date	Revision #	Reason for Revision
27-Feb-17	0	Procedure issued



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19-Jul-17	1	Changed wording from every 12 months to once every calendar year under sections 5.1.4 & 5.2.3; removed the comment that internal and external audit results should be reviewed in section 5.1.4 and added section 5.1.5 stating that previous audits results will get reviewed; section 5.6.3 relating to non conformities within the report was added; added section 5.8.1 relating to documenting potential non conformities; added section 5.8.2 relating to the review of OFIs at management reviews;
02-Oct-18	2	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. 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.
15-May-19	3	Changed the name of the action analysis spreadsheet to the action items spreadsheet under 4. Related documents



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MANAGEMENT REVIEW

Reviewed by: PCT

Approved by: Operations Management

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 review of the facility’s operations 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 general manager, 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 *Echo Bay Drinking Water System* as:

- operations management – [North Shore Area](#)
- regional hub manager – [Northwestern Ontario, Espanola](#)
- safety, process & compliance (SPC) manager – [Northwestern Ontario, Espanola](#)

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 time 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 rep., at least one member of top management and at least one facility operator must take part in the management review. Other members of top management may take part in the review.

3.3 Other staff may be invited to take part in the management review 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;



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- 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 If any BMPs to address drinking water system risks are discussed during other agenda items, they must be 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 QEMS rep. collects all relevant information and provides the package to operations management and operations personnel.

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 rep. ensures that minutes of and actions resulting from the management review are prepared and distributed to the appropriate OCWA top management, personnel and [The Corporation of the Township of MacDonald, Meredith & Aberdeen Additional](#).

3.9 The QEMS rep. monitors the progress and documents the completion of actions resulting from the management review.

4. Related Documents

[Echo Bay Action Items Spreadsheet](#)
Management Review Reference Materials
Minutes and Actions Resulting from the Management Review
OP-21 Continual Improvement



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5. Revision History

Date	Revision #	Reason for Revision
27-Feb-10	0	Procedure issued
19-Jul-17	1	Changed wording from every 12 months to once every calendar year under definitions and section 5.1
02-Oct-18	2	Removed Scope and Responsibilities sections. Added definitions for Top Management and Operations Management. Efficacy changed to effectiveness. 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.
15-May-19	3	Changed the name of the action analysis spreadsheet to the action items spreadsheet under 4. Related documents



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CONTINUAL IMPROVEMENT

Reviewed by: PCT

Approved by: Operations Management

1. Purpose

To describe the procedure for tracking and measuring continual improvement of the Quality & Environmental Management System (QEMS) for the *Echo Bay Water Treatment Facility & Distribution System*.

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 this drinking water system. 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 rep. (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 rep. determines the corrective action needed based on this consultation. The operations management (or designate) assigns responsibility and a target date for resolution.



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3.2.4 The QEMS rep. ensures corrective actions are documented in the *Echo Bay* Action Items Spreadsheet. The QEMS rep. 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 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 rep. (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 rep. determines the action to be taken based on this consultation and the operations management assigns responsibility and a target date for implementation.

3.3.4 The implementation of preventive actions is tracked by the QEMS rep. using the *Echo Bay* Action Items 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 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.



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3.5 Best Management Practices (BMPs)

3.5.1 The QEMS rep. and/or operations management in consultation with the SPC manager will review and consider applicable BMPs identified by internal and/or external sources as part of the management review 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 of the Environment and Climate Change.

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

4. Related Documents

Internal Audit Records
[Echo Bay](#) Action Items Spreadsheet
 MOECC Inspection Report
 OP-05 Document and Records Control
 OP-20 Management Review

5. Revision History

Date	Revision #	Reason for Revision
02-Oct-18	0	Procedure issued – Some of the information within OP-21 was originally set out in the main body of OCWA’s Operational Plan (last revision #1, dated 01-Mar-18) and in QP-10 Internal Audit procedure (last revision #1, dated 19-Jul-17). Procedure issued – The original information within the main body of OCWA’s Operational Plan was not used in OP-21 as it did not meet the requirements of the new DWQMS v. 2.0. Information from QP-10 Internal Audit 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.
15-May-19	1	Changed the name of the action analysis spreadsheet to the action items spreadsheet in 3 locations