

OPERATIONAL PLAN

For the Carleton Place DWS



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*.

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|  Ontario Clean Water Agency | OPERATIONAL PLAN Carleton Place DWS | QEMS Doc: OP-ToC Issue Date: 2018-Aug-28 Pages: 1 of 1 |
| TABLE OF CONTENTS | | |

| | |
|--------------|--|
| OP-01 | OCWA's Quality & Environmental Management System (QEMS) |
| OP-02 | Quality & Environmental Management System Policy |
| OP-03 | Commitment & Endorsement of OCWA's QEMS & Operational Plan |
| OP-03A | Signed Commitment and Endorsement |
| OP-04 | Quality Management System Representative |
| OP-05 | Document and Records Control |
| OP-05A | Document and Records Control Locations |
| OP-06 | Drinking Water System |
| OP-07 | Risk Assessment |
| OP-08 | Risk Assessment Outcomes |
| OP-08A | Summary of Risk Assessment Outcomes |
| OP-09 | Organizational Structure, Roles, Responsibilities & Authorities |
| OP-09A | Organizational Structure |
| OP-10 | Competencies |
| OP-11 | Personnel Coverage |
| OP-12 | Communications |
| OP-13 | Essential Supplies and Services |
| OP-14 | Review and Provision of Infrastructure |
| OP-15 | Infrastructure Maintenance, Rehabilitation and Renewal |
| OP-16 | Sampling, Testing and Monitoring |
| OP-17 | Measurement and Recording Equipment Calibration and Maintenance |
| OP-18 | Emergency Management |
| OP-19 | Internal QEMS Audits |
| OP-20 | Management Review |
| OP-21 | Continual Improvement |
| Schedule "C" | Director's Directions Minimum Requirements for Operational Plans |

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|  Ontario Clean Water Agency | <p style="text-align: center;">OPERATIONAL PLAN</p> <p style="text-align: center;">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-01 Rev Date: 2018-Aug-28 Rev No: 0 Pages: 1 of 2 |
| QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

1 Purpose

To document OCWA's Quality & Environmental Management System (QEMS). This Operational Plan defines and documents the QEMS for The Corporation of the Town of Carleton Place Drinking Water System operated by the Ontario Clean Water Agency (OCWA). It sets out the 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) – 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 Carleton Place Drinking Water System is owned by The Corporation of the Town of Carleton Place. OCWA is the contracted Operating Authority for the Drinking Water System.


OCWA is the contracted Operating Authority for the Carleton Place Drinking Water System which includes the following facilities:

- Carleton Place Water Treatment Plant
- Carleton Place Water Tower

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

- 3.2.1 Establishing policy and objectives with respect to the effective management and operation of water/wastewater facilities;
- 3.2.2 Understanding and controlling the risks associated with the facility's activities and processes
- 3.2.3 Achieving continual improvement of the QEMS and the facility's performance.

- 3.3 The Operational Plan for the Carleton Place Drinking Water System listed above fulfils the requirements of the Ministry's DWQMS. The 21 QEMS Procedures within this Operational Plan align with the 21 elements of the DWQMS.


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|  Ontario Clean Water Agency | <p align="center">OPERATIONAL PLAN</p> <p align="center">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-01 Rev Date: 2018-Aug-28 Rev No: 0 Pages: 2 of 2 |
| QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

4 Related Documents

- Ministry's Drinking Water Quality Management Standard
- All QEMS Procedures and Documents referenced in this Operational Plan

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|--|
| 2018-08-28 | 0 | Procedure issued- Information within OP-01 was originally set out in the Main Body of OCWA's Operational Plan. This revision has removed the Main Body format of the Operational Plan. |

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|  Ontario Clean Water Agency | <p align="center">OPERATIONAL PLAN</p> <p align="center">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-02 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 2 |
| QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) POLICY | | |
| Reviewed by: Alison O'Connor (PCT) | Approved by: Vanessa Greatrix (SPC Manager) | |

1 Purpose

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

2 Definitions

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

3 Procedure

- 3.1 The Ontario Clean Water Agency, its Board of Directors, Officers and entire staff are committed to the principles and objectives set out in our QEMS Policy.
- 3.2 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)

- 3.3 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).
- 3.4 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.
- 3.5 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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|  Ontario Clean Water Agency | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-02 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 2 |
| QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) POLICY | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |


- 3.6 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.
- 3.7 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 (Posted on OCWA's intranet and internet)
- QEMS Policy Revision History (Posted on OCWA's intranet)
- OP-05 Document and Records Control
- OP-13 Essential Supplies and Services

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|--|
| 2018-08-28 | 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. The full revision history for the QEMS policy is available on OCWA's intranet. |

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|  Ontario Clean Water Agency | <p style="text-align: center;">OPERATIONAL PLAN</p> <p style="text-align: center;">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-03 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 2 |
| COMMITMENT AND ENDORSEMENT | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

1 Purpose

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

2 Definitions


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

3 Procedure

- 3.1 The Operational Plan is provided to OCWA Top Management and to the Owner for endorsement. The signed written endorsement is presented in Appendix OP-03A. At a minimum, two members of Top Management must endorse the Operational Plan; however, the Operational Plan is made available to all members of Top Management in the specified document control location (refer to OP-05 Document and Records Control). Endorsement by OCWA's Top Management is represented by Senior Operations Manager and Safety, Process and Compliance Manager or 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:
 - A revision to OCWA's QEMS Policy;
 - A change to both representatives of the facility's Top Management and/or both of the Owner's representatives that endorsed the Operational Plan;
 - A modification to the drinking water system processes/components that would require a change to the description in OP-06 Drinking Water System;
 - The addition of a drinking water subsystem owned by the same Owner to this operational plan.
- 3.3 Any other changes would be considered a minor change and would not require the Operational Plan to be re-endorsed.

4 Related Documents

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

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|---|---|---|
|  Ontario Clean Water Agency | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-03 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 2 |
| COMMITMENT AND ENDORSEMENT | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|--|
| 2018-08-28 | 0 | Procedure issued – Information within OP-03 was originally set out in the main body of OCWA's Operational Plan |

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|  Ontario Clean Water Agency | <p align="center">OPERATIONAL PLAN</p> <p align="center">Carleton Place Drinking Water System</p> | QEMS Doc: OP-03A Rev Date: 2018-08-28 Rev No: 0 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 Town of Carleton Place (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 Carleton Place Drinking Water 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

Owner Endorsement

| | | | |
|--|---------------|--|---------------|
| _____ Shane Hogan Senior Operations Manager Mississippi Cluster | _____ Date | _____ Authorized municipal representative of The Corporation of the Town of Carleton Place | _____ Date |
| _____ Andrew Trader Regional Hub Manager Eastern Regional Hub | _____ Date | _____ Authorized municipal representative of The Corporation of the Town of Carleton Place | _____ Date |

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

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|  Ontario Clean Water Agency | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-04 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 1 |
| QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) REPRESENTATIVE | | |
| Reviewed by: Alison O'Connor (PCT) | Approved by: Vanessa Greatrix (SPC Manager) | |

1 Purpose

To identify and describe the specific roles and responsibilities of the QEMS Representative(s) for the Carleton Place Drinking Water System.

2 Definitions

None

3 Procedure

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

3.2 The QEMS Representative is responsible for:


- Administering the QEMS for the Carleton Place 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.

4 Related Documents

- None

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|--|
| 2018-08-28 | 0 | Procedure issued – Information within OP-04 was originally set out in the main body of OCWA's Operational Plan |

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|  Ontario Clean Water Agency | <p align="center">OPERATIONAL PLAN</p> <p align="center">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-05 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 3 |
| DOCUMENT AND RECORDS CONTROL | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

1 Purpose

To describe how OCWA's QEMS documents are kept current and how QEMS documents and records are kept legible, readily identifiable, retrievable, stored, protected, retained and disposed of. Applies to QEMS Documents and QEMS records pertaining to The Carleton Place Drinking Water 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 Representative |
| Approval | SPC Manager |

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|  Ontario Clean Water Agency | <p style="text-align: center;">OPERATIONAL PLAN</p> <p style="text-align: center;">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-05 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 3 |
| DOCUMENT AND RECORDS CONTROL | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

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

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

- 3.5 Access to OCWA's computer network infrastructure is restricted through use of individually-assigned usernames and passwords and local area servers. Network security is maintained by OCWA's Information Technology department through a number of established mechanisms and practices such as daily back-up of files stored on servers, password expiry, limitations on login attempts 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 records are maintained as per Appendix OP-05A and are accessible to all staff when required.

- 3.6 Any employee of the drinking water system may request, to the QEMS Representative, a revision be made to improve an existing internal QEMS document or the preparation of a new document. The need for new or updated documents may also be identified through the Management Review or system audits.

The QEMS Representative communicates any changes made to QEMS documents to relevant operations personnel and coordinates related training (as required). Changes to corporately controlled QEMS documents are communicated and distributed to facility QEMS Representatives by OCWA's Corporate Compliance Group through e-mails, memos and/or provincial, regional hub/cluster or facility-level training sessions.

- 3.7 When a QEMS document is superseded, the hardcopy of the document is promptly removed from its location and forwarded to the QEMS Representative for disposal or retention (as appropriate).

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

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|  | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-05 Rev Date: 2018-08-28 Rev No: 0 Pages: 3 of 3 |
| DOCUMENT AND RECORDS CONTROL | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

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

| Type of Document/Record | Minimum Retention Time | Requirement Reference |
|---|--|----------------------------------|
| 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 |
| Documents/records required to demonstrate compliance with Ontario Legislation | As per applicable regulations | SDWA O. Reg 170/03, O.Reg 128/04 |

- 3.10 The Operational Plan is reviewed for currency by the QEMS Representative during internal/external audit and Management Review processes. Other QEMS-related documents are reviewed as per the frequencies set out in this Operational Plan or as significant changes (e.g., changes in regulatory requirements, corporate 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 |
|------------|------------|---------------------|
| 2018-08-28 | 0 | Procedure issued |

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 | |
| Operational Plan (includes QEMS Procedures) | E - Shared Drive HC – PCT Office & WTP Office |
| QEMS Reference Manual | E - On OCWA Intranet |
| QEMS Policy | E - OCWA's Intranet and Public Website-Internet HC – Primary Reporting Locations |
| Facility Emergency Plans | HC – WTP Office |
| Emergency Response Plan (corporate) | E - OCWA's Intranet |
| Standard Operating Procedures (referenced in Operational Plan and QEMS Procedures) | E - Shared Drive HC – PCT Office & WTP Office |
| Essential Supplies & Services List | E - Shared Drive HC – WTP Office & PCT Office |
| Shift/Vacation Schedule | E – Sr. Operations Manager & O&M Team Lead Offices HC – WTP Office |
| On-call Schedule | E - Shared Drive |
| Round Sheet Form | E – Data in PDM; On Shared Drive HC – at WTP Lobby |
| Sampling Schedule/Plan/Calendar | E – PCT Hard Drive; Shared Drive HC – WTP Office/Laboratory |
| Chain of Custody Forms | E – On Shared Drive HC – WTP Office |
| OPEX Database Action Plan Form (Preventive/Corrective) /Action Plan Summary Spreadsheet (Preventive/Corrective Form) | E – Lotus Notes (OPEX) |
| External QEMS Documents | |
| Maintenance/equipment manuals | HC – WTP Office |
| Engineering schematics/plans/drawings | HC – WTP |
| Municipal Drinking Water Licence | E – Eastern Regional Shared Drive HC – WTP Office |
| Drinking Water Works Permit | E – Eastern Regional Shared Drive HC – WTP Office |
| Permit to Take Water | E – Eastern Regional Shared Drive HC - WTP Office |
| Operator certificates | E – Eastern Regional Shared Drive HC – WTP Office |
| AWWA Standards | E - \\Torwan\PCT\AWWA Standards |
| DWQMS Standard | E - https://www.ontario.ca |

DOCUMENT AND RECORDS CONTROL LOCATIONS

| Type of Document/Record | Designated Document Control Location (HC = Hardcopy, E = Electronic) |
|---|---|
| ANSI/NSF product registration documentation for Chemicals/Materials Used | E http://info.nsf.org/Certified/PwsChemicals/ |
| Applicable federal and provincial legislation and municipal by-laws | Online at www.e-laws.gov.on.ca |
| Operations Manual <i>**delete if manual is an internal document**</i> Original Equipment Manuals (OEM) | HC – WTP Office |
| Source Water Protection Plan | HC-WTP Office E-PCT folder |
| QEMS Records | |
| Rounds sheets | HC – WTP Office Process data maintained electronically through PDM |
| Facility Operations Logbook(s) | HC – WTP Office |
| Operator training records | HC - Facility Logbook |
| Maintenance records | E - maintained in OCWA's Training Summary dB |
| Internal Calibration records | E - maintained in WMS |
| External Calibration records | E - maintained through WMS or Shared Drive |
| Chain Custodies | E – Shared Drive HC – WTP Office |
| Laboratory analyses | HC – Sampling Binder E - PDM |
| In-house lab results | HC – maintained on Rounds Sheets E - PDM |
| SCADA records (Wonderware, OCWA) | HC – WTP Office E – maintained through SCADA |
| SCADA Records (Plant SCADA, Client Owned) | E – Eastern Region Shared Drive HC – PCT Office |
| Internal QEMS audit reports | E – Eastern Region Shared Drive |
| External audit and inspection reports | E – Eastern Region Shared Drive |
| Management Review documentation | E – Lotus Notes (OPEX) |
| OPEX Database Action Plan records (Preventive/Corrective) /Action Plan Summary Spreadsheet (Preventive/Corrective records | E - QEMS Rep |
| QEMS Communications | E – PCT HD & Eastern Region Shared Drive |
| Annual Reports | E – PCT HD & Eastern Region Shared Drive |
| AWQI Reports | E - Sr. Ops Manager Office |
| Infrastructure review (capital/maintenance works recommendations) | E – OPEX database, PCT HD HC - PCT |
| Community complaint records | E – WMS |
| Call In Reports | E – WMS System |



OPERATIONAL PLAN

Carleton Place Drinking Water System


QEMS Doc: OP-05A
Rev Date: 2018-08-28
Rev No: 0
Pages: 3 of 3

DOCUMENT AND RECORDS CONTROL LOCATIONS

Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|---|
| 2018-08-28 | 0 | Appendix issued; Table was previously included within the Document and Records Control Procedure (QP-01) in the last revision (REV 6) prior to updating to 2.0. |



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|  | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-06 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 6</p> |
| DRINKING WATER SYSTEM | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

1 Purpose

To document the following for the Carleton Place 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
- e) 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) anything that conveys or stores water and is part of a treatment process, including any treatment equipment installed in plumbing,
- (b) anything 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

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|  | <p align="center">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-06 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 6</p> |
| DRINKING WATER SYSTEM | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

3.1 Drinking Water System Overview

The Carleton Place Drinking Water System (DWS) provides a potable water supply to the residents of Carleton Place. The facilities consist of a Class III Actiflo treatment process operated by the Ontario Clean Water Agency and a Class I water distribution system operated by the Carleton Place Public Works. Raw water is drawn from the Mississippi River.

Potential pathogenic organisms are removed or deactivated by; Coagulation / flocculation / sedimentation, filtration, post-chlorination (primary disinfection) and seasonal distribution system chlorine residual (secondary disinfection). This multiple barrier approach helps to ensure consistently compliant drinking water quality, and ultimately improves the level of public health protection.

Although the Carleton Place DWS has ammonia storage and feed facilities to provide chloramination, this equipment is currently not in use. This equipment is available for use in the event of elevated Trihalomethanes (THM's).


3.2 Source Water

3.2.1 General Characteristics

The raw water source for the treatment plant is the Mississippi River. The water from the Mississippi River is typically low in turbidity and high in colour. Temperature fluctuates significantly through the seasons ranging from approximately 1 °C in the winter to as high as 27°C during the summer. Bacteriological analysis of the raw water indicates a source of relatively good quality. The results of chemical analyses are consistently below the Ontario Drinking Water Quality Standards.

Raw Water Characteristics at Intake (based on 2017 data)

| Characteristic | Minimum | Maximum | Annual Average |
|------------------|---------|---------|----------------|
| Temperature (°C) | 1.3 | 24.5 | 12.7 |
| Turbidity (NTU) | 0.14 | 12.16 | 1.23 |
| pH | 7.7 | 8.04 | 7.92 |
| Alkalinity | 71 | 93 | 82.2 |
| Colour | 6 | 39 | 8.0 |
| DOC | 5.9 | 9.2 | 7.9 |

| | | |
|---|---|---|
|  | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-06 Rev Date: 2018-08-28 Rev No: 0 Pages: 3 of 6 |
| DRINKING WATER SYSTEM | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

| Characteristic | Minimum | Maximum | Annual Average |
|----------------------|---------|---------|----------------|
| TOC | 5.9 | 9.3 | 8.0 |
| E. coli (CFU/100 mL) | 0 | 12 | Not applicable |
| Total Coliforms | 2 | 66 | Not applicable |

3.2.2 Common Fluctuations

Raw water turbidity increases when the area receives high wind conditions and after significant rainfall events.

Water temperature changes significantly from winter to summer. Warm summer temperatures, combined with river low flow, may result in an increase of taste and odour concerns.

3.2.3 Threats

Potential sources of raw water contamination include recreational activities on Mississippi Lake and river and potential spills from vehicles traveling across the bridge on Highway 7.

3.2.4 Operational Challenges


During summer month, increased motor boat activity on the lake and river causes weeds to be chopped up. This weed debris is pulled onto the raw water screen. During these periods, the screens are changed and washed manually as frequently as needed to prevent blockages.

Windy conditions cause an increase in raw water turbidity. This may result in decreased filter runs. Operators may need to make adjustments to optimize the water treatment process.

3.3 Treatment System Description

The source water for the Carleton Place DWS is the Mississippi River. The water intake is a 600 millimetre (mm) diameter intake pipe complete with an upturned elbow at the river which is surrounded by a coarse screen.

Raw water is directed through the intake pipe into a raw water well, the first of which is equipped with a 1/4 inch opening mesh screen. The wet well is equipped with four (4) vertical turbine low lift pumps which are operator selectable and are automatically controlled by the water level in the treated water clear well. There is a raw water turbidimeter installed.

| | | |
|---|---|---|
|  | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-06 Rev Date: 2018-08-28 Rev No: 0 Pages: 4 of 6</p> |
| DRINKING WATER SYSTEM | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

The raw water is directed by the low lift pumps into a 400 mm diameter stainless steel header which extends to the Actiflo™ treatment process. The common raw water header is equipped with a flow meter. An in-line static mixer and coagulant injection point are located just upstream of the flow meter. The system is designed to provide pre-chlorination with chlorine gas at this point, dependent on the time of year and the source water conditions. A chlorine injection point is also located near the raw water intake and is used for pre-chlorination / zebra mussel control.

3.3.1 Actiflo treatment (coagulant/flocculation/sedimentation)

The treatment system consists of two (2) Actiflo™ treatment trains operating in parallel. Each treatment train consists of a coagulation tank, an injection tank, a maturation tank and lamella settling tubes. Each treatment train is complete with microsand recirculation pumps, piping and hydrocyclones, which are used to separate the microsand from residual solids. A polymer coagulant aid is added to the process at the hydrocyclones.

3.3.2 Filtration

The effluent from the two (2) Actiflo™ settling tanks is discharged to a concrete splitter box which divides the flow to three (3) cylindrical double compartment dual media (sand/anthracite) gravity filters. The filters are each equipped with underdrains, self-contained backwash storage compartments, air scour systems and automated control valves for backwash operations.


Filtered water is chlorinated and fluoridated prior to being directed to two (2) clearwells, which include isolation gates and piping for flow control. The Carleton Place DWS has provision to add lime to the filtered water. Four (4) vertical turbine high lift pumps discharge treated water into the distribution system via a common 450 mm diameter discharge header.

Filter to Waste is directed to the backwash flow residue compartment.

3.3.3 Residual Management

Backwash wastewater and Actiflo™ residuals are discharged to a two compartment settling tank equipped with two sludge pumps and two supernatant pumps. One compartment is configured to receive the Actiflo residuals and one compartment is configured to receive the filter backwash residue.

The Actiflo compartment is configured to send all residue to the on-site pumping station. The pumping station pumps the residue to the sewer collection system.

| | | |
|---|--|---|
|  | <p align="center">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-06 Rev Date: 2018-08-28 Rev No: 0 Pages: 5 of 6</p> |
| DRINKING WATER SYSTEM | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

The filter backwash compartment is configured to pump the supernatant is discharged to the Mississippi River while settled sludge is discharged to the sanitary sewer.


3.3.4 Elevated Tower

The distribution system for the Town of Carleton Place includes a 3,180 m³ elevated water storage tower located on Nelson Street, east of Park Street. The water tower has provision for chlorine boosting with sodium hypochlorite, however, this is only used in the summer during warmer temperatures to maintain adequate chlorine residual in the distribution system.

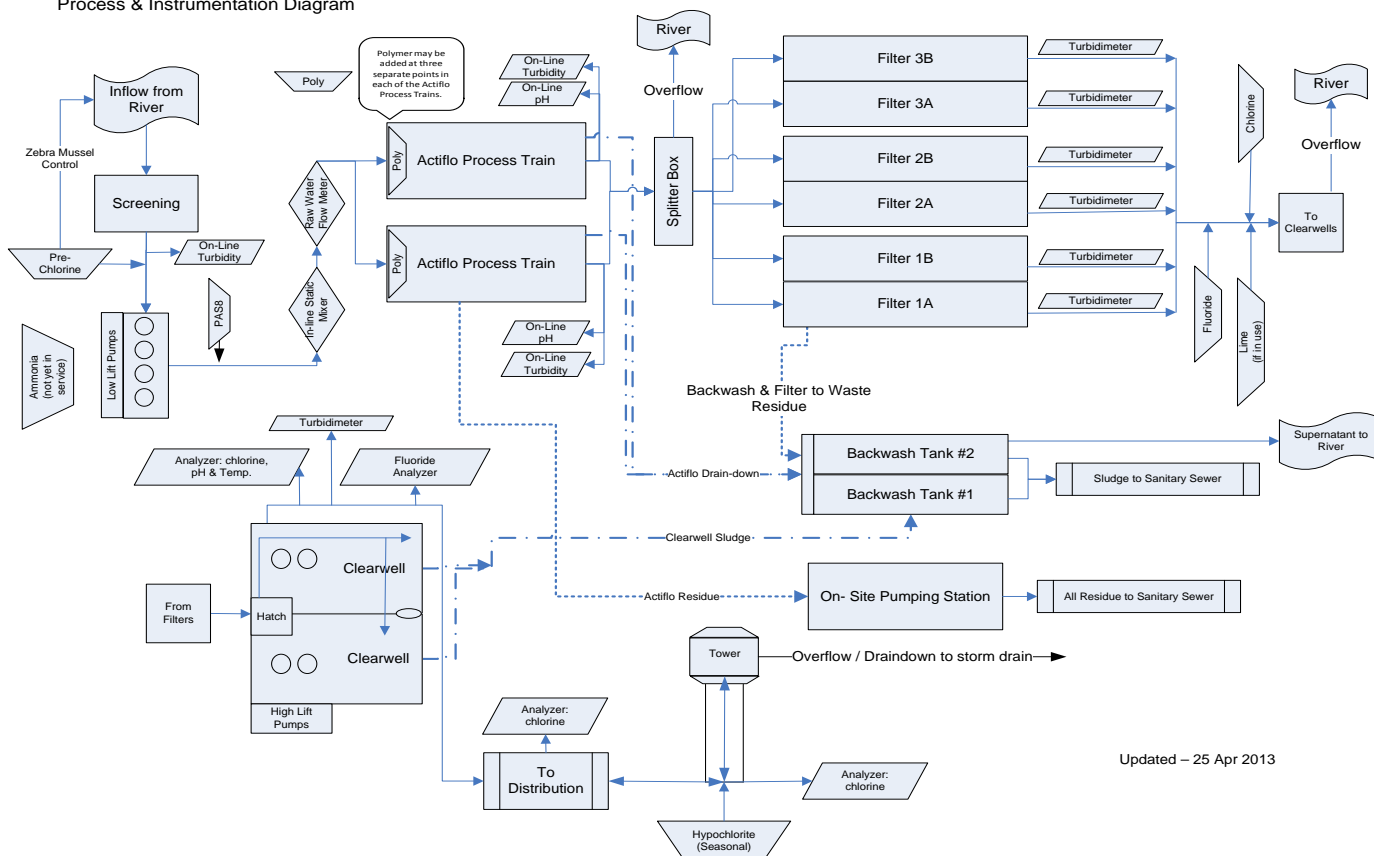
3.3.5 Back-up Power

A back-up generator is on-site with capabilities of providing power to the entire treatment plant in the event of a power failure.

3.4 Treatment System Process Flow Chart

| | | |
|---|---|---|
|  Ontario Clean Water Agency | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-06 Rev Date: 2018-08-28 Rev No: 0 Pages: 6 of 6 |
| DRINKING WATER SYSTEM | | |
| Reviewed by: Alison O'Connor (PCT) | Approved by: Vanessa Greatrix (SPC Manager) | |

Carleton Place DWS: Water Treatment Plant
Process & Instrumentation Diagram



3.5 Distribution System Components

Distribution system is operated by the Corporation of the Town of Carleton Place.

4 Related Documents

SOP Manual Carleton Place DWS

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|--|
| 2018-08-28 | 0 | Procedure issued – Information within OP-06 was originally set out in the Main body of OCWA's Operational Plan |

| | | |
|---|---|---|
|  | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-07 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 4 |
| RISK ASSESSMENT | | |
| Reviewed by: Alison O'Connor (PCT) | Approved by: Vanessa Greatrix (SPC Manager) | |

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 ensures that operations personnel are assigned to conduct a risk assessment at least once every thirty-six months. At a minimum,

| | | |
|---|---|---|
|  | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-07 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 4</p> |
| RISK ASSESSMENT | | |
| Reviewed by: Alison O'Connor (PCT) | Approved by: Vanessa Greatrix (SPC Manager) | |

the Risk Assessment Team must include the QEMS Representative, at least one Operator for the system and at least one member of Operations Management.

- 3.2 The QEMS Representative is responsible for coordinating the risk assessment and ensuring that documents and records related to the risk assessment activities are maintained.
- 3.3 The Risk Assessment Team performs the risk assessment as follows:
 - 3.3.1 OP-07 Risk Assessment and OP-08 Risk Assessment Outcomes are reviewed.
 - 3.3.2 For each of the system's activities/process steps, potential hazardous events and associated hazards (possible outcomes) that could impact the system's ability to deliver safe drinking water are identified. At a minimum, potential hazardous events and associated hazard as identified in the most current version of the Ministry 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).

| | | |
|---|---|---|
|  | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-07 Rev Date: 2018-08-28 Rev No: 0 Pages: 3 of 4 |
| RISK ASSESSMENT | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

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

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

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

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

- 3.3.7 Hazardous events and rankings are reviewed and any activity/process step is identified as an additional CCP if 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

| | | |
|---|---|---|
|  Ontario Clean Water Agency | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-07 Rev Date: 2018-08-28 Rev No: 0 Pages: 4 of 4 |
| RISK ASSESSMENT | | |
| Reviewed by: Alison O'Connor (PCT) | Approved by: Vanessa Greatrix (SPC Manager) | |

- 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 Representative facilitates the verification of the currency of the information and the validity of the assumptions used in the risk assessment in preparation for the Management Review (OP-20). When performing this review, the following may be considered:
- Process/equipment changes
 - Reliability and redundancy of equipment
 - Emergency situations/service interruptions
 - CCP deviations
 - Audit/inspection results

4 Related Documents

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

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|---|
| 2018-08-28 | 0 | Procedure issued – Information within OP-07 was originally set out in the QEMS Procedure QP-02 Risk Assessment and Risk Assessment Outcomes |

| | | |
|---|---|---|
|  | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-08 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 2</p> |
| RISK ASSESSMENT OUTCOMES | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

1 Purpose

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

2 Definitions

Critical Control Point (CCP) – An essential step or point in the subject system at which control can be applied by the Operating Authority to prevent or eliminate a drinking water health hazard or reduce it to an acceptable level

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

3 Procedure

3.1 The QEMS Representative is responsible for updating the information in OP-08A Summary of Risk Assessment Outcomes 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;
Note: Hazards listed in the MOECC's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" are indicated in the appropriate column using the reference numbers in Table 4 of OP-08A.
- Identified control measures to address the potential hazards and hazardous events; and
- Assigned rankings for the hazardous events (likelihood x consequence = risk value) and whether the hazardous event is a Critical Control Point (CCP) (mandatory or additional).

Note: If the hazardous event is ranked as 12 or higher and it is 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:

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

| | | |
|---|--|---|
|  | <p align="center">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-08 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 2</p> |
| RISK ASSESSMENT OUTCOMES | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

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.

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

4 Related Documents

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

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|---|
| 2018-08-28 | 0 | Procedure issued – Information within OP-08 was originally set out in the QEMS Procedure QP-02 Risk Assessment and Risk Assessment Outcomes |
| | | |

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)

Table 1: Risk Assessment Table

Note: Processes referred to in section 3.3.4 of OP-07 Risk Assessment must be identified as mandatory Critical Control Points (CCPs) as applicable. Mandatory CCPs are not required to be ranked.

| Activity/ Process Step | MOECC Potential Hazardous Event/Hazard Reference # (see Table 4) | Description of Hazardous Event | Possible Outcome (Hazards) | Existing Control Measures | Likelihood | Consequence | Risk Value | CCP? |
|----------------------------|---|--|--|---|------------|-------------|------------|--|
| Raw Water Source/Intake | 1,3,4 | Frazil ice | Loss of water supply | None – staff would take appropriate response measures - alternate intake pipe, supply from reservoir/tower Water Supply Shortfall | 2 | 3 | 6 | <input checked="" type="checkbox"/> No |
| | 5 | Spill of biological or chemical material into Mississippi River | Contamination of source water | None – when notified, staff would take appropriate response action | 1 | 4 | 4 | <input checked="" type="checkbox"/> No |
| | 2 | Breakage/blockage of intake pipe | Loss of water supply | None – staff would take appropriate response measures - alternate intake pipe, supply from reservoir/tower | 1 | 3 | 3 | <input checked="" type="checkbox"/> No |
| | 2 | Chlorination failure (zebra mussel control) – extended period of time | Restricted flow | Inspected yearly, flushing, monitoring, alarms | 2 | 2 | 4 | <input checked="" type="checkbox"/> No |
| | 1,4,9 | Adverse weather/seasonal | Any influence to normal raw water characteristics. | None – routine operations | 3 | 1 | 3 | <input checked="" type="checkbox"/> No |

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)

| Activity/ Process Step | MOECC Potential Hazardous Event/Hazard Reference # (see Table 4) | Description of Hazardous Event | Possible Outcome (Hazards) | Existing Control Measures | Likelihood | Consequence | Risk Value | CCP? |
|---|---|-----------------------------------|---|--|------------|-------------|------------|---|
| | | fluctuations | i.e.turbidity, pH, colour and temperature. | | | | | |
| Low Lift Pumping | 2 | Blockage of screen | Reduced plant capacity | Screens switched out as required, redundancy (2 screens), SOP Raw Water Low Level Tank Alarm Response | 5 | 1 | 5 | <input checked="" type="checkbox"/> No |
| | 2 | Low lift pump failures | Loss of water supply | Redundancy (4 pumps), scheduled maintenance activities, back-up generator for loss of power situations, alarms | 2 | 2 | 4 | <input checked="" type="checkbox"/> No |
| Filtration Process (includes flocculation, coagulation, dual media gravity filters) | 10 | Primary coagulate feed failure | Ineffective removal of pathogens (minimum treatment requirements not met) | Redundancy (1 back-up pumps), operator inspections (tank levels, calculate dosage), scheduled maintenance activities, new pumps with auto switch over, low/high tank level alarms, pH monitoring and Actiflo effluent turbidity alarm, quality of chemical (Kemira issues), supply shortages | | | | <input checked="" type="checkbox"/> Yes – Mandatory CCP <input type="checkbox"/> Yes – Additional CCP identified for facility <input type="checkbox"/> No |
| | 10 | Polymer feed failure | Increased turbidity, ineffective removal of | Operational control, 4 pumps, alarms, operator inspections (tank levels, calculate dosage) | | | | |

OPERATIONAL PLAN

Carleton Place Drinking Water System

QEMS Doc.: OP-08A
Rev Date: 2018-08-28
Rev No: #
Pages: 3 of 11

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)

| Activity/ Process Step | MOECC Potential Hazardous Event/Hazard Reference # (see Table 4) | Description of Hazardous Event | Possible Outcome (Hazards) | Existing Control Measures | Likelihood | Consequence | Risk Value | CCP? |
|---------------------------|---|---|---|--|------------|-------------|------------|------|
| | | | pathogens | | | | | |
| | 10 | Loss of silica sand | Increased turbidity, ineffective removal of pathogens | Operational control, turbidity analyzers and alarm, operator inspections | | | | |
| | 10 | Filter breakthrough | Increased turbidity, ineffective removal of pathogens, potential for AWQI | On-line monitoring of turbidity, alarm on high turbidity, redundancy 3 dual compartments (6 filters), regular backwashes, scheduled maintenance activities | | | | |
| | 10 | High Splitter Box | Reduced capacity | Alarmed, on-line monitoring | | | | |
| | 10 | Backwash system failure (compressor and/or valves) | Potential for loss of treated water supply | Alarms, on-line monitoring, scheduled maintenance activities | | | | |
| | 10 | Mixer | Reduced flocculation and sand settling | Alarms, online monitoring, Actiflo turbidity and scheduled maintenance activities | | | | |
| | 10 | Turbidimeter failure | Unknown turbidity | Alarms, filter redundancy (take | | | | |

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)

| Activity/ Process Step | MOECC Potential Hazardous Event/Hazard Reference # (see Table 4) | Description of Hazardous Event | Possible Outcome (Hazards) | Existing Control Measures | Likelihood | Consequence | Risk Value | CCP? |
|---|---|-----------------------------------|---|--|------------|-------------|------------|---|
| | | | levels, potential for AWQI | filter out of service until analyzer replaced/repared), scheduled maintenance activities, in-house readings, operator inspections | | | | |
| Chlorine System (for primary disinfection) | 2,10 | Chlorination system failure | Low chlorine residual, inadequate inactivation of pathogens, potential for AWQI | Redundancy (1 duty and 1 standby), on-line monitoring with alarms, in-house residual testing and dosage calculations, scheduled maintenance activities, SOP | | | | <input checked="" type="checkbox"/> Yes – Mandatory CCP |
| | 2, 10 | Analyzer failure | Unknown chlorine residual levels, potential for AWQI | In-house residual testing, scheduled maintenance activities, back-up analyzers | | | | <input checked="" type="checkbox"/> Yes – Mandatory CCP |
| Fluoridation | | HFS overdose | Potential for public health effects, AWQI | Alarms, on-line monitoring, in- house residual testing, flow-paced calculated dosages (SCADA), High Fluoride Residual Alarm SOP | | | | <input checked="" type="checkbox"/> Yes – Mandatory CCP |
| | | Analyzer failure | Unknown fluoride residual levels, potential for AWQI | In-house residual testing, scheduled maintenance activities | | | | <input checked="" type="checkbox"/> No |

OPERATIONAL PLAN

Carleton Place Drinking Water System

QEMS Doc.: OP-08A
Rev Date: 2018-08-28
Rev No: #
Pages: 5 of 11

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)

| Activity/ Process Step | MOECC Potential Hazardous Event/Hazard Reference # (see Table 4) | Description of Hazardous Event | Possible Outcome (Hazards) | Existing Control Measures | Likelihood | Consequence | Risk Value | CCP? |
|---|---|--|--|--|------------|-------------|------------|---|
| High Lift | 7 | High lift pump failure | Reduced pumping capacity | Redundancy (4 pumps), scheduled maintenance activities, operational control, on-line monitoring of distribution pressure, low tower alarms, failure to start alarm, supply from storage, water conservation methods | 2 | 1 | 2 | <input checked="" type="checkbox"/> No |
| Control System | | Stealth PLC / SCADA failure Outpost redundancy | Loss of automatic control | Operate plant manually as per SOP | 3 | 3 | 9 | <input checked="" type="checkbox"/> No |
| Secondary Disinfection (Seasonal chlorine boosting) | 2,11 | Reduced chlorine residual | Failure to maintain minimum chlorine residual, potential AWQI | Continuous on-line monitoring, system-wide residual testing, Low Chlorine Residual Distribution SOP, increase dosage at plant and / or tower | | | | <input checked="" type="checkbox"/> Yes – Mandatory CCP |
| Distribution (Water Tower) | 2,7 | Loss of standpipe level control | Inability to meet peak demand, high/low pressure, reduced fire protection | Redundant alarms, operate manually as per system pressure, local control, communication loss alarm, operator inspections, pressure connected to tower levels | 3 | 2 | 6 | <input checked="" type="checkbox"/> No |
| | 6 | Vandalism/terrorism | Contamination of | Security system, intruder alarms, | 2 | 4 | 8 | <input checked="" type="checkbox"/> No |

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)

| Activity/ Process Step | MOECC Potential Hazardous Event/Hazard Reference # (see Table 4) | Description of Hazardous Event | Possible Outcome (Hazards) | Existing Control Measures | Likelihood | Consequence | Risk Value | CCP? |
|---------------------------|---|---|---|---|------------|-------------|------------|---|
| | | | the water supply | locks, signage | | | | |
| Raw Water Taking | | Cyanobacteria | Toxins released into water supply system | SOP in the event bacteria reaches the water intake line | | | | <input checked="" type="checkbox"/> Yes – Mandatory CCP |
| SCADA programming | | SCADA control of water treatment process. | Alarm malfunction | SOP for operators to test alarms before programmer leaves the facility. | 3 | 4 | 12 | <input checked="" type="checkbox"/> No |
| Hatch in Clearwell | 2,10 | CT short circuit | Water without the proper CT time could be sent to the distribution system | Gate has been labeled to instruct operators to lock out and tag high lift pump 3 & 4. | 2 | 4 | 8 | <input checked="" type="checkbox"/> No |
| Power Failure | 3 | Loss of power | Danger of low / no water supply. | Emergency backup generator programmed to start & switch over automatically. Month inspection and test running. | 5 | 1 | 5 | <input checked="" type="checkbox"/> No |
| Generator Failure | 3 | Loss of power | Danger of low / no water supply. | Service agreement with Generator company – deemed as ESS. OCWA's Y2K generator available. | 1 | 5 | 5 | <input checked="" type="checkbox"/> No Note: FEP Contingency plan for Loss of Service |

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)

Table 2: Identified Critical Control Points (CCPs)

| CCP | Critical Control Limits | Monitoring Procedures | Response, Reporting and Recording Procedures |
|--|--|---|--|
| Filtration Process (includes flocculation, coagulation, dual media gravity filters) | Filter Effluent: > 1.0 NTU two samples taken 15 minutes or more apart. (95% rule) | SCADA (continuous online analyzers) Operator checks including dosage calculations Trend review and sign-off Alarm set points established in advance of the process reaching the CCP | Refer to Alarm Response Procedures located in the Alarms section of the Emergency Plan Binder. |
| Primary Disinfection | CT is calculated at the time of the event under the conditions present at the time of the low chlorine residual. Worst case scenario described in the 2000 Engineer's Report indicates a free chlorine residual of 0.5 mg/L would provide sufficient CT time (provided both clearwells are in service). Low Clearwell < 40% | SCADA (continuous online analyzers) Operator checks including dosage calculations Trend review and sign-off Alarm set points established in advance of the process reaching the CCP | Refer to Alarm Response Procedures located in the Alarms section of the Emergency Plan Binder. |
| Secondary Disinfection | Seasonal addition of hypochlorite at the water standpipe. Dosage is adjusted to provide a Distribution Free Chlorine Residual 0.05 mg/L. | SCADA (continuous online analyzers) Flushing SOP if free Cl residual drops to below 0.2 mg/L Trend review and sign-off Alarm set points established in advance of the process reaching the CCP | Refer to Alarm Response Procedures located in the Alarms section of the Emergency Plan Binder. |



OPERATIONAL PLAN

Carleton Place Drinking Water System

QEMS Doc.: OP-08A
Rev Date: 2018-08-28
Rev No: #
Pages: 8 of 11

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)

| CCP | Critical Control Limits | Monitoring Procedures | Response, Reporting and Recording Procedures |
|----------|---|---------------------------------------|--|
| Fluoride | Fluoride residual greater than 1.5 mg/L | On-line analyzer equipped with alarm. | Refer to Alarm Response Procedures located in the Alarms section of the Emergency Plan Binder. |

Note: Standard Operating Procedures (SOPs) referenced in Tables 1 and 2 are controlled as per OP-05 Document and Records Control.


| | | |
|---|--|--|
|  Ontario Clean Water Agency | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | QEMS Doc.: OP-08A Rev Date: 2018-08-28 Rev No: # Pages: 9 of 11 |
| SUMMARY OF RISK ASSESSMENT OUTCOMES | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

Table 3: Record of Annual Review/36-Month Risk Assessment

The Drinking Water Quality Management Standard (DWQMS) requires that the currency of the information and the validity of the assumptions used in the risk assessment be verified at least once every calendar year. In addition, the risk assessment must be conducted at least once every thirty-six months. Annual reviews are conducted during the Management Review and the 36 month risk assessment is scheduled and will be documented in the WMS. Revisions to any tables will be documented in the revision history.



SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)

Table 4: Potential Hazardous Event/Hazard Reference Numbers

Based on MOECC's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" dated February 2017

If the hazardous event/hazard is not applicable to this drinking water system (DWS), it will be noted in the first column of this table.

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



OPERATIONAL PLAN

Carleton Place Drinking Water System

QEMS Doc.: OP-08A
Rev Date: 2018-08-28
Rev No: #
Pages: 11 of 11


SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)

Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|---|
| 2018-08-28 | 0 | Summary of Risk Assessment Outcomes assigned document number (OP-08A); added table to reference MOECC's "Potential Hazardous Events for Municipal Residential Drinking Water Systems"; 36-month risk assessment that took place on 2018-02-19 |

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|---|--|---|
|  Ontario Clean Water Agency | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | QEMS Proc.: OP-09 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 7 |
| ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES | | |
| Reviewed by: Alison O'Connor (PCT) | Approved by: Vanessa Greatrix (SPC Manager) | |

1 Purpose

To document the following for The Corporation of the Town of Carleton Place 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 Carleton Place Drinking Water System is owned by The Corporation of the Town of Carleton Place and is represented by Owner representative(s) e.g., Council, Mayor, CAO, etc.)

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

3.2 Top Management

Top Management for the Carleton Place Drinking Water System consists of:

- Operations Management – Cluster

| | | |
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|  Ontario Clean Water Agency | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-09 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 7 |
| ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES | | |
| Reviewed by: Alison O'Connor (PCT) | Approved by: Vanessa Greatrix (SPC Manager) | |

- Regional Hub Manager – Regional Hub
- Safety, Process & Compliance Manager – Regional Hub

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

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


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

3.3 Corporate Oversight

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

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

| Role | Responsibilities and Authorities |
|------------------------------|---|
| Board of Directors | <ul style="list-style-type: none"> • Set the Agency's strategic direction, monitor overall performance and ensure appropriate systems and controls are in place in accordance with the Agency's governing documents • Review and approve the QEMS Policy |
| Senior Leadership Team (SLT) | <ul style="list-style-type: none"> • Establish the Agency's organizational structure and governing documents and ensure resources are in place to support strategic initiatives • Monitor and report on OCWA's operational and business performance to the Board of Directors • Review the QEMS Policy and recommend its approval to the Board • Approve corporate QEMS programs and procedures |
| Corporate Compliance | <ul style="list-style-type: none"> • Manage the QEMS Policy and corporate QEMS programs and procedures • Provide support for the local implementation of the QEMS • Monitor and report on QEMS performance and any need for improvement to SLT • Consult with the MECP and other regulators and provide compliance support/guidance on applicable legislative, regulatory |

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|  Ontario Clean Water Agency | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-09 Rev Date: 2018-08-28 Rev No: 0 Pages: 3 of 7 |
| ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES | | |
| Reviewed by: Alison O'Connor (PCT) | Approved by: Vanessa Greatrix (SPC Manager) | |

| | |
|--|--|
| | and policy requirements <ul style="list-style-type: none"> • Manage contract with OCWA's DWQMS accreditation body |
|--|--|

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 Eastern Regional Hub

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

ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)

| Role | Responsibilities and Authorities |
|--|--|
| | <ul style="list-style-type: none"> Ensure operational training is provided for the cluster (in consultation with the SPC Manager as required) Maintain appropriate personnel coverage Act as Overall Responsible Operator (ORO) when required. |
| Safety, Process & Compliance (SPC) Manager (Top Management) | <ul style="list-style-type: none"> Supervise facility compliance staff and provide technical and program support to the Regional Hub related to process control and compliant operations Fulfill role of Top Management Ensure corporate/regional QEMS programs and procedures are implemented consistently throughout the Regional Hub Assist in the development of site-specific operational procedures as required Ensure training on applicable legislative and regulatory requirements and the QEMS is provided for the Regional Hub (in consultation with Operations Management as required) Monitor and report to the Regional Hub Manager and Operations Management on the compliance status and QEMS performance within his/her Regional Hub and any need for improvement Act as alternate QEMS Representative (when required) May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. |
| Process & Compliance Technician (PCT) (QEMS Representative) | <ul style="list-style-type: none"> Implement, monitor and support corporate programs relating to environmental compliance and support management by evaluating and implementing process control systems at his/her assigned facilities Fulfill role of QEMS Representative (OP-04) Monitor, evaluate and report on compliance/quality status of his/her assigned facilities Implement facility-specific QEMS programs and procedures consistently at his/her assigned facilities Participate in audits and inspections and assist in developing, implementing and monitoring action items to respond to findings Report to the SPC Manager on QEMS implementation and identify the need for additional/improved processes and procedures at the regional/cluster/facility level (in consultation with the Operations Management as required) Communicates to Owners on facility compliance and DWQMS accreditation as directed Deliver/participate in/coordinate training including applicable legislative and regulatory requirements and the QEMS Perform duties of Operator/Mechanic as required May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. |
| Operational and Maintenance (O&M) Team Lead | <ul style="list-style-type: none"> Perform duties as assigned by Operations Management Oversee maintenance activities on equipment and process in order to maintain compliance with applicable legislation, regulations, approvals and |

ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)

| Role | Responsibilities and Authorities |
|--------------------------|---|
| | <p>established operating procedures</p> <ul style="list-style-type: none"> • Prepare and/or coordinate staff work assignments and follow up to ensure completion • Act for management during vacations or periodic absences. • Develop and provide O&M reports to management and recommend changes in operating procedures/processes to improve facility operations • Assist with facility operations including monitoring facility processes, reviewing process data and trouble-shooting • Assist management in developing annual O&M budgets and provide recommendations relating to potential O&M expenditures • Oversee the computerized Work Management System (WMS) • Perform duties of Operator/Mechanic as required • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. |
| Senior Operator/Mechanic | <ul style="list-style-type: none"> • Perform duties as assigned by Operations Management • Prepare and/or coordinate operational staff work assignments and follow up to ensure completion • Assist management in providing recommendations for annual capital forecasts and gathering information for operational reports as required • Assist in the preparation of facility manuals and documenting operating processes and procedures for staff • Act for management during vacations or periodic absences. • Perform duties of Operator/Mechanic as required • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. |
| Operator/Mechanic | <ul style="list-style-type: none"> • Perform duties as assigned by Operations Management or designate • Monitor, maintain and operate facilities in accordance with applicable regulations, approvals and established operating procedures • Collect samples and perform laboratory tests and equipment calibrations as required • Regularly inspect operating equipment, perform routine preventive maintenance and repairs and prepare and complete work orders as assigned • Participate in facility inspections and audits • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. |
| Mechanic/Operator | <ul style="list-style-type: none"> • Perform duties as assigned by Operations Management or designate • Act as lead with other staff on extensive maintenance/repair projects • Schedule and perform maintenance on equipment and processes in accordance with established procedures and record the maintenance data • Regularly inspect operating equipment, perform routine preventive maintenance and repairs • Perform duties of Operator/Mechanic as required • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator |

ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES


Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)

| Role | Responsibilities and Authorities |
|-----------------------------------|--|
| | (ORO) when required. |
| Instrumentation Technician (UPIT) | <ul style="list-style-type: none"> Provide advice and technical expertise on the services required for process control and automation systems Discuss and advise on detailed system and programming requirements, modify existing and new software in response to plant requests, analyze and resolve problems/error conditions, document changes/modifications and configure, install and support related software, hardware and network for such systems Conduct inspections of the process control and automation systems to validate that all is operating within established parameters as requested Install and commission new electrical/electronic equipment and automation systems Perform duties of Operator/Mechanic as required May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. |
| Maintenance Electrician/Operator | <ul style="list-style-type: none"> 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 Monitor facility processes through visual inspection, the SCADA system or by taking readings from the process control equipment Operate and adjust equipment/processes to maintain compliance with applicable legislation, regulations, approvals and established operating procedures Perform duties of Operator/Mechanic as required May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. |
| Maintenance Foreman | <ul style="list-style-type: none"> Fulfill duties assigned by the Senior Operations Manager Act as team lead with other staff on extensive maintenance/repair projects Regularly inspect operating equipment, perform routine preventive maintenance and repairs Assist management in developing annual O&M budgets and provide recommendations relating to potential O&M expenditures Perform duties of Operator/Mechanic as required. Maintain the facility log book according to regulatory requirements |

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

| | | |
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|  | <p align="center">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | QEMS Proc.: OP-09 Rev Date: 2018-08-28 Rev No: 0 Pages: 7 of 7 |
| ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES | | |
| Reviewed by: Alison O'Connor (PCT) | Approved by: Vanessa Greatrix (SPC Manager) | |

- OP-20 Management Review

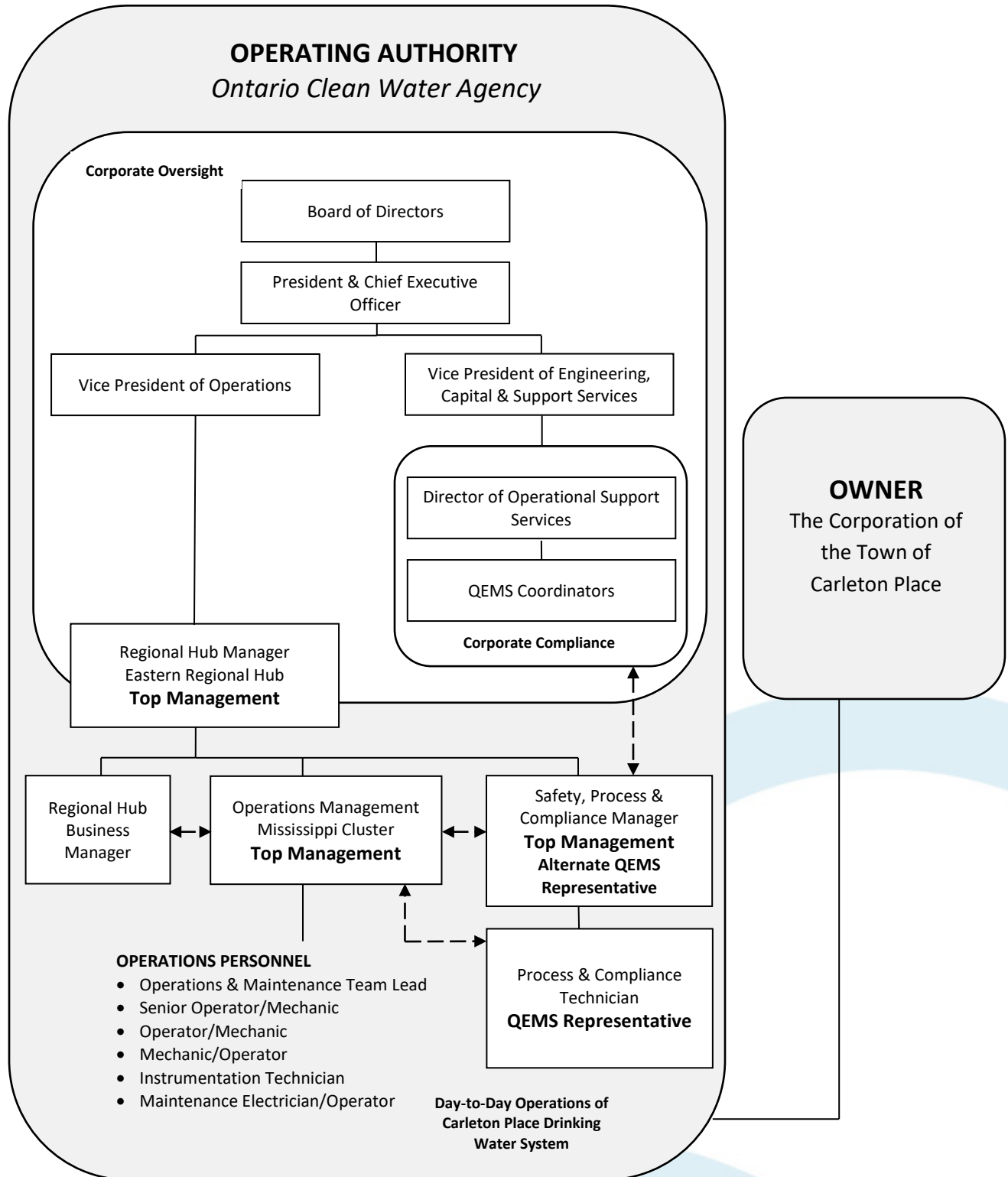
5 Revision History


| Date | Revision # | Reason for Revision |
|------------|------------|---|
| 2018-08-28 | 0 | Procedure issued – Information within OP-09 was originally set out in the main body of OCWA's Operational Plan. |

ORGANIZATIONAL STRUCTURE

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)



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|---|---|---|
|  Ontario Clean Water Agency | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Doc.: OP-09A Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 2 |
| ORGANIZATIONAL STRUCTURE | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|---|
| 2018-08-28 | 0 | Appendix issued - Organizational Chart previously contained as Appendix C of the Operational Plan. Moved to a new Appendix for 2.0 updates. |

| | | |
|---|---|---|
|  Ontario Clean Water Agency | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-10 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 5 |
| COMPETENCIES | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

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 • Experience and/or training in managing/supervising drinking water system operations, maintenance, financial planning and administration • Training and/or experience related to drinking water system processes, principles and technologies • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures • Experience using computers and operational computerized systems |

COMPETENCIES

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)

| Position | Required Minimum Competencies |
|--|--|
| Safety, Process & Compliance (SPC) Manager | <ul style="list-style-type: none"> Valid operator certification Experience in providing technical support and leading/managing programs related to process control and compliant operations Experience and/or training in conducting compliance audits, and management system audits Experience and/or training in preparing and presenting informational and training material Training on OCWA's QEMS and the DWQMS Training on relevant legislation, regulations, codes, policies, guidelines and procedures Experience using computers and operational computerized systems |
| Process & Compliance Technician | <ul style="list-style-type: none"> Valid operator certification Experience and/or training in resolving/addressing compliance issues for drinking water systems Experience and/or training in monitoring, assessing and reporting on facility performance against legal requirements and corporate goals Experience and/or training in preparing and presenting informational and training material Experience in conducting management system audits or internal auditor education/training Training on OCWA's QEMS and the DWQMS Training on relevant legislation, regulations, codes, policies, guidelines and procedures Experience using computers and operational computerized systems |
| O&M Team Lead | <ul style="list-style-type: none"> Valid operator certification Experience and/or training in managing and planning multiple projects, assessing priorities and effectively coordinating operation and maintenance programs 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 Experience using computers and operational computerized systems |
| Senior Operator/Mechanic | <ul style="list-style-type: none"> Valid operator certification Experience leading/directing operations personnel, and providing technical guidance to resolve operational issues 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 Experience using computers and operational computerized systems |

COMPETENCIES

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)

| Position | Required Minimum Competencies |
|---|---|
| Operator/Mechanic | <ul style="list-style-type: none"> Valid operator certification Training and/or 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 Experience using computers and operational computerized systems |
| Mechanic/Operator | <ul style="list-style-type: none"> Valid operator certification Experience in maintaining and repairing equipment and structures and in planning and scheduling maintenance and repair tasks 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 Experience using computers and operational computerized systems |
| Utility Process Instrumentation Technician (UPIT) | <ul style="list-style-type: none"> Valid operator certification; minimum OIT Experience and/or training in monitoring, programming, installing and troubleshooting network, hardware, software and instrumentation Experience and/or training in drinking water system processes, design, instrumentation, process control and automation systems Training on OCWA's QEMS and the DWQMS Training on relevant legislation, regulations, codes, policies, guidelines and procedures Experience using computers and operational computerized systems |
| Maintenance Electrician/Operator | <ul style="list-style-type: none"> Valid operator certification Valid Electrical Trade Certificate Experience in performing maintenance and repair of electrical and electronic equipment Training on OCWA's QEMS and the DWQMS Training on relevant legislation, regulations, codes, policies, guidelines and procedures Experience using computers and operational computerized systems |

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

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

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|  Ontario Clean Water Agency | <p style="text-align: center;">OPERATIONAL PLAN</p> <p style="text-align: center;">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-10 Rev Date: 2018-08-28 Rev No: 0 Pages: 4 of 5 |
| COMPETENCIES | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

- 3.3 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.
- 3.4 OCWA's Operational Training Program aims to:
- Develop the skills and increase the knowledge of staff and management;
 - Provide staff with information and access to resources that can assist them in performing their duties; and
 - Assist OCWA certified operators in meeting the legislative and regulatory requirements with respect to training.
- 3.5 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.
- 3.6 Awareness of OCWA's QEMS is promoted during the orientation of new staff, at facility/cluster/regional hub level training sessions and meetings and through OCWA's Environmental Compliance 101 (EC 101) course. All new staff are required to complete the EC 101 course within their first year of joining OCWA. The purpose of the EC 101 course is to ensure staff are aware of applicable legislative and regulatory requirements, to promote awareness of OCWA's QEMS and to reinforce their roles and responsibilities under OCWA's QEMS.
- 3.7 Staff are 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. This list is available on OCWA's intranet.
- 3.8 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.
- 3.9 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.
- 3.10 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

| | | |
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|  Ontario Clean Water Agency | <p align="center">OPERATIONAL PLAN</p> <p align="center">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-10 Rev Date: 2018-08-28 Rev No: 0 Pages: 5 of 5 |
| COMPETENCIES | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

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.


- 3.11 Individual OCWA employee training records are maintained and tracked using a computerized system, the Training Summary database, which is administrated by OCWA's Training Department. Training records maintained at the facility are controlled as per OP-05 Document and Records Control.

4 Related Documents

- OCWA's Training Resources (OCWA Intranet)
- OCWA's Mandatory Compliance Training list (OCWA intranet)
- OP-5 Document and Records Control
- OCWA Training Summary Database

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|---|
| 2018-08-28 | 0 | Procedure issued- Information was originally set out in the Main Body of OCWA's Operational Plan. This revision has removed the Main Body format of the Operational Plan. |

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|---|---|---|
|  | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-11 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 2</p> |
| PERSONNEL COVERAGE | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

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 Carleton Place 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.

3.2 The Carleton Place DWS is staffed by OCWA personnel as follows:


7:00 a.m. to 3:30 p.m. Monday to Friday

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.

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). On-Call assignments are documented in the on-call schedule.

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

| | | |
|---|--|---|
|  Ontario Clean Water Agency | <p align="center">OPERATIONAL PLAN</p> <p align="center">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-11 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 2 |
| PERSONNEL COVERAGE | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

- 3.4 The facility alarming system auto dialer is programmed to contact a contracted call-centre operator whenever there is an alarm condition. The call-centre operator contacts the on-call operator. The on-call operator contacts the call-centre to obtain the details of the alarm to determine the appropriate response. If the nature of the alarm requires additional staff, the on-call operator can request assistance from any of the other certified operators. The on-call operator records details of the call-in in the facility logbook and in WMS.
- 3.5 Each 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.
- 3.6 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.
- 3.7 A contingency plan for Critical Shortage of Staff is included in the Facility Emergency Plan. This plan 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

- OP-10 Competencies
- Facility Logbook
- Daily Round Sheets
- On-Call Schedule
- Call-In Reports
- Vacation Schedule
- Critical Shortage of Staff Contingency Plan (Facility Emergency Plan)
- Overall Responsible Operator (ORO) SOP

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|--|
| 2018-08-28 | 0 | Procedure re-issued and updated to DWQMS 2.0 |
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|  Ontario Clean Water Agency | <p align="center">OPERATIONAL PLAN</p> <p align="center">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-12 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 3 |
| COMMUNICATIONS | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

1 Purpose

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

- OCWA staff;
- the Owner;
- essential suppliers and service providers (as identified in OP-13);
- 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 Representative are responsible for identifying and coordinating any site-specific communications in relation to the status/ development of the facility's QEMS.
- 3.2 Internal and external communication responsibilities and reporting requirements for emergency situations are set out under OCWA's Emergency Management Program (i.e., Facility Emergency Plan and OCWA's Emergency Response Plan). Refer to OP-18 Emergency Management for more information.
- 3.3 Communication with OCWA staff:
 - 3.3.1 Within the first year of hire, all staff are required to complete the Environmental Compliance 101 (EC101) course. The objective of the EC 101 course is to ensure that staff are aware of applicable legislative and regulatory requirements and of OCWA's QEMS and to reinforce their roles and responsibilities under OCWA's QEMS.
 - 3.3.2 Operations Management are responsible for ensuring operations personnel receive site-specific training on the Operational Plan, the organizational structure for the facility including the roles and responsibilities and authorities (outlined in OP-09 Organizational Structure, Roles, Responsibilities and Authorities), QEMS Procedures

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|  Ontario Clean Water Agency | <p style="text-align: center;">OPERATIONAL PLAN</p> <p style="text-align: center;">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-12 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 3 |
| COMMUNICATIONS | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

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 legislative and regulatory requirements and the QEMS.
- 3.3.4 The QEMS Representative assists Operations Management and/or the SPC Manager in the coordination/delivery of training as required.
- 3.3.5 Revisions to the QEMS and associated documentation are communicated as per OP-05 Document and Records Control.
- 3.3.6 The QEMS Policy is available to all OCWA personnel as per OP-05A Table 1.
- 3.3.7 Operations personnel are responsible for identifying potential hazards at the facility that could affect the environmental and/or public health, and communicating these to Operations Management. They may also recommend changes be made to improve the facility's QEMS by making a request to the QEMS Representative (as per OP-05).
- 3.3.8 The QEMS Representative is responsible for ensuring that the Operations Management and the Safety, Process and Compliance Manager are informed regarding the compliance/quality status of the facility and QEMS implementation and any need for improved processes/procedures at the cluster/facility level.
- 3.3.9 The SPC Manager reports to the Regional Hub Manager on the compliance status, the QEMS performance and effectiveness, any need for improvement and on issues that may have Agency-wide significance. Operations Management reports to the Regional Hub Manager on facility operational performance.
- 3.4 Communication with the Owner:
 - 3.4.1 The Operations Management ensures that the Owner is provided with QEMS updates and that they are kept informed of the status of the facility's operational and compliance performance during regularly scheduled meetings and/or through electronic and/or verbal communications. The QEMS Representative assists in the coordination of these meetings and with communicating the updates as directed.
 - 3.4.2 The continuing suitability, adequacy and effectiveness of OCWA's QEMS are communicated to the Owner as part of the Management Review process (refer to OP-20 Management Review).

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|  Ontario Clean Water Agency | <p align="center">OPERATIONAL PLAN</p> <p align="center">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-12 Rev Date: 2018-08-28 Rev No: 0 Pages: 3 of 3 |
| COMMUNICATIONS | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

3.5 Communications with Essential Suppliers and Service Providers:

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

3.6 Communication with the Public:


- 3.6.1 Media enquiries must be directed to the facility's Operations Management. The Operations Management will co-ordinate 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.
- 3.6.3 Facility tours of interested parties must be approved in advance by the Operations Management. Relevant forms are available on OCWA's intranet.
- 3.6.4 All complaints, whether received from the consumer, the community or other interested parties, are documented in the OPEX database. Complaints are responded to as per the Complaints SOP. The QEMS Representative ensures that consumer feedback is included for discussion at the Management Review.

4 Related Documents

- 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
- Facility Emergency Plan
- Emergency Response Plan
- OPEX Database

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|--|
| 2018-08-28 | 0 | Procedure issued- Information was originally set out in the previous revision of OCWA's Operational Plan. The procedure was revised to the 2.0 Standard. |
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|  | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-13 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 2</p> |
| ESSENTIAL SUPPLIES AND SERVICES | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

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 Carleton Place Drinking Water System are contained in the Facility Emergency Plan, Emergency Contact/Essential Supplies and Services List. The list is reviewed and updated at least once every calendar year by the QEMS Representative as part of the FEP Review Work Order in WMS.
- 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. Essential suppliers and service providers (including those contracted locally) are sent a letter that provides an overview of the relevant aspects of the QEMS.
- 3.4 Contractors are selected based on their qualifications and ability to meet the facility's needs without compromising operational performance and compliance with applicable legislation and regulations.

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

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

ESSENTIAL SUPPLIES AND SERVICES

Reviewed by: Alison O'Connor (PCT)

Approved by: Vanessa Greatrix (SPC Manager)


- 3.5 All third-party drinking water testing services are provided by accredited and licensed laboratories. The Ministry of the Environment, Conservation and Parks (Ministry) has agreement with The Canadian Association for Laboratory Accreditation (CALA) for accreditation of laboratories testing drinking water. The QEMS Representative is responsible for notifying the Ministry of any change to the drinking water testing services being utilized.
- 3.6 Internal verification and calibration activities (e.g. chlorine analyzer, turbidimeter, 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. The service provider is responsible for providing a record/certificate of all calibrations conducted.
- 3.8 Chemicals purchased for use in the drinking water treatment process must meet AWWA Standards and be ANSI/NSF certified as per the Municipal Drinking Water Licence (MDWL).
- 3.9 The facility orders and receives ongoing deliveries of chemicals to satisfy current short-term needs based on processing volumes and storage capacities. Incoming chemical orders are verified by reviewing the manifest or invoice in order to confirm that the product received is the product ordered.
- 3.10 Process components/equipment provided by the supplier must meet applicable regulatory requirements and industry standards for use in drinking water systems prior to their installation.

4 Related Documents

- Emergency Contact/Essential Supplies and Services List
- OP-17 Measurement Recording Equipment Calibration and Maintenance
- ANSI/NSF Documentation
- AWWA Standards
- MDWL
- Calibration Certificates/Records

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|--|
| 2018-08-28 | 0 | Procedure issued- Information was originally set out in the previous revision of OCWA's Operational Plan. The procedure was revised to the 2.0 Standard. |
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|  | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-14 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 2</p> |
| REVIEW AND PROVISION OF INFRASTRUCTURE | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

1 Purpose


To describe OCWA's procedure for reviewing the adequacy of infrastructure necessary to operate and maintain the Carleton Place 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

3 Procedure

- 3.1 At least once every calendar year, Operations Management in conjunction with operations personnel conducts a review of the drinking water system's infrastructure to assess its adequacy for the operation and maintenance of the system. Operations personnel assist with identifying the need for infrastructure repairs, replacements or alterations and with prioritizing each identified item. Documents and records that are reviewed may include:
 - Maintenance records
 - Call-in reports
 - Adverse Water Quality Incidents (AWQIs) or other incidents
 - Health & Safety Inspections
 - Ministry Inspection Reports
 - Previous Capital and Major Maintenance Recommendations Report
- 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 the Capital and Major Maintenance Recommendations Report to assist the Owner and OCWA with planning infrastructure needs for the short and long-term. This report is submitted, at least once every calendar year by Operations Management, to the Owner for review and approval. Together with the Owner, Operations Management determines and documents timelines and responsibilities for implementation of priority items.

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|  | <p align="center">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-14 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 2</p> |
| REVIEW AND PROVISION OF INFRASTRUCTURE | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |


- 3.4 The final approved Capital and Major Maintenance Recommendations Report forms the long term forecast for any major infrastructure maintenance, rehabilitation and renewal activities as per OP-15.
- 3.5 Operations Management ensures that results of this review are considered during the Management Review process (OP-20).

4 Related Documents

- Capital and Major Maintenance Recommendations Report
- OP-08 Risk Assessment Outcomes
- OP-15 Infrastructure Maintenance, Rehabilitation and Renewal
- OP-20 Management Review
- Management Review Minutes

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|--|
| 2018-08-28 | 0 | Procedure issued for revision to new standard. |

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|  | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-15 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 3</p> |
| <p style="text-align: center;">INFRASTRUCTURE MAINTENANCE, REHABILITATION AND RENEWAL</p> | | |
| <p>Reviewed by: Alison O'Connor (PCT)</p> | <p>Approved by: Vanessa Greatrix (SPC Manager)</p> | |

1 Purpose

To describe OCWA's infrastructure maintenance, rehabilitation and renewal program for the Carleton Place 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.

3.2 Planned Maintenance

Routine planned maintenance activities may include:

- Inspect, adjust and calibrate process control equipment to ensure proper operation of water distribution systems, pumps, chemical feeders, and all other equipment installed at the facilities.
- Carry out a routine maintenance program including greasing and oiling as specified in the lubrication schedule.
- Perform day-to-day maintenance duties to equipment including checking machinery and electrical equipment when required.
- Maintain an equipment inventory
- Maintain accurate records of work conducted, activities, and achievements.

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|  | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-15 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 3</p> |
| INFRASTRUCTURE MAINTENANCE, REHABILITATION AND RENEWAL | | |
| Reviewed by: Alison O'Connor (PCT) | Approved by: Vanessa Greatrix (SPC Manager) | |

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 schedule as determined based on manufacturer's recommendations and site specific operational and maintenance needs and are assigned directly to the appropriate operations personnel. This schedule is set up by the designated WMS Primary. 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 designated WMS Primary maintains the inventory of equipment in WMS and ensures that appropriate maintenance plans are in place. Maintenance plans are developed according to the manufacturer's instructions, regulatory requirements, industry standards, and/or client service requirements. Equipment Operation and Maintenance (O&M) manuals are accessible to operations personnel at the locations specified in OP-05 Document and Records Control.

3.3 Unplanned Maintenance

Unplanned maintenance is conducted as required. All unplanned maintenance activities are authorized by the Operator in Charge. Unplanned maintenance activities are entered into WMS by the person responsible for identifying or completing the unplanned maintenance activity.

3.4 Rehabilitation and Renewal

Rehabilitation and renewal activities including capital upgrades (major infrastructure maintenance) are determined at least once every calendar year in consultation with Operations Management and the Owner. A list of required replacement or desired new equipment is compiled and prioritized by Operations Management in conjunction with operations personnel and is presented to the Owner for review and comment. All major expenditures require the approval of the

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|  | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-15 Rev Date: 2018-08-28 Rev No: 0 Pages: 3 of 3</p> |
| INFRASTRUCTURE MAINTENANCE, REHABILITATION AND RENEWAL | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

Owner. In addition to the short-term facility needs (i.e. current year), the Capital and Major Maintenance Recommendations Report also provides a long-term list of major maintenance recommendations. (Refer to OP-14 Review and Provision of Infrastructure).

3.5 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 various views and reports are available to the Operations Manager to review the efficacy.


- 3.6 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 at a minimum of at least once every calendar year through submission of the Capital and Major Maintenance Recommendations Report and through the results of the Management Review.

4 Related Documents

- Minutes of Management Review
- Capital and Major Maintenance Recommendations Report
- OP-05 Document and Records Control
- OP-14 Review and Provision of Infrastructure

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|--|
| 2018-08-28 | 0 | Procedure issued – Information within OP-15 was originally set out in the Main body of OCWA's Operational Plan |

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|  | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-16 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 2</p> |
| SAMPLING, TESTING AND MONITORING | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

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, the facility's Municipal Drinking Water License (MDWL) and as directed.
- 3.2 Sampling requirements for the facility are defined in the facility's sampling schedule which is available to operations personnel, at the location(s) noted in OP-05 Document and Records Control. The sampling schedule is maintained by the PCT and is updated as required.
- 3.3 Samples that are required to be tested by an accredited and licensed laboratory, are collected, handled and submitted according to the directions provided by the licensed laboratory(ies) that conducts the analysis. The laboratory(ies) used for this facility are listed in the Essential Supplies and Services List (within the Facility Emergency Plan (FEP)).

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

- 3.4 Continuous monitoring equipment is used to sample and test for legislated and process parameters. 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.

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

Adverse water quality incidents are responded to and reported.

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|  Ontario Clean Water Agency | <p align="center">OPERATIONAL PLAN</p> <p align="center">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-16 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 2 |
| SAMPLING, TESTING AND MONITORING | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

- 3.5 In-house process control activities are conducted on a regular basis by the certified operator(s) on duty as per the schedule for in-house sampling.

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

- 3.6 Additional sampling, testing and monitoring activities related to the facility's/system's most challenging conditions are included in the existing in-house program as described in this procedure or additional sampling, testing and monitoring activities related to the facility's most challenging conditions.
- 3.7 There are no relevant upstream sampling, testing and monitoring activities that take place for this facility/system.
- 3.8 Sampling, testing and monitoring results are readily accessible to the Owner as requested.

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.


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

4 Related Documents

- Facility Logbook
- OP-05 Document and Records Control
- OP-20 Management Review
- Annual Report (O. Reg. 170)
- Process Data Management System (PDM)
- Facility Emergency Plan (FEP) Binder
- SOP - Reporting and Responding to Adverse Results
- Operational Check Sheets/Data Collection Sheet
- Sampling Schedule
- SCADA Records

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|---|
| 2018-08-28 | 0 | Procedure issued. Updated to new 2.0 Standard |

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|  | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | <p>QEMS Proc.: OP-17 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 2</p> |
| MEASUREMENT AND RECORDING EQUIPMENT CALIBRATION AND MAINTENANCE | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

1 Purpose


To describe the procedure for the calibration and/or verification and maintenance of measurement and recording equipment at the Carleton Place 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 designated WMS Primary establishes and maintains 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 added to the WMS system by the WMS Primary. 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.

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|  | <p align="center">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | QEMS Proc.: OP-17 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 2 |
| MEASUREMENT AND RECORDING EQUIPMENT CALIBRATION AND MAINTENANCE | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |


- 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 Overall Responsible Operator 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. The PCT ensures that any notifications required by applicable legislation are completed and documented within the specified time period.
- 3.7 Calibration and maintenance records and maintenance/equipment manuals are maintained as per OP-05 Document and Records Control.

4 Related Documents

- Facility Logbook
- WMS Records
- Calibration/Maintenance Records
- Maintenance/Equipment Manuals
- 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 |
|------------|------------|--|
| 2018-08-28 | 0 | Procedure issued [update revision history based on your current procedure] |
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|  Ontario Clean Water Agency | <p style="text-align: center;">OPERATIONAL PLAN</p> <p style="text-align: center;">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-18 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 4 |
| EMERGENCY MANAGEMENT | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

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

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

Level 3 is an actual or potential situation that will likely require significant additional resources and/or threatens continued operations. It may require

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|  Ontario Clean Water Agency | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-18 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 4 |
| EMERGENCY MANAGEMENT | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

corporate-level support including activation of the OCWA Action Group and opening of an Emergency Operations Centre (EOC) as described in the corporate ERP. Level 3 events usually involve intervention from outside organizations (client, emergency responders, Ministry of the Environment and Climate Change, media, etc.). Examples may include:

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


3.3 Potential emergency situations or service interruptions identified for the Carleton Place DWS 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 a FEP that meets the corporate standard | Safety, Process and Compliance Manager and/or Corporate Compliance (as required) | On-the-Job Practical | Upon hire and when changes are made to the corporate standard* | PCTs (or others identified by the Operations Management) |
| Contents of the site-specific FEP | Facility Level (coordinated by QEMS Representative) | On-the-Job Practical | Upon hire and when changes to the FEP are made* | All operations personnel with responsibilities for responding to an emergency |


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|  Ontario Clean Water Agency | <p align="center">OPERATIONAL PLAN</p> <p align="center">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-18 Rev Date: 2018-08-28 Rev No: 0 Pages: 3 of 4 |
| EMERGENCY MANAGEMENT | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

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

- 3.6 At least one CP must be tested each calendar year and each CP must be reviewed at least once in a five-calendar year period. The reviews and tests are recorded in On-The-Job Training Records and scheduled in WMS. Opportunities for improvement and actions taken are reflected in the revision history. A CP-related response to an actual event may also be considered a review or a test. A review of the incident including lessons learned should be completed following the resolution of the actual event, along with any opportunities for improvement/actions identified.
- 3.7 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).
- 3.8 Roles and responsibilities for emergency management at OCWA-operated facilities are set out in the FEP. Specific roles and responsibilities related to a particular emergency situation or service interruption (including those of the Owner where applicable) are set out in the relevant site-specific CP. A general description of the respective responsibilities of the Owner and the operating authority in the event an emergency occurs is included in the service agreement with the Owner (as required by the *Safe Drinking Water Act*).
- 3.9 Where they exist, any relevant sections of the Municipal Emergency Response Plan (MERP) are included or referenced in the appendices section of the FEP. Measures specified in the MERP are incorporated into CPs where appropriate.
- 3.10 An emergency contact list in conjunction with the essential supplies and services list is contained within the FEP and is reviewed/updated at least once per calendar year. An emergency communications protocol is contained within the FEP. Specific notification requirements during emergency situations or service interruptions are set out in the individual CPs and in the ERP.

4 Related Documents


- Facility Emergency Plan
- Corporate Emergency Response Plan
- WMS
- Municipal Emergency Response Plan (as applicable)
- Emergency Contact List/Essential Supplies & Services List (Contacts section of FEP)

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|  Ontario Clean Water Agency | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-18 Rev Date: 2018-08-28 Rev No: 0 Pages: 4 of 4 |
| EMERGENCY MANAGEMENT | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

- OP-20 Management Review

5 Revision History

| Date | Revision # | Reason for Revision |
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| 2018-08-28 | 0 | Procedure issued- Information was originally set out in the previous revision of OCWA's Operational Plan. The procedure was revised to the 2.0 Standard. |
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|  Ontario Clean Water Agency | <p style="text-align: center;">OPERATIONAL PLAN</p> <p style="text-align: center;">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-19 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 5 |
| INTERNAL QEMS AUDITS | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

1 Purpose

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

This procedure applies to Internal QEMS Audits conducted at the Carleton Place DWS 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;

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|  Ontario Clean Water Agency | <p style="text-align: center;">OPERATIONAL PLAN</p> <p style="text-align: center;">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-19 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 5 |
| INTERNAL QEMS AUDITS | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

- To identify non-conformances with the documented QEMS; and
- To assess the effectiveness of the QEMS and assist in its continual improvement.

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

3.1.3 The criteria covered by an internal QEMS audit include:

- Drinking Water Quality Management Standard (DWQMS)
- Current Operational Plan
- QEMS-related documents and records

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

3.2 Audit Frequency

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

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


3.3 Internal Auditor Qualifications

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

- Internal auditor training or experience in conducting management system audits; and
- Familiarity with the DWQMS requirements.

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

3.3.3 Internal Auditors must remain objective and, where practical, be independent of the areas/activities being audited.

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|---|--|---|
|  Ontario Clean Water Agency | <p style="text-align: center;">OPERATIONAL PLAN</p> <p style="text-align: center;">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-19 Rev Date: 2018-08-28 Rev No: 0 Pages: 3 of 5 |
| INTERNAL QEMS AUDITS | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

3.4 Audit Preparation

3.4.1 Together, the QEMS Representative and the Lead Auditor:

- Establish the audit objectives, scope and criteria;
- 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.).

3.4.2 Each Internal Auditor is responsible for:

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

3.5 Conducting the Audit


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

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

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

3.6 Reporting the Results

3.6.1 The Lead Auditor reviews the audit findings and conclusions with the QEMS Representative and Top Management. Other audit participants may also take part in this review as appropriate. This review may take place in person (e.g., during a closing meeting) or through other means

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|  Ontario Clean Water Agency | <p align="center">OPERATIONAL PLAN</p> <p align="center">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-19 Rev Date: 2018-08-28 Rev No: 0 Pages: 4 of 5 |
| INTERNAL QEMS AUDITS | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

(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 Representative. 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 were conducted;
- Audit findings including:
 - Related objective evidence for each element;
 - Any non-conformance identified referencing the requirement that was not met; and
 - OFIs or other observations.
- Audit conclusions.

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

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

3.7 Corrective Actions and Opportunities for Improvement (OFIs)

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


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

3.8 Record-Keeping

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


4 Related Documents

- Internal Audit Records (checklists, forms, reports, etc.)
- OP-05 Document and Records Control
- OP-20 Management Review
- OP-21 Continual Improvement
- DWQMS Access Database

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|  Ontario Clean Water Agency | <p align="center">OPERATIONAL PLAN</p> <p align="center">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-19 Rev Date: 2018-08-28 Rev No: 0 Pages: 5 of 5 |
| INTERNAL QEMS AUDITS | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|--|
| 2018-08-28 | 0 | Procedure issued- Information was originally set out in the previous revision of OCWA's Operational Plan. The procedure was revised to the 2.0 Standard. |

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|---|--|---|
|  Ontario Clean Water Agency | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | QEMS Proc.: OP-20 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 3 |
| MANAGEMENT REVIEW | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |

1 Purpose

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

2 Definitions

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

Operations Management – refers to the 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 Carleton Place Drinking Water System as:


- Operations Management – Mississippi Cluster
- Regional Hub Manager – Eastern Regional Hub
- Safety, Process & Compliance (SPC) Manager – Eastern Regional Hub

3 Procedure

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

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

- 3.2 At a minimum, the QEMS Representative, at least one member of Top Management, and at least consider one representative from operations must attend the Management Review meeting. Other members of Top Management may participate though their attendance is optional.
- 3.3 Other staff may be invited to attend the Management Review meeting or to assist with presenting information or in reviewing the information presented, where they offer additional expertise regarding the subject matter.


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|---|--|---|
|  Ontario Clean Water Agency | <p style="text-align: center;">OPERATIONAL PLAN Carleton Place Drinking Water System</p> | QEMS Proc.: OP-20 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 3 |
| MANAGEMENT REVIEW | | |
| Reviewed by: Alison O'Connor (PCT) | Approved by: Vanessa Greatrix (SPC Manager) | |

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 and complete the annual review of the current risk assessment
- e) Internal and third-party audit results (including any preventive actions implemented to address Opportunities for Improvement (OFI) or rationale as to why OFIs were not implemented);
- f) Results of emergency response testing (including any OFIs identified);
- g) Operational performance;
- h) Raw water supply and drinking water quality trends;
- i) Follow-up on action items from previous Management Reviews;
- j) The status of management action items identified between reviews;
- k) Changes that could affect the QEMS;
- l) Consumer feedback;
- m) The resources needed to maintain the QEMS;
- n) The results of the infrastructure review;
- o) Operational Plan currency, content and updates;
- p) Staff suggestions; and
- q) Consideration of applicable Best Management Practices (BMPs).

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

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

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|---|---|---|
|  Ontario Clean Water Agency | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-20 Rev Date: 2018-08-28 Rev No: 0 Pages: 3 of 3 |
| MANAGEMENT REVIEW | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC Manager) |


- 3.7 The Management Review participants review the data presented and make recommendations and/or initiate action to address identified deficiencies as appropriate as per OP-21.
- 3.8 The QEMS Representative ensures that minutes of and actions resulting from the Management Review meeting are prepared and distributed to the appropriate OCWA Top Management, personnel and the owner contact.
- 3.9 The QEMS Representative monitors the progress and documents the completion of actions resulting from the Management Review.

4 Related Documents

- Management Review Reference Materials
- Minutes and actions resulting from the Management Review
- OP-21 Continual Improvement

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|--|
| 2018-08-28 | 0 | Procedure issued- Information was originally set out in the previous revision of OCWA's Operational Plan. The procedure was revised to the 2.0 Standard. |

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|---|---|---|
|  Ontario Clean Water Agency | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-21 Rev Date: 2018-08-28 Rev No: 0 Pages: 1 of 4 |
| CONTINUAL IMPROVEMENT | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC) |

1 Purpose

To describe the procedure for tracking and measuring continual improvement of the Quality & Environmental Management System (QEMS) for the Carleton Place DWS.

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


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|  Ontario Clean Water Agency | <p style="text-align: center;">OPERATIONAL PLAN</p> <p style="text-align: center;">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-21 Rev Date: 2018-08-28 Rev No: 0 Pages: 2 of 4 |
| CONTINUAL IMPROVEMENT | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC) |

and other stakeholders and the consideration of BMPs as appropriate.

- 3.2.3 The QEMS Representative determines the corrective action needed based on this consultation. The Operations Management assigns responsibility and a target date for resolution.
- 3.2.4 The QEMS Representative ensures corrective actions are documented using DWQMS Access Database. The QEMS Representative monitors the progress of corrective action(s) and provides status updates to Top Management.
- 3.2.5 The implementation and effectiveness of corrective actions are verified during subsequent internal QEMS audits and are considered during the Management Review. If there is evidence that the action taken was not effective, the Operations Management (or designate) initiates further corrective action and assigns resources as appropriate until the non-conformance is fully resolved.

3.3 Preventive Actions

- 3.3.1 Potential preventive actions may be identified through an internal or external QEMS audit as Opportunities For Improvement (OFIs), during the Management Review or through other means such as:
 - staff/Owner suggestions;
 - regulator observations;
 - evaluation of incidents/emergency response/tests;
 - the analysis of facility/Regional Hub or OCWA-wide data/trends;
 - non-conformances identified at other drinking water systems; or
 - a result of considering a BMP.
- 3.3.2 The QEMS Representative (in consultation with Operations Management and/or the SPC Manager) considers whether a preventive action is necessary. The review may also include input from the operators and other stakeholders and the consideration of BMPs as appropriate.
- 3.3.3 If it is decided that a preventive action is necessary, the QEMS Representative determines the action to be taken based on this consultation and the Operations Management (or designate) assigns responsibility and a target date for implementation.

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|  Ontario Clean Water Agency | <p align="center">OPERATIONAL PLAN</p> <p align="center">Carleton Place Drinking Water System</p> | QEMS Proc.: OP-21 Rev Date: 2018-08-28 Rev No: 0 Pages: 3 of 4 |
| CONTINUAL IMPROVEMENT | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC) |

3.3.4 The implementation of preventive actions are tracked by the QEMS Representative using the DWQMS Access Database.

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

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

3.5 Best Management Practices (BMPs)

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

3.5.2 BMPs may include, but are not limited to:

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

- OP-05 Document and Records Control
- OP-20 Management Review

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|  Ontario Clean Water Agency | OPERATIONAL PLAN Carleton Place Drinking Water System | QEMS Proc.: OP-21 Rev Date: 2018-08-28 Rev No: 0 Pages: 4 of 4 |
| CONTINUAL IMPROVEMENT | | |
| Reviewed by: Alison O'Connor (PCT) | | Approved by: Vanessa Greatrix (SPC) |

- Internal Audit Records

5 Revision History

| Date | Revision # | Reason for Revision |
|------------|------------|--|
| 2018-08-28 | 0 | Procedure issued- Information within OP-01 was originally set out in the Main Body of OCWA's Operational Plan. This revision has removed the Main Body format of the Operational Plan. |