Ontario Clean Water Agency
Agence Ontarienne Des Eaux

OPERATIONAL PLAN

For the Powassan Drinking Water System

Revision 6, Aug 17 2016

DISCLAIMER STATEMENT

This Operational Plan is designed for the exclusive use of Municipality of Powassan.

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 and its associated Standard Operating Procedures, policies, Facility Emergency Plans, and audit protocol) remain the property of OCWA. Accordingly, these documents shall not be considered to form part of the Operational Plan belonging to the owner of a drinking-water system under Section 17 of the *Safe Drinking Water Act, 2002*.

OPERATIONAL PLAN

Powassan Drinking Water System

Owned by the Corporation of the Municipality of Powassan
Operated by the Ontario Clean Water Agency

This Operational Plan defines and documents the Quality & Environmental Management System (QEMS) for the Powassan 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).

This Operational Plan expands on OCWA's corporate QEMS Reference Manual. Linkages between OCWA corporate and facility requirements are identified where appropriate.

OPERATIONAL PLAN REVISION HISTORY

Date	Revision	Description of Revision
2010-04-01	0	Operational Plan issued
2011-05-12	1	Corporate update to the template
2011-12-12	2	Change in management titles
17-Oct-2012	3	Update to management titles; Removed CofA and replaced with MDWL in element 6 - Drinking water system description; changed provincial structure to whole province from “North and South”; removed O&M team lead from list of roles& responsibilities; added QEMS rep to Operations Manager’s roles; removed “valid g driver’s licence” as a competency
21-Oct-2014	4	Changed the wording of the Sr operations Manager’s duties in relation to Management reviews under Facility Level Top Management in section 9; it now reads, participates instead of leads; added a ‘designate’ to section 9 as an option for holding Management Reviews; Section 6 – Updated description and removed the information about the pressure transmitter on the raw water header.
16-July-15	5	Removed requirement to complete environmental compliance every 5 years.
17-Aug-16	6	Updated QEMS policy; Corrected Reservoir location and update Raw Characteristics in Sec 6; Updated Endorsement and Approval Section 3

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LIST OF APPENDICES

1 OCWA's Quality & Environmental Management System (QEMS)

OCWA is the contracted Operating Authority for the Powassan Drinking Water System

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

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

2 Quality & Environmental Management System (QEMS) Policy

The Ontario Clean Water Agency, its Board of Directors, Officers and entire staff are committed to the principles and objectives set out in our Quality & Environmental Management System (QEMS) Policy.

OCWA's Policy is to:

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

Originally issued as Environmental Policy on June 8, 1995

Last revised, approved by OCWA's Board of Directors on April 6, 2016

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).

OCWA's QEMS Policy is readily communicated to all OCWA personnel, the Owner and the public through OCWA's intranet and public websites. A complete review/revision history of the QEMS Policy is maintained on OCWA's intranet.

3 Commitment & Endorsement of OCWA'S QEMS & Operational Plan

This Operational Plan supports the overall goal of OCWA and the Municipality of Powassan 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 Powassan Drinking Water System and will do so in a manner that ensures compliance with applicable legislation and regulations. Through the endorsement of this Operational Plan, the Municipality of Powassan commits to cooperating in any reasonable request of OCWA to facilitate this goal.

Top management of both OCWA and the Municipality of Powassan has approved the QEMS for the drinking water system as documented in this Operational Plan.

Any major revision of the operational plan will be re-endorsed by top management of both OCWA and the Municipality of Powassan. Major revisions include:

1. Change of Owner
2. Addition or removal of any treatment process
3. Operation of additional drinking water subsystems owned by the same Owner

Due to staffing changes at the Municipality of Powassan, the Operational Plan (Rev 5) required re-endorsement and approval. The last endorsement dated back to March 2010. This updated version of the Operational Plan (Rev 6) and associated procedures will be communicated to relevant employees and provided to the Owner.

Operating Authority Approval

Paul Dyrda
Operations Manager — Date: Aug. 30 2016

Eric Nielson
Regional Manager — Date: Aug 20/16

Owner Endorsement & Approval

Maureen Lang
Clerk-Treasurer — Date: Aug. 31/16

Frank Young
Public Works Foreman — Date: Aug 31/16

4 Quality Management System Representative

All personnel have a role and associated responsibilities within OCWA's QEMS.

The role of QEMS Representative for the Powassan Drinking Water System is shared between the Sr. Operations Manager and Process and Compliance Technician (PCT).

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

To assist in fulfilling the specific duties set out for the QEMS Representative, the PCT is responsible for:

- Reporting on QEMS performance and identifying opportunities for improvement,
- Ensuring that current versions of documents related to the QEMS are in use, and
- Ensuring personnel are aware of all applicable legislative and regulatory requirements that pertain to their operational duties.

Both the Sr. Operations Manager and PCT are responsible for promoting awareness of the QEMS to all facility personnel.

5 Document and Records Control

Refer to Appendix A for QEMS Procedure QP-01 Document and Records Control.

6 Drinking Water System

Owner / Operator

The Powassan Well Supply and the connected Powassan Distribution System are owned by the Municipality of Powassan. They are operated by the Ontario Clean Water Agency on behalf of the municipality. The Powassan Well Supply is "Water Treatment Subsystem Class 1", and the Powassan Distribution System is a "Water Distribution Subsystem Class 1".

Description of the Drinking Water System

The Municipality of Powassan obtains water from a ground water source through two (2) municipal drilled (overburden) wells. The water treatment facility was constructed in 1981 and the system was upgraded in 2003 including the addition of a chlorine contact chamber and a new standby diesel gen set. The water system also includes an in ground storage reservoir. The Powassan water system serves an approximate population of 1000. In accordance with the Municipal Drinking Water Licence, the drinking water system shall not be operated to exceed 1,313 cubic meters per day.

The pumphouse houses valves, piping, magnetic flow meters chlorination system, pressure gauge, transducers to facilitate well level monitoring, and electrical controls. The pumphouse is a 4.7m 6.9 m masonry building containing the process piping, flow meters and treated water sample points and disinfection system.

Well #1 consists of a 0.15 m diameter steel casing, 23.2 m deep drilled production well including 3.8 meters of screen, pump is 15 kW, 3 phase, 60 Hertz, 575 Volt Grudfos Submersible Pump Model 225s200-8 with the capacity of 15.2 L/sec or 1,313 m3/d at a TDH of 76.2 m. The well is capped, and a monitoring well is located 5 m south of well #1, which is protected by a vertical 0.45 m diameter corrugated steel pipe around the well casing and standing 1.2 m above the ground. Well No. 1 is operated at 7.56 L/s at an operating pressure of 470 kPa. Well #1 is located about 75 Meters South of Well #2.

Well #2 pump is 22.4 kW, 3 phase, 60 Hertz, 575 Volt Grudfos Submersible Pump Model 225s300-9 with the capacity of 15.2 L/sec or 1,313 m3/d at a TDH of 92.2 m. The well casing was raised 2 m in 2003 and furnished with a pitless adapter and locked down insect proof vented cap. A 0.15 m diameter test well is located approximately 3 m east of well #2. Well No. 2 is operated at 15.1 L/s at an operating pressure of 380 kPa. Well #2 is situated about 30 metres from Genesee Creek within the Genesee Creek floodplain.

Both wells No.1 and 2 raw water supply lines have a pressure reducing flow control valve to ensure water taking does not exceed 912 L/min in accordance with the Permit to Take water.

Two magnetic flow meters are installed on the raw water piping and connected to a videographic recorder. The purpose of the flow meters are to measure and record the water flow rate to ensure the limit of each well is not exceeded as well as total water taking as required in the certificate of Approval. Another function of the flow meters if for chlorination system pump pacing. The flow meters are both alike: ABB Kent Taylor Magnetic Flow meters Model MFE101341801004ER13031111, 100 mm diameter with a minimum flow of 3.53 L/Min and a maximum flow of 4716 L/min.

The disinfection system includes a sodium hypochlorite feed system that consists of two (2) Prominent GALA Model 1005NPB900UD112000 metering pumps with a maximum capacity of 3.6 L/hr. The two sodium hypochlorite pumps are mounted on a pre-piped, pre-wired panel. There are two (2) chemical injection points (one duty and one standby) with manual duty pump selection and automatic switch over to ensure continuous supply of chlorine. Two (2) 160 L capacity polyethylene solution tanks are installed in the treatment plant. As well one (1) Poly Spill Pallet 2000 with drain is provided for secondary spill containment.

Chlorinated water leaves the wellhouse and enters chlorine contact piping to ensure 15 minutes of contact time prior to distribution to the first consumer. The chlorine contact piping has a serpentine configuration piping 600 mm diameter and a length of 48.5 meters of concrete pressure pipe supplied by Hyprescon.

A sample line is installed from the main header downstream of the chlorine contact piping to a Prominent Chlorine Residual Analyzer, mounted on the wall of the water treatment plant.

A sample line is installed from the main header downstream of the chlorine contact piping to an ABB turbidimeter, Model No. 4670 Series with a range of 0-100 NTU, and mounted on the wall

of the water treatment plant. The turbidimeter is connected to a videographic recorder and totalizer.

A 6 channel ABB videographic recorder, Model No. Screen Master 2000 Hybrid Module with Advanced Math, 6 digital inputs and outputs and 2 analog outputs, is installed on the wall of the water treatment plant adjacent to the turbidimeter and chlorine analyzers. The videographic recorder has advanced math including 12 equations with the ability to perform generic arithmetic calculations using up to a 40 character equation.

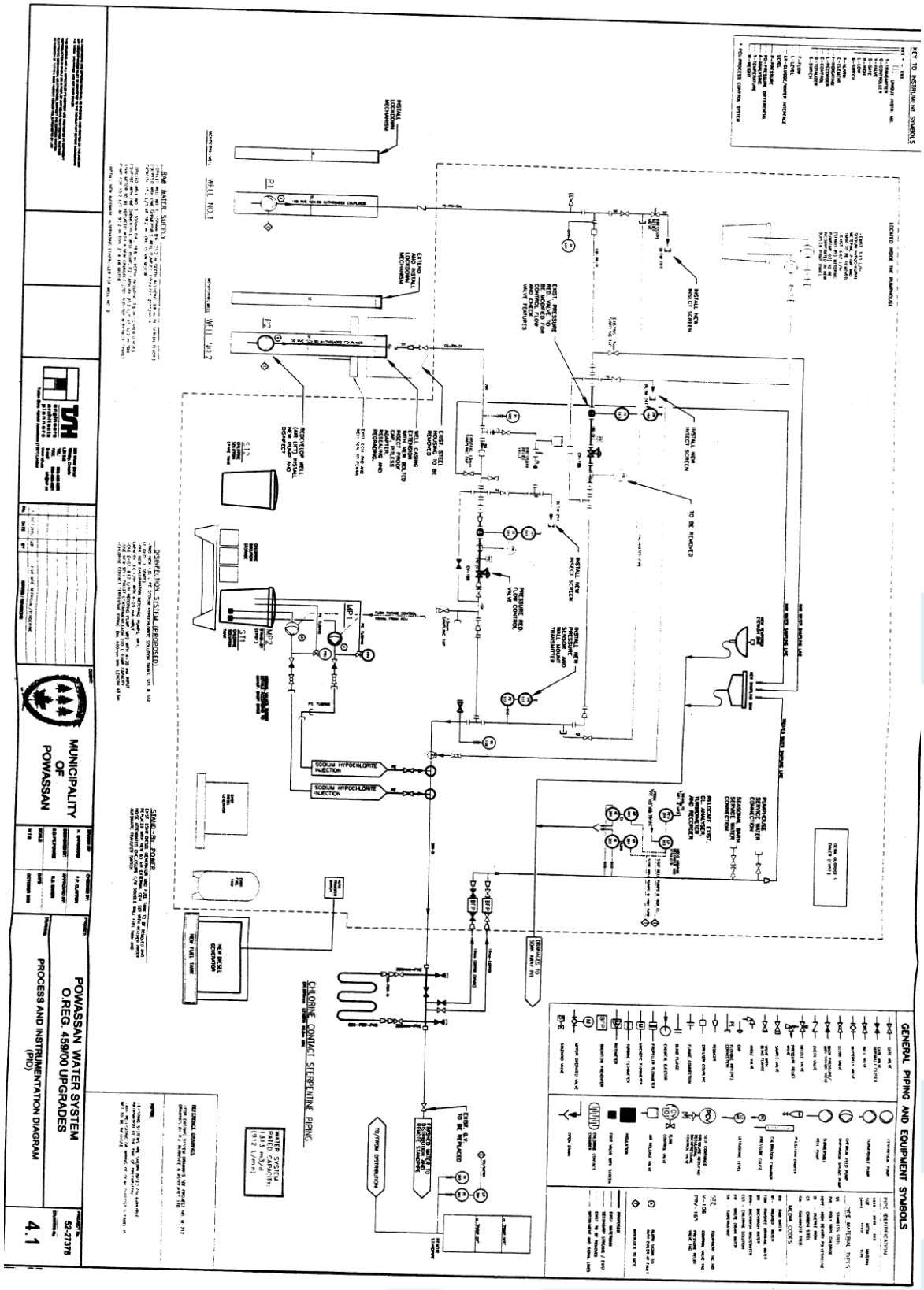
Electrical power to the water facility and nearby St. Gregorie School sewage lift station is provided from the Hydro One electricity distribution grid through the pumphouse. There is a permanent 75 kW 3 phase standby diesel Gen Set equipped with an automatic transfer switch should there be a power failure. The standby gen set and double walled fuel storage is located outside adjacent to the pumphouse in a weather proof acoustical enclosure.

The distribution system consists of approximately 9.2 km of water mains ranging in size from 100 mm to 250 mm in diameter. They are mostly ductile and pvc piping.

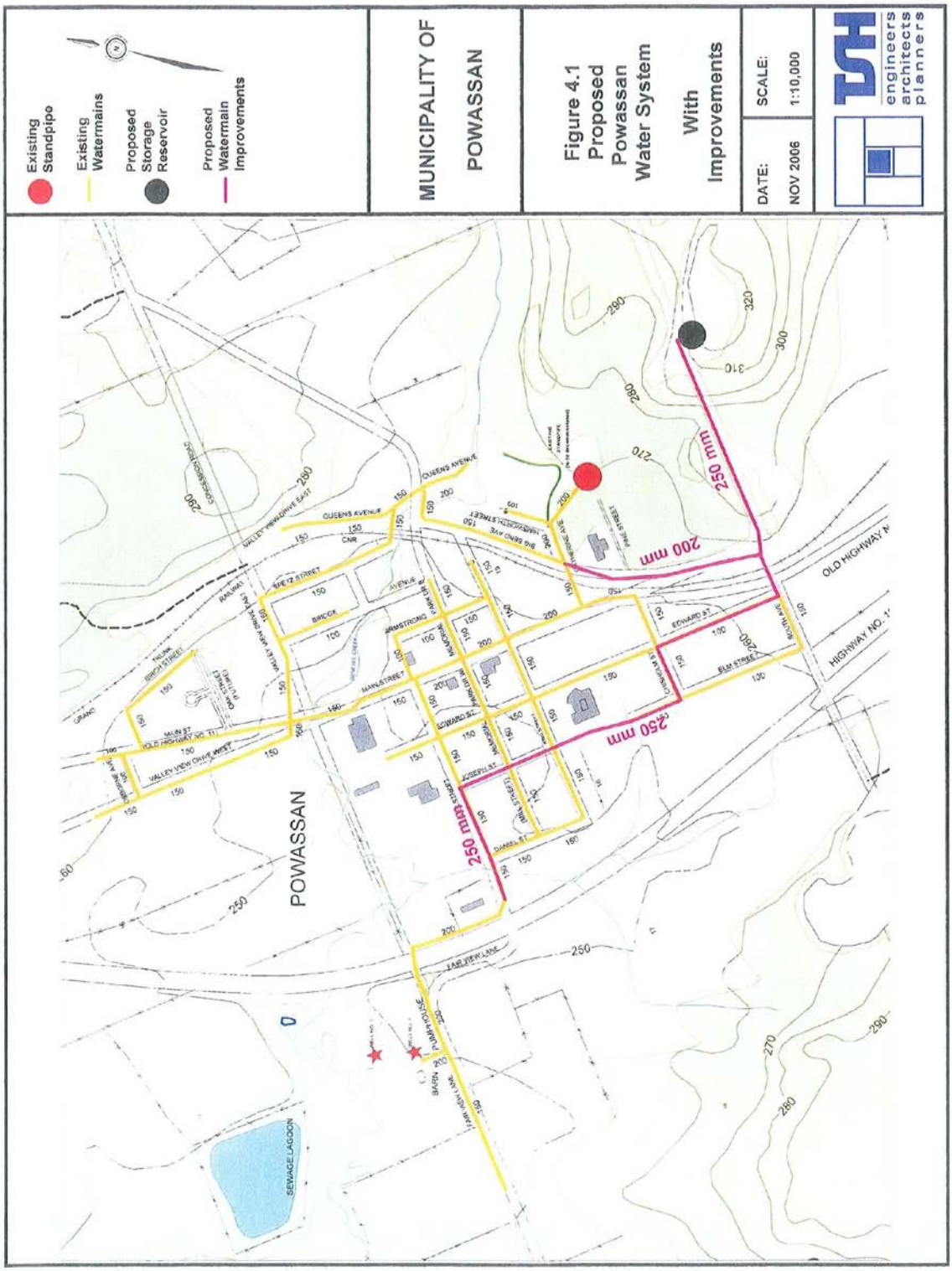
The municipality has constructed a new 1278 cubic meter in-ground water storage reservoir to replace the aging standpipe. The dual celled reservoir located at the end of McRae Drive is equipped as a re-chlorination facility. The reservoir will improve water pressure in the distribution system which has been a concern for many years.

Industrial /institutional /commercial at risk are required to have backflow preventers.

Process Flow Chart



Distribution Layout



Source Water

General Characteristics

This is a ground water well system, with good, consistent characteristics. Both wells do not appear to be vulnerable to bacteriological contamination.

Raw Water Characteristics at Raw Water Source (based on 2015 data)

Characteristic	Typical Values
Turbidity (NTU) Well #1 Turbidity (NTU) Well #2	0.06 - 0.36 0.06 - 0.15
E. coli (CFU/100 mL) Well #1 *E. coli* (CFU/100 mL) Well #2	0 0
Total Coliforms Well #1 Total Coliforms Well #2	0 0
Alkalinity (mg/L as CaCO3) Well #1 Alkalinity (mg/L as CaCO3) Well #2	77 108
Total Dissolved Solids (mg/L) Well #1 Total Dissolved Solids (mg/L) Well #2	137 260
Hardness (mg/L as CaCO3) Well #1 Hardness (mg/L as CaCO3) Well #2	86.4 137
Calcium (mg/L) Well #1 Calcium (mg/L) Well #2	21.2 35.9
Sodium (mg/L) Well #1 Sodium (mg/L) Well #2	6.86 26.2

Common Fluctuations / Threats

There are no major event-driven fluctuations or threats in the characteristics of the raw water supply.

Operational Challenges

There are no operational challenges envisioned.

Critical upstream / downstream processes relied upon

This system does not rely upon "upstream" treatment provided by others. Downstream processes put in place to help with the delivery of safe drinking water involve municipal backflow preventer by-laws.

7 Risk Assessment

Refer to Appendix B for QEMS Procedure QP-02 Risk Assessment and Risk Assessment Outcomes.

8 Risk Assessment Outcomes

Refer to Appendix B for Summary of Risk Assessment Outcomes.

9 Organizational Structure, Roles, Responsibilities and Authorities

Organizational Structure and Top Management

OCWA provides operation, maintenance and management services for hundreds of water and wastewater facilities throughout the Province of Ontario. Direct operational activities are primarily delivered through the Agency's Operations Division. Corporate level divisions that carry out administrative functions for the Agency are expanded upon in the QEMS Reference Manual.

To best meet the needs of each facility and its owner, OCWA's Operations Division is structured as follows:

- *Hub* – Facilities are grouped together geographically to form hubs. The Sr. Operations Manager has oversight responsibility for all of the facilities contained within a particular hub. In some hubs, an Operations Manager assists the Sr. Operations Manager with his/her duties.
- *Regional* – Hubs are further grouped together to form regions, each headed by a Regional Manager. Regional Managers play a critical role within OCWA's QEMS in that they act as a key link between corporate and facility level management.
- *Provincial* – All regions fall under the province.

The chart, QEMS Organizational Structure for the Powassan Drinking Water System (Appendix C), reflects the lines of responsibility and authority for OCWA's QEMS at both the facility and corporate level.

OCWA has defined two levels of Top Management within its structure, which, through a shared responsibility for ensuring periodic management reviews, ensure the maintenance and continual improvement of OCWA's QEMS:

Facility Level Top Management – consisting of the Sr. Operations Manager, (or designate) and the Operations Manager. The Sr. Operations Manager, or designate, in accordance with QEMS Procedure QP-11 Management Review, holds a special meeting at least once per year to review the effectiveness and performance of the QEMS implemented at the facility and to initiate appropriate facility management action to maintain and improve the QEMS. The results of the meeting are provided to the Regional Manager for consideration by corporate level Top Management and to initiate appropriate action with respect to the Agency's broader QEMS.

Corporate Level Top Management – consisting of Regional Managers, VPs of Operations, Director of Risk, Compliance & Training, President & CEO and OCWA's Board of Directors. Each has specific corporate oversight responsibilities for the Agency's QEMS, which are described in the QEMS Reference Manual. The overall performance and effectiveness of OCWA's QEMS is formally reviewed and reported to corporate level Top Management on an annual basis. It is also monitored on an ongoing basis through scheduled meetings of OCWA's Operations & Compliance Committee, Executive Management Team and Board of Directors. Through these reporting and monitoring activities, corporate level Top

Management identifies opportunities for improvement, initiates action plans and assigns responsibility for their completion.

QEMS Roles, Responsibilities and Authorities

OCWA management defines the roles, responsibilities and authorities under its QEMS for all employees whose work could have a significant impact on drinking water quality. These are communicated to all personnel to ensure that individual roles and responsibilities and how they relate to those of the rest of the organization are understood.

Specific QEMS-related roles, responsibilities and authorities of Operations personnel for the facility are summarized in the table below. Additional duties of employees are described in their job specifications.

Corporate level roles, responsibilities and authorities are defined in the QEMS Reference Manual.

Responsibilities and authorities for implementing and maintaining individual elements of the facility's QEMS are outlined in the QEMS Procedures referenced throughout this Operational Plan.

Position	QEMS Roles, Responsibilities and Authorities
All Operations Personnel	• Work in accordance with OCWA policies, procedures and plans • Document all activities • Participate in QEMS training • Be aware of all the environmental and public health risks at the facility • Consider risks and ramifications of all actions • Participate in testing and development of SOPs and contingency plans • Implement action plans to rectify deficiencies identified in audits and inspections of the facility • Take all appropriate training to ensure competence in their job • Identify and bring forward to the Sr. Operations Manager opportunities for improving the facility's QEMS • Perform duties in compliance with applicable legislation and regulations
Regional Manager (Corporate Level Top Management)	• Ensure appropriate facility resources to maintain and continually improve the QEMS • Review major issues/deficiencies (including those from audit and inspection reports) and provide further direction to address/resolve • Ensure that each facility in the region has a site-specific emergency plan that meets the corporate standard • Participate in/respond to regular facility Management Reviews, as appropriate • Report to corporate level Top Management on the status of the QEMS implemented at the facilities in his/her region

	• Liaise with the owner on relevant components of the QEMS including OCWA's roles, responsibilities and authorities for the facility, as appropriate
Sr. Operations Manager (Facility Level Top Management and QEMS Representative)	• Delegate responsibilities, deploy resources and supervise sound operation and maintenance of the facility and of the QEMS • Arrange for/review annual internal audits (compliance and QEMS) • Develop action plans to respond to the findings of the internal audits and MOE inspections and verify action plan completion • Establish, test and update a site-specific emergency plan for each facility • Participates in regular facility Management Reviews • Report to the Regional Manager on the performance and effectiveness of the QEMS implemented at the facility • Liaise with the owner on relevant components of the QEMS including OCWA's roles, responsibilities and authorities for the facility • Establish a training plan for staff to address regulatory requirements and the QEMS as part of the PPR process • Fulfill defined duties of the QEMS Representative (refer to element 4) • May act as Overall Responsible Operator (ORO) when required. Refer to Powassan WTP ORO SOP.
Operations Manager (Facility Level Top Management & QEMS Representative)	• Fulfill duties assigned by the Sr. Operations Manager • Deploy resources and supervise sound operation and maintenance of the facility and of the QEMS • Participate in the completion of annual internal audits • Assist in the development and implementation of action plans to respond to audit and MOE inspection findings • Assist in the establishment, testing and updating of a site-specific emergency plans • Participate in regular facility Management Reviews • Report to the Sr. Operations Manager on QEMS implementation and identify the need for additional processes and procedures • Liaise with the owner on relevant components of the QEMS • Develop/implement training plans for staff to address regulatory requirements and the QEMS • Act for the Sr. Operations Manager in his/her absence • May act as Overall Responsible Operator (ORO) when required. Refer to Powassan WTP ORO SOP.
Process & Compliance Technician (PCT) (QEMS Representative)	• Fulfill duties assigned by the Sr. Operations Manager • Participate in the completion of annual internal audits and develop/monitor/implement action plans to respond to the findings • Participate in MOE inspections and assist in the response to required actions or recommendations • Actively participate in the development and maintenance of facility emergency plans • Participate in regular facility Management Reviews • Report to the Sr. Operations Manager on QEMS implementation and identify the need for additional processes and procedures • Liaise with the owner on relevant components of the QEMS

	• Deliver/participate in training on regulatory requirements and the QEMS • Implement, monitor and support corporate QEMS programs • Support Sr. Operations Manager on all aspects of the QEMS and fulfill assigned duties of the QEMS Representative (refer to element 4) • May act as Overall Responsible Operator (ORO) when required. Refer to Powassan WTP ORO SOP.
Senior Operator/Mechanic	• Fulfill duties assigned by the Sr. Operations Manager • Participate as a technical advisor to staff and management and provide specialized training on technical or other issues. • Prepare and/or coordinate staff work assignments and follow up to ensure completion • Assist management in providing recommendation 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 • Actively participate in the development and maintenance of facility emergency plans and assist with emergencies as required. • Act for management during vacations or periodic absences. • Perform duties of Operator/Mechanic as required • Maintain the facility log book according to regulatory requirements • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to Powassan WTP ORO SOP.
Operator/Mechanic	• Fulfill duties assigned by the Sr. Operations Manager • 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 regulations, permits, certificates 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 • Train and direct new staff on the facility processes, equipment and procedures. • Maintain the facility log book according to regulatory requirements • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to Powassan WTP ORO SOP.
Mechanic/Operator	• Fulfill duties assigned by the Sr. Operations Manager • Act as team 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 • Prepare work orders according to established procedures and create detailed reports • Perform duties of Operator/Mechanic as required. • Maintain the facility log book according to regulatory requirements • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to Powassan WTP ORO SOP.
Instrumentation Technician	• Provide advice and technical expertise on the services required for process control and automation systems • Formulate technical plans and proposals for deployment and delivery of process control and automation systems in support of operational activities • Coordinate, maintain and provide technical services in regards to process control and automation systems including preventive maintenance procedures • Discuss and advise on detailed system and programming requirements, modify existing and new software in response to plant requests, train plant operations and maintenance staff, 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 • Install and commission new electrical/electronic equipment and automation systems • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to Powassan WTP ORO SOP.
Maintenance Electrician/Operator	• Perform repairs and/or scheduled maintenance on electrical systems, equipment, components and devices in accordance with established procedures and record the maintenance data • Regularly inspect operating equipment, perform routine preventive maintenance and repairs • 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 regulations, permits, certificates and established operating procedures • Maintain the facility log book according to regulatory requirements • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. Refer to Powassan WTP ORO SOP.

10 Competencies

The following table presents the competencies required by OCWA personnel whose duties directly affect drinking water quality.

Position	Required Competencies
Sr. Operations Manager	• Operator certification in good standing; minimum level 1 Water Treatment if required to act as ORO • Comprehensive general knowledge of and experience in managing water treatment operations, maintenance as well as facility financial planning and administration • Outstanding team leadership, managerial and co-ordinating skills • Sound knowledge of relevant legislation, regulations, codes, policies, guidelines and procedures • Knowledge and awareness of the DWQMS • Strong initiative, analytical, evaluating and problem-solving skills to assess administrative and technical needs and capabilities • Well-developed priority-setting and time management skills • Superior interpersonal skills • Excellent oral and written communication skills • Proficiency in office and operational computerized systems
Operations Manager	• Operator certification in good standing; minimum OIT or minimum level 1 Water Treatment if required to act as ORO • Experience in water treatment operations, maintenance as well as facility financial planning and administration • Advanced knowledge of relevant legislation, regulations, codes, policies, guidelines and procedures • Knowledge and awareness of the DWQMS • Advanced technical knowledge of principles, practices, technologies and methodologies for water treatment • Familiarity with complex mechanical equipment and electronic controls • Analytical, evaluating and problem-solving skills • Project management, work planning and scheduling skills • Good oral and written communication skills • Proficiency in office and operational computerized systems • Management/supervisory experience
Senior Operator/Mechanic	• Operator certification in good standing; minimum level 1 Water Treatment if required to act as ORO • Extensive knowledge and experience of water treatment processes to operate the facility • Experience and knowledge of the maintenance and repair of a variety of equipment and structures • Good working knowledge of legislation, regulations, codes, policies, guidelines and procedures related to operations and maintenance • Knowledge and awareness of the DWQMS • Basic mathematics and chemistry • Good knowledge of computers, monitoring and operating systems • Good knowledge to use and understand operating and maintenance

	manuals, blueprints and other technical specifications • Planning and organizational skills to lead projects and provide technical direction to staff • Demonstrated leadership and decision making skills required to direct an operational team • Problem solving and evaluative skills to provide technical guidance and resolve operational issues • Planning skills to regularly inspect and monitor the facility, processes and equipment and perform routine preventative maintenance • Good oral and written communication skills • Ability to work in a team and take initiative when required.
Operator/Mechanic	• Operator certification in good standing; minimum level 1 Water Treatment if required to act as ORO • Good knowledge of water treatment processes to operate the facility • Experience and knowledge of the maintenance and repair of a variety of equipment and structures • Good working knowledge of legislation, regulations, codes, policies, guidelines and procedures related to operations and maintenance • Knowledge and awareness of the DWQMS • Basic mathematics and chemistry • Familiarity with computers, monitoring and operating systems • Knowledge to use and understand operating and maintenance manuals, blueprints and other technical specifications • Planning, scheduling and problem-solving skills to regularly inspect and monitor the facility, processes and equipment and perform routine preventative maintenance • Good oral and written communication skills • Ability to work in a team and take initiative when required.
Mechanic/Operator	• Operator certification in good standing; minimum level 1 Water Treatment if required to act as ORO • Millwright and/or other trades certificates • Demonstrated experience and knowledge of the maintenance and repair of a variety of equipment and structures • Good knowledge of water treatment processes to operate the facility • Good working knowledge of legislation, regulations, codes, policies, guidelines and procedures related to operations and maintenance • Knowledge and awareness of the DWQMS • Basic mathematics and chemistry • Familiarity with computers, monitoring and operating systems • Knowledge to use and understand operating and maintenance manuals, blueprints and other technical specifications • Planning, scheduling and problem-solving skills to perform a variety of maintenance and repair tasks • Good oral and written communication skills • Ability to work with a team and take initiative when required.
Process & Compliance Technician	• Operator certification in good standing; minimum level 1 Water Treatment if required to act as ORO • Extensive knowledge of compliance requirements related to water

	treatment processes • Good knowledge of relevant legislation, regulations, codes, policies, guidelines and procedures to monitor program delivery and ensure compliance • Knowledge and awareness of the DWQMS • Good knowledge and understanding to apply impact of changes to legislative and regulatory requirements on programs and operational processes • Excellent knowledge of computers, operating programs and systems • Evaluative and analytical skills to monitor and assess facility performance against legal requirements and corporate goals • Excellent oral and written communication skills to provide technical advice related to compliance to a variety of staff and officials and to prepare analytical reports • Presentation skills to prepare and present informational material • Auditing skills/experience • Problem-solving skills to resolve compliance issues • Ability to work with a team and take initiative when required
Instrumentation Technician	• Theoretical and practical knowledge/experience/training in water/wastewater treatment operation processes, design, instrumentation, process control and automation systems • Knowledge and awareness of the DWQMS • Technical evaluation and design skills necessary for process control and automation optimization and deployment • Experience in delivering technical guidance for hardware/software selection • Thorough understanding of network and telecommunications environment, standards and operating systems, computer language, ladder logic and relational and document based database management systems • Ability to monitor, review and troubleshoot network, hardware, software and instrumentation performance • Analytical and evaluative problem-solving skills to assess client, process and control requirements • Well-developed organizational, time and project management skills • Superior interpersonal skills • Good oral and written communication skills
O&M Team Lead	• One of: Electrical/Electronic/Instrumentation Technician or Technologist Diploma; Mechanical Millwright; Certified Engineering Technician/Technologist designation, or; a valid Engineering or Environmental Technician diploma • Good technical knowledge of theories, principles and practices related to the operation, maintenance and administration of water processes and related equipment • Good knowledge of relevant legislation, regulations, codes, policies, guidelines and procedures to monitor program delivery and ensure compliance • Knowledge and awareness of the DWQMS • Good planning, financial and analytical skills to manage and plan multiple projects, assess priorities and effectively coordinate operation

	and maintenance programs within budget • Good interpersonal and oral and written communication skills • Supervisory experience/skills to train, direct and assign work • Proficiency in office and operational computerized systems
Maintenance Electrician/Operator	• Completion of any electrical or electronic training program certified by the Ministry of Colleges and Universities • Experience in performing maintenance and repair of electrical and electronic equipment • Good working knowledge of tools and test equipment • Good oral and written communication skills • Ability to work from plans and schematic diagrams • Knowledge and awareness of the DWQMS

OCWA's recruiting and hiring practices follow those of the Ontario Public Service (OPS). As part of the OPS, 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 and based on this evaluation, the hiring manager selects and assigns personnel for specific duties.

Certified operators are responsible for completing the annual number of required training hours for the highest type and class of subsystem where the operator works and 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 Sr. Operations Manager takes reasonable steps to ensure that every operator has the opportunity to attend training to meet the annual training hour requirements.

OCWA's Operational Training Program is maintained by the Risk, Compliance & Training Division and aims to:

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

The Program consists of both continuing education and on-the-job training and is delivered using a combination of methods (e.g., traditional classroom courses 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.

Facility personnel receive site-specific training 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.

Awareness of OCWA's QEMS is promoted through the OCWA Employee Orientation Program for new employees, hub/regional level training sessions and meetings and the Agency's Environmental Compliance course. It is recommended that the Environmental Compliance course be attended by all new staff to reinforce their roles and responsibilities under OCWA's QEMS. Other mandatory and recommended training requirements are listed as part of the

Employee Orientation Program available on OCWA's intranet or through the Human Resources department.

Individual OCWA employee training records are maintained and tracked using a computerized system, the Training Summary database, which is also administrated by the Risk, Compliance & Training Division. Training records maintained at the facility are controlled as per QEMS Procedure QP-01 Document and Records Control.

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 by the facility's management team as part of this process (and on an ongoing basis).. In addition to this process, OCWA employees may at any time request training by both internal and external providers by submitting a "Request for Staff Development" form to the Sr. Operations Managerfor approval.

11 Personnel Coverage

Refer to Appendix D for QEMS Procedure QP-03 Personnel Coverage.

12 Communications

Refer to Appendix E for QEMS Procedure QP-04 Communications.

13 Essential Supplies and Services

Refer to Appendix F for QEMS Procedure QP-05 Essential Supplies and Services.

14 Review and Provision of Infrastructure

Refer to Appendix G for QEMS Procedure QP-06 Review and Provision of Infrastructure.

15 Infrastructure Maintenance, Rehabilitation and Renewal

Planned Maintenance

OCWA, under contract with the owner, maintains a program of scheduled inspection and maintenance of infrastructure for which it is operationally responsible. Specific requirements

related to the general operation and routine maintenance of the drinking water system are contained within the contractual agreement with the owner.

. Records of these activities are maintained as per QEMS Procedure QP-01 Document and Records Control.

The two critical elements of OCWA's approach to infrastructure maintenance, rehabilitation and renewal are:

1) A computerized Work Management System (WMS) that allows users to
    - Enter detailed asset information
    - Generate and process work orders
    - Access maintenance and inspection procedures
    - Plan, schedule and document all asset related tasks and activities
    - Access maintenance records and asset histories
2) Development of a list of capital works required for the water system and regular consultation with the owner to set priorities (see Review and Provision of Infrastructure).

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 staff at the locations specified in QEMS Procedure QP-01 Document and Records Control.

To assist in monitoring the effectiveness of the program, the Sr. Operations Manager(or designate) is provided with a monthly summary report for the facility. In addition, OCWA's Senior Management Committee is provided with hub and regional summary reports on an ongoing basis. Monthly maintenance reports are developed and sent electronically to the owner and facility staff.

Unplanned Maintenance

Unplanned maintenance is conducted as required. All unplanned maintenance activities are authorized by the Operations Manager. Unplanned maintenance activities are recorded on work orders and are entered into WMS Filed as per QP-01.

Rehabilitation and Renewal

Rehabilitation and renewal activities including capital upgrades are determined on an annual basis in consultation with the Owner (refer to QP-06 Review and Provision of Infrastructure). A list of required replacement or desired new equipment is compiled and prioritized by the Sr. Operations Managerand is presented to the Owner for review and comment. All major expenditures require the approval of the Owner.

Program Monitoring and Reporting

To assist in monitoring the effectiveness of program, Regional Managers and Sr. Operations Managers are provided with monthly summary reports for each facility. In addition, OCWA's

Executive Management Team is provided with hub and regional summary reports on an ongoing basis.

16 Sampling, Testing and Monitoring

Refer to Appendix H for QEMS Procedure QP-07 Sampling, Testing and Monitoring.

17 Measurement and Recording Equipment Calibration and Maintenance

Refer to Appendix I for QEMS Procedure QP-08 Measurement and Recording Equipment Calibration and Maintenance.

18 Emergency Management

Refer to Appendix J for QEMS Procedure QP-09 Emergency Management.

19 Internal QEMS Audits

Refer to Appendix K for QEMS Procedure QP-10 Internal QEMS Audits.

20 Management Review

Refer to Appendix L for QEMS Procedure QP-11 Management Review.

21 Continual Improvement

In conjunction with the internal QEMS audit and Management Review processes documented above, OCWA uses action plans to continually improve its QEMS. Through these processes, areas of concern as well as opportunities for improvement are identified at the drinking water systems operated and maintained by OCWA.

Appendix A

QP-01 Document and Records Control

DOCUMENT and RECORDS CONTROL

1.0 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.

2.0 Scope

Applies to QEMS Documents and QEMS Records pertaining to the Powassan Drinking Water System, as identified in this procedure.

3.0 Responsibility

Sr. Operations Manager
Process & Compliance Technician (PCT)
All Facility Staff
Information Technology Department
Corporate Compliance Group

4.0 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

5.0 Procedure

5.1 Documents and records required by OCWA's QEMS are listed in Table 1.

5.2 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.

5.3 Additional controls for QEMS Procedures within this Operational Plan are used to ensure appropriate review and approval. These include the use of authorized approval, alpha-numeric procedure code, issue date, revision number and revision history.

Authorized personnel for review and approval of QEMS Procedures for the Powassan Drinking Water System are:

Review	PCT
Approval	Sr. Operations Manager, Operations Manager

5.4 The PCT 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 document control locations established by the QEMS Representative. 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 Table 1.

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.

5.5 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., OPEX, PDM, WMS) is administered by designated application managers/trustees, requires the permission of the Sr. Operations Manager and is restricted through use of usernames and passwords.

SCADA records are maintained and accessible to all staff when required.

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

The QEMS Representative communicates any changes made to QEMS documents to relevant facility 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, OCWA's weekly electronic bulletin and provincial, regional, hub or facility-level training sessions.

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

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

5.9 QEMS documents and records are retained in accordance with applicable regulations and legal instruments. Relevant regulatory and corporate minimum retention periods are listed in Table 2.

5.10 The Operational Plan is reviewed for currency at least annually by the PCT in preparation for audits and the Management Review. Other QEMS-related documents are reviewed as per the schedules 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 QEMS Procedure QP-10 Internal QEMS Audits.

6.0 Related Documents

QP-10 Internal QEMS Audits

7.0 Revision History

Date	Revision #	Reason for Revision
01-Apr-2010	0	Procedure issued
20-Sept-2011	1	Table 1 and Table 2 revised, document reissued
12-Dec-11	2	Table 1 updated to reflect change in document locations Change in Hub location Change in management position titles
17-Oct-12	3	Change in document locations
08-July-14	4	Change PDC to PDM
17-Aug-16	5	Added “or verbally” to section 5.6; Updated location to Public Drive to reflect the recent internal transition from Espanola Hub

Table 1: Designated location for documents and records required by OCWA's QEMS

Type of Document/Record	Designated Document Control Location (HC = Hardcopy, E = Electronic)
Internal QEMS Documents	
Emergency Response Plan (corporate)	E = OCWA's intranet
Essential Supplies & Services List	E- Maintained on Public Drive HC – Powassan Well House
Facility Emergency Plans & Contingencies	HC – Powassan Well House
On-call Schedule	E – Maintained on Public Drive
Operations Manual	HC – Powassan Well House
Operational Plan (includes QEMS Procedures)	E – Maintained on Public Drive HC - Powassan Well House HC – Powassan Municipal Office
QEMS Policy	E – OCWA Intranet and at www.ocwa.com HC- Powassan Well House
QEMS Reference Manual	E – OCWA Intranet
Shift/Vacation Schedule	E – Maintained on Public Drive
Standard Operating Procedures (referenced in Operational Plan and QEMS Procedures)	E – Maintained on Public Drive HC – Powassan Well House
External QEMS Documents	
Applicable federal and provincial legislation and municipal by-laws	Online at www.e-laws.gov.on.ca
Engineering schematics/plans/drawings	HC – Powassan Well House
Maintenance/equipment manuals	HC – Powassan Well House
Municipal Drinking water Licence/ Drinking Water Works Permit	HC – Powassan Well House
Operator certificates	HC – Powassan Well House
Permit to Take Water	HC – Powassan Well House
QEMS Records	
Daily rounds sheets	HC – Powassan Well House Process data maintained electronically through PDM
Facility Operations Logbook(s)	HC – Powassan Well House
Operator training records	E – Electronic records are maintained in OCWA's Training Summary Database
Maintenance records	E – Electronic records are maintained in WMS
Calibration records	E - Maintained on Public Drive
Laboratory analyses	E – Electronic records are maintained through PDM E - Maintained on Public Drive
In-house lab results	HC – Powassan Well House
Internal QEMS audit reports	E - Maintained on Public Drive
External audit and inspection reports	E - Maintained on Public Drive
Management Review documentation	E - Maintained on Public Drive
Internal QEMS Communications	E - Maintained on Public Drive
External QEMS Communications	E - Maintained on Public Drive

Type of Document/Record	Designated Document Control Location (HC = Hardcopy, E = Electronic)
Annual Reports	E – Maintained on Public Drive HC—Powassan Town Office
Summary Reports for Municipalities	E – Maintained on Public Drive
AWQI Reports	E – Maintained on Public Drive
Infrastructure review (capital/maintenance works recommendations)	E- Maintained on Public Drive
Action Plans	E - Summary of Findings Spreadsheet
Community complaint records	E – Maintained on Public Drive and OPEX database

Table 2: Relevant regulatory and corporate minimum retention periods

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	3 years	OCWA Requirement
Documents/records required to demonstrate compliance with Ontario legislation	As per applicable regulations	SDWA O. Reg. 170/03, O. Reg. 128/04

Appendix B

QP-02 Risk Assessment and Risk Assessment Outcomes

RISK ASSESSMENT and RISK ASSESSMENT OUTCOMES

1.0 Purpose

To define the process for conducting a drinking water risk assessment and for documenting and reviewing the results of the assessment at the facility level.

2.0 Scope

Applies to all OCWA-operated municipal residential drinking water systems and includes the identification and assessment of potential hazardous events and hazards that could affect drinking water safety. OCWA's approach to addressing other potential hazards is set out in QEMS Procedure QP-09 Emergency Management.

3.0 Responsibility

Sr. Operations Manager
Process & Compliance Technician (PCT)
Risk Assessment Personnel

4.0 Definitions

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

a) a condition of the system or a condition associated with the system's waters, including anything found in the waters,
    i. that adversely affects, or is likely to adversely affect, the health of the users of the system,
    ii. that deters or hinders, or is likely to deter or hinder, the prevention or suppression of disease, or
    iii. that endangers or is likely to endanger public health,
b) a prescribed condition of the drinking water system, or
c) a prescribed condition associated with the system's waters or the presence of a prescribed thing in the waters

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

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

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

Likelihood – the probability of a hazard or hazardous event occurring

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

5.0 Procedure

5.1 The Sr. Operations Manager assigns personnel to conduct the risk assessment (e.g., Process & Compliance Technician (PCT), Maintenance staff, Operators, Facility Managers).

5.2 Using the system's process diagram, identify hazardous events and associated hazards (possible outcomes) that could impact the system's ability to deliver safe drinking water in Table 1[1] for each activity/process step.

5.3 For each of the hazardous events, specify control measures currently in place at the facility that eliminate the hazard or prevent it from becoming a threat to public health.

Note: Some hazards/hazardous events may have step-by-step contingency plans associated with them. These contingency plans are developed as per OCWA's Emergency Management Program and are further described in QEMS Procedure QP-09 Emergency Management.

5.4 To ensure that potential drinking water health hazards are addressed and minimum treatment requirements as regulated by SDWA O. Reg. 170/03 and the *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 at all OCWA-operated facilities (as applicable):

- Processes necessary to achieve the required log removal or inactivation of pathogens (i.e., chemical and/or UV disinfection system, filtration process[2] for surface water and GUDI systems)
- Processes necessary for maintaining a disinfectant residual in the distribution system (includes re-chlorination points)
- Fluoridation system

Identify the above processes (as they apply) as mandatory CCPs in the 'CCP?' column in Table 1.

5.5 To determine if there are any additional CCPs for the system, evaluate and rank the hazardous events (as set out below in steps 5.6 and 5.7) for the remaining activities/process steps (i.e., those not included as OCWA's minimum CCPs).

5.6 Taking into consideration existing control measures (including the reliability and redundancy of equipment), assign each hazardous event 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

[1] Tables referred to in this procedure are contained within the facility-specific **Summary of Risk Assessment Outcomes**

[2] Filtration process includes related processes (e.g., chemical coagulation, rapid mixing, flocculation, sedimentation)

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

Multiply the likelihood and consequence values to determine the risk value (ranking) of each hazardous event and record all values in Table 1. Hazardous events with a ranking of 12 or greater are considered high risk.

5.7 Review the hazardous events and rankings documented in Table 1 and identify any activity/process step as an additional CCP if <u>all</u> of the following criteria are met:

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

5.8 List identified CCPs (required minimum and any additional CCPs established by the risk assessment) in Table 2. Set related critical control limits (e.g., limits for turbidity, chlorine residual, temperature, pH) for each CCP as appropriate.

5.9 Ensure procedures have been developed and implemented at the facility to:

- Monitor the critical control limits
- Respond to, report and record deviations from the critical control limits.

List these procedures in Table 2.

5.10 The information recorded in the Summary of Risk Assessment Outcomes is maintained at the facility level on an ongoing basis. At least once a year, the PCT reviews the risk assessment documentation to verify the currency of the information and the validity of the assumptions used in the risk assessment in preparation for the Management Review.

5.11 The Sr. Operations Manager ensures that a risk assessment is conducted and documented at least once every thirty-six months.

6.0 Related Documents

Summary of Risk Assessment Outcomes (facility-specific)
QP-09 Emergency Management

7.0 Revision History

Date	Revision #	Reason for Revision
01-Apr-2010	0	Procedure issued
20-May-2011	1	Procedure reissued as per corporate directive
12-Dec-2011	2	Change in management titles

Summary of Site Specific Risk Assessment Outcomes

Powassan Drinking Water System

Table 1: Risk Assessment Outcome Table

Note: Processes referred to in section 5.4 of QP-02 Risk Assessment and Risk Assessment Outcomes must be identified as mandatory Critical Control Points (CCPs). Mandatory CCPs are not required to be ranked.

Activity/ Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Raw Water/Well	Well casing collapse	Loss of raw water	Back-up well and pump	3	2	6	☐ Yes ☒ No ☐ Mandatory CCP
	Well pump failure	Loss of raw water	Back-up well and pump	4	2	8	☐ Yes ☒ No ☐ Mandatory CCP
	Chemical Spill	Contamination of aquifer	Monitor and sample	1	4	4	☐ Yes ☒ No ☐ Mandatory CCP
	Agricultural run-off	Contamination of aquifer	Monitor and sample	2	3	6	☐ Yes ☒ No ☐ Mandatory CCP
Primary Disinfection (Sodium Hypochlorite System)/Well House	Well House Fire	Loss of Primary Disinfection/loss of supply	None at this time	2	5	10	☐ Yes ☒ No ☐ Mandatory CCP
	Feed pump failure	Low chlorine residual, inadequate inactivation of pathogens	Redundancy (back-up pump), on-line monitoring with alarms, handheld residual readings and dosage calculations, scheduled maintenance activities raw water well pump lockout.				☐ Yes ☐ No ☒ Mandatory CCP
	Analyzer failure	Unknown chlorine residual levels, potential for inadequate inactivation of pathogens	Alarms, handheld residual testing, scheduled maintenance activities, raw water well pump lockout.				☐ Yes ☐ No ☒ Mandatory CCP
	Low supply of sodium hypochlorite	Low chlorine residual, inadequate inactivation of pathogens	Operator checks, chemical available from other hub facilities, raw water well pump lockout				☐ Yes ☐ No ☒ Mandatory CCP

Activity/ Process Step	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Distribution	Main break	Contamination, loss of supply	SOPs, up/down sampling, training, AWWA standards, capital replacement	3	2	6	☐ Yes ☒ No ☐ Mandatory CCP
	Fire	Low pressure, contamination/turbidity	Fire dept, fire flow design, communication	4	2	8	☐ Yes ☒ No ☐ Mandatory CCP
	Cross connection/ backflow, back siphonage	Contamination	Plumbing code, design std-ICI, inspections, respond to complaints	2	3	6	☐ Yes ☒ No ☐ Mandatory CCP
	Loss of secondary disinfection	Biological re-growth/contamination	Sampling, flushing, monitoring				☐ Yes ☐ No ☒ Mandatory CCP
	Human error	Contamination, loss of supply	Training, inspection, quick response time, SOPs, certified staff	4	2	8	☐ Yes ☒ No ☐ Mandatory CCP
	Air in the line	Loss of supply, loss of public trust	Maintenance & valve inspection, customer complaints	3	2	6	☐ Yes ☒ No ☐ Mandatory CCP
	Power loss	Loss of supply, surges,	Backup genset, SOP's, alarms	4	2	8	☐ Yes ☒ No ☐ Mandatory CCP
	Single main contamination	Loss of supply	Capital programs, reservoir, alternative method of providing water including alternative supply arrangements/emergency response contractors	3	3	9	☐ Yes ☒ No ☐ Mandatory CCP
	Natural disaster	Loss of supply, Contamination	Emergency plans, FEPs	2	4	8	☐ Yes ☒ No ☐ Mandatory CCP

Distribution (continued)	Leaching contaminants into hydrant drain port	Contamination	Maintain positive pressure, inspections	4	2	8	☐ Yes ☒ No ☐ Mandatory CCP
	Residential service leak	Loss of supply	Response to customer	4	1	4	☐ Yes ☒ No ☐ Mandatory CCP
	Bio-film & tuberculation	Public health	Flushing, maintenance, capital replacement	4	2	8	☐ Yes ☒ No ☐ Mandatory CCP
	Dead ends & related flushing operations	Contamination	Routine flushing, SOPs	4	2	8	☐ Yes ☒ No ☐ Mandatory CCP
	Critical shortage of staff	Contamination, loss of supply	Cross training staff, emergency contractors, emergency response plans	2	2	4	☐ Yes ☒ No ☐ Mandatory CCP
Reservoir	Reservoir out of service for maintenance, repair	Loss of supply	Redundancy (2 cells), high lift pumps	2	1	2	☐ Yes ☒ No ☐ Mandatory CCP
	Intentional contamination-vandalism	Contamination	Security, Inspections	2	3	6	☐ Yes ☒ No ☐ Mandatory CCP
	Loss of structural integrity	Contamination, loss of supply	Alarms, inspections	1	4	4	☐ Yes ☒ No ☐ Mandatory CCP
	Loss of communication	Loss of service, public health	Manual inspections, heart beat alarm	4	1	4	☐ Yes ☒ No ☐ Mandatory CCP
	Fire	Contamination, loss of supply	Alarms, inspections	2	4	8	☐ Yes ☒ No ☐ Mandatory CCP

Table 2: Identified Critical Control Points (CCPs)

CCP	Critical Control Limits	Monitoring Procedures	Response, Reporting and Recording Procedures
Primary Disinfection (Sodium Hypochlorite System)	Free Chlorine residual: < 0.9 mg/L (Low) > 3.50 mg/L (High)	Daily system checks Continuous monitoring	Alarm SOP (Facility Emergency Plan) CT Calculations/Minimum Free Chlorine Residual SOP CCP exceedances tracked on facility round sheets and logbooks
Secondary disinfection	Operational: Low: < 0.2 mg/L Free Cl_2 residual Regulatory: Low < 0.05 mg/L, High: > 4 mg/L Free Cl_2 residual	Flushing, sampling/analysis, continuous monitoring-OCWA	Adverse water quality reporting procedure, Receipt and investigation of water quality complaints, scheduling of sampling, records, log book, Chlorine residual reports, SOPs CCP exceedances tracked on facility round sheets and logbooks

Table 3: Record of Annual Review

Participants	Date of Review	Reason for Review (e.g. management review, annual review, etc.)
Darren Aljoe	April 03, 2013	Annual Review
Darryl Colnar	March 29, 2013	Annual re-write
Natalie Wagar & John Hemingway	April 23, 2014	Annual review
Natalie Wagar & Patti O'Handley	December 19, 2014	Annual Review

Natalie Wagar	July 16, 2015	Annual review
Paul Dyrda & Donald Michaud	March 9, 2016	3 Year Risk Assessment

Revision History

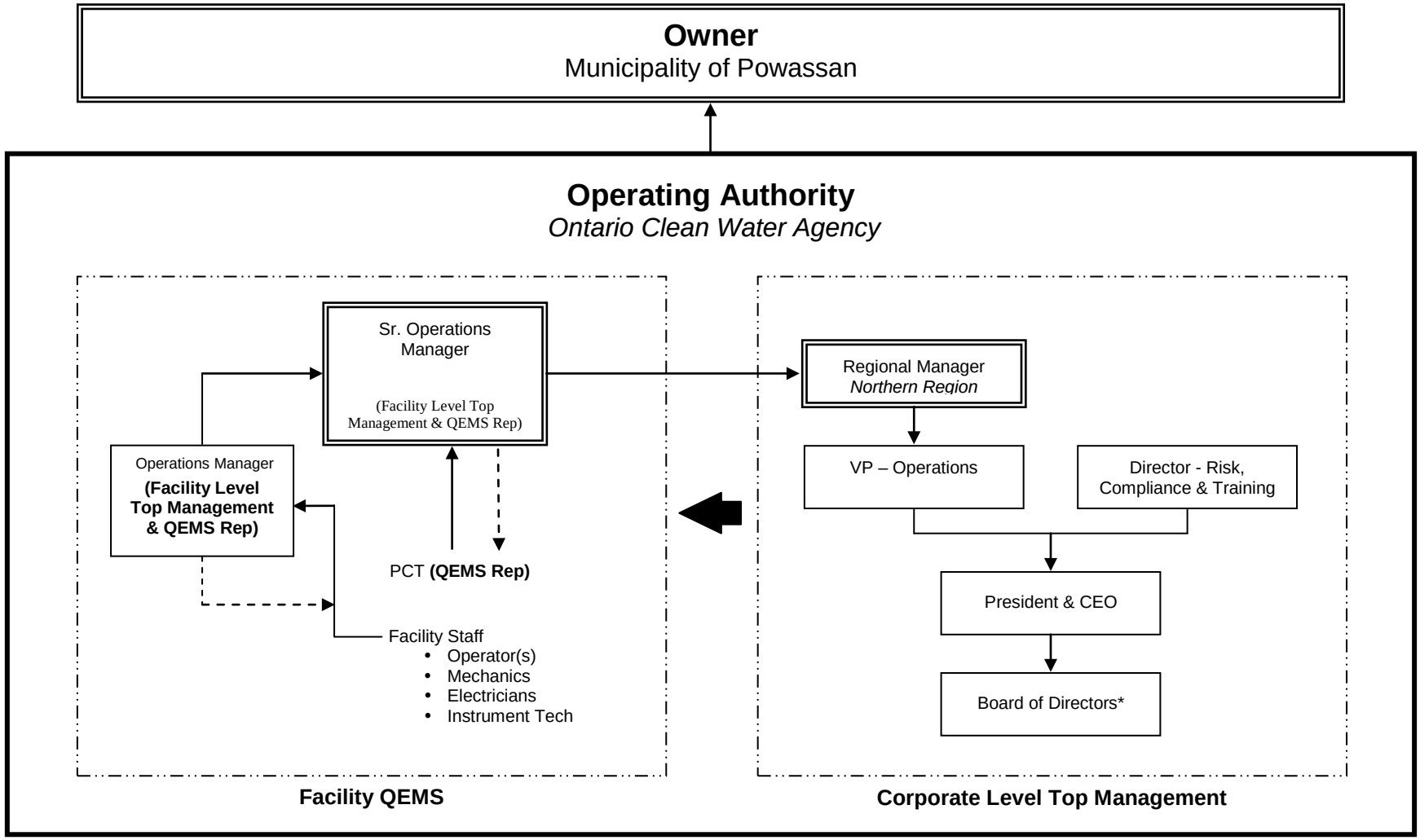
Date	Revision #	Reason for Revision
10-Mar-2010	0	Initial risk assessment conducted
20-May-2011	1	Added Table 3: Record of Annual Review
17-Oct-2012	2	Added comment as to how CCPs are tracked
29-Mar-13	3	Re-write of Risk assessment conducted
23-Apr-14	4	Annual review
9-Mar-16	5	Changed critical control limits of free chlorine residual

Appendix C

QEMS Organizational Structure for the Powassan Drinking Water System

Ontario Clean Water Agency

QEMS Organizational Structure for the Powassan DWS



Endorsement & Approval of the Facility's QEMS & Operational Plan

Overall Leadership & Support for OCWA's QEMS

Reports To

Supervises/Directs

Delineates Corporate & Facility Level Functions

* Represents the highest level of OCWA's Top Management

Ontario Clean Water Agency

QEMS Organizational Structure for the Powassan DWS

1.0 Revision History

Date	Revision #	Reason for Revision
12-Dec-11	2	
16-Jul-15	3	Addition of Revision Chart

Appendix D

QP-03 Personnel Coverage

PERSONNEL COVERAGE

1.0 Purpose

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

2.0 Scope

Applies to operations personnel at the Powassan DWS.

3.0 Responsibility

Sr. Operations Manager
Operations Manager
Municipality of Powassan (Public Works Superintendent)

4.0 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)

5.0 Procedure

5.1 The Sr. Operations Manager ensures that personnel meeting the competencies identified in the Operational Plan are available for duties that directly affect drinking water quality.

5.2 The Powassan DWS is staffed by OCWA personnel as follows:

Covered 24/7 and staffed to the level to meet regulatory requirements and to ensure compliant operations. 24/7 coverage is accomplished by SCADA monitoring and on-call staff during non-regular hours (e.g. evenings and weekends).

5.3 If deemed appropriate, qualified OCWA personnel are dispatched to the Powassan DWS from the Espanola Hub Pool. These may include:

5.3.1 Mechanics

5.3.2 Electricians

5.3.3 Instrument Technicians

5.3.4 Other OCWA staff as required

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

Under suitable circumstances, contractors will be used as per QP-05 Essential Supplies and Services.

5.4 OCWA 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, for both the Distribution and the Treatment System.

A designated operator is the designated overall responsible operator (ORO). When the designated operator is unavailable, a backup is designated as the ORO and is recorded as such in the facility logbook. In the case of the Distribution System, the ORO will be recorded by the OIC performing the work on his/her activity form.

The designated OIC for each shift is recorded in the facility logbook. In the case of the Distribution System, the ORO will be recorded by the OIC performing the work on his/her activity form.

5.5 Regular flushing and maintenance of fire hydrants and valves is the responsibility of OCWA, and is contracted out as necessary.

5.6 Repairs to line breaks are undertaken (coordinated) by the Municipality of Powassan.

5.7 Other construction and maintenance involving new or existing pipe works for the purpose of transporting drinking water for distribution to the Town of Powassan is also coordinated by the Municipality of Powassan.

5.8 All work coordinated by the Municipality of Powassan that is associated with the Powassan Drinking Water System is conducted under the licence of the ORO (OCWA) as required under the Ontario Safe Drinking Water Act.

5.9 Work by municipal personnel on the Powassan Distribution System is conducted in accordance with current legislation (under the SDWA).

5.10 The Municipality of Powassan informs and updates the ORO (OCWA) on situational progress when work is carried out to/in the Powassan Distribution system pursuant to provincial regulations, and as required.

5.11 The Sr. Operations Manager or designate assigns an on-call operator for the time that the treatment facility is un-staffed (i.e., evenings, weekends and Statutory Holidays). The on-call shift change is end of business day on Monday. The on-call responsibilities alternate weekly.

5.12 The duty operator conducts a physical inspection of the facility Monday to Friday during the regular work week, and as required on weekends and Statutory Holidays. Details of the inspection are recorded in the facility logbook and Monthly Data Summary Sheets.

5.13 The on-line analyzers (and intrusion alarms) are programmed to contact True Steel, which in turn calls the on-call pager whenever there is an alarm condition. The on-call operator contacts True Steel 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 in the Espanola Hub. The on-call operator records details of the call-in in the facility logbook and in the Call-In Report form.

5.14 The Municipality of Powassan provides on-call support through the use of cell phones as required for distribution line breaks and other duties.

5.15 The Sr. Operations Manager is responsible for approving vacation time for staff in a manner which ensures sufficient personnel are available for the performance of normal operating duties.

5.16 The Powassan Public Works Superintendent is responsible for approving vacation time for municipal staff in a manner which ensures sufficient personnel are available for the performance of normal operating duties as they relate to the Distribution System.

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

6.0 Related Documents

Facility Logbook
Powassan DWS Monthly Data Summary Sheets
Call-In Reports
Shift/Vacation Schedule (OCWA)
QP-05 Essential Supplies and Services
Activity Form (for Distribution)

7.0 Revision History

Date	Revision #	Reason for Revision
01-Apr-2010	0	Procedure issued
20-Sep-2011	1	Corporate updates
12-Dec-2011	2	Change in management titles

Appendix E

QP-04 Communications

COMMUNICATIONS

1.0 Purpose

To describe the procedures for QEMS-related communications between the facility's Top Management and OCWA personnel, the owner, suppliers and the public.

2.0 Scope

Applies to facility level internal and external communications regarding the Quality & Environmental Management System (QEMS) implemented at the Powassan DWS.

3.0 Responsibility

Sr. Operations Manager (Facility Level Top Management)
Operations Manager (Facility Level Top Management)
Process & Compliance Technician (PCT)
Regional Manager (Corporate Level Top Management)

4.0 Definitions

None

5.0 Procedure

5.1 The Sr. Operations Manager and PCT are responsible for identifying and coordinating any site-specific communications in relation to the status/development of the facility's QEMS. They are also responsible for ensuring that the Regional Manager is promptly informed regarding QEMS-related matters with Agency-wide significance.

5.2 New OCWA personnel are scheduled, as soon as possible, to attend the Environmental Compliance course which provides general awareness training on OCWA's QEMS.

The Sr. Operations Manager ensures facility personnel receive site-specific training on the Operational Plan, QEMS Procedures and other related operating instructions and procedures as part of the orientation process.

Revisions to the QEMS and associated documentation are communicated to relevant employees at meetings, through internal memos or e-mails on an as-needed basis. The Operational Plan and procedures are available to all facility employees as per Table 1 of QP-01 Document and Records Control.

The QEMS Policy and an overview of the QEMS are available to all OCWA personnel through OCWA's intranet.

5.3 The continuing suitability, adequacy and effectiveness of OCWA's QEMS are communicated to the owner as part of the Management Review process (refer to QEMS Procedure QP-11 Management Review). Ongoing QEMS updates are provided to the owner during regularly scheduled meetings and/or through electronic and verbal communications.

5.4 Communication requirements for ensuring suppliers and contractors understand the relevant OCWA QEMS policies, procedures and expectations are described in QEMS Procedure QP-05 Essential Supplies and Services.

5.5 Media enquiries must be directed to the facility's designated media spokesperson. The Sr. Operations Manager or Operations Manager is the media spokesperson for the Powassan DWS. The media spokesperson coordinates with facility and corporate personnel (as appropriate) and the Owner in responding to media enquiries.

5.6 OCWA's QEMS and QEMS Policy are communicated to the public through OCWA's public website. The QEMS Policy is also posted at the facility.

5.7 Facility tours of interested parties must be approved in advance by the Water/ Wastewater Systems Manager. A record of any tour is made in the facility logbook.

All complaints, whether received from the consumer, the community or other interested parties, are documented in the OPEX database. As appropriate, the Sr. Operations Manager ensures that the Owner is informed of the complaint and/or an action plan is developed to address the issue in a timely manner. The PCT ensures that consumer feedback is included for discussion at the Management Review.

5.8 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 QEMS Procedure QP-09 Emergency Management.

6.0 Related Documents

Facility Logbook
QP-01 Document and Records Control
QP-05 Essential Supplies and Services
QP-09 Emergency Management
QP-11 Management Review
Facility Emergency Plan
Emergency Response Plan
OPEX Incident Reports

7.0 Revision History

Date	Revision #	Reason for Revision
01-Apr-2010	0	Procedure issued
20-May-2011	1	Updated procedure to reflect communications with new employees
12-Dec-2011	2	Change In management titles

Appendix F

QP-05 Essential Supplies and Services

ESSENTIAL SUPPLIES and SERVICES

1.0 Purpose

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

2.0 Scope

Applies to essential supplies and services pertaining to the Powassan DWS, as identified in this procedure.

3.0 Responsibility

Corporate Procurement and Administration
Sr. Operations Manager
Operations Manager
Process & Compliance Technician (PCT)

4.0 Definitions

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

5.0 Procedure

5.1 Essential supplies and services for the Powassan DWS are listed on North Bay Hub S: drive for this procedure. The list is reviewed and updated as required by the QEMS Representative.

5.2 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.

5.3 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/service providers (including those contracted locally) are sent a letter that provides an overview of the relevant aspects of the QEMS.

5.4 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.

5.5 All third-party drinking water testing services are provided by accredited and licensed laboratories.

5.6 Calibration services are provided by qualified personnel.

5.7 Chemicals purchased for use in the drinking water treatment process and in the Distribution System must meet AWWA Standards and be ANSI/NSF certified.

The facility orders and receives ongoing deliveries of chemicals to satisfy current short-term needs based on processing volumes and storage capacities.

5.8 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.

6.0 Related Documents

Essential Supplies and Services

7.0 Revision History

Date	Revision #	Reason for Revision
01-Apr-2010	0	Procedure issued
20-May-2011	1	Corporate directive regarding Element 13—Essential Supplies and Services: Procedure reissued
12-Dec-2011	2	Change in management titles

Appendix G

QP-06 Review and Provision of Infrastructure

REVIEW and PROVISION of INFRASTRUCTURE

1.0 Purpose

To describe OCWA's procedure for reviewing the adequacy of infrastructure necessary to operate and maintain a drinking water system.

2.0 Scope

Applies to the Powassan DWS.

3.0 Responsibility

Sr. Operations Manager
Owner/Municipal Representative(s)

4.0 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

5.0 Procedure

5.1 On an annual basis, the Sr. Operations Manager conducts a review of the drinking water system's infrastructure to assess its adequacy for the operation and maintenance of the system.

5.2 The output of the review is a Capital Forecast Spreadsheet that is submitted to the owner for review and comment. Together with the owner, timelines and responsibilities for implementation of priority items are determined and documented.

5.3 The Sr. Operations Manager ensures that results of the review are included as input to the Management Review process.

6.0 Related Documents

Minutes of Management Review
Letter of Recommended Capitol Works

7.0 Revision History

Date	Revision #	Reason for Revision
01-Apr-2010	0	Procedure issued
12-Dec-2011	1	Change in management titles
17-Aug-2016	2	5.2 changed capital letter to Capital Forecast Spreadsheet

Appendix H

QP-07 Sampling, Testing and Monitoring

SAMPLING, TESTING and MONITORING

1.0 Purpose

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

2.0 Scope

Applies to sampling, testing and monitoring at the Powassan DWS.

3.0 Responsibility

Sr. Operations Manager
Operations Manager
Process & Compliance Technician (PCT)
Operators

4.0 Definitions

Challenging Conditions – any existing characteristic of the water source or event-driven fluctuations that impact the operational process as identified and listed under the Drinking Water System section in the facility's Operational Plan

5.0 Procedure

5.1 All sampling, monitoring and testing is conducted at a minimum in accordance with SDWA O. Reg. 170/03. Adverse water quality incidents are responded to and reported as per Powassan DWS *SOP:* Adverse Notification Protocol

5.2 Samples are submitted to an accredited and licensed laboratory according to the following table:

Parameter	Sample Type/Location	Frequency
Microbiological (E. Coli, Total Coliforms)	Raw –Well 1 Raw – Well 2	Weekly
Microbiological (E. Coli, Total Coliforms, HPC)	Treated – POE	Weekly
Microbiological (E. Coli, Total Coliforms, 25% for HPC)	Distribution • Random Location • Random Location	Weekly
Schedule 23 & 24	Treated – POE	Every 36 months
THMs	Distribution • Random Location	Quarterly
Nitrate/Nitrite	Treated – POE	Quarterly
Sodium	Treated – POE	Every 5 years
Fluoride	Treated – POE	Every 5 years

All regulated analytical results from laboratory reports are entered or uploaded into PDM.

5.3 Continuous monitoring equipment is used to sample and test for treated free chlorine residual. Test results from continuous monitoring equipment are captured by the PLC (data logger and chart recorder), and are reviewed by a certified operator in accordance with the requirements of SDWA O. Reg. 170/03.

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

- *Raw and treated water flow rates to the distribution*
- *Treated pH*

5.4 In-house process control activities are conducted on a regular basis by the certified operator(s) on duty and are as follows:

Operational Parameter	Location	Frequency
Turbidity	*Raw Well (#1 & #2)*	*Monthly grab*
Free Chlorine Residual	*Point of Entry (Well house)*	*grab during rounds*
Total Chlorine Residual	*Point of Entry (Well house)*	*grab during rounds*
Free Chlorine	*Distribution*	*Minimum 7 grabs per week*
pH	*Point of Entry (Well house)*	*reading during rounds*
Reservoir Level	*Reservoir / Well house*	*reading during rounds*
Sodium Hypochlorite Usage	*Well house*	*reading during rounds*
Flow Meter	*Well house*	*reading during rounds*

In-house samples are analyzed following approved laboratory procedures. The results of these activities are recorded on the Powassan DWS Monthly Data Summary Sheet and are entered into PDM. Any adjustments made to process parameters are recorded in the facility log book.

5.5 The Municipality of Powassan also monitors the free chlorine residual and the level of the reservoir from the municipal garage.

5.6 There are no challenging conditions identified at this time, nor are there any relevant upstream sampling, testing, and monitoring activities required at this time.

5.7 Sampling, testing and monitoring results are readily accessible to the owner at the Espanola Hub PCT office.

As a minimum, owners are provided with an annual summary of sampling, testing and monitoring results through the SDWA O. Reg. 170/03 section 11 and schedule 22 reports and through the Management Review process outlined in QP-11 Management Review.

6.0 Related Documents

Facility Logbook
QP-01 Document and Records Control
QP-11 Management Review
Powassan DWS Monthly Data Summary Sheet
Laboratory Analysis Reports
Annual Report: Section 11

Municipal Summary Report: Schedule 22

7.0 Revision History

Date	Revision #	Reason for Revision
01-Apr-2010	0	Procedure issued
20-May-2011	1	Distribution chlorine sampling added to in-house process control table Procedure reissued
12-Dec-2011	2	Change in management titles
17-Oct-2012	3	Added table to 5.2; removed comment that hardcopy of lab reports are kept in the hub office; removed reference to non-existent SOPs
21-Oct-2014	4	Changed frequency of IH parameters from daily to during rounds.
30-Jun-2015	5	Changed PDC to PDM

Appendix I

QP-08 Measurement and Recording Equipment Calibration and Maintenance

MEASUREMENT and RECORDING EQUIPMENT CALIBRATION and MAINTENANCE

1.0 Purpose

To describe the procedure for the calibration and maintenance of measurement and recording equipment.

2.0 Scope

Applies to the measurement and recording equipment at the Powassan DWS.

3.0 Responsibility

Sr. Operations Manager
Operations Manager
Maintenance Personnel

4.0 Definitions

None

5.0 Procedure

5.1 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 QP-05 Essential Supplies and Services).

5.2 The Operations Manager establishes and maintains a list of measurement and recording devices and associated calibration schedules using the automated Work Management System (WMS).

5.3 Calibration and maintenance activities are carried out in accordance with procedures specified in the manufacturer's manual.

5.4 Any measurement device which does not meet its specified performance requirements during calibration must be removed from service (if practical) until repaired or replaced. The failure must be reported to the ORO and Operations Manager as soon as possible so that 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 ORO and/or Operations Manager ensure(s) that any notifications required by applicable legislation are completed and documented within the specified time period.

5.5 Calibration and maintenance records and maintenance/equipment manuals are maintained as per QP-01 Document and Records Control.

6.0 Related Documents

Facility Logbook
Maintenance Records (WMS)
Calibration/Maintenance Records
QP-01 Document and Records Control
QP-05 Essential Supplies and Services

7.0 Revision History

Date	Revision #	Reason for Revision
01-Apr-2010	0	Procedure issued
12-Dec-2011	1	Change in management titles

Appendix J

QP-09 Emergency Management

EMERGENCY MANAGEMENT

1.0 Purpose

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

2.0 Scope

Applies to potential operations emergency situations or service interruptions identified for the Powassan DWS.

3.0 Responsibility

Corporate Compliance Group
Sr. operations Manager
Operations Manager
Process & Compliance Technician (PCT)

4.0 Definitions

Facility Emergency Plan – a facility level plan for preparedness for operations emergencies that can be managed by plant staff and local resources

Emergency Response Plan – a corporate level plan for preparedness for serious operations emergencies

5.0 Procedure

5.1 The Corporate Compliance Group maintains the corporate level Emergency Response Plan and the OCWA template for establishing a plan for facility level emergencies (the "Facility Emergency Plan" template). The Sr. operations Manager (or designate) ensures that a site-specific Facility Emergency Plan is established and kept up-to-date for each facility in the Hub.

5.2 OCWA has established a list of mandatory contingencies for potential emergency situations or service interruptions. These are:

- Potential or actual unsafe water
- Catastrophic equipment failure that impacts the ability to provide service
- Power failure that impacts the ability to provide service
- Accidental release that could impact the environment
- Critical injury
- Critical shortage of staff

The Sr. operations Manager (or designate) ensures that a site-specific contingency plan defining the processes for response and recovery is in place for each of the mandatory contingencies (as applicable) and that additional contingency plans to address site-specific risks and hazards are identified and developed.

Site-specific contingencies for the Powassan DWS include:

Accidental Release……Section 1

Catastrophic Equipment Failure……..Section 2

Critical Injury……..Section 3

Critical Shortage of Staff/Pandemic……Section 4

Potential or Actual Unsafe Water……Section 5

Power Failure……..Section 6

Town Fire……Section 7

Water Line Break……Section 8

The contingency plans are contained within the Facility Emergency Plan.

5.3 Each contingency plan must be reviewed at a minimum annually and at least one plan must be tested each year. Training on the Facility Emergency Plan is provided on an ongoing basis.

5.4 Roles and responsibilities for emergency management at OCWA operated facilities are set out in the Facility Emergency Plan under the "Roles and Responsibilities" section. Specific roles and responsibilities related to a particular emergency situation or service interruption, including those of the owner where necessary, are set out in the relevant contingency plan. Additional information on emergency roles and responsibilities may also be contained in OCWA's operating agreements with the municipal owner(s).

5.5 Relevant sections of the Powassan Municipal Emergency Plan, which may also contain additional information on emergency roles and responsibilities, are contained in the "Appendices" section of the Facility Emergency Plan and are incorporated into contingency plans when appropriate.

5.6 An emergency contact list is contained within the Facility Emergency Plan and is updated at least annually. Protocols for communication during emergency situations or service interruptions are set out in the individual contingency plans and in OCWA's Emergency Response Plan.

6.0 Related Documents

Facility Emergency Plan
Emergency Response Plan

7.0 Revision History

Date	Revision #	Reason for Revision
01-Apr-2010	0	Procedure issued
12-Dec-2011	1	Change in management titles

Appendix K

QP-10 Internal QEMS Audits

INTERNAL QEMS AUDITS

1.0 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).

2.0 Scope

Applies to all activities within the scope of the QEMS implemented at the Powassan DWS as documented in the Operational Plan.

Note: this procedure does not include the facility's internal compliance audits conducted in accordance with OCWA's Internal Audit Program.

3.0 Responsibility

Sr. Operations Manager
Operations Manager
Corporate Compliance Group
Process & Compliance Technician (PCT)

4.0 Definitions

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

Internal Auditor – person with skills, training and/or experience to conduct an internal audit

Nonconformity – non-fulfillment of a requirement

5.0 Procedure

5.1 The Sr. Operations Manager (or designate) ensures that an internal QEMS audit is conducted for the facility on an annual basis by personnel with adequate skills, training and/or experience.

5.2 In consultation with Operations, OCWA's Corporate Compliance Group established an internal audit protocol to be used by the facility's auditor(s). Protocol questions are designed to encompass all of the requirements of the DWQMS. The auditor reviews and updates the protocol as required.

5.3 The auditor(s) reviews the facility's approved policies and procedures, the results of previous internal and external QEMS audits, the status of corrective and preventive actions and other QEMS-related documentation prior to the audit.

5.4 The auditor(s) follows the audit protocol and engages in activities that may include asking questions, observing operations and reviewing documents and records. Non-conformities with reference to specific documents and details are recorded on the audit protocol along with any additional comments and suggestions.

5.5 Upon completion of the final audit report, the auditor(s) reviews the results and identified nonconformities with the Sr. Operations Manager (or designate). The audit report and supporting documentation are filed by the QEMS Representative and retained as per QP-01 Document and Records Control.

5.6 When a nonconformity is identified through the internal audit process, an action plan to rectify the issue is developed by the Sr. Operations Manager (or designate), specifying responsibility and a target date for resolution. The Sr. Operations Manager or designate monitors progress of the action plan related to the identified nonconformity until it is fully resolved.

The QEMS Representative ensures that any necessary revisions to QEMS procedures and policies are completed and communicated to relevant facility personnel.

5.7 The QEMS Representative ensures that results of the audit are included as input to the management review process.

6.0 Related Documents

QEMS Internal Audit Protocol
Audit Reports (Internal/external)
QP-01 Document and Records Control

7.0 Revision History

Date	Revision #	Reason for Revision
01-Apr-2010	0	Procedure issued
12-Dec-2011	1	Change in management titles
17-Oct-2012	2	Update to section 5.2; the auditor updates and reviews the protocol
21-Oct-2014	3	Added to Senior Operations Manager - (or designate)

Appendix L

QP-11 Management Review

MANAGEMENT REVIEW

1.0 Purpose

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

2.0 Scope

Applies to the review of the QEMS implemented at the Powassan DWS.

3.0 Responsibility

Top Management (facility level):

- Sr. Operations Manager
- Operations Manager

Other Management Review Participants:

- Process & Compliance Technician (PCT)
- Regional Compliance Advisor (as required)
- Others (as required)

4.0 Definitions

Management Review – a formal (documented) meeting conducted at least once every 12 months by Top Management to evaluate the continuing suitability, adequacy and effectiveness of OCWA's Quality & Environmental Management System (QEMS)

5.0 Procedure

5.1 The Sr. Operations Manager determines a suitable frequency for Management Review meetings for the drinking water system. As a minimum, reviews must be conducted at least once every 12 months.

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 5.2 below are taken into account for each individual system and documented in the Management Review meeting minutes.

5.2 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 efficacy of the risk assessment process,
e) Internal and third-party audit results,
f) Results of emergency response testing,
g) Operational performance,
h) Source (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, and
p) Staff suggestions.

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.

5.3 The Management Review participants review the data presented and make recommendations and/or initiate action plans to address identified deficiencies as appropriate.

5.4 The QEMS Representative ensures that minutes of and action plans resulting from the Management Review meeting are prepared and distributed to the appropriate OCWA management (including the Regional Manager) and personnel, and the Municipality of Powassan Public Works Superintendant and CAO.

5.5 The Sr. Operations Manager or designate monitors the progress and documents the completion of action plans resulting from the Management Review.

6.0 Related Documents

Minutes from the Management Review
Action plans

7.0 Revision History

Date	Revision #	Reason for Revision
01-Apr-2010	0	Procedure issued
12-Dec-2011	1	Change in management titles

Appendix M

MOE's Director's Directions *Minimum Requirements for Operational Plans* – Schedule "C"

Schedule "C"

Subject System Description Form

Municipal Residential Drinking-Water System

Owner of Municipal Residential Drinking-Water System:[1]	The Corporation of the Municipality of Powassan
Name of Municipal Residential Drinking-Water System:[2]	Powassan Drinking Water System

Subject Systems

	Name of Operational Subsystems (if applicable)[3]	Name of Operating Authority[5]	DWS Number(s)[6]
✓ Check here if the Municipal Residential Drinking-Water System is operated by one operating authority. Enter the name of the operating authority in adjacent column		Ontario Clean Water Agency	220000576
Operational Subsystem 1:			
Operational Subsystem 2:			
Operational Subsystem 3:			
Operational Subsystem 4:			

Add attachments if there are additional 'Operational Subsystems'

Contact Information[7]

Name	Title	Phone No(s).	Email Address
Paul Dyrda	Operations Manager	705-303-9767	pdyrda@ocwa.com
Yvan Rondeau	Process and Compliance Technician	705-642-5619	yrondeau@ocwa.com

Subject System Description Form Notes:

1. The legal name of the owner should be used for this entry.

2. The name of the municipal residential drinking-water system should be the name most commonly used to describe the entire system. If information or records have been submitted to the ministry respecting this system, using an identifier name (e.g. for DWS), that identifier name should be used.

3. The identification of each operational subsystem will be necessary in cases where the municipal residential drinking-water system is being operated by more than one operating authority. For example, if a municipality owns a treatment and distribution system but contracts the operation of the treatment system to a separate entity there will be two 'operational subsystems', treatment and distribution. The name used to identify these operational subsystems should be one that is commonly used or describes the component. For example, the Everytown Treatment System and the Everytown Distribution System as separate operational subsystems of the same municipal residential drinking-water system.

4. If there is only one operating authority for the municipal residential drinking-water system, the box should be checked as such. In this case the subject system is the municipal residential drinking-water system and there will be no operational subsystem. The operating authority will need to be identified in the adjacent box.

5. The legal or corporate name of the operating authority should be used for this entry.

6. The DWS number is the number, or numbers, assigned to the drinking-water system by the Ministry of the Environment in response to the owner submitting a written notice containing information about the system further to section 10.1 of O. Reg. 170/03. In some cases multiple DWS numbers may exist for components of a municipal residential drinking-water system. In these cases enter all DWS numbers. Conversely, if one DWS number exists for multiple subject systems, enter the number opposite each operational subsystem.

7. The contact entry should identify a person who may be contacted for clarification of information contained in the form. An alternate person may also be identified.