



**Ontario Clean Water Agency
Agence Ontarienne Des Eaux**

The Town of Smooth Rock Falls

OPERATIONAL PLAN

for the Smooth Rock Falls Drinking Water System

Revision 4, August 7, 2013



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DISCLAIMER STATEMENT

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

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Smooth Rock Falls Drinking Water System

Owned by the Corporation of the Town of Smooth Rock Falls
Operated by the Ontario Clean Water Agency

This Operational Plan defines and documents the Quality & Environmental Management System (QEMS) for the *Smooth Rock Falls 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).

OPERATIONAL PLAN REVISION HISTORY

Date	Revision	Description of Revision
2009-10-30	0	Operational Plan issued
2012-02-03	1	Revised QEMS Policy section (to address CGSB non-conformance); Replaced “continuous improvement” with “continual improvement to be more consistent with language in the Standard (CGSB OFI); Added additional information/instruction for completing the drinking water description based on the MOE’s guidance document (section 6); Added roles and responsibilities for Senior Operator/Mechanic, Operator/Mechanic and Instrumentation Technician based on standard job descriptions and added ORO/OIC prompts to section 9 (CGSB non-conformance); Revised competencies table to reflect skills and knowledge required as per standard job descriptions and section 10 text (CGSB non-conformance and OFIs); Revised Infrastructure Maintenance, Rehabilitation and Renewal to better describe OCWA’s maintenance program (CGSB non-conformance and OFIs); added list of tables, list of figures and list of acronyms & abbreviations; revised header and footer
2013-01-21	2	Revised Operational Plan from only water treatment to include the distribution system, since OCWA was deemed operating authority on January 1, 2013.
2013-06-24	3	Removed reference to Northern and South VPs as there is now one for the Province, changed the description under raw water characteristics to match the values in Table A
2013-08-07	4	Added updated process flow diagram (Figure 1) and distribution system map (Figure 2)

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LIST OF ACRONYMS AND ABBREVIATIONS

AAP	Analysis/Action Plan
ANSI	American National Standards Institute
AWQI	Adverse Water Quality Indicator
AWWA	American Water Works Association
CCP	Critical Control Point
CEO	Chief Executive Officer
CFU	Colony Forming Units
CP	Contingency Plan
CPR	Cardiopulmonary resuscitation
CT	Concentration of disinfectant residual x Contact Time
DWQMS	Drinking Water Quality Management Standard
EEP	Environmental Emergency Procedure
FEP	Facility Emergency Plan
GUDI	Groundwater Under the Direct Influence of Surface Water
LMRS	Large Municipal Residential System
MOIR	Monthly Operations Report
ND	Not Detectable
NEO	Northeastern Ontario
NSF	National Sanitation Foundation
NTU	Nephelometric Turbidity Units
O. Reg.	Ontario Regulation
OCWA	Ontario Clean Water Agency
OIC	Operator-In-Charge
OIT	Operator-In-Training
OPEX	Operational Excellence
ORO	Overall Responsible Operator
OTJPT	On the job practical training
PCT	Process and Compliance Technician
PDC	Process Data Collection
PLC	Programmable Logic Controller
PPR	Performance Planning & Review
PVC	Polyvinyl chloride
QEMS	Quality & Environmental Management System
QP	Quality Procedure
SCADA	Supervisory Control and Data Acquisition
SDWA	Safe Drinking Water Act
SOP	Standard Operating Procedure
UV	Ultraviolet (light)
VP	Vice President
WHMIS	Workplace Hazardous Materials Information System
WMS	Work Management System
WTS	Water Treatment System

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

OCWA is the contracted Operating Authority for the *Smooth Rock Falls 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 continuous 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:

- Maintain and continually improve upon a comprehensive quality and environmental management system (QEMS) to support the delivery of safe, reliable and cost-effective clean water services that protect public health and the environment.
- Establish clear objectives against which OCWA's environmental performance can be measured and assessed with the goal of continual improvement.
- Understand and comply with applicable legislation and regulations and audit the facilities we operate to ensure compliance.
- Utilize a risk-based approach to quality management that accounts for the complexity and specific challenges of providing operation and maintenance services.
- Promote client and consumer confidence through service excellence and effective communications.
- Collaborate with its clients to prevent pollution and contribute to a more sustainable future by promoting the use of operational efficiencies and improved technology.
- Train staff on their responsibilities under the QEMS and how meeting these responsibilities assist with the protection of public health and the environment.
- Report on facility performance to its employees, clients and stakeholders.

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

Refer to Appendix A for Commitment & Endorsement of OCWA's QEMS & Operational Plan.

4 Quality Management System Representative

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

The role of QEMS Representative for the *Smooth Rock Falls Drinking Water System* is shared between Facility Level Top Management (Senior Operations Manager and Operations Manager) and Process & Compliance Technician (PCT).

The Senior Operations Manager and/or the 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 Facility Level Top Management and the PCT are 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.

The QEMS Representative(s) are responsible for promoting awareness of the QEMS to all facility personnel.

5 Document and Records Control

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

6 Drinking Water System

Description of the Drinking Water System

The Smooth Rock Falls Drinking Water System is owned by the Corporation of the Town of Smooth Rock Falls. It is located on 46 First Street in the Town of Smooth Rock Falls, and serves the residents of Smooth Rock Falls. The Ontario Clean Water Agency is designated as the Overall Responsible Operator for both water treatment and distribution systems. However, the distribution system is maintained by the Town of Smooth Rock Falls Public Works Department.

The treatment facility is a surface water treatment plant located next to the Mattagami River which serves as the plant's raw water source. It has a maximum rated capacity of 45 liters per second or 3,897 cubic meters per day. Water is drawn from the river through a 450 mm diameter intake pipe with 150 mm holes covered with 25 mm mesh which ensures minimal

debris is carried into the wet well. The pipe is located 3.66 meters deep and extends 35 meters into the river. Water is pumped from the river to an underground wet well having an effective storage volume of 54.1 cubic meters at an average river depth of 9.0 meters. The wet well is equipped with three low lift pumps each rated at 22.5 L/s that direct water to the treatment plant.

The treatment plant houses all the main operation facilities such as: two package treatment units, laboratory, washrooms and storage areas. Water treatment consists of coagulation, flocculation, sedimentation, filtration, disinfection and pH control. Two flow meters, located at the inlet of the two package treatment units, monitor the water into the plant.

The raw water entering the plant is flash mixed with soda ash for pH/alkalinity adjustment and alum for coagulation before moving into the two package treatment units. A back up caustic soda feed system is available for pH adjustment if required. Each treatment unit consists of polymer injection into a coagulation/flocculation tank, a sedimentation tank with sludge removal, and dual media anthracite/silica sand filters. Filter backwashes occur automatically and the backwash water is directed to the sanitary sewer for disposal. Water off the filters is measured for turbidity using an on-line analyzer.

The treated water is injected with caustic soda for pH adjustment and sodium hypochlorite for disinfection before entering a two-celled clearwell having a storage volume of 715 cubic meters. An on-line chlorine residual analyzer monitors the water as it goes to the high lift pumps. Two vertical turbine pumps, each rated at 45 L/s, and equipped with a flow meter, pump the water from the clearwell to the distribution system. Water leaving the treatment plant is treated with ammonium sulphate for chloramination prior to entering the distribution system which includes a 2281 cubic meter capacity water tower. See Figure 1 for Process Flow Diagram.

The Distribution System has an estimated 782 service connections, 82 fire hydrants, two dead end locations equipped with bleeders, two additional dead end locations without bleeders, a 2,281 cubic meter capacity water tower, and watermains (cast iron and plastic pipes). It supplies private residences and a pulp mill site. The pulp mill has ceased operation for a few years, but water is still being supplied for drinking, showering and emergency uses. The Distribution System does not receive water from other water systems and also does not service other water systems. See Figure 2 for Distribution System Map.

A 174 kW diesel generator and fuel storage tank are available to provide emergency power for the entire facility in the event of a power interruption.

The Smooth Rock Falls water treatment plant is a standalone system not connected to a larger drinking water system. There are no upstream or downstream processes relied upon to ensure the provision of safe drinking water. It is classified as a Large Municipal Residential Drinking Water System serves an estimated population of 1,400 residents.

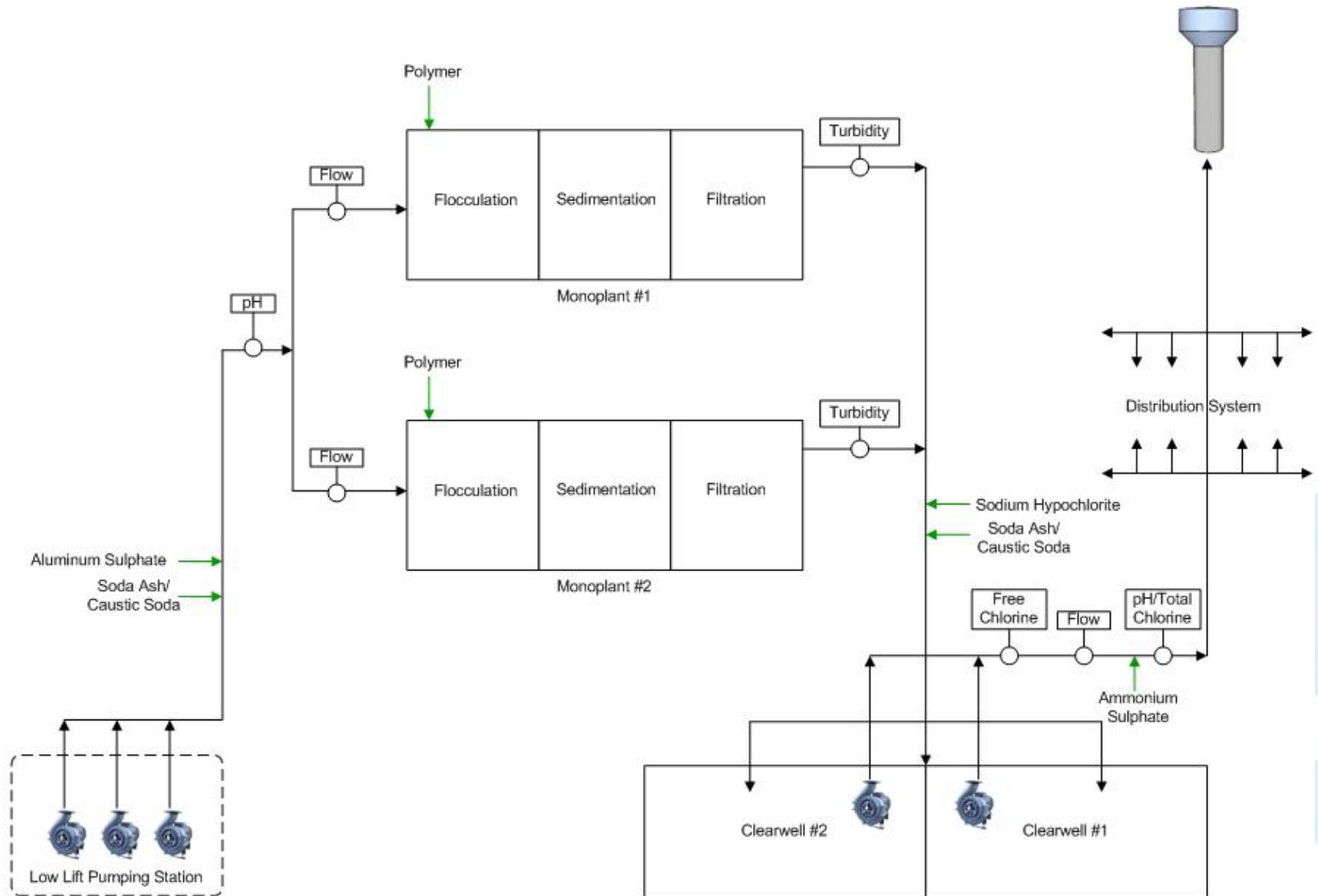


Figure 1 – Process Flow Diagram

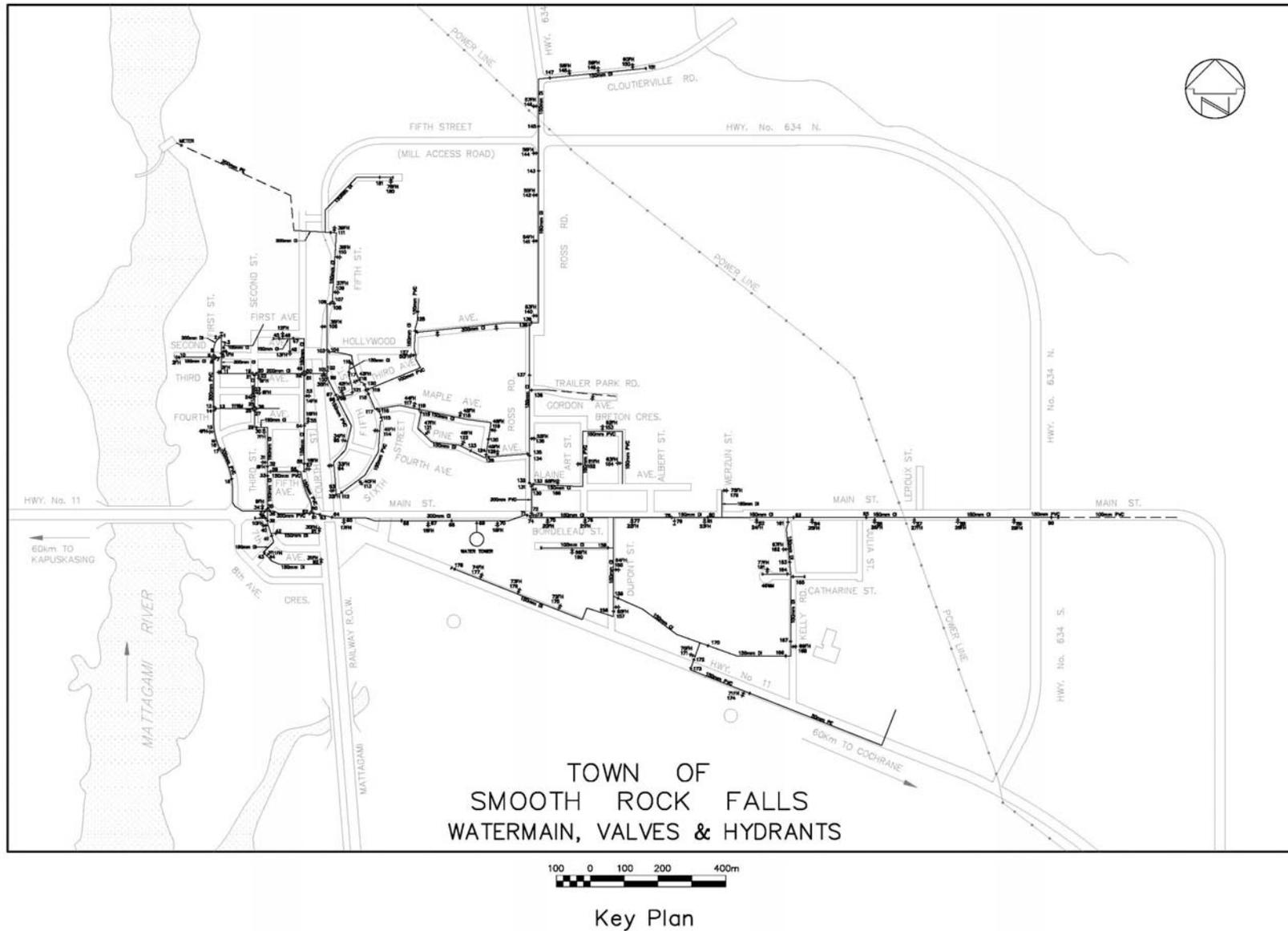


Figure 2 - Distribution System Map

Source Water

General Characteristics

The raw water source for the treatment plant is the Mattagami River. Information derived from the facility's Engineer's Report dated March 2001 indicates that the source water can be categorized as good quality water with low turbidity, dissolved organic matter, and alkalinity. Typically, the water is slightly basic and very high in colour. Temperature fluctuates significantly throughout the seasons ranging from approximately 0.1 °C in the winter months to as high as 22.7 °C in the warmest summer months.

Bacteriological analysis of the raw water indicates a source of relatively good quality.

Table A - Raw Water Characteristics at Intake (based on 2012 data)

Characteristic	Minimum	Maximum	Annual Average
Temperature (°C)	0.1	22.7	8.78
Turbidity (NTU)	1.73	311	6.63
pH (units)	6.22	7.66	7.1
Alkalinity (mg/L)	3	75	49.20
Colour (TCU)	38	173	89.2
<i>E. coli</i> (CFU/100 mL)	<1	24	4
Total Coliforms	<1	160	58

Common Fluctuations

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

During the winter months ice cap formation on the river contributes to a more chemically stable raw water source which allows for a more consistent process.

Threats

Potential sources of raw water contamination include fuel spills from recreational water crafts or highway traffic. Other threats include heavy recreational use of the waterway, beaver activity, and train derailment.

Upstream and downstream sampling is not deemed necessary at this time.

Operational Challenges

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

Watermain breaks in the winter time are the only challenges faced on the distribution system. Most breaks are handled by Town staff, but sometimes assistance of specialized service providers is required.

7 Risk Assessment

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

8 Risk Assessment Outcomes

Refer to Appendix C 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 Senior Operations Manager has oversight responsibility for all of the facilities contained within a particular hub. In some hubs, an Operations Manager assists the Senior 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* – Regions fall under the direction of the VP of Operations.

The chart, QEMS Organizational Structure for the *Smooth Rock Falls Drinking Water System* (Appendix D), 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 conducting periodic management reviews, ensure the maintenance and continual improvement of OCWA's QEMS:

Facility Level Top Management – consisting of the Senior Operations Manager and the Operations Manager. Management, 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, VP 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 Table C 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.

Table B: QEMS Roles, Responsibilities and Authorities

Position	QEMS Roles, Responsibilities and Authorities
All Operations Personnel	<ul style="list-style-type: none"> • 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 Operations Manager opportunities for improving the facility’s QEMS • Perform duties in compliance with applicable legislation and regulations

Position	QEMS Roles, Responsibilities and Authorities
<p>Regional Manager <i>(Corporate Level Top Management)</i></p>	<ul style="list-style-type: none"> • Review major issues/deficiencies (including those from audit and inspection reports) and provide further direction to address/resolve • 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
<p>Senior Operations Manager <i>(Facility Level Top Management and QEMS Representative)</i></p>	<ul style="list-style-type: none"> • Delegate responsibilities, deploy resources and supervise sound operation and maintenance of the facility and of the QEMS • Liaise with the owner on relevant components of the QEMS including OCWA's roles, responsibilities and authorities for the facility • Ensure appropriate facility resources to maintain and continually improve the QEMS • Participate in regular facility Management Reviews • 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)
<p>Operations Manager <i>(Facility Level Top Management and QEMS Representative)</i></p>	<ul style="list-style-type: none"> • Fulfill duties assigned by the Senior 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 • Liaise with the owner on relevant components of the QEMS • Develop/implement training plans for staff • Support Operations Manager on all aspects of the QEMS and fulfill assigned duties of the QEMS Representative (refer to element 4) • Act for the Senior Operations Manager in his/her absence • Act as Overall Responsible Operator (ORO) when required. Refer to ORO Letter

Position	QEMS Roles, Responsibilities and Authorities
<p>Process & Compliance Technician (PCT) (QEMS Representative)</p>	<ul style="list-style-type: none"> • Fulfill duties assigned by the Senior 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 Senior 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 Senior Operations Manager on all aspects of the QEMS and fulfill assigned duties of the QEMS Representative (refer to element 4)
<p>Overall Responsible Operator</p>	<ul style="list-style-type: none"> • Fulfill duties assigned by the 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
<p>Operator/Mechanic</p>	<ul style="list-style-type: none"> • Fulfill duties assigned by the Operations Manager and/or Overall Responsible Operator • 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

Position	QEMS Roles, Responsibilities and Authorities
	and procedures. <ul style="list-style-type: none"> • Maintain the facility log book according to regulatory requirements • May act as Operator-in-Charge (OIC)
Instrumentation Technician	<ul style="list-style-type: none"> • 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

10 Competencies

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

Table C: Competencies

Position	Required Competencies
Senior Operations Manager	<ul style="list-style-type: none"> • Operator certification in good standing • 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 coordinating 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 • Valid Class G Driver's Licence
Operations Manager	<ul style="list-style-type: none"> • Operator certification in good standing

Position	Required Competencies
	<ul style="list-style-type: none"> • 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 • Valid Class G Driver's Licence
<p>Overall Responsible Operator</p>	<ul style="list-style-type: none"> • Operator certification in good standing; minimum level required to act as OIC and 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. • Valid Class G Driver's Licence
<p>Operator/Mechanic</p>	<ul style="list-style-type: none"> • Operator certification in good standing; minimum OIT; minimum level required to act as OIC and/or 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

Position	Required Competencies
	<p>and monitor the facility, processes and equipment and perform routine preventative maintenance</p> <ul style="list-style-type: none"> • Good oral and written communication skills • Ability to work in a team and take initiative when required. • Valid Class G Driver's Licence
<p>Process & Compliance Technician</p>	<ul style="list-style-type: none"> • Operator certification in good standing; minimum OIT • 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 • Valid Class G Driver's Licence
<p>Instrumentation Technician</p>	<ul style="list-style-type: none"> • Operator certification in good standing; minimum OIT • 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 • Valid Class G Driver's Licence

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 Senior 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 and at least every five years to ensure staff are kept current on any changes to regulatory requirements and 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 their respective managers for authorization.

11 Personnel Coverage

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

12 Communications

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

13 Essential Supplies and Services

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

14 Review and Provision of Infrastructure

Refer to Appendix H 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. As the service provider, OCWA has prepared a Preventative Maintenance Plan, which includes a complete list of all equipment, as well as daily, monthly, seasonal, annual maintenance activities to be conducted to ensure the good and proper upkeep of the Municipal water facilities. OCWA is responsible for completing the following routine maintenance:

- Inspect, adjust and calibrate process control equipment to ensure proper operation of water treatment systems, pumps, chemical feeders, and all other equipment installed at the facilities.
- Check of clearwell level to ensure everything is in order.
- Carry out a routine maintenance program including greasing and oiling as specified in manufacturers' recommendations.
- Perform day-to-day maintenance duties to equipment including checking machinery and electrical equipment when required.
- Maintain an inventory of equipment and tools.
- Maintain accurate records of work conducted, activities, and achievements.

Planned maintenance activities are scheduled using a computerized Work Management System (WMS) that allows user 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

Planned maintenance activities are communicated to the person responsible for completing the task through the issuance of WMS work orders. Work orders are generated by the ORO on a monthly basis and are distributed accordingly. Completed work orders are submitted to the designated data entry Operator/Mechanic for entry into WMS except for those pertaining to the calibration of equipment. Completed calibration reports are entered into WMS by a designated Instrumentation Technician. Records of these activities are maintained as per QEMS Procedure QP-01 Document and Records Control.

The ORO maintains the inventory of equipment in WMS and ensures that appropriate maintenance plans are in place. Maintenance plans are developed according to the manufacturer's instructions, regulatory requirements, industry standards, and/or client service requirements. Equipment Operation and Maintenance (O&M) manuals are accessible to staff at the locations specified in QEMS Procedure QP-01 Document and Records Control.

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 and/or the facility's logbook

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 Senior Operations Manager and/or designate and is presented to the Owner for review and comment. All major expenditures require the approval of the Owner.

Program Monitoring and Reporting

As mentioned above, maintenance needs for the facility are determined through review of manufacturer's instructions, regulatory requirements, industry standards, and/or client service requirements and are communicated by means of monthly, quarterly, seasonal, or annual work orders. In addition to the monthly reports completed by the Operations Manager which indicate the status of completed work orders, the Senior Operations Manager and Regional Manager are provided with monthly summary reports for each facility to assist in monitoring the effectiveness of the program. OCWA's Executive Management Team is also provided with hub and regional summary reports on an ongoing basis.

Any major unplanned maintenance activities and deficiencies are communicated with the owner. Summary reports are available at the owner's request.

16 Sampling, Testing and Monitoring

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

17 Measurement and Recording Equipment Calibration and Maintenance

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

18 Emergency Management

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

19 Internal QEMS Audits

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

20 Management Review

Refer to Appendix M 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.

Schedule C – Subject System Description Form

Refer to Appendix N for a completed Subject System Description Form (Schedule C).