



PORT COLBORNE

WATER DISTRIBUTION SYSTEM

Waterworks Number: 260001643

QUALITY MANAGEMENT SYSTEM OPERATIONAL PLAN

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Authorized by:	<u>Top Management Representative</u>	<u>Cassandra Banting, QMS Representative</u>
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PORT COLBORNE

Quality Management System Operational Plan

A. INTRODUCTION

1. Purpose

The purpose of this Operational Plan is to document the Quality Management System (QMS) developed and implemented by the City of Port Colborne for the operation and maintenance of its water distribution system.

This Operational Plan includes references to all components of the Drinking Water Quality Management Standard.

2. Scope

This Operational Plan covers the activities and personnel associated with all operational aspects of the drinking water distribution system for the City, identified by waterworks number 260001643.

This Operational Plan, the procedures, work instructions and other DWQMS documentation that are referenced herein have been developed in accordance with the legislated requirements for the provision of safe drinking water in the Province of Ontario.

The application of this Plan, and associated procedures and work instructions begins at the point where treated water enters the watermain from the treatment facilities and ends at the property lines of the consumers.

3. References

- Drinking Water Quality Management Standard, February 2017
- Safe Drinking Water Act, 2002 and applicable regulations

4. Definitions and Acronyms

CCL – Critical Control Limit

CCP – Critical Control Point

City – City of Port Colborne

DWQMS or Standard – Drinking Water Quality Management Standard

OIC – Operator-In-Charge

OP – Operational Plan

ORO – Overall Responsible Operator

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QMS – Quality Management System

QMS Rep – QMS Representative

Region – Regional Municipality of Niagara

PCDS – Port Colborne Distribution System

B. OPERATIONAL PLAN

1. Quality Management System

The City of Port Colborne has prepared this Operational Plan, in conformance with the DWQMS, to document the City's commitment to providing clean, safe and reliable drinking water throughout the City's water distribution system. The development and continual improvement of the OP will help ensure that all regulatory requirements are met and that consumers can be confident that their drinking water will be protected through the effective implementation of the QMS at the City.

2. Quality Management System Policy

The City of Port Colborne is committed to provide safe and reliable drinking water of high quality to the consumer. In particular, the City makes the following commitments:

- To provide safe and reliable drinking water to the consumer;
- To comply with, or exceed, applicable legislation and regulations;
- To implement, maintain, and continually improve the Quality Management System;
- To deliver excellent customer service through listening and communicating with the public regarding safe drinking water.

These commitments have been summarized in a poster, QMS-PP, provided in Appendix 1, which shall be displayed at City owned properties, and provided on the City's website in order to inform water consumers of the City's commitments.

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3. Commitment and Endorsement

The City of Port Colborne supports the implementation, maintenance and continual improvement of the drinking water QMS (Quality Management System) for the City of Port Colborne water distribution system, as described in the Operational Plan. The Owner (the Mayor and Council), endorses this Operational Plan through a Council Resolution within one (1) year following the election of a new Council, or following significant changes to the Operational Plan. Council's endorsement is provided in Appendix 2. Top Management (Director of Public Works and Manager of Water/Wastewater), by signing below, acknowledges the need for a Drinking Water QMS and the responsibility for providing sufficient resources to maintain and continually improve the QMS.

Director of Public Works (Top Management)
Steve Shypowskyj

Date

Manager of Water/Wastewater (Top Management)
Darlene Suddard

Date

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4. Quality Management System Representative

The City of Port Colborne has appointed and authorized the Environmental Compliance Supervisor as the Quality Management System Representative, who, irrespective of other duties, has the following responsibilities including, but not limited to:

- Ensuring that processes and procedures needed for the QMS are established and maintained,
- Reporting to Top Management on the performance of the QMS and any needed improvement,
- In cooperation with all Operating Authority staff, ensuring that current versions of documents required by the QMS are easily identified, retrievable and being used at all times,
- In cooperation with Operating Authority staff, ensuring that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the subject system;
- Promoting awareness of the QMS throughout the operating authority.

Additional responsibilities and authorities are detailed in Section 9.

5. Document and Records Control

Document and record control is an essential part of the QMS. To ensure all QMS documents and records are current, legible, identified and retrievable, a document and record control procedure has been developed and implemented:

Procedure QMS-SOP05-1 Document and Record Control

This procedure also details how QMS documents and records are stored, protected, retained and disposed of.

6. Drinking Water System

The City of Port Colborne is the Owner and Operating Authority of the Port Colborne Distribution System, which serves approximately 16,000 residents. The PCDS is a standalone, Class 1, distribution system, with no downstream connections, and obtains water from the Region, who is the owner and operating authority of the Port Colborne Drinking Water System, which consists of

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the Port Colborne Water Treatment Plant (WTP), the Fielden Avenue Reservoir, the Barrick Road Water Tower and trunk water mains. Treated water is purchased from the Region on a volume basis and distributed through the City owned distribution system via Region owned trunk mains.

The Region draws water from the Welland Canal, treats it at the WTP (using only sodium hypochlorite and aluminum sulphate, Liquid Polymer (Nalcolyte 8100), according to the Region's annual report), and is responsible for sampling, testing and monitoring water at and leaving the WTP.

The City of Port Colborne does not perform any secondary disinfection, as the WTP sufficiently chlorinates the water to meet the minimum requirement of >0.05 mg/L free chlorine residual. The City performs flushing activities on an as-needed basis to maintain free chlorine residuals throughout the PCDS. The distribution system has an average pressure of 58 psi, with pressure maintained by the Region's Barrick Road Water Tower together with the Fielden Avenue Reservoir. As a result, booster pumps are not required. The City and the Region have a Memorandum of Understanding, dated April 21, 2016, which details not only where ownership demarcation points are, but also detail water quality, supply, maintenance, mutual assistance, emergency response, customer complaints and communication requirements.

The description of the PCDS is updated when required.

7. Risk Assessment

The City assesses potential risks to the PCDS at scheduled intervals, as per the risk assessment process detailed in:

Procedure QMS-SOP07-1 Risk Assessment

This procedure also ensures that any changes to the PCDS are assessed to ensure any potential risks and CCP's are identified.

8. Risk Assessment Outcomes

A summary of Risk Assessment Outcomes are provided in Table 8.1: Risk Assessment Outcomes, in Appendix 3. As indicated on the Table, the identified CCP, and the CCL, where applicable, are addressed in:

Procedure QMS-SOP11-1 Personnel Shortage Contingency Procedure
Operational Procedure C1 Adverse Drinking Water Quality Incident Notification –Port Colborne Distribution System and Sherkston Community Centre Cistern System
Operational Procedure C2 Repair of Watermain Breaks

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Operational Procedure C5 Corrective Action for Adverse Water Quality – Distribution System

Procedure QMS-SOP18-1 Provision of Drinking Water in a Distribution System Emergency

9. Organizational Structure, Roles, Responsibilities and Authorities

9.1 Organizational Chart

The organizational chart showing the Owner, Top Management and Operating Authority is provided in Figure 9.1: Drinking Water Responsibilities Organizational Chart, in Appendix 4.

9.2 Roles, Responsibilities and Authorities

Table 9.2: Roles, Responsibilities and Authorities

Mayor and Council (Owner)

Responsibilities	Authorities
<p>Ultimate responsibility for ensuring the provision of safe drinking water. Other responsibilities related to the provision of safe drinking water are:</p> <ul style="list-style-type: none"> • Provide resources and infrastructure necessary to comply with legislation. • Ensure compliance and proper accreditation according to the requirements of the Safe Drinking Water Act, Drinking Water Quality Management Standard and associated regulations. • Endorse the QMS 	<ul style="list-style-type: none"> • Financial and administrative authority relating to the distribution of safe drinking water.

Director of Public Works (Top Management)

Responsibilities	Authorities
<p>Reporting to the system Owner, the Director of Public Works is the link between the system Owner and the Operating Authority. Other responsibilities related to the provision of safe drinking water are:</p> <ul style="list-style-type: none"> • Request funding required to maintain system • Recommend improvements to system • Provide budgetary information to the Owner • Provide the Owner with technical and administrative information • Participate in Management Review 	<ul style="list-style-type: none"> • Create administrative and technical policy when necessary • Manipulate long term capital plan when necessary

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**Manager of Water/Wastewater (Acting QMS Representative)**

<i>Responsibilities</i>	<i>Authorities</i>
<p>The Manager of Water/Wastewater is responsible for the organization, operation, strategic planning and efficient delivery of drinking water services. Specific responsibilities include:</p> <ul style="list-style-type: none"> • Ensure sufficient resources for the inspection, maintenance, rehabilitation and construction of the water distribution system • Ensure that Water Operators remain certified • Participate in Management Review • Participate in Infrastructure Review • Staff hiring and evaluation • Approve payments for goods and services beyond the signing authority of the Water Wastewater Operations Supervisor, as per corporate purchasing policy • Prepare operating and capital budget submissions • Provide direction to the Water Wastewater Operations Supervisor and Operators regarding operation and maintenance of the systems which meets or exceeds the requirements of all relevant legislation and regulations, and the City of Port Colborne's policies and procedures • Develops, directs and evaluates inspection and maintenance activities • <u>Responsibilities the same as QMS Representative when Acting QMS Representative</u> 	<ul style="list-style-type: none"> • Make suggestions to improve QMS and Operational Plan • Appoint Primary and Supplemental OIC(s) • Staffing for unionized and non-unionized positions in water and wastewater division • Approval of expenditures beyond the signing authority of the Water Wastewater Operations Supervisor as per corporate purchasing policy • Procurement of resources – staffing and materials in a distribution system emergency • <u>Authorities the same as QMS Representative when Acting QMS Representative</u>

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**Water/Wastewater Operations Supervisor (ORO, Primary OIC)**

<i>Responsibilities</i>	<i>Authorities</i>
<p>The Water Wastewater Operations Supervisor is the ORO for the PCDS and is responsible for the day-to-day operation of the system.</p> <ul style="list-style-type: none"> • ORO duties as described in O. Reg 128/04 • OIC duties as described in O. Reg 128/04 • Ensure the system is operated in accordance with all applicable legislation and regulations • Ensure Water Operators are trained appropriately • Schedule staff • Oversee equipment calibration • Respond immediately and effectively to an emergency • Staff hiring and evaluation • Ensure submission of water samples to accredited laboratory • Ensure that Water Operators remain certified • Participate in Management Review • Participate in Infrastructure Review • Assist with the preparation of operating and capital budget submissions • Development and review of procedures and processes for assuring water quality • Provide direction to Operators with regard to operation and maintenance of the systems which meets or exceeds the requirements of all relevant legislation and regulations, and the City of Port Colborne's policies and procedure • Recommend to the Manager of Water Wastewater ways to improve water quality and operational effectiveness • Ensure scheduled equipment maintenance is performed and output maintained 	<ul style="list-style-type: none"> • ORO authority as described in O. Reg 128/04 • OIC authority as described in O. Reg 128/04 • Delegate or appoint Acting ORO • Review and approve procedures and processes for assuring water quality • Review and approve procedures and processes for assuring water quality • Ensure delivery and quality of maintenance activities • Approval of expenditures as per corporate purchasing policy • Ensure adverse incidents addressed as per legislative requirements • Directs the Water Wastewater Operations Crew Leader and Operators in daily activities • Make suggestions to improve QMS and Operational Plan • Order supplies as needed

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**Water Wastewater Operations Crew Leader (Supplemental OIC, Acting ORO and Acting Primary OIC)**

<i>Responsibilities</i>	<i>Authorities</i>
<p>The Water Wastewater Operations Crew Leader is a licensed Water Operator and OIC on a daily basis.</p> <ul style="list-style-type: none"> • OIC duties as described in O. Reg 128/04 • Responsibilities as above when Acting ORO • See Water Operators for additional responsibilities 	<ul style="list-style-type: none"> • OIC authority as described in O. Reg 128/04 • Authorities as above when Acting ORO • Direct operators in day to day activities • Make suggestions to improve QMS and Operational Plan • See Water Operators for additional responsibilities

Water Operators (Supplemental OICs)

<i>Responsibilities</i>	<i>Authorities</i>
<ul style="list-style-type: none"> • OIC duties as described in O. Reg 128/04 (Class 1 or higher Operators only – OITs ineligible for OIC designation) • Set operational parameters or direct or instruct other operators on same (When Supplemental OICs) • Oversee, monitor and verify the work of contractors installing water services from the watermain to the property line • Drinking water tests • Regular maintenance • Report any incidence of non-compliance • Respond to repairs to the system • Conduct regular checks on monitoring equipment • Input lab and sampling results into WaterTrax • Follow SOPs and QMS requirements • Operate processes and equipment safely, in accordance with manuals • Make adjustments as needed • Complete and maintain records • Use and maintain equipment • <u>Oversee, monitor and verify the work of contractors:</u> <ul style="list-style-type: none"> • <u>hired by the City to install watermains</u> • <u>Conduct sampling to verify disinfection in accordance with watermain commissioning protocol</u> 	<ul style="list-style-type: none"> • OIC authority as described in O. Reg 128/04 (Class 1 or higher Operators only – OITs ineligible for OIC designation) • Make suggestions to improve QMS, SOPs and Operational Plan • <u>Authority to halt construction if the Contractor is not in compliance with any of the relevant specifications and/or procedures</u>

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**Construction Inspector-Engineering Technologist**

<i>Responsibilities</i>	<i>Authorities</i>
<ul style="list-style-type: none"> Oversee, monitor and verify the work of contractors: <ul style="list-style-type: none"> hired by the City to install watermains installing private services/fire lines larger than 3 inches in diameter that connect to the City's distribution system Conduct sampling to verify disinfection in accordance with watermain commissioning protocol 	<ul style="list-style-type: none"> Authority to halt construction if the Contractor is not in compliance with any of the relevant specifications and/or procedures

Facilities Technician- Fluid Mechanical

<i>Responsibilities</i>	<i>Authorities</i>
<ul style="list-style-type: none"> Test backflow devices 	<ul style="list-style-type: none"> Authority to test backflow devices and require repairs if they fail

Environmental Compliance Supervisor (QMS Representative)

<i>Responsibilities</i>	<i>Authorities</i>
<p>The QMS Rep reports the current performance of the QMS to Top Management. In addition to the specific responsibilities outlined in Section 4, the QMS Rep is responsible for:</p> <ul style="list-style-type: none"> Control and maintenance of documents and records Facilitating Top Management reviews and the Risk Assessment process Providing compliance related training to Water/Wastewater staff Ensuring corrective and preventive actions are completed and maintained Developing and maintaining the internal audit program 	<ul style="list-style-type: none"> Report and recommend any resource needs in order to ensure conformance to the QMS Create and update SOPs, make changes to the Operational Plan and QMS as needed. Represent Port Colborne at Regional and Provincial meetings.

Climate Change Coordinator (~~backup QMS Representative~~)

<i>Responsibilities</i>	<i>Authorities</i>
<ul style="list-style-type: none"> Responsibilities as above when Acting QMS Representative 	<ul style="list-style-type: none"> Authorities as above when Acting QMS Representative

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10. Competencies

Personnel competencies are listed in Table 10.1, with additional required knowledge, skills and abilities relevant to specific positions described in corporate job descriptions. Annual training activities are provided to ensure that personnel meet or exceed the minimum standards for annual training and continuing education hours, as established in O. Reg. 128/04, to maintain operator certification. Training is also provided, as required, to ensure other required competencies and certificates (i.e. First Aid) are maintained. All training records are maintained by the QMS Representative in an Excel spreadsheet.

Additionally, personnel receive refresher training in the QMS to ensure that they are aware of the relevance of their duties and how they affect safe drinking water. This training is conducted by the QMS Rep, who maintains records of the training, and is detailed in:

Procedure *QMS-SOP12-1* *Communications*

Training effectiveness is evaluated.

Table 10.1: Competency requirements for personnel whose duties directly affect the PCDS

Position	Required Competencies and Certificates	Desired Competencies*
Water Wastewater Operations Supervisor (Designated ORO, Primary OIC, non-union staff)	<ul style="list-style-type: none"> Class 1 Water License Valid DZ driver's license First Aid/CPR WHMIS Confined space entry QMS Awareness 	<ul style="list-style-type: none"> Information Technology skills Administrative skills
Water Wastewater Operations Crew Leader (Supplemental OIC, Acting ORO and Primary OIC if Supervisor is absent, union staff)		
Water Operators (Supplemental OICs, union staff)		
Construction Inspector <u>Engineering Technologist</u> (union staff)	<ul style="list-style-type: none"> Proficient comprehension of engineering drawings, principles, construction procedures and standards Knowledge of watermain installation & testing requirements in AWWA C651, DWWP, contract documents etc. Class 1 or OIT water license WHMIS QMS Awareness 	

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**Information Technology skills are defined as but not limited to skills dealing with e-mail, spreadsheets and database knowledge. Administrative skills are defined as but not limited to skills dealing with fellow employees, citizens and those contracted by the City. Administrative and Information Technology skills are obtained via practical experience with limited instruction.*

11. Personnel Coverage

The PCDS is staffed regularly Monday to Friday. Hours are 07:00 to 15:00. Schedules are set by the Water Wastewater Operations Supervisor. During regular operating hours, any PCDS issues are initially received by Operations administrative staff, who forward the information to the Water Wastewater Operations Supervisor. The Water Wastewater Operations Supervisor then directs the appropriate personnel to resolve the issue.

The City's PCDS requires minimal staffing during off hours. However, if a situation does arise where more staff is required, the necessary information can be found contained within the On-Call List. Service calls during off hours are received by the On-call Supervisor/Crew Leader via an answering service. Once a call is received and the On-call Supervisor/Crew Leader determines it is a PCDS issue, a call is placed to the On-call Water Operator.

The Water Wastewater Operations Supervisor is the designated ORO for the PCDS. In the event the designated ORO is absent the Acting ORO is the Water Wastewater Operations Crew Leader, as indicated in Table 10.1 above, and detailed in:

Port Colborne Distribution System Emergency Preparedness Plan

In the event of a personnel shortage, coverage is achieved as detailed in:

Procedure QMS-SOP11-1 Personnel Shortage Contingency Procedure

12. Communications

The QMS is communicated from Top Management to the Owner, OA personnel, suppliers and the public through a variety of methods, which have been detailed in:

Procedure QMS-SOP12-1 Communications

13. Essential Supplies and Services

Where applicable, supplies shall adhere to AWWA and ANSI standards. All laboratory analysis shall be conducted by accredited, licensed laboratories.

The water supply inventory is set with ordering points determining when supplies are ordered, and the quantity required. Received orders are visually checked against the packing slip and then the packing slip is checked against the purchase order. The Water Wastewater Operations

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Supervisor shall further verify any ordered material that requires knowledge of water industry terminology.

PCDS supplies are available 24 hours a day, 7 days a week in the Stores Department at the Engineering and Operations Centre.

Supplies and services considered essential for the delivery of safe drinking water, and the procedure by which the City ensures their quality are detailed in:

Procedure QMS-SOP13-1 Essential Supplies and Services

14. Review and Provision of Infrastructure

The City reviews the PCDS infrastructure once every calendar year to ensure the adequacy of the infrastructure necessary to operate and maintain the PCDS. The procedure for the review is detailed in:

Procedure QMS-SOP14-1 Review and Provision of Infrastructure

15. Infrastructure Maintenance, Rehabilitation and Renewal

The City addresses infrastructure maintenance, rehabilitation and renewal programs through three methods: planned maintenance, unplanned maintenance and renewal and rehabilitation. These activities are detailed in:

Procedure QMS-SOP15-1 Infrastructure Maintenance and Replacement

16. Sampling, Testing and Monitoring

Sampling, testing and monitoring activities are conducted throughout the PCDS and are conducted in accordance with O.Reg 170/03 and as per:

Procedure QMS-SOP16-1 Sampling, Testing and Monitoring

17. Measurement and Recording Equipment Calibration and Maintenance

Measuring and recording equipment used to monitor the quality of water includes but is not limited to:

- Colorimeter
- pH meter
- turbidity meter

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This equipment is calibrated and maintained on a regular basis, as detailed in:

Procedure QMS-SOP17-1 Control of Monitoring and Measuring Devices

18. Emergency Management

Some emergency situations/service interruptions that could occur include, contamination, transmission line or major watermain breaks, or interruptions in pressure. The Risk Assessment Outcomes in Section 8 can be referenced for emergency procedures or contingency plans. Specific responses for drinking water system emergencies and training requirements are detailed in:

Port Colborne Distribution System Emergency Preparedness Plan

In addition to the above, the City has an Emergency Plan in accordance with prevailing legislation and regulations which is updated annually. The Director of Public Works maintains a copy of the corporate Emergency Plan in their office, located at the Engineering and Operations Centre.

The responsibilities of all positions within the municipality during an emergency are listed in the Emergency Plan, as is the emergency communication protocol.

19. Internal Audits

The QMS Rep ensures that all elements of the QMS are audited within the three (3) year audit cycle, with specific processes audited once every calendar year, to evaluate conformity to the DWQMS. Internal audit criteria, frequency, scope, methodology and recordkeeping requirements are detailed in:

Procedure QMS-SOP19-1 Internal Audit

20. Management Review

Management reviews are conducted once every calendar year to evaluate the continuing suitability, adequacy and effectiveness of the QMS and considers information from a variety of sources, including internal and external audit findings. Details regarding the information to be used by management to review the QMS are provided in:

Procedure QMS-SOP20-1 Management Review

21. Continual Improvement

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The City shall strive to continually improve the effectiveness of the QMS through the results of internal audits, external audits, risk assessment reviews, infrastructure reviews, management reviews and through the consideration of best management practices at least once every thirty-six (36) months. Additionally, staff suggestions and comments from the public may also be used to continually improve the QMS.

The use of corrective and/or preventive actions to generate continual improvement opportunities is detailed in:

Procedure QMS-SOP21-1 Corrective Action and Continual Improvement

C. RELATED DOCUMENTS AND RECORDS

Procedures:

QMS-SOP05-1	Document and Record Control Procedure
QMS-SOP07-1	Risk Assessment Procedure
QMS-SOP11-1	Personnel Shortage Contingency Procedure
QMS-SOP12-1	Communications Procedure
QMS-SOP13-1	Essential Supplies and Services Procedure
QMS-SOP14-1	Review and Provision of Infrastructure Procedure
QMS-SOP15-1	Infrastructure Maintenance and Replacement Procedure
QMS-SOP16-1	Sampling, Testing and Monitoring Procedure
QMS-SOP17-1	Control of Monitoring and Measuring Devices Procedure
QMS-SOP18-1	Provision of Drinking Water in a Distribution System Emergency
QMS-SOP19-1	Internal Audit Procedure
QMS-SOP20-1	Management Review Procedure
QMS-SOP21-1	Corrective Action and Continual Improvement Procedure

Operational Procedures:

SOP	C1	Adverse Drinking Water Quality Incident Notification – Port Colborne Distribution System and Sherkston Community Centre
SOP	C2	Repair of Watermain Breaks
SOP	C5	Corrective Action for Adverse Water Quality – Distribution System

QMS Policy

Port Colborne Distribution System Emergency Preparedness Plan
Port Colborne Distribution System Operations and Maintenance Manual
Port Colborne Emergency Plan

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APPENDIX 1
QUALITY POLICY
QMS-PP



PORT COLBORNE

The City of Port Colborne owns, operates and maintains the Port Colborne water distribution system.

The City of Port Colborne is committed to **CLEAN** drinking water.

Consistent compliance with legislation

Listening and communicating with the public regarding safe drinking water

Establishing a Quality Management System that is always improving

Allowing only the safest water to reach your tap

Necessity of life, of the highest quality

APPENDIX 2
COUNCIL ENDORSEMENT

APPENDIX 3

**TABLE 8.1: Distribution System Risk Assessment Outcomes
QMS-OPA3**

Table 8.1: Distribution System Risk Assessment Outcomes – October 26, 2022

Hazardous Event	Hazard	Hazard Type	Preventive Measure	Control Measure	Mitigating Processes/Procedure	Likelihood	Consequence	Responsiveness	Hazard Total (CCP Threshold =7)	Critical Control Point (CCP)?	Critical Control Limits (CCL)
Category 1 Main Break	Loss of pressure Quality/Quantity Contamination	Physical/ Biological	Water Main Replacement Program, valve turning program	Sampling after repair, up and downstream of break, following Provincial Watermain Disinfection Procedure	Annual Infrastructure Review process to identify priority replacements; identify breaks in timely manner; sample to ensure adequate chlorine residuals are maintained. Refer to Repair of Watermain Breaks (SOP C2)	5	1	1	6	Yes	Free Chlorine Residual 0.20 mg/L
Category 2 Main Break				Mechanical cleaning, sampling after repair, up and downstream of break, following Provincial Watermain Disinfection Procedure		4	2	1	9	Yes	Free Chlorine Residual 0.20 mg/L
Special Contamination Main Break				Development and implementation of site specific procedures, approved by the local Ministry office and Medical Officer of Health, as per the Provincial Watermain Disinfection Procedure		1	3	3	6	Yes	Free Chlorine Residual 0.20 mg/L
Chlorine Residual \leq <u>CCL</u>	Contamination	Biological/ Physical	Automatic/manual flushing in areas of concern	Monitoring free chlorine levels throughout WDS weekly	Flush system and resample. If still outside the CCL, continue flushing and re-sampling until adequate levels achieved. If cannot get appropriate residuals, investigate possible cause. If falls below 0.05 mg/L initiate reporting as per Adverse Drinking Water Quality Incident Notification – Port Colborne Distribution System (SOP C1) and corrective action as per Corrective Action for Adverse Water Quality – Distribution System (SOP C5) procedures	5	2	1	11	Yes	Free Chlorine Residual 0.20 mg/L

Hazardous Event	Hazard	Hazard Type	Preventive Measure	Control Measure	Mitigating Processes/Procedure	Likelihood	Consequence	Responsiveness	Hazard Total (CCP Threshold =7)	Critical Control Point (CCP)?	Critical Control Limits (CCL)
Cross Connection/ Backflow - ICI	Contamination	Chemical/ Biological	Future Backflow Prevention Program and Backflow Prevention Bylaw	Building Code requirements for new Industrial/Commercial builds	Refer to Port Colborne Distribution System Emergency Preparedness Plan – section 4.5 Suspected Backflow or Back Siphonage. Plumbing Permits	1	4	3	7	Yes	Free Chlorine Residual <u>0.20 mg/L</u>
			Installation of backflow prevention devices on City facilities and on all temporary connections to distribution system	Devices tested annually; devices for temporary connections tested before use	Watermain Commissioning Protocol (QMS-WCP) and Provincial Watermain Disinfection Procedure specifies requirement for backflow protection; contractors required to state methodology in their Commissioning Plan						
Cross Connection/ Backflow - Residential			Plumbing inspections during building permit process	Building Code requirements for certain plumbing installations (i.e. external hose bibbs)	Refer to Port Colborne Distribution System Emergency Preparedness Plan – section 4.5 Suspected Backflow or Back Siphonage. Plumbing Permits	1	2	3	5		
Improper construction/ commissioning of new watermain	Contamination	Biological	Construction Inspector On-site; Provincial Watermain Disinfection Procedure	New Water Main Testing before put into service	Re-charge watermain as required to maintain chlorine levels and/or to achieve effective disinfection as evidenced by sample analysis results Watermain Commissioning Protocol (QMS-WCP) Provincial Watermain Disinfection Procedure	1	2	1	3	Yes	Free Chlorine Residual as dictated by AWWA C651; microbiological samples meet provincial standards
Submerged air release valves	Contamination	Chemical Biological	All new valves come with flood-safe system	None	If contamination from a submerged ARV is suspected to have occurred, would treat as a backflow/back siphonage and refer to Port Colborne Distribution System Emergency Preparedness Plan – section 4.5 Suspected Backflow or Back Siphonage	1	4	2	6	No	
Illegal hydrant use/tampering	Contamination/ Loss of pressure	Biological Chemical Physical	Use a key lock system on municipal hydrants where history of issues	Ensure key locks are in place	All hydrants inspected during annual hydrant flushing activities and any deficiencies reported and corrected	4	2	1	9	No	
Vandalism	Loss of pressure Quality/Quantity Contamination Unable to distribute	Biological Chemical Physical	None	N/A	Refer to Port Colborne Distribution System Emergency Preparedness Plan – section 4.4: Suspected Tampering of Distribution System	1	2	2	4	No	

Hazardous Event	Hazard	Hazard Type	Preventive Measure	Control Measure	Mitigating Processes/Procedure	Likelihood	Consequence	Responsiveness	Hazard Total (CCP Threshold =7)	Critical Control Point (CCP)?	Critical Control Limits (CCL)
Terrorism	Loss of pressure Quality/Quantity Contamination Unable to distribute	Biological Chemical Physical	None	N/A	Refer to Port Colborne Distribution System Emergency Preparedness Plan – section 4.4: Suspected Tampering of Distribution System	1	4	3	7		
Staff Shortage	Loss of staff	Biological Chemical Physical	Certified management staff, approved contractors, Regional personnel backup, Member of ONWarn	N/A	Refer to Personnel Shortage Contingency procedure (QMS-SOP11-1)	2	3	1	7	No	
Disruption in water supply from Regional facilities/ trunk lines	<u>Sustained pressure loss,</u> Quality/Quantity, Contamination, Water supply <u>shortfall/Chemical spill impacting source water, cybersecurity</u>	Biological Chemical Physical	None	None	Refer to Disrupted Water Supply procedure (QMS-SOP18-1)	3	4	5	17	No	
Long term impacts of Climate Change	Thermal - Severe temperature variations/ Sustained extreme temperatures	Biological, Physical	None	N/A	Follow best practices for advanced construction techniques	2	3	2	8	No	
	Hydraulic - External pipe pressures	Physical, Biological	None	N/A	Refer to Port Colborne Distribution System Emergency Preparedness Plan	1	3	2	5	No	
	Physical - Extreme Weather/ Geological Events	Physical, Biological, Chemical	None	N/A		1	4	4	8	No	
<u>Cybersecurity threats</u>	<u>Loss of data and records</u>	<u>physical</u>	<u>Backing up data, records and having paper copies</u>		<u>City is backing up data using industry best practices, corporate training</u>	1	1	1	2		

Rating System			
Rating	Likelihood	Consequence	Responsiveness
1	Rare	Insignificant	Excellent
2	Unlikely (<once per 5-10 years)	Minor	Very Good
3	Possible (=>once or more per 2-5 yrs)	Moderate	Good
4	Likely (=>one or more per year)	Major	Fair
	Very Likely (=>monthly or quarterly)	Catastrophic	Poor

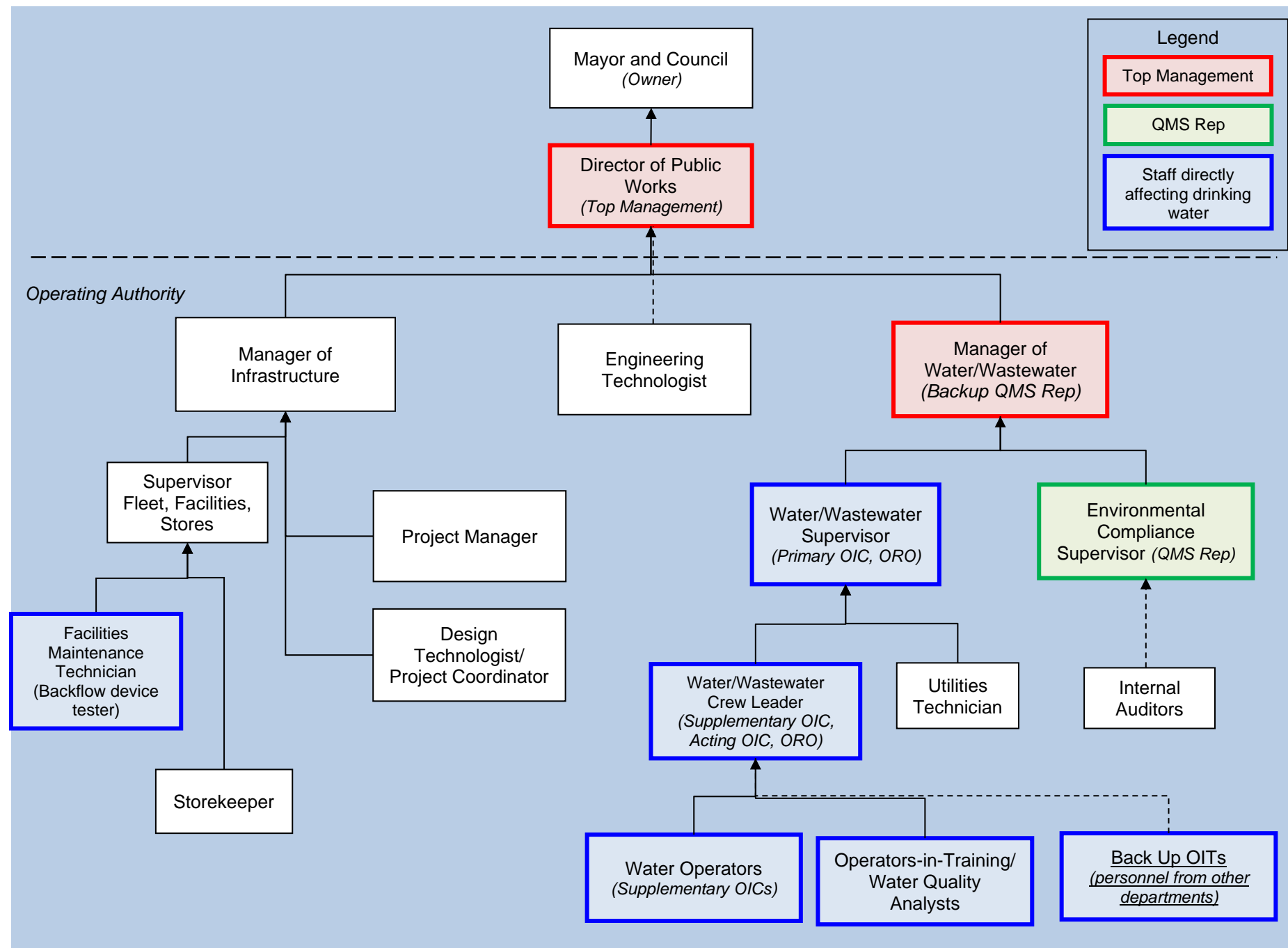
Risk	
Hazard Calculation	Category
2-3	Very Low
4-6	Low
7-14	Moderate
15-30	High

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APPENDIX 4

**Figure 9.1: Drinking Water Responsibilities Organizational Chart
QMS-OPA4**

Figure 9.1: Drinking Water Responsibilities Organizational Chart – March 2023



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APPENDIX 5

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

Fields marked with an asterisk (*) are mandatory.

Owner of Municipal Residential Drinking Water System *
[The Corporation of the City of Port Colborne](#)

Subject Systems

Name of Drinking Water System (DWS) *	Licence Number *	Name of Operating Subsystems (if applicable)	Name of Operating Authority *	DWS Number(s) *
1. Port Colborne Distribution System	073-101		City of Port Colborne	260001643

Contact Information for Questions Regarding the Operational Plan

Primary Contact

Last Name *	First Name *	Middle Initial
Banting	Cassandra	
Title *	Telephone Number *	Email Address *
Environmental Compliance Supervisor	905-835-2900 ext. 250	cassandra.banting@portcolborne.ca

Secondary Contact

Last Name	First Name	Middle Initial
Suddard	Darlene	
Title	Telephone Number	Email Address
Manager of Water/Wastewater	905-835-2900 ext. 256	darlene.suddard@portcolborne.ca