



Drinking Water Quality Management System

Operational Plan

for

Richmond Hill Distribution System





Richmond Hill Drinking Water

City of Richmond Hill
QMS Operational Plan 7.0

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*The *Safe Drinking Water Act, 2002*, requires the inclusion of Schedule "C" from the Director's Directions in all Operational Plans.

1.0 Quality Management System

1.1. Requirement

Element 1 of the Drinking Water Quality Management Standard (DWQMS) version 2 (April 6 ,2017) requires the City of Richmond Hill (“the City”) to establish and maintain a **Quality Management System (QMS)** that conforms to the standard, and to document this QMS in an Operational Plan.

1.2. Operational Plan

This document is the City’s Operational Plan for its drinking water QMS. It provides a short summary of the system that describes how the QMS meets the requirements of the DWQMS. More detailed QMS documents, such as Element Procedures, and Standard Operating Procedures, can be appended as required.

The Operational Plan is the primary instrument for communicating the City’s QMS from staff to Council, and from Council to Ontario’s Ministry of Environment, Conservation and Parks (“the Ministry”) and to the Richmond Hill public. It is endorsed by QMS Top Management and City Council, accredited by a provincially-appointed Accreditation Authority and approved by the Ministry.

1.3. Scope

a. Drinking Water System

The City owns a stand-alone drinking water distribution system. This system receives potable water at transfer points from York Region watermains and distributes it to service connections for customer consumption and to hydrants for fire protection. Quality Management System policies and procedures govern those activities and services performed by the City, as the system’s operating authority, that relate to drinking water.

The City’s Community Services Department, Public Works Division, maintains a network of watermains and related valves, hydrants and meters. Trained and certified Public Works staff perform preventative and operational maintenance on this infrastructure, and take regular water samples for lead, chlorine residual, disinfection by-product, and microbiological testing. Staff from the Planning and Infrastructure Department design and construct new watermains as part of an ongoing Capital Replacement program. Watermains added as part of new subdivision development are reviewed and approved by the Planning and Infrastructure Department. Municipal Inspectors ensure all applicable standards are met when new watermains are connected to the existing network.

b. Personnel

The DWQMS prescribes roles and responsibilities for the drinking water system owner and operating authority, including Top Management. Accordingly, the scope of the City of Richmond Hill’s QMS extends to the following:

- City of Richmond Hill Council (System Owner)
- Community Services (CS) Department– Public Works Operations Division

- Planning and Infrastructure Services (PIS) Department – Infrastructure Delivery Division (Project Managers-Capital Infrastructure and Municipal Inspections)
- QMS Top Management:
 - Commissioner of Community Services Department
 - Director Public Works Operations
 - Director Infrastructure Delivery
 - Manager Water & Wastewater
 - Manager Design and Construction
 - Manager Capital Infrastructure Planning & Project Management Office (PMO)
 - QMS Program Coordinator

1.4. Documentation

The QMS Policy and Operational Plan are public documents that set broad commitments and establish the framework for Richmond Hill's QMS. Internal documents such as procedures, tables, and forms are organized into three levels and are located and coded according to the format below:

- a. EP (Element Procedure) – correspond to the 'plan' requirements of the DWQMS and demonstrate how the QMS conforms to the provincial standard. Reviews and outcomes required by certain Element Procedures are included as attachments to those procedures. Element procedures are coded as EP-DW-1
- b. SOP (Standard Operating Procedure) – umbrella document for a category of work activities, coded as SOP-DW-4. Standard operating procedures are made up of various specific work instructions, coded as WI-DW-4.1.
- c. Records and other documents – forms and work orders used to capture output of an activity, these are not coded.

1.5. Associated Documents

- WI-DW-4.3 *Operational Plan*

2.0 QMS Policy

2.1 Requirement

Element 2 of the DWQMS requires the inclusion of a QMS Policy in the Operational Plan. The Policy must be appropriate for the size and type of drinking water system, and must state commitments to:

1. maintain and continually improve a QMS
2. provide safe drinking water to the consumer
3. comply with all applicable legislation and regulations

The Policy must also be accessible to all QMS personnel, Council, and the public.

2.2 QMS Policy

The QMS Policy is developed by the QMS Team and approved by QMS Top Management before being communicated to Council. The Policy is reviewed on an annual basis to ensure accuracy and currency, and revised as needed. It is available to all Staff electronically through RHLINK (rhlink.richmondhill.ca), and to the public through the City's website and City facilities.

Appendix 'A' contains *Richmond Hill's Drinking Water QMS Policy*.

2.3 Associated Documents

None

3.0 Commitment and Endorsement

3.1 Requirement

Element 3 of the DWQMS requires written endorsement of the Operational Plan from QMS Top Management and Council. As well, it requires Top Management to ensure a QMS is in place, ensure QMS personnel are aware of applicable legislative and regulatory requirements, communicate the QMS as required, and determine, obtain or provide resources to maintain and continually improve the QMS.

3.2 Top Management Commitment and Endorsement

Top Management must sign and date a Commitment and Endorsement form that clearly expresses endorsement of the Operational Plan and commitment to fulfilling its requirements. Evidence of this commitment is achieved primarily through the Management Review process, and by appointing and supporting a QMS Representative.

- a. Top Management shall ensure the QMS is in place and in conformance with the provincial standard through *EP-DW-7 Management Review*.
- b. Top Management shall ensure appropriate personnel are aware of all applicable legislative and regulatory requirements through Operational Plan Element 4: *QMS Representative*.
- c. Top Management shall communicate the QMS according to *Operational Plan Element 12: Communications*.
- d. Top Management shall, to the best of its ability and subject to budget approval, determine, maintain, or provide the necessary resources for maintaining and continually improving the QMS through *EP-DW-7 Management Review*.

Appendix 'B' contains *Top Management endorsement of the Operational Plan*.

3.3 Council Endorsement

Council receives the Plan or its updates through an annual staff report, and endorses it by enacting a confirmatory by-law as contained in official Council meeting minutes. The QMS Representative shall ensure Council endorsement is received for the most current Operational Plan following changes in Council due to elections or otherwise.

Appendix 'C' contains *Council endorsement of the Operational Plan*.

3.4 Associated Documents

- WI-DW-4.2 *Reports to Council*
- WI-DW-4.3 *Operational Plan*

4.0 QMS Representative

4.1 Requirement

Element 4 of the DWQMS requires Top Management to appoint and authorize a QMS Representative to carry out the following:

- Administer the Quality Management System by ensuring that applicable processes and procedures are established and maintained;
- Report QMS performance and need for improvement to Top Management;
- Ensure the use of the most current versions of QMS documents;
- Ensure personnel are aware of applicable legislative and regulatory requirements;
- Promote awareness of the QMS throughout the Operating Authority.

The QMS Representative must be identified in the Operational Plan.

4.2 QMS Representative

Top Management ensures a QMS Representative is in place to manage the QMS. A full-time, permanent position within the Public Works Division, titled 'QMS Program Coordinator', has been created and approved to fulfill the QMS Representative duties. A Top Management member must sign and date a form confirming the appointment. Upon a vacancy in this position the Manager of Water and Wastewater will fulfil the QMS Representative duties until the position is fill.

Appendix 'D' contains the signed *QMS Representative Appointment and Authorization form*.

4.2.1 Responsibilities of the QMS Representative

- a. The QMS Representative shall establish system procedures ('Elements') and ensure standard operating procedures and associated forms/work orders are in place to meet DWQMS requirements.
- b. The QMS Representative shall maintain applicable QMS documents and records and ensure their currency and accuracy by following *EP-DW-1* and *EP-DW-2*.
- c. On an annual basis, the QMS Representative shall report to Top Management on QMS performance and any need for improvement by following *EP-DW-7 Management Review*.
- d. The QMS Representative shall ensure that appropriate personnel are aware of all applicable legislative and regulatory requirements through staff meetings and other communications as needed.

- e. The QMS Representative shall promote QMS awareness to department staff, including the role of the QMS Representative, through training and awareness activities as described in *Operational Plan Element 10: Competencies*.

4.3 Associated Documents

- None

5.0 Document and Records Control

5.1 Requirement

Element 5 of the DWQMS requires a procedure for document and record control that describes how documents and are kept current, and how documents and records are kept legible and identifiable, retrieved, stored, protected, retained and disposed of.

5.2 Document Control

All required QMS documents are controlled and stored on the City's network server and are accessible through the City's RHLink website, which permits read-only access.

Documents are kept current through periodic review process led by the QMS Representative. All QMS personnel within the CS & PIS Departments can access and request changes to documents through the QMS Representative. The QMS Representative maintains the master copy of all QMS documents. Once printed, all QMS documents become 'uncontrolled'.

5.3 Records Control

Electronic records are stored, managed and maintained in the following applications: WaterTrax (water quality), Maximo (water maintenance) and other software applications.

Hard-copy records are stored, managed and maintained by Public Works personnel or the Municipal Offices File Clerk using the City's ATRIUM records management system. All record keeping is in accordance with *Chapter 290 Record – Retention – Destruction* of the *Richmond Hill Municipal Code*. Retention and disposal practices comply with applicable provincial legislation. In addition, pdf copies of records are maintained in chronological order in the City's network server.

5.4 Associated Documents – Document Control

- EP-DW-1 *Control of Documents*
 - Attachment 2: Release of New and Revise Documents using RHLink website
 - Attachment 2: *External Document Control*

5.5 Associated Documents – Records Control

- EP-DW-2 Control of Records
 - Attachment 1: *WaterTrax Security Features*
- WI-DW-4.1 *Record Keeping*

6 Drinking Water System Description

6.1 Requirement

Element 6 of the DWQMS requires a description of the City's drinking water system, including treatment processes and distribution components, as well as a process flow chart and summary descriptions of any connected drinking water systems.

6.2 Drinking Water System Description and Flow Chart

Appendix 'E' contains the *Drinking Water System Description and Flow Chart*.

7.0& 8.0 Risk Assessment & Risk Assessment Outcomes

7.1/8.1 Requirement

Element 7 of the DWQMS requires the City to document a risk assessment process and to conduct a risk assessment accordingly. Risk assessments must be conducted every three years, and consider the reliability and redundancy of equipment. In addition, on an annual basis the currency of the information and the validity of the assumptions must be reviewed.

Elements 8 of the DWQMS requires the City to document the outcomes of the risk assessment, including procedures for monitoring Critical Control Limits, and for responding to, reporting and recording deviations from Critical Control Limits.

7.2/8.2 Risk Assessment Process

The City of Richmond Hill manages risk to its drinking water system through proactive planning and preventative measures. The QMS Risk Assessment identifies and ranks potential hazards and events, referencing existing procedures to monitor limits and measures to prevent, mitigate, or respond to hazards. As well, it defines Critical Control Limits and Critical Control Points where required. The Risk Assessment process reveals gaps where no measures exist to address certain risks, providing direction for future improvement. Top Management annually reviews the currency of outcomes and the validity of the process as part of Management Review.

7.3/8.3 Risk Assessment Outcomes

The QMS Team conducts a risk assessment for the City's drinking water system once every three years. Risk Assessment outcomes are recorded and communicated to Top Management through the Management Review process.

7.4/8.4 Associated Documents

- EP-DW-3 *Risk Assessment and Risk Assessment Outcomes*
 - Attachment 1: *Potential Hazardous Events Table*
 - Attachment 2: *High Risk Table*
- WI-DW-4.5 *Risk Assessment*

9.0 Organizational Structure, Roles, Responsibilities and Authorities

9.1 Requirement

Element 9 of the DWQMS requires a description of the organizational structure of the Operating Authority that includes roles, responsibilities, and authorities. Owner, Top Management, and those responsible for Management Review must also be identified.

9.2 Owner

The City of Richmond Hill, as represented by Council, is identified as 'Owner' of the drinking water system. Council assumes Owner responsibilities and authorities outlined in the *Safe Drinking Water Act, 2002* and the DWQMS. These include:

- ensuring the Operating Authority is accredited
- endorsing and submitting the Operational Plan to the Ministry
- applying for the Municipal Drinking Water Licence & Drinking Water Works Permit
- developing and submitting Financial Plans to the Ministry of Municipal Affairs and Housing

9.3 Operating Authority

The City of Richmond Hill, as represented by the Public Works Operations Division of the Community Services Department, is identified as the Operating Authority. Public Works Certified Operators maintain and operate the drinking water system, and ensures an "Overall Responsible Operator" (ORO) is available at all times to provide direction and to lead emergency response.

QMS Top Management is composed of Operating Authority administrators, and is responsible for ensuring the QMS is established and maintained. Top Management must endorse the Operational Plan before it is submitted to Council and the Ministry.

Appendix 'F' contains the *QMS Organizational Chart and the table of Roles, Responsibilities, Authorities, and Competencies*

9.4 Associated Documents

- None

10.0 Competencies

10.1 Requirement

Element 10 of the DWQMS requires documentation of competencies for drinking water personnel, and of activities for developing and maintaining these competencies and for ensuring personnel are aware of the relevance of their duties. It also requires that competencies are achieved and records of the activities are maintained.

10.2 Competencies

The outcomes of this Element are identified competencies (knowledge, skills, and abilities), training needs and training activities for all Operating Authority personnel whose duties directly affect drinking water quality. The QMS Representative ensures applicable training and certification requirements are met.

Appendix 'F' contains the *QMS Organizational Chart and the table of Roles, Responsibilities, Authorities, and Competencies*

10.3 Associated Documents

- WI-DW-4.7 *Operator Training and Certification*
 - Attachment 1: *Work Duties Training Log*

11.0 Personnel Coverage

11.1 Requirement

Element 11 of the DWQMS requires a procedure for ensuring sufficient trained personnel are available to maintain the City's drinking water system.

11.2 Personnel Coverage

The Public Works Division ensures that a Certified Operator is always available to operate the City's drinking water system. Administrative staff is available on-call and to fill in for each other to ensure respective duties can be fulfilled. The department maintains a strike plan in the case of a walkout by union staff, whereby non-unionized staff and contractors assume union duties. A 'mutual assistance' agreement between Richmond Hill and neighbouring municipalities makes additional resources (equipment, staff) available in emergency situations. Element 11 is reviewed annually to ensure personnel coverage is sufficient.

11.3 Procedure

- a. The QMS Representative shall consult with Supervisors and Manager of Water & Wastewater to determine how sufficient personnel coverage for drinking water operations is achieved. Personnel coverage is determined by adhering to the most up to date stand-by list and considering:
 - the roles, defined in *QMS Roles, Responsibilities and Authorities Table*, critical for maintaining the delivery of safe drinking water, including, Overall Responsible Operator, regular staff, on-call personnel, and union staff
 - normal (regular shifts with full staff) and extraordinary circumstances (emergencies, union walkouts, staff shortage, etc.)
 - the availability of personnel to ensure key responsibilities under each role can be fulfilled in both normal and extraordinary circumstances
 - who sets the schedule
 - rationale for contacting personnel

- response times for contacting personnel
 - SCADA or other monitoring; off-site checks
- b. In the event that personnel coverage is deemed insufficient, the Manager of Water & Wastewater is responsible for investigating and implementing options for increasing coverage to an adequate level.

Appendix 'G' contains the *QMS Personnel Coverage Table*.

11.4 Associated Documents

- None

12.0 Communications

12.1 Requirement

Element 12 of the DWQMS requires a procedure for communications between Top Management and Council, Operating Authority, suppliers and the public.

12.2 Procedure

The QMS Representative shall facilitate required communication between Top Management and Council, department personnel, suppliers, and the public in the following ways:

- a. Top Management and Council
 - Formal communication is achieved through preparing and submitting Staff Reports to Council on a regular and as-needed basis
 - Informal communication occurs between the Commissioner of Community Services and Council at regular Council meetings and through personal correspondence
- b. Top Management and Operating Authority personnel
 - The Drinking Water QMS Policy is posted at City facilities and is available electronically on the City's website.
 - The QMS Representative facilitates communication between Department personnel and Top Management at least once every calendar year through Management Review meeting, as detailed in EP-DW-7: *Management Review*.
 - Management and staff meet regularly through Department Meetings, and Manager/Staff, Manager/Supervisor, and Supervisor/Staff Meetings.
 - Relevant QMS information is delivered through staff meetings.
 - Informal communication occurs on an as-needed basis through emails, written memos, phone calls, bulletin boards, informal meetings, etc.
 - Managers and staff can communicate in the form of non-conformance reports and opportunities for improvement, corrective and preventive actions, and document change requests.

- c. Top Management and Suppliers
 - Regular meetings (pre-construction, progress, etc.)
 - Informal 'field' communications (inspectors and other City staff)
 - Contract documents, RFQ's, tenders, information packages
 - City of Richmond Hill QMS Contractors and Suppliers Responsibilities Package
 - City of Richmond Hill Design Standards and Specifications Manual
 - d. Top Management and the Public
 - The QMS Policy is accessible to the public through postings at City facilities, and is available electronically on the City's website.
 - Drinking water information with public relevance is communicated through the local Richmond Hill newspaper (The Liberal).
 - The City's website contains pertinent drinking water information and is regularly updated with important notices and changes.
 - The Operational Plan and Annual Water Quality Report are available to the public through the City's website and upon request from the Community Services Dept.
 - The Public communicates with Top Management through calling Access Richmond Hill, customer inquiries & complaints and their resolution are logged using the appropriate work order as detailed in WI-DW-5.3 Water Quality Inquiries and Complaints.
 - Customer inquiries and complaints are communicated to Top Management under Consumer Feedback during the Management Review.
- 12.3 Associated Documents
- EP-DW-7 *Management Review*
 - WI-DW-4.2 *Reports to Council*
 - WI-DW-5.3 *Water Quality Inquiries and Complaints*

13.0 Essential Supplies and Services

13.1 Requirement

Element 13 of the DWQMS requires identification of all essential supplies and services, and a procedure for ensuring procurement and quality of each supply or service.

13.2 Essential Supplies and Services

Supplies and services deemed essential for the City to deliver safe drinking water to Richmond Hill consumers are identified within EP-DW-4 *Essential Supplies and Services*. This list includes alternate or contingent contacts (where possible) to ensure essential supplies and services can be procured whenever necessary.

Quality requirements for supplies and services are determined through provincial regulations, City standards, and industry best practices. Quality requirements are ensured through the City's purchasing practices, which are subject to Purchasing By-Law No.113-16.

13.3 Associated Documents

- EP-DW-4 *Essential Supplies and Services*
 - Attachment 1: *QMS Essential Suppliers and Services Table*
 - Attachment 2: *QMS Essential Supplies List*
 - Attachment 3: *QMS Contractors and Suppliers Responsibilities Package*

14.0 Review and Provision of Infrastructure

14.1 Requirement

Element 14 of the DWQMS requires a procedure for the annual review of drinking water infrastructure. The outcomes of this review must be communicated to Council.

14.2 Infrastructure Review

The Public Works Division on an ongoing basis through maintenance management data tracking assesses the immediate status and adequacy of Richmond Hill's drinking water infrastructure. Resource requirements for maintaining adequacy are determined and communicated annually through the budget process.

Applicable sections within CS and PIS Departments annually update the Ten-Year Capital Forecast for Roads, Water and Wastewater, which establishes future infrastructure needs based on factors such as population growth, break rates, and material aging. This program is communicated to Council through the budget process.

14.3 Associated Documents

- EP-DW-5 *Infrastructure*

15.0 Infrastructure Maintenance, Rehabilitation and Renewal

15.1 Requirement

Element 15 of the DWQMS requires a summary of infrastructure maintenance, rehabilitation and renewal programs. The Operating Authority is required to keep this summary current, communicate it to Council, and monitor the effectiveness of its maintenance program.

15.2 Infrastructure Maintenance, Rehabilitation and Renewal Programs

The Public Works Division performs scheduled and unscheduled/emergency maintenance and rehabilitation on the City's drinking water infrastructure. Maintenance and rehabilitation activities are planned and tracked using maintenance management software. The Infrastructure Delivery Division also participates in rehabilitation activities, depending on the nature of the project, and are responsible for infrastructure renewal and replacement under the Ten-Year Capital Forecast for Roads, Water and Wastewater Program. Infrastructure maintenance, rehabilitation and renewal programs are summarized and communicated to Council through the QMS Annual Report.

15.3 Associated Documents

- EP-DW-5 *Infrastructure*
 - Attachment 1: *Infrastructure Process Flow Chart*
 - Attachment 2: *QMS Infrastructure Maintenance Rehabilitation and Renewal Programs*
 - Attachment 3: *QMS Infrastructure Maintenance, Rehabilitation and Renewal Responsibilities*

16.0 Sampling, Testing and Monitoring

16.1 Requirement

Element 16 of the DWQMS requires a procedure for process control that details sampling, testing and monitoring requirements and activities, and how results are communicated to Council. Relevant upstream sampling, testing and monitoring activities must also be described.

16.2 Sampling, Testing and Monitoring

The Public Works Division maintains procedures for sampling, testing, and monitoring activities required under provincial legislation and regulations. These procedures are developed for both normal and unscheduled/emergency conditions, and staff are trained accordingly. Outcomes from these activities are communicated to Council through the Annual and Summary Reports as required by O. Reg. 170/03. Upstream sampling, testing and monitoring activities are performed by the City of Toronto and the Regional Municipalities of Peel and York. Details and outcomes of these activities are available through respective annual/summary reports.

16.3 Associated Documents

- WI-DW-3.1 *Water Samples*
- WI-DW-3.2 *Residual Chlorine Monitoring*
- WI-DW-3.4 *Adverse Water Quality Reporting – Large Drinking Water System*
- WI-DW-3.5 *Trihalomethanes*
- WI-DW-3.6 *Lead Samples (pH & Turbidity)*
- WI-DW-3.10 *Halo-acetic Acids*
- WI-DW-3.11 *Nitrosodimethylamine*
- WI-DW-4.2 *Reports to Council*
- WI-DW-5.3 *Water Quality Inquiries and Complaints*

17.0 Equipment Calibration and Maintenance

17.1 Requirement

Element 17 of the DWQMS requires a procedure for the calibration and maintenance of measurement and recording equipment.

17.2 Equipment Calibration and Maintenance

Applicable standard operating procedures contain instructions for calibration and maintenance of measurement and recording equipment. Calibration and maintenance is performed either in house or by the manufacturer or contractor, in accordance with relevant legislative requirements and/or manufacturers' specifications.

17.3 Associated Documents

- WI-DW-6.1 *HACH Equipment Calibration and Inspection*
- WI-DW-6.2 *Confined Space Entry Equipment Certification*

18.0 Emergency Management

18.1 Requirement

Element 18 of the DWQMS requires a procedure for maintaining a state of emergency preparedness that identifies potential emergencies and covers response and recovery, training and testing, responsibilities, and communications.

18.2 Emergency Management

The City of Richmond Hill, through its QMS Risk Assessment identifies and documents potential emergency situations that might ultimately impact drinking water safety. Preventive, response and recovery measures are identified for each type of emergency, and described in applicable procedures.

Response and recovery measures are initiated when adverse water conditions are detected. Internal procedures contain communications protocols, departmental and corporate roles and responsibilities, contact lists, and where appropriate references to the Corporate *Emergency Plan*. An inter-municipal communications procedure contains instructions for reporting adverse conditions between connected drinking water systems.

Staff are trained to deal with emergencies and to follow applicable procedures in accordance with provincial and municipal regulations. Where possible, emergency procedures are tested and emergency equipment inspected and maintained.

18.3 Associated Documents

- EP-DW-6 *Emergency Management*
- WI-DW-4.8 *Emergency Response*
- WI-DW-4.9 *After Action Review*

19.0 Internal Audits

19.1 Requirement

Element 19 of the DWQMS requires a procedure for internal audits to evaluate QMS conformity with the standard. Audits must be conducted at least once every calendar year.

19.2 Internal Audits

On an annual basis, the QMS Representative establishes an Internal Audit program that evaluates conformity with the requirements of the provincial Drinking Water Quality Management Standard. This program is set up in accordance with QMS procedures that outline how the audit should be conducted, who will perform the audit, when it will occur, and how the outcomes will be recorded and communicated. Typically, an Audit Team consisting of trained auditors develops checklists used in interviews with a sampling of QMS personnel, from Commissioner to Operator. Non-conformities and opportunities for improvement are identified through the interview process and are entered in the QMS Opportunities for Improvement List through which corrective actions are generated, assigned and tracked. Internal Audit outcomes are summarized and communicated to the Operating Authority.

19.3 Associated Documents

- WI-DW-4.4 *Internal Audits*

20.0 Management Review

20.1 Requirement

Element 20 of the DWQMS requires a procedure for management review that evaluates the continuing suitability, adequacy and effectiveness of the QMS.

20.2 Management Review

At least once every calendar year, the QMS Top Management is required to evaluate the suitability, adequacy and effectiveness of the QMS. This evaluation occurs through the Management Review process:

- The QMS Representative collects QMS information, such as Internal Audit and Risk Assessment outcomes, and distributes it to Top Management for review
- At a meeting or series of meetings, Top Management provide feedback, direction, and recommendations to the QMS Representative regarding system status and improvement
- Recommendations are recorded and entered in the QMS Opportunities for Improvement List, where they are assigned, tracked and stored for future reference

Outcomes of the annual Management Review are communicated to Council through the QMS Annual Report.

20.3 Associated Documents

- EP-DW-7 *Management Review*

21.0 Continual Improvement

21.1 Requirement

Element 21 of the DWQMS requires the Operating Authority shall develop a procedure for tracking and measuring continual improvement of its QMS by:

- Reviewing and considering applicable best management practices.
- Documenting a process for identification and management of QMS corrective and preventative actions.

21.2 Continual Improvement

Continual improvement is understanding what is done well and then finding ways to do it better. Therefore, the QMS shall strive to implement programs and initiatives with the objective of reaching goals and targets that ensure continual improvement.

Best management practices for drinking water will be assess for feasibility of implementation as continual improvement for the City's QMS.

Corrective Actions that are generated through internal and external audits, management reviews, document reviews and on an ongoing basis through non-conformities and opportunities for improvement submissions will be addressed and evaluated to ensure its application improves the QMS. Preventative Actions will be undertaken to address potential problems that have been identified within the QMS.

21.3 Associated Documents

- EP-DW-8 *Continual Improvement*
 - Attachment 1: *QMS Continual Improvement Process – Flow Chart*
 - Attachment 2: *Corrective Action Report*

DEFINITIONS

“Adverse Water Quality Incident” – occurs when testing of water samples reveals a breach of Ontario’s prescribed drinking water quality standards, indicating the potential presence of a drinking water health hazard in the water.

“Certified Operator” – an individual who has been certified by the province, based on a combination of relevant and ongoing education and experience, to perform operational duties on a drinking water system. Certification is renewed every three years.

“Critical Control Limit” – a determined threshold for a *critical control point* that, if exceeded, triggers initiation of an appropriate response procedure

“Critical Control Point” – an essential step or point in the drinking water system at which control can be applied to prevent or eliminate a drinking water health hazard, or reduce it to an acceptable level (from DWQMS Terms and Definitions)

“DWQMS” – the Drinking Water Quality Management Standard (*DWQMS*) is a provincially developed management standard based on ISO 9001 and HACCP standards. It was created, in response to the Walkerton Report’s recommendations for quality management in municipal drinking water systems, and was first released in 2006.

“the Ministry” – Ontario’s Ministry of Environment, Conservation and Parks.

“Operating Authority” – means, in respect to the drinking water system, the person or entity that is given responsibility by the Owner for the operation, management, maintenance or alteration of the drinking water system.

“Operator-in-Charge” – is a certified operator in position of ensuring that all equipment used in the processes within his or her responsibility is properly monitored, inspected and evaluated and that records of equipment operating status are prepared and available at the end of every operating shift.

“Owner” – City of Richmond Hill Council.

“Quality Management” – in the context of drinking water, is to protect public health by achieving consistent good practice in managing and operating a water system (Walkerton Report, Part II).

“Quality Management System” (QMS) – a system to:

- a. establish policy and objectives, and to achieve those objectives; and
- b. direct and control an organization with regard to quality (from DWQMS Terms and Definitions)

“QMS Team” – composed of, but not limited to the Manager of Water and Wastewater, Supervisors, Water Quality Analyst and QMS Program Coordinator.

HISTORY OF CHANGES

Version Number	Release Date	Details of Changes
1.0	10/20/2008	Original version.
1.1	11/20/2008	<ul style="list-style-type: none"> • Element 18 - Emergency Management now specific to QMS • Minor wording and format changes • Schedule 'C' added
1.2	07/01/2010	Minor updates stemming from Annual Review of document.
2.0	04/20/2011	<ul style="list-style-type: none"> • Updates from Annual Review and departmental re-organization • Printed documents considered 'uncontrolled' • Internal Audit outcomes no longer required to be communicated to Council
2.1	Not released	<ul style="list-style-type: none"> • Added 'Definitions' and 'History of Changes' sections • Changed 'Senior Management' to 'Top Management' • 5.2 – multiple hard copy QMS binders no longer maintained • 9.3 – Added information about 'Overall Responsible Operator' • Other minor wording and formatting changes
3.0	09/06/2013	<ul style="list-style-type: none"> • Elements 1-4, 6, 9-12: Element Procedures eliminated, and where possible relevant information and/or Element Outcome incorporated into Plan • Element 1 – added reference to approval process for new water mains • Modified description of and references to QMS documentation • Combined Elements 7 & 8 in OP • Created new Element Procedure for Element 21 Continual Improvement • Added signed Top Management endorsement
3.1	12/02/2013	<ul style="list-style-type: none"> • Added Release Date for v. 3.0 • Updated Contact Information in Schedule "C"
3.2	02/05/2014	<ul style="list-style-type: none"> • Added March 24, 2014 Council Endorsement to Appendix 'C' • Updated QMS Organizational Chart in Appendix 'F'
4.0	03/05/2015	<ul style="list-style-type: none"> • Updated QMS Representative in Appendix 'D' • Updated QMS Organizational Chart in Appendix 'F' • Other minor wording and formatting changes
4.1	04/20/2015	<ul style="list-style-type: none"> • Updated name of Acting Manager of Water & Wastewater with current Manager of Water & Wastewater information. • Inserted Council Endorsement in Appendix 'C'
4.2	02/29/2016	<ul style="list-style-type: none"> • Associated Documents cited for each Element of the Standard. • Added to Element 12, in section 12.2.d clarification as to how the Public communicates with Top Management. • TRH(water drop)DWQMS symbol has been updated to RH(tap)WATER for it promotes the quality of the water instead of the quality management system. • Organizational Chart and Table of Roles and Responsibilities has been updated to include Project Managers for Capital Infrastructure

Version Number	Release Date	Details of Changes
4.3	02/28/2017	<ul style="list-style-type: none"> Updated Design and Construction Division in Element 1 as Project Managers-Capital Infrastructure are part of 'Appendix F' Element 7 & 8 updated to include annual review of the currency of the information and the validity of the assumptions. Corrected associated documents within all Elements as Standard Operating Procedures have changed. Other minor wording and formatting changes. New Endorsement Form 'Appendix B' updated to include current Operational Plan Version/Release Date and Endorsement Date.
5.0	01/21/2019	<ul style="list-style-type: none"> All Elements updated to conform to Version 2 of the DWQMS dated April 6, 2017. Updated Commissioner in Appendix B and D Updated QMS Representative in Appendix B and D Updated information within Appendix E Updated information within Appendix F
6.0	02/05/2020	<ul style="list-style-type: none"> Richmond Hill has change from Town to City. Updated Element 1, Appendix B and Appendix F as Director Infrastructure Delivery Services, Manager Design and Construction and Manager Capital Infrastructure Planning & Project Management Office are now part of Top Management. Updated Element 1 and 15 with Infrastructure Delivery Services for the former Design and Construction Division. Updated Element 19 and 20, with "QMS Corrective Action Database" as Intelex is no longer utilized as QMS Document Control tool. Added "Operator-in-Charge" to the Definitions section Updated Competencies and Responsibilities to Appendix F 1.2A, in Section 6, 10, 11.
6.1	03/22/2021	<ul style="list-style-type: none"> Updated Director in Appendix B. Updated section 7.4/8.4 with corrected names for attachments. Updated section 10.3 with Attachment 1: Work Duties Training Log Updated section 13.3 with corrected Attachment number.
7.0	01/11/2023	<ul style="list-style-type: none"> Updated section 1.3.b with Planning and Infrastructure Services for the former Environmental and Infrastructure Services. Updated section 5.2 as documents are not password protected and are not longer kept in a master hard binder. Updated section 9.3 with acronym "ORO" for Overall Responsible Operator. Updated section 11.3 as Supervisors in addition to the Manager are in charge of appropriate Personnel coverage by adhering to the most up to date stand-by list. Updated section 12.c with QMS Contractors and Suppliers Responsibilities Package for the former QMS Contractor and Suppliers Brochure. Updated section 13.3 by removing "Attachments 4 and 5 as they are now part of "Attachment 3 – QMS Contractors and Suppliers Responsibilities Package". Updated section 17.3 with Associated Document: "WI-DW-6.2 Confined Space Entry Equipment Calibration.

		<ul style="list-style-type: none">• Updated sections 19.2 and 20.2 as corrective action report are not kept in "Opportunities for Improvement List".• Updated section 21.3 by adding "Attachment 2 – Corrective Action Report"• Updated Appendix A by removing reference to outdated "Strategic Plan"• Updated Commissioner in Appendix B and D• Updated Manager of Capital Infrastructure Planning & Project Management Office in Appendix B.• Updated information within Appendix E.• Updated position titles within Appendix F.
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APPENDICES
QMS Operational Plan

Appendix 'A': QMS Policy

RH WATER
Richmond Hill Drinking Water

City of Richmond Hill
Drinking Water Quality Management System Policy

The City of Richmond Hill is committed to providing a safe, consistent supply of drinking water to the community.

To help ensure the drinking water distribution system and the drinking water itself are of the highest quality possible, the City has implemented and will maintain a Quality Management System (QMS). As well, the City will strive to continually improve the QMS through regular review, evaluation, and action.

The City commits to complying with all applicable legislation and regulations in pursuit of high quality water and efficient distribution.

Richmond Hill

RichmondHill.ca/Water

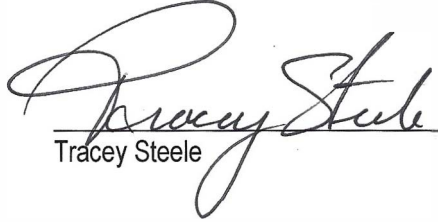
City of Richmond Hill Drinking Water Quality Management System	QMS Elements	Prepared by: QMS Representative Approved by: QMS Top Management
Document Title: QMS Policy	Page: 1 of 1	Revision #: 6 Date: January 9, 2023

Appendix 'B': Top Management Signed Commitment and Endorsement Form

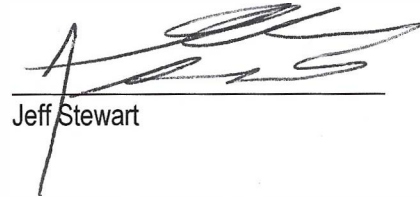
QMS Top Management, through signing this document, expresses its endorsement of this Operational Plan and its commitment to fulfilling the respective roles and responsibilities outlined therein.

Specifically, Top Management commits, to the best of its ability and subject to budget approval, to providing resources and support for satisfying or exceeding the requirements of Ontario's Drinking Water Quality Management Standard, and for maintaining and continually improving the City's Drinking Water Quality Management System.

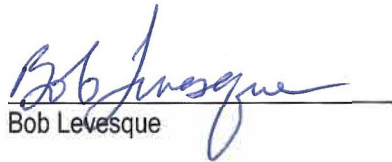
Commissioner of Community Services


Tracey Steele

Director Public Works Operations


Jeff Stewart

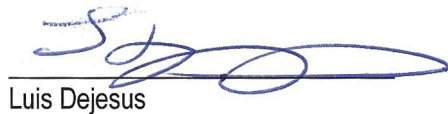
Director Infrastructure Delivery


Bob Levesque

Manager Water and Wastewater Services


Diogo Oliveira

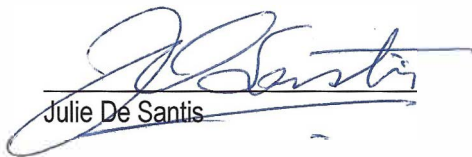
**Manager Capital Infrastructure Planning
and Project Management Office**


Luis Dejesus

Manager Design and Construction


Mohammad Kashani

QMS Program Coordinator


Julie De Santis

January 31, 2023
Endorsement Date

Version 7 / Feb. 8, 2023
Operational Plan Version/Release Date

Appendix 'C': Council Endorsement (to be inserted once approved)


Appendix 'D': QMS Representative Authorization and Appointment

The City of Richmond Hill's QMS Top Management hereby appoints and authorizes **Julie De Santis** as the Drinking Water QMS Representative, effective from **September 29, 2014**.

The QMS Representative has the following responsibilities:

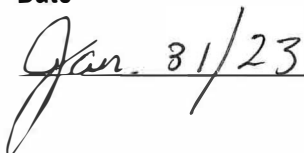
- Administer the Quality Management System by ensuring that applicable processes and procedures are established and maintained;
- Report QMS performance and need for improvement to Top Management;
- Ensure the use of most current versions of QMS documents;
- Ensure personnel are aware of applicable legislative and regulatory requirements;
- Promote awareness of QMS throughout the Department.

Commissioner of Community Services Department



Tracey Steele

Date



Appendix 'E' – Element 6 Drinking Water Description and Flow Chart

1.1 Drinking Water System Description

DW System	Owner/Operator	System Description
<p>City of Richmond Hill</p> <ul style="list-style-type: none"> Supplies drinking water to residential and business consumers 	<p><i>Owner:</i></p> <ul style="list-style-type: none"> The Corporation of The City of Richmond Hill <p><i>Operating Authority:</i></p> <ul style="list-style-type: none"> City of Richmond Hill, Public Works Operations Division 	<p>Richmond Hill owns and operates a Class 2 Water Distribution System</p> <ul style="list-style-type: none"> Approximately 653 km of watermains located typically on local roads Watermain sizes: 50-600 mm in diameter Materials are predominately PVC, cast iron and ductile iron, but also include: Asbestos Cement, Concrete, Copper, Concrete Pressure Pipe, and HDPE Average age of watermains = 26 years <p>This distribution system does not include water storage, chlorine boosting, pressure boosting, or secondary disinfection.</p>
<p>Region of York</p> <ul style="list-style-type: none"> Supplies potable water wholesale to Richmond Hill 	<p><i>Owner:</i></p> <ul style="list-style-type: none"> The Regional Municipality of York <p><i>Operating Authority:</i></p> <ul style="list-style-type: none"> The Regional Municipality of York – Environmental Services Department 	<p>York Region obtains treated and tested water from the City of Toronto and Peel Region</p> <ul style="list-style-type: none"> The infrastructure of the York Water Distribution System is responsible for the continuous supply of potable water to area municipalities (Aurora, Markham, Newmarket, Richmond Hill and Vaughan) The York Water Distribution System consists of 3 water treatment plants, 8 pumping stations, 5 elevated tanks, 7 reservoirs, 14 metering chambers, and 7 valve chambers Large diameter watermains transmit water between pumping stations and storage facilities
<p>City of Toronto</p> <ul style="list-style-type: none"> Draws raw water from Lake Ontario and supplies potable water to the City of Toronto and parts of York Region 	<p><i>Owner:</i></p> <ul style="list-style-type: none"> City of Toronto <p><i>Operating Authority:</i></p> <ul style="list-style-type: none"> City of Toronto 	<p>The City of Toronto Drinking Water System is owned by the City of Toronto and operated by the City's Toronto Water Division. The system consists of:</p> <ul style="list-style-type: none"> 4 water treatment plants 18 pumping stations 11 major underground storage reservoirs 4 elevated storage tanks <p>The system supplies drinking water to the City of Toronto and parts of York Region. The York Water System is owned and operated by the Regional Municipality of York.</p>
<p>Region of Peel</p> <ul style="list-style-type: none"> Draws and treats raw water from Lake Ontario and supplies potable water wholesale to York Region 	<p><i>Owner:</i></p> <ul style="list-style-type: none"> Regional Municipality of Peel <p><i>Operating Authority:</i></p> <ul style="list-style-type: none"> Ontario Clean Water Agency (treatment) Region of Peel (distribution) 	<p>Ontario Clean Water Agency, on behalf of Peel Region, operates and maintains</p> <ul style="list-style-type: none"> Lakeview Water Treatment Plant Lorne Park Water Treatment Plant 18 storage facilities <p>Region of Peel operates and maintains the South Peel distribution system:</p> <ul style="list-style-type: none"> 13 pumping stations (with reservoirs) 2 standpipes 4 elevated tank <p>Water is pumped from Lakeview Treatment Plant to Airport P.S. and reservoir via the South Peel transmission system, chloraminated using sodium hypochlorite and ammonia and pumped to York Region Maple Reservoir.</p>

1.2 Raw Water Characterisation

Richmond Hill's drinking water originates in Lake Ontario, where it is treated by the City of Toronto and Region of Peel.

a. City of Toronto – Raw Water Characterization

The following information is from the City of Toronto's QMS Operational Plan, 2017.

Description of the Water Source and Protection Initiatives

Lake Ontario is the raw water source for Toronto's drinking water. Lake Ontario's turbidity is generally low, alkalinity is low to moderate, pH experiences limited seasonal fluctuation (peak values may reach the upper range in the summer months), and colour is low. Raw water temperatures vary seasonally. Water temperatures can exceed 20 degrees Celsius in summer and approach zero degrees Celsius in winter. The water is considered moderately hard.

Common event-driven fluctuations, operational challenges and threats may include:

- seasonal temperature changes which can impact settling and disinfection
- vertical lake turnover in spring and fall which can increase raw water turbidity
- algal blooms which can cause taste and odour issues or release of toxins such as microcystin
- zebra/quagga mussel or debris which have the potential to block intakes

Additionally, Lake Ontario is impacted by basin-wide pollution inputs and local, nearshore water quality. The City of Toronto (the City) has taken an active role in protecting water quality within its boundaries and improving water quality within the lake through the Wet Weather Flow Master Plan (the Plan). The Plan is expected to be the foundation of the City's contribution toward the Source Water Protection Plan being developed through the Toronto and Region Conservation Authority, in accordance with the requirements of Ontario's Clean Water Act. The Plan is a long-term plan to protect our environment and sustain healthy rivers, streams and other water bodies. The 25-Year Plan outlines programs and projects that, together, provide a solution for stormwater pollution.

b. Region of Peel – Raw Water Characterization

The following information is from the Region of Peel's 2017 Water Quality Report - South Peel Drinking Water Distribution System.

Source Water

Lake Ontario is the sole source of raw water for the Lakeview and Lorne Park WTPs. The raw water from Lake Ontario is typically low in turbidity. The temperature fluctuates significantly through the seasons. Bacteriological analysis of the raw water indicates a source of relatively good quality. The results of chemical analyses consistently meet the Ontario Drinking Water Quality Standards. For general characteristics of the raw water supply, refer to *Water Quality Report*.

Table 1: Physical Characteristics of Lake Ontario (as supplied by OCWA)

Item	Imperial Units	Metric Units
Length	193 miles	311 km
Breadth	53 miles	85 km
Average Depth	283 ft.	86 m
Maximum Depth	802 ft.	244 m
Volume	393 cu. miles	1,640 km ³
Surface Area	7,340 sq. miles	18,960 km ²
Land Drainage	24,720 sq. miles	64,030 km ²
Shoreline Length	712 miles	1146 km
High Water Level and Low Water Level*	244 to 247 ft.	74.3 to 74.990 m

* Source: National Oceanic and Atmospheric Administration (NOAA): Great Lakes Environmental Research Library (GLERL) <http://www.glerl.noaa.gov/pubs/brochures/lakelevels/lakelevels.pdf>.

Common Fluctuations

- Refer to OCWA's Operational Plan
- Temperature in the Distribution System

Threats

- Contamination resulting from illegal connections/water theft and failure of: upstream treatment processes, storage facilities, pipe failure, backflow or cross-connections
- Loss of water supply or pressure due to failure of: pumps, pipes, appurtenances or control instrumentation
- Damage to pipes or appurtenances due to high (excessive) pressure, corrosion, construction activity, etc.

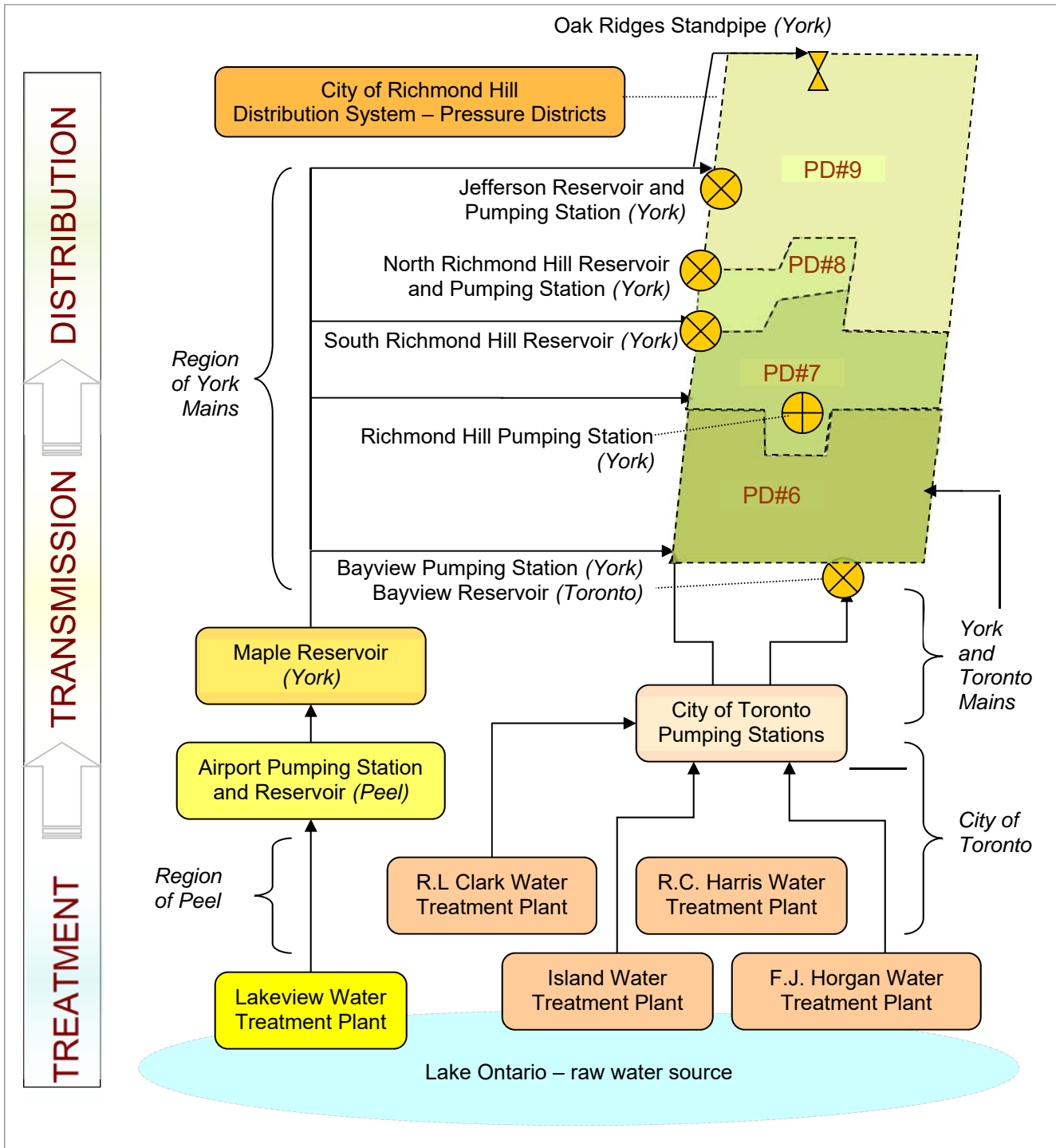
Operational Challenges

- Optimizing pressure throughout pressure zones
- Controlling pressure transients and surges
- Preventing failure of pumps, SCADA and control instrumentation
- Mitigating a prolonged power outage
- Minimizing third-party damage to system components
- Ensuring fire hydrant function
- Maintaining an adequate & qualified labour force
- Minimizing water odour & taste problems

1.3 CRH Common Event Driven Fluctuations and Resulting Operational Challenges

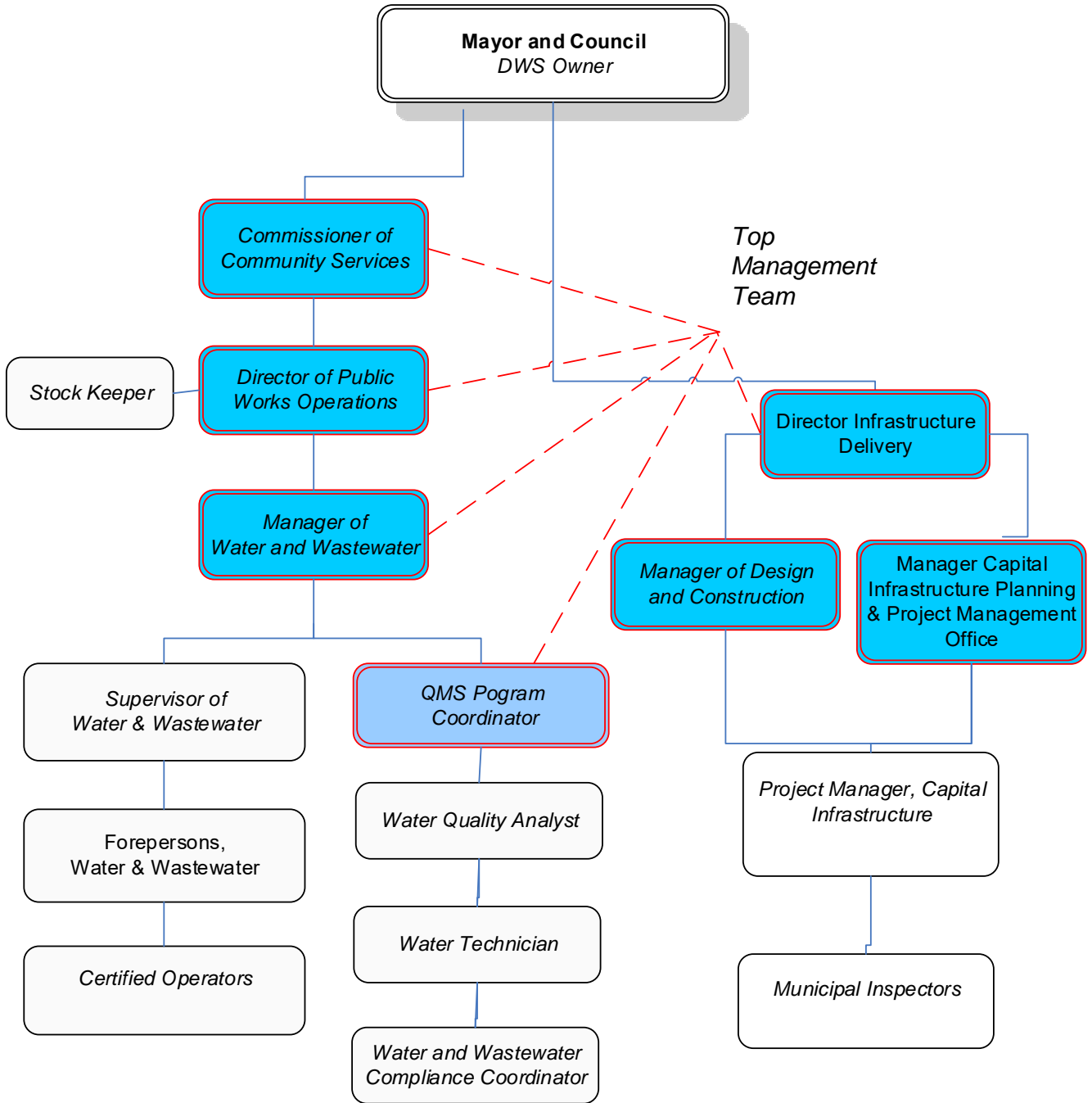
- algae blooms in Lake Ontario can affect the taste and odour of the water that eventually enters Richmond Hill's distribution system
 - customer complaints regarding taste and odour may rise
- warm weather can decrease the duration, and therefore effectiveness, of residual chlorine in the distribution system
 - increased flushing may be necessary to introduce new water and mitigate the risk of low residuals

1.4 Drinking Water System – Process Flow Chart



Appendix 'F' – Element 9 & 10 Organizational Chart and Table of Roles, Responsibilities, Authorities and Competencies

1.1 QMS Organizational Chart



*Competencies are only included for personnel directly affecting drinking water quality.

1.2 Table of Roles, Responsibilities, Authorities and Competencies

A. Drinking water System Administration and Oversight

1. **Owner:** The Corporation of the City of Richmond Hill, as represented by Council

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Ensure accreditation of Operating Authority • Endorse and submit Operational Plan • Submit application for Drinking Water Works Permit and Municipal Drinking Water Licence • Develop Financial Plan and submit to Ministry of Municipal Affairs and Housing • Provide water that meets all prescribed drinking water quality standards • Ensure water distribution system is kept in a fit state of repair • Ensure to meet all reporting requirements 	<ul style="list-style-type: none"> • To establish and alter drinking water system • To approve QMS and Operational Plan • Financial and administrative authority related to distribution of safe drinking water • Approve by-laws and taxation rates

2. **Operating Authority:** City of Richmond Hill, Public Works Operations Division of the Community Services Department

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Develop Operational Plan and implement QMS • Submit Operational Plan and application to accreditation body for audit • Ensure Owner endorses Operational Plan • Provide and/or obtain resources required for QMS and for ensuring safe supply of drinking water 	<ul style="list-style-type: none"> • To operate a drinking water system • Technical authority related to distribution of safe drinking water • Set user fees

3. **QMS Top Management:** Commissioner of Community Services, Director of Public Works Operations, Director Infrastructure Delivery, Manager of Water and Wastewater, Manager of Design and Construction, Manager of Capital Infrastructure Planning & Project Management Office and QMS Program Coordinator

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Endorse Operational Plan • Ensure QMS is in place and conforms to standard • Ensure applicable staff are aware of legislative and regulatory requirements • Communicate QMS to Owner, applicable staff and personnel, suppliers, and public • Determine, obtain or provide resources for maintaining and improving the QMS • Appoint a QMS Representative • Conduct regular Management Reviews of QMS • Communicate results of reviews to Owner 	<ul style="list-style-type: none"> • Authorize a QMS Representative • Budget requests for QMS maintenance and improvement • Authorize Policy and Operational Plan • Hire, discipline or terminate department staff

4. **Commissioner of Community Services**

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Liaise between department, CAO, and Council • Participate in Top Management activities • Approve and sign QMS Policy • Ensure Community Services Department complies with all drinking water legislation • Determine, obtain or provide resources for maintaining and improving the QMS 	<ul style="list-style-type: none"> • Recommends staff reports to Council • Authorize budgetary requests for department • Endorse QMS Representative

5. **Director of Public Works Operations**

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Participate in Top Management activities 	<ul style="list-style-type: none"> • Recommends staff reports to Council

<ul style="list-style-type: none"> • Ensure Community Services Department complies with all drinking water legislation • Determine, obtain or provide resources for maintaining and improving the QMS 	<ul style="list-style-type: none"> • Authorize budgetary requests for department • Management authority - hire, discipline or terminate staff
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6. Director Infrastructure Delivery

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Participate in Top Management activities • Ensure Infrastructure Delivery Services Division complies with all drinking water legislation. • Determine, obtain or provide resources for maintaining and improving the QMS 	<ul style="list-style-type: none"> • Recommends staff reports to Council • Authorize budgetary requests for division • Management authority - hire, discipline or terminate staff

7. Manager of Water & Wastewater

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Ensure staff are certified and trained as required • Supervise and provide technical expertise to staff in regards to water infrastructure maintenance, rehabilitation and renewal • Manage and assess essential supplies and services for the drinking water distribution system • Establish conditions for assumption of all servicing to be assumed into the City's infrastructure inventory • Provide yearly capital budget estimates for the operations of the drinking water system • Facilitate QMS processes as part of Implementation/Risk Assessment Team • Approve payments for goods and services • Ensure emergency management preparation • Acting QMS Representative upon a leave of absence (vacation, vacancy, etc.) • Communicate with connected water systems (City of Toronto, Region of York) • Prepare, review and approve SOPs and forms and other QMS documents/records • Acting Overall Responsible Operator (ORO) as necessary • Staff hiring, training and evaluation 	<ul style="list-style-type: none"> • Delegate ORO • Management of day-to-day operations of the drinking water system – emergency, maintenance or alteration • Identify and oversee staff training needs • Review and approve SOPs and all QMS related documents • Recommend projects and contractors to Council • Management authority - hire, discipline or terminate staff for unionized and non-unionized positions in water section
COMPETENCIES: QMS	COMPETENCIES: GENERAL
<p>QMS:</p> <ul style="list-style-type: none"> • QMS Awareness • Confined Space Entry and Rescue • CPR/AED Training • First Aid Certification • Spill Response Training • Transportation of Dangerous Goods • Media Training • WHMIS • Emergency Management • Occupational Health & Safety Act (OHSA)-Competent Supervisor 	<p>General:</p> <ul style="list-style-type: none"> • Diploma in Civil Engineering or related discipline • Ministry of Environment Certificate in Water Distribution Class 2 and Licence in Wastewater Collection Class 2 • 7-10 years experience in water distribution and wastewater collection system maintenance and management within a unionized environment • Thorough knowledge of Safe Drinking Water Act; maintenance and design standards, materials, and construction methods; applicable laws and legislation • Experience in operating a maintenance management system for water and wastewater services • Excellent project management, organizational, time management skills and ability to work under pressure • Strong team player, strong customer service skills, excellent written, oral, presentation and problem solving skills

8. Manager Capital Infrastructure Planning & Project Management Office

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Prepare tender documents and administer all contracts for municipal watermain capital projects • Ensure staff are certified and trained as required • Liaise with consultants and contractors for municipal watermain capital projects design • Provide technical expertise to staff, and Capital Project Managers • Provide yearly capital budget estimates (related to new watermains) 	<ul style="list-style-type: none"> • Financial authority for design of capital projects • Management authority (hire, discipline, terminate staff) • Recommend projects and contractors to Council Staff training and certification

9. Manager Design and Construction

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Prepare tender documents and administer all contracts for municipal watermain capital projects • Ensure staff are certified and trained as required • Liaise with consultants and contractors for municipal watermain capital projects design • Provide technical expertise to staff, and Capital Project Managers • Provide yearly capital budget estimates (related to new watermains) 	<ul style="list-style-type: none"> • Financial authority for design of capital projects • Management authority (hire, discipline, terminate staff) • Recommend projects and contractors to Council Staff training and certification

10. QMS Program Coordinator

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Ensure personnel are aware of applicable legislative and regulatory requirements • Promote awareness of QMS throughout the Operating Authority • Preparation and assessment of Internal Audit criteria and scope • Implementation of corrective actions – non-conformance and/or opportunities for improvement of the QMS • Ensure third-party certification of the QMS • Facilitate QMS processes as part of Implementation/Risk Assessment Team • Monitoring and managing certification and licensing process for the Municipality and staff. • Managing training records and training sessions for certified staff. • Manage drinking water documents and records related to operations and ensuring the use of most current versions of QMS documents • Liaison and representative of the City's Drinking Water QMS with other municipalities and connected water systems (City of Toronto, Region of York) 	<ul style="list-style-type: none"> • Review and revise Operational Plan • Develop/lead QMS Awareness Training • Lead Management Review, Risk Assessment and Internal Audits • Establish, implement and maintain QMS policies/procedures
COMPETENCIES: QMS	COMPETENCIES: GENERAL
<p>QMS Awareness & EMS Awareness</p> <ul style="list-style-type: none"> • Strong working knowledge of Quality Management Systems and Standards • Completion of an Internal Auditors course • Familiarity with the ISO 9001 Quality Management and 14001 Environmental Management System Standards • Occupational Health & Safety Act (OHSA)-Competent Supervisor 	<ul style="list-style-type: none"> • University degree in Environmental Studies, Science or Engineering • Knowledge of Risk Assessment methodologies and processes • Ability to work independently with little supervision and capability to meet deadlines • Possess superior communication, organizational and project management skills

	<ul style="list-style-type: none"> • Excellent written and keyboarding skills including knowledge in word processing and spreadsheets are essential to the position
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B. DRINKING WATER OPERATIONS

11. Supervisor, Water and Wastewater

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Facilitate QMS processes as part of Implementation/Risk Assessment Team • Supervise operations staff and provide technical direction for drinking water activities • Prepare and review standard operating procedures, forms • Identify training needs for certified staff • Overall Responsible Operator (ORO) unless absent (delegated to Director/Manager/Supervisor/Foreperson, as applicable and available) • Emergency incident reporting (AWQI, spill reports) 	<ul style="list-style-type: none"> • Overall Responsible Operator (ORO) • Staff scheduling and supervision • Supervision of maintenance contractors • Ordering of materials and resources as necessary
COMPETENCIES: QMS	COMPETENCIES: GENERAL
<ul style="list-style-type: none"> • QMS Awareness & EMS Awareness • Confined Space Entry and Rescue • Construction Safety • Continuing Education Training – W&WW • CPR/AED Training / First Aid Certification • Electrical Safety Awareness • Spill Response Training • Traffic Control Safety • Trench Safety • WHMIS • Occupational Health & Safety Act (OHS)-Competent Supervisor 	<ul style="list-style-type: none"> • Diploma in Civil Engineering or related discipline • Ministry of Environment Certificate in Water Distribution Class 2 and Licence in Wastewater Collection Class 2 • Certified Engineering Technologist designation – preferred • 5 to 7 years progressive experience in a water/wastewater maintenance and operation capacity • Supervisory experience in a unionized environment • Practical working knowledge in: municipal water distribution and wastewater collection infrastructure operations and maintenance, associated materials and supplies, applicable health and safety legislation, MTO traffic control regulations and maintenance procedures • Excellent communication, organizational, writing and customer service skills

12. Water & Wastewater Foreperson / Lead Hand

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Plan, assign, organize, assist where necessary work crews and equipment in daily maintenance and repair of water distribution, sanitary sewer and storm sewer systems • Receive and investigate emergency and other calls regarding water systems and carry out authorized remedial action • Maintain up-to-date records of work performed • Maintain daily work records of water crews, including contractors planning of daily work schedules and scheduling of staff and contractors • Coordinate with other departments for new construction, system expansion, system controls and system planning as required • Communicate on a regular basis with supervisory staff and residents on any related water and sewer matter, both verbally and written • Ensure the City's water distribution system is operated in compliance with Ontario's <i>Safe Drinking Water Act</i> & Regulations • Emergency incident reporting (AWQI, spill reports) • Lead Hand may assume forepersons responsibilities as required 	<ul style="list-style-type: none"> • assign and schedule work crews for daily routine and emergency maintenance

<ul style="list-style-type: none"> • Oversee worksite health and safety aspects • Supervising the work activities of contractor 	
COMPETENCIES: QMS	COMPETENCIES: GENERAL
<ul style="list-style-type: none"> • QMS Awareness & EMS Awareness • Construction Safety • Continuing Education Training – W&WW Operators • CPR/AED Training / First Aid Certification • Electrical Safety Awareness • Spill Response Training • Traffic Control Safety • Trench Safety • Propane Handling • Confined Space Entry and Rescue • Heavy Equipment Operator Safety • WHMIS 	<ul style="list-style-type: none"> • Ministry of Environment Certificate in Water Distribution Class 2 and Licence in Wastewater Collection Class 2 • Minimum 5 years experience in all elements of Water and Wastewater maintenance and operations • Secondary School Graduation Diploma, or equivalent • Experience in a supervisory capacity with demonstrated skills in assigning work to staff and being aware of conditions that affect employee safety • Working knowledge of the Occupational Health and Safety Act • Experience in reading and interpreting engineering drawings and site plans • Working knowledge of computer programs. • Excellent oral and written communication skills • Ability to compile various reports

13. Certified Operator

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Perform daily maintenance and emergency repairs to the water distribution systems • Perform water sampling to comply with all sampling, testing and monitoring requirements • Perform confined space entry • Investigate and assess water related emergencies and inquiries • Maintain up-to-date records of individual, small work crew, or contractor work performed • Coordinate with other departments for new construction, system expansion, system controls and system planning as required • Communicate on a regular basis with forepersons, supervisory staff and residents on water and sewer issues, both verbally and written • Ensure the City's water distribution system is operated in compliance with the Ontario's <i>Safe Drinking Water Act</i> and Regulations • Emergency incident reporting (AWQI, spill reports) 	<ul style="list-style-type: none"> • Supervise routine and emergency maintenance by individuals and small work crews • Operator-in-charge (OIC)
COMPETENCIES: QMS	COMPETENCIES: GENERAL
<ul style="list-style-type: none"> • QMS Awareness & EMS Awareness • Continuing Education Training – W&WW Confined Space Entry and Rescue • Construction Safety • CPR/AED Training / First Aid Certification • Spill Response Training • Traffic Control Safety • Trench Safety • WHMIS • Log Book Writing • Propane Handling • Heavy Equipment Operator Safety • Electrical Safety Awareness 	<ul style="list-style-type: none"> • Secondary School Graduation Diploma, or equivalent • Minimum Operator in Training status in Water Distribution and Wastewater Collection • Completed WCWC "Entry Level Drinking Water Operators Course" • Achieve Ministry of Environment Certification of Water Distribution Class 2 and Licence of Wastewater Collection Class 2 within 3 years from date of hire into this position • Proficient in the use of sampling instruments to comply with sampling requirements • Proper log book and record keeping for compliance with regulation requirements • General knowledge of Occupational Health and Safety Act • Physically and medically able and competent to perform the physical demands of this position under adverse weather and site conditions.

14. Water Quality Analyst

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Provide technical skills and data collection for water sampling requirements • Preparing reports and tender documents • Day-to-day coordination/supervision of activities related to water quality maintenance programs • Ensure compliance with Ontario Regulation 169/03 – Ontario Drinking Water Quality Standards • Coordinate special projects for construction/maintenance contracts • Coordinate and provide first line supervision for municipal water contracts, maintain water quality records and act as the division's contact for water quality issues • Technical assistance & cost estimating related to annual budgets and maintenance projects • Liaise with the public, property owners, builders, contractors, other departments, utilities, consultants, government agencies and other municipalities regarding matters pertaining to various drinking water programs • Emergency incident reporting (AWQI, spill reports) 	<ul style="list-style-type: none"> • Overseer of water quality programs such as Unidirectional Flushing (UDF) and Dead-end Flushing • Water quality instruments calibration and maintenance
COMPETENCIES: QMS	COMPETENCIES: GENERAL
<ul style="list-style-type: none"> • QMS Awareness & EMS Awareness • Ministry's Water Quality Analyst Certificate • Spill Response Training • Traffic Control Safety • Trench Safety • WHMIS • Log Book Writing 	<ul style="list-style-type: none"> • Diploma in Civil Engineering or related discipline • 5 – 7years experience in municipal water distribution systems maintenance and operations, or equivalent • Demonstrated experience in a supervisory capacity • Word processing and spreadsheet software applications • Proper log book and record keeping for compliance with regulation requirements • Working knowledge of Ontario's <i>Safe Drinking Water Act</i> and Regulations • Working knowledge of Occupational Health & Safety Act • Excellent analytical administrative, organizational, customer service, problem solving and written/oral communication skills

15. Water & Wastewater Compliance Coordinator

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Review, approve and process: backflow prevention device and maintenance application, cross connection control surveys, compliance programs (TSS, FOG parameters, pH), dewatering discharge request • Checks, examines and review design drawings for compliance and permit applications for backflow prevention devices • Monitor overall program to ensure service quality, legislative compliance and assist in the development of plans and policies • Ensure regulatory compliance with legislation such as the Ontario Safe Drinking Water Act, Sewer Use By-law and Backflow and Cross Connection By-law • Data entry, database maintenance of industrial/commercial/institutional water user, certified testers, property survey reports, device testing reports and compliance status • Record management of all associated program documents and maintain the filing system including database 	<ul style="list-style-type: none"> • Overseer of the Backflow Prevention Program • Overseer of new water commissioning for site plan agreements (industrial/commercial/ institutional)

<ul style="list-style-type: none"> • Liaise with contractors, property owners and tenants with respect to compliance programs • Monitor all Ministries regulatory requirements and associated guidelines 	
COMPETENCIES: QMS	COMPETENCIES: GENERAL
<ul style="list-style-type: none"> • QMS Awareness & EMS Awareness • Spill Response Training • Traffic Control Safety • Trench Safety • WHMIS 	<ul style="list-style-type: none"> • Diploma in Civil Engineering or related discipline • 3 years experience in municipal water distribution systems maintenance and operations, or equivalent • Eligibility to acquire certification as a licensed Cross Connection Control Specialist as issued by OWWA • Certified Engineering Technologist designation – preferred • Working knowledge of Ontario's <i>Safe Drinking Water Act</i> and Regulations • Proper log book and record keeping for compliance with regulation requirements • Excellent analytical administrative, organizational, customer service, problem solving and written/oral communication skills

16. Water Technician

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Provide technical skills and data collection, including the updating of the City's infrastructure • Prepare reports and tender documents relating to residential and site plan servicing • Coordinate special projects for construction/maintenance contracts • Coordinate and provide first line supervision for municipal water and wastewater contracts, specifically residential and commercial service installations, curb cuts and culverts • Maintain water, wastewater, residential infill development records • Provide technical assistance including cost estimating, preparation of payment certificates calculating quantities • Liaise with the public, property owners, builders, contractors, other departments, utilities, consultants, government agencies and other municipalities regarding matters pertaining to various City Policies and procedures, municipal services and programs 	<ul style="list-style-type: none"> • Overseer of Infill water/wastewater service connection • Overseer of residential and commercial service installations
COMPETENCIES: QMS	COMPETENCIES: GENERAL
<ul style="list-style-type: none"> • QMS Awareness & EMS Awareness • Confined Space Entry Program Elements • Construction Safety • Spill Response Training • Traffic Control Safety • Trench Safety • WHMIS 	<ul style="list-style-type: none"> • Diploma in Civil Engineering or related discipline • 3 years experience in municipal infrastructure maintenance & operations, or equivalent • Certified Engineering Technologist designation – preferred • Proficient in word processing and spreadsheet software applications • Working knowledge of Ontario's <i>Safe Drinking Water Act</i> and Regulations • Working knowledge of Occupational Health and Safety Act • Proper log book and record keeping for compliance with regulation requirements • Ability to perform all the physical demands of the job • Excellent analytical administrative, organizational, customer service, problem solving and written/oral communication skills

17. Stock Keeper

RESPONSIBILITIES
<ul style="list-style-type: none"> • Order, receive, and stock items necessary for repair and maintenance of water distribution system • Ensure items are delivered and received in accordance with applicable City standards and contract terms • Ensure items are stocked in organized manner, with consideration for maintaining their accessibility and integrity • Monitor inventory and register item quantities using electronic database WAMS, replenishing items to maintain adequate quantities • Ensure items are signed out of stock room in accordance with approved process, billing for items as appropriate

18. Project Managers, Capital Infrastructure

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Prepare tender documents and administer all contracts for municipal watermain capital projects • Liaise with consultants and contractors for municipal watermain capital projects design • Provide technical expertise to staff, contractors, consultants, municipal inspectors and surveyors • Direct the investigative, detailed design, approval, tender, utility coordination, construction and contract administration for municipal watermain capital projects • Liaise with contractors for municipal watermain capital projects • Establish conditions for assumption of all servicing to be assumed into the City's infrastructure inventory • Assist in providing yearly capital budget estimates (related to new watermains) 	<ul style="list-style-type: none"> • Limited authority for construction projects • Recommend projects and contractors to Council

19. Municipal Inspectors

RESPONSIBILITIES	AUTHORITIES
<ul style="list-style-type: none"> • Ensure standards for commissioning new watermains are met • Inspect/operate fire hydrants, valve chambers, water service curb stop to ensure compliance with Standard • Communicate with contractors to ensure procedures for sampling, swabbing, flushing are being followed • Coordinate opening and closing of valves with Maintenance & Operations staff (through Supervisor of Water & Wastewater) • Ensure water samples are delivered to York-Durham laboratory and applicable records obtained 	<ul style="list-style-type: none"> • Overseer of new watermain commissioning for subdivision projects • Supervise connections from existing watermains to new watermain for compliance with standard
COMPETENCIES: QMS	COMPETENCIES: GENERAL
<p>QMS:</p> <ul style="list-style-type: none"> • QMS Awareness • Confined Space Entry and Rescue • Construction Safety • CPR/AED Training / First Aid Certification • Spill Response Training • Traffic Control Safety • Trench Safety • WHMIS • Continuing Education Training – W&WW 	<p>General:</p> <ul style="list-style-type: none"> • Diploma in Civil Engineering or related discipline • 3 years experience in municipal infrastructure maintenance & operations, or equivalent • Minimum Operator-in-Training (O.I.T.) status in Water Distribution and Wastewater Collection • Achieve Ontario Ministry of Environment certification of Water Distribution Subsystem Class 1 and Wastewater Collection Class 1 within 3 years from date of hire into this position • Certified Engineering Technologist designation – preferred • Read/interpret engineering drawings • Proper log book and record keeping for compliance with regulation requirements • Working knowledge of Ontario's <i>Safe Drinking Water Act</i> and Regulations

	<ul style="list-style-type: none">• General knowledge of Occupational Health and Safety Act• Physically and medically able and competent to perform the physical demands of this position under adverse weather and site conditions, including confined space entry
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Appendix 'G': QMS Personnel Coverage Table

Role or Work Situation	On-Call?	Coverage	Delegated by:
Manager of Water & Wastewater	Yes	Supervisor of Water & Wastewater Director of Public Works Operations	Manager Director
Supervisor of Water & Wastewater	Yes	W&WW Technical Staff Manager of Water & Wastewater Water Foreperson	Manager Director
QMS Program Coordinator	No	Manager of Water & Wastewater Supervisor of Water & Wastewater	Manager
Water Quality Analyst	No	Supervisor and Foreperson Certified Operator	Manager Supervisor
Water Technician	No	Supervisor and Foreperson	Manager Supervisor
Water Foreperson	Yes	A Certified Operator is available 24 hours/day, 7 days/week (OIC) through Public Works personnel or backup service	Manager Supervisor
Certified Operator (OIC)	Yes	A Certified Operator is available 24 hours/day, 7 days/week (OIC) through Public Works personnel or backup service	Manager Supervisor
Overall-Responsible-Operator (ORO)	Yes	Supervisor acts as ORO unless otherwise delegated to Certified Operator holding Class 2 Water Distribution (facility-level certification) Supervisor absence: Manager acts as ORO	Supervisor Manager
On-Call Schedule	-	A 'live' on-call schedule is determined by assessing staff availability and levels of competency	Supervisor
Union staff – walk-outs	-	Strike plan in place: non-unionized staff (Municipal Inspectors) and contractors to assume duties	Director and Manager

Schedule "C"

Subject System Description Form
Municipal Residential Drinking Water System

Owner of Municipal Residential Drinking Water System:

Name of Municipal Residential Drinking Water System:

Subject Systems			
Name of Operational Subsystems (if Applicable)	Name of Operating Authority	DWS Number(s)	
<input checked="" type="checkbox"/> 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	<input type="text" value="City of Richmond Hill"/>	<input type="text" value="W260001968"/>	
Operational Subsystem 1:	<input type="text"/>	<input type="text"/>	<input type="text"/>
Operational Subsystem 2:	<input type="text"/>	<input type="text"/>	<input type="text"/>
Operational Subsystem 3:	<input type="text"/>	<input type="text"/>	<input type="text"/>
Operational Subsystem 4:	<input type="text"/>	<input type="text"/>	<input type="text"/>

Add attachments if there are additional 'Operational Subsystems'

Contact Information			
Name	Title	Phone Number	e-mail address
<input type="text" value="Diogo Oliveira"/>	<input type="text" value="Manager of Water and Wastewater"/>	<input type="text" value="905-780-2971"/>	<input type="text" value="diogo.oliveira@richmondhill.ca"/>
<input type="text" value="Mario Puopolo"/>	<input type="text" value="Supervisor of Water and Wastewater"/>	<input type="text" value="905-780-2916"/>	<input type="text" value="mario.puopolo@richmondhill.ca"/>