



# Operational Plan

For the Township of King  
Drinking Water Systems

King City Drinking Water System

Nobleton City Drinking Water System

Schomberg City Drinking Water System

Ansnorveldt City Drinking Water System

September 2019



**Operational Plan for King City Drinking Water System**  
**Operational Plan for Schomberg Drinking Water System**  
**Operational Plan for Nobleton Drinking Water System**  
**Operational Plan for Ansnorveldt Drinking Water System**

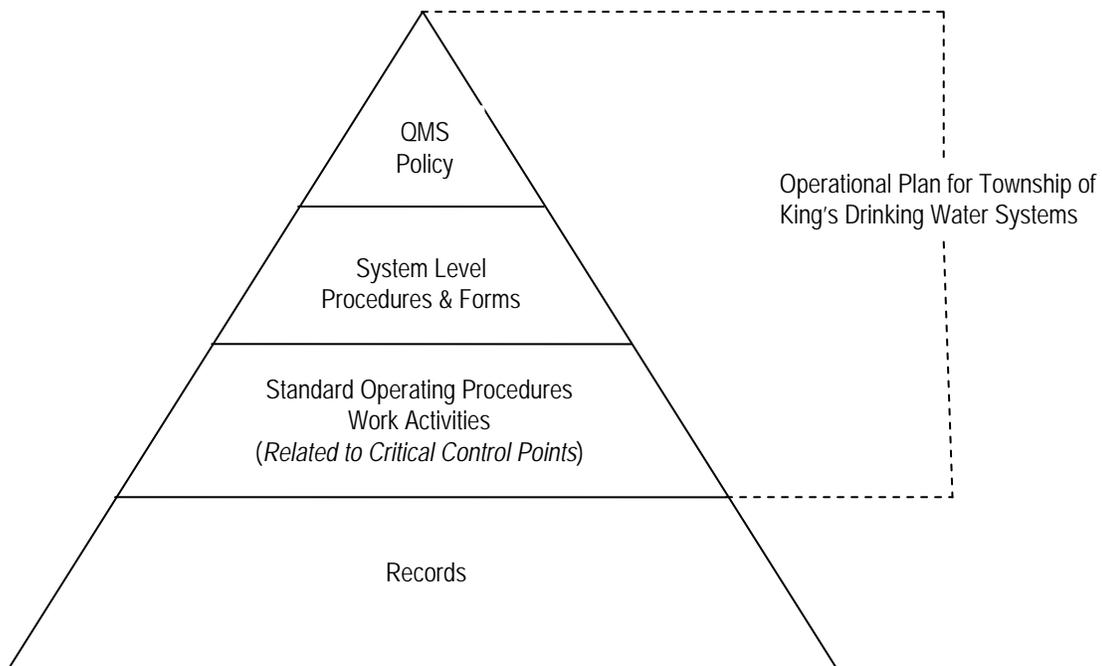
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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-01-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: September 26, 2011
	Procedure Title: Overview of Operational Plan	Revision No: 3
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 2

## Overview of Operational Plans

The Operational Plan is one portion of the mandated Drinking Water Quality Management System (DWQMS) that is enforced by the Ministry of Environment for all Drinking Water Systems in the province of Ontario. This Operational Plan is a document created by the Township of King to help ensure that safe, reliable drinking water is provided to all the citizens, businesses, and visitors of the Township. The Operational Plan is a document that provides an understanding of the drinking water system, the responsibilities of the owner and operator (Operating Authority) of the water system, and a commitment to the provision of safe drinking water. This will allow the Township of King to plan, implement, check, and continually improve, helping to build confidence and security in the Drinking Water Systems they operate.

The Quality Management System (QMS) has been developed to meet the requirements of the DWQMS. The QMS is based on Plan, Do, Check and Improve principle. The Operational Plan is the documentation that addresses the 21 elements of the DWQMS. The QMS for the Township of King is comprised of the Operational Plan (documentation) and the records that demonstrate implementation of the Operational Plan. The following is the structure of the QMS (including the implementation records):



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As described in Element 5 - Document and Records Control of the Operational Plan, the Table of Contents has been signed off to demonstrate that the “approval date” and “revision number” noted are the Operational Plan procedures that have been approved.

### **Differentiation between King, Schomberg, Nobleton and Ansnorveldt’s Operational Plans**

The Township of King owns and operates four drinking water systems for the distribution of water. The four drinking water systems and communities they serve are:

- King City,
- Schomberg,
- Nobleton, and
- Ansnorveldt.

As required by the DWQMS, each of the drinking water systems has their own Operational Plan, however for ease of use the Township of King has combined them into one manual.

As identified in the Operational Plan Table of Contents, the Operational Plan for each of the Township’s drinking water distribution systems is comprised of all 21 elements. In Element 6 Drinking Water System the descriptions are specific to each of the four drinking water systems and thus subsections have been provided for each system. As well, the risk assessment outcomes (Element 8) were done for each drinking water system separately but again combined together. Any risk assessment outcomes that were specific to a particular system are noted, otherwise the outcomes identified are applicable to all four drinking water systems.

### **Document Change History**

<b>Revision Level</b>	<b>Date</b>	<b>Change</b>	<b>Developed By</b>
1	September 26, 2011	Document Creation	M.N.
2	June 24, 2013	New Township Logo & inclusion of this table	J.V.
3	February 24, 2015	Move to “Paperless” protocol	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-02-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: July 6, 2009
	Procedure Title: Quality Management System Policy	Revision No: 2
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 1

## QUALITY MANAGEMENT SYSTEM POLICY

As the owners and operators of the Township of King's water distribution systems we are committed to:

- providing safe drinking water to our residents and businesses
- complying with applicable legislation and regulations as related to the provision of safe drinking water
- implementing and continually improving the effectiveness of our Quality Management System
- operating the Township's Municipal Drinking Water Systems as effectively and efficiently as possible
- implementing and seeking sustainable and environmentally sound operational practices and technologies

To assist the Township in meeting these commitments the Township will adopt the principles of quality management in the design, construction and operation of the drinking water systems. The Township of King will strive to use the best available, cost-effective technology, materials, management and planning methodologies to ensure that the infrastructure is well operated, maintained and managed in support of the provision of safe drinking water.

Date: January 29, 2016

### Document Change History

Revision Level	Date	Change	Developed By
0	July 06, 2009	Document Creation	M.N.
1	June 24, 2013	New Township Logo & inclusion of this table	J.V.
2	January 29, 2016	Added two new commitment bullets	J.V.

	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-03-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: July 14, 2011
	Procedure Title: Commitment and Endorsement	Revision No: 3
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The Owner endorses the Operational Plan through a Council Resolution. The Owner's commitment to an effective QMS is evidenced by the resources provided during implementation and maintenance of the Operational Plan and QMS.

The Corporation of the Township of King (owner) and Top Management of the Operating Authority (as defined in QMS-09-SYS) are committed to the implementation, maintenance and continual improvement of a Quality Management System that meets the requirements of the Drinking Water Quality Management Standard. The QMS for the drinking water systems is documented in the Operational Plan. Endorsement by the owner and top management acknowledges the need for and supports the provision of sufficient resources to maintain and continually improve the QMS. Top Management demonstrates their endorsement of the Operational Plan through the Staff Report to Council on the results of Management Review and by the key signatures on Appendix 03-01.

The Operational Plan will be endorsed by the Owner during each term of Council through a Council Resolution.

The Operational Plan will be endorsed by Top Management following the Annual Management Review, referred in QMS-20-SYS.

Operational Top Management's commitment to an effective QMS is evidenced by:

- a) Ensuring that a QMS is in place that meets the requirements of the DWQMS,
- b) Ensuring that the Operating Authority is aware of all applicable legislative and regulatory requirements,
- c) Communicating the QMS according to procedures (QMS-12-SYS), and
- d) Determining, obtaining or providing the resources needed to maintain and continually improve the QMS.

## REFERENCES

QMS-09-SYS  
QMS-12-SYS  
QMS-20-SYS

## APPENDICES

Appendix 03-01 Top Management Endorsement  
Appendix 03-02 Council (Owner) Endorsement

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### Document Change History

Revision Level	Date	Change	Developed By
1	July 14, 2011	Document Creation	M.N.
2	June 24, 2013	New Township Logo & inclusion of this table	J.V.
3	March 02, 2015	Moved to "paperless" protocol	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-04-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: June 19, 2012
	Procedure Title: QMS Representative	Revision No: 3
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 1

## 1 PURPOSE

To identify a Quality Management System Representative and outline their specific responsibilities.

## 2 PROCEDURE

### 2.1 Procurement Process

Top Management appoints and provides authority to the Quality Management System Representative, irrespective of their other responsibilities. The authority, roles and responsibilities are provided in QMS-09-SYS.

A notice of appointment of the QMS Representative has been signed by Top Management and is included in Appendix 04-A.

Top Management, through their annual review meeting, may decide to re-endorse or change the appointment of the QMS Representative.

If the staff position held by the QMS Representative becomes vacant, Top Management will appoint a new QMS Representative within a reasonable amount of time.

## 3 REFERENCES

QMS-09-SYS Organizational Structure, Roles, Responsibilities and Authorities

## 4 APPENDICES

Appendix 04-A Notice of Appointment of QMS Representative

### Document Change History

Revision Level	Date	Change	Developed By
1	June 19, 2012	Document Creation	M.N.
2	June 24, 2013	New Township Logo & inclusion of this table	J.V.
3	March 02, 2015	Moved to "paperless" protocol	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-05-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: August 11, 2011
	Procedure Title: Document and Records Control	Revision No: 3
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 3

## 1 PURPOSE

To document a procedure that describes how: a) documents required by the QMS are kept current, legible, readily identifiable, retrievable; as well as stored, protected, retained and disposed of; and b) records are kept legible, readily identifiable, retrievable, as well as stored, protected, retained and disposed of.

## 2 PROCEDURE

### 2.1 DOCUMENTS

A controlled document is the Operational Plan and its associated policies, procedures, (including applicable Standard Operating Procedures), forms, exhibits, flowcharts or other documents that are subject to revision and are maintained on the Document Master List (Form 05-01).

Controlled documents (excluding drawings) of both internal (refers to documents created by the Operating Authority) or external origin are listed on the Document Master List. The QMS Representative is responsible for maintaining the electronic list and ensuring an updated hard copy is included in the Operational Plan.

All electronically controlled documents (excluding drawings) for the QMS are available on the network drive. The network drive is backed up daily by Corporate.

Documents have revision numbers and a date listed on them to identify the current version.

The electronic documents are "read only" on the network drive. If the document is printed from a read only file then the document is considered uncontrolled and not subject to revision.

The Operational Plan system procedures (QMS-##-SYS) identify in the header the person who approves the document. The Table of Contents for the Operational Plan includes a signature by that person, which confirms that the system procedures (including the applicable version number and date) have been approved.

The QMS Representative and Director determine the point of use that controlled documents are to be made available. These locations (along with the title and revision number) are recorded on the Document Master List.

All staff are responsible for ensuring that documents remain legible and readily identifiable. If a document has been damaged or made illegible, staff are to request a replacement copy from the QMS Representative.

Documents that are only available in hard copy are kept in a safe, dry location that will ensure no damage or deterioration.

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### Document Changes

Any employee can make a request for the creation or a change to a QMS related document. Changes to documents can be a result of change in procedure, results of an audit or suggestion for improvement.

The request is recorded in Part A on a Document Change Form (Form 05-03). Suggested changes can also be attached to the Document Change form.

The Document Change Form is then sent to the QMS Representative who will forward the Form to the appropriate management staff (responder) who initially approved the document.

Prior to processing document changes, the QMS Representative will be responsible for ensuring that the changes will not affect the integrity of the QMS or the processes.

The responder notes the decision on the Document Change Form and forwards the form to the QMS Representative.

If the request is denied, the responder will send notification to the requester and the QMS Representative advising of the decision and the reason why.

The QMS Representative then updates the Document Master List Form 05-01. The QMS Representative will send an email explaining what has changed in the document to all management affected by the change. Management are responsible for advising any staff affected by the change.

The QMS Representative ensures that Part C of the Document Change Form is completed, dated, and filed.

Obsolete documents must be marked "Obsolete" if retained for legal and/or historical purposes, otherwise they are disposed of once a current version is made available. Only current versions of documents are maintained on the Document Master List by the QMS Representative. The user of the obsolete document is responsible for disposing of the document once they determine there is no further use for the document. The retention time for obsolete documents is not preset and is based on the user's requirements.

QMS documents are retained until they are replaced by a more current version (e.g., forms) or the life of the asset (e.g., manufacturing specifications). Documents that have been identified as obsolete or superseded by updated versions or replaced due to being damaged/illegible are disposed of by being thrown out.

The QMS Representative will review the Document Master List, a minimum of once per year, to verify that any documents that have not been revised since the previous review are still adequate.

## **2.2 RECORDS**

The Record Master List Form (Form 05-02) identifies all of the records that this procedure applies to.

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The electronic documents and records associated with the QMS are maintained on the network drive which is backed up daily.

The person completing the record must ensure the record is legible, accurate and complete with regard to recording requirements.

The QMS Representative, in consultation with the Director, determines the retention time (active and storage) for records.

Records may be electronic and/or hard copy.

Electronic records associated with the QMS are maintained on the network drive which is backed up daily, weekly and monthly. The monthly copy is stored off-site.

### 3 REFERENCES

Form 05-01	Document Master List
Form 05-02	Record Master List
Form 05-03	Document Change Form

### 4 APPENDICES

Not Applicable

### 5 CHANGE HISTORY

Revision Level	Date	Change	Developed By
2	May 05, 2013	New Township Logo	J.V.
3	March 02, 2015	Moved to "paperless" protocol	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-06-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: July 12, 2012
	Procedure Title: Drinking Water System	Revision No: 6
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 5

## 1. PURPOSE

The Township of King, as the owner and operating authority of the drinking water systems, is responsible for the distribution of drinking water to the citizens of the Township of King (which includes the communities of King, Schomberg, Nobleton and Ansnorveldt). Engineering and Public Works Department is responsible for the operation, management, maintenance and/or alteration of four drinking water systems: King City, Schomberg, Nobleton and Ansnorveldt.

## 2. PROCEDURE

The Township purchases its drinking water from the Region of York sourced from municipal lake-based water and groundwater wells in the Township of King area. Since the Region of York treats all of the water in the drinking water systems the description of the critical upstream processes used are included in the Region of York's Operational Plan. There are no critical downstream processes relied upon to ensure the provision of safe drinking water. In addition, there are no recurring event-driven fluctuations or any resulting operational challenges and threats to the water source since the Township of King is only provided with treated water by the Region of York.

The Township's King, Schomberg and Nobleton Water Distribution Systems are each classified as "Large Municipal Residential System". The Township's Ansnorveldt Water Distribution system is classified as a "Small Municipal Residential System". The Township does not treat the water and only distributes water supplied by the Region of York.

Certificates of classification were issued to the Township of King for the water distribution systems under the Ontario Water Resources Act. All four of the water distribution systems classifications are Class I.

### 1 KING CITY WATER DISTRIBUTION SYSTEM

The Township of King is responsible for maintaining the King City watermain distribution system in the village of King City. Refer to Appendix 6-A for a schematic of the distribution system and the associated Region of York facilities. A detailed water distribution system map is maintained by Engineering & Public Works.

#### 1.1 Water Supply

Water supply for the village of King City is through the York Water System (YWS) and backed-up by local groundwater wells. The Region of York owns and operates and maintains the York Water System (lake-based water) and the King City Well Supply system. Disinfection of the lake-based water is by chloramination, and for well water, is through chloramination and iron sequestering. The Region of York owns and operates and maintains two elevated tanks as the storage facilities in the system. Secondary disinfection is provided by maintenance of combined

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chlorine residual in the distribution system. The Region collects samples from the points where treated water enters the distribution system.

Water withdrawal from each of the wells is regulated by a “Permit to Take Water”, issued by the Ministry of the Environment to the Region of York. This permit allows for the development of water resources for beneficial purposes, while providing reasonable protection to existing water uses and water users.

## 1.2 Water Distribution

The King City Distribution System services a population of approximately 7,400 people (as of 2019) with 2,317 service connections. The Township owns approximately 55 km of watermains (cast, ductile iron and PVC), and 381 hydrants within the King City Water Distribution System.

Maintenance and operation of the King City Distribution System is carried out by distribution staff from the Township of King Engineering and Public Works Department. Township Operators are responsible for regular hydrant and valve inspections, watermain flushing, investigation of water pressure and water quality complaints and repair of water mains, water services valves and hydrants.

## 2 SCHOMBERG WATER DISTRIBUTION SYSTEM

The Township of King is responsible for maintaining the Schomberg watermain distribution system in the village of Schomberg. Refer to Appendix 6-B for a schematic of the distribution system and the associated Region of York facilities. A detailed water distribution system map is maintained by Engineering & Public Works.

### 2.1 Water Supply

The village of Schomberg receives its drinking water from groundwater wells. The Region of York owns and operates and maintains the Schomberg Well Supply system utilizing chloramine disinfection and iron sequestering processes. The Region of York owns and operates and maintains an elevated tank as the storage facility in the system. The Region of York also provides secondary disinfection for the Schomberg Distribution System. The Region collects samples from the points where treated water enters the distribution system.

Water withdrawal from each of the wells is regulated by a “Permit to Take Water”, issued by the Ministry of the Environment to the Region of York. This permit allows for the development of water resources for beneficial purposes, while providing reasonable protection to existing water uses and water users.

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## 2.2 Water Distribution

The Schomberg Water Distribution System services a population of approximately 2,700 people (as of 2019) with 844 service connections. The Township owns approximately 16 km of watermains (ductile iron and PVC) and 114 hydrants within the Schomberg Water Distribution System

Maintenance and operation of the Schomberg Distribution System is carried out by distribution staff from the Township of King Engineering and Public Works Department. Township Operators are responsible for regular hydrant and valve inspections, watermain flushing, investigation of water pressure and water quality complaints and repair of water mains, water services valves and hydrants.

The Schomberg DWS has nitrification challenges in the distribution system due to high levels of methane and ammonia in the source water. The Region of York currently strives to remove as much methane as possible by “scrubbing” however elevated levels of ammonia are contained in the final treated water which can cause elevated nitrites in the water. Township staff work in close coordination with the Region to identify potential incidents of nitrification and respond in a timely manner to prevent adverse conditions. There is also an enhanced monitoring program in place with agreed upon trigger points whereby both teams will respond to indicators of rising nitrites/nitrates.

## 3 NOBLETON WATER DISTRIBUTION SYSTEM

The Township of King is responsible for maintaining the Nobleton watermain distribution system in the village of Nobleton. Refer to Appendix 6-C for a schematic of the distribution system and the associated Region of York facilities. A detailed water distribution system map is maintained by Engineering & Public Works.

### 3.1 Water Supply

The village of Nobleton receives its drinking water from groundwater wells. The Region of York owns and operates and maintains the Nobleton Well Supply system utilizing chlorine disinfection and iron sequestering processes. The Region of York owns and operates and maintains elevated tanks as the storage facility in the system. The Region of York also provides secondary disinfection for the Nobleton Distribution System. The Region collects samples from the points where treated water enters the distribution system.

Water withdrawal from each of the wells is regulated by a “Permit to Take Water”, issued by the Ministry of the Environment to the Region of York. This permit allows for the development of water resources for beneficial purposes, while providing reasonable protection to existing water uses and water users.

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### 3.2 Water Distribution

The Nobleton Water Distribution System services a population of approximately 6,300 people (as of 2019) with 1,960 service connections. The Township owns approximately 41 km of watermains (cast, ductile iron and PVC), and 344 hydrants within the Nobleton Water Distribution System.

Maintenance and operation of the Nobleton Distribution System is carried out by distribution staff from the Township of King Engineering and Public Works Department. Township Operators are responsible for regular hydrant and valve inspections, watermain flushing, investigation of water pressure and water quality complaints and repair of water mains, water services valves and hydrants.

## 4 ANSNORVELDT WATER DISTRIBUTION SYSTEM

The Township of King is responsible for maintaining the Ansnorveldt watermain distribution system in the hamlet of Ansnorveldt. Refer to Appendix 6-D for a schematic of the distribution system and the associated Region of York facilities. A detailed water distribution system map is maintained by Engineering & Public Works.

### 4.1 Water Supply

The hamlet of Ansnorveldt receives its drinking water from groundwater wells. The Region of York owns and operates and maintains the Ansnorveldt Well Supply system utilizing a chlorine disinfection process. The Region of York also provides secondary disinfection for the Ansnorveldt Distribution System. The Region collects samples from the points where treated water enters the distribution system.

Water withdrawal from the wells is regulated by a "Permit to Take Water", issued by the Ministry of the Environment to the Region of York. This permit allows for the development of water resources for beneficial purposes, while providing reasonable protection to existing water uses and water users.

### 4.2 Water Distribution

The Ansnorveldt Water Distribution System services a population of approximately 170 people (as of 2019) with 53 service connections. The Township owns approximately 1 km of watermains (cast, ductile iron and PVC), and 2 hydrants within the Ansnorveldt Water Distribution System.

Maintenance and operation of the Ansnorveldt Distribution System is carried out by distribution staff from the Township of King Engineering and Public Works Department. Township Operators are responsible for regular hydrant and valve inspections, watermain flushing, investigation of

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water pressure and water quality complaints and repair of water mains, water services valves and hydrants.

### 3. REFERENCES

Water Distribution Map of King City  
 Water Distribution Map of Schomberg  
 Water Distribution Map of Nobleton  
 Water Distribution Map of Ansnorveldt

### 4. APPENDICES

Appendix 6-A schematic of the distribution system and the associated Region of York facilities for King City  
 Appendix 6-B schematic of the distribution system and the associated Region of York facilities for Schomberg  
 Appendix 6-C schematic of the distribution system and the associated Region of York facilities for Nobleton  
 Appendix 6-D schematic of the distribution system and the associated Region of York facilities for Ansnorveldt

#### Document Change History

Revision Level	Date	Change	Developed By
3	May 05, 2013	New Township Logo & inclusion of this table	J.V.
4	March 02, 2015	Moved to "paperless" protocol	J.V.
5	November 10, 2015	Added clause identifying nitrification challenges in the Schomberg DWS	J.V.
6	November 7, 2018	Update to DWQMS version 2.0	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-07-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: July 14, 2011
	Procedure Title: Risk Assessment	Revision No: 7
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 5

## 1 PURPOSE

To document the procedure used to complete a risk assessment for the drinking water system. The risk assessment process will

- identify potential hazardous events and associated hazards as identified in the MOECC document Potential Hazardous Events for Municipal Residential Drinking Water Systems,
- identify additional potential hazardous events and associated hazards,
- assess and rank the risks associated with the hazards,
- identify control measures to address the hazards,
- identify critical control points within the drinking water system,
- identify a method to verify the risk assessment validity and assumptions at least once a year,
- ensure a risk assessment is conducted at least once every three years, and
- consider the reliability and redundancy of the equipment.

## 2 PROCEDURE

### 2.1 Annual Review Process

1. At least once every calendar year, or following a major process change, the QMS Representative facilitates a review (referred to as the annual review) of the currency of the information and validity of the assumptions used in the risk assessment process for the drinking water system. This is undertaken by a team comprised of (at a minimum) the Director of Engineering, Public Works & Building and Urban Services Manager and/or their designates.
2. When reviewing the currency of the risk assessment information, the following may be considered:
  - process changes
  - reliability and redundancy of equipment
  - emergency situations
  - critical control point deviations
  - QMS non-conformances related to standard operating procedures

#### ***Risk Assessment Methodology***

3. The risk assessment is completed by filling out the Risk Assessment Form (Table 08-01) in the order of the drinking water system steps so that the risk assessment outcomes are created (as per DWQMS Element 08). The previous years' completed form is used as a template during the annual review. Newly identified hazards are inserted into the previous year's form and the columns are filled out as described below and removed hazards are deleted.

<b>Column in Risk</b>	<b>Information in Column</b>
-----------------------	------------------------------

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<b>Assessment Form</b>	
A – <i>Event Number</i> B – <i>Event</i> C – <i>Event Description</i>	Column A is populated with the event number and the event is documented in Column B. At least annually the information in these columns is reviewed to ensure the drinking water system steps have been captured, and associated hazards are identified and described. Column C details the event through physical, biological and chemical parameters
D – <i>Control Measures, Best Practices, and SOPs</i>	The “Control Measures, Best Practices, and SOPs” section is used to provide additional information such as: <ul style="list-style-type: none"> <li>• Brief description of the applicable best management practice</li> <li>• Description of applicable control measures</li> <li>• Standard Operating Procedures / practices that address the hazard</li> </ul>
E – <i>Likelihood</i> F – <i>Consequence</i> G - <i>Detectability</i>	The likelihood (L), consequence (C) and detectability (D) of the hazardous event occurring are assessed using the Table 08-02 Risk Assessment Outcomes as updated. Vulnerability and/or critical customers may also be considered when assigning the likelihood and/or consequence rating. Using this methodology, the higher number indicates a higher likelihood or consequence.
H – <i>Risk</i>	The risk (R) is then assigned for each hazard based on the calculation of the likelihood of the event occurring (L) plus the consequence (C) plus the detectability (D)
I through K – <i>Screening Questions to Identify Critical Control Point (CCP) and Control Point (CP)</i>	The three questions in these columns are then answered: <ol style="list-style-type: none"> <li>1) If the hazard is controlled by a best management practice (summarized in Table 08-02), then the practice is noted in column I under a Yes (Y) answer.</li> <li>2) For a hazard to be identified as a CCP, the answers to columns J and K must be “yes” <ul style="list-style-type: none"> <li>• To answer “Yes” to column K (“If control was lost could someone be hurt?”), the calculated risk (Column H) must be greater than <u>or</u> equal to the “priority risk” number.</li> <li>• The assigned priority risk rating is 8. This rating will be reviewed during the three-year review process.</li> </ul> </li> <li>3) “Critical Control Points (CCP)”/Control Points (CP) are identified as hazards that: <ul style="list-style-type: none"> <li>• are controlled by a best management practice, and</li> </ul> </li> </ol>

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	<ul style="list-style-type: none"> <li>• have a calculated risk that is greater than or equal to “priority risk” number.</li> </ul>
L – CCP#	The identified CPs and CCPs are numbered sequentially and highlighted.

Hazard identification as a CCP is shown on the Chart 07-01 for ease of reference.

- The outcome of the Risk Assessment is the completed Risk Assessment Form, which is an output generated for the Risk Assessment Outcomes (QMS-08-SYS). Additionally, the identified CCPs are summarized in Table 08-02 (Summary of Critical Control Points).

## 2.2 Three-Year Review Process

- At least once every three years, a more comprehensive review of the drinking water system risk assessment process is conducted. This is an opportunity to review the risk assessment process and outcomes and to assess the risks. For example, the reviewers could consider changes in microbial risks based on new research, or changes to the risk assessment process as a continual improvement feature. To undertake this more comprehensive review, the QMS Representative facilitates a team comprised of (at a minimum) Director and Manager and other potential external reviewers (e.g., other Township Departments, consultants, other utilities) that the QMS Representative may decide to invite.
- In the years where the three-year review process is completed, the annual risk assessment review will be completed at the same time.

## 2.3 Document and Records Management

- The completed Risk Assessment Outcomes Form (Table 08-01) is forwarded to the Director for review and approval.
- The QMS Representative is responsible for ensuring that minutes are taken during the annual and three-year review meetings and that these are maintained as per Document and Records Control QMS-05-SYS Procedure.
- The QMS Representative is responsible for maintaining and making any necessary changes/updates to the Risk Assessment Form as per Document and Records Control QMS-05-SYS Procedure.
- The QMS Representative is responsible for ensuring that any necessary changes are made to the training requirements, standard operating procedures, system procedures or other parts of the QMS resulting from changes to the Risk Assessment.

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### 3 REFERENCES

QMS-05-SYS Document and Records Control QMS System Procedure

### 4 APPENDICES

Chart 07-01 Hazard Identification as a Critical Control Point (CCP)

### 5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
3	June 19, 2013	New Township Logo & inclusion of this table	J.V.
4	June 10, 2014	Outcomes of 2014 Risk Assessment Review meeting-revised to reflect changes to Table 08-02 and deletion of Table 07-01	J.V.
5	March 02, 2015	Moved to "paperless" protocol	J.V.
6	March 15, 2018	Move to three item risk protocol and revised to reflect MOECC document	J.V.
7	November 7, 2018	Further revisions to update to DWQMS version 2.0	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-07-SYS
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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-08-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: July 14, 2011
	Procedure Title: Risk Assessment Outcomes	Revision No: 2
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 1

## 1 PURPOSE

To document the outcomes of the risk assessment for the drinking water systems and identifying the Control Points (CP) and Critical Control Points (CCP).

## 2 PROCEDURE

1. The risk assessment outcomes are reflected in Table 08-01
2. The identified CCPs are summarized in Table 08-02 (Summary of Critical Control Points) and are updated following the Annual Review and the 3-year Review of this element.

## 3 REFERENCES

QMS-07-SYS Risk Assessment

## 4 APPENDICES

Table 08-01 Risk Assessment Outcomes  
Table 08-02 Summary of Critical Control Points

## 5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
1	June 19, 2013	New Township Logo & inclusion of this table	J.V.
2	March 02, 2015	Moved to "paperless" protocol	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-09-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: July 06, 2009
	Procedure Title: Organizational Structure, Roles, Responsibilities & Authorities	Revision No: 2
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 2

## 1 PURPOSE

To document a procedure ensuring that the Owner, Operating Authority and Top Management are defined, the organizational structure of the Operating Authority is described and the roles, responsibilities and authorities of Top Management and key positions within the Operating Authority are identified.

## 2 PROCEDURE

### 2.1 Organizational Structure

The organizational structure of the Operating Authority and the Owner is outlined in Appendix 9-A: DWQMS Organizational Chart.

The Owner is the Corporation of the Township of King and is represented by Council.

#### Identifying Key QMS Roles

The members of Top Management, the QMS Representative and the Operating Authority of the drinking water systems are defined in Appendix 9-A.

Top Management is responsible for conducting management review as outlined in procedure QMS-20-SYS Management Review.

The QMS Representative is appointed by Top Management and irrespective of other responsibilities shall have specific QMS related responsibilities as outlined in Table 09-01.

The appointment letter for the QMS Representative is included in procedure QMS-04-SYS.

### 2.2 Organizational Roles, Responsibilities and Authorities

Specific responsibilities and authorities for positions with key roles in the Drinking Water Quality Management System are detailed in the various system procedures and standard operating procedures that form the Operational Plan.

Table 09-01 provides a summary of the overall roles, responsibilities and authorities related to the provision of safe drinking water in the drinking water system. The specific responsibilities and authorities for the various roles are provided in the Job Descriptions.

## 3 REFERENCES

Job Descriptions  
QMS-04-SYS QMS Representative  
QMS-20-SYS Management Review

## 4 APPENDICES

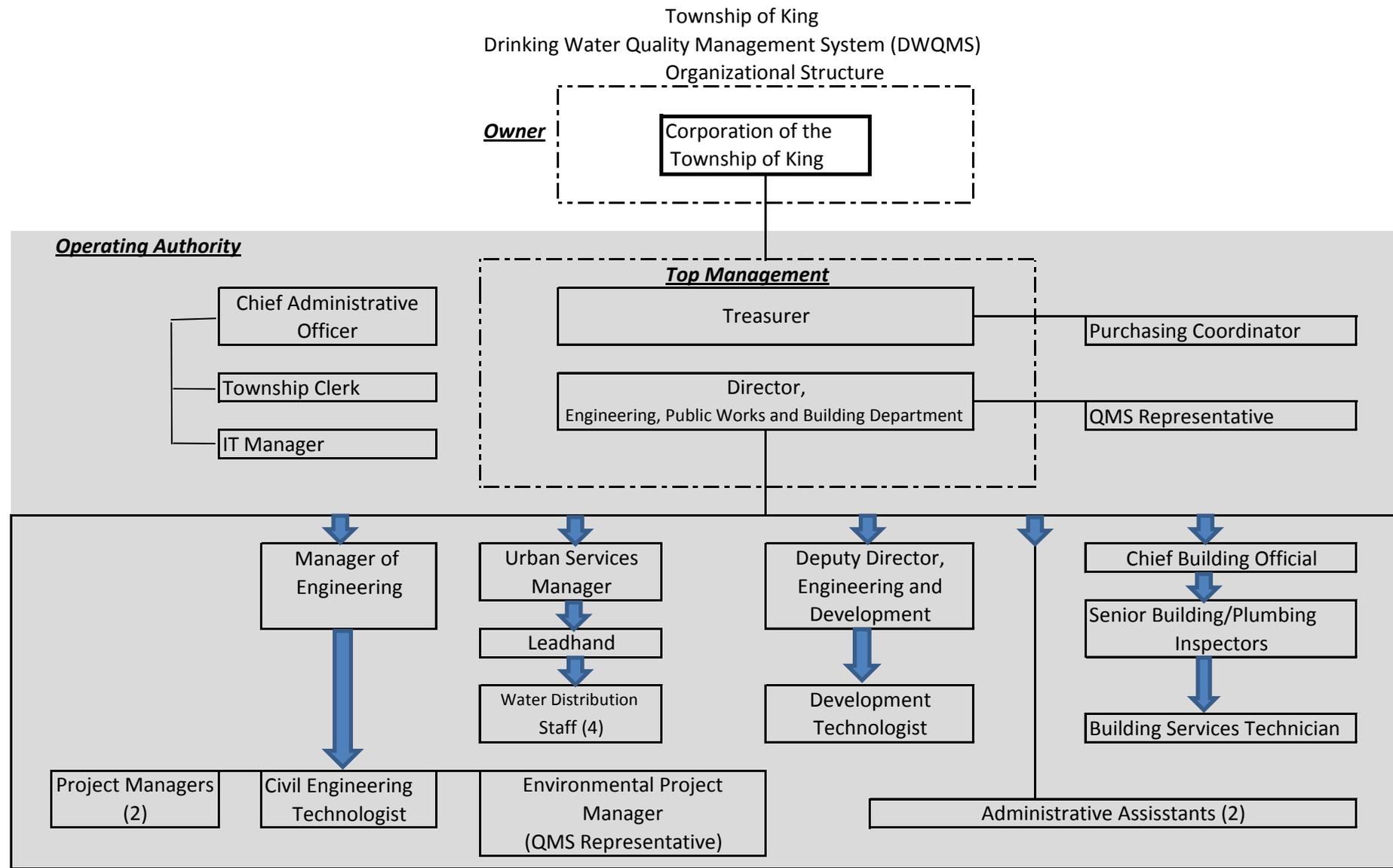
Appendix 9-A DWQMS Organizational Chart  
Table 09-01 QMS Roles, Responsibilities and Authorities

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### Document Change History

Revision Level	Date	Change	Developed By
1	June 19, 2013	New Township Logo & inclusion of this table	J.V.
2	March 02, 2015	Moved to "paperless" protocol	J.V.

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Revision Level	Change	Date	Developed by:
1	Document creation	December 20, 2010	R.F.
2	Move to "Paperless" protocol	February 24, 2015	J.V.
3	Revise to reflect new Director title	May 13, 2016	J.V.
4	Revise to reflect new Environmental Project Manager title	May 14, 2016	J.V.
5	Revise to reflect the new Top Management Structure	August 28, 2019	MW

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-10-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: December 21, 2012
	Procedure Title: Competencies	Revision No: 5
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 5

## 1 PURPOSE

To document a procedure that identifies:

- a) competencies required for personnel performing duties directly affecting drinking water quality,
- b) activities to develop and/or maintain competencies for personnel performing duties directly affecting drinking water quality, and
- c) activities to ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water.

## 2 PROCEDURE

### 2.1 Competencies

The Manager is responsible for identifying required competencies for employees performing duties directly affecting drinking water quality. The minimum levels of competencies required for personnel with duties affecting drinking water quality are identified in Table 10-01 Competencies.

Table 10-01 indicates the skill level required for each position whose actions may have a direct impact on water quality. The following is a general description of the various competency levels:

- Competency Level 1 indicates a basic, theoretical level of understanding. Level 1 understanding is normally acquired through a combination of theoretical instruction, on-the-job training, review of journal articles, and specialty seminar attendance.
- Level 2 indicates an intermediate, theoretical and working knowledge of a skill, typically acquired through post-secondary theoretical and practical instruction, on-the-job experience, and participation in specialty workshops and courses.
- Level 3 indicates advanced theoretical and working understanding of a particular subject area, particularly as it pertains to the person's responsibilities in the water distribution process. Level 3 is achieved through a combination of successful completion of a post-secondary degree or diploma in engineering, science, or technology, at least 10 years of directly related experience and training, as well as regular participation at specialty seminars and courses.

Job descriptions are developed by the Manager and are reviewed periodically for currency. The job descriptions include identification of responsibilities and education and experience requirements.

Competency is demonstrated by having appropriate education, training, skills and experience required for each relevant position.

There is a probationary period for new or transferred employees and at the end of the probationary period the Manager evaluates the employee's competency.

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Competency for management positions is reviewed at least annually during performance reviews conducted by the manager one level up.

## 2.2 Training Needs Identification

Manager identifies training needs for employees performing duties directly affecting drinking water quality based on the identified competencies.

The need for training (to ensure competency is maintained) may also be determined based on the following:

- Comparison of the person's skills and abilities with the requirements of the job description and qualifications, in particular for new, temporary and transferred employees;
- Corrective action (e.g., resulting from internal audits or non-conformances) if the need for training is found to be a root cause (Element 21);
- Changes due to updates to the risk assessment outcomes (Element 8); and
- Changes in legislative/regulatory requirements.

## 2.3 Training Plan

The Manager and Director meet at the end of each year to plan out the training for various positions affecting drinking water quality for the next year. They refer to the required competencies, the completed training from previous years, and other currently available courses to develop the training plan for that year. Table 10-01 is a guide for the level of competency that staff should obtain and provides the Manager with some guidance on the type of courses that staff may need to take courses related to in order to achieve and/or maintain the level of competency.

For Water Operators the Training Plan addresses the completion of mandatory courses, number of CEU's and on the job training hours.

The Manager reviews the training schedule twice per year to determine additional requirements (e.g., CEUs, on-the-job training) and to assist in monitoring the required training hours for positions with duties directly affecting the drinking water quality.

The Water Operator maintains a record of On-the-Job Practical Training using Form 10-01. The Water/Wastewater Compliance Technologist records completion of all trainings in the Operator Training database. Original and Copy of operators' current licences and certificates are maintained and filed by Urban Services Manager. Training Records are maintained as per QMS-05-SYS Document and Records Control.

## 2.4 Employee DWQMS Orientation

The QMS Representative ensures a Drinking Water Quality Management Standard (DWQMS) awareness session is provided to new or transferred employees. The following types of information are included in the DWQMS awareness session:

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- introduction to management systems and QMS Representative;
- review of pertinent procedures and Standard Operating Procedures; and
- review of QMS policy and ensuring that personnel are aware of the relevance of their duties and how they affect safe drinking water.

The Administrative Assistant records completion of the DWQMS awareness session and other applicable training. Copies of current licences or certificates issued from training are maintained and filed by the Administrative Assistant.

## 2.5 Training Methods

Competency requirements can be satisfied through the use of in-house, off-site, or on-line training, attendance at seminars/conferences, presentations by subject matter experts or on-the-job training.

On-the-job training may include using a “job shadowing system” to demonstrate and monitor how to perform various job duties using the appropriate documented procedures.

## 2.6 Effectiveness of Training

When external trainers conduct courses, the trainer may review and verify training effectiveness through various means (e.g., mini quiz or mini workshops are undertaken for CEU courses). If the employee is knowledgeable and able to demonstrate the skills, then the external trainer often issues a certificate to indicate the training was effective.

When internal training courses are conducted, the Manager talks to staff following completion of the course to determine the effectiveness of the training. In addition, the person setting up the training will ask the instructor to provide feedback on the trainee's understanding of the information.

Training needs may be identified through the Continual Improvement process (Element 21), and documented in a Corrective Action Report (CAR - Form 21-01). For these training needs, the employee's Manager is responsible for ensuring the training is completed and competency is achieved and reporting it to the QMS Representative.

On-the-job training is provided to employees through courses and job shadowing and is determined to be effective when the Manager allows the employee to work alone.

Training session(s) to cover off any legislation and regulatory requirement for Operation Staff shall be provided once every two years or at the time of any regulatory changes.

## 3 REFERENCES

QMS-05-SYS Procedure Document and Records Control  
 QMS-08-SYS Risk Assessment Outcomes  
 QMS-21-SYS Continual Improvement  
 Training Plan (Training Records Database)  
 Form 21-01 Corrective Action Report

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#### 4 APPENDICES

Table 10-01 Drinking Water Related Competencies  
Form 10-01 On-the-Job Practical Training

#### 5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
3	June 19, 2013	New Township Logo & inclusion of this table	J.V.
4	March 02, 2015	Moved to "paperless" protocol	J.V.
5	November 7, 2018	Update to DWQMS version 2.0	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-10- SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: December 21, 2012
	Procedure Title: Competencies	Revision No: 5
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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-11-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: July 14, 2011
	Procedure Title: Personnel Coverage	Revision No: 3
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 2

## 1 PURPOSE

To document a procedure for ensuring that sufficient personnel (meeting competency requirements) are available for duties directly affecting drinking water quality.

## 2 PROCEDURE

### 2.1 OVERALL RESPONSIBLE OPERATOR (ORO)

The daily work schedule is maintained in the log book that is kept in the Manager's office in the Works Yard. The log book identifies who is the designated Overall Responsible Operator (ORO) and who is the Operator in Charge (OIC).

The Manager and Leadhand are the designated ORO and back-up, respectively.

The Manager and Leadhand are the OIC during regular business hours. During non-business hours, the OICs rotate on a weekly basis (Friday to Friday) with the on-call person being the OIC.

### 2.2 REGULAR HOURS

Licensed distribution operators are available during regular business hours (Monday to Friday from 7:00 am to 4:00 pm).

The Administrative Assistant receives emergency calls during regular business hours of Monday to Friday from 8:30 am to 4:30 pm.

### 2.3 ON-CALL HOURS

A contracted answering service receives calls from the public from 4:30 pm to 8:30 am during weekdays; and 24-hours per day during weekends and on holidays.

The contracted answering service contacts the cellphone which is carried by the on-call Operator, if a call-out is required. If there is no response, the service will call next alternate person on the contact list until they receive a response.

If the on-call operator does not respond after-hours (On-call Hours), answering service calls down the list that identifies back-up personnel as needed.

The Manager develops the on-call list every year and makes any modifications that are needed on a daily basis, based on operator's informing the Manager of changes that are needed. The On-call Schedule is posted in the Manager's office in the Works Yard.

The answering service Administrative Assistant notifies the contracted answering service when the ORO is away and who the back-up ORO is.

The on-call Operator is the Operator-in-Charge (OIC) and is present for on-call repairs.

The designated ORO is contacted by the OIC if there are problems.

All Operators have an emergency list of contractors that can be contacted to assist in the repairs. The contractors are supervised by an Operator at all times.

The list of contractors is available in the Emergency Contact List – Element 18, Appendix 18-A.

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### 3 REFERENCES

QMS-10-SYS Competencies  
Log Book  
On-Call Schedule  
QMS-18-SYS Emergency Management, Appendix 18-A

### 4 APPENDICES

Not applicable

### 5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
2	June 19, 2013	New Township Logo & inclusion of this table	J.V.
3	March 02, 2015	Moved to "paperless" protocol	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-12-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: January 30, 2012
	Procedure Title: Communications	Revision No:4
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 4

## 1 PURPOSE

To document a procedure for communications that describes how relevant aspects of the Quality Management System are communicated between Top Management and:

- a) the Owner;
- b) the Operating Authority personnel;
- c) Suppliers that have been identified as essential under QMS-13-SYS; and
- d) the Public.

This procedure does not include communication procedures used in Emergency situations. These are described in QMS-18-SYS Emergency Management.

## 2 PROCEDURE

### 2.1 COMMUNICATION OF QMS POLICY

The QMS Policy is made available to Operating Authority personnel, the public and the Owner:

- on the Township of King's website,
- posted in the Township Main Office and Works Yard,
- is available to the public upon request, and
- to all suppliers of Essential Supplies and Services

### 2.2 COMMUNICATION METHODOLOGIES

#### ***2.2.1 Communication to and from Owner (Council)***

Communication to Council from Top Management is through the use of staff reports, information memos or presentations to Council following established Corporate communication protocols. As well, contact during emergency situations may be made directly between Top Management and the Mayor. A current copy of the Operational Plan is provided to Council on a yearly basis or when significant changes are made to the Operational Plan.

Council can communicate directly to Top Management during "Committee of the Whole", Working Sessions of Council and/or Council meetings. The CAO, Treasurer and Director of Engineering and Public Works (or their designate) are present at all Committee of the Whole meetings (which form part of the Council meetings). The CAO may receive direction from the Mayor and Council separately from the Committee meeting.

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### **2.2.2 *Communication to and from Operating Authority Personnel***

1. Top Management communicates to and from the Operating Authority personnel (which includes the QMS Representative) through various regularly held meetings. Where applicable, meeting minutes are retained as per QMS-05-SYS Document and Records Control. Generally, the process for relaying information related to drinking water issues from Top Management to personnel is achieved through the following tiered approach:
  - a) Top Management to the Manager through various management meetings
  - b) Manager is then responsible for relaying applicable information to staff, often in regularly held staff meetings, or other means.
  
2. Other forms of communication between Top Management and Operating Authority personnel include:
  - written documentation,
  - emails,
  - verbal discussions,
  - training sessions,
  - circulation of applicable procedures and other QMS documentation, and
  - posting of material on bulletin board.

It should be noted that the Operating Authority management staff have an open door policy that encourages direct communication between management and personnel.

### **2.2.3 *Communication to and from Essential Suppliers***

1. Communication to **Essential** Suppliers is done through the Manager, Supervisors and Purchasing through the issuance of tenders, contracts and/or purchase orders to suppliers. Operating Authority personnel may deal directly with suppliers through the use of purchase orders. The QMS Policy and copies of specific standard operating procedures are provided to Suppliers of Essential Supplies and Services along with the purchase orders, contracts or tender documents.
2. Communication from Suppliers to Top Management (via Township staff) can be through written correspondence, email, phone calls, and the purchasing process.
3. Operating Authority personnel contact suppliers directly if problems occur with the supplier. For ongoing issues Purchasing and/or Budget Coordinator (assigned to Public Works) will also be contacted to deal with ongoing supplier related problems.

### **2.2.4 *Communications to and from the Public***

1. All non-emergency communication (related to water issues) to the public is achieved through:

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- newspaper notification and/or media advisories;
- hand delivered letters;
- posting on the Township of King's website (e.g., annual reports, Policy),
- coordination with York Region and/or Fire Department (i.e., water bans)
- Reports to Committee/Council
- public meetings

2. The public can communicate water related issues/queries through:
- calling the Township's main telephone line and/or the contracted Answering Service (after business hours);
  - water related calls are routed to the Administrative Assistant for Engineering and Public Works for issuance of a service request;
  - e-mails and/or phone calls directly to Township staff;
  - letters; and
  - faxes.

The contracted after-hours Answering Service contacts on-call staff to address issues and the after-hours Answering Service maintains a log of callers, which is faxed to the Administrative Assistant of Engineering and Public Works.

Administrative Assistant of the Engineering and Public Works manages the complaints/concerns received through any of the above noted communication forms and records them in the Customer Service Relationship Management (CRM) program for further action(s), as indicated on Section 2.2 of QMS-15-SYS.

### 3 REFERENCES

QMS-05-SYS Document and Records Control  
 QMS-13-SYS Essential Supplies and Services  
 QMS-15-SYS Infrastructure Maintenance, Renewal and Rehabilitation  
 QMS-18-SYS Emergency Management

### 4 APPENDICES

Not Applicable

### 5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
2	June 19, 2013	New Township Logo & inclusion of this table	J.V.
3	March 02, 2015	Moved to "paperless" protocol	J.V.
4	November 7, 2018	Update to DWQMS version 2.0	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-12- SYS
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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-13-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: September 10, 2012
	Procedure Title: Essential Supplies and Services	Revision No: 4
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 3

## 1 PURPOSE

To document a procedure ensuring the quality of essential supplies and services, in as much as they may affect drinking water quality. The procedure shall include identification of these supplies and services and a means to ensure their procurement

## 2 PROCEDURE

### 2.1 Procurement Process

The Engineering and Public Works Department forwards specifications and/or certification of product requirements for supplies and services to the Purchasing Coordinator prior to issuance of new and/or renewal of tenders, RFPs, contracts, etc. The Engineering Design Criteria and Standard Details includes a listing of the approved products and specifications.

If required, the Director ensures that Standard Operating Procedures are developed and provided to establish procedures/specifications for suppliers and contractors.

Prior to issuance, the Purchasing Coordinator forwards the RFP and other bid documents to the Director for review.

The By-Law to *“Define the Procurement Policies and Procedures for the Township of King”* (referred to **Purchasing By-Law**) has price thresholds, and thus some supplies (below the threshold) may be purchased directly by the Manager from local sources.

Some supplies are kept in stock (e.g., repair clamps, odd-sized pipes, etc.) and are available at the Works Yard.

A copy of the relevant procedures/specifications, a copy of the Quality Policy and general information regarding the presence of a QMS are included in the appropriate contractual agreement.

A contact list for Essential Supplies and Services identifying approved suppliers and contractors is maintained (including a yearly update review) by the Water & Wastewater Compliance and Engineering Technologist. The yearly review will assess but not be limited to the following:

1. Performance of any agencies on the Contact List used throughout the review period;
2. The completeness of the Contact List as it relates to agencies used and their inclusion on the Contact List

For the provision of supplies and/or services during emergency situations the OIC and/or ORO can contact appropriate suppliers and/or contractors from the approved list.

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During emergency situations when a contractor is used, the Manager contacts the Director to inform them about what was done and the approximate costs.

## 2.2 Identification of Supplies & Services and Requirements

Form 13-01 Essential Supplies and Services for drinking water identifies the essential supplies and services critical to the provision of safe drinking water.

The form provides a description of the Procurement of Supplies or Services including:

- how do you ensure it is available, when required
- how do you ensure it is made available, when required (daily operations & emergencies)

The form also includes identification of the Quality Requirements:

- what requirements are needed related to quality of supply or service (e.g., product/service quality; performance of supplier/service provider; method of delivery; on-site activities)
- definition of how they make sure they are met

## 2.3 Monitoring Supplies and Services

Engineering and Public Works ensures that the supplies and services meet the requirements and/or specifications identified in the documentation.

Any problems that are encountered are documented regarding the supplies and/or services and forwarded to Purchasing Coordinator (generally by e-mail).

## 3 REFERENCES

Form 13-01 Essential Supplies and Services

## 4 APPENDICES

Appendix 13-A Essential Supplies and Services Contact List (Maintained in QMS-18 Emergency Plan)

Appendix 13-B Letter to inform the supplier/contractor of the Township's DWQMS

	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-13-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: September 10, 2012
	Procedure Title: Essential Supplies and Services	Revision No: 4
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 3 of 3

## 5 CHANGE HISTORY

Revision Level	Date	Change	Developed By
2	May 05, 2013	New Township Logo	J.V.
3	June 11, 2013	Response to 2013 Accreditation Audit Minor Non-Conformance	J.V.
4	March 02, 2015	Moved to "paperless" protocol	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-14-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: July 14, 2011
	Procedure Title: Review and Provision of Infrastructure	Revision No: 7
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 4

## 1 PURPOSE

To describe the annual review process that results in the provision of drinking water infrastructure. The objective is to review at least once every calendar year the adequacy of the infrastructure or what infrastructure is necessary to operate and maintain the drinking water system and to determine if that infrastructure is in place as needed. The procedure also describes how the findings of the review are communicated to Council.

## 2 PROCEDURE

Review and provision of the Township of King's drinking water infrastructure needs is achieved through two different means depending on whether the infrastructure is existing, or intended to address growth needs.

### 2.1 REVIEW OF INFRASTRUCTURE NEEDS

Planning for watermain construction is captured through the 10 year capital plan for both new and replacement of existing infrastructure. The 10 year capital plan is reviewed by Engineering and Public Works annually during the budget process to identify the list of projects for the next year as they fit in the 10 year capital plan.

In addition, Engineering, Public Works and Building (EPWB) identifies concurrent projects that will be undertaken each year (e.g., wastewater, roads), including projects to be undertaken by the Region of York.

On an annual basis EPWB conducts a condition assessment based on the outputs of the Asset Management Program. EPWB staff will coordinate with the Program leads to provide asset condition summaries for consideration during this process.

EPWB also reviews the Water System models to identify problem areas, including the areas with water quality and/or quantity/flow issues (eg. Fire Flows).

EPWB conducts an assessment of the operational issues by looking at the number of breaks and repairs that have occurred during the previous year.

EPWB will review the Risk Assessment Outcomes (QMS-08-SYS) to assess applicability to the on-going provision of infrastructure.

Based on the information provided by EPWB on the condition of the infrastructure, concurrent projects and the 10 year capital plan, a list of priority projects is developed for Water Distribution. This may include projects for new and/or replacement of infrastructure.

A summary of the Engineering and Public Works review output will be recorded on Form 14-01.

### 2.2 NEW INFRASTRUCTURE

The review process for new infrastructure is primarily driven by the Planning Department

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and EPWB.

The results of the growth related drinking water infrastructure needs review is documented in the following:

- Township of King Official Plan
- Region of York Transportation, Water and Wastewater Master Plans
- Township of King Water and Wastewater Master Plan
- Functional Servicing/Development Area Studies

Long term planning for growth related infrastructure starts with the development and updating of the **Official Plan (OP)**, which provides the policy framework to guide the provision of infrastructure within the Township of King. The OP focuses on population projections, land use and infrastructure development policies.

**Region of York Transportation and Water & Wastewater Master Plans** guide the Region's infrastructure needs for water, sewers, roads and transit. They typically have a planning horizon of 25 years or greater and are updated on a 5 year basis. The Master Plans incorporate the provincial population projections and employment forecasts, changes in land use planning and environmental policies.

Prior to any new development and draft plan of subdivision approval, the Township requires a **Functional Servicing/Development Area Study (FS/DAS)** be completed. The purpose of the FS/DAS is to coordinate the major components (e.g., roads, servicing, open space, etc.) of the future new development to ensure that future plans of subdivisions are properly integrated between themselves and the existing community.

The Township has a Water and Wastewater Master Plan that outlines infrastructure requirements. This Master Plan also indicates if the proposed works are subject to Development Charges or will be addressed through Capital Works budget.

The Region of York is also consulted if regional roads are to be used for a project. Any road reconstruction projects being completed by the Region are also reviewed to help identify priority projects.

The Region develops and maintains a capital 10 year plan. This plan is posted on the website and reviewed during development of the priority list of projects.

### 2.3 PROVISION OF INFRASTRUCTURE

Engineering and Public Works develops a list of priority projects that are needed to maintain the water services. This is based on a review of the 10 year capital plan, concurrent projects (e.g., roads (Township and Region) and wastewater) and a review of the current infrastructure.

EPWB forwards the list of priority projects to Finance for review as part of the annual budget process.

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Finance determines the projects that will be carried forward (based on the projection of availability of funds) through the budget process. Engineering and Public Works are notified of the priority projects that were not carried forward in the annual budget process.

EPWB will identify projects that were on the priority list but did not receive budget approval or received approval but were not constructed during a specific year. These are put back onto the list when developing the priority list of projects for the following year and when updating the 10 year capital plan.

Annual operating budgets are also used to provide infrastructure needs and maintenance. Budgets can be increased through Council if new initiatives (e.g., lead testing) occur. Changes in regulations are the main category to consider for an increase in operating budget from the previous year.

Annually there is also a review of the water rates and these can be re-set to support renewal and/or rehabilitation projects.

#### 2.4 OTHER REQUIREMENTS

EPWB develops a list of other requirements and forwards it to the Finance Department for their review and budget allocation.

Other requirements include but are not limited to: buildings; work space; process equipment; hardware and software; and supporting services such as transport (i.e. fleet) or communication tools.

Once a year, EPWB reviews the work constraints and requirements that may have direct impact on work efficiency. These items will be considered in the 10 year capital program or annual operating budget.

### 3 REFERENCES

QMS-05-SYS Document and Records Control  
 QMS-08-SYS Risk Assessment Outcomes  
 Regional Water and Wastewater Master Plan  
 Township of King Water and Wastewater Master Plan  
 Applicable Functional Servicing Reports and Development Area Studies

### 4 APPENDICES

Form 14-01

### 5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
2	June 19, 2013	New Township Logo & inclusion of this	J.V.

	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-14-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: July 14, 2011
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		table	
3	December 01, 2014	Administrative revisions to accurately reflect Township department names, grammatical corrections, deletions to reflect current operational processes,	J.V.
4	March 02, 2015	Moved to "paperless" protocol	J.V.
5	September 12, 2016	Revisions from 2016 Review and Provision of Infrastructure meeting. Revisions include the following: <ul style="list-style-type: none"> <li>• Removal of reference to TCA in lieu of Asset Management Program;</li> <li>• Expansion of "References";</li> </ul>	J.V.
6	April 12, 2018	Revised to reflect minor changes in the Standard	J.V.
7	November 7, 2018	Update to DWQMS version 2.0	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-15-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: September 28, 2012
	Procedure Title: Infrastructure Maintenance, Renewal and Rehabilitation	Revision No: 7
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 5

## 1 PURPOSE

To document a procedure for infrastructure maintenance, rehabilitation and renewal programs for the drinking water systems. This is a continuation from the review and provision of infrastructure and is a summary of the infrastructure rehabilitation, renewal and maintenance programs and activities that are undertaken. This includes a long-term forecast of major infrastructure rehabilitation, renewal and maintenance activities.

## 2 PROCEDURE

### 2.1 INFRASTRUCTURE - PREVENTATIVE MAINTENANCE

All preventative maintenance activities are recorded in a logbook.

#### Hydrant Inspection and Preventative Maintenance

The Urban Services Manager or their designate sets up overall programs for hydrant maintenance. Hydrant maintenance is completed twice per year (spring and fall).

Hydrant maintenance is completed by the Operators. During the maintenance/flushing cycle the Operator starts at the water supply point and works out into the distribution system. The Operator tracks these activities in the log books for each distribution system.

As part of the hydrant maintenance program, a static pressure test is undertaken and recorded in the log book for tracking and analysis.

#### System Dead End Flushing

The entire distribution system is flushed twice per year as part of the hydrant inspection and maintenance program.

Dead ends within the system are flushed at least three times per year or more frequently depending on system performance.

#### Watermain Swabbing

All or some of the watermains within each distribution system may be swabbed based on the quality of water, history of Adverse Water Quality Incidents, and the number and nature of water quality complaints. The Urban Services Manager sets up the swabbing program for each year.

#### Valve Exercising

The Township undertakes a Valve Exercising Program within each distribution system at least once every three years. Any deficiencies identified through the annual valving program are prioritized and responded to accordingly. As well, valves are exercised as part of watermain repairs or during the process for locates.

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## Backflow Preventers

All of the Township owned backflow preventers are certified annually as a minimum, or after each field use if the manager suspects that the device has been damaged or misused.

### **2.2 INFRASTRUCTURE - UNPLANNED MAINTENANCE**

Each drinking water system has a log book for tracking of unplanned maintenance activities. Customer complaints related to the drinking water systems are recorded in the Customer Relationship Management (CRM) Program as a means of tracking operational issues within the system. The Operator records the action taken on the printed CRM request and forwards it to the Administrative Assistant for filing as per QMS-05-SYS Document and Records Control. The action is recorded in the CRM system and the case is closed.

All maintenance activities are completed according to the Township's Standard Operating Procedures.

#### Hydrant Repairs and Leaking Valves

The Township operates a Customer Relationship Management System (CRM) to receive and record reports of system failures. The CRM also manages issuance of works requisitions which are distributed to the Urban Services Manager.

Staff "close" the works requisition upon completion within the CRM and this information is retained in a data base. Staff can then access this historical data to evaluate systems performance and establish both maintenance and Capital priorities.

#### Watermain Repairs

Watermain breaks are typically repaired by contracted services with oversight and compliance assurance provided by Township staff. As with hydrant and valve repairs these works are recorded within the CRM as well as applicable log books.

The Urban Services Manager or their designate reports watermain breaks to the Director immediately if significant impacts to residents or risks to the integrity of the distribution system and the provision of compliant, safe and potable are or may be encountered.

### **2.3 EFFECTIVENESS OF MAINTENANCE**

The effectiveness of the maintenance is reviewed at least once every calendar year by the Urban Services Manager and Director by various means:

- The number of watermain breaks is reviewed on an annual basis to evaluate opportunities and requirements for system rehabilitation. Operationally all breaks are evaluated as they occur to establish priorities.
- The annual valving program identifies necessary valve works.

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- Review the number of CRM requests that are received for water quality complaints.

## 2.4 RENEWAL AND REHABILITATION

Renewal and/or rehabilitation projects that are done as capital works are described in QMS-14-SYS Review and Provision of Infrastructure as part of the replacement component of the annual budget process.

EPWB staff review operational performance through the Review and Provision of Infrastructure process, the Infrastructure Renewal and Rehabilitation process, the Top Management Review process as well as on an on-going basis through monthly DWQMS meetings and operational interactions.

The renewal and rehabilitation infrastructure needs are driven by EPWB based upon the outcomes and determinations of these processes.

The EPWB Department coordinates internally through these processes, monthly Departmental meetings and on-going operational communications to identify and capitalize upon opportunities to address infrastructure needs concurrently. These processes also support the development of long-term infrastructure maintenance programs through operational and/or capital budgets. The long-term forecast of infrastructure rehabilitation, renewal and maintenance activities is reviewed at least once every calendar year.

## 3 REFERENCES

QMS-05-SYS Document and Records Control  
 QMS-14-SYS Review and Provision of Infrastructure  
 Standard Operating Procedures / Work Activity  
 Standardized Water Operating Procedures (Area Municipalities and York Region)  
 Repair Form  
 Request for Service  
 Log Books (water distribution system)

## 4 APPENDICES

Not Applicable

## 5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
3	June 19, 2013	New Township Logo & inclusion of this table	J.V.
4	December 01, 2014	Overall administrative and grammatical corrections as well as greater alignment	J.V.

	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-15- SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: September 28, 2012
	Procedure Title: Infrastructure Maintenance, Renewal and Rehabilitation	Revision No: 7
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		with operational processes	
5	March 04, 2015	Moved to "paperless" protocol	J.V.
6	April 18, 2018	Minor revisions to reflect updated Standard	J.V.
7	November 7, 2018	Further revisions to update to DWQMS version 2.0	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-15- SYS
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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-16-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: July 14, 2011
	Procedure Title: Sampling, Testing and Monitoring	Revision No:2
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 3

## 1 PURPOSE

To document a procedure for sampling, testing and monitoring activities scheduled and completed for drinking water quality. The procedure describes how the sampling, testing and monitoring results are recorded and shared with the Owner, where applicable.

## 2 PROCEDURE

### 2.1 Sampling & Testing

Sampling, testing and monitoring is completed on distributed water to:

- provide operators with knowledge required to proactively operate the drinking water system, especially at Critical Control Points
- ensure water quality is maintained as water travels through the distribution system, and
- ensure compliance with applicable Ontario Drinking Water Regulations

For the purposes of this procedure, “sampling” is defined as the process of collecting water samples for laboratory analysis, and “testing” is considered to be the laboratory analysis. “Monitoring” consists of on-site data collection and analysis.

To further ensure disinfection throughout the distribution network, operators collect water samples at various points for microbiological analyses and chlorine residuals. Handheld colorimeters are used to test chlorine residual in the distribution systems.

These samples are taken at various locations throughout the system to ensure the water meets applicable regulations. A Sampling Schedule is updated and maintained by the Manager that shows the sample locations, parameters and sampling frequency.

The sampling points and corresponding analyses are listed on the chain of custody sheets (which track the sample from the point of collection to the lab for analysis). The person responsible for completing the sampling is also noted on the sheets.

The number of samples taken per week/month is determined by the Manager in accordance with the Ministry of the Environment’s Drinking Water Systems Regulation (O. Reg. 170/03). The number of samples will continue to increase as the population grows, in accordance with the requirements of the Safe Drinking Water Act (SDWA).

Maintenance of the database for all sampling and testing results is duty of the Water/Wastewater Compliance Technologist.

The protocols for collecting and handling water samples are provided in the standard operating procedures (SOP 1.1 to 1.4).

On a yearly basis the Manager is responsible for reviewing and updating the water quality sampling program for changes required to the water quality parameters, sampling frequency and sampling locations.

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## 2.2 Sampling & Testing Results

Analytical results are compared to the Ministry of Environment's Ontario Drinking Water Standards (ODWS, O. Reg. 169/03) and Ontario Drinking Water Systems (O.Reg. 170/03). The analytical results are compiled annually and listed along with the Maximum Acceptable Concentration (MAC), (based on the ODWS). In addition, the statistics are compiled and reviewed for all analytical results for all min, max and average for each parameter that is tested.

All the lab results and chlorine residual results (provided by Manager) are downloaded (entered) into an internal database by the Water/Wastewater Compliance Technologist. The Technologist also analyzes those results against the standards and runs reports through this database.

Adverse conditions are identified through alerts from lab notification. Should the analytical results indicate adverse conditions, the Standardized Water Operating Procedures and Work Procedures that indicate how these adverse conditions are reported and addressed, are followed.

Sampling and testing records are managed in accordance with QMS-05-SYS Document and Record Control System Procedure.

## 2.3 Monitoring

Monitoring consists of Chlorine Residual Testing in compliance with the requirements of O.Reg. 170/03 and during regular maintenance of the systems (i.e. during dead-end flushing).

## 2.4 Reporting to the Owner

The Manager collects the information and develops an annual report showing any adverse, chemical analyses, etc.

In accordance with relevant legislation, summary reports are provided to Council and posted on the Township of King's website on an annual basis, with an emphasis on outlining problems/issues (abnormal conditions) that have occurred during the past year. The summary report includes a spreadsheet showing a summary of the results.

## 3 REFERENCES

QMS-05-SYS Document and Records Control  
Standard Operating Procedures (SOP 1.1 to 1.4)  
Standardized Water Operating Procedures (Area Municipalities and York Region)

## 4 APPENDICES

Not Applicable

	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-16-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: July 14, 2011
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## 5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
1	June 19, 2013	New Township Logo & inclusion of this table	J.V.
2	March 02, 2015	Moved to "paperless" protocol	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-17-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: July 14, 2011
	Procedure Title: Measurement and Recording Equipment Calibration and Maintenance	Revision No: 3
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 2

## 1 PURPOSE

To document the calibration and maintenance of measurement and recording equipment used for safe drinking water quality.

## 2 PROCEDURE

### 2.1 CALIBRATION AND MAINTENANCE FREQUENCY AND SCHEDULE

Measurement and recording equipment are maintained and calibrated as per equipment manufacturer's specifications.

The frequency and responsibility for calibration and maintenance of each equipment type is summarized on Form 17-01.

The Manager is responsible for ensuring that the calibration is undertaken and the information is recorded in the Log Books (for in-house calibration and maintenance) and certificates are obtained from the designated outside calibrations service.

Standard Operating Procedures (SOP 1.1) are used to inform an operator what to do if the equipment is out of calibration.

### 2.2 ANNUAL REVIEW

The equipment calibrated in-house is identified by the Manager on Form 17-1 (e.g., pH Tester, Chlorine Residual).

On an annual basis the Manager files a copy of the yearly log of the maintenance and calibration as per QMS-05-SYS Document and Records Control Procedure.

At least once per year the Water/Wastewater Compliance Technologist reviews the calibration and maintenance schedules to ensure the information is kept updated.

## 3 REFERENCES

QMS-05-SYS Document and Records Control  
SOP 1.1 Water Quality Sampling

## 4 APPENDICES

Form 17-01 Measurement & Recording Equipment Maintenance & Calibration Schedule

	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-17-SYS
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	Procedure Title: Measurement and Recording Equipment Calibration and Maintenance	Revision No: 3
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## 5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
2	June 19, 2013	New Township Logo & inclusion of this table	J.V.
3	March 02, 2015	Moved to "paperless" protocol	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-18-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: January 30, 2012
	Procedure Title: Emergency Management	Revision No: 4
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 2

## 1 PURPOSE

The purpose of this procedure is to document how we maintain a state of emergency preparedness, including:

- a) a list of potential emergency situations or service interruptions,
- b) processes for emergency response & recovery,
- c) emergency response training & testing requirements,
- d) Owner & Operating Authority responsibilities during emergency situations,
- e) references to municipal emergency planning measures, and
- f) emergency communication protocol and up-to-date list of emergency contacts.

## 2 PROCEDURE

### 2.1 Identification of Emergency Situations or Service Interruptions

On an annual basis the Director and Manager meet to review the list of emergency situations or service interruptions that have been identified and to examine current operations to determine if additional emergency situations or service interruptions exist. This review occurs during the annual Top Management Review

In addition, during the risk assessment process (including the annual and three year reviews) the outcomes (QMS-08-SYS) were identified which include some emergency situations or service interruptions. This is another opportunity where the review process may identify emergency situations or service interruptions that can be added to the list from the above meeting.

The types of emergencies that are addressed in the Engineering and Public Works Department Water Distribution Emergency Plan are:

- Major service disruption - large scale watermain breaks affecting water supply
- Adverse water quality – microbial or chemical contamination

The QMS Representative is responsible for maintaining and updating the potential emergency situations or service interruptions.

### 2.2 Process for Emergency Response and Recovery

Based on the emergencies identified the QMS Representative is responsible for ensuring that Standard Operating Procedures (SOP) are developed.

The SOPs outline the roles and responsibilities for various staff and the activities related to the response and recovery from the emergency situation or service interruption.

The Township of King has a corporate emergency plan that outlines communication procedures during emergency situations and the roles and responsibilities of the Owner and appropriate Engineering and Public Works Department Water Distribution staff depending on the level of emergency.

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The Director is responsible for initiating corporate communications for emergencies that have escalated to a corporate level of response.

For escalation of emergencies, the Emergency Communications Protocol should be referred to as it provides the emergency communication protocol for situations that have the potential to escalate to Corporate level impacts. The emergency list of contacts is included in this protocol.

### 2.3 Emergency Response Training and Testing Requirements

The Manager is responsible for ensuring that emergency response training is undertaken by appropriate staff. The training is tracked for staff as per QMS-10-SYS Competencies.

In addition a debriefing after larger scale emergencies will be undertaken by the Manager and may include the Director, Deputy Director, Manager, and QMS Representative and other applicable staff.

At least once a year, the emergency procedures (response and recovery) will be evaluated and modifications made to the procedures where required based on the review and/or debriefing following emergency situations.

### 3 REFERENCES

- QMS-08-SYS Risk Assessment Outcomes
- QMS-10-SYS Competencies
- Standard Operating Procedures
- Township of King Water Distribution Emergency Plan (including the Emergency Communications Protocol and Emergency Contact List)
- Township of King Emergency Plan (Corporate)

### 4 APPENDICES

Not Applicable

### 5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
2	June 19, 2013	New Township Logo & inclusion of this table	J.V.
3	January 14, 2015	Remove Deputy Director reference	J.V.
4	March 02, 2015	Moved to "paperless" protocol	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-19-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: January 30, 2012
	Procedure Title: Internal Audits	Revision No: 6
	Approved by: Rob Flindall Director, Engineering and Public Works	Page 1 of 5

## 1 PURPOSE

This System Procedure documents the procedure for internal audits that:

- Evaluates conformity of the QMS with the requirements of the DWQMS,
- Identifies internal audit criteria, frequency, scope, methodology and record keeping requirements,
- Considers previous internal and external audit results,
- Describes how the QMS corrective actions are identified and initiated, and
- Shall ensure an audit is undertaken at least once every calendar year.

## 2 PROCEDURE

### 2.1 AUDIT TEAM STRUCTURE AND ROLES

The audit team roles are as follows.

- The **QMS Representative** acts as a liaison between the audit team (through the Lead Auditor) and the auditees.
- The **Lead Auditor(s)** is responsible for overseeing the internal audit process and ensuring qualified auditors conduct internal audits.
- **Auditors** work with the Lead Auditor to prepare for and conduct internal audits.

### 2.2 AUDITOR QUALIFICATIONS AND SELECTION

The Lead Auditor(s) and Auditors must meet the following criteria:

- knowledge of the DWQMS and Township of King's drinking water QMS;
- independent of the work that is going to be audited;
- ability to make objective observations and record the results;
- successfully complete an auditing course.

The Lead Auditor(s) along with the QMS Representative will select internal auditors for each audit.

### 2.3 AUDIT PROCESS

#### 2.3.1 Schedule

Each element of the QMS for the drinking water system must be audited a minimum of once per year. Additional audits can be scheduled based on the importance of the process or area, or in response to previous audits results (internal and external). Typically, the internal audit focuses on the previous calendar year.

The Lead Auditor(s) creates an Annual Internal Audit Schedule using Form 19-01, with assistance from the QMS Representative. The Lead Auditor(s) appoints an Auditor(s) for each

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element or process and ensures that Auditors do not audit their own work. The Lead Auditor or QMS Representative forwards the Audit Schedule to the Director of Engineering and Public Works for approval.

The Audit Schedule is posted on the information boards in the Engineering and Public Works office, and an email notification is sent out by the QMS Representative to applicable Department Heads and Section Managers at least one week in advance of the audits.

### **2.3.2 Checklist**

The Lead Auditor works with the QMS Representative and other Auditor(s) to prepare an Internal Audit Checklist Form 19-02 or other similar document that records questions asked and points verified. The checklist defines the scope (i.e., applicable area of the QMS, time period to be audited, organizational unit and/or facility) and audit criteria (i.e., applicable manuals and standards).

The checklist reflects the current policies and procedures of the area that are being audited. A copy of the procedures with the points highlighted that are going to be checked can be attached to the checklist and referenced for the audit.

### **2.3.3 Opening Meeting**

An opening meeting may be held before the audit is conducted. The people present would be the Audit Team, the Auditor(s), and the personnel responsible for the area to be audited. Other employees to be interviewed during the audit can be included in the meeting.

The opening meeting includes the following agenda:

- audit team introductions
- review the objective and scope of the audit
- discuss method of conducting and communicating the audit
- clarify schedule and availability of staff for the audit.

### **2.3.4 Audit**

The audit is performed by the auditing team using the Internal Audit Checklist Form 19-02 or applicable document. Observations that provide evidence of conformance or nonconformance are noted on the Internal Audit Checklist.

### **2.3.5 Audit Findings**

The results of the audit are reviewed by the Audit Team. Agreement is reached under the leadership of the Lead Auditor. The Auditors complete the summary of findings on the Audit Report Form 19-03 or similar document.

The Lead Auditor(s) records nonconformances from the internal audits on Nonconformance Report (NCR) Form 19-04 which records:

- Audit report number

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- Report date
- Brief description of nonconformance

The QMS Representative tracks the internal audit nonconformances by recording the NCR number in the Non-conformance Report Log Form 19-05.

### **2.3.6 Closing Meeting**

The results of the audit are presented at the closing meeting, if one is held. At a minimum the Supervisor responsible for the area audited and the Audit Team would attend.

The closing meeting will include the following:

- thank the staff for their cooperation
- review the commendable features
- review documented observations – what is effective, what needs improvement and what is unsatisfactory
- Ensure the issue is understood and get agreement on a response date for the Corrective Action for each finding or NCR with the person responsible for the area audited
- Record the NCR number on the Audit Report to ensure audit results are understood

## **2.4 AUDIT REPORT**

The Auditors draw up an Internal Audit Report Form 19-03 and fill out any Nonconformances and/or Corrective Actions that may be required from the audit. The report has to be signed by the Lead Auditor.

A copy of the report is given to the applicable Department Heads and Section Managers and the QMS Representative; the original is kept by the Lead Auditor(s) and used for follow up. The report is filed according to QMS-05-SYS Document and Records Control.

## **2.5 AUDIT FOLLOW UP AND REVIEW**

The Lead Auditor makes sure that the follow up audit is carried out. The follow up audit has to be carried out to verify that the action has been taken and that it is effective. The results of the follow up are recorded in the original Internal Audit Report Form 19-03 and by the QMS Representative on the NCR Log (including the date closed). The QMS Representative may also issue a CAR for any of the NCRs to address continual improvement as per QMS-21-SYS.

The results of the internal audits and the follow up audits are reviewed by management at the annual Management Review meeting as per QMS-20-SYS (Management Review) or more frequently, if required.

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## 2.6 AUDIT FREQUENCY

The Internal Audit is conducted at least once every calendar year and in accordance with the requirements of the Drinking Water Quality Management Standard. The Township is compliant with this requirement.

## 3 REFERENCES

QMS-05-SYS Document and Records Control  
 QMS-20-SYS Management Review  
 QMS-21-SYS Continual Improvement

## 4 APPENDICES

Form 19-01 Annual Internal Audit Schedule  
 Form 19-02 Internal Audit Checklist  
 Form 19-03 Internal Audit Report  
 Form 19-04 Nonconformance Report  
 Form 19-05 Nonconformance Report Log

## 5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
2	June 19, 2013	New Township Logo & inclusion of this table	J.V.
3	March 02, 2015	Moved to "paperless" protocol	J.V.
4	December 11, 2015	Addition of 2.6 in response to 2015 SAI Surveillance Audit	J.V.
5	March 15, 2018	Minor revisions to reflect updated Standard	J.V.
6	November 7, 2018	Further revision to update to DWQMS version 2.0	J.V.

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**Engineering and Public Works Department  
Water Distribution**

Procedure No: QMS-19-  
SYS

**OPERATIONAL PLAN - SYSTEM PROCEDURE**

Approval Date:  
January 30,  
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## 1 PURPOSE

To document the procedure for describing how the QMS will ensure its continuing suitability, adequacy and effectiveness. In this respect, the necessary information is collected for Top Management to review and to provide review output on any decisions and actions related to the QMS. Records of the reviews are maintained/filed.

A Top Management Review shall be undertaken once every calendar year at a minimum.

## 2 PROCEDURE

### 2.1 Management Review

QMS-09-SYS (Organizational Structure, Roles, Responsibilities and Authorities) identifies the management team for Top Management.

An Annual Management Review will be held at least once every calendar year by Top Management to review the overall suitability, adequacy and effectiveness of the QMS. All members of Top Management (as per the Appendix 9-A) must be present at the Management Review meeting. In addition, the Engineering and Public Works Deputy Director, Manager of Engineering and Development, and Urban Services Manager will participate in the Top Management Review meeting and process whenever possible.

The QMS Representative is responsible for:

- establishing the date for the Annual Management Review meeting
- forwarding notification of the meeting to participants, and
- forwarding the agenda for the meeting to the participants

### 2.2 Management Review Input

Top Management will review information in the agenda on Form 20-01, where applicable on:

- a) Incidents of regulatory non-compliance
- b) Incidents of adverse drinking water tests
- c) Deviations from critical control point limits and response actions
- d) Efficacy of the risk assessment process
- e) Results of audits (internal and external)
- f) Review of Corrective Action Reports (CARs)
- g) Results of relevant emergency response testing
- h) Operational performance
- i) Raw water supply and drinking water quality trends
- j) Follow-up action items from previous management reviews
- k) Status of management action items identified between reviews
- l) Changes that could affect the QMS
- m) Summary of consumer feedback
- n) Resources needed to maintain the QMS

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- o) Results of the infrastructure review
- p) Operational Plan currency, content and updates
- q) Summary of staff suggestions

Regional water testing data will be collated and reviewed at the annual Top Management Review Meeting.

### 2.3 Management Review Output

Management review outputs will include identification of specific actions items to address deficiencies, personnel responsible for delivering those action items and proposed implementation timelines. During Management Review, Top Management will provide a record of any decisions and actions related to:

- Improvement of the QMS and related procedures
- Improvement of the Operating Authority's ability to implement consistently the QMS
- Human and financial resource needs

The QMS Representative will track the status of the action items identified during Management Review. The QMS Representative will track this on Form 20-03. A summary of the output will be recorded on Form 20-02 as a means of reporting to the Owner (Committee / Council).

### 2.4 Recording of Management Review

Minutes of the meeting will be recorded on Form 20-01 and maintained as per QMS-05-SYS Document and Records Control. These minutes will reflect the review inputs for the meetings. Copies of the minutes are distributed to the Top Management by the QMS Representative.

The QMS Representative will ensure the results of the management review, the identified deficiencies, decisions and action items are conveyed to the Owner on Form 20-02.

### 2.5 Top Management Review Frequency

The Top Management Review is conducted annually and in accordance with the Drinking Water Quality Management Standard. The Township is in conformance with the review frequencies.

## 3 REFERENCES

Form 20-01 Management Review Agenda & Meeting Minutes  
 Form 20-02 DWQMS and Top Management Review  
 Form 20-03 Management Review Action Items Tracking  
 QMS-05-SYS Document and Records Control  
 QMS-09-SYS Organizational Roles, Responsibilities and Authorities

## 4 APPENDICES

Not Applicable

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## 5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
2	June 19, 2013	New Township Logo & inclusion of this table	J.V.
3	June 20, 2014	Minor revisions from 2014 Top Management Review Meeting	J.V.
4	March 02, 2015	Moved to "paperless" protocol	J.V.
5	December 11, 2015	Insertion of 2.5 in response to 2015 SAI Surveillance Audit findings	J.V.
6	March 15, 2018	Minor revisions to reflect updated Standard	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: QMS-21-SYS
	<b>OPERATIONAL PLAN - SYSTEM PROCEDURE</b>	Approval Date: January 30, 2012
	Procedure Title: Continual Improvement	Revision No: 5
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## 1 PURPOSE

To document the procedure established for the Operating Authority to strive to continually improve the effectiveness of its Quality Management System through commitment to the policy and use of tools such as audit results, preventive and corrective actions and management review. The tracking and measuring of continual improvement of the QMS will also include reviewing and considering applicable best management practices at least once every 36 months.

## 2 PROCEDURE

### Corrective Action

Corrective action involves investigating causes and taking measures to eliminate causes of identified quality problems (e.g., related product, process or service) to ensure the problems or non-conformities do not recur.

Corrective action may be initiated as a result of the following indicators of a breakdown in the Quality Management System:

- Internal audits
- Management Review
- External audits
- After Action Review (AAR)
- Customer complaints
- Trends identified in management reports

QMS Representative shall initiate corrective action by issuing a Corrective Action Report (CAR) Form 21-01 to address the requirements of the above noted indicators.

Any employee can also initiate corrective action by issuing a Corrective Action Report (CAR) Form 21-01.

The Issuer completes Part A of the CAR Form 21-01 and forwards the CAR to the QMS Representative. The QMS Representative will issue the CAR number and determine who is assigned as Team Leader to address the issue. The QMS Representative records the CAR in the CAR Log Form 21-02 and notes the CAR number on the report.

The Team Leader creates a cross-functional team which includes the Manager and/or Director (minimum of 2 people) and completes Part B of the CAR.

The Team Leader will determine and implement the corrective action and change all applicable documentation as per QMS-05-SYS Document and Records Control. The Team Leader is responsible for investigating:

- who is involved,
- what is the root cause of the problem or potential problem,

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- what action is required,
- what are the steps to be taken, for ensuring that the necessary actions are taken in an appropriate timeframe and for responding back on the Corrective Action Report (Form 21-01), and
- a plan that will review and verify implementation of the corrective action and its effectiveness at correcting and preventing the re-occurrence of the non-conformity.

The Team Leader forwards the CAR Form 21-01 to the QMS Representative. The QMS Representative is responsible for determining that the corrective action has been taken and is effective. The QMS Representative completes Part C of the CAR. The QMS Representative records that the CAR is complete on the Corrective Action Report (CAR) Log.

The QMS Representative reviews the CAR Log during Management Review and records if any further action is required.

CAR and CAR Log are maintained as per QMS-05-SYS Document and Records Control.

### **Preventive Action**

Preventive action involves taking measures to prevent the occurrence of potential non-conformities in the Quality Management System.

Preventive action may be initiated as a result of the following indicators of a potential breakdown in the Quality Management System:

- Internal audits
- Management Review
- External audits
- After Action Review (AAR)
- Customer complaints
- Staff suggestions
- Trends identified in management reports

The QMS Representative shall review potential non-conformities that are identified to determine if any preventive actions are necessary. The outcome of this review will be documented and any preventive actions will be recorded on a Corrective Action Report (CAR) Form 21-01.

The QMS Representative completes Part A of the CAR Form 21-01 and issues the CAR number and determines who is assigned as Team Leader to address the preventive action. The QMS Representative records the CAR in the CAR Log Form 21-02 and notes the CAR number on the report and indicates that it is a preventive action.

The Team Leader creates a cross-functional team which includes the Manager and/or Director (minimum of 2 people) and completes Part B of the CAR. Part B for a Preventive Action is used to review the actions needed to prevent the non-conformity from occurring.

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The Team Leader will determine and implement the preventive action and change all applicable documentation as per QMS-05-SYS Document and Records Control. The Team Leader is responsible for investigating:

- who is involved,
- what is the cause of the potential problem,
- what action is required to prevent the potential problem,
- what are the steps to be taken, for ensuring that the necessary actions are taken in an appropriate timeframe and for responding back on the Corrective Action Report (Form 21-01), and
- a plan that will review and verify implementation of the preventive action and its effectiveness at preventing the occurrence of the non-conformity.

The Team Leader forwards the CAR Form 21-01 to the QMS Representative. The QMS Representative is responsible for determining that the preventive action has been taken and is effective. The QMS Representative completes Part C of the CAR. The QMS Representative records that the CAR is complete on the Corrective Action Report (CAR) Log.

The QMS Representative reviews the CAR Log during Management Review and records if any further action is required.

CAR and CAR Log are maintained as per QMS-05-SYS Document and Records Control.

QMS Representative shall ensure that a review of opportunities to implement Preventive Actions is an Agenda Item at the following annual DWQMS Activities:

- Regular DWQMS Meetings
- Review and Provision of Infrastructure Meetings
- Infrastructure Maintenance, Rehabilitation and Renewal Meetings
- Bi-annual BMP and Industry Standard Review Meeting

## **2.1 Best Management Practices (BMP)**

The QMS Representative shall co-ordinate a review of available BMP's. The QMS Representative shall regularly review (at least every 36 months) the MECP website for published BMP's. The DWQMS Meetings shall have a standing item discussing/reviewing BMP's and applicable industry standards. Outcomes and implementations from these meetings shall be documented in the Meeting Summary and managed according to QMS 5- Documents and Records Control.

## **2.2 Customer Complaints**

The log of all customer complaints is reviewed at regular staff meetings of the Operating Authority. The Administrative Assistant for Engineering and Public Works records drinking water system and QMS related complaints in the Customer Relationship Management (CRM) system and creates the Request for Service.

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### 2.3 After Action Review

In support of the QMS Policy, employees in the Operating Authority are encouraged to perform an After Action Review (AAR) following completion of any significant task or process. Examples of significant tasks or processes include:

- Completion of major Preventative Maintenance Programs,
- Completion of System Repairs outside of normal operating procedures
- Commissioning of new systems or equipment

The Manager or Director will be required to initiate an AAR following any Level 1, 2 or 3 Emergency and following the initiation of any new program for Regulatory Compliance or any new program for preventative/corrective maintenance.

The outcome of the AAR may or may not result in a Preventive or Corrective Action. The AAR may be used as a tool to complete Part B of the CAR (root cause analysis).

### 3 REFERENCES

QMS-05-SYS Procedure Document and Records Control

### 4 APPENDICES

Form 21-01 Corrective Action Report  
Form 21-02 Corrective Action Report Log

### 5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
2	June 19, 2013	New Township Logo & inclusion of this table	J.V.
3	March 02, 2015	Moved to "paperless" protocol	J.V.
4	March 21, 2018	Revised to reflect updated MOECC Standard	J.V.
5	November 7, 2018	Further revision to update to DWQMS version 2.0 and add preventive action	J.V.

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