Municipality of Kincardine Drinking Water Quality Management System

Huronville Subdivision Distribution System Operational Plan #087-401

Revision 5 September 2014

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Introduction

This operational plan describes the Drinking Water Quality Management System developed in accordance with the Ministry of the Environment Drinking Water Quality Management Standard (DWQMS). The Quality Management System (QMS) has been developed and implemented by the Municipality of Kincardine Water Services Department.

All elements of the DWQMS are addressed within this operational plan. The Plan is written to meet or exceed the requirements of the DWQMS and is applicable to the management and operation of the works described in Section 6 of this Plan.

1. Quality Management System

The Drinking Water System's Operational Plan documents a Quality Management System that meets all of the requirements of the DWQMS. The Operational Plan was developed by the Operating Authority (the Municipality of Kincardine Water Services Department) and approved by Top Management. The Township of Huron-Kinloss Council, the Municipality of Kincardine Council and the Operating Authority personnel are jointly responsible for understanding, implementing, maintaining and contributing to the continuous improvement of the Quality Management System.

2. Quality Management System Policy

The Quality Management System policy statement was developed at the operations level, reviewed by Top Management and the Public Works Committee, and approved by both the Municipality of Kincardine Council and the Township of Huron-Kinloss Council. The QMS Policy is communicated to all Operations personnel and is posted at the Water Services Department Office. The public can access a copy of the Policy through both the Municipality of Kincardine web site and Township of Huron-Kinloss web site. The Compliance Officer and Top Management will review this policy on an annual basis to coincide with the management review. Any changes proposed, will be subject to approval by both Councils.

A copy of the QMS Policy can be found in Appendix A.

3. Commitment and Endorsement

The Township of Huron-Kinloss and the Municipality of Kincardine are committed to managing and operating the drinking water system in a responsible manner in accordance with documented QMS policies and procedures. Top Management fully supports and is committed to the development, maintenance and continuous improvement of the Operational Plan by providing the necessary training and resources. Top Management ensured the QMS Policy was brought forward to the Public Works Committee and then to the Councils of both the Municipality of Kincardine and the Township of Huron-Kinloss where it was approved and passed. Any future changes to the QMS Policy will be approved by Top Management and both Councils. Copies of Council resolution(s) are found in Appendix B.

4. Quality Management System Representative

The Compliance Officer has been appointed as the Quality Management System Representative by Top Management. As the QMS Representative, the Compliance Officer is responsible for establishing and maintaining the QMS and ensuring that the most current versions of documents are in use at all times.

It is the Compliance Officer's responsibility to be aware of the regulatory requirements, any changes that have been made to them and to ensure that they are reflected in the QMS. Notification of changes may be obtained through various channels such as ministry web sites, updates from industry associations or various communications such as letters and e-mails. The

QMS Representative shall ensure that operations staff are aware of the QMS and all legislative and regulatory requirements that pertain to their duties within the drinking water systems. The QMS Representative reports to Top Management on an on-going basis the status of the QMS, any issues or concerns regarding it, and any improvements that need to be made that require additional resources.

5. Document and Records Control

For the purpose of this Operational Plan, records are defined as documented information that states results achieved or provides proof of activities performed. Records cannot be changed and refer to events that have happened in the past. Some examples of records are laboratory test results, log books, log sheets, completed forms and checklists, training records and meeting minutes.

Documents are defined as information such as documented policies, procedures, manuals, maps, drawings, forms, legislation and regulations. Documents can be generated internally or come from external sources and therefore may not be controlled entirely by the Municipality of Kincardine staff. Documents are subject to change and so every effort must be made to ensure that the most current version is in use. Some examples of QMS documents are the QMS Policy, this Operational Plan, QMS Procedures, Standard Operating Procedures, blank forms and checklists, licences and certificates, Permit to Take Water, legislation and regulations.

Both records and documents provide proof that the QMS is being implemented and therefore must be controlled so that they are kept up-to-date, legible, and easily accessible. The *QMS Procedure for Document and Records Control* (QMS001) outlines how records and documents will be created or obtained and managed – this includes how they will be filed, stored, protected, disposed of and how long they will be retained.

Internal QMS documents can only be edited by the ORO or the Compliance Officer or by a person designated by them. The QMS Representative is responsible for ensuring that all QMS documentation is reviewed on an annual basis to ensure that the information is still correct and current. Any QMS internal documents that are revised will be approved by the ORO prior to being put into circulation.

6. Drinking Water System Description

The Huronville Subdivision Distribution System, also known as Huronville, is owned by the Township of Huron-Kinloss and operated by the Municipality of Kincardine. The distribution system receives all of its water from the Kincardine Drinking Water System (a surface water, conventional treatment plant). The Kincardine Drinking Water System is owned and operated by the Municipality of Kincardine. Appendix C contains a basic Flow Diagram.

The Municipality of Kincardine Water Services Department maintains the infrastructure and fire hydrants. As of 2008, the Huronville Subdivision has approximately 1.4 km of cast iron watermain, ranging in size from 4 to 8 inches in diameter, 5 hydrants, 93 service connections and 24 main and secondary valves. The Huronville Distribution System is accepted by the Ministry of the Environment as part of the Kincardine Drinking Water System and as such does not have separate chlorine residual sampling and monitoring requirements other than those required for the Kincardine DWS. Secondary disinfection is monitored daily in the Kincardine Drinking Water System at two different locations. The Inverhuron Booster station has an on-line chlorine analyzer for one of the distribution samples and a daily distribution grab sample is taken at another location in the Kincardine distribution system.

A valve is located on the south end of the Huronville Subdivision that connects the Huronville Distribution System with the Lakeshore Distribution System owned by the Township of Huron-Kinloss. The valve may be operated to feed water to the Huronville and the Kincardine distribution systems from the Lakeshore system and vice versa.

There is no flow meter installed to determine what volume of water is being supplied to the Huronville Subdivision but each residential property has a flow meter and total volume can be determined from these if necessary.

Critical Processes
The Kincardine Water Treatment Plant is considered a critical upstream process as it supplies water to the Huronville Subdivision Distribution System.

Operational Challenges
Routine operations present no challenges.

7. Risk Assessment

A risk assessment is performed on each drinking water system operated by the Municipality of Kincardine to identify potential hazardous events and associated hazards and evaluate their significance. A risk assessment will be completed at least once every thirty-six months, with annual reviews used to ensure that the information is still current and applicable. Currently, the risk assessments are performed by the Water Services Department following procedure *QMS002 Risk Assessment*.
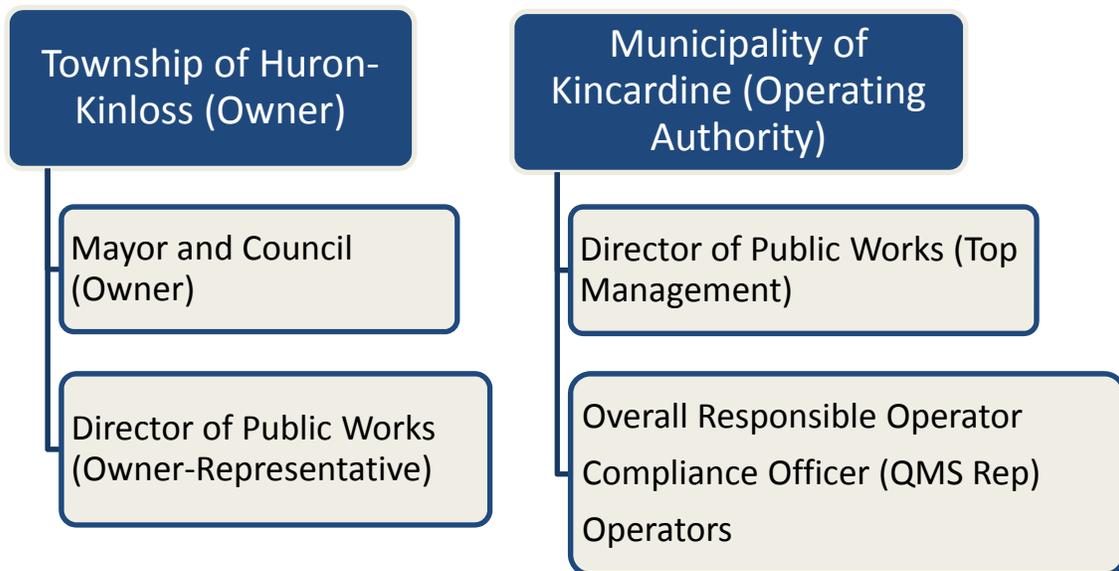
8. Risk Assessment Outcomes

The results of the Risk Assessment are documented in a Risk Assessment Table. Appendix D contains the most current Risk Assessment Table and related documentation. The Risk Assessment Table is a living document, subject to change. The QMS Representative will ensure that this information is kept up-to-date.

Deviations from critical control limits are reported to the ORO and, where applicable, to Top Management, MOE and MOH. Deviations from critical control limits are recorded in the appropriate place(s) (ie. facility log book, data logger review sheet, alarm response sheet, etc.) and summarized for the Management Review.

9. Organizational Structure, Roles, Responsibilities and Authorities

The Township of Huron-Kinloss is the owner of the Huronville Subdivision Distribution System. The Municipality of Kincardine is the Operating Authority. The Public Works Department within the Municipality of Kincardine oversees the municipal drinking water system. Within the Public Works Department, the Water Services Department attends to the daily operations of the drinking water systems. The organizational structure of the Owner and Operating Authority is shown in the organizational chart below.

Township of Huron-Kinloss Organizational Chart
(Owner & Operating Authority)

Township of Huron-Kinloss (Owner)	Municipality of Kincardine (Operating Authority)
Mayor and Council (Owner)	Director of Public Works (Top Management)
Director of Public Works (Owner-Representative)	Overall Responsible Operator Compliance Officer (QMS Rep) Operators

The Mayor and Council as the Owners of the drinking water system ultimately have the responsibility for ensuring a safe and reliable supply of potable water and for providing the necessary resources and infrastructure.

The Municipality of Kincardine Director of Public Works is responsible for keeping the Operating Authority structure, respective roles, responsibilities and authorities current, and communicates this information to operations personnel. The roles, responsibilities and authorities of the Operating Authority are outlined in Appendix E.

During times when the Director of Public Works is unavailable (ie. on vacation or sick leave), the Overall Responsible Operator has the authority to make necessary decisions related to operations. When an Operator is acting as Overall Responsible Operator because the ORO is unavailable, the Acting ORO has the authority to make decisions related to operations normally made by the ORO.

10. Competencies

Operating Authority personnel must be competent in their jobs based upon appropriate education, training, skills and experience. Appendix E outlines required and desired competencies for each role within the Operating Authority.

The competency requirements are satisfied through the following measures:

- All new employees must provide evidence of certification and other competency requirements. All operator certificates are posted at the Water Services Department office.
- New employees undergo on-the-job training at all facilities, conducted by experienced staff.
- All operators are required to work towards attaining and maintaining a minimum Class 2 in both Water Treatment and Water Distribution.
- All employees receive training which meets or exceeds the requirements of Ontario Regulation 128/04.
- Training and competency requirements are met through various ways, including in-house training, on-the-job practical training and training through outside providers. Training documentation is signed by the Overall Responsible Operator unless a certificate is received, showing proof that the training was provided. All records of training are maintained by the Compliance Officer at the Water Services Department office as proof that training has been successfully completed.

During times when the Overall Responsible Operator is unable to act and an Operator is designated as the replacement ORO, the Operator must hold a minimum Class 1 Water Treatment and Water Distribution certificates.

Standard Operating Procedure #SOP007 outlines who can be an Operator-in-Charge (OIC) and some of their duties. All operators must have a minimum Class 1 certification in order to act as OIC as per Reg. 128/04.

Because all Operations personnel have to meet minimum education requirements (OIT) to work as an operator they are expected to have a general understanding of the relevance of their duties and how they affect safe drinking water. To reinforce this principle and ensure that personnel are aware of the importance of their work, various activities are carried out. Two activities that personnel are involved in are in-house training sessions and morning tailgate sessions. In-house training sessions may include discussions on things such as recent Orders, Convictions or Charges across the province and the results of recent MOE Inspections. Morning tailgate sessions discuss events and alarms from the previous day, any actions that were taken and the results achieved as well as what may need to be done or things to watch out for in the future. Operators also discuss general issues that have been encountered and what worked or didn't work in these situations. These are a constant reminder that what they are doing does indeed affect safe drinking water.

11. Personnel Coverage

The Municipality of Kincardine takes the necessary steps to ensure that adequate staffing levels are maintained to efficiently run all water and wastewater facilities.

The Water Services Department hours are from 7:00 am – 4:30 pm Monday to Thursday and from 7:00 am – 11:00 am on Fridays. Outside of these hours, an assigned Operator is on-call to address any issues that may arise. All operators with a minimum Class 1 certification are on the on-call rotation, overseen by the Overall Responsible Operator. New hires and OITs are placed on the on-call rotation at the discretion of the ORO.

One on-call operator is capable of completing all minimal weekend rounds during routine operations. Similarly, most alarm conditions can be addressed by a single operator when following standard operating procedures. If circumstances arise that require assistance, the on-call operator will contact the ORO. The ORO will determine how to best assist the on-call operator. Contact information for all operations personnel is readily accessible to the on-call operator.

The Overall Responsible Operator and each of the Operators have an assigned cell phone. The ORO and on-call operator carry their cell phones at all times. The other operators carry their cell phones during regular working hours. Operators are asked to carry their cell phones after hours, if possible, in case of an emergency, so that they can be easily reached. If an operator will not be available outside of regular working hours, they are asked to inform the ORO if possible.

When the Overall Responsible Operator is unavailable, a replacement ORO is designated as outlined in Emergency Response Procedure #CP018 and identified in the facility log book. The Operator-in-Charge is designated by the ORO as per Standard Operating Procedure #SOP007 and identified in the facility log book.

Personnel are not at the drinking water system at all times, but all systems are monitored and alarmed. All alarms are responded to in accordance with Standard Operating Procedure #SOP002 and as required by regulation.

All vacation requests must be approved by the ORO prior to the day(s) requested.

12. Communications

Relevant aspects of the Quality Management System will be communicated between Top Management and:

- the Owner,
- Operating Authority personnel,
- Suppliers and
- the Public.

Procedure *QMS003 Communications* outlines various methods that can be used to achieve and maintain this communication.

The Municipality of Kincardine and the Township of Huron-Kinloss have an agreement in place regarding the Huronville Subdivision. In the agreement, the Township of Huron-Kinloss vested the administration and control of all watermains, fire hydrants and accessories to the Municipality of Kincardine. The Municipality of Kincardine is responsible for the maintenance, repair and replacement of this infrastructure. Therefore, much of the communications in regards to the Huronville Subdivision will be between Top Management and the Municipality of Kincardine Council and staff.

13. Essential Supplies and Services

The Municipality of Kincardine operates multiple facilities, some using the same chemicals and equipment. This allows for supplies to be shared among these facilities. The Overall Responsible Operator oversees the inventory of supplies including supplies that are kept on-site in case of an emergency. Purchases are made by a Purchase Order.

An operator must be on site to accept chemical shipments and oversee offloading. Appropriate paperwork must be provided upon delivery to confirm the product being delivered. Where applicable, supplies must meet NSF standards. Chemicals used for coagulation must have a Certificate of Analysis delivered with each shipment or one must be available from the supplier upon request.

All drinking water samples are tested in accordance with Reg. 248/03 Drinking Water Testing Services. All laboratories used for testing water samples are accredited to test for the parameters requested. A Notification of Lab Services must be submitted to the Ministry of the Environment prior to lab use as required under O. Reg. 170/03.

Contractors hired by the Municipality of Kincardine are required to abide by the municipality's policies and procedures and applicable legislative and regulatory requirements under the Ministry of the Environment and the Ministry of Labour.

A list of all supplies and services deemed essential for the production and delivery of safe water can be found in Appendix F. Included here are the names of primary suppliers/service providers and alternates, ordering information and delivery times. The Water Services Administrative Assistant will make changes on an on-going basis to ensure that contact information is current. If at any time, the Overall Responsible Operator is not satisfied with a product, supplier or service provider, changes may be made to this list. At a minimum, the ORO or designate will review the list annually.

Companies and contractors listed in Appendix F are notified of the Municipality's QMS and applicable requirements.

14. Review and Provision of Infrastructure

Adequate infrastructure to produce and provide safe drinking water needs to be in place, maintained and improved when necessary. The Municipality of Kincardine and the Township of Huron-Kinloss put an agreement into place on December 20, 2004, making the Municipality of Kincardine responsible for maintaining, repairing and replacing the Huronville Subdivision Distribution System infrastructure. The Municipality of Kincardine supports regularly examining the infrastructure, reviewing what is in place and determining what is needed to operate the drinking water system safely and effectively.

Drinking water system infrastructure includes such things as buildings, process equipment, watermains, hardware and software. Infrastructure needs are reviewed on an on-going basis by the Overall Responsible Operator and these needs are communicated to Top Management. A summary of the identified needs is compiled and reviewed annually to ensure that adequate infrastructure is available and/or planned for to operate and maintain the system. Top Management uses a 5 year rolling plan to assist with meeting future needs.

Procedure *QMS004 Infrastructure Review* provides details on the infrastructure review procedure. Results of the review are communicated to the Municipality of Kincardine Council through annual budgets.

15. Infrastructure Maintenance, Rehabilitation and Renewal

The Water Services Department strives to maintain the water system infrastructure to ensure the production of potable water for all users. This is accomplished through preventative maintenance, rehabilitation and renewal. For the purposes of this Plan, rehabilitation refers to the repairing or refurbishing of infrastructure and renewal refers to the replacement of infrastructure.

All planned and unplanned maintenance, rehabilitation and renewal of infrastructure are the direct responsibility of the ORO.

The maintenance, rehabilitation and renewal program is monitored by the ORO to determine its effectiveness. The maintenance-monitoring program reviews such things as the frequency of unplanned maintenance activities and infrastructure performance.

In 2009, the Water Services Department purchased Computerized Maintenance Management Software (CMMS). The CMMS has been a useful tool for tracking inventory and maintenance activities, scheduling work and for monitoring the maintenance program.

Maintenance

Wherever possible, preventative maintenance is performed with the intent of lengthening the useful life of equipment and avoiding unplanned maintenance activities. Preventative maintenance is scheduled by the Overall Responsible Operator and is based on manufacturer's

recommendations, history and overall performance. A tentative schedule is kept by the ORO and work assigned to operations staff accordingly.

Planned preventative maintenance includes such things as visually inspecting, lubricating, flushing and changing fluids on equipment, spring flushing and winterizing of hydrants, and valve inspection/exercising. Drinking water system planned and unplanned maintenance activities are documented in the drinking water system log book.

Rehabilitation

Operations staff are responsible for identifying infrastructure needs while working in the Huronville Subdivision Distribution System. Repairs that can be done immediately are dealt with and logged in the facility log book. Any other issues are reported to the ORO for future follow-up.

Drinking water system repairs are documented in the drinking water system log book. Repair sheets and/or work orders are completed by operations staff for distribution maintenance. Information is entered into the maintenance program and kept electronically as well as in the filing cabinet.

In order to deal with unplanned repairs as quickly and efficiently as possible, back-up units, spare parts and current drawings/mapping are available to operations staff.

Renewal

Infrastructure needs are communicated from the ORO to Top Management. Planning for the repair and replacement of major infrastructure components is the responsibility of Top Management. This is done through a 5 year rolling plan with annual capital and operating budgets approved by the Municipality of Kincardine Council. Consideration is given to other components and activities such as wastewater and roads repairs and replacements, and new or expanding subdivisions.

16. Sampling, Testing and Monitoring

Sampling, testing and monitoring of drinking water at various stages can help ensure process control and verify finished drinking water quality. As a distribution system that receives all of its water from the Kincardine Drinking Water System, most of the sampling, testing and monitoring required is performed prior to the water entering the Huronville Subdivision Distribution System. Sampling, testing and monitoring for the Kincardine Drinking Water System and the Huronville Subdivision DS is based on O. Reg. 170 and the Kincardine DWS Drinking Water Works Permit and Municipal Drinking Water Licence. The Municipality of Kincardine has agreed to sample and test the Huronville distribution system as part of the Kincardine distribution system in accordance with O. Reg. 170/03 Section 5(4)(b).

Routine sampling of the Huronville Subdivision DS is done on a monthly basis for microbiological testing and free chlorine residual monitoring. Additional distribution system sampling, testing and monitoring is performed on the Kincardine Distribution System. All sampling, testing and monitoring of the raw, process and treated water is performed prior to the water entering the Huronville DS at the Kincardine WTP. Appendix G contains a Sampling and Monitoring Table for the Kincardine WTP. The Kincardine DWS Operations Manual outlines the sampling, testing and monitoring for this system, some of which are beyond regulatory requirements to maintain process control or because of possible challenging conditions. *SOP006 Sampling Requirements* outlines the microbiological and chemical sampling requirements and schedule for all Drinking Water Systems operated by the Municipality of Kincardine. An Operator(s) is assigned the responsibility of performing the required tasks with the Operator-in-Charge and Overall Responsible Operator giving oversight.

Raw water quality is monitored at the Kincardine WTP for various parameters and some are used to make process adjustments, the most significant of these being turbidity. Source Water Protection studies are underway that may outline additional monitoring requirements of the Intake Protection Zones.

Certified operators perform all sampling, testing and monitoring. Important process data for the Kincardine WTP is continuously monitored, recorded on a SCADA system and alarmed. The SCADA system is programmed to monitor some parameters, such as free chlorine residual, in several locations to maintain the treatment process and identify potential problems early. The operator can use the information gathered on-site and from the SCADA system to adjust processes affecting water quality. The SCADA trends are reviewed by a licenced operator at a minimum of every 72 hours. Wherever possible, alarm limits are set such that an operator has sufficient time to respond to the site and deal with the issue prior to an adverse effect.

Contingency Plans have been developed for dealing with emergency situations. These can be found in the Kincardine DWS Operations Manual.

At the Kincardine WTP, in-house testing results are recorded on monthly log sheets and monitoring and adjustments notes for both systems are made in their respective log books. Relevant sampling, testing and monitoring results are summarized for Top Management in the ORO's and/or Compliance Officer's reports. Annual and Summary Reports for the Kincardine

DWS are completed and a copy of the Annual Report is given to the Township of Huron-Kinloss. Lab results are directly e-mailed to the Municipality of Kincardine Public Works Department and the Water Services Department from the lab. Hard copies are kept at both of these locations. Copies of chemical analysis completed on the Kincardine DWS as well as copies of microbiological testing on the Huronville Subdivision are sent to the Township of Huron-Kinloss. Adverse notifications required for the Huronville Subdivision are completed by the Water Services Department and faxed to the Kincardine Public Works Department and the Township of Huron-Kinloss at the same time they are faxed to SAC and MOH.

17. Measurement and Recording Equipment Calibration and Maintenance

Measurement and recording equipment accuracy is an essential part of ensuring that the consumer is provided with quality drinking water that meets or exceeds the legislated requirements and internal targets. Most of the equipment that requires calibration and maintenance applies to raw, process and treatment equipment at the Kincardine WTP, prior to the Huronville Subdivision Distribution System.

Equipment maintenance and calibrations are scheduled by the Overall Responsible Operator. It is the responsibility of the ORO to ensure that all maintenance and calibrations are completed. Annual calibrations of flow meters and continuous monitoring chlorine analyzers are done through an outside contractor. Legislated continuous monitoring turbidity analyzers are calibrated quarterly, either in-house or by an outside contractor. More frequent calibrations may be performed in-house on continuous monitoring chlorine and turbidity analyzers as required by maintenance activities and performance.

Maintenance and verification checks are done internally by operations staff on various equipment such as pH meters, pocket colorimeters and continuous monitoring chlorine and turbidity analyzers. Preventative maintenance is performed on an as-needed basis by observing equipment condition and performance. Verification checks are performed on portable colorimeters approximately once per month. These portable units are used to verify on-line analyzers.

Maintenance and calibration activities are documented in the facility log book. Records are filed at the Water Services Department. The Compliance Officer and/or ORO report to Top Management when annual calibrations are completed for the flow meters and chlorine analyzers.

18. Emergency Management

Emergencies may still occur in spite of our best efforts to prevent them. Proper planning for emergencies is necessary to minimize potential health risks. The Operating Authority has developed procedures in preparation for potential situations or service interruptions that may result in the loss of the ability to maintain a supply of safe drinking water to consumers. These procedures cover how to respond and restore the system to normal operation.

Potential emergency situations or service interruptions are listed in Appendix H. The relevant Emergency Response Procedures are listed for each emergency situation or service interruption. These Procedures are located in the Operations Manuals located on-site and at the Water Services Department Office. Master copies are kept by the Compliance Officer who is responsible for ensuring that these Procedures are kept up to date.

Generally, all emergencies will be handled directly by the Water Services Department. The Director of Public Works will be kept informed of the emergencies at the time by the ORO or Compliance Officer. Details of the emergencies will be documented by the ORO or Compliance Officer for Top Management and other relevant parties. Any Operating Authority personnel may contact the Ministry of the Environment or the Medical Officer of Health during an emergency situation.

For emergency situations that cannot be dealt with solely by the Water Services Department, the Municipality of Kincardine Emergency Response Plan will be put into effect. This will be arranged and co-ordinated through the Municipality of Kincardine Director of Public Works as outlined in the Emergency Response Plan. A copy of the Emergency Response Plan is located at the Water Services Department Office.

An Emergency Contact List is posted at each water and wastewater facility operated by the Water Services Department. In addition, contact lists and an emergency supplies list are kept at the Water Services Office that detail contact information for key parties and supply locations. The Contact Lists are reviewed and updated by the Administrative Assistant as required, or at least once a year.

The Emergency Management section of the Operational Plan, along with the Emergency Response Procedures, will be reviewed on a regular basis, as outlined in SOP022. The Compliance Officer is responsible for ensuring that these reviews are completed. Changes to the Emergency Response Procedures are approved by the ORO. Reviews and changes to emergency procedures may be initiated from an actual emergency, training or testing session, change at the facility, personnel change, or a scheduled review.

In-house training sessions are conducted every year and include training on some of the Emergency Response Procedures. Procedures that are most critical will be given a higher priority. New Procedures, once approved by the ORO, will be reviewed with operations personnel within 2 months. Licenced operators are required to participate in the in-house training sessions to maintain a state of preparedness and to understand their roles and responsibilities. Because the Procedures cannot all be reviewed during in-house training

sessions, operators are given time to read through them on their own and discuss them with the ORO or Compliance Officer if they have questions. The internal goal is to have staff review each Emergency Response Procedure every two years.

An Emergency Response Testing session will be held every 2 years. The Compliance Officer is responsible for organizing and scheduling training and testing sessions. Training and testing for emergency response may be done through various means such as checklist testing, table-top walkthrough exercises, hands-on training (ie. First Aid, CPR, Confined Space, etc.) or functional exercises (ie. simulated disaster testing).

19. Internal Audits

Internal audits are conducted to ensure the QMS conforms to the requirements of the DWQMS and that it has been effectively implemented. The Operating Authority is responsible for ensuring that internal audits of the QMS are conducted on an annual basis according to procedure *QMS005 Internal Audit*.

20. Management Review

Top Management is responsible for ensuring that a Management Review is completed at least once every 12 months. Management Reviews are designed to provide Top Management with appropriate and sufficient data to make decisions about the QMS and, whenever necessary, to prompt changes and improvement in the QMS. *QMS006 Management Review* outlines the procedure for performing these reviews.

21. Continual Improvement

The QMS is regularly reviewed by operations personnel for the purpose of implementation and improvement. The Operating Authority strives to continually improve the effectiveness of the QMS through the use of corrective actions. Corrective actions may result from various sources such as Internal Audits, Management Reviews, External Audits or staff suggestions.

Internal and External Audits are reviewed by the QMS Representative for the purpose of effecting changes to continually improve the QMS. In addition to the Corrective Action Requests that need to be addressed, the Recommendations and Opportunities for Improvement are reviewed and whenever possible changes and revisions are made.

All grammatical or typographical errors that do not change the intent of this Operational Plan shall be incorporated, without an Amendment to this Plan.