

# City of Owen Sound

## Quality Management System Operational Plan

Revision 16: April 2023



Owen Sound Drinking Water System

Licence 094-101 Issue Number 5

## RECORD OF REVISIONS

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## DISCLAIMER STATEMENT

This Operational Plan is designed for the exclusive use of the City of Owen Sound. As stated in Section 17 of the Safe Drinking Water Act, 2002, “all operational plans for a drinking water system remain the property of the owner of the system, irrespective of who prepares or revises the plans. 2002, c. 32, s. 17 (1).” Therefore, this Operational Plan is the property of the City of Owen Sound.

This Operational Plan has been developed with the City’s operating practices in mind and utilizing the City’s personnel to implement it. Any use which a third party makes of this Operational Plan, or any part thereof, is the responsibility of such third parties. The City of Owen Sound accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this Operational Plan or any part thereof.

Any documents developed and owned by the City, which are referred to in this Operational Plan, including but not limited to the System Level Documents, the Risk Assessment Outcomes, and other policies, protocols, and records, remain the property of the City.

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# 1. QUALITY MANAGEMENT SYSTEM

## 1.1 OBJECTIVES AND SCOPE

The objectives of the City of Owen Sound's Quality Management System (QMS), as related to the provision of safe drinking water are to:

- Establish and maintain the policy and objectives with respect to the effective management and operation of the water system
- Understand and control the risks associated with activities and processes related to the water system
- Achieve continuous improvement of the QMS and the water system performance

This Operational Plan and its 21 Elements applies to all activities, processes, and practices related to the provision of drinking water by the City of Owen Sound.

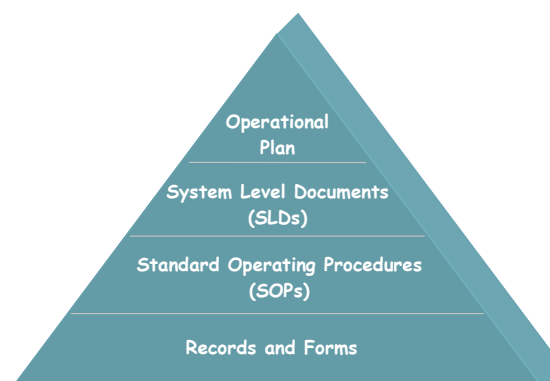
## 1.2 ACTIVITY DESCRIPTION

This Operational Plan defines and documents the Quality Management System (QMS) for the City of Owen Sound Water Treatment and Distribution System, which are owned and operated by the City of Owen Sound. It sets out the policies and procedures with respect to quality management in accordance with the requirements of the Province of Ontario's Drinking Water Quality Management Standard (DWQMS).

The numbering of Sections in this Operational Plan directly corresponds to the numbering of the elements of the DWQMS.

Figure 1-1 below illustrates the structure of the City's Quality Management System documentation. This "Documentation Pyramid" is based on four levels. It is important to note that not all 21 elements of the DWQMS require four levels of documentation (i.e. all information related to some DWQMS elements might be fully contained within the first or second levels of documentation). The four documentation levels are explained below.

**Figure 1-1 – DWQMS Documentation Pyramid**



### 1.2.1 Operational Plan

The Operational Plan presents an overview of the QMS and makes reference to all applicable System Level Documents (SLDs), reference documents, records, etc, as relating to the 21 elements of the DWQMS. This document contains:

- Statements about the City's commitment to quality
- The Quality Management System Policy
- Organizational Structure, Roles, Responsibilities, and Authorities
- References to other quality management standard documents not contained in the Operational Plan
- High-level information about key areas of the quality system and the applicable SOP's that apply to the overall operation of the City's water system

### 1.2.2 System Level Documents

System Level Documents (SLDs) as indicated in Figure 1-1, describe who is responsible for completing the described procedure, when is the procedure applicable, what documentation is needed, etc. SLDs may also refer to other procedures that contain more specific information.

### 1.2.3 Standard Operating Procedures

Standard Operating Procedures (SOPs) detail how an activity is carried out, specifying the tools and materials (if any), locations, specific steps, etc.

### 1.2.4 Records and Forms

This documentation level includes all the records and documentation required to demonstrate compliance of the Environmental Compliance Approval (ECA) and conformance of the DWQMS and to track performance. These records document the results of activities carried out following SLDs. Records include work orders, calibration records, water quality test results, etc.

## 2. QUALITY MANAGEMENT SYSTEM POLICY

### 2.1 OBJECTIVES AND SCOPE

The Operational Plan shall document a Quality Management System Policy that provides the foundation for the Quality Management System, and:

- a) includes a commitment to the maintenance and continual improvement of the Quality Management System,
- b) includes a commitment to the Consumer to provide safe drinking water,
- c) includes a commitment to comply with applicable legislation and regulations, and
- d) is in a form that can be communicated to all Operating Authority personnel, the Owner and the Public.

### 2.2 ACTIVITY DESCRIPTION

The Quality Management System Policy establishes the principles and commitments of the City of Owen Sound with regards to their Quality Management System.

- a) Establish, maintain and continually improve the Drinking Water Quality Management System
- b) The DWQMS Policy is the foundation of the Quality Management System and it relates to all activities, processes, and practices involved in the provision of safe drinking water by the City of Owen Sound.
- c) The DWQMS Policy will be communicated to all staff via internal communication, to suppliers through RFPs and purchase contracts, and to the public via the City's website and on other publications associated to the City's water works.
- d) Comply with all applicable legislation and regulations.

#### 2.2.1 Quality Policy

The City of Owen Sound is committed to the continuous supply of safe drinking water to all its water users. To fulfill this commitment every aspect of the water operations is guided by three overarching principles.

- **Quality** – Establishing and maintaining a Quality Management System and being in compliance with all applicable legislation and regulations
- **Sustainability** – Maintaining infrastructure and operations in an environmentally-responsible fashion with a reasonable cost without sacrificing performance
- **Continual Improvement** – Striving always to improve the Drinking Water Quality Management System





The City of Owen Sound is committed to the continuous supply of safe drinking water to all its water users. To fulfill this commitment every aspect of the water operations is guided by three overarching principles:



**● QUALITY**

Implementing and maintaining a Quality Management System and being in compliance with all applicable legislation and regulations.

**● SUSTAINABILITY**

Maintaining infrastructure and operations in an environmentally-responsible fashion with a reasonable cost without sacrificing performance.

**● CONTINUAL IMPROVEMENT**

Striving always to improve the Drinking Water Quality Management System.

## 3. COMMITMENT AND ENDORSEMENT

### 3.1 OBJECTIVES AND SCOPE

Top Management shall provide evidence of its commitment to an effective Quality Management System by:

- a) ensuring that a Quality Management System is in place that meets the requirements of this Standard,
- b) ensuring that the Operating Authority is aware of all applicable legislative and regulatory requirements,
- c) communicating the Quality Management System according to the procedure for communications,
- d) determining, obtaining or providing the resources needed to maintain and continually improve the Quality Management System.

### 3.2 ACTIVITY DESCRIPTION

The staff at the City of Owen Sound are committed to ensuring that a Drinking Water Quality Management System (DWQMS) is developed and implemented for the City's Drinking Water System in accordance with the requirements of the Drinking Water Quality Management Standard. Both the Owner and Top Management, which are represented by members of council, are committed to maintaining the DWQMS and ensuring that the established DWQMS complies with all applicable legislation and regulations and that all resources required for its maintenance and continual improvement are identified and provided. They are also committed to ensuring that the Operating Authority as defined in Section 9 is aware of all applicable legislative and regulatory requirements governing the provision of safe drinking water.

To promote awareness and understanding of the DWQMS, the City of Owen Sound's DWQMS policy, will be communicated to relevant parties according to the procedures outlined in the Operational Plan.

This Operational Plan is endorsed and supported by the City of Owen Sound Top Management and Owner.

\_\_\_\_\_

Mayor

\_\_\_\_\_

Date

\_\_\_\_\_

City Manager

\_\_\_\_\_

Date

\_\_\_\_\_

Director of Public Works and Engineering

\_\_\_\_\_

Date

## 4. QUALITY MANAGEMENT SYSTEM REPRESENTATIVE

### 4.1 OBJECTIVES AND SCOPE

The QMS Representative is generally responsible for the upkeep of the QMS as well as ensuring that City staff are aware of all applicable legislative and regulatory requirements relevant to their duties regarding the provision of safe drinking water. The description below details the QMS Representative's roles and responsibilities.

### 4.2 ACTIVITY DESCRIPTION

The Public Works Manager has been appointed as the QMS Representative by the City of Owen Sound. The QMS Representative is authorized and responsible for managing all processes and procedures associated with the operation and maintenance of the QMS. The QMS Representative will discuss the performance of the QMS and continual improvement activities with members of Top Management. Section 21 of this Operational Plan details the City's continual improvement activities. Clear communication channels between Top Management and the QMS Representative are required to deal with issues as they arise.

The QMS Representative will ensure that current versions of documents related to the QMS are in use. The procedures outlined in Section 5 of this Operational Plan, Document and Records Control will be used to ensure that all personnel have access to the most current versions of all required procedures and documents.

It is the responsibility of the QMS Representative to promote awareness of the QMS to all City of Owen Sound Water Department personnel. The QMS policies and procedures will be presented to personnel in internal training sessions and reviewed during internal audits, and management review meetings with Top Management. All training sessions, internal audit and management review meetings will be coordinated by the QMS Representative.

A detailed description of the roles and responsibilities of the QMS Representative is also included in Section 9, Organizational Structures, Roles, Responsibilities and Authorities.

## 5. DOCUMENTS AND RECORDS CONTROL

### 5.1 OBJECTIVES AND SCOPE

The Operational Plan shall document a procedure for Document and Records control that describes how:

- a) Documents required by the Quality Management System are:
  - i. kept current, legible and readily identifiable
  - ii. retrievable
  - iii. stored, protected, retained and disposed of, and
- b) Records required by the Quality Management System are:
  - i. kept legible, and readily identifiable
  - ii. retrievable
  - iii. stored, protected, retained and disposed of.

The Operating Authority shall implement and conform to the procedure for Document and Records control and shall ensure that the Quality Management System documentation for the Subject System includes:

- a) the Operational Plan and its associated policies and procedures,
- b) Documents and Records determined by the Operating Authority as being needed to ensure the effective planning, operation and control of its operations, and
- c) the results of internal and external Audits and management reviews.

### 5.2 ACTIVITY DESCRIPTION

This Section outlines the procedures followed to ensure that documents and records pertaining to the provision of safe drinking water are maintained and controlled. This Section applies to all documents that are described within this Operational Plan and its referenced SLDs.

- Documents are the procedures, forms, and templates required for the effective conformance of the DWQMS and the compliance of the Drinking Water System.
- Records are snapshots of the activities that take place, such as operational records for flushing, maintenance, and repairs.
- Results from Internal and External Audits as well as Management Reviews.

Procedures for documents and records control have been established to describe the methods and activities for ensuring that documents and records are properly managed. These are included in *SLD-05A-Control of Documents* and *SLD-05B-Control of Records*.

Documents and records will be stored, protected, retained, and disposed of in accordance with the above mentioned SLDs. Any modifications to documents will be recorded as described in the procedure. Records cannot be modified. Staff will ensure that only the current versions of documents are being used at all times.

## 6. DRINKING WATER SYSTEM

### 6.1 OBJECTIVES AND SCOPE

The Operational Plan shall document, as applicable:

- a) for the Subject System:
  - i. the name of the Owner and Operating Authority,
  - ii. if the system includes equipment that provides Primary Disinfection and/or Secondary Disinfection:
    - A. a description of the system including all applicable Treatment System processes and Distribution System components,
    - B. a Treatment System process flow chart, C. a description of the water source, including:
      - I. general characteristics of the raw water supply, II. common event-driven fluctuations, and
      - III. any resulting operational challenges and threats.
  - iii. if the system does not include equipment that provides Primary Disinfection or Secondary Disinfection:
    - A. a description of the system including all Distribution System components, and
    - B. a description of any procedures that are in place to maintain disinfection residuals.
- b) if the Subject System is an Operational Subsystem, a summary description of the Municipal Residential Drinking Water System it is a part of including the name of the Operating Authority(ies) for the other Operational Subsystems.
- c) if the Subject System is connected to one or more other Drinking Water Systems owned by different Owners, a summary description of those systems which:
  - i. indicates whether the Subject System obtains water from or supplies water to those systems,
  - ii. names the Owner and Operating Authority(ies) of those systems, and
  - iii. identifies which, if any, of those systems that the Subject System obtains water from are relied upon to ensure the provision of safe drinking water.

## 6.2 ACTIVITY DESCRIPTION

The City of Owen Sound, as represented by Members of Council and Top Management operates and maintains a water treatment and distribution system which services approximately 24,000 persons. This is marginally more than the population of the City of Owen Sound, as some households are serviced outside the City boundaries. These households are billed directly by the City, except for the Leith Water System, which is owned and operated by the Municipality of Meaford.

In addition to the residential demand, there are several large industrial, institutional, and commercial users of water in the City which require a significant quantity of water. The total number of water services is approximately 7000. The existing water treatment plant has a rated capacity of 27,276 m<sup>3</sup>/day.

A simplified process schematic of the water treatment plant is shown in Figure 6.1 and a schematic of the water distribution system is shown in Figure 6.2.

There are no critical upstream or downstream processes that are relied upon to ensure the provision of safe drinking water.

Raw water quality fluctuation results from storm driven or runoff events, which often present operational challenges, caused by elevated Turbidity and Colour in the raw water. This can result in elevated Turbidity and elevated Colour in the filtered water.

Elevated filtered water Turbidity can indicate a threat to water quality since failure to meet the 1.0 NTU requirement is indicative of less effective filtration. However, adequate disinfection can still be achieved via UV Disinfection, as long as the UV Units are operated such that the continual Pass-Through Dose of at least 40 mJ/cm<sup>2</sup> is maintained as specified in the Drinking Water Works Permit and Licence.

Elevated treated water colour can be a threat to water quality since it can result in lower Ultraviolet Transmittance (UVT) in the water. This reduces the effectiveness of the UV units. However, even during past high colour events, despite slightly lower than normal UVT readings, the UV units compensate by increasing power to maintain the dosage.

It should be noted that by themselves, Turbidity and Colour are not threats to water quality and are aesthetic objectives in the distribution system; the issues are how Turbidity indicates less effective filtration, and how Colour can affect UVT and subsequently UV disinfection.

For more information regarding the raw water characterisation, refer to the City of Owen Sound Water System Raw Water Assessment Report (Genivar, May 2009) This report can be found where indicated in SLD 05-A.

### 6.2.1 Water Treatment Plant

The entire distribution system is serviced by one plant. The R H Neath Water Purification Plant is located at 3<sup>rd</sup> Avenue East near 28<sup>th</sup> Street East. The plant is a direct filtration plant using Georgian Bay as the source. The raw water intake pipe extends approximately 670 meters into Georgian Bay.



The plant uses ultraviolet disinfection and gaseous chlorine disinfection.

Prechlorination is used for zebra mussel control.

The raw water is screened at the low lift pumping station and then pumped to the rapid mixing tanks by low lift pumps (three (3) available). These pumps transfer raw water through two (2) separate, 350 mm diameter feed pipes to supply both Plant 1 and Plant 2 with raw water (Refer to Figure 6.1). “Plant 1” and “Plant 2” are terms used to describe two (2) parallel treatment trains, consisting of two (2) filters each, and the associated downstream unit processes.

The coagulant chemical is added at the inlet of the rapid mixers of each plant. Coagulated water is divided into two flocculation tanks. Plant 1 uses walking beam flocculation and Plant 2 uses stage tapered turbine mixing. Flocculation tank effluents combine in a channel before splitting into the dual-media gravity filters for filtering. Filtered water is then stored in Clear Wells 1, 2 and 3 (refer to Figure 6.1). Post-chlorination is done as soon as the water enters the Clear Wells.

Three (3) Industrial High Lift pumps, and four (4) Municipal High Lift pumps are available to pump treated water to the distribution system.

Fluoridation is also practiced and the Hydro Fluosilicic Acid is injected in the clearwells, near the location where chlorine is dosed.

## 6.2.2 Water Distribution Pressure Zones

The Water Distribution System consists of six (6) pressure zones: The Municipal Pressure Zone; the Municipal Core Pressure Zone (formerly Spring Pressure Zone); the Industrial Pressure Zone, the East Hill Pressure Zone, the East Hill South Pressure Zone, and the Beattie Street Booster Pumping Station Pressure Zone.

There are two high lift pump systems at the plant. The Municipal High Lift (MHL) pumps supply the Municipal Pressure Zone, the Municipal Core Pressure Zone, East Hill Pressure Zone, East Hill South Pressure Zone, and the Beattie Street Pressure Zone, while the Industrial High Lift (IHL) pumps supply the Industrial Pressure Zone.

Free Chlorine Residuals are maintained in the system in number of ways: (1) Looping Dead Ends (2) Blowoffs on some dead ends to continually flush water at a low rate (3) Annual flushing program including flush hydrants (4) small bypass connections at check valve or flow control valve chambers to allow a small amount of flow between pressure zones.

### 6.2.2.1 Municipal Pressure Zone

The Municipal Pressure Zone is the largest zone in the city. This zone is serviced by the Municipal High Lift Pumps directly, and storage is provided by the Norman H. Robertson ("Bay") Reservoir.

### 6.2.2.2 Municipal Core Pressure Zone

When the spring water system was decommissioned in 1998, these watermains were connected to the Municipal Pressure Zone. The Municipal Core Pressure Zone is now

interconnected to the Municipal Pressure Zone by pressure reducing valves at interconnection locations.

#### 6.2.2.3 East Hill Pressure Zone

The East Hill Booster Pumping Station is located on the south side of 8th Street East, across from the Norman H. Robertson Reservoir and provides booster pumping capacity for the East Hill Pressure Zone and the East Hill South Pressure Zone. This station draws directly from the Norman H. Robertson ("Bay") Reservoir, which improves circulation in that reservoir.

#### 6.2.2.4 East Hill South Pressure Zone

The East Hill South Pressure Zone receives water from the East Hill Booster Pumping Station through pressure reducing/pressure sustaining valves under normal circumstances, but reverts back to the Municipal Pressure Zone under greater than Maximum Day flow conditions, in order to prevent overloading the East Hill Booster Pumping Station.

#### 6.2.2.5 Industrial Pressure Zone

The Industrial Pressure Zone is served by the Industrial High Lift Pumps at the Water Treatment Plant. There is currently no equalization storage on this zone. Some of the larger industrial users supply their own on-site fire storage. Pressures are controlled on this zone via pressure-reducing valving at the treatment plant.

#### 6.2.2.6 Beattie Street Booster Station Pressure Zone

The Beattie Street Booster Pumping Station was commissioned in 2006 and provides increased pressure to the southwest quadrant of the city as indicated in Figure 6.2. The Beattie Street booster pumping station normally operates during the hours of 6:00 a.m. to 11:00 p.m. to boost domestic pressure in the subject area. This operating time period is operator adjustable. Outside of the operating time, the pressure zone reverts to the Municipal Pressure Zone.

In the event of fire flow requirements however, the Beattie Street Booster Pumping Station would activate to provide the fire flows, regardless of the time of day.

The Beattie Street Booster Pumping Station has four (4) 25 HP vertical turbine pumps operating on variable frequency drives, on a rotating duty system.

### 6.2.3 Water Distribution System: Piping

The Water Distribution System consists of approximately 140 km of watermains, consisting of Ductile Iron, Cast Iron, Asbestos Cement (AC) and PVC watermains. About 90% of the system is Ductile Iron or Cast Iron main. The remaining 10% is AC and PVC.

### 6.2.4 Leith Water Distribution System

The Leith Water Distribution System is owned and operated by the Municipality of Meaford. A flow meter chamber at the boundary of the City of Owen Sound distribution

system provides flow information and the Municipality of Meaford is billed by the City on the basis of the consumption, and then Meaford bills the water users.

#### 6.2.5 The Norman H. Robertson ("Bay") Reservoir

This reservoir is located near the intersection of 8th Street and 9th Avenue East and provides a total of approximately 22,730 m<sup>3</sup> (5 MIG) of storage for the Municipal Pressure Zone (including the East Hill and East Hill South Pressure Zones, the Municipal Core Pressure Zone and the Beattie Street Booster Pumping Station Pressure Zone; these are sub-pressure zones of the Municipal Pressure Zone).

The reservoir consists of two volumetrically equivalent chambers, north and south. These chambers are linked by a 400 mm diameter interconnection pipe. The flow enters the north chamber and leaves through the south chamber. This pattern is controlled via internal check valves in the dry well between the north and south chambers.

## 7. RISK ASSESSMENT PROCEDURE

### 7.1 OBJECTIVES AND SCOPE

The Operational Plan shall document a risk assessment process that:

- a) Considers potential hazardous events and associated hazards, as identified in the Ministry of the Environment and Climate Change document titled Potential Hazardous Events for Municipal Residential Drinking Water Systems, dated February 2017 as it may be amended. A copy of this document is available at [www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater).
- b) identifies additional potential hazardous events and associated hazards,
- c) assesses the risks associated with the occurrence of hazardous events,
- d) ranks the hazardous events according to the associated risk,
- e) identifies control measures to address the potential hazards and hazardous events,
- f) identifies Critical Control Points,
- g) identifies a method to verify, at least once every calendar year, the currency of the information and the validity of the assumptions used in the risk assessment,
- h) ensures that the risks are assessed at least once every thirty-six months, and
- i) considers the reliability and redundancy of equipment.

### 7.2 THE OPERATING AUTHORITY SHALL PERFORM A RISK ASSESSMENT CONSISTENT WITH THE DOCUMENTED PROCESS.ACTIVITY DESCRIPTION

This Section documents a risk assessment process that identifies, assesses and where possible, mitigate and/or eliminate potential risks within the drinking-water system.

The Risk Assessment applies to the entire Drinking Water System within the City of Owen Sound. The focus of the assessment is on risks to water quality and water quantity (capacity).

A risk assessment process has been established to collectively identify, assess, rank and prioritize potential drinking water related hazards and related risks.

As a past and current practice, the City has historically defaulted to a full risk assessment practice annually. That is, the requirements of both g) and h) above are both met on an annual basis, rather than differentiating between 12 month and 36 month requirements (refer to Section 20).

The Operational Plan shall document a risk assessment process that:

- a) Considers potential hazardous events and associated hazards, as identified in the Ministry of the Environment and Climate Change document titled Potential Hazardous Events for Municipal Residential Drinking Water Systems, dated February 2017 as it may be amended. A copy of this document is available at [www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater).

The methodology and approach taken to conduct the risk assessment are described in detail in *SLD-07 Risk Assessment and Risk Assessment Outcomes*.

## 8. RISK ASSESSMENT OUTCOMES

### 8.1 OBJECTIVES AND SCOPE

The results of the risk assessments are documented in the *Risk Assessment Table* and the *Critical Control Points Table* and are maintained according to the guidelines identified in Section 5, Document and Records Control.

The following is identified in the risk assessment table and the critical control point table:

- a) The identified potential hazardous events and associated hazards,
- b) The assessed risks associated with the occurrence of hazardous events,
- c) The ranked hazardous events,
- d) The identified control measures to address the potential hazards and hazardous events,
- e) The identified Critical Control Points and their respective Critical Control Limits,
- f) Procedures and/or processes to monitor the Critical Control Limits,
- g) Procedures to respond to deviations from the Critical Control Limits, and
- h) Procedures for reporting and recording deviations from the Critical Control Limits.

### 8.2 ACTIVITY DESCRIPTION

This Section includes information to describe the approach taken by the City of Owen Sound to document the outcomes of the risk assessment activities undertaken as part of the risk assessment procedures identified in Section 7.

## 9. ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

### 9.1 OBJECTIVES AND SCOPE

The Operational Plan shall:

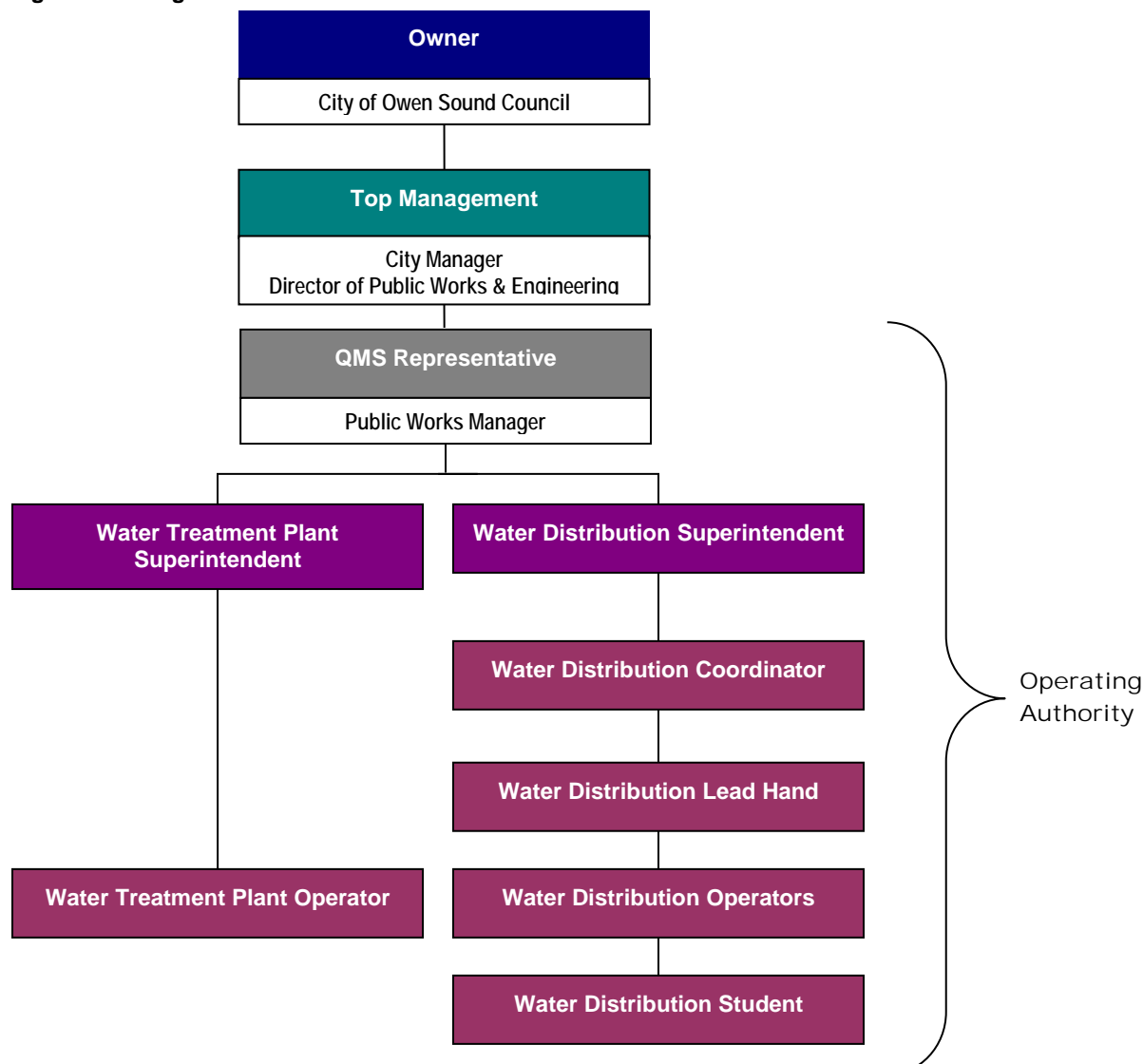
- a) describe the organizational structure of the Operating Authority including respective roles, responsibilities and authorities,
- b) delineate corporate oversight roles, responsibilities and authorities in the case where the Operating Authority operates multiple Subject Systems,
- c) identify the person, persons or group of people within the management structure of the organization responsible for undertaking the Management Review described in Element 20,
- d) identify the person, persons or group of people, having Top Management responsibilities required by this Standard, along with their responsibilities, and
- e) identify the Owner of the Subject System.

The Operating Authority shall keep current the description of the organizational structure including respective roles, responsibilities and authorities, and shall communicate this information to Operating Authority personnel and the Owner.

### 9.2 ACTIVITY DESCRIPTION

The reporting structure of the City of Owen Sound Water Department is outlined in the Organizational Chart in Figure 9-1 below.

**Figure 9-1 – Organizational Chart**



The Owner of the Drinking Water System is the the City of Owen Sound as represented by City of Owen Sound Council. The responsibilities and authorities for all staff related to the operation of the DWQMS and the provision of safe drinking water are documented in Table 9-1 below.

**Table 9-1 Responsibilities and Authorities**

Position	Responsibilities and Authorities
Owner (City Council)	<p><b>Responsibilities</b></p> <ul style="list-style-type: none"> <li>Responsible for ensuring the Operating Authority has sufficient resources to guarantee the provision of safe drinking water</li> <li>Endorses the Water Department’s Operational Plan and commits to it continuous improvement</li> <li>Ensures that adequate financial resources are available for the operations, maintenance, renewal, and replacement of water treatment and distribution infrastructure</li> </ul> <p><b>Authorities</b></p>



**Table 9-1 Responsibilities and Authorities**

Position	Responsibilities and Authorities
Top Management (City Manager)	<ul style="list-style-type: none"> <li>• Approves major infrastructure projects which may impact drinking water quality</li> <li>• Approves and selects Operating Authority including Top Management</li> </ul> <p><b>Responsibilities</b></p> <ul style="list-style-type: none"> <li>• Reports to the Owner</li> <li>• Responsible for ensuring the broad mandate of administrative and operational requirements of the City are carried out.</li> <li>• Oversees the administration (e.g. day to day activities) of the Public Works &amp; Engineering Department to implement the City’s policies and procedures as set by Council through by-law, resolution or as otherwise established.</li> <li>• Ensures the Water Department’s QMS is in place and endorse the Operational Plan</li> <li>• Communicates the QMS per the Communication Procedure</li> <li>• Participates in Management Review meetings</li> </ul> <p><b>Authorities</b></p> <ul style="list-style-type: none"> <li>• Hires management staff</li> <li>• Allocates operations and maintenance budgets across all City Departments</li> </ul>
Top Management (Director of Public Works & Engineering)	<p><b>Responsibilities</b></p> <ul style="list-style-type: none"> <li>• Responsible for overseeing the operation of the drinking-water system</li> <li>• Reports on the drinking-water system performance to the City Manager</li> <li>• Attends meetings with the Owner, as required</li> <li>• Ensures the QMS is in place and endorse the Operational Plan</li> <li>• Participates in Management Review meetings</li> <li>• Ensures Operating Authority staff are aware of applicable legislation regarding the provision of safe drinking water</li> <li>• Communicates the QMS per the Communication Procedure</li> <li>• Ensures that resources required for the QMS are made available to the manager and superintendents</li> <li>• Provides oversight of the manager(s) in accordance with current policies and applicable laws</li> <li>• Formulates goals, policies, programs, for the Department</li> <li>• Manages departmental budget and resources</li> <li>• Consults legal counsel to ensure policies, procedures, and practices comply with federal, provincial, and local laws</li> <li>• Ensures that staff address errors and complaints</li> <li>• Reviews reports authored by the superintendents and/or manager(s)</li> </ul> <p><b>Authorities</b></p> <ul style="list-style-type: none"> <li>• Allocates water treatment and distribution operations and maintenance budgets</li> <li>• Hires operations and maintenance staff</li> <li>• Manages and evaluates performance of staff</li> </ul>
QMS Representative (Public Works Manager)	<p><b>Responsibilities</b></p> <ul style="list-style-type: none"> <li>• Develops and maintains the Quality Management System</li> </ul>

**Table 9-1 Responsibilities and Authorities**

Position	Responsibilities and Authorities
	<ul style="list-style-type: none"> <li>• Ensures Water Department staff are aware of all applicable legislative and regulatory requirements relevant to their duties regarding the provision of safe drinking water</li> <li>• Reports on the performance of the QMS and continual improvement activities to Top Management</li> <li>• Ensures current versions of documents related to the QMS are in use</li> <li>• Promotes awareness of the QMS to all personnel in the Water Department</li> <li>• Responsible for auditing programs</li> <li>• Responsible for emergency management training</li> <li>• Schedules and attends Management Review meetings</li> <li>• Provides risk assessment review</li> <li>• Ensures that the Water Treatment Plant is operating effectively within the guidelines and standards set by the City and all applicable Ministries and regulatory bodies</li> <li>• Identifies appropriate materials and equipment, provides technical standards for the same and recommends the approvals and acquisition: Takes action to correct substandard equipment and facility equipment</li> <li>• Prepares annual water/wastewater capital budget and monitors compliance with the approved budget</li> <li>• Prepares and presents in-house water/wastewater distribution, collection and treatment specific training and information program for water and wastewater staff and other staff as required</li> <li>• Undertakes special analysis, system and water treatment reviews as required</li> <li>• Participates in the review process of all water/wastewater related projects as they relate to modifications and or expansion of the water/wastewater system</li> <li>• Participates in the review process of all water/wastewater projects as they relate to modification and or expansions of the system</li> <li>• Responsible for specific complex inquiries</li> <li>• Promotes public awareness of water conservation</li> <li>• Responsible for the Water/Wastewater Section, secondary pumping station, collection and treatment facilities</li> </ul> <p><b>Authorities</b></p> <ul style="list-style-type: none"> <li>• Manages all processes and procedures associated with the operation and performance of the QMS</li> <li>• Implements changes in QMS documentation and procedures</li> <li>• Manages and evaluates staff performance</li> <li>• Coordinates Training</li> <li>• Decision making re Capital project delivery, method and priority</li> <li>• Evaluate RFP's and Tenders and report to Upper Management and Owner</li> <li>• Directs Superintendents, Lead Hands, and Operators when required</li> <li>• Purchasing Authority for capital projects in accordance with purchasing bylaw</li> </ul>
Water Treatment Plant Superintendent	<p><b>Responsibilities</b></p> <ul style="list-style-type: none"> <li>• Overall Responsible Operator (ORO)</li> </ul>

**Table 9-1 Responsibilities and Authorities**

Position	Responsibilities and Authorities
	<ul style="list-style-type: none"> <li>• Participates in the Management Review Process</li> <li>• Ensures all regulatory and QMS procedures are being followed by Public Works &amp; Engineering Staff</li> <li>• Ensures Public Works &amp; Engineering Staff Training and Certifications are kept current</li> <li>• Directs the work consistent with acceptable Utility and Industry standards and practices</li> <li>• Plans, schedules, and assigns staff to undertake treatment and maintenance programs on a daily basis and other projects as assigned</li> <li>• Responsible for emergency situations</li> <li>• Gives direction to ensure the work progress is undertaken efficiently and effectively and the work program is accomplished</li> <li>• Schedules staff to ensure familiarity with all aspects of water treatment, equipment and facilities</li> <li>• Assists with in-house water treatment specific training and information programs</li> <li>• Provides input to the preparation of operation and capital items for budgets</li> <li>• Ensures economic utilization of equipment and when necessary arrange for rental of additional equipment</li> <li>• Maintains all treatment drawings and allowing for changes to be added or deleted, thus keeping these current</li> <li>• Maintains the SCADA System and assure its security</li> <li>• Maintains the water treatment quality parameters and adjust as required</li> <li>• Ensures compliance with the Ministry of Health and Ministry of Environment (MOE) &amp; Energy Guidelines</li> <li>• Performs routine duties at Water Treatment Plant such as chlorine residual tests. Changes cylinders, adjusts controls, and conducts general inspection</li> <li>• Completes and maintains all work progress and employee reports, records, and information</li> <li>• Maintains inventory control and approves accounts payable for completeness and accuracy</li> <li>• Assists in the interviews and selection of new water treatment employees</li> <li>• Ensures that tools, vehicles, and work equipment are maintained to a high standard</li> <li>• Responsible for arranging and coordinating all plant shut downs</li> <li>• Responds to customer water quality (taste, odour, and colour) problems</li> <li>• Authors water treatment plant Annual Reports</li> <li>• Other duties as assigned by the Public Works Manager</li> </ul> <p><b>Authorities</b></p> <ul style="list-style-type: none"> <li>• All operations of the Water Treatment Plant (WTP) including meeting all legislative sampling requirements</li> <li>• Manages and evaluates performance of staff</li> <li>• Direct WTP Operators as required</li> </ul>

**Table 9-1 Responsibilities and Authorities**

Position	Responsibilities and Authorities
	<ul style="list-style-type: none"> <li>• Coordinating capital projects in Water Treatment</li> <li>• Coordinating Training</li> <li>• Prepare Work Schedules for Water Treatment operators</li> <li>• Annual Reporting to Ministry of Environment</li> <li>• Purchasing for Water Treatment in accordance with Purchasing Bylaw</li> <li>• All other authorities under “Water Treatment Operator”</li> </ul>
<p>Water Treatment Plant Operator</p>	<p><b>Responsibilities</b></p> <ul style="list-style-type: none"> <li>• Stays informed of City policies and procedures</li> <li>• Stays informed of provincial and federal regulations and how they affect the operation of the water treatment plant</li> <li>• Communicates with superintendents, peers, and subordinates</li> <li>• Operates the water treatment plant and remote facilities in accordance with in plant procedures in order to exceed MOE quality standards</li> <li>• Collects water samples and submits to accredited laboratories per MOE regulations and MOE sampling protocol</li> <li>• Collects samples and performs in plant quality testing for turbidity, chlorine residual, pH, and other water quality parameters in order to assess plant operation to ensure compliance with MOE regulations and guidelines.</li> <li>• Maintains records relating to water quality and plant operations</li> <li>• Calibrates on a scheduled basis, analytical equipment</li> <li>• Performs preventative maintenance on facility equipment at Water Plant and other remote facilities including security checks.</li> <li>• Makes adjustments to process controls, equipment and treatment units</li> <li>• Responds to customer complaints regarding water quality</li> <li>• Participates in water plant upgrade projects</li> <li>• Provides general ground maintenance and snow clearing</li> <li>• Flushes hydrants to maintain water quality compliance</li> <li>• Ensures automatic flushing and dechlorinating units in the distribution system are in proper working order</li> <li>• Participates in the standby duty roster on a rotating basis</li> <li>• May be designated (by management) to be the Overall Responsible Operator (ORO) per Provincial Regulations section 23 of O.Reg. 128/04</li> <li>• Obtains regular training and upgrading per Provincial Regulations</li> <li>• Other duties as assigned by the Water Treatment Superintendent or Public Works Manager</li> </ul> <p><b>Authorities</b></p> <ul style="list-style-type: none"> <li>• Operations and maintenance of the WTP under the direction of the Water Treatment Plant Superintendent</li> <li>• Authorities designated to Operators, and Operator In Charge (OIC), as specified in O Reg 170/03.</li> <li>• Order needed materials and chemicals as needed</li> <li>• Perform process changes to WTP and booster pumping stations</li> <li>• Regulatory sampling</li> <li>• Respond to complaints</li> </ul>

**Table 9-1 Responsibilities and Authorities**

Position	Responsibilities and Authorities
Water Distribution Superintendent	<ul style="list-style-type: none"> <li>• Undertake system flushing</li> <li>• Report Adverse Water Quality Incidents in accordance with regulations</li> <li>• Respond to alarms</li> <li>• Operate or work on equipment for maintenance or operational purposes</li> <li>• Calling in support contractors when required</li> <li>• Advise contractors re City's requirements for water systems</li> <li>• Direct other Operators if acting as OIC</li> </ul> <p><b>Responsibilities</b></p> <ul style="list-style-type: none"> <li>• Overall Responsible Operator (ORO)</li> <li>• Ensures water is distributed in full compliance with the policies of the Municipality and in accordance with the regulations of the MOE.</li> <li>• Completes a variety of reports related to water quality operations, chemical testing, and mechanical repairs and regulatory changes for submission to the Director of Public Works &amp; Engineering</li> <li>• Participates in the Management Review process</li> <li>• Ensures all regulatory and QMS procedures are being followed by the Public Works &amp; Engineering staff</li> <li>• Ensures Public Works &amp; Engineering staff training and certifications are kept current</li> <li>• Responds to inquiries, complaints, and problems from the public regarding the availability or quality of services</li> <li>• Participates in the installation and maintenance of water mains, appurtenances, valves, hydrants and all other WDS components.</li> <li>• Oversees the operation and maintenance of motorized vehicles and equipment used in the above note tasks</li> <li>• Troubleshoots, locates and repairs of watermain leaks in the distribution system as required</li> <li>• Oversees the winter maintenance program of fire hydrants as required by regulations</li> <li>• May be required to participate in the standby duty roster</li> <li>• Provides assistance to City of Owen Sound work crews and external work crews during emergency conditions</li> <li>• Identification of capital and long term WDS needs</li> <li>• Works with consultants, Engineering Services, and other City Staff in regard to matters relating to the maintenance, operation, and capital upgrading of the distribution system.</li> <li>• Maintains records pertaining to field information, i.e., drawings</li> <li>• Assists as required in the performance of routine duties at various remote water system plant sites</li> <li>• Interacts with Water Treatment Plant staff in regards to general issues including water quality issues.</li> <li>• Assists in inspecting customers portion of service lateral</li> <li>• Authors water distribution system reports</li> <li>• Other duties as assigned by the Public Works Manager</li> </ul>

**Table 9-1 Responsibilities and Authorities**

Position	Responsibilities and Authorities
	<p><b>Authorities</b></p> <ul style="list-style-type: none"> <li>• All operations of the water distribution system including meeting all legislative sampling requirements</li> <li>• Manages and evaluates performance of staff</li> <li>• Direct Distribution Operators as required</li> <li>• Coordinating capital projects in Water Distribution</li> <li>• Coordinating Training</li> <li>• Prepare Work Schedules for Water Distribution operators</li> <li>• Annual Reporting to Ministry of Environment</li> <li>• Purchasing for Water Distribution in accordance with Purchasing Bylaw</li> <li>• Maintain inventory</li> <li>• All other authorities under “Water Distribution Operator”</li> </ul>
<p>Water Distribution Coordinator</p>	<p><b>Responsibilities</b></p> <ul style="list-style-type: none"> <li>• Inspects meter installations</li> <li>• Repairs/replaces/installs meters and appurtenances as required</li> <li>• Tests water meters as required</li> <li>• Communicates with internal/external contacts in regard to billing issues</li> <li>• Enters meter data into electronic files and maintains all water meter records</li> <li>• Monitors and maintains water meter and associated equipment inventory</li> <li>• Reads and records pertinent meter information inclusive of reading checks</li> <li>• Locates services for both water and electric distribution systems</li> <li>• Ensures water locate records are kept current</li> <li>• Performs water service turnings</li> <li>• Inspects customers portion of service lateral</li> <li>• Performs minor service box maintenance</li> <li>• Responds to customer water quantity (pressure) problems</li> <li>• Assists Water Distribution operators during repairs and service interruptions</li> <li>• Monitors contractors during watermain construction projects to ensure proper construction, disinfection, flushing, and sampling procedures are followed</li> <li>• Provides relief and assistance to Water Distribution Lead Hand as required</li> <li>• Other duties as assigned by the Water Distribution Superintendent</li> <li>• Participates in the stand-by duty roster</li> </ul> <p><b>Authorities</b></p> <ul style="list-style-type: none"> <li>• Operations and maintenance of the water distribution system under the direction of the Water Distribution Superintendent</li> <li>• Enter home or building with permission of owner</li> <li>• Shut off water service for non-payment or other reason</li> <li>• Purchase Water Meter stock and equipment</li> <li>• Electrical (streetlight and traffic light) locates</li> </ul>

**Table 9-1 Responsibilities and Authorities**

Position	Responsibilities and Authorities
Water Distribution Lead Hand	<ul style="list-style-type: none"> <li>• Commission mains in accordance with AWWA procedures</li> <li>• All other authorities under “Water Distribution Operator”</li> </ul> <hr/> <p><b>Responsibilities</b></p> <ul style="list-style-type: none"> <li>• Is familiar with specifications and standards for the Water Distribution System</li> <li>• Participates in the review of Water Distribution projects as they relate to modifications and/or expansions of Water Distribution System</li> <li>• Participates in a work crew engaged in installing and maintaining water services, mains, hydrants, and equipment</li> <li>• Assists in the identification of water distribution system capital needs, i.e. lead service replacements, watermain deficiencies, and equipment needs</li> <li>• Arranges for utility locates</li> <li>• Ensures safe and proper work practices are followed by the water distribution staff</li> <li>• Provides basic training for water distribution staff in the performance of tasks related to the water distribution system</li> <li>• Provides assistance to distribution staff during emergencies</li> <li>• Troubleshoots and repairs water leaks in the water distribution system</li> <li>• Obtains regular training and upgrading per Provincial Regulations</li> <li>• Participates in the rotating standby duty roster</li> <li>• Operates and maintains motorized vehicles and equipment, such as truck mounted crane, pumps and generators</li> <li>• Other duties as assigned by the Water Distribution Superintendent or designate</li> </ul> <p><b>Authorities</b></p> <ul style="list-style-type: none"> <li>• Operations and maintenance of the water distribution system under the direction of the Water Distribution Superintendent</li> <li>• Acts as Water Distribution Superintendent, and ORO as needed, when the Superintendent is absent or unavailable to act.</li> <li>• Coordinate repairs and order needed materials</li> <li>• Direct other operators at worksite as required</li> <li>• Direct contractors</li> <li>• All other authorities under “Water Distribution Operator”</li> </ul>
Water Distribution Operator	<p><b>Responsibilities</b></p> <ul style="list-style-type: none"> <li>• Stays informed of City policies and procedures</li> <li>• Stays informed of provincial and federal regulations and how they affect the operation of the Water Distribution System</li> <li>• Maintains and operates the Water Distribution System to ensure proper operation</li> <li>• Installs and ensures proper operation and maintenance of fire hydrants, watermains (various sizes), and appurtenances, i.e. valves, pressure regulating valves</li> <li>• Bypasses or shuts down portions of the distribution system during emergencies or planned maintenance</li> <li>• Maintains and operates motorized vehicles and equipment related to water</li> </ul>

**Table 9-1 Responsibilities and Authorities**

Position	Responsibilities and Authorities
	<p>distribution maintenance</p> <ul style="list-style-type: none"> <li>• Trouble shoots and repairs water leaks in the distribution system</li> <li>• Responds to customer complaints regarding flooding, water service, leaks, low pressure, frozen lines and other related matters</li> <li>• Clears snow, inspect and perform winter maintenance on fire hydrants</li> <li>• Participates in the standby duty roster on a rotating basis</li> <li>• May be designated (by management) to be the Overall Responsible Operator (ORO) per Provincial Regulations Section 23 of O.Reg. 128/04</li> <li>• Obtains regular training and upgrading per Provincial Regulations</li> <li>• Obtains MOE certificate to the level of the Water Distribution System as per MOE regulations in a reasonable time period</li> <li>• Maintains logs and other forms of record-keeping related to distribution activities</li> <li>• Assists in the performance of routine duties and inspections at various water system sites including reservoirs, and pumping stations</li> <li>• Other duties as assigned by the Water Distribution Lead Hand or Water Distribution Superintendent.</li> </ul> <p><b>Authorities</b></p> <ul style="list-style-type: none"> <li>• Operations and maintenance of the water distribution system under the direction of the Water Distribution Lead Hand or Water Distribution Superintendent</li> <li>• Authorities designated to Operators, and Operator In Charge (OIC), as specified in O Reg 170/03.</li> <li>• Order needed materials and chemicals as needed</li> <li>• Operation of valves and hydrants in the system</li> <li>• Regulatory sampling</li> <li>• Respond to complaints</li> <li>• Undertake system flushing</li> <li>• Report Adverse Water Quality Incidents in accordance with regulations</li> <li>• Respond to alarms</li> <li>• Authority to make decisions about repairs in the absence of the Lead Hand or Superintendent</li> <li>• Calling in support contractors when required</li> <li>• Advise contractors re City's requirements for water systems</li> <li>• Direct other Operators if acting as OIC</li> </ul>
Water Distribution Student	<p><b>Responsibilities</b></p> <ul style="list-style-type: none"> <li>• Maintains and operates water distribution system to ensure proper operation</li> <li>• Maintains and operates motorized vehicles and equipment related to assigned water distribution maintenance</li> <li>• Obtains and maintains MOE certification, a minimum of an Operator-in-Training Water Distribution System is required</li> <li>• Maintain logs and other forms of record-keeping related to assigned distribution activities</li> <li>• Assists in the performance of routine duties and inspections at various</li> </ul>



**Table 9-1 Responsibilities and Authorities**

Position	Responsibilities and Authorities
	<p>water system sites including reservoirs, and pumping stations</p> <ul style="list-style-type: none"> <li>• Performs routine water analyses</li> <li>• Other duties as assigned by the Water Distribution Lead Hand or Water Distribution Superintendent</li> </ul> <p><b>Authorities</b></p> <ul style="list-style-type: none"> <li>• Works under the direction of the Water Distribution Lead Hand or Water Distribution Superintendent</li> <li>• Flush the system as directed and record results, and undertake traffic control</li> <li>• Must report Adverse results to immediate supervisor for regulatory reporting to regulators by the superintendent</li> <li>• Not generally authorised to operate mainline valves, directly report Adverses, or participate in repairs. Authority generally limited to the flushing program and associated work only.</li> </ul>

Note: The responsibilities and authorities are not limited to those listed in Table 9-1.

## 10. COMPETENCIES

### 10.1 OBJECTIVES AND SCOPE

The Operational Plan shall document:

- 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.

The Operating Authority shall undertake activities to:

- a) meet and maintain competencies for personnel directly affecting drinking water quality and shall maintain records of these activities, and
- b) ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water, and shall maintain records of these activities.

### 10.2 ACTIVITY DESCRIPTION

In order to help ensure the use of competent individuals to operate and maintain the drinking water system, Table 10-1 has been developed to identify and manage the knowledge, skills, and abilities of personnel involved in the provision of safe drinking water.

**Table 10-1 Competency Table**

Position	Required Competency
Top Management (City Manager and Director of Public Works & Engineering)	<ul style="list-style-type: none"> <li>• Training in Emergency Management and Response Work Instructions</li> <li>• At least 10 years related experience</li> </ul>
QMS Representative (Public Works Manager)	<ul style="list-style-type: none"> <li>• Bachelor of Science Degree in Civil Engineering with a P.E.O. designation or a post secondary education inclusive of a certificate and or diploma in civil, environmental science or chemical engineering with a C.E.T. designation would be an asset.</li> <li>• DWQMS related experience</li> <li>• Class III Water Treatment</li> <li>• Class II Water Distribution Certification</li> <li>• Class III Wastewater collection</li> <li>• Five (5) years experience with water distribution</li> <li>• Three (3) years minimum of supervisory and project management experience</li> <li>• Knowledge and experience in water distribution and water treatment</li> <li>• Strong leadership and management skills</li> </ul>

**Table 10-1 Competency Table**

Position	Required Competency
Water Treatment Plant Superintendent	<ul style="list-style-type: none"> <li>• Excellent oral and written communication skills</li> <li>• Ontario Secondary School Diploma with a Class III Water Treatment Operators Certificate and several years experience in all aspects of water treatment</li> <li>• Demonstrate leadership ability and management skills</li> <li>• Good communication skills, oral and written</li> <li>• Good planning and organization skills</li> <li>• Good public relation skills</li> <li>• Thorough understanding of water treatment systems, utility policies, practices and equipment</li> <li>• Valid first aid/CPR Certificate</li> <li>• Valid Work Place Hazardous Material Information System Certificate</li> <li>• Valid Driver's License</li> </ul>
Water Treatment Plant Operator	<ul style="list-style-type: none"> <li>• Ontario Secondary School Diploma or a General Educational Development (GED) certificate</li> <li>• Class III Water Treatment Plant Operator Certification</li> <li>• Basic knowledge of chemistry involved in water treatment</li> <li>• Mechanical ability in regards in the use of use hand and power tools, minor repairs to pumps, and motors and related equipment</li> <li>• Experience in the proper use and handling of various chemicals used in a water treatment plant</li> <li>• Hold a valid Class "G" drivers licence</li> <li>• Ability to communicate effectively both verbally and in written format with supervisors, co-workers, contractors, other City employees and the general public</li> <li>• Basic knowledge and ability relating to computer systems and software</li> <li>• Demonstrated ability to work in a safe manner including confined spaces, proper use of chemicals, and safety equipment</li> <li>• WHMIS training</li> <li>• Standard First Aid and CPR-Level C</li> <li>• Basic Water Treatment training</li> <li>• Gas Chlorination Certificates</li> <li>• Confined Space Entry Certificate</li> </ul>
Water Distribution Superintendent	<ul style="list-style-type: none"> <li>• Ontario Secondary School Diploma</li> <li>• Ontario Water Resources Act (OWRA) Certificate of Competency in Water Distribution to the level of the City of Owen Sound's Distribution System (WDS), currently Class III.</li> <li>• Sound understanding of the operational requirements of the Owen Sound Waterworks Distribution System (WDS) and the applicable regulations governing the operation of waterworks in Ontario.</li> <li>• Good understanding of the OHS and Ministry of Transportation regulations as required for WDS operations requirements</li> <li>• Proficient in the use with all equipment utilized and associated with the maintenance and operation of the WDS</li> </ul>

**Table 10-1 Competency Table**

Position	Required Competency
	<ul style="list-style-type: none"> <li>• Ability to train and mentor Water Distribution staff in areas relating to maintenance, operation, repair, and new procedures for work pertaining to the Water Distribution System</li> <li>• Valid Ontario Class “D” drivers licence with “Z” endorsement</li> <li>• Ability to work with minimal supervision from work orders, specifications, standards, and instructions, and to interpret plan/profile drawings, sketches and diagrams</li> <li>• Promotes and encourages a positive/professional image to the general public at all times and applies positive public relation skills</li> <li>• Good organizational , communication, and computer skills</li> </ul>
Water Distribution Coordinator	<ul style="list-style-type: none"> <li>• Ontario Secondary School Diploma with a certificate of competency in Water Distribution Operation II and either Water Treatment Operations Class I or MOE Sampling Technician as required by Ont. Reg. 459</li> <li>• Good mechanical skills</li> <li>• Computer knowledge and experience</li> <li>• Good communication skills, both oral and written</li> <li>• Ability to work with others and maintain good relationships</li> <li>• Ability to develop and maintain good customer relations.</li> <li>• Possess a valid Ontario Class “D” drivers license, with “Z” endorsement</li> </ul>
Water Distribution Lead Hand	<ul style="list-style-type: none"> <li>• A minimum of a Ontario Secondary School diploma or General Educational Development (GED) certificate</li> <li>• A minimum of Class II Ministry of the Environment certification or one level below the Classification of the Water Distribution System, whichever is highest.</li> <li>• Knowledge of proper methods, tools and equipment used in waterworks maintenance and construction</li> <li>• Ability to communicate effectively with supervisors, co-workers, contractors, other City employees, and the general public</li> <li>• Knowledgeable and experienced in the operation of the Owen Sound Water Distribution System</li> <li>• Valid Class “D” drivers licence with “Z” endorsement</li> <li>• Ability to work from work orders, specifications, standards, and instructions, and to interpret plan/profile drawings, sketches and diagrams</li> <li>• Work in a safe manner and must have knowledge and use proper work methods that relate to the safety of co-workers and the general public</li> <li>• Basic knowledge and ability relating to computer systems and software</li> </ul>
Water Distribution Operator	<ul style="list-style-type: none"> <li>• A minimum of an Ontario Secondary School Diploma or a General Education Development (GED) certificate</li> <li>• Water Distribution Class II Certification</li> <li>• Knowledge of proper methods, tools and equipment used in waterworks maintenance</li> <li>• Ability to communicate effectively with supervisors, co-workers, contractors, other City employees and the general public</li> <li>• Knowledge of the operation of the Owen Sound Water Distribution System</li> <li>• Valid Class “D” drivers licence with “Z” endorsement</li> <li>• Ability to work from work orders, specifications, standards, and instructions,</li> </ul>

**Table 10-1 Competency Table**

Position	Required Competency
	<p>and to interpret plan/profile drawings, sketches and diagrams</p> <ul style="list-style-type: none"> <li>• Work in a safe method and use proper work methods that relate to the safety of co-workers and the general public</li> <li>• WHMIS training</li> <li>• Standard First Aid and CPR-Level C</li> <li>• Fall Arrest Certificate</li> <li>• Confined Space Entry Certificate</li> </ul>
Water Distribution Student	<ul style="list-style-type: none"> <li>• A minimum of an Ontario Secondary School Diploma or a General Education Development (GED) certificate</li> <li>• Ministry of the Environment Water Distribution System Certification (OIT – Operator-In-Training)</li> <li>• Ability to communicate effectively with supervisors, co-workers, contractors, other City employees or and general public</li> <li>• Valid Class Minimum G-2 Driver's License.</li> <li>• Work in a safe method and use proper work methods that relate to the safety of co-workers and the general public</li> <li>• Basic computer knowledge</li> </ul>

### Satisfying Competencies : General

All Operators shall receive training as required by O. Reg. 128/04, in addition to the following. The training may be provided on or off-site by qualified employees or contracted subject matter experts. The required number of CEU's and on the job training hours are defined for the operators as per O. Reg. 128/04.

- WHMIS Training – This training is the responsibility of the City Human Resources Department. This training has no expiry, but should be renewed every three years. It is provided by an outside entity and the training needs to be updated if chemicals are changed in the system. The WHMIS binders are maintained by the Water Treatment and Water Distribution Superintendents.
- The Operator's Certificates are maintained and kept where indicated in SLD 5A.
- Confined Space Entry Training – is provided every three years and reviewed annually in the intervening two (2) years.
- First Aid/CPR - This training is the responsibility of the City Human Resources Department and is good for three (3) years.
- Water Distribution Operators are required to have a DZ driver's licence and Water Treatment Operators are required to have a G driver's licence and maintaining this licence is the operator's responsibility.
- The handheld analysis of chlorine residual and the calibration of analyzers is demonstrated

by on-the-job training by the Water Treatment Superintendent or Water Distribution Superintendent (whichever is appropriate) or his delegate with each operator until competency is achieved.

- SCADA training for an operator is carried out on-the-job by the Water Treatment Superintendent or his informed delegate or as required by the SCADA supplier.
- Chemical feed adjustment dosage calculations. On the job training is provided by the Water Treatment Superintendent.
- Safe handling practices regarding gas chlorine, sodium bisulphite, hydrofluorosilicic acid, coagulant, and sodium hypochlorite are covered by on the job training provided by the Water Treatment Superintendent, or Water Distribution Superintendent (whichever is appropriate) This training is provided initially to an operator and as required thereafter, and supplements the above-mentioned WHMIS training.
- Repairing and maintaining chlorinators: on the job training is provided by the Water Treatment Superintendent or his qualified delegate.
- Pump operation training is provided by on the job training by the Water Treatment Superintendent, supplemented with the Operation and Maintenance Manual review, and SCADA training.
- Familiarity with the Water Distribution System is provided by on the job training by the Water Distribution Superintendent or his qualified designate, especially during the Water Distribution System flushing process, and team response to main breaks.
- An understanding of secondary disinfection is provided by the Water Distribution Superintendent or his qualified designate during on the job training during flushing of the Water Distribution System and also via the abovementioned SOP review.
- Repairing leaks – training is provided by the Water Distribution Superintendent and/or his qualified designate during on the job team experience and also during review of the Standard Operation Procedures and AWWA Procedures.
- Attendance at conferences and seminars is used to attain training CEU's.

### **Recording Training**

Training records are kept where indicated in SLD 05B and include on-the-job training hours, and CEU's received. Operator's certificates are kept where indicated on SLD 05B. The Water Treatment Superintendent and Water Distribution Superintendent ensure that certificates are kept current by advising Operators when their certificates are coming due for renewal.

In addition to retaining paper copies of certification an Excel Spreadsheet is to be maintained by the Water/Wastewater Administrative Assistant in the Operations Shared Drive located here : O:\TOMRMS\H-HUMAN RESOURCES\H12-TRAINING AND DEVELOPMENT.

Training which has been undertaken as an individual, or in a group, shall be documented in a Training Documentation Form (Form 10-2), overleaf, which is to be initialled by the participants, and provided by the Superintendent to the Water/Wastewater Administrative Assistant to enter into the abovementioned spreadsheet.

## **Planning Training**

The following Table 10-2 is intended to be used for planning training by the Public Works Manager, the Water Treatment Superintendent, and the Water Distribution Superintendent. It is meant to provide an “at a glance” summary of all the training required for the group, and the individual operators.

Each year, in January, the Public Works Manager, the Water Treatment Superintendent and the Water Distribution Superintendent are to meet to generally plan the coming years’ training, and document the plan on Table 10-2. The planning of training shall consider the following:

1. What group training (ie confined space, lock out/tag out) training is required in the coming year.
2. Which individual operators are coming due for renewal and how many CEU’s do they require and what type of training should be planned for those individuals, and do those individuals need to take the mandatory course.
3. Estimate in consultation with HR, which months will WHMIS and First Aid training be undertaken, and enter those dates into the table.
4. Have consideration for the budget.

The completed Table 10-2 is to be retained by the Public Works Manager, the Water Treatment Superintendent and the Water Distribution Superintendent and also posted at the Water Shop and Water Plant.

## 11. PERSONNEL COVERAGE

### 11.1 OBJECTIVES AND SCOPE

The Operational Plan shall document a procedure to ensure that sufficient personnel meeting identified competencies are available for duties that directly affect drinking water quality.

The Operating Authority shall implement and conform to the procedure.

### 11.2 ACTIVITY DESCRIPTION

This section relates to procedures followed to ensure that competent individuals are available to fulfill the responsibilities needed for the ongoing operation of the drinking water system, and the maintenance of the City's QMS. This section applies to all City of Owen Sound personnel involved in the provision of safe drinking water.

The City of Owen Sound will ensure that competent personnel are available at all times to fulfill duties required to ensure the quality/quantity of safe drinking water in the City. This includes ensuring that positions requiring back-up personnel have an appropriate number of qualified and competent replacements, and ensuring employees have access to all tools and resources needed to perform their roles.

The water treatment plant is staffed from Monday to Friday from 7:30 am to 4:00 pm. The Water Treatment Superintendent is the primary Overall Responsible Operator (ORO). A formal letter is posted in the Laboratory stating who the ORO is for the water treatment plant. If the ORO is unavailable (due to extended time sickness, injury, etc) then another operator is selected by Top Management to act as the ORO.

There is an assigned on-call water treatment plant operator during weekends and after-hours. The on-call schedule is set and printed off an annual roster by the Water Treatment Plant Superintendent. An assigned support operator is called in if the on-call operator requires additional support.

At all other times, the water treatment plant is monitored by the SCADA system. The SCADA system has an auto-dialer that has been programmed to page the on-call operator whenever conditions warrant. The on-call operator is the designated Operator-In-Charge (OIC) and will respond to and investigate all alarms in a timely manner. The ORO is available by cell phone when not physically at the system during normal hours and is able to respond on-site in a timely manner. If there is an emergency during other hours, the operator-on-call can reach the ORO by cell phone. In addition there is also an after-hours answering service, which calls the operator on-call.

The water treatment plant staff are responsible for the reservoir and booster stations, as these are monitored by the SCADA system for process and building security. Checks at the booster stations and the reservoir are conducted by water treatment personnel, when conditions warrant. For any work completed during these checks, the date of the visit and the details of any related action taken are recorded in the field book.



The after-hours answering service is also maintained for the distribution system. The Distribution Superintendent is the ORO for the distribution system. The Distribution Superintendent schedules the on-call distribution operator

In Special Emergency Circumstances, ERO Notice #019-3513 provides specific rules and exceptions for the use of operators during special emergency situations such as pandemics, strikes and lockouts. In such circumstances reference should be made to the exceptions allowed under the notice and associated regulations.

## 12. COMMUNICATIONS

### 12.1 OBJECTIVES AND SCOPE

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

- a) the Owner,
- b) Operating Authority personnel,
- c) Suppliers that have been identified as essential under Plan (a) of Element 13 of this Standard, and
- d) the Public.

The Operating Authority shall implement and conform to the procedure.

### 12.2 ACTIVITY DESCRIPTION

This Section identifies the process to communicate information related to the City's Drinking Water Quality Management System to appropriate internal and external parties.

The internal and external communication related to the City of Owen Sound's Drinking Water Quality Management Standards (DWQMS) are described in detail in *SLD-12 Communications*.

## 13. ESSENTIAL SUPPLIES AND SERVICES

### 13.1 OBJECTIVES AND SCOPE

The Operational Plan shall:

- a) identify all supplies and services essential for the delivery of safe drinking water and shall state, for each supply or service, the means to ensure its procurement, and
- b) include a procedure by which the Operating Authority ensures the quality of essential supplies and services, in as much as they may affect drinking water quality.

The Operating Authority shall implement and conform to the procedure.

### 13.2 ACTIVITY DESCRIPTION

This Section describes the processes by which supplies and services deemed essential to the safety and high quality of drinking water are procured, obtained, and verified.

The Operating Authority maintains a list of essential supplies and services as part of the Master Contact List included in the *City of Owen Sound Water System Emergency Response Plan*, which describes and/or references methods for:

- Procuring essential supplies and services
- Establishing and communicating quality expectations
- Ensuring quality expectations are met accordingly

For all supplies and services listed, City staff attempt, where possible, to multi-source and have an established, pre-approved supplier on call in cases of emergency.

The ERP essential suppliers contact list shall be kept current in the following pro-active manner.

1. Water Distribution Superintendent and Water Treatment Superintendent to advise Water/Wastewater Administrative Assistant when supplier information has changed, then Administrative Assistant to update the list and redistribute.

## 14. REVIEW AND PROVISION OF INFRASTRUCTURE

### 14.1 OBJECTIVES AND SCOPE

The Operational Plan shall document a procedure for reviewing the adequacy of the infrastructure necessary to operate and maintain the Subject System that:

- a) Considers the outcomes of the risk assessment documented under Element 8, and
- b) Ensures that the adequacy of the infrastructure necessary to operate and maintain the Subject System is reviewed at least once every Calendar Year.

The Operating Authority shall implement and conform to the procedure and communicate the findings of the review to the Owner.

### 14.2 ACTIVITY DESCRIPTION

This Section relates to the processes to review the adequacy of the existing and planned infrastructure needed to ensure the ongoing supply of safe drinking water. This Section applies to all City of Owen Sound personnel responsible for ensuring the adequacy of the City's water infrastructure.

The review of the adequacy of existing infrastructure to supply safe drinking water for the City of Owen Sound's drinking water system is conducted following the procedures outlined in *SLD-14- Review, Rehabilitation, and Renewal of Infrastructure*.

The results and corresponding recommendations of this review are communicated to Top Management and the Owner through the Management Review process (See Section 20, Management Review).

## 15. INFRASTRUCTURE MAINTENANCE, REHABILITATION AND RENEWAL

### 15.1 OBJECTIVES AND SCOPE

The Operational Plan shall document:

- a) a summary of the Operating Authority's infrastructure maintenance, rehabilitation and renewal programs for the Subject System, and
- b) a long term forecast of major infrastructure maintenance, rehabilitation and renewal activities.

The Operating Authority shall:

- a) keep the summary of the infrastructure maintenance, rehabilitation and renewal programs current,
- b) ensure that the long term forecast is reviewed at least once every Calendar Year,
- c) communicate the programs to the Owner, and
- d) monitor the effectiveness of the maintenance program.

### 15.2 ACTIVITY DESCRIPTION

This Section identifies the maintenance, rehabilitation, and renewal programs that the City of Owen Sound has in place for its drinking water system infrastructure. This Section applies to all City of Owen Sound personnel responsible for ensuring the maintenance, rehabilitation, and renewal of the City's water infrastructure.

The City of Owen Sound's infrastructure management program outlines scheduled activities to ensure all essential water system infrastructure is maintained in good working order. *SLD-14- Review, Rehabilitation, and Renewal of Infrastructure* details the processes and activities conducted to ensure the adequacy of the infrastructure, including all maintenance, rehabilitation, and renewal/replacement programs in place.

*SLD-15- Maintenance, Rehabilitation, and Renewal Programs* provides a summary of the maintenance, rehabilitation, and renewal programs for the system.

## 16. SAMPLING, TESTING AND MONITORING

### 16.1 OBJECTIVES AND SCOPE

The Operational Plan shall document:

- a) a sampling, testing and monitoring procedure for process control and finished drinking water quality including requirements for sampling, testing and monitoring at the conditions most challenging to the Subject System,
- b) a description of relevant sampling, testing or monitoring activities, if any, that take place upstream of the Subject System, and
- c) a procedure that describes how sampling, testing and monitoring results are recorded and shared between the Operating Authority and the Owner, where applicable.

The Operating Authority shall implement and conform to the procedures.

### 16.2 ACTIVITY DESCRIPTION

This Section refers to the sampling, testing, and monitoring program for drinking water quality that is currently in place for the City of Owen Sound. This Section and associated procedures apply to all sampling and testing, conducted either internally or by a third-party agent.

The City of Owen Sound is responsible for establishing and maintaining a regular sampling, testing, and monitoring program for its water system that, at a minimum, meets regulatory requirements, as spelled out in O Reg 170/03

The following describes how the sampling, testing, and monitoring results are recorded and communicated:

- Regular sampling of water quality for chemical, physical, and bacteriological parameters is performed in accordance with the Laboratory Manual as well as the relevant Water Treatment SOP or SOP's.
- Water quality monitoring which takes place in the water distribution system during the performance of fire hydrant flushing and flush hydrant flushing is performed in accordance with the relevant Water Distribution SOP's.
- In the case of Adverse Water Quality results, the relevant SOP's must be followed, as appropriate.
- The lead sampling procedure followed is as per the most recent MOEECC Guidelines and as outlined in the drinking water licence.
- With respect to bacteriological sampling, samples are taken in accordance with O.

Reg. 170/03 and laboratory protocols (sampling, holding and holding time, etc.) are also followed.

- Note that only trained and certified Operators are authorized to take handheld measurements or to take samples for laboratory analysis.
- Additionally, only an accredited laboratory may be utilized as per the Regulations.
- Currently, online analyzers are installed at the Water Treatment Plant, and the East Hill Booster Pumping Station. All these online analyzers are connected to the SCADA and alarmed.

### 16.3 COMMUNICATION OF RESULTS TO THE OWNER

- Normal routine non-adverse results for all the sampling, testing and monitoring requirements are summarized to the Owner in the Annual Summary Report.
- In the case of adverse conditions, additional communication with the Owner, in accordance with the relevant SOP's is required, as appropriate.

### 16.4 REQUIRED SAMPLING SCHEDULE – RICHARD H. NEATH WATER PURIFICATION PLANT

The following testing is required under Ontario Regulation 170/03 (O. Reg 170), or the Municipal Drinking Water License (MDWL) 092-101 except the quarterly raw water testing.

#### WEEKLY TESTING

1. **Bacti Sampling – 30 distribution samples required per month** - 8 distribution samples + 1 per 1,000 people (current population 21,341 (2016 Census), along with a Raw and Treated sample from the Water Plant.

##### **Testing is required for the following;**

Raw Sample – E. Coli and Total Coliform

Treated Sample (Municipal Header) - E. Coli, Total Coliform, and Heterotrophic Plate Count (HPC)

8 Distribution samples – E Coli and Total Coliform, and once a month HPC's for all distribution samples

#### MONTHLY TESTING

1. 1 x Free Chlorine Residual on Wastewater Tank Decant Line

## QUARTERLY TESTING

1. 1 x Total Suspended Solids – (composite sample on backwash water)
2. 1 x Trihalomethanes (THMs) – (one distribution sample taken at a point where there is likely a elevated potential for the formation of THM's)
3. 1 x Haloacetic Acid (HAA) – (taken from the entrance point to the distribution system)
4. 1 x Nitrate & Nitrite – (taken from the entrance point to the distribution system)

### EXTRA:

**1 x THM** at the Municipal Header

**1 x Aluminum** at the Municipal Header

5. Raw Water Testing – This testing is not required as per any water regulation but tested to monitor Raw water quality entering the water plant.

**1 x Polycyclic Aromatic Hydrocarbon (PAH)**

**1 x Mercury**

**1 x Metal Scan**

## BI-ANNUALLY TESTING

1. Lead Testing (distribution) - 4 distribution samples are tested for pH and Alkalinity in two sampling periods between (December 15 – April 15, and June 15-October 15).

**NOTE:** Only tested for Lead every three years.

## ANNUALLY TESTING

1. **1 x Aluminum** - (1 sample from the point of entrance to the distribution system.) \* this is done quarterly.
2. **1 x Inorganic Scan – (Schedule 23 of O Reg. 170/03)** – taken from the entrance point to the distribution system)
3. **1 x Organic Scan – (Schedule 24 of O Reg. 170/03)** – taken from the entrance point to the distribution system)

## 3 YEAR TESTING

1. Lead Testing (distribution) – 4 distribution samples are tested for pH, Alkalinity and Lead in two sampling periods (December 15 – April 15, June 15-October 15)

## 5 YEAR TESTING

1. Sodium – (taken from the entrance point to the distribution system)
2. Fluoride – (taken from the entrance point to the distribution system)



## 17. CALIBRATION OF SAMPLING, TESTING AND MONITORING EQUIPMENT

### 17.1 OBJECTIVES AND SCOPE

The Operational Plan shall document a procedure for the calibration and maintenance of measurement and recording equipment.

The Operating Authority shall implement and conform to the procedure.

### 17.2 ACTIVITY DESCRIPTION

This section describes the calibration program for all water sampling, monitoring and/or testing equipment and devices. These procedures apply to all devices, tools or equipment used within the City of Owen Sound to take water quality samples and conduct water quality testing.

The City of Owen Sound's Water Department uses several instruments, tools, devices and/or equipment for their sampling and testing activities. The frequency of calibration for each piece of equipment is outlined in the *Laboratory Manual*. Measurement and recording equipment calibration and maintenance activities will be performed by appropriately trained and qualified personnel or by a third-party calibration service provider.

The Water Treatment Superintendent will maintain a list of sampling, testing, and monitoring devices, and associated calibration schedules.

The Water Treatment Superintendent or designate, will coordinate the implementation of the calibration and maintenance program with input from Operators, as appropriate.

#### 17.2.1 Calibration and Maintenance Procedures

The calibration and maintenance procedures are performed in accordance with the manufacturer's recommendations and procedures outlined in the *Laboratory Manual*. The Water Treatment / Distribution Superintendents will coordinate the selection and documentation of appropriate calibration methods and standards for each device.

#### 17.2.2 Equipment Maintained Externally

For external services such as laboratory services, leak detection services, large pressure relief valve maintenance services, the service provider will be responsible for maintenance and calibration of the required test equipment.

#### 17.2.3 Records

All calibration records will be maintained per *SLD-05B Control of Records*.

## 18. EMERGENCY PREPAREDNESS AND RESPONSE

### 18.1 OBJECTIVES AND SCOPE

The Operational Plan shall document a procedure to maintain a state of emergency preparedness that includes:

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

The Operating Authority shall implement and conform to the procedure.

### 18.2 ACTIVITY DESCRIPTION

This Section refers to the procedure used to identify emergency situations, and prepare response plans to deal with these situations. This procedure applies to all City of Owen Sound personnel involved in the provision of safe drinking water.

An outcome of the risk assessment process (see Sections 7 and 8) is the identification of potential emergencies that could impact the City's supply of safe drinking water. The *City of Owen Sound Water System Emergency Response Plan* includes the appropriate procedures for preparedness, response, and recovery in case of emergency.

Employee training on emergency response is conducted on a yearly basis to ensure that established emergency procedures are well-understood by those responsible for carrying out response activities. Through this training, the City of Owen Sound will ensure that all personnel working within the drinking-water system are aware of:

- Individual roles and responsibilities
- All relevant procedures
- Existing threats and hazards, and associated protective actions
- Details and location of any emergency equipment required

Training can be in the form of desktop exercises, and where possible, mock emergency situation exercises. In the event of an actual emergency, the results of the response will be reviewed through the Management Review process (see Section 20).

A master contact list has been developed and included in the *City of Owen Sound Water System Emergency Response Plan* to ensure that the appropriate individuals will be contacted in the event of an emergency and that the necessary actions are taken to respond to the situation. This list is reviewed on a yearly basis to ensure that it remains current.

The Communication Protocol specifies the City of Owen Sound Water Department's response to any incident based on its severity and complexity. For this purpose, three incident/emergency levels have been identified:

**Classification 1** – is an event that can be handled entirely by staff and regular contractors. These incidents usually involve situations which can effectively be handled by the Operator as part of the normal operations. It is however, in the discretion of the Operator to escalate notification to the Water Treatment / Distribution Superintendent.

These events would normally have minimal impact on customers, community, stakeholders, and the environment.

**Classification 2** – is an event that is more serious and requires immediate notification to the Water Treatment / Distribution Superintendent. Notification to Top Management, MOE, MOH, and other emergency services may be required. The Water Treatment / Distribution Superintendent will decide if wider communication is required. These incidents have a more serious impact on customers, community, stakeholders, and the environment, but pose no immediate health concern or damage to property.

**Classification 3** – is an actual or potential situation that poses imminent/immediate threat to property and public health. It will likely require significant additional resources from normal operations and/or can threaten continued operations. These events have significant impact on customers, community, stakeholders, and the environment. The corrective actions to resolve this emergency may require extensive involvement of others (i.e., emergency responders).

A Classification 3 emergency requires the notification of the Water Treatment / Distribution Superintendent and Director of Public Works & Engineering. Notification may escalate to the City Manager or Mayor, if necessary. It is possible for an event to initially be responded as Classification 1 or 2, but continuing circumstances could elevate it to Classification 3. The Water Treatment / Distribution Superintendent is responsible for deciding if emergency is a Classification 2 or Classification 3 and notifying appropriate agencies.

Examples of the various types of events can be found in the Emergency Response Plan.

## 19. INTERNAL AUDITS

### 19.1 OBJECTIVES AND SCOPE

The Operational Plan shall document a procedure for internal Audits that:

- a) evaluates conformity of the Quality Management System with the requirements of this Standard,
- b) identifies internal Audit criteria, frequency, scope, methodology and record-keeping requirements,
- c) considers previous internal and external Audit results, and
- d) describes how Quality Management System Corrective Actions are identified and initiated.

The Operating Authority shall implement and conform to the procedure and shall ensure that internal Audits are conducted at least once every Calendar Year.

### 19.2 ACTIVITY DESCRIPTION

This Section outlines the approach for conducting internal audits of the City of Owen Sound's drinking water QMS to ensure proper implementation and continual conformance to the requirements of the DWQMS. The entire QMS, as related to the provision of safe drinking water, is subject to the auditing procedures described herein.

At a minimum, the entire QMS will be audited at least once every calendar year. The procedure followed by the City to conduct an Internal Audit is explained in *SLD-19-Internal Auditing Procedure*.

## 20. MANAGEMENT REVIEW

### 20.1 OBJECTIVES AND SCOPE

The Operational Plan shall document a procedure for management review that evaluates the continuing suitability, adequacy and effectiveness of the Quality Management System and that includes consideration of:

- a) incidents of regulatory non-compliance,
- b) incidents of adverse drinking water tests,
- c) deviations from Critical Control Point limits and response actions,
- d) the effectiveness of the risk assessment process,
- e) internal and third-party Audit results,
- f) results of emergency response testing,
- g) operational performance,
- h) raw water supply and drinking water quality trends,
- i) follow-up on action items from previous management reviews,
- j) the status of management action items identified between reviews,
- k) changes that could affect the Quality Management System,
- l) Consumer feedback,
- m) the resources needed to maintain the Quality Management System,
- n) the results of the infrastructure review,
- o) Operational Plan currency, content and updates, and
- p) staff suggestions.

Top Management shall implement and conform to the procedure and shall:

- a) ensure that a management review is conducted at least once every Calendar Year,
- b) consider the results of the management review and identify deficiencies and actions items to address the deficiencies,
- c) provide a record of any decisions and action items related to the management review including the personnel responsible for delivering the action items and the proposed timelines for their implementation, and
- d) report the results of the management review, the identified deficiencies, decisions and action items to the Owner.

## 20.2 ACTIVITY DESCRIPTION

This Section outlines the process by which the performance of the City of Owen Sound's drinking water QMS is periodically reviewed. This Section and associated procedures apply to all Management Review meetings conducted by the City of Owen Sound, with regards to the provision of safe drinking water, and any documentation associated with these meetings.

At a minimum, one Management Review Meeting will be conducted once every calendar year to provide Top Management of the City of Owen Sound with the information required for reviewing and evaluating the continued suitability, adequacy, and effectiveness of its QMS.

The QMS Representative is responsible for scheduling and coordinating the effort to bring the management team together for Management Review and ensure all the documentation and records required for this meeting are available.

The procedure followed to conduct the Management Review is detailed in *SLD-20-Management Review*.

All relevant personnel are made aware of the Management Review procedure requirements through internal training sessions (see Section 12, Communications).

## 21. CONTINUAL IMPROVEMENT

### 21.1 OBJECTIVES AND SCOPE

The Operating Authority shall develop a procedure for tracking and measuring continual improvement of its Quality Management System by:

- a) reviewing and considering applicable best management practices, including any published by the Ministry of the Environment and Climate Change and available on [www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater), at least once every thirty-six months;
- b) documenting a process for identification and management of Quality Management System Corrective Actions that includes:
  - i. investigating the cause(s) of an identified non-conformity,
  - ii. documenting the action(s) that will be taken to correct the nonconformity and prevent the non-conformity from re-occurring, and
  - iii. reviewing the action(s) taken to correct the non-conformity, verifying that they are implemented and are effective in correcting and preventing the re-occurrence of the nonconformity.
- c) documenting a process for identifying and implementing Preventive Actions to eliminate the occurrence of potential non-conformities in the Quality Management System that includes:
  - i. reviewing potential non-conformities that are identified to determine if preventive actions may be necessary,
  - ii. documenting the outcome of the review, including the action(s), if any, that will be taken to prevent a non-conformity from occurring, and
  - iii. reviewing the action(s) taken to prevent a non-conformity, verifying that they are implemented and are effective in preventing the occurrence of the non-conformity.

The Operating Authority shall strive to continually improve the effectiveness of its Quality Management System by implementing and conforming to the procedure.

### 21.2 ACTIVITY DESCRIPTION

This Section outlines the processes by which the improvements of the City of Owen Sound's QMS is identified, developed and maintained. The entire QMS, as related to the provision of safe drinking water, is subject to the approaches and procedures identified in this Section of the Operational Plan.

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The procedure for Continual Improvement is defined in *SLD-21-Continual Improvement*. It identifies the approach taken to define and implement corrective and preventive actions that are required as a result of the Internal Auditing and Management Review processes (See Sections 19 and 20) or that are identified as opportunities for improvement.



SLD No: 05A	Original Date: 05/14/09	Developed By: MGP
Revision No: 09	Revision Date: 04/04/23	Authorized By: MGP

## SLD – 05A – CONTROL OF DOCUMENTS

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### Purpose

The procedure describes the process for managing documents for the Drinking Water System and the Quality Management System (QMS), as related to the provision of safe drinking water. Documents are to be kept current, legible, readily identifiable, and retrievable. This procedure also details the process for storing, protecting, retaining, and disposing of documents.

### Scope

This procedure is applicable to all documents that are described within the Operational Plan and/or its referenced SLDs.

### Definitions

**Documents** - are the procedures, forms, and templates used to manage the drinking water system and the QMS, which can, if needed, be amended or changed.

**QMS Documents** - are documents required by City of Owen Sound's drinking water QMS as identified in this procedure.

**Controlled Documents** - are documents which are managed per the conditions of this procedure.

**Internal Documents** – are any documents created/generated within the City including policies, procedures, work instructions, forms, etc., related to the drinking water system. Internal documents can be in any format or media.

**External Documents** – are any documents related to the drinking water system that are generated/provided by an outside stakeholder for use within the City including supplier/vendor specifications/manuals, standards, by-laws, regulations, etc. External documents can be in any format or media.

**Records** – are any documents related to the drinking water system that can serve as objective evidence of a process transaction (i.e. documents bearing signatures, completed form fields, reports, etc.). Examples include sampling and monitoring results/reports completed applications, completed internal audits, meeting minutes, etc.

**Retention Period** - is the length of time that a document must be retained by the City. It starts from the date of issue or from the point of time when a QMS document is replaced by a new or amended document.

**DWQMS** - Drinking Water Quality Management Standard

**MOE** - Ontario Ministry of the Environment

**SLD** - System Level Document

**DRF** – Quality Management System Document / Change Request Form

SLD No: 05A	Original Date: 05/14/09	Developed By: MGP
Revision No: 09	Revision Date: 04/04/23	Authorized By: MGP

## SLD – 05A – CONTROL OF DOCUMENTS

### Procedure

The QMS Representative is responsible for ensuring that the current version of all documents is being used to operate and maintain the drinking water system including the procedures outlined in this document are being followed.

#### QMS Document Control (Other than Records)

This procedure is applicable to the following QMS documents, itemized in the following two tables.

Table 1 City of Owen Sound Water System - Internal Documents

Item	Location
<b>Operational Plan</b> (Master Copy)	Fireproof Cabinet in Water Shop. Copies at Director of Public Works and Engineering Office and Water Treatment Plant SCADA Office.
<b>Operational Plan</b> , Annual Owner Distribution Copy	Distributed to Mayor and Council, returned to QMS Representative’s Office.
Operations Manual	Master copy located in the Water Treatment Plant SCADA Office. No other subsidiary copies.
<b>SOP Binder: Water Treatment</b>	Water Treatment Plant SCADA Office
SCADA Manual	Water Treatment Plant SCADA Office
<b>SOP Binder: Water Distribution</b>	Water Distribution Shop
Water Treatment Plant Drawings	Front office of the Water Treatment Plant
Distribution System Drawings	Maintained by City Engineering Department
Water System GIS	Maintained by City IT Department (Work in Progress)
Water Use Bylaw and Cross-Connection Bylaw	Master at Clerk’s office with copies in the Operations Manual Appendices
<b>Emergency Response Plan</b>	Three copies: (1) in the Director’s Operational Plan Binder (2) in the Water Distribution SOP Binder and (3) in the Water Treatment SOP Binder.
Laboratory Manual	Water Treatment Plant - Laboratory
Financial Plan	Public Works Shop (Available For Public Review)

SLD No: 05A	Original Date: 05/14/09	Developed By: MGP
Revision No: 09	Revision Date: 04/04/23	Authorized By: MGP

## SLD – 05A – CONTROL OF DOCUMENTS

Table 2 City of Owen Sound Water System - External Documents

Item	Location
Binder: Regulations and Legislation, Ontario Drinking Water Standards, Procedure for Disinfection	Water Treatment Plant SCADA Office
Drinking Water Licence and Drinking Water Works Permit, Permit To Take Water	Dedicated file in the Water Treatment Plant SCADA Office
Facility Licences - Water Treatment and Water Distribution	Originals on the Foyer wall
Operators' Licences	Wall on the Water Treatment Plant SCADA Office for Water Treatment operators, QMS Water Distribution Superintendent's Office wall for Water Distribution operators
AWWA Standards	Water Treatment Plant SCADA Office Water Distribution Superintendent's Office (Distribution system related AWWA standards)
Owen Sound Water System Raw Water Assessment Report (Genivar: May 2009)	Water Treatment Plant SCADA Office

### Digital Documents in Sharepoint

The Operational Plan and associated documents, and a number of other documents are located on Sharepoint under Department Sites/Water and Wastewater/DWQMS. Items highlighted in yellow above can be found in digital version in that location.

### Document Development and Changes to Documents

Any employee may request the creation of a new QMS document or a change to an existing one. The procedure for the request is as follows:

- Employees need to obtain a QMS Document/Change Request Form (DRF) from their immediate supervisor.
- On the DRF, the employee will include the reason for requesting a new document and how it would enhance process control, support regulatory requirements, eliminate risks or improve operational efficiency.
- The employee will complete the form and submit a hard-copy to the Water Treatment Plant Superintendent, Water Distribution Superintendent, or to the QMS Rep.

If approved, the requester may develop the new/changed document and submit it to the QMS Representative for approval, or the QMS Representative will perform the revision. Once the changes have been completed, the Water Treatment Plant / Distribution Superintendent and the QMS Representative will sign off on the DRF.

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## **SLD – 05A – CONTROL OF DOCUMENTS**

The need for new or updated documents may also be identified by audits or management review.

In addition, the following specific documents control is required:

- Operations manual will be kept current and revised every two (2) years per the Regulation.
- As new regulations and standards come forward, they are to be placed in location stated in the previous table.
- Similarly, when replacement Drinking Water System Works Permits and Licences, Permits to Take Water, Operator’s licences, facility licences, etc. are received, they are to be placed where indicated above.

The QMS Representative will review the currency of documents as part of internal Audit Cycle.

All QMS related documents created by the City (or by others as directed by the QMS representative) will be approved by the QMS representative before release.

The QMS representative will be responsible for ensuring that copies of the new or changed document are distributed. Obsolete documents (due to changes) will be collected and destroyed by the QMS representative.

Document versions will be controlled by date. Documents with the most recent date should be considered the most current. Older versions should be either updated or retained separately for storage.

If a document has been released, then it is the most up to date version, until a new version is released.

Except for the Master Copy, printed documents of the Operational Plan are uncontrolled. On some occasions, copies of documents and records may be made for personnel on the field, these documents are uncontrolled.

**To ensure that documents are readily identifiable**, binders which contain DWQMS-related material which are referenced in this SLD shall be provided with titles on yellow labels on the spine and front of the document to ensure they stand out in the locations stored as indicated in this SLD.

**To ensure that documents are legible**, documents shall either be prepared with a word processor or typewriter or neatly handwritten on the forms provided, then stored as indicated in this SLD.

**To ensure that documents are protected from damage and loss:**

- Documents at the Water Treatment Plant in the SCADA office shall be kept in the protective file drawer at all times when not in use (The Water Treatment Plant is a post-disaster-designed building)
- Documents in Engineering (drawings) are kept in a fireproof/waterproof cabinet
- Documents in the QMS Rep and Water Distribution Superintendents area are kept in a fireproof/waterproof cabinet, in the Water Distribution shop



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## SLD – 05A – CONTROL OF DOCUMENTS

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- Digital Documents are protected by virtue of the fact that the City’s IT department backs up the City’s servers on a regular basis. Risk of data loss and frequency of backup is addressed in the risk assessment documentation.

SOP’s for Water Distribution are indicated as SOPWD. SOP’s for Treatment are simply designated SOP.

### Standard Operating Procedure Review Schedule

The Standard Operating Procedures are to be reviewed on an annual basis.

Water Treatment SOP’s shall be reviewed by the Water Treatment Superintendent and Water Treatment Operators.

Water Distribution SOP’s shall be reviewed by the Water Distribution Superintendent and Water Distribution Operators.

SOP’s common to Treatment and Distribution shall be reviewed by all Operators, facilitated by the QMS Rep.

Scheduling of SOP review shall be done by the QMS Rep via Outlook and shall be generally as follows:

In March/April/May 50% of the SOP’s will be reviewed.

In October/November/December the remaining 50% will be reviewed.

In addition to reviewing existing SOP’s, operators should ensure that other procedures that are rudimentarily documented outside the QMS should be included in the QMS.

Following completion of the SOP review and revision:

- Check all SOP binders to ensure no obsolete SOP’s remain there.
- Check the Operational Plan and eliminate references to obsolete SOP’s



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## SLD – 05B – CONTROL OF RECORDS

### Purpose

The procedure describes the process for managing records for the drinking water system and the QMS. Records are to be kept current, legible, readily identifiable, and retrievable. This procedure also details the process for storing, protecting, retaining, and disposing of records.

### Scope

This procedure is applicable to all records that are generated from processes and activities that are described within the Operational Plan and/or its referenced SLDs.

### Definitions

**Records** – are any documents related to the drinking water system that serve as objective evidence of a process transaction (i.e. documents bearing signatures, completed form fields, reports, etc.). Examples include sampling and monitoring results/reports completed applications, completed internal audits, meeting minutes, etc. Records cannot be changed or amended.

**QMS Records** - are records required by City of Owen Sound’s drinking water QMS as identified in this procedure.

**Retention Period** - is the length of time that a record must be retained by the City.

**DWQMS** - Drinking Water Quality Management Standard

**MOE** - Ontario Ministry of the Environment

**SLD** - System Level Document

### Procedure

This procedure is applicable to all records that demonstrate conformance to DWQMS requirements. All records that demonstrate regulatory compliance are covered by Ontario Regulations 170/03 and 128/04.

#### QMS Records Control

All QMS records are retained for a minimum of 5 years at the location indicated in Table 1 below. However, if a QMS record is also a requirement of O. Reg. 128/04 and/or 170/03, then the retention time will be as per the regulation. Once the record retention time has been reached, records may be destroyed, at the QMS Representative’s discretion.

The following items in Table 1 constitute the QMS records for the water system.

Table 1 City of Owen Sound Water System - QMS Records

Item	Location
Engineer’s Reports	Dedicated file in the Water Treatment Plant SCADA Office.
Water Treatment Plant Log Books	Kept in the Water Treatment Plant SCADA

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## SLD – 05B – CONTROL OF RECORDS

**Table 1 City of Owen Sound Water System - QMS Records**

Item	Location
	Office. Once MOE Inspection complete, taken to Low Lift Storage.
Field Log Book Documenting the Operation and Maintenance of the Booster Stations, the Reservoir and the Automatic Flushing Units	Normally kept at the Water Treatment Plant or with the field kit.
Daily SCADA Printouts	Filed in the Water Treatment Plant SCADA office. Once MOE Inspection complete, moved to the Low Lift Storage.
<b>Annual Reports</b>	City website has the Final Copy. Copies to the City Clerk’s Office, the Public Works Building, the Library, the Water Treatment Plant and copies are sent to the Municipality of Meaford and Township of Georgian Bluffs.
Laboratory Analysis Reports Binder (Bacteriological)	Both kept in the Water Treatment Plant SCADA office. Once MOE inspection completed, the results are taken to the Low Lift Storage.
Chemical Analysis Results Binder	Indefinitely kept in the Water Treatment Plant SCADA Office.
<b>MOE Inspection Reports</b>	At a dedicated location in the Water Treatment Plant SCADA Office.
Operator Training Records	The current training records for all treatment operators are contained in one binder for ease of retrieval for operator licence renewal. Operator Training Records for Distribution are kept in the Water Distribution Superintendent’s Office. There are Operator-specific files (i.e. one file per operator).
Calibration Records - Flow Meters	A dedicated file in the Water Treatment Plant SCADA office.
Calibration of On-line Analyzers	Calibration records for on-line analyzers are kept in a binder in the Water Treatment Plant Lab.
Alarm Records	Noted in the Water Treatment Plant Log Book and also noted in the SCADA records.
Generator Set Test Forms	The Diesel Run Records file in the Water Treatment Plant SCADA office.
Adverse Results: Water Treatment	Dedicated file in the Water Treatment Plant SCADA office (includes copies of water distribution results also, see below).
Adverse Results: Water Distribution	Water Distribution Superintendent completes the



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## SLD – 05B – CONTROL OF RECORDS

**Table 1 City of Owen Sound Water System - QMS Records**

Item	Location
	paperwork and keeps copies of the paperwork in the Water Distribution Superintendent’s office and sends copies to the Water Treatment Plant for filing with the Water Treatment Plant Adverse Results Records (above-mentioned).
Distribution System Log Book (2 to 3 years ongoing capacity)	A general log of the operation and maintenance of the distribution system. It is kept in the Distribution System Workshop. Once completed, the log book is kept in the Water Distribution Superintendent’s office.
Customer Complaints Binder : Water Treatment (Generally Quality Related)	Water Treatment Plant SCADA office Complaints Binder.
Customer Complaints Binder: Water Distribution (Generally Pressure Related)	Public Works Front Desk
Risk Assessment Table	With Operational Plan in Fireproof Cabinet in Water Shop.
Critical Control Points Table	
As-built drawings	Water Treatment Plant Front Office (for drawings related to the treatment system).  Engineering Services Office and Water Distribution Shop (for drawings related to the distribution system).
QMS Representative’s DWQMS Binder (Ongoing record of DWQMS activities)	With Operational Plan in Fireproof Cabinet in Water Shop.
Spreadsheets:	Spreadsheet updated by Water Distribution Operators typically twice yearly:
SharePoint\Water & Wastewater\Water Distribution & Treatment \ Flush Hydrants	-List of Flush Hydrants
SharePoint\Water & Wastewater\Water Distribution & Treatment \ Master Hydrant & Flush Route Updates	-Master hydrant and master flush route
SharePoint\Water & Wastewater\Water Distribution & Treatment \ Dead End Flush Route Updates	-All dead-end flushing points including fire hydrants and Flush Hydrants





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## SLD – 05B – CONTROL OF RECORDS

### Digital Records in Sharepoint

Some of the above records are located on Sharepoint under Department Sites/Water and Wastewater. Items highlighted in yellow above can be found in digital version in that location.

### General Requirements

The following points are general requirements for records:

- The record title will be clearly visible and legible.
- Manual records will be legible. Pencil or any other erasable marker will not be used to record process or product information or data.
- QMS records will be filed by type and by date.
- QMS records will be stored in such a manner as to prevent deterioration.
- All manual records will show the name or initials of the recorder and the date (and time if appropriate), the record was generated.

### To ensure that records are protected from damage and loss:

- Records at the Water Treatment Plant in the SCADA office shall be kept in the protective file drawer at all times when not in use (The Water Treatment Plant is a post-disaster-designed building)
- Records taken to the low lift building are stored in waterproof totes. They are retained for long duration, since data of that nature can be invaluable for design purposes. See attached example table of contents for a tote.
- Records in Engineering (drawings) are kept in a fireproof/waterproof cabinet
- Records in the QMS Rep and Water Distribution Superintendent’s area are kept in a fireproof/waterproof cabinet, in a secured office
- Digital Records are protected by virtue of the fact that the City’s IT department backs up the City’s servers on a regular basis, and the Water Plant Server. The Flushing Student’s laptop is also backed up weekly.
- Archived records are stored in a separate secured storage area

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## SLD – 07 – RISK ASSESSMENT AND RISK ASSESSMENT OUTCOMES

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### Purpose

This document explains the key terminology and methodology used by the City of Owen Sound to systematically assess the hazards and associated risks to which its drinking-water system is exposed. This procedure has been developed to describe the process for identifying, assessing and ranking potential drinking water quality hazards, and identifying critical control points, control measures and monitoring procedures.

This procedure also explains the tasks involved in conducting a review of the Risk Assessment Outcomes.

### Scope

This document and associated documentation applies to all City of Owen Sound business practices that relate to the distribution of safe drinking-water and to all personnel involved in these processes. The QMS Representative will be responsible for the application of the process and procedures explained in this document.

### Definitions

A **Drinking Water Quality Hazard** is a possible source of danger that may cause drinking water to be unsafe for human consumption. It is a biological, chemical, or radiological agent that has the potential to cause harm. Under the scope of the DWQMS, only hazards related to drinking water safety must be considered. For example, health and safety or environmental hazards need not be included if they do not present a hazard to drinking water safety.

A **Hazardous Event** is an incident or situation that can lead to the presence of a hazard.

Hazards and hazardous events can result from natural or technological causes, or from human activities.

For this procedure four different types of hazards are considered:

- **Biological Hazards** correspond to biological pathogens that may be present in the water. Waterborne biological hazards include bacterial, viral and parasitic organisms that may occur naturally or may be caused by the introduction of waste and other substances into the environment by humans or other animals. Biological hazards also include substances and particles that cause turbidity, since they can be a source of disease-causing organisms, and can shield pathogenic organisms from the disinfection process
- **Chemical Hazards** refer to contaminants that may be naturally occurring or may be added or created during the processing of water, and if present at high levels can have negative health effects.
- **Radiological Hazards** include all those substances that may have a negative impact on human health due to their emission of radiation. There are more than 200 radionuclides (radiation emitting substances). Some occur naturally while others are products from human activities such as mining and nuclear energy production.

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## SLD – 07 – RISK ASSESSMENT AND RISK ASSESSMENT OUTCOMES

Ingestion of radionuclides in drinking water may cause cancer in individuals exposed and hereditary genetic changes in their children.

- **Capacity Hazards** are factors that affect the distribution system’s ability to supply water to its customers and can lead to an interruption to the supply of drinking water.

**Control Measures** refer to any processes, steps, or contingencies to prevent or reduce a hazard. For clarity purposes, the terms control and monitoring measures and response/mitigating measures are used for the risk assessment to distinguish between actions to eliminate or reduce the occurrence of the hazardous event before it occurs and to track the change of parameters that are related to the presence of the hazard, and actions to mitigate the effects of the hazardous event once it has occurred, respectively.

A **Critical Control Point (CCP)** refers to an essential step or point in the water system at which control can be applied to prevent or eliminate a drinking water health hazard or to reduce it to an acceptable level.

A **Critical Control Limit (CCL)** is a level of a hazard (or the process variable used to monitor the hazard) at which a Critical Control Point response is initiated.

**Risk** is the magnitude of the identified hazards causing harm measured as a numerical score that includes their likelihood, severity and detectability. For this risk assessment, risk is defined as the sum of the likelihood, severity and detectability scores.

**Likelihood** is the probability of occurrence of a hazard or hazardous event. It may also be referred to as “frequency.”

**Severity** is the magnitude of the effects or consequences of the hazard/hazardous event if the hazard is not controlled. For this risk assessment, only the potential effects on human health will be considered to define severity.

**Detectability** is a measure of how easy it is to identify the occurrence of a hazard/hazardous event. It contributes to risk since as the detectability of a hazard decreases the more difficult it is for appropriate control measures to be implemented.

### Procedure

The MOE’s guidance document entitled Implementing Quality Management: A Guide For Ontario’s Drinking Water Systems lists 12 main tasks as part of the risk assessment. This section explains the considerations and methodology used to perform each of these 12 tasks.

#### Risk Assessment Team

Performing a risk assessment requires a good knowledge of the system in question, including all aspects of the system from operation and maintenance, management and design. For this reason, it is recommended that the assessment be conducted by a group of people with a wide-ranging knowledge of the system. The risk assessment team should include at a minimum the Water and Wastewater Superintendent, the Water Treatment Superintendent, the Water Distribution Superintendent, one other Water Treatment Operator, and two other Water Distribution Operators.

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## **SLD – 07 – RISK ASSESSMENT AND RISK ASSESSMENT OUTCOMES**

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### **Risk Assessment Approach**

The approach taken to conduct the assessment is based on the process illustrated in the DWQMS Guidance Document. It involves recognizing the types of hazards (defined in the previous section) for each of the processes/components of the subject system. The components considered for the assessment include the following, where applicable:

Source water elements: surface water sources;

Intake and/or transmission elements: lake or river bed intakes, connections to neighbouring water supply systems, and transmission pipes from intakes or connections to treatment plants;

Treatment plant elements: chemical dosing facilities, flocculation and coagulation units, post treatment disinfection, etc.;

Storage and distribution elements: Piped transmission systems (including appurtenances), reservoirs, and pumping; and

Customer elements: Interactions with others - e.g. domestic and commercial, industrial and institutional customers, and neighbouring cities.

### **Hazard Identification**

The risk assessment is conducted in a workshop during which hazards to water quality are identified, given a score (assessed), and ranked. Control measures already in place are identified, and when necessary, recommendations for new control measures are developed.

The reliability/redundancy of the equipment and infrastructure forming part of the distribution system was considered when identifying hazards/hazardous events and control measures. The effect of equipment failure was determined and assessed when considering high risk areas.

### **Control Measure Identification**

The method outlined in the Hazard Identification subsection above was used to identify available control measures. This is reflected in the Risk Assessment spreadsheet (prepared during the Risk Assessment process) by listing existing mitigation measures and adjusting the total risk score.

### **Risk Assessment**

Risk was expressed as the sum of likelihood, severity, and detectability, each of which was assigned a value between 1 and 5. A high value indicated high risk (e.g. a hazard with a high likelihood, high severity, and low detectability was given a high score). The likelihood, severity, and detectability ratings were assigned to better reflect the reality of the City’s system and standards of operation. Table 1 below shows the rating systems for each of the risk criteria, with their qualitative and quantitative ratings.

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## SLD – 07 – RISK ASSESSMENT AND RISK ASSESSMENT OUTCOMES

**Table 1 Likelihood, Severity, and Detectability Rating System**

Description	Likelihood of Hazardous Event Occurring	Rating
Rare	May occur in exceptional circumstances, and has not occurred in a period of over 10 years OR Equipment is new (within warranty period).	1
Unlikely	Could occur at some time. Historically, has occurred less than once every 5 or 10 years OR Equipment is refurbished or rebuilt.	2
Possible	Has occurred or may occur once every 2 to 5 years OR Equipment is approaching the end of its life cycle.	3
Likely	Has occurred or may occur on a monthly to quarterly or seasonal basis.	4
Very Likely	One or more occurrences on a monthly or more frequent basis OR Equipment has exceeded its life cycle.	5
Description	Severity of Hazardous Event Occurring	Rating
Insignificant	Little disruption to normal operation.	1
Minor	Some manageable operation disruption OR Treatment train out of service.	2
Moderate	Significant modification to normal operation but manageable	3
Major	Drinking water advisory OR Possible reduced production and supply.	4
Catastrophic	No water available for distribution therefore negative pressure in the distribution system OR Production and uncontrolled distribution of unsafe water.	5
Description	Detectability of Hazardous Event	Rating
Very detectable	Easy to detect. On-line monitoring through SCADA. Operator continuous monitoring.	1
Moderately Detectable	Alarm present but not on SCADA. May require operator to walk by and notice alarm OR Problem is indicated by in-house lab test results.	2
Normally Detectable	Visually detectable on operator rounds or during regular maintenance. Third Party Notification.	3
Poorly Detectable	Visually detectable but not inspected on a regular basis OR not normally detected before problem becomes evident OR Lab tests are not done frequently (e.g. quarterly) OR Only found by chance.	4
Undetectable	Cannot detect.	5

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## **SLD – 07 – RISK ASSESSMENT AND RISK ASSESSMENT OUTCOMES**

### **Risk Ranking**

Based on the above, four risk categories were defined depending on the risk range of the particular hazard/hazardous event. Table 2 below illustrates these categories.

**Table 2 Risk Assessment Categories**

<b>Risk = Likelihood + Severity + Detectability</b>	<b>Risk Category</b>
3 - 5	Low
6 - 8	Moderate
9 - 11	High
12 – 15	Very High

All risks with values of 9 and over (categories “High” and “Very High”) were given the highest priority. The rationale for this cut-off value is that there are 19 different possible sums of the above criteria (likelihood, severity and detectability) that result in a risk score of 9. All these are due to a combination of a low value of one of the criteria and a high and/or moderate value for the remaining two criteria, or a moderate value of the three criteria. Any of these combinations was deemed critical to water quality and considered to require control either in the form of preventive measures, monitoring and/or responses.

### **Critical Control Point Identification**

As defined previously a Critical Control Point (CCP) is an essential step in the water system at which control can be applied to prevent or eliminate a drinking water health hazard or to reduce it to an acceptable level.

The CCPs are defined (regardless of the risk value associated to them) as those control points required by regulation to meet minimum treatment requirements for primary disinfection and secondary disinfection as outlined in O. Reg. 170/03 and the Procedure for Disinfection of Drinking Water in Ontario. These CCPs are those points where control can be applied to ensure the minimum log removal or pathogen inactivation is achieved (primary treatment) or to maintain a disinfectant residual in the distribution system (secondary treatment).

Specifically in the case of the Owen Sound Water System, these include control points and parameters related to the Coagulation Feed and Filtration system, the Ultraviolet Disinfection System, the Chlorination system at the plant, and maintaining adequate Chlorine Residual in the Water Distribution System. The flowchart overleaf is designed to assist in determining if a point in the process is truly a critical control point.

### **Critical Control Limits**

Critical Control Limits (CCLs) are values indicating maximum, minimum, or a range of levels for the parameters that best describe the presence of a hazard related to a CCP. CCLs are only assigned to CCPs. When a CCL is reached a deviation procedure is implemented to correct the situation prior to reaching a level of regulatory non-compliance. Some hazards may be mitigated by monitoring/controlling several variables that may be used as surrogate parameters. For those cases, the corresponding CCLs are specified for each variable.



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### **Critical Control Point Monitoring**

Monitoring of CCPs includes any checks or systems available to detect hazards or the potential for hazards. This includes continuous monitoring, visual inspection, and periodic sampling. Monitoring can be complemented by control measures to ensure CCPs stay within the desired limits.

### **Procedures for Deviations from Critical Control Points**

The DWQMS specifies that each CCP must have one or more documented response procedures to respond to cases when the CCLs are exceeded. These procedures ensure that adequate response or corrective measures are applied so that the hazard is eliminated, minimizing the risk of the production and/or distribution of unsafe water, and preventing a recurrence from happening.

The procedure defines and describes:

- Who responds;
- How the cause of the CCL deviation is investigated;
- How the hazardous event and hazard are corrected or addressed;
- To whom the hazard occurrence is reported;
- How it is reported; and
- How the whole event should be recorded.

The documentation of procedures developed for each CCP is consistent with Element 5 of the Operational Plan, Document and Records Control.

### **Risk Assessment Review**

As required by the DWQMS, this risk assessment includes documentation to guarantee that the risk assessment information undergoes regular review and validation. A review of the validity of the risk assessment (including hazards identified, control measures, monitoring procedures, and risk values) is to be conducted for Owen Sound’s water system on a yearly basis.

If necessary, new hazards/hazardous events will be added to the original assessment. The annual review of the Risk Assessment will be performed according to the following procedure:

1. The Risk Assessment spreadsheet developed during the Risk Assessment process will be amended including any new information regarding equipment, process or regulatory changes, and any new mitigation methods or procedures.
2. A review of the system will include each step of the water treatment process from intake to distribution and storage. The review will be conducted by the Risk Assessment Team.
3. For each hazardous event identified on the spreadsheet, the values assigned for the three risk criteria: likelihood, severity, and detectability will be reviewed. Values for these criteria will be based on the ratings defined in Figure 1 above. The risk score for

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each hazardous event is determined by adding the likelihood, severity, and detectability numbers.

4. For each hazardous event, confirm the fields corresponding to existing preventive measures, monitoring processes/procedures, and emergency response procedures.
5. Identify items marked as CCPs within the drinking water system. Confirm the values of the CCLs specified for each CCP.
6. Confirm the monitoring and risk mitigating measures to control CCPs and ensure their control parameters are within the CCLs listed on the spreadsheet.
7. For those risks for which new mitigating actions have been implemented, modify the risk values.

### Risk Assessment Continuous Improvement

The risk assessment will be redone every year in accordance with this SLD. This re-assessment will include the effects any new regulations that may affect the validity of the assessment, any changes/additions to water sources, any major modifications to the systems water treatment processes, and any other factors that may have arisen since the development of the current risk assessment.

### Risk Assessment Outcomes

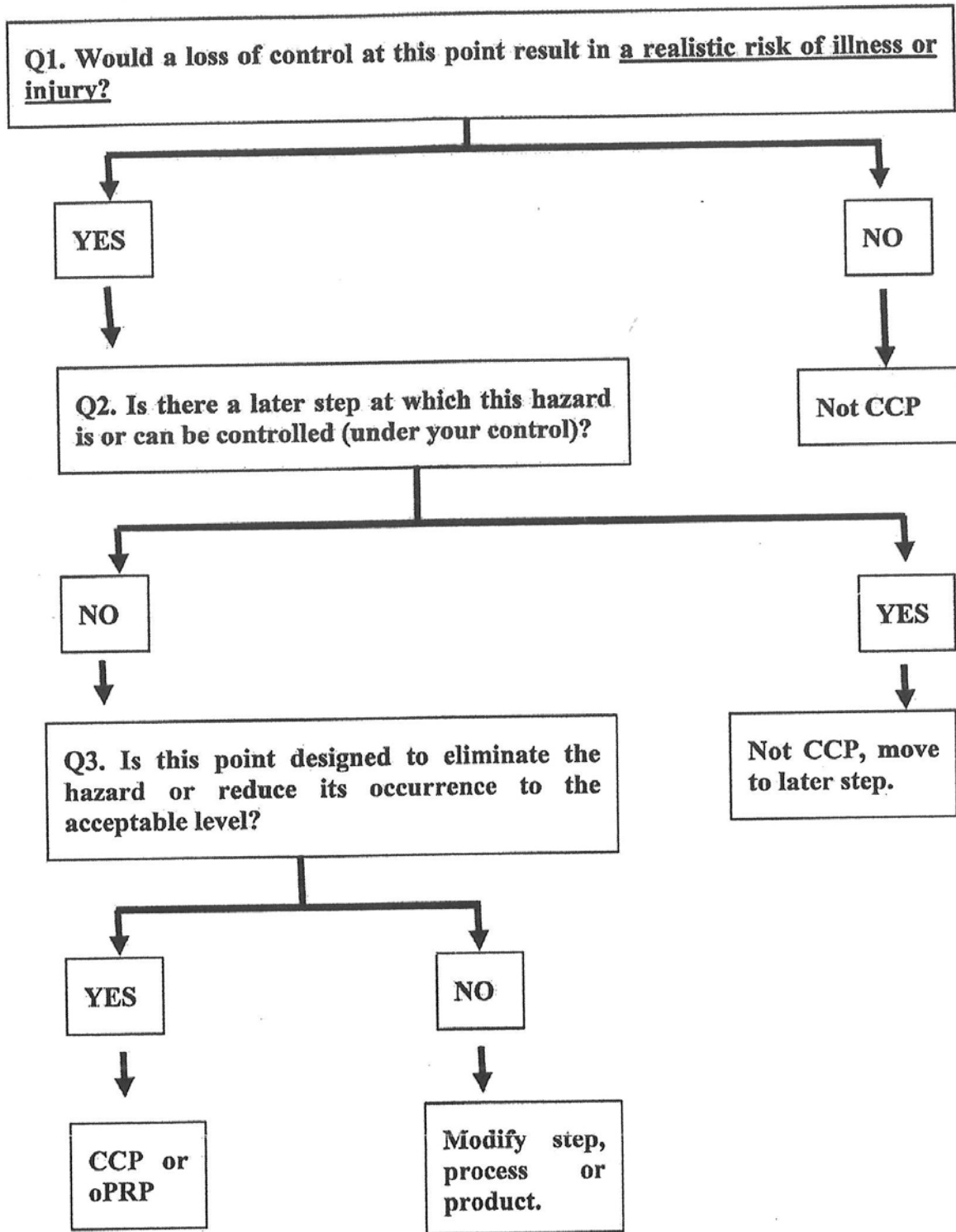
The Risk Assessment Outcomes are documented in the *Risk Assessment Table* and the *Critical Control Points Table*, which provide details of the following:

- Identified potential hazardous events and associated hazards;
- Assessed risks associated with the occurrence of hazardous events;
- Ranked hazardous events;
- Identified control measures to address the potential hazards and hazardous events;
- Identified CCPs and their respective CCLs; and
- Procedures and/or processes to monitor, respond to, report and record deviations in the CCLs.



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## SLD – 07 – RISK ASSESSMENT AND RISK ASSESSMENT OUTCOMES



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## SLD – 12 – COMMUNICATIONS

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### Purpose

This Section identifies the process to communicate information related to the City’s drinking water QMS to appropriate internal and external parties. This Section applies to all internal and external communication related to the City of Owen Sound’s drinking water QMS.

### Scope

The entire QMS is subject to this SLD.

### Procedure

#### Internal Communication

The Operational Plan will be made available to all City of Owen Sound personnel involved in the provision of safe drinking water including new, part-time, temporary, and student employees.

For new hires, QMS awareness will be provided. Existing employees will be notified of any changes to the QMS through internal training sessions. Internal training sessions will be organized by the QMS Representative to identify and review this documentation and ensure that personnel understand the content. Attendance will be documented through sign-in sheets (See element 10).

Communication between staff (i.e. Operators) and Top Management will be managed by the QMS Representative. Communication between Top Management and the Owner will be managed through the Operations Committee. Information documented as a result of Management Review meetings (refer to Section 20, Management Review) will be forwarded to the Owner via Minutes of the Operations Committee. These Minutes are provided to the Council for approval and include details such as updates on progress and actions taken.

#### External Communication

The QMS Policy, Statement of Commitment and Endorsement, and quality requirements and standards for essential supplies and services will be communicated to all suppliers and service providers during tender processes. This information will also be made available to the public via the City of Owen Sound’s website, or by other means upon request.

The QMS Policy and Statement of Commitment and Endorsement will be communicated to the Owner during regular meetings with the Operations Committee.

Additional special communication procedures are detailed in other Operational Plan Sections if applicable.

There are two Standard Operating Procedures that set out the reporting of Adverse conditions to the regulatory agencies; common SOP’s C11 and C12.

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Revision No: 03	Revision Date: 01/04/19	Authorized By: MGP

## ***SLD – 14 – REVIEW, REHABILITATION, AND RENEWAL OF INFRASTRUCTURE***

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### **Purpose**

This SLD describes the means by which the adequacy of infrastructure necessary to operate and maintain the drinking water system is reviewed. This procedure details how maintenance, rehabilitation, and renewal projects of the drinking water infrastructure are initiated, approved, funded, and communicated to the Owner.

### **Scope**

This policy applies to all City of Owen Sound personnel responsible for ensuring the adequacy of the City's water infrastructure.

### **Definitions**

**Infrastructure** – the set of interconnected structural elements that provide the framework for supporting the operation of the drinking water system, including pipes, pumps and treatment process equipment, as well as buildings and other supporting services.

**Rehabilitation** – the process of repairing or refurbishing an infrastructure element.

**Renewal** – the process of replacing the infrastructure element with new elements.

**ORO** – Overall Responsible Operator

**Financial Plan** – the plan prepared as required by the Safe Drinking Water Act to meet Drinking Water Licence requirements.

**Five-Year Capital Plan** – Two spreadsheets maintained for capital planning purposes by (1) Engineering Services Division (mostly road work and associated water and sewer pipe replacements) and (2) Water and Wastewater (mostly work at the facilities or other specialized water/wastewater rehabilitation projects or studies)

### **Procedure**

#### **Infrastructure Review**

The review of the adequacy of the drinking-water infrastructure is an ongoing process. The adequacy and condition of the infrastructure is examined through various venues, including:

- Operations Staff Meetings
- Operations Department Manager Meetings
- Water and Wastewater Engineering Meetings
- Monthly Water and Wastewater Superintendant Meetings with Water Treatment Plant and Water Distribution Superintendents
- Risk Assessment Meetings

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Outcomes from the above meetings classify each identified infrastructure issue as requiring:

- No further action.
- Further discussions with the Engineering Division for potential inclusion in the 5-year Capital Plan.
- If a project does not qualify as capital, and will not be included in the 5-year Capital Plan then the works are forwarded to the appropriate department for consideration.

The following are examples of how the provision, renewal or rehabilitation of infrastructure could be initiated:

- A project is recommended during one of the aforementioned meetings.
- A project is recommended when results of the infrastructure review are discussed at the Management Review Meeting.
- MOE inspections may call attention to infrastructure changes for areas of vulnerability as documented in inspection reports.
- Any staff may suggest projects by bringing it to the attention of the Water Treatment / Distribution Superintendent following which the infrastructure request will be discussed during one of the aforementioned meetings.
- Complaints

Based on the infrastructure requirements identified during the meeting, recommendations to renew or rehabilitate the infrastructure are discussed with the Engineering Division. The Engineering Division then prioritizes and constructs the 5-year Capital Plan. It is this Capital Plan which is communicated to the owner through the Operations Committee.

### **Council Approval**

The Top Management with Operation Committee input prepares a final capital budget for Council's approval. Timing of approval is subject to corporate budget timetables.

### **Communication to the Owner**

The results of the infrastructure review will be documented as the final draft budget and communicated to the Owner (City Council) once every calendar year as described above.

### **Infrastructure Maintenance**

#### **Water Treatment Plant**

All maintenance activities at the plant are planned using the Scheduling and Record Book by the Water Treatment Superintendent and/or any Water Operator. Regular preventive maintenance is completed according to a predetermined maintenance schedule. Maintenance plans are developed according to industry best practices, manufacturer's instructions, and regulatory requirements.

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### **Preventive Maintenance**

Preventive maintenance tasks are typically defined by manufacturer’s literature, when available, and revised (or created) as needed according to operator experience / observations. Preventive maintenance tasks are communicated to the Water Operator through the Scheduling and Record Book. Once the work is completed, it is signed off in the Record Book. It is then reviewed and filed by the Water Treatment Superintendent.

Facility Equipment Maintenance (i.e. maintenance of critical operations equipment in the booster stations and reservoir) is scheduled by the Water Treatment Superintendent.

### **Emergency Maintenance**

Emergency maintenance tasks result from equipment malfunction or breakage. Emergency maintenance is authorized by the Water Treatment Superintendent (or designate). The Water Operator responds to all emergency maintenance or anything considered outside normal operations and notifies the Water Treatment Superintendent, if necessary. Measures to prepare for and expedite emergency maintenance include: equipment redundancy (back-up units), spare parts inventory, availability of updated plans, as well as documented repair and safety procedures.

### **Water Distribution System**

#### **Preventive Maintenance**

The Water Distribution Superintendent also schedules preventive maintenance for linear infrastructure and other critical operations, based on historical practices.

The Water Distribution Superintendent assigns maintenance tasks to designated water distribution personnel. When the assigned work is completed, the Water Distribution Superintendent confirms completion of work, noting any relevant work details. A description of the work completed by Water Distribution Operators is noted on the Distribution System Log Book and also noted in the Field Book. Hard-copies of the maintenance records are stored in the Water Distribution office.

#### **Preventive Maintenance Programs**

The City of Owen Sound Water Distribution Division oversees the following preventive maintenance programs:

- *Hydrant inspection and watermain flushing:* The Water Distribution Superintendent is responsible for scheduling the hydrant inspections and watermain flushing annually. Upon completion of task, assigned water distribution personnel sign and date the appropriate card. Hard-copies of the maintenance records are stored in the Water Operators’ office.
- *Reservoir Inspection:* Reservoir inspection is performed every 5 years and is scheduled by the Water Treatment Superintendent. Records of the inspection are stored in the Water Treatment Superintendent’s office.

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- *Mapping:* The Water Distribution Superintendent completes a map of all the activities completed by the Water Distribution personnel on an annual basis. This information is stored in the Water Distribution Superintendent's office.

### **Emergency Maintenance**

Emergency maintenance tasks result from equipment malfunction, breakage or third party damage occurring in the distribution system. Emergency maintenance is authorized by the Water Distribution Superintendent, depending on the severity of event. During off-hours, the on-call Operator responds to emergency maintenance, and notifies the Water Distribution Superintendent if necessary. When the operating budget is insufficient to deal with the emergency, the Water Distribution Superintendent requests an emergency budget from the Budget Committee.

### **Monitoring and Communication of the Maintenance Program**

The Water Treatment / Distribution Superintendents are responsible for monitoring the effectiveness of the maintenance program by evaluating the key maintenance indicators which include:

- Percent of unaccounted water
- Number of leaks
- Number of watermain breaks

The number of leaks and watermain breaks are recorded in the year end report.

Maintenance issues are discussed during the preparation process for the annual operating budget.

The flushing program is documented in an Excel spreadsheet prepared by the flushing student.

The valve chamber maintenance is documented in a log book dedicated to that purpose.

### **Watermain Rehabilitation and Renewal Programs**

There are primarily two methods by which the City delivers capital programs to rehabilitate and renew watermain:

1. The Watermain Rehabilitation Program : by which capital monies are specifically set aside to replace watermain in a given block or blocks, other infrastructure is typically only restored to match existing. This approach may be used when the other infrastructure needs in that block are not pressing, or the watermain is in particular need of replacement. The budget for this work is part of the Water Distribution capital budget, and it is administered by the City Engineering Department.

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2. Full Reconstruction : by which a comprehensive full reconstruction of all the infrastructure in a given block is contemplated and planned. This would include Storm Sewers, Sanitary Sewers, Asphalt, Curb and Gutter, Watermain, etc. This would typically be undertaken when all or almost all of the infrastructure in a given block requires comprehensive treatment. The budget for this work is part of the Engineering Department budget and that department plans and administers the work.

These programs are planned as part of the Capital Budget, which is laid out in a spreadsheet under the control of the Finance Department, and all versions of that document are draft until a final version is accepted by Council.





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Revision No: 01	Revision Date: 01/24/23	Authorized By: MGP

**SLD – 15 – MAINTENANCE, REHABILITATION, AND RENEWAL PROGRAMS – TABLE 1**

<b>Water Distribution System Annual Maintenance Activities - Planning and Documentation Sheet</b>						<b>YEAR: _____</b>
<b>This Year's Planned Tasks</b>	<b>Work Order #</b>	<b>Hours associated to W.O. #</b>	<b>Dates Undertaken</b>	<b>Date Complete</b>	<b>Additional Notes/Needs/Discussion</b>	
1. Hydrant Flushing/ Hydrant Inspection at every hydrant in City						
2. Valve Chamber (PRV) Maintenance (Twice Yearly, Spring & Fall), valve chamber list update, confined space binder update						
3. Leak Detection (Every Three Years)						
4. Hydrant Shovelling (Winter Requirement)						
5. Water Meter Repair (As Required)						
6. Water Service Drawings (Updated by Distribution, ongoing), FDWS, hydrant cards, valve cards, flush hydrant cards						
7. Water System Drawings ("Platts": Annual Update by Engineering Services)						
8. Lead Sampling Program (Annual Regulatory Requirement), Winter, Summer						
9. Valve Turning/Repair Program (Annual: First Year, 2015)						
10. Update Watermain Break "Pin Map" and corresponding database (Winter Update) excel spreadsheet						
11. Update Excel database on watermain age and condition (Winter Update)						
12. Service Box Repair						
13. Flush Hydrant Flushing						



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**SLD – 15 – MAINTENANCE, REHABILITATION, AND RENEWAL PROGRAMS – TABLE 1**

14.	Valve Box Repair				
15.	Flush Hydrant Pumping				
16.	New Water Valve Replacement/Repair				
17.	Hydrant Weed Eating				
18.	Master Hydrant List, Flush Route, Flush Hydrant, Dead End Hydrant/Flush, N/C Valve all updated on Excel, meter pit list, msds binder update				
19.	Frozen List Priority 1, 2, 3, and Map Wall/Updated on Excel				
20.	Annual Equipment servicing list filled out when serviced to small equipment complete (i.e. pumps, saws, generators, tapping machines)				
21.	Hydrant pumping/install colour code				
22.	Hydrant Flagging – put up and take down				
23.	DWQMS – binder updates, sop review, erp review, risk assessment review				
24.	Hydrant Greasing				
25.	Repairs to Hydrant Deficiencies (Driven from Annual Hydrant Flushing/Inspection Report) or Water Operator / Fire Department Observation				
26.	Update the Annual Work Plan on Sharepoint				

SLD No: 15	Original Date: 06/30/11	Developed By: MGP
Revision No: 04	Revision Date: 02/14/20	Authorized By: MGP

## **SLD – 15 – MAINTENANCE, REHABILITATION, AND RENEWAL PROGRAMS**

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### **Purpose**

This Section provides a summary of the maintenance, rehabilitation, and renewal programs for the water system.

### **Scope**

The entire QMS is subject to this process.

### **Procedure**

A detailed “Water Distribution System Annual Maintenance Activities – Planning and Documentation Sheet” is attached. This must be completed once every calendar year typically in December.

### **Water Distribution**

The following provides a summary of the annual maintenance program activities undertaken by Water Distribution staff, as directed by the Water Distribution Superintendent:

1. Lead Service Replacement (Completed in 2012)
2. Hydrant Flushing, Hydrant Inspection and Address Deficiencies (Annual)
3. Valve Chamber (PRV) Maintenance (Twice Yearly, Spring and Fall)
4. Leak Detection (Every three years)
5. Hydrant Shovelling (Winter requirement)
6. Water Meter Repair (As required)
7. Water Service Drawings (Updated by Distribution, ongoing)
8. Water System Drawings (“Platts” : Annual Update by Eng Services)
9. Lead Sampling Program (Twice Annual Regulatory Requirement)
10. Valve Turning/Repair Program (Annual : First Year, 2013)
11. Update Watermain Break “Pin Map” and corresponding database (Winter update)
12. Update Excel database on watermain age and condition (Winter update)
13. Flush Hydrant Flushing
14. Valve Box Repair
15. Flush Hydrant Pumping
16. New Water Valve Replacement/Repair
17. Hydrant Weed Eating
18. Master Hydrant List, Flush Route, Flush Hydrant, Dead End Hydrant/Flush, N/C Valve all updated on Excel

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## **SLD – 15 – MAINTENANCE, REHABILITATION, AND RENEWAL PROGRAMS**

19. Frozen List Priority 1, 2, 3, and Map Wall/Updated on Excel
20. Annual Equipment servicing list filled out when serviced to small equipment complete (i.e. pumps, saws, generators, tapping machines)
21. Hydrant pumping/install colour code
22. Hydrant Flagging
23. DWQMS
24. Hydrant Greasing

### **Water Treatment**

The following provides a summary of the capital and equipment review which is undertaken yearly by the Water Treatment staff, coordinated by the Water Treatment Superintendent. Performance of equipment is reviewed annually, maintenance expenses are reviewed to determine which equipment may be approaching the end of its useful life. All critical equipment is on a preventative maintenance schedule including UV units, motors, analysers, zebra mussel control system, etc.

1. Chlorine and Fluoride Analysers Calibrated and documented in Maintenance Binder
2. Particle Counters and Turbidity Analysers Calibrated and documented in Maintenance Binder
3. Chlorinators and Chemical Pumps Maintenance documented in Maintenance Binder
4. Large Pumps and Motors : Oil Changes in accordance with Maintenance Binder
5. SCADA components including comm units : Replaced as needed when age/obsolescence requires
6. Any other aging hardware or structural components replaced as age/obsolescence requires
7. Filter media : generally a 15 to 20 year cycle for replacing filter media is recommended however more lengthy service for the Owen Sound filters (up to 30 years) has been observed. Next filter due for media replacement is Filter 4 however this filter still performs well and it may be many years before performance decrease is noted.
8. Clearwells and reservoirs : inspected and cleaned as needed; The Bay reservoir is inspected every 8 years with the next inspection (via TV) to be done in 2013.
9. Addressing low chlorine residual areas on the distribution system in consultation with Distribution : ongoing and as needed, in response to documented readings.

If a capital need is identified, it can be dealt with in 2 ways; if the need must be addressed immediately it can be handled under the current repair budget. Otherwise the item must be considered in the following year (or later depending on resources) as a capital request.

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## ***SLD – 15 – MAINTENANCE, REHABILITATION, AND RENEWAL PROGRAMS***

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### **Measuring Effectiveness of the Maintenance Program : Water Treatment**

- The effectiveness of the chlorine, fluoride, and turbidity calibration is checked via daily comparison to bench lab equipment readings.
- Effectiveness of filter media replacement is demonstrated by improved effluent turbidity.
- Effectiveness of clearwell cleaning is demonstrated by the TV inspection record.
- Effectiveness of efforts to improve low chlorine residual areas on the distribution system is demonstrated by improved residuals data.

### **Measuring Effectiveness of the Maintenance Program : Water Distribution**

- The effectiveness of the flushing program is demonstrated by improved turbidity and chlorine residual readings pre vs post flushing
- The effectiveness of the leak detection and repair program is demonstrated by the number of leaks found and repaired, which is reported in the annual report.
- The effectiveness of the hydrant maintenance program is demonstrated by the identification of hydrant maintenance issues, and their resolution before the end of the year.
- The effectiveness of the water meter maintenance program is demonstrated by the records of accuracy checks on those meters serviced.



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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

CITY OF OWEN SOUND DWQMS Audit Checklist	
Drinking Water Quality Management System (DWQMS)	Created by: Deb Zehr      Approved by: Effective date: To be reviewed annually or when procedure changes
CITY OF OWEN SOUND WATER SYSTEM AUDIT CHECKLIST	
Date of the Audit:	Auditor's Name:

Requirement	Notes, Observations and Audit Evidence	Conformance?	Records or Documents Reviewed, Interviews Conducted
Verify			
<p><b>PLAN AND DO elements of the Quality Management Standard</b></p> <p><b>1. Quality Management System</b></p> <p><b>PLAN</b> The operational plan shall document a quality management system that meets the requirements of this Standard.</p> <p><b>DO</b> The operating authority shall establish and maintain the quality management system in accordance with the requirements of this Standard and the policies and procedures documented in the operational plan.</p>			



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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

<p><b>2. Quality Management System Policy</b></p> <p><b>PLAN</b>                  The operational plan shall document a quality management system policy that provides the foundation for the quality management system, and:</p> <ul style="list-style-type: none"> <li>• includes a commitment to the maintenance and continual improvement of the quality management system</li> <li>• includes a commitment to the consumer to provide safe drinking water</li> <li>• includes a commitment to comply with applicable legislation and regulations</li> <li>• is in a form that can be communicated to all operating authority personnel, the owner and the public</li> </ul> <p><b>DO</b>                  The operating authority shall establish and maintain a quality management system that is consistent with the quality management system Policy.</p>			
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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

### 3. Commitment and Endorsement

**PLAN**

The operational plan shall contain a written endorsement of its contents by top management and the owner.

**DO**

top management shall provide evidence of its commitment to an effective quality management system by:

- ensuring that a quality management system is in place that meets the requirements of this standard
- ensuring that the operating authority is aware of all applicable legislative and regulatory requirements
- communicating the quality management system according to the procedure for communications
- determining, obtaining or providing the resources needed to maintain and continually improve the quality management system



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<p><b>4. Quality Management System Representative</b></p> <p><b>PLAN</b> The operational plan shall identify a quality management system representative.</p> <p><b>DO</b> top management shall appoint and authorize a quality management system representative who, irrespective of other responsibilities, shall:</p> <ul style="list-style-type: none"> <li>• administer the quality management system by ensuring that processes and procedures needed for the quality management system are established and maintained</li> <li>• report to top management on the performance of the quality management system and any need for improvement</li> <li>• ensure that current versions of documents required by the quality management system are being used at all times</li> <li>• ensure that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the subject system</li> <li>• promote awareness of the quality management system throughout the operating authority</li> </ul>			
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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

### 5.Document and Record Control

**PLAN**

The operational plan shall document a procedure for document and records control that describes how:

- Documents required by the quality management system are:
  - kept current, legible and readily identifiable
  - retrievable
  - stored, protected, retained and disposed of
- Records required by the quality management system are:
  - kept legible, and readily identifiable
  - retrievable
  - stored, protected, retained and disposed of

**DO**

The operating authority shall implement and conform to the procedure for document and records control and shall ensure that the quality management system documentation for the subject system includes:

- the operational plan and its associated policies and procedures
- documents and records determined by the operating authority as being needed to ensure the effective planning, operation and control of its operations
- the results of internal and external Audits and management reviews



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<p><b>6. Drinking-Water System</b></p> <p><b>PLAN</b></p> <p>The operational plan shall document, as applicable:</p> <ul style="list-style-type: none"> <li>• for the subject system:             <ul style="list-style-type: none"> <li>○ the name of the owner and operating authority</li> <li>○ if the system includes equipment that provides primary disinfection and/or secondary disinfection:                 <ul style="list-style-type: none"> <li>▪ a description of the system including all applicable treatment system processes and distribution system components</li> <li>▪ a Treatment System process flow chart</li> <li>▪ a description of the water source, including:                     <ul style="list-style-type: none"> <li>▪ general characteristics of the raw water supply</li> <li>▪ common event-driven fluctuations</li> <li>▪ any resulting operational challenges and threats</li> </ul> </li> </ul> </li> <li>○ if the system does not include equipment that provides primary disinfection or secondary disinfection:                 <ul style="list-style-type: none"> <li>▪ a description of the system including all distribution system components</li> <li>▪ a description of any procedures that are in place to maintain disinfection residuals</li> </ul> </li> </ul> </li> <li>• if the subject system is an operational subsystem, a summary description of the municipal residential drinking water system it is a part of including the name of the operating authority(ies) for the other operational subsystems</li> <li>• if the subject system is connected to one or more other Drinking Water Systems owned by different owners, a summary description of those systems which:             <ul style="list-style-type: none"> <li>○ indicates whether the subject system obtains water from or supplies water to those systems</li> <li>○ names the owner and operating authority(ies) of those systems</li> </ul> </li> </ul>			
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<ul style="list-style-type: none"><li>○ identifies which, if any, of those systems that the subject system obtains water from are relied upon to ensure the provision of safe drinking water</li></ul> <p><b>DO</b> The operating authority shall ensure that the description of the Drinking Water System is kept current.</p>			
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<p><b>7. Risk Assessment</b></p> <p><b>PLAN</b> The operational plan shall document a risk assessment process that:</p> <ul style="list-style-type: none"> <li>• Considers potential hazardous events and associated hazards, as identified in the Ministry of the Environment, Conservation and Parks document titled “Potential Hazardous Events for Municipal Residential Drinking Water Systems”, dated December 2016 as it may be amended. A copy of this document is available at <a href="http://www.ontario.ca/drinkingwater">www.ontario.ca/drinkingwater</a></li> <li>• identifies additional potential hazardous events and associated hazards</li> <li>• assesses the risks associated with the occurrence of hazardous events</li> <li>• ranks the hazardous events according to the associated risk</li> <li>• identifies control measures to address the potential hazards and hazardous events</li> <li>• identifies critical control points</li> <li>• identifies a method to verify, at least once every calendar year, the currency of the information and the validity of the assumptions used in the risk assessment</li> <li>• ensures that the risks are assessed at least once every thirty-six months</li> <li>• considers the reliability and redundancy of equipment</li> </ul> <p><b>DO</b> The operating authority shall perform a risk assessment consistent with the documented process</p>			
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<p><b>8. Risk Assessment Outcomes</b></p> <p><b>PLAN</b> The operational plan shall document:</p> <ul style="list-style-type: none"> <li>• the identified potential hazardous events and associated hazards</li> <li>• the assessed risks associated with the occurrence of hazardous events</li> <li>• the ranked hazardous events</li> <li>• the identified control measures to address the potential hazards and hazardous events</li> <li>• the identified critical control points and their respective critical control limits</li> <li>• procedures and/or processes to monitor the critical control limits</li> <li>• procedures to respond to deviations from the critical control limits</li> <li>• procedures for reporting and recording deviations from the critical control limits</li> </ul> <p><b>DO</b> The operating authority shall implement and conform to the procedures.</p>			
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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

**9. Organizational Structure, Roles, Responsibilities and Authorities**

**PLAN**

The operational plan shall:

- describe the organizational structure of the operating authority including respective roles, responsibilities and authorities
- delineate corporate oversight roles, responsibilities and authorities in the case where the operating authority operates multiple subject systems
- identify the person, persons or group of people within the management structure of the organization responsible for undertaking the Management Review described in Element 20
- identify the person, persons or group of people, having top management responsibilities required by this standard, along with their responsibilities
- identify the owner of the subject system

**DO**

The operating authority shall keep current the description of the organizational structure including respective roles, responsibilities and authorities, and shall communicate this information to operating authority personnel and the owner.



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<p><b>10. Competencies</b></p> <p><b>PLAN</b> The operational plan shall document:</p> <ul style="list-style-type: none"> <li>• competencies required for personnel performing duties directly affecting drinking water quality</li> <li>• activities to develop and/or maintain competencies for personnel performing duties directly affecting drinking water quality</li> <li>• activities to ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water</li> </ul> <p><b>DO</b> The operating authority shall undertake activities to:</p> <ul style="list-style-type: none"> <li>• meet and maintain competencies for personnel directly affecting drinking water quality and shall maintain records of these activities</li> <li>• ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water, and shall maintain records of these activities</li> </ul>			
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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

### 11. Personnel Coverage

**PLAN**

The operational plan shall document a procedure to ensure that sufficient personnel meeting identified competencies are available for duties that directly affect drinking water quality.

**DO**

The operating authority shall implement and conform to the procedure.





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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

### 12. Communications

**PLAN**

The operational plan shall document a procedure for communications that describes how the relevant aspects of the quality management system are communicated between top management and:

- the owner
- operating authority personnel
- suppliers that have been identified as essential under Plan (a) of Element 13 of this standard
- the public

**DO**

The operating authority shall implement and conform to the procedure.



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<p><b>13. Essential Suppliers and Service Providers</b></p> <p><b>PLAN</b> The operational plan shall:</p> <ul style="list-style-type: none"><li>• identify all supplies and services essential for the delivery of safe drinking water and shall state, for each supply or service, the means to ensure its procurement</li><li>• include a procedure by which the operating authority ensures the quality of essential supplies and services, in as much as they may affect drinking water quality</li></ul> <p><b>DO</b> The operating authority shall implement and conform to the procedure.</p>			
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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

### 14. Review and Provision of Infrastructure

**PLAN**

The operational plan shall document a procedure for reviewing the adequacy of the infrastructure necessary to operate and maintain the subject system that:

- considers the outcomes of the risk assessment documented under Element 8
- ensures that the adequacy of the infrastructure necessary to operate and maintain the subject system is reviewed at least once every Calendar Year

**DO**

The operating authority shall implement and conform to the procedure and communicate the findings of the review to the owner.



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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

<p><b>15. Infrastructure Maintenance, Rehabilitation and Renewal</b></p> <p><b>PLAN</b> The operational plan shall document:</p> <ul style="list-style-type: none"> <li>• a summary of the operating authority's infrastructure maintenance, rehabilitation and renewal programs for the subject system</li> <li>• a long term forecast of major infrastructure maintenance, rehabilitation and renewal activities</li> </ul> <p><b>DO</b> The operating authority shall:</p> <ul style="list-style-type: none"> <li>• keep the summary of the infrastructure maintenance, rehabilitation and renewal programs current</li> <li>• ensure that the long term forecast is reviewed at least once every Calendar Year</li> <li>• communicate the programs to the owner</li> <li>• monitor the effectiveness of the maintenance program</li> </ul>			
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<p><b>16. Sampling and Monitoring</b></p> <p><b>PLAN</b> The operational plan shall document:</p> <ul style="list-style-type: none"> <li>• a sampling, testing and monitoring procedure for process control and finished drinking water quality including requirements for sampling, testing and monitoring at the conditions most challenging to the subject system</li> <li>• a description of relevant sampling, testing or monitoring activities, if any, that take place upstream of the subject system</li> <li>• a procedure that describes how sampling, testing and monitoring results are recorded and shared between the operating authority and the owner, where applicable</li> </ul> <p><b>DO</b> The operating authority shall implement and conform to the procedures.</p>			
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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

### 17. Measurement and Recording Equipment Calibration and Maintenance

**PLAN**

The operational plan shall document a procedure for the calibration and maintenance of measurement and recording equipment.

**DO**

The operating authority shall implement and conform to the procedure



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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

<p><b>18. Emergency Management</b></p> <p><b>PLAN</b>          The operational plan shall document a procedure to maintain a state of emergency preparedness that includes:</p> <ul style="list-style-type: none"> <li>• a list of potential emergency situations or service interruptions</li> <li>• processes for emergency response and recovery</li> <li>• emergency response training and testing requirements</li> <li>• owner and operating authority responsibilities during emergency situations</li> <li>• references to municipal emergency planning measures as appropriate</li> <li>• an emergency communication protocol and an up-to-date list of emergency contacts</li> </ul> <p><b>DO</b>          The operating authority shall implement and conform to the procedure</p>			
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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

### 19. Internal Audits

#### **PLAN**

The operational plan shall document a procedure for internal audits that:

- evaluates conformity of the quality management system with the requirements of this standard
- identifies internal audit criteria, frequency, scope, methodology and record-keeping requirements
- considers previous internal and external audit results
- describes how quality management system corrective actions are identified and initiated

#### **DO**

The operating authority shall implement and conform to the procedure and shall ensure that internal audits are conducted at least once every calendar year.





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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

<p><b>20. Management Review</b></p> <p><b>PLAN</b></p> <p>The operational plan shall document a procedure for management review that evaluates the continuing suitability, adequacy and effectiveness of the quality management system and that includes consideration of:</p> <ul style="list-style-type: none"> <li>a) incidents of regulatory non-compliance</li> <li>b) incidents of adverse drinking water tests</li> <li>c) deviations from critical control point limits and response actions</li> <li>d) the effectiveness of the risk assessment process</li> <li>e) internal and third-party Audit results</li> <li>f) results of emergency response testing</li> <li>g) operational performance</li> <li>h) raw water supply and drinking water quality trends</li> <li>i) follow-up on action items from previous management reviews</li> <li>j) the status of management action items identified between reviews</li> <li>k) changes that could affect the quality management system</li> <li>l) consumer feedback</li> <li>m) the resources needed to maintain the quality management system</li> <li>n) the results of the infrastructure review</li> <li>o) operational plan currency, content and updates</li> <li>p) staff suggestions</li> </ul> <p><b>DO</b></p> <p>top management shall implement and conform to the procedure and shall:</p> <ul style="list-style-type: none"> <li>• ensure that a management review is conducted at least once every calendar year</li> <li>• consider the results of the management review and identify deficiencies and actions items to address the deficiencies</li> </ul>			
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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

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<ul style="list-style-type: none"><li>• provide a record of any decisions and action items related to the management review including the personnel responsible for delivering the action items and the proposed timelines for their implementation</li><li>• report the results of the management review, the identified deficiencies, decisions and action items to the owner</li></ul>			
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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

<p><b>21. Continual Improvement</b></p> <p><b>PLAN</b></p> <p>The operating authority shall develop a procedure for tracking and measuring continual improvement of its quality management system by:</p> <ul style="list-style-type: none"> <li>• reviewing and considering applicable best management practices, including any published by the Ministry of the Environment, Conservation and Parks and available on <a href="http://www.ontario.ca/drinkingwater">www.ontario.ca/drinkingwater</a>, at least once every thirty-six months</li> <li>• documenting a process for identification and management of quality management system Corrective Actions that includes:             <ul style="list-style-type: none"> <li>○ investigating the cause(s) of an identified non-conformity</li> <li>○ documenting the action(s) that will be taken to correct the non-conformity and prevent the non-conformity from re-occurring</li> <li>○ reviewing the action(s) taken to correct the non-conformity, verifying that they are implemented and are effective in correcting and preventing the re-occurrence of the non-conformity</li> </ul> </li> <li>• documenting a process for identifying and implementing Preventive Actions to eliminate the occurrence of potential non-conformities in the quality management system that includes:             <ul style="list-style-type: none"> <li>○ reviewing potential non-conformities that are identified to determine if preventive actions may be necessary</li> <li>○ documenting the outcome of the review, including the action(s), if any, that will be taken to prevent a non-conformity from occurring</li> <li>○ reviewing the action(s) taken to prevent a non-conformity, verifying that they are implemented and are effective in preventing the occurrence of the non-conformity</li> </ul> </li> </ul>			
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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

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**DO**  
The operating authority shall strive to continually improve the effectiveness of its quality management system by implementing and conforming to the procedure.

**Element 21 Checks and rechecks**



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## FORM 1 - SLD – 19 – INTERNAL AUDITING PROCEDURE

<p>Audit sign offs for verification of Element 21 Best Management Practices verified</p>  <p>_____</p> <p>Signature of Auditor</p>  <p>Audit sign offs for verification of Element 21 Corrective actions verified</p>  <p>_____</p> <p>Signature of Auditor</p>  <p>Audit sign offs for verification of Element 21 Preventative Actions verified</p>  <p>_____</p> <p>Signature of Auditor</p>			
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Table of Revisions

Date	Revision #	Description of the revision

SLD No: 19	Original Date: 05/14/09	Developed By: MGP
Revision No: 03	Revision Date: 04/13/22	Authorized By: MGP

## SLD – 19 – INTERNAL AUDITING PROCEDURE

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### Purpose

The procedure describes the process for managing the Internal Audit program of the drinking water QMS. It describes the procedure for conducting internal audits to ensure that the QMS meets all of the requirements of the DWQMS. The procedure also describes the process for correcting any non-conformities found during the audit process.

### Scope

The entire QMS, as related to the provision of safe drinking water is subject to the auditing procedures described herein.

### Definitions

**QMS** - Quality Management System

**DWQMS** - Drinking Water Quality Management Standard

**Internal Audit** - An internal verification process that involves a systematic and objective review of all documents, procedures and practices pertaining the drinking water QMS. The objective of an internal audit is to ensure the QMS conforms to the requirements of the DWQMS.

**System Non-Conformance** - Any practice or procedure that does not meet the requirements of the DWQMS.

**Opportunity for Improvement** - A procedure or practice that can be improved upon, but does not represent a true system non-conformance.

**Corrective Action** - An action taken to fix the identified problem.

**Preventive Action** - An action taken to prevent the identified problem from occurring or recurring.

### Procedure

The QMS Representative is responsible for ensuring that these procedures are followed specifically:

- Ensuring that all persons conducting internal audits are competent and readily available to conduct audits.
- Developing a QMS Schedule.
- Ensuring an annual Internal Audit is included in the QMS Schedule.
- Ensuring that system non-conformances are addressed in a timely manner.
- Ensuring that the Top Management is informed if additional internal auditing resources are required.

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## **SLD – 19 – INTERNAL AUDITING PROCEDURE**

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### **Audit Program**

The City of Owen Sound will conduct internal audits of its drinking water QMS on a regular basis to ensure that it continues to perform according to established policies and objectives. The audits will evaluate the performance of the QMS against the specific requirements of the DWQMS.

An audit schedule will be defined in the QMS schedule by the QMS Representative to ensure that the entire QMS is audited at least once every calendar year. The development of a schedule should consider results of previous audits, and may be amended based on these results.

Internal Auditors will be appointed by the QMS Representative. Auditors may be employees of the City of Owen Sound or other competent people.

### **Conducting the Audit**

The QMS Representative will strive to ensure that auditors are scheduled to conduct audits in areas outside of their day-to-day responsibilities. If necessary, external resources can be used to perform the audit.

The auditors will gather all required documents (procedures, work instructions, DWQMS, etc.) and background information on the element being audited to become familiar with the requirements. The Auditors will observe activities, review records, review previous internal and external audit results, and interview personnel as necessary to ensure that the status of the audited element of the QMS has been effectively covered.

The QMS Representative is responsible for coordinating and scheduling personnel interviews. During interviews, internal auditors will collect information and any data serving as objective evidence that a requirement has been met.

### **Audit Results**

Audit results will be determined by comparing audit findings against the audit criteria defined within the DWQMS. This will be achieved by filling out the Internal Audit Checklist. When a systematic problem, gap or discrepancy is identified through the internal audit process, the auditor will include a System Non-Conformance in the Audit Report, describing the problem. Where the auditor finds a problem with the QMS, but the issue does not represent a true system interruption, the auditor will refer to it as an Opportunity for Improvement.

Members of the audit team will compile the results of the audit and submit a completed Audit Report to the QMS Representative within 30 days of the internal audit. The Audit Report will summarize System Non-Conformances, Opportunities for Improvement and other notations. A description of the physical locations, organizational units, activities and processes audited, as well as the time period covered will be documented for every internal audit performed.

Upon receipt of the final Audit Report, the QMS Representative will review the results and identified non-conformances.

### **Corrective Action and Opportunities for Improvement**

When a System Non-Conformance is identified through the internal audit process, the process outlined in SLD 21 will be followed.

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## ***SLD – 19 – INTERNAL AUDITING PROCEDURE***

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### **Communication**

The QMS Representative (with the internal auditor, where required) will communicate the results of the audit to the appropriate Superintendents, Managers and personnel of the audited area(s) as applicable.

The results of the audit will be provided to Top Management and are included as input to the Management Review Process.

The QMS Representative will ensure that copies of documents and records abovementioned are stored appropriately as per SLD-05A-Control of Documents and SLD-05B-Control of Records.

All relevant personnel will be made aware of the internal auditing procedure requirements through internal training sessions (see Section 12, Communications).





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Revision No:	Revision Date:	Authorized By: MGP

## MANAGEMENT REVIEW MEETING - DWQMS

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Held on: \_\_\_\_\_ in the Public Works Boardroom

**PRESENT:** Matt Prentice, Manager of Public Works  
 Dennis Kefalas, Director of Public Works & Engineering  
 Wayne Ritchie, City Manager  
 Mike Duncan, Water Distribution Superintendent  
 Mark Hill and/or John Vary, Water Distribution Lead Hand  
 Troy Pelletier, Water Treatment Superintendent  
 Ashley Ford, Administrative Assistant

#	Item	Discussion and Action Items	Action by WHOM	Action by (DATE)
1.0	<b>Incidents of non-compliance with applicable regulations</b>	<b>Identified Action Items :</b>		
2.0	<b>Incidents of adverse drinking-water tests</b>	<b>Identified Action Items :</b>		
3.0	<b>Deviations from critical control point limits &amp; corresponding actions taken</b>	<b>Identified Action Items :</b>		
4.0	<b>The effectiveness of the risk assessment process</b>	<b>Identified Action Items :</b>		



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## MANAGEMENT REVIEW MEETING - DWQMS

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5.0	<b>Results of internal and external audits</b>	Identified Action Items :		
6.0	<b>Results of water system emergency response testing</b>	Identified Action Items :		
7.0	<b>Operational performance</b>	Identified Action Items :		
8.0	<b>Trends in the quality of raw water supply and drinking-water</b>	Identified Action Items :		
9	<b>Follow-up on action items from previous management review meetings</b>	Identified Action Items :		
10	<b>Updates on action items identified between management review meetings</b>	Identified Action Items :		
11	<b>Changes to services, activities, regulations, etc. that could impact the QMS</b>	Identified Action Items :		



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## MANAGEMENT REVIEW MEETING - DWQMS

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12	<b>Consumer feedback</b>	Identified Action Items :		
13	<b>Resources needed for QMS maintenance</b>	Identified Action Items :		
14	<b>Results of the infrastructure review</b>	Identified Action Items :		
15	<b>The currency and content of Operational Plan</b>	Identified Action Items :		
16	<b>Comments and suggestions made by personnel</b>	Identified Action Items :		
17	<b>Financial Plan</b>	Identified Action Items :		

Meeting Recorder: Ashley Ford, Administrative Assistant  
 Meeting Completed at: \_\_\_\_\_

SLD No: 20	Original Date: 05/14/09	Developed By: MGP
Revision No: 06	Revision Date 04/13/22	Authorized By: MGP

## SLD – 20 – MANAGEMENT REVIEW

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### Purpose

This procedure identifies the process by which the performance of the drinking water Quality Management System (QMS) is periodically reviewed. The purpose of the Management Review is to review and evaluate the continuing suitability, adequacy and effectiveness of the QMS.

### Scope

This procedure applies to all procedures and practices related to the City of Owen Sound's drinking water and the QMS.

### Definitions

**QMS** - Quality Management System

**DWQMS** - Drinking Water Quality Management Standard

**System Non-Conformance** - Any practice or procedure that does not meet the requirements of the DWQMS.

**Opportunity for Improvement** - A procedure or practice that can be improved upon, but does not represent a true system non-conformance.

### Procedure

The QMS Representative is responsible for scheduling the Management Review Meeting. It is up to the discretion of the QMS Representative to schedule one or multiple meetings covering the minimum requirements.

**At a minimum, the QMS Representative, Top Management (City Manager and Director of Public Works and Engineering), and the Water Treatment Plant and Distribution Superintendents will attend all scheduled management review meetings. If for some reason, a participant cannot attend, that individual can name an alternate to avoid unnecessarily delaying the meeting.**

**At a minimum, one Management Review Meeting will be conducted once every calendar year, prior to January 31<sup>st</sup>. The meeting shall be scheduled in the middle of the month of January to allow for minor rescheduling if needed. The review will cover at a minimum the agenda items listed below.**

### Agenda

It is the responsibility of the QMS Representative to ensure that at a minimum, each of the following agenda items are addressed. The individuals responsible for appropriate reporting are listed beside each item and are defined as follows:

- QMS Rep      Quality Management System Representative
- ORO            Water Treatment Plant/Distribution Superintendents
- DO             Director of Operations

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## SLD – 20 – MANAGEMENT REVIEW

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### Agenda Items:

1. Incidents of non-compliance with applicable regulations (ORO);
2. Incidents of adverse drinking-water tests (ORO)
3. Deviations from critical control point limits and corresponding actions taken; (ORO)
4. The effectiveness of the risk assessment process (QMS Rep.);
5. Results of internal and external audits (QMS Rep.);
6. Results of water system emergency response testing (QMS Rep);
7. Operational performance (QMS Rep);
8. Trends in the quality of raw water supply and drinking-water (ORO);
9. Follow-up on action items from previous management review meetings (DO and QMS Rep.);
10. Updates on action items identified between management review meetings (QMS Rep.);
11. Changes to services, activities, regulations, etc. that could impact the QMS (QMS Rep.);
12. Consumer feedback (ORO);
13. Resources needed for QMS maintenance (QMS Rep.);
14. Results of the infrastructure review (QMS Rep);
15. The currency and content of the Operational Plan (QMS Rep.);
16. Comments and suggestions made by personnel (All)

### Review Process

The participants of the Management Review Meeting will review all data presented for each agenda item in order to identify where improvements to the QMS and its procedures are required. The participants will make recommendations and/or initiate action plans to address identified deficiencies as appropriate. The QMS Representative will make note of any changes or action items required during the course of the review.

**Minutes of the Management Review Meeting in the attached format, will be documented by the QMS Representative (or designate) and will include, at a minimum, the:**

- Date and time of the Management Review Meeting(s);
- List of attendees;
- Summary of issues discussed and decisions made;
- List of identified system non-conformances and opportunities for improvement, as well as the recommended actions to correct the identified deficiencies; and

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## ***SLD – 20 – MANAGEMENT REVIEW***

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- Any recommendations for additional resources needed for maintenance or improvement of the QMS.

### **Corrective Action**

The QMS Representative will compile a record of new and outstanding action items including all System Non-Conformances and Opportunities for Improvement. SLD-21 will be utilized to document Corrective Actions and Opportunities for Improvement.

### **Communication**

The minutes of the meeting (including action items) will be distributed by the QMS Representative to all meeting participants.

Results of the Management Review Process will be communicated to Council by Top Management.

The QMS Representative will ensure that copies of the abovementioned documents and records are stored appropriately as per *SLD-05A-Control of Documents* and *SLD-05B-Control of Records*.

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## SLD – 21 – CONTINUAL IMPROVEMENT

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### Purpose

This procedure outlines the processes for tracking and measuring continual improvement of the QMS and Drinking Water System by:

1. Reviewing and considering applicable best management practices (BMP's), including any published by the Ministry of Environment and available at <http://www.ontario.ca/drinkingwater> at least once every thirty-six months.
2. Documenting a process for identification and management of Quality Management System Corrective Actions that includes:
  - a. Investigating the cause(s) of an identified non-conformity
  - b. Documenting the action(s) that will be taken to correct the non-conformity from recurring, and
  - c. Reviewing the actions(s) taken to correct the non-conformity, verifying that they are implemented and they are effective in correcting and preventing the recurrence of the non-conformity and
3. Documenting a process for identification and implementation of preventative actions to eliminate the cause of potential issues of non-compliance or non-conformity.

### Scope

The entire QMS is subject the continual improvement procedures prescribed herein.

### Definitions

**Non-Conformance (NC)** – Any situation where an aspect of the QMS has not been met according to specified standards and/or procedure

**Corrective Action (CA)** - An action taken to identify the root causes of a problem and apply actions to fix the identified problem.

**Preventive action (PA)** - An action taken to prevent the occurrence of nonconformity of the QMS with the requirements of the DWQMS or other undesirable situation.

**Opportunity for improvement – (OFI)** An idea, suggestion, or program that serves to improve upon a process that has had a history of stability with few or no identified non-conformances.

**Management Review** - A formal (documented) meeting conducted at least once every 12 months by Top Management to evaluate the continuing suitability, adequacy, and effectiveness of the QMS.

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## SLD – 21 – CONTINUAL IMPROVEMENT

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### Procedure

#### Continual Improvement

Issues of non-compliance, non conformance, and opportunities for improvement can present themselves via:

1. the Management Review process
2. customer complaints
3. personnel suggestions/comments
4. AWQI's
5. Ministry of the Environment and Climate Change BMP's
6. MOE Inspection Reports
7. Internal and External Audits

An ongoing CA log in spreadsheet form ("Continual Improvement Report (CIR) Spreadsheet") shall be used to document all OFI's and their current status. As issues that can be characterised as OFI's arise, such as from the list above, the QMS representative shall revise the spreadsheet accordingly and address the identified issues as time permits, in consultation with other water staff as needed.

**Immediately after the receipt of MOE Inspection Reports, or the completion of an internal or external audit, the Waster and Wastewater Admin Assistant shall begin the entries of CAR's and OFI's in the abovementioned CIR Spreadsheet.**

An example, uncontrolled copy of the CIR spreadsheet is attached to this SLD, overleaf.

#### Corrective Action

All City of Owen Sound personnel involved in the provision of the safe drinking water have the authority to communicate any QMS non-conformance found to the QMS Representative.

The QMS Representative will consult with appropriate staff (i.e. Water Treatment or Distribution personnel), as applicable and corrective action will be assigned to appropriate staff, if corrective action is required. This process will be documented via the CIR Spreadsheet.

The QMS Representative is responsible for overseeing that corrective action items are followed up on.



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## **SLD – 21 – CONTINUAL IMPROVEMENT**

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### **Preventative Actions**

All City of Owen Sound personnel involved in the provision of safe drinking water have the authority to offer suggestions and identify opportunities for improvement to the QMS and its performance. All suggestions will go to the QMS Representative, who will review them and make appropriate improvements, if warranted, and may raise these suggestions in the next Management Review meeting, as applicable. Additional sources of ideas for preventative improvement include any of the seven (7) items listed above under “Continual Improvement” above.

Using the CIR Spreadsheet to document the process, the QMS Rep will:

- Review the potential nonconformities or other ideas identified
- Document the outcome of the review, including the action(s) if any, that will be taken to prevent a non-conformity or negative outcome from occurring (or cause a positive outcome) and
- Reviewing the action(s) taken, and verifying they are implemented, and effective in preventing a non-conformity or negative outcome from occurring (or causing a positive outcome)