

WATER AND WASTEWATER SERVICES
DRINKING WATER QUALITY MANAGEMENT SYSTEM
OPERATIONAL PLAN



THE DISTRICT MUNICIPALITY OF MUSKOKA DRINKING WATER QUALITY MANAGEMENT SYSTEM OPERATIONAL PLAN INDEX

ELEMENT 1 QUALITY MANAGEMENT SYSTEM.....	1
ELEMENT 2 QUALITY MANAGEMENT SYSTEM POLICY.....	2
ELEMENT 3 COMMITMENT AND ENDORSEMENT	3
ELEMENT 4 QUALITY MANAGEMENT SYSTEM REPRESENTATIVE.....	4
ELEMENT 5 DOCUMENT AND RECORDS CONTROL.....	5
ELEMENT 6 DRINKING WATER SYSTEM	7
ELEMENT 7 RISK ASSESSMENT	11
ELEMENT 8 RISK ASSESSMENT OUTCOMES.....	13
ELEMENT 9 ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES.....	14
ELEMENT 10 COMPETENCIES.....	18
ELEMENT 11 PERSONNEL COVERAGE	19
ELEMENT 12 COMMUNICATIONS.....	20
ELEMENT 13 ESSENTIAL SUPPLIES AND SERVICES.....	21
ELEMENT 14 REVIEW AND PROVISION OF INFRASTRUCTURE	22
ELEMENT 15 INFRASTRUCTURE MAINTENANCE, REHABILITATION AND RENEWAL ..	23
ELEMENT 16 SAMPLING, TESTING AND MONITORING.....	24
ELEMENT 17 MEASUREMENT & RECORDING EQUIPMENT CALIBRATION & MAINTENANCE	25
ELEMENT 18 EMERGENCY MANAGEMENT.....	26
ELEMENT 19 INTERNAL AUDITS	27
ELEMENT 20 MANAGEMENT REVIEW.....	28
ELEMENT 21 CONTINUAL IMPROVEMENT	29

QUALITY MANAGEMENT SYSTEM DEFINITIONS

Accreditation: in the context of the Ministry's Municipal Drinking Water Licensing Program, accreditation is the verification by a third-party accreditation body that an operating authority has a Quality Management System (QMS) in place for a specific drinking water system that meets the requirements of the Drinking Water Quality Management Standard (DWQMS).

Action Report: this report is used to document the systematic process for identifying "root causes" of drinking water problems or events and an approach for responding to them. It can be used for corrective and/or preventative actions in response to non-conformances, opportunities for improvement, adverse water quality incidents, and any other drinking-water related issues. Formerly Root Cause Analysis.

Annual or Annually: refers to a calendar year; a period of one year beginning and ending with the dates conventionally accepted as marking the beginning and end of a year (January 1st to December 31st).

Audit: a systemic and documented verification process that involves objectively obtaining and evaluating documents and processes to determine whether a quality management system conforms to the requirements of the DWQMS.

Calibration: an adjustment to an instrument to match a reference value to ensure the measured results are both accurate and precise.

Certified Operator: with respect to a Sub-System, an individual who holds or is deemed to hold a certificate under O. Reg. 128/04 that is applicable under that regulation to that sub-system or that type of sub-system, but does not include an individual that holds or is deemed to hold only a water quality analyst's certificate or conditional water quality analyst's certificate under that regulation.

Controlled Document: includes a digital or hard-copy document which must be managed within a tightly controlled process that maintains the integrity of the document's content through revisions. This document must be accurate, current, and available to all personnel.

Corrective Action: an action to eliminate the cause of a detected non-conformity with the QMS, with the requirements of the DWQMS, or other undesirable situations.

Critical Control Limit (CCL): the point at which a Critical Control Point response procedure is initiated.

Critical Control Point (CCP): an essential step or point in the subject system where a control measure is applied to prevent or eliminate a drinking water health hazard or to reduce it to an acceptable level.

Drinking Water Quality Management Standard (DWQMS): the Standard and its collective requirements for a quality management system established by the Ministry.

Emergency: a situation or service interruption that may result in the loss of the ability to maintain a supply of safe drinking water to consumers.

Infrastructure: the set of interconnected structural elements that provide the framework for supporting the operation of the drinking water system, including buildings, workspace, process equipment, hardware and software, and supporting services, such as communication.

Management Form: a type of Controlled Document specifically for the WWW Department which is maintained by the QMS Coordinator. These documents are identified by the naming convention “MF” before the form number and the revisions are tracked.

Non-conformance: the non-fulfillment of a DWQMS requirement.

Operating Authority: means, in respect of a subject system, the person or entity that is given responsibility by the owner for the operation, management, maintenance or alteration of the subject system.

Operational Plan: written documentation of the Operating Authority’s QMS developed for the drinking water system to meet the requirements of the DWQMS.

Operator: means a person who conducts operational checks of or who adjusts tests or evaluates a process that controls the effectiveness or efficiency of a sub-system and includes a person who adjusts or directs the flow, pressure or quality of the water within the sub-system if the person works in a Distribution sub-system, Water Treatment sub-system or Distribution and Supply sub-system.

Overall Responsible Operator (ORO): means an operator designated as Overall Responsible Operator of a sub-system under Section 23 of O. Reg. 128/04.

Owner: includes, in respect of a drinking-water system, every person who is a legal or beneficial owner of all or part of the system.

Owner Representative: a representative designated by the Owner to assume roles and responsibilities as defined in the Operational Plan that documents the QMS maintained by Water Operations. The owner representative for the District is the Commissioner of Engineering and Public Works.

Policy: a set of basic principles designed to guide decision making.

Preventative Maintenance: regularly scheduled and periodic maintenance as directed by vendor or other maintenance guide to prevent possible break down and extend the lifecycle of assets.

Procurement: is the process of acquiring goods, works and services, covering both acquisitions from third parties and from in-house providers. The process spans the whole life cycle from identification of needs, through to the end of a services contract or the end of the useful life of an asset. It involves options appraisal and the critical 'make or buy' decision.

Public: subject system consumers and stakeholders

Quality Management System (QMS): is a system to establish policy and objectives and achieve those objectives to direct and control an organization with regard to quality.

Record: a document stating results achieved providing evidence of activities performed such as internal and external audit results, management review results, sampling/testing and monitoring results, or other record that is subject to revision.

Rehabilitation: the process of repairing or refurbishing an infrastructure.

Renewal: the process of replacing the infrastructure with new infrastructure.

Risk: the probability of identified hazards causing harm, including the detectability, likelihood, and consequence of that harm.

Risk Assessment: an orderly methodology of identifying hazards or hazardous events that may affect the safety of drinking water and evaluating their significance.

Sampling: the process of collecting water samples for analysis.

Standard Operating Procedure (SOP): a set of step-by-step instructions to help staff carry out operational tasks. SOPs aim to achieve efficiency, quality output,¹ and uniformity of performance, while reducing miscommunication and failure to comply with industry regulations.

Supervisory Control and Data Acquisition (SCADA): is an industrial process control application that monitors and controls unit processes including data collection, system alarming, and ability to change set points.

Supplier: an organization or person that provides a product or service that may affect drinking water quality.

The Ministry: the provincial governing ministry responsible for the regulation of drinking water systems to ensure water quality and safety through the enforcement of the Safe Drinking Water Act and its associated regulations.

Top Management: a person, persons or a group of people at the highest management level within an Operating Authority that makes decisions respecting the QMS and recommendations to the Owner, respecting the subject system or subject systems.

Verification: a minimum monthly comparative check of instrumentation by operators to verify the reading of the instrument using a traceable and dated standard or using a comparison reading to a similarly calibrated and verified instrument.



ELEMENT 1 QUALITY MANAGEMENT SYSTEM

This document is the Drinking Water Quality Management System Operational Plan for the District Municipality of Muskoka.

The District of Muskoka owns and operates municipal water treatment and distribution systems in the municipalities of Bracebridge, Gravenhurst, Huntsville, Port Carling, MacTier, Port Sydney, Port Severn, Bala, and Baysville.

This Plan has been written to meet or exceed the requirements of the Ministry's prescribed standard and is applicable to the management and operation of the District of Muskoka's water treatment and distribution systems.

The development and continual improvement of the Plan will help ensure that all regulatory requirements are met, and that consumers can be confident that their drinking water will continue to be protected through the effective application of the QMS.



ELEMENT 2 QUALITY MANAGEMENT SYSTEM POLICY

The District Municipality of Muskoka owns, maintains, and operates municipal water treatment and distribution systems.

The District Municipality of Muskoka is committed to:

- (i) ensuring a consistent supply of safe, high quality drinking water,
- (ii) maintaining and continually improving its Quality Management System, and
- (iii) meeting or surpassing applicable regulations and legislation.

The Owner representative, for purposes of the Quality Management Standard, is the Commissioner of Engineering and Public Works.

The QMS policy is available for viewing at the Engineering and Public Works office at the District of Muskoka, the District of Muskoka's Intranet, and on our website at www.muskoka.on.ca.

Endorsed By:

May 24, 2018
(Date)

F. Jahn
(For the Owner)
Commissioner of Engineering and Public Works
Fred Jahn, P.Eng.



ELEMENT 3 COMMITMENT AND ENDORSEMENT

The District Municipality of Muskoka, as owner and operating authority for all of Muskoka's Municipal Drinking Water Systems, endorses the implementation, maintenance and continual improvement of a Drinking Water QMS, as documented in this Operational Plan.

Feb. 5, 2019

Date

F. Jahn

(For the Owner)

Commissioner of Engineering and Public Works
Fred Jahn, P.Eng.

February 5, 2019

Date

M. Firman

Director of Water & Wastewater Services
Marcus Firman, C.E.T.



ELEMENT 4 QUALITY MANAGEMENT SYSTEM REPRESENTATIVE

The designated QMS Representative at the District of Muskoka is the Director, Water and Wastewater Services.

The QMS Representative, or designate, shall:

- administer the Quality Management System by ensuring that processes and procedures needed for the Quality Management System are established and maintained.
- report to Top Management on the performance of the Quality Management System and any need for improvement.
- ensure that current versions of documents required by the Quality Management System are being used at all times,
- ensure that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the subject system, and
- promote awareness of the Quality Management System throughout the Operating Authority.



ELEMENT 5 DOCUMENT AND RECORDS CONTROL

PROCEDURE DESCRIPTION

This procedure is applicable to QMS documents and records.

Key Documents and Records QMS Document/Record	Location
Calibration Records	Water Treatment Plant Shared Network (Annually)
Distribution Equipment Maintenance Records	Facilities Shared Network
QMS Audit Records	Public Works Office Shared Network
QMS Operational Plan	Public Works Office Shared Network Website
Lab Results	Shared Network (Monthly)
Operator Training Records	Cloud-based System (Quarterly)
Standard Operating Procedures	Shared Network Cloud-based System
Maintenance Management Systems Software	Facility Off-site backup by Consultant

DOCUMENT & RECORD RETRIEVABILITY & AVAILABILITY

SCADA data is backed up daily at the Water Treatment Plant (WTP) on the SCADA computer and archived annually at the District Head Office.

RETENTION AND DISPOSAL OF DOCUMENTS AND RECORDS

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

All QMS records and documents are retained for a minimum of 5 years, unless a QMS record or document is also a requirement of O. Reg. 128/04 and/or 170/03, then retention time shall be as per the regulation. Once the retention time has been reached, records and documents may be destroyed or placed in the Public Works archives in accordance with the District of Muskoka’s retention by-law as revised.

QMS OPERATIONAL PLAN



Operational records within the QMS shall be stored in such a manner as to prevent deterioration and/or damage.

ELECTRONIC DOCUMENTS

Electronic versions of documents and records are stored on a shared electronic drive and sharing permissions are in place to prevent unauthorized personnel from making amendments.

REFERENCE DOCUMENTATION

District of Muskoka Retention By-law
SOP WS-47 Posting of Operator Certifications & License Renewals
SOP WS-50 Document Control Procedure



ELEMENT 6 DRINKING WATER SYSTEM

OWNER & OPERATING AUTHORITY

The District Municipality of Muskoka is the Owner and Operating Authority for water treatment facilities throughout Muskoka. There are no subject systems connected to other drinking water systems owned by other owners.

COMMON EVENT DRIVEN FLUCTUATIONS

All surface water supplies experience seasonal lake/river fluctuations, which generally cause changes in the raw water characteristics. These changes require seasonal adjustments to the coagulant feed rates. The stability of the raw water source provides moderate operational challenges or threats.

Treatment Plants that experience seasonal fluctuations which require more treatment than adjusting coagulant feed rates are listed and explained below.

Lone Pine WTP – Port Severn

The presence of zebra mussels in Little Lake requires an annual inspection of the intake structure. It is also cleaned, and any presence of mussels is scraped. The intake pipe is inspected every 5 years and cleaned as required.

Minto WTP – Bala

The presence of manganese in the source water is a usual occurrence. This is treated with a permanganate solution.

Beech WTP – MacTier

The presence of manganese in the source water is a usual occurrence. This is treated with a permanganate solution.

Clarke Well – Port Sydney

The Clarke Well is a ground water source. There are no common event-driven fluctuations at this facility.



SOURCE WATER CHARACTERISTICS

Source water characteristics for each system are described below.

Bala

The Minto Water Treatment Plant's intake source is Lake Muskoka. Lake Muskoka water is soft, low in alkalinity (6 to 12 mg/L), hardness (8 to 12 mg/L), turbidity (0.3 to 0.6 NTU), colour (12 to 18 TCU) and pH (6.6 to 7.1); it has a seasonal manganese content in the 0.005 to 0.025 mg/L range. The water is aggressive and it will attack pipes and equipment potentially causing health, economic, and aesthetic problems.

Baysville

The Birch Glen Water Treatment Plant uses the Muskoka River/Lake of Bays as a surface water source. The Muskoka River is typical of coloured waters in that it is characterized by low alkalinity, hardness, and pH values. Seasonal temperature fluctuations range between 3 to 21 degrees Celsius. The intake is located 385 meters from shore and maintains a 5 meter water cover. The intake is located in a residential/recreational area with no industrial or large scale agricultural activities; this source has low vulnerability of chemical contamination, and more significant vulnerability to bacteriological contamination because of septic systems located along the upstream water course.

Bracebridge

Kirby's Beach Water Treatment Plant draws its water from Lake Muskoka, a surface water source. The raw water intake structure is located approximately 300 m from shore, at 13 m below the surface and 2.2 m from the bottom. Lake Muskoka water is moderately coloured (typically 15 to 18 TCU) with a normal turbidity of approximately 0.3 to 0.4 NTU. The water is characterized by low alkalinity (typically 6 to 8 mg/L), lower pH (typically 6.5 to 7.0), and low hardness (typically 10 to 12 mg/L).

There are no seasonal changes other than a slight rise in turbidity during the spring run-off season (up to 1 to 1.2 NTU) of which the plant has no problems with removal by making slight coagulant dosage adjustments.

Gravenhurst

The Muskoka Beach Water Treatment Plant uses Lake Muskoka, near Brydon's Bay, as its raw water source. Lake Muskoka water is typical of coloured waters in that it is characterized by low alkalinity and pH values. Lake Muskoka raw water is very soft and low in calcium. These characteristics indicate that the water is under-saturated with respect to calcium carbonate. The water is aggressive and it will attack pipes and equipment, potentially causing health, economic, and aesthetic problems.



Huntsville

Fairyview Water Treatment Plant uses raw water from Fairy Lake. Fairy Lake water is very soft and typical of coloured waters in that it is characterized by low alkalinity and pH values. These characteristics indicate that the water is under-saturated with respect to calcium carbonate. The water is aggressive and it will attack pipes and equipment, potentially causing health, economic, and aesthetic problems

MacTier

The intake source for the Beech Water Treatment Plant is Stewart Lake. Stewart Lake water is soft, low in alkalinity and calcium content, and has a low pH. These characteristics indicate that the water is under-saturated with respect to calcium carbonate. The water is aggressive and will attack pipes and equipment, potentially causing health, economic, and aesthetic problems. There are seasonal elevated manganese and low dissolved oxygen levels.

Port Carling

The Ferndale Water Treatment Plant takes its raw water from Lake Rosseau. The raw water is very soft, low in alkalinity and calcium, and has a low pH. The water is aggressive and it will attack pipes and equipment potentially causing health, economic, and aesthetic problems.

Port Severn

The intake source for the Lone Pine Water Treatment Plant is Little Lake (Severn River). Little Lake water has slightly basic pH (7.6 to 8.2), moderate alkalinity (48 to 80 mg/L) and hardness (57 to 97 mg/L), moderate colour (15 to 25 TCU), and turbidity levels (0.3 to 0.6 NTU). There are seasonal fluctuations in alkalinity, hardness, and turbidity during the spring runoff period.

Port Sydney

The Clarke Well System consists of a non-potable water system and a well supply drinking water system. The well supply drinking water system is supplied from Well Number 2.

Well Number 2 is classified as groundwater under the direct influence of surface water. This well draws water from a sand aquifer with a consistent average turbidity of 0.20 NTU, pH of 6.52, alkalinity of 28 mg/L, and hardness of 80 mg/L. The raw ground water may be described as slightly acidic, moderately soft water containing low concentrations of iron and manganese. Mantled by about 12 meters of silty sand, the overburden aquifer developed by the Clarke Crescent Well has moderate vulnerability to surface derived chemical constituents (road salt, fertilizers, fuel spills). The developed aquifer may also be considered to have a low vulnerability to bacteriological contamination, as supported by the continued absence of total coliform and E. coli bacteria in the raw water supply.

TREATMENT PROCESS AND DISTRIBUTION COMPONENTS

Key treatment and distribution process components are described as part of this Plan under Supporting Documentation and in the Drinking Water Works Permit for each drinking water system.



TREATMENT PROCESS AND DISTRIBUTION FLOW CHARTS

Treatment and distribution flow charts can be found in Supporting Documentation.

CRITICAL UPSTREAM AND DOWNSTREAM PROCESSES

The District of Muskoka has a by-law (97-1, as amended) which regulates the supply of water and provides for water rates and charges within District supplied areas. This by-law prohibits potential cross connections in a general way in that it provides the representatives of the District with the authority to disconnect any user from the system given reasonable grounds of any non-conformance with the by-law including suspicion of a potential cross connection.

The District of Muskoka has also developed “The Muskoka Water Strategy.” It was adopted in February 2003 to address issues of source water protection. The strategy includes enhanced water quality monitoring programs (including taking part in the Drinking Water Surveillance Program (DWSP) through the Ministry) and maintenance of shoreline vegetative buffers.

In addition to the Muskoka Water Strategy, a source water protection plan for South Georgian Bay Lake Simcoe adopted on July 1, 2015 further protects source water for our Port Severn drinking water system.

By-law 97-1 as amended, the Muskoka Water Strategy, and the South Georgian Bay Lake Simcoe source water protection plan are included as part of this Plan under Supporting Documentation.



ELEMENT 7 RISK ASSESSMENT

The District of Muskoka operates and maintains drinking water systems and conducts regular risk assessments to identify hazards or hazardous events that pose a risk to the drinking water quality resulting in a risk to public health.

Risk assessment reviews shall take into consideration reliability and redundancy of equipment, plant and process upgrades, and regulatory changes. Prior to completing the Risk Assessments, Operations staff will review the most recent Lake Data for their intake lake (located on the Muskoka Water Web website). Table 1 (page 12) will be referenced to numerically assess the risk.

Revisions to risk assessments may be recommended by any Operations staff and will be made as determined by an Area Manager, Chief Operator, or the QMS Rep.

The methodology for assessments may be changed as required by the QMS Representative or designate.

The methodology, procedure, and frequency with which these risk assessments are conducted are outlined in Standard Operating Procedure (SOP) WS-51.

REFERENCE DOCUMENTATION

Action Report Form MF021

Risk Assessment Outcomes Template MF020

SOP WS-51 Risk Assessment for Drinking Water Systems



TABLE 1
RISK ASSESSMENT RATING TABLE FOR DETECTABILITY, CONSEQUENCE AND LIKELIHOOD
OF HAZARDS OR HAZARDOUS EVENTS

Detectability Rating System

Description	Detectability of Hazardous Event	Rating
Very Detectable	Easy to detect, on-line monitoring through SCADA (Supervisory Control and Data Acquisition)	1
Moderately Detectable	Moderately detectable, alarm present but not in SCADA, may require operator to walk by and notice alarm; problem is indicated promptly by in-house lab test results.	2
Normally Detectable	Normally detectable, visually detectable on rounds or through regular maintenance.	3
Poorly Detectable	Poorly detectable, visually detectable but not inspected on a regular basis; not normally detected before problem becomes evident; lab tests are not done on a regular basis (e.g. quarterly).	4
Undetectable	Cannot be detected.	5

Consequence Rating System

Description	Consequence of Hazardous Event	Rating
Insignificant	Insignificant impact, little public exposure, little or no health risk.	1
Minor	Limited public exposure, minor health risk.	2
Moderate	Minor public exposure, health impact on small part of the population.	3
Major	Large part of population at risk.	4
Catastrophic	Major impact for large part of the population, complete failure of systems.	5

Likelihood Rating System

Description	Likelihood of Hazardous Event	Rating
Rare	May occur in exceptional circumstances, and has not occurred in past.	1
Unlikely	Could occur at some time, historically has occurred less than once every five or 10 years.	2
Possible	Has occurred or may occur once or more per year.	3
Likely	Has occurred or may occur on a monthly to quarterly basis.	4
Very likely	One or more occurrences on a monthly or more frequent basis.	5



ELEMENT 8 RISK ASSESSMENT OUTCOMES

Risk assessment outcomes for each drinking water system within the District of Muskoka are stored on the shared network.

Included under critical control limits are references to SOPs and our Water and Wastewater Emergency Response Plan.

CRITICAL CONTROL POINTS

Critical control points are as regulated, or higher than the threshold. These control points are typically:

- able to prevent, eliminate, or reduce hazards,
- monitored, preferably in real time,
- able to have determined control limits, and,
- essential to ensure the safety of the drinking water.

Any hazards or hazardous events that are at the threshold or higher, which cannot have control measures, must have contingency procedures or emergency response procedures developed.

CRITICAL CONTROL LIMITS

Critical control limits may be numerical or descriptive and need only be assigned to critical control points that are regulatory or higher than the threshold.

Appropriate action will be taken by the Operator for any deviations from critical control limits. SCADA records can be retrieved by viewing trending records. Deviations from critical control limits will alarm and page out to the certified operator whose response will include a report of the deviation in the logbook and a root cause analysis will also be completed.

REFERENCE DOCUMENTATION

SOP WS-51 Risk Assessment for Drinking Water Systems

SOP WS-52 Communications, as revised

Water and Wastewater Emergency Response Plan MF032, as revised



ELEMENT 9 ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

OPERATING AUTHORITY

The Operating Authority under this QMS Plan is the District Municipality of Muskoka. The Operating Authority shall keep a current description of the organizational structure including respective roles, responsibilities, and authorities.

OWNER

The Owner for purposes of this Operational Plan is the District Municipality of Muskoka. The Owner Representative is the Commissioner of Engineering and Public Works.

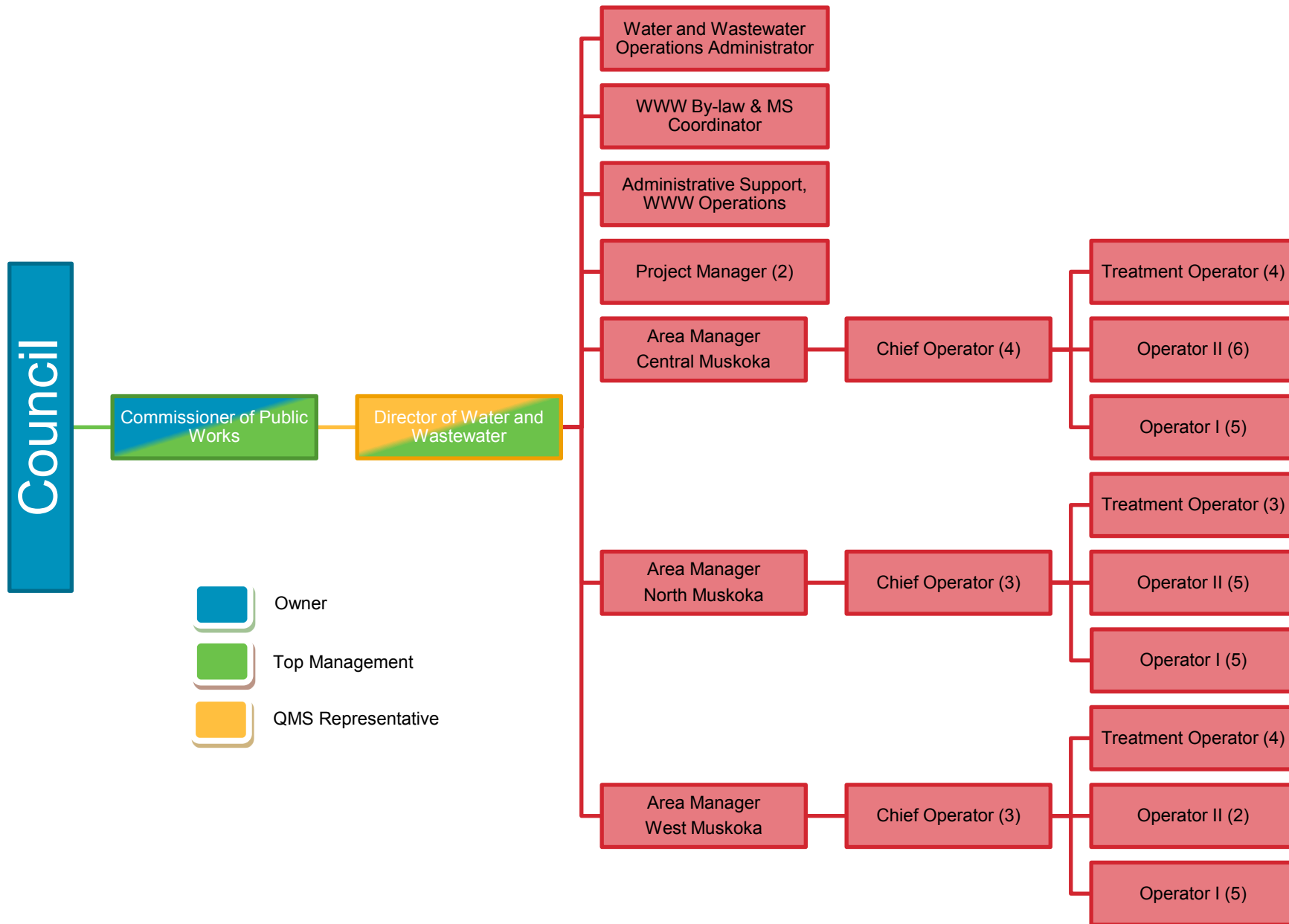
MANAGEMENT REVIEW

Management reviews shall be conducted by Top Management, specifically the Commissioner of Engineering & Public Works and the Director, Water and Wastewater Services.

ORGANIZATION CHARTS

The District of Muskoka's water and wastewater organizational structure is comprised of three areas, North Muskoka, Central Muskoka, and West Muskoka as illustrated by the following organizational chart (page 15). All areas fall under the direction of the Commissioner of Public Works and subsequently the Director, Water and Wastewater Services, however each area has a Manager who is responsible for managing the operation in their designated area.

QMS OPERATIONAL PLAN





RESPONSIBILITIES AND AUTHORITIES

Operating Authority

As the Operating Authority, the District Municipality of Muskoka has responsibility and authority to maintain finances in order to sustain water and wastewater systems.

Commissioner of Engineering & Public Works

The Commissioner of Engineering and Public Works is responsible for the strategic leadership, management, and administration of the Engineering and Public Works department including the development, operation, maintenance, renewal and/or replacement of the District roads system, wastewater collection and treatment systems, water treatment and distribution systems, and solid waste management facilities.

The Commissioner of Engineering and Public Works has the authority to establish and implement operating policies governing the execution of major Engineering & Public Works Department functions and administrative practices.

Director, Water and Wastewater Services – QMS Representative

The Director, Water and Wastewater Services is responsible for the identification and assessment of needs, strategic planning, prioritization, operation, compliance, renewal, and maintenance of the District Municipality of Muskoka's water and wastewater systems including budgeting, engineering, design, approval, tender preparation, and contract management of all major water and sewage works including hauled waste (lagoons).

The Director, Water and Wastewater Operations has authority to maintain day to day operations, long and short term operations of water and wastewater systems, including hauled waste and establish policies and procedures relative to water and wastewater operations.

As QMS Representative, the Director, Water and Wastewater Operations shall be responsible for:

- ensuring that the process required for the QMS are established, implemented and maintained,
- reporting to Top Management on the performance of the QMS and making any suggestions for improvement,
- ensuring that the most current versions of documents required by the QMS are being used at all times,
- ensuring that personnel are aware of all current regulatory requirements that pertain to their duties within the operation of the drinking water system, and
- ensuring the promotion of awareness and effectiveness of the QMS throughout the Operating Authority.

Area Manager – Water and Wastewater Operations

The Area Manager is responsible for managing the operation, maintenance and repair of Muskoka's public water treatment, storage and distribution systems and wastewater



collection, treatment, and disposal systems in a designated area.

The Area Manager has the authority for the following:

- purchase orders for payment of invoices,
- timesheets in accordance with the Collective Agreement,
- distribution of safety wear and uniform allowances to assigned staff,
- use and coordination of outside forces involving large capital expenditures in emergency situations,
- operational expenditures – major and minor capital items, and
- acceptance of completed projects (substantial completion).

Operators

Operations staff consists of Chief Operators, Treatment Operators, Operators 1 and 2, and Operators-in-training. Operators assist with the safe operations and maintenance of District water and wastewater treatment, water distribution and wastewater collection systems, and hauled waste facilities with minimal supervision.

Authorities for Operators are determined by license as per regulations, and their training and experience. They also have authority for the supervision of staff and/or contractors as required.

General Labourer and Summer Students

The Labourer and Summer Students perform all tasks of a physical nature required in the operation and maintenance of District operations and facilities. They have no authorities.

Instrument Technician

There are no plans to fill the Instrument Technician position at this time.

Water & Wastewater Operations Administrator

The Water and Wastewater Operations Administrator is primarily responsible for providing and coordinating office administration and support services to the Water and Wastewater Department including front line customer interface. Provides administrative support for senior management and liaises with Area Managers.

The Water and Wastewater Operations Administrator has no authorities.

QMS Coordinator

The QMS Coordinator participates or assists in the development and implementation of the drinking water QMS program and in by-law compliance.

The QMS Coordinator has no authorities.



ELEMENT 10 COMPETENCIES

SATISFYING COMPETENCIES

The District of Muskoka hires licensed wastewater operators in accordance with O. Reg. 129/04 and certified water operators in accordance with O. Reg. 128/04. Area Managers act as Overall Responsible Operators and as such are also licensed and certified. The District conducts interviews, and verifies references and/or requests specific documentation as part of the hiring process in order to verify skills, experience, and knowledge. Training is facilitated and budgeted.

In order to meet the ongoing changes to technology, software, regulatory requirements, and Water and Wastewater Department processes, all licensed and certified staff shall receive training as required by the regulations, at a minimum. The training may be provided on or off site by qualified employees or contracted subject matter experts. Training effectiveness is evaluated when appropriate through testing, or a demonstration of knowledge gained. On-site training is provided on a continual basis as required, where treatment processes or equipment changes warrant. Training records are maintained by the Chief Operator and stored on a cloud-based system.



ELEMENT 11 PERSONNEL COVERAGE

WATER AND WASTEWATER TREATMENT AND DISTRIBUTION STAFFING

The District of Muskoka Water & Wastewater Operations Department presently has a staff compliment of licensed certified operators who cover operations 24 hours a day, 7 days a week by pagers, cell phones, emails, and communications from Public Works staff.

Water and wastewater staffing is outlined under SOP WS-10 as revised, which is available on a shared network and a cloud-based system.

Top Management will determine the number of personnel required to staff the Drinking Water and Wastewater Systems to maintain continuous operations.

Top Management will determine the ORO and appoint the position in accordance with O. Reg. 128/04.

The ORO can be contacted 24/7 by cell phone, email, and Public Works staff.

Top Management will appoint a qualified person in the case of long term absentee of the ORO (150) days and that appointment will be communicated to all Operations staff.

In the event of a strike, continuity of the operations of the water and wastewater systems will be ensured according to a document prepared and maintained by the Director of Water and Wastewater Services. For reasons of confidentiality, this document will be presented upon request.

REFERENCE DOCUMENTATION

SOP WS-10 On Call Staffing, as revised

SOP WS-25 ORO and OIC Procedure, as revised



ELEMENT 12 COMMUNICATIONS

The following procedure describes how the District of Muskoka communicates the QMS to Council, its employees, suppliers, and the public.

OWNER/OPERATING AUTHORITY – DISTRICT OF MUSKOKA

The Commissioner of Engineering and Public Works or their designate will provide a written report to the Owner once annually upon completion of the Management Review.

DISTRICT OF MUSKOKA EMPLOYEES

The District of Muskoka provides QMS training to all Water Department employees. An Employee information session is held as changes to the Plan require and the Operational Plan is available for viewing on the District of Muskoka website. New employees are trained during their orientation. A hard copy of the Plan is available for viewing at the District of Muskoka Administration Office Public Works Department.

CONSUMERS

The QMS Policy statement is included on a rate brochure that is mailed out annually. The rate brochure also directs customers to the District of Muskoka Administration Office should they wish to view a hard copy of the Operational Plan. The Plan can also be viewed on the District of Muskoka's website at www.muskoka.on.ca. The Quality Management System link can be found by going to the District website and following this path: Live and Play → Water and Wastewater → Municipal Water and Wastewater → Drinking Water Quality Management System (DWQMS) → View the District's DWQMS Operational Plan.

Consumers may contact the District of Muskoka at publicworks@muskoka.on.ca or they may reach on-call staff by calling the Public Works office during office hours or by calling the Public Works office after hours for on-call contact phone information.

Contact information is also provided in the Annual Report and maintenance activity notifications that are published in the local newspapers.

SUPPLIERS

Suppliers of essential supplies and services will receive written communication from the Director of Water and Wastewater Operations or their designate, informing them of our requirements such as ANSI/NSF certification, SDSs and proof of laboratory accreditation for analysis of samples. Requirements are also included on Requests for Proposals/Quotations.

REFERENCE DOCUMENTATION

Action Report Form MF021
Essential Supplies Table MF031, as revised
Operator OTJ Training Record MF012, as revised
SOP WS-01 Customer Complaints
SOP WS-52 Communications



ELEMENT 13 ESSENTIAL SUPPLIES AND SERVICES

CHEMICAL AND MATERIAL STANDARDS

All chemicals and materials used in the operation of the drinking water system that come into contact with water within the system shall meet all applicable standards set by both the American Water Works Association (AWWA) and the American National Standards Institute (ANSI) safety criteria standards NSF 60, NSF 61, and NSF 372. NSF 60, NSF 61, and NSF 372 certification will be available at all times.

PROCUREMENT

Procurement of supplies and services is administered under our Finance Policies and Procedures Procurement Policy, as revised. The means the provision of supplies and services is allocated during the annual budget process and sufficient reserves are available in the event of emergencies. Additional resources for supplies and services are referenced in the Water and Wastewater Emergency Response Plan (included in Supporting Documentation). SOP WS-35 as revised describes the procedure for ordering of treatment chemicals and water system parts. The Essential Supplies and Services Table identifies supplies and services that are essential for the delivery of safe drinking water. This table is included in the Water and Wastewater Emergency Response Plan .

To ensure safe delivery of drinking water, the District maintains an inventory of critical repair parts.

REFERENCE DOCUMENTATION

Essential Supplies Table MF031, as revised

Procurement Policy, as revised

SOP WS-35 Ordering and Receiving Treatment Chemicals as revised

Water and Wastewater Emergency Response Plan MF032, as revised



ELEMENT 14 REVIEW AND PROVISION OF INFRASTRUCTURE

An annual review of the District of Muskoka's infrastructure needs is conducted by the Director of Water and Wastewater Services, Area Managers and Chief Operators where recommendations for maintenance, rehabilitation, and renewal programs are considered. Recommendations may be as a result of improvements to be made to the drinking water system as identified in risk assessment outcomes which may include input from Operations Staff.

These programs are implemented in conjunction with input from the Finance Department and then presented to the Owner for approval.

Details of the ten year forecast can be viewed in the Capital Budget and the Asset Management Plan can be viewed on the shared network.



ELEMENT 15 INFRASTRUCTURE MAINTENANCE, REHABILITATION AND RENEWAL

The Director, Area Managers, and Chief Operators review maintenance, rehabilitation, and renewal programs annually as part of the budget process. The approved budget is on the District's website at www.muskoka.on.ca.

PLANNED MAINTENANCE

Planned maintenance activities include an annual watermain flushing program where all municipal watermains in Muskoka are flushed to maintain water quality and fire flow capabilities, and a fall program that includes flushing of municipal watermains at dead ends. These procedures are outlined in SOP WS-08, as revised.

Electronic records of treatment and distribution maintenance activities are maintained by supervisors and tracked using software. These include standing and demand work orders. All equipment is maintained as per the User Manuals.

Fire hydrants are maintained in accordance with SOP WS-14, as revised.

An ongoing valve maintenance program ensures that valves are checked and exercised to ensure reliability. The procedure for this maintenance is outlined in SOP WS-14, as revised.

In treatment facilities, visual inspections occur at a minimum of every 72 hours and each facility has a maintenance schedule to ensure reliability and performance.

The completion of planned maintenance activities shall be the responsibility of the facility Chief Operator, under the direction of the Area Manager.

In the distribution system, air relief valves and vacuum breakers or combination valves are maintained through annual inspections. The procedure for air relief valve maintenance is outlined in SOP WS-45, as revised.

UNPLANNED MAINTENANCE

All repairs are prioritized and acted upon based on criticality.

REFERENCE DOCUMENTATION

SOP WS-08 Watermain Flushing
SOP WS-12 Watermain Distribution Repair
SOP WS-14 Valve and Fire Hydrant Maintenance
SOP WS-45 Watermain Air Relief Valve Maintenance
SOP WS-53 Water Meter Replacements
Draft Rate Supported Operating Budget and Capital Budget and Forecast



ELEMENT 16 SAMPLING, TESTING AND MONITORING

The District of Muskoka has a sampling program based on the requirements set out in O. Reg. 170/03, SOP WS-02 as revised, and the Municipal Drinking Water Licence.

The procedure for sampling of newly constructed watermains is set out in SOP WS-09, as revised.

The District of Muskoka also monitors water quality at various locations throughout the distribution system to detect changes in water quality and to meet the requirements of O. Reg. 170/03.

A procedure for addressing water quality parameters that are out of compliance is set out in SOP WS-23 as revised (refer to the Ministry's Adverse Water Quality form, current version).

Regulatory sampling is carried out to meet O. Reg. 170/03 as revised. Additional discretionary sampling outside the regulatory requirements is performed using a schedule that varies by facility and is located on the shared network.

Sampling, testing, and monitoring activities performed upstream before water enters the drinking water system are carried out to meet O. Reg. 170/03 and the drinking water system permits and municipal licenses, as revised. Upstream sampling is summarized in an annual report which is produced for the Lake System Health Program and details the components of the District's Recreational Water Quality Monitoring Program. The most current annual report is available on the District's website. Currently, the Severn Sound Environmental Association is not sampling upstream of Little Lake which is Port Severn's water source.

All results, excepting upstream sampling, are summarized in tables at the end of the year in the annual compliance report. Data is compiled by Chief Operators and provided to Area Managers for verification. These reports are provided to the Commissioner of Engineering and Public Works, the owner's representative.

The District of Muskoka uses SCADA as a tool to collect and monitor data. If the data points go outside established critical control limits, communication infrastructure is in place that will alert the Operator to take appropriate action.

REFERENCE DOCUMENTATION

SOP WS-02 Sampling Drinking Water for Microbiological Analysis, as revised

SOP WS-09 Disinfection & Sampling Procedures for Newly Constructed Watermains, as revised

SOP WS-23 Adverse Water Quality, as revised



ELEMENT 17 MEASUREMENT & RECORDING EQUIPMENT CALIBRATION & MAINTENANCE

The District of Muskoka operates and maintains flow measurement, pressure transmitter analytical instrumentation in treatment plants, water storage reservoirs, and other remote stations to provide for process control, monitoring, trending, and to ensure compliance with Provincial regulations.

Instrumentation includes those instruments required for demonstration of compliance verification including but not limited to, online chlorine analyzers, turbidimeters, fluoride analyzers, pH analyzers laboratory benchtop equipment, field test kits, etc.

Annual external calibration is required for flow measurement, pressure transmitter devices, and instrumentation used for demonstration of compliance.

For definitions and the procedure for calibrations and verifications refer to SOP WS-48.

REFERENCE DOCUMENTATION

Generic Verification Form MF004

Measuring & Recording Devices Requiring Calibration/Verification MF010

SOP WS-48 Instrument Calibration and Verification



ELEMENT 18 EMERGENCY MANAGEMENT

The District of Muskoka has emergency plans that outline steps to be taken to respond to an emergency involving the water and wastewater works.

Potential emergency situations or service interruptions such as adverse drinking water quality, watermain breaks, and power failures, have emergency response procedures as outlined in our Water and Wastewater Emergency Response Plan, Standard Operating Procedures, Muskoka Emergency Response Plan, and the Engineering and Public Works Emergency Response Plan. These can all be found in PDF format on the shared network.

RESPONSIBILITY DURING EMERGENCIES

The certified operator on duty must be capable of responding to any emergency or alarm condition or event that may arise at the water treatment plant, wastewater treatment plant, or within the distribution or collection systems.

The Muskoka Emergency Response Plan and Program is updated annually by the Emergency Management Coordinator and is available in hardcopy in the Commissioner's office in the Public Works office.

The Emergency Response Plan for the Engineering and Public Works Department is also updated on an annual basis by the Engineering and Public Works Administrative Assistant and is available in hardcopy in the Commissioner's office.

The Water and Wastewater Emergency Response Plan contains definitions of response actions and notifications required for alarms and events, internal and external contact information for staff, external agencies, and supplier contacts as well as references to standard operating procedures. These are available on the shared network drive. This is reviewed annually by the QMS Coordinator. Supplier contact information is reviewed annually by Chief Operators.

The District of Muskoka Water and Wastewater Operations staff will conduct an annual exercise to evaluate the Department's Emergency Response Plan following SOP WS-29.

REFERENCE DOCUMENTATION

Engineering & Public Works Emergency Response Plan
Muskoka Emergency Response Plan
SOP WS-12 Watermain Distribution Repair, as revised
SOP WS-23 Adverse Water Quality, as revised
SOP WS-24 Extended Power Outage, as revised
SOP WS-29 Training & Testing of Emergency Response Plans, as revised
SOP WS-52 Communications, as revised
Water & Wastewater Emergency Response Plan MF032



ELEMENT 19 INTERNAL AUDITS

The District of Muskoka conducts annual audits to ensure conformance to the requirements of the District of Muskoka Drinking Water QMS Operational Plan in accordance with the Standard set out by the Ministry and SOP WS-55. This requirement includes ensuring that the Quality Management System has been effectively implemented and properly maintained.

REFERENCE DOCUMENTATION

Action Report Form MF021

Procurement Policy

SOP WS-35 Ordering and Receiving of Treatment Chemicals, as revised

SOP WS-55 DWQMS Internal Audit, as revised



ELEMENT 20 MANAGEMENT REVIEW

This procedure defines the Management Review process to evaluate the continuing suitability, adequacy, and effectiveness of the QMS.

REVIEW FREQUENCY

Management review shall be conducted at least once every calendar year.

REVIEW PARTICIPANTS

The management review is conducted by Top Management including the Commissioner of Engineering and Public Works and the QMS Representative, or their designates. Other personnel may be included at the discretion of Top Management.

REVIEW PROCESS

The QMS Representative or their designate shall provide information and data concerning the following categories, for the review:

- incidents of regulatory non-compliance,
- incidents of adverse drinking-water tests,
- deviations from critical control-point limits and response actions,
- the effectiveness of the risk assessment process,
- internal and third-party audit results,
- results of emergency response testing,
- operational performance,
- raw water supply and drinking water quality trends,
- follow-up on action items from previous management reviews,
- the status of management action items identified between reviews,
- changes that could affect the QMS,
- consumer feedback,
- the resources needed to maintain the QMS,
- the results of the infrastructure review,
- operational plan currency, content and updates, and
- staff suggestions

The management review participants shall review all data presented, and where necessary, identify deficiencies. These may include deficiencies related to the:

- effectiveness of the QMS and related procedures
- ability of the Operating Authority to implement the QMS
- provision of adequate human and financial resources
- level of consumer satisfaction

REFERENCE DOCUMENTATION

Management Review Minutes MF019



ELEMENT 21 CONTINUAL IMPROVEMENT

The District of Muskoka is committed to the continual improvement of the Quality Management System and drinking water quality through preventative maintenance programs, corrective actions, best management practices, and the QMS Committee that meets a minimum of annually or as required.

Through the performance of annual management reviews and effective auditing, training, and communication between all parties, deficiencies can be identified, recorded, corrected, and prevented.

Annual outcomes of all of these procedures can be compared to ensure continuous improvement.

Updates from the Ministry are emailed to Engineering and Public Works and distributed to Operations Management. Those applicable are forwarded to the W&WWSuggestion email account to be scheduled for review by the QMS Committee.

REFERENCE DOCUMENTATION

SOP WS-55 DWQMS Internal Audit

SOP WS-57 Continual Improvement