

Municipality of West Perth

**Drinking Water Quality Management Standard
(DWQMS)**

Operational Plan

For the following system:

Mitchell Drinking Water System

Owned and operated by:

The Corporation of the Municipality of West Perth



Version 19.0
November 17, 2022

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Definitions and Abbreviations

Adverse Water Quality Incident – when an operational parameter is found to be outside the provincial water quality standards.

Applicable Legislative And Regulatory Requirements – the *Safe Drinking Water Act*, 2002 the *Ontario Water Resources Act*, 1990 and all regulations and instruments issued under these Acts which are associated with drinking water.

Actionable item – a task that must be completed or accomplished resulting from a Non Conformance (NC), Opportunity for Improvement (OFI), Adverse Water Quality Incident (AWQI), Critical Control Point (CCP) and internal audits.

Audit – a systematic 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.

Authority – official permission or approval to carry out a responsibility or task.

Calendar Year – a time frame of one year that begins on January 1 and ends on December 31.

Competence – the combination of observable and measurable knowledge, skills and abilities which are required for a person to carry out assigned responsibilities.

Compliance – the fulfillment of a regulatory requirement.

Conformance – the fulfillment of a DWQMS requirement.

Consumer – the drinking water end user.

Control Measure – includes any processes, physical steps, or other contingencies that have been put in place to prevent or reduce a hazard before it occurs.

Corrective Action – 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 – 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 at which control can be applied by the operating authority to prevent or eliminate a drinking-water health hazard or to reduce it to an acceptable level.

Document – includes a sound recording, video tape, film, photograph, chart, graph, map, plan, survey, book of account, and information recorded or stored by means of any device.

Drinking-Water Health Hazard – means, in respect of a drinking-water system,

- a) a condition of the system or a condition associated with the systems' waters, including any thing found in the waters,
 - i. that adversely affects, or is likely to adversely affect, the health of the users of the system,
 - ii. that deters or hinders, or is likely to deter or hinder, the prevention or suppression of disease, or
 - iii. that endangers or is likely to endanger public health,
- b) a prescribed condition of the drinking-water system or,

- c) a prescribed condition associated with the system's waters or the presence of a prescribed thing in the waters.

Drinking Water Quality Management Standard (DWQMS) – means the quality management standard approved by the Minister in accordance with section 21 of the SDWA.

Drinking-Water System – means a system of works, excluding plumbing, that is established for the purposes of providing users of the system with drinking water and that includes,

- a) any thing used for the collection, production, treatment, storage, supply or distribution of water,
- b) any thing related to the management of residue from the treatment process or the management of the discharge of a substance into the natural environment from the treatment system, and
- c) a well or intake that serves as the source or entry point of raw water supply for the system.

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

Emergency response – the effort to mitigate the impact of an emergency on consumers.

Facts – information recorded by the auditor to meet audit objectives, gathered in the course of performing an audit. It includes the results of interviews, document information and observations.

Frequency – the number of times that an audit occurs per unit time, e.g. once a year.

Hazard – a source of danger or a property that may cause drinking water to be unsafe for human consumption. The hazard may be biological, chemical, physical or radiological in nature.

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

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 transportation or communication.

Ministry – means the Ministry of the Environment, Conservation and Parks.

Monitoring – includes any checks or systems that are available to detect hazards or the potential for hazards.

Municipal Drinking-Water System – means a drinking-water system or part of a drinking-water system,

- a) that is owned by a municipality or by a municipal service board established under section 195 of the *Municipal Act, 2001*,
- b) that is owned by a corporation established under section 203 of the *Municipal Act, 2001*,
- c) from which a municipality obtains or will obtain water under the terms of a contract between the municipality and the owner of the system, or
- d) that is in a prescribed class.

Non-compliance – a failure under the *Safe Drinking Water Act, 2002*, the *Ontario Water Resources Act*, or any regulations or instruments under these Acts which are associated with drinking water.

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.

Opportunity for Improvement (OFI) – a recommendation that could potentially improve the Quality Management System.

Owner – the Corporation of the Municipality of West Perth.

Preventative Action – action to prevent the occurrence of nonconformity of the QMS with the requirements of the DWQMS or other undesirable situation.

Primary Disinfection – a process or series of processes intended to remove or inactivate human pathogens such as viruses, bacteria and protozoa in water.

Public – subject system consumers and stakeholders.

Quality Management System (QMS) – a system to:

- a) establish policy and objectives, and to achieve those objectives, and
- b) direct and control an organization with regard to quality.

Record – a document stating results achieved or providing proof of activities performed.

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

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

Resources – tangible inputs that are required to deliver safe drinking water.

Responsibility – a charge, trust, or duty for which one is responsible.

Retrievable - For documents, “retrievable” means the documents must be readily available for personnel to refer to, especially in emergency situations, or in areas where operational procedures would need to be promptly referenced. For example, sampling procedures should be available for reference where sampling activities are performed. For records, “retrievable” is a slightly more flexible term. Usually, a record is considered to be retrievable if it can be produced on request by the end of the business day. This definition stems from audits and inspections – if a record can be provided by the end of the audit, it is usually considered to be retrievable.

Risk – the probability of identified hazards causing harm, including the magnitude of that harm or its consequences.

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

Scope – a description of the extent and boundaries of an audit.

Secondary Disinfection – a process or series of processes intended to provide and maintain a disinfectant residual in a drinking-water system’s distribution system, and in plumbing connected to the distribution system, for the purposes of:

- a) protecting water from microbiological re-contamination,

- b) reducing bacterial regrowth,
- c) controlling biofilm formation, and
- d) serving as an indicator of distribution system integrity.

This process includes the use of disinfectant residuals from primary disinfection to provide and maintain a disinfectant residual in a drinking-water system's distribution system for the purposes described in clauses (a) to (d).

Supplier – an organization or person that provides a product or service that affects drinking water quality.

SDWA – means the *Safe Drinking Water Act, 2002, S.O. 2002, c. 32*, as amended.

Top Management – A person, or a group of people at the highest management level within the municipality and its operating authority; which makes decisions about the QMS and makes recommendations about the subject system.

Ownership and Operation

The Municipality of West Perth, as the Owner and Operating Authority of the Mitchell Drinking Water System, is required to attain conformance to the Drinking Water Quality Management Standard developed by the Ministry through the Drinking Water Licensing Program. This Operational Plan has been developed to represent the Operating Authority's Quality Management System (QMS) that conforms to the Drinking Water Quality Management Standard.

Element 1. Quality Management System (QMS)

This Operational Plan describes the contents of the Drinking Water Quality Management System for the Mitchell Drinking Water System. The contents of this Operational Plan are based upon the requirements of the *Drinking Water Quality Management Standard Version 2.0 (February 2017)*.

This Operational Plan has been reviewed and approved by the Owner.

Element 2. QMS Policy

The QMS Policy is in place and is as follows:

The Municipality of West Perth, is committed to supplying a safe, consistent drinking water supply while maintaining strict adherence to all applicable legislative and regulatory requirements. We strive to achieve these goals through the implementation of a management system comprised of policies, procedures, instructions and forms that demonstrate risk-based treatment process, evaluation, staff competency, open communication, workplace safety, and appropriate contingency/emergency response procedures.

The Municipality of West Perth is committed to:

- Managing and operating the drinking water system in a responsible manner in accordance with documented quality management policies and procedures
- Providing the customer with clean, safe drinking water
- Maintaining and continually improving the quality management system
- Complying with applicable regulations and legislation

The Municipality and its Operating Authority is committed to accomplishing our common goals through the dedication, support and participation of all, and through the maintenance and continual improvement of the Quality Management System.

Communication of the QMS Policy is described in the Communications Procedure (WP-ADMIN-1200).

The QMS Policy is posted in the Mitchell Water Distribution facilities and a copy is posted on the Municipality's website (Appendix A).

Element 3. Commitment & Endorsement

This Operational Plan has been reviewed and endorsed by the Municipality as Owner and Operating Authority. The signatures of the Mayor on behalf of the Owner and the Chief Administrative Officer on behalf of the Operating Authority below commits to ensuring that the Quality Management System is regularly assessed to confirm its ongoing applicability and relevance.

April 11, 2016

Date

Walter McKenzie

Mayor Walter McKenzie

April 11, 2016

Date

Jeff Brick

CAO Jeff Brick

Owner endorsement is shown by municipal council resolution (Appendix B).

Top Management will ensure the Operating Authority is aware of all applicable legislative and regulatory requirements. Top Management will ensure that a QMS is in place that meets the requirements of the Standard, and that the QMS is communicated by following the Communication Procedure.

Top Management will determine, obtain or provide the resources needed to maintain and improve the QMS, as demonstrated through records created under the QMS, and through the Management Review Process. The Review and Provision of Infrastructure Procedure describes how a need for resources may be identified, documented, and followed through.

Controlled copies of the related procedures are located on the G:\Environmental Services\Water\DWQMS\DWQMS current folder of the Municipality of West Perth central server located at Town Hall.

WP-ADMIN-1200	Communication Procedure
WP-ADMIN-1400	Review and Provision of Infrastructure Procedure
WP-ADMIN-2000	Management Review Procedure

Element 4. QMS Representative

The QMS representative is the Environmental Services Coordinator. Top Management appoints and authorizes the QMS representative with the responsibility and authority to:

- Administer the QMS by ensuring that processes and procedures needed for the QMS are established and maintained,
- Report to Top Management on the performance of the QMS and any need for improvement,
- Ensure that current versions of documents required by the QMS are being used at all times,

- Ensure that all personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the Mitchell Drinking Water System and;
- Promote the awareness of the QMS throughout the Operating Authority.

Element 5. Document and Records Control

Procedures are in place for QMS Document Control and Record Control. These procedures describe how and what documents and records are controlled.

WP-ADMIN-500 Document Control Procedure

WP-ADMIN-510 Record Control Procedure

Element 6. Drinking-Water System

The Mitchell Drinking Water System is a Class II Distribution and Supply sub-system owned and operated by the Municipality of West Perth. The system consists of four drilled groundwater wells.

Well #1, contained within Well-house #1, is 23.2m deep and has a 200mm steel liner inserted into the original 305mm well casing. Raw water from this well is pumped through piping past Well-house #2 where, when required, it is combined with raw water from Well #2 and directed to Distribution Center 123.

Well #2 is 30.2m deep and has a 200mm steel liner inserted into the original 305mm well casing. Raw water is combined with raw water from Well #1 when required and directed to Distribution Center 123.

Well #3 is the main well for Distribution Center 123. The well is 54.7m deep with a 200mm steel liner inserted into the original 305mm well casing. Water from this well is conveyed through piping to Distribution Center 123.

Well #4, located within Distribution Center 4, was drilled to a final depth of 71.6m with a 300mm steel casing. Raw water from this well is treated within Distribution Center 4.

Raw water from all four wells is typically free from any bacteriological activity. The water is hard and naturally has elevated levels of fluoride. The turbidity of the raw water ranges from 0 - 1 NTU.

For annual average water flows from each well, refer to current water system annual report.

Other than the normal increase in usage during the summer months, there are no major operational challenges due to event-driven fluctuations.

Distribution Center 123 is located on the west side of St. George St. The storage reservoir is located adjacent to the eastern limit of the plant. It has a baffled section with a capacity of 155m³ and an unbaffled section with a capacity of 243m³. Raw water from the wells 1, 2 and 3 is conveyed into the plant, after which treatment chemicals are injected; sodium silicate for iron sequestering, and sodium hypochlorite for disinfection. The treated water is directed into the reservoir for contact time and then through the high lift pumps into the distribution system. The disinfection system at Distribution Center 123 has been designed with backup chemical pumps.

Distribution Center 4 is located near the NW corner of Arthur and Herbert streets. The plant includes a disinfection system and a 305m³ baffled, below grade reservoir. Disinfection is achieved using liquid sodium hypochlorite. Sodium silicate is injected for iron sequestering. As in Distribution Center 123, the treated water is directed into the reservoir for contact time and then through the high lift pumps into the distribution system. The disinfection system at Distribution Center 4 has been designed with backup chemical pumps.

The Mitchell Standpipe is located at 97 Arthur Street. It is approximately 46m high and approximately 11m wide. The standpipe control building houses a series of water pipes and valves used to regulate the level of the standpipe. A diesel-powered fire pump is also connected to the piping system.

The Mitchell Water Tower is located at 125 Clarke Street. It is approximately 41m high and has a capacity of 1,000 m³. The control room has pipes and valves, level and flow monitoring equipment, and re-chlorination equipment.

The works currently service a population of approximately 4,000. There is approximately 42 km of distribution piping of various diameters and materials contained within the Mitchell Drinking Water System (see Watermain Plan Inventory drawing in Appendix C). There are approximately 1950 service connections and 233 fire hydrants. Flow varies across the grid, with lower flow volumes in the most remote and dead-end parts of the grid. Pressure within the distribution system is maintained by the level of the standpipe and water tower. If required the distribution system pressure can be controlled by the high lift pump at Distribution Center 4.

For the process diagram for the Mitchell well supply system, refer to Appendix C.

Element 7. Risk Assessment

The procedure entitled Risk Assessment describes the method of hazard identification, risk assessment, and critical control point determination for the Mitchell Drinking Water System.

WP-ADMIN-700 Risk Assessment Procedure

Element 8. Risk Assessment Outcomes

The results of the Risk Assessment are documented in the Risk Assessment spreadsheet.

Controlled conditions for each Critical Control Point (CCP) identified in the Risk Assessment spreadsheet are described in detail in the CCP procedures.

Risk Assessment Spreadsheet Mitchell Drinking Water System
(Appendix D)

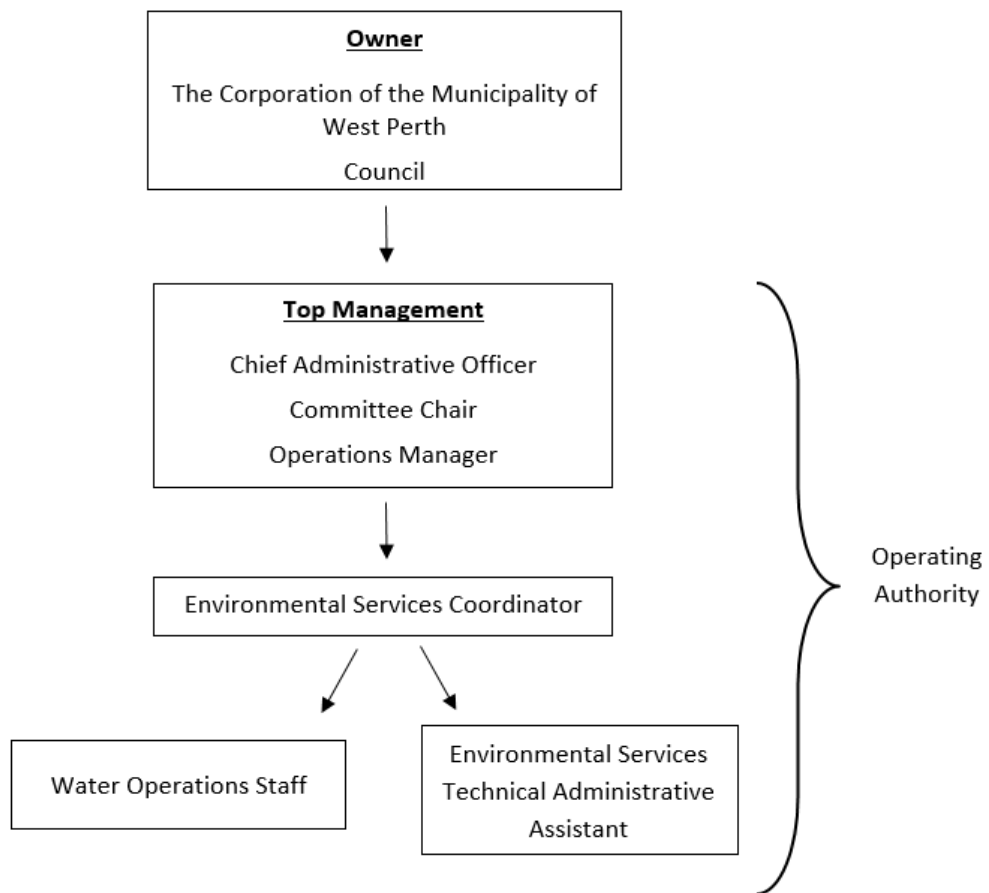
CCP Procedures Designated by a "WP-CCP" prefix in their title

Element 9. Organizational Structure, Roles, Responsibilities & Authorities

The organizational structure, roles, responsibilities and authorities for the Owner, oversight Operating Authority roles, and Top Management are described in the Organizational Structure, Roles, Responsibilities & Authorities Procedure.



QMS Organizational Chart The Municipality of West Perth



WP-ADMIN-900 Organizational Structure, Roles, Responsibilities & Authorities Procedure

Element 10. Competencies

The Competencies Procedure describes how competencies are identified, developed, maintained, and documented. It also describes activities to ensure personnel are aware of the relevance of their duties and how they affect safe drinking water.

WP-ADMIN-1000 Competencies

Element 11. Personnel Coverage

The method to ensure sufficient personnel coverage at all sites is documented in the procedure:

WP-ADMIN-1100 Personnel Coverage

Element 12. Communications

The Communications Procedure describes how the QMS is communicated between Top Management and the Operating Authority personnel, suppliers, and the public.

WP-ADMIN-1200 Communications Procedure

Element 13. Essential Supplies & Services

A list of all supplies and services deemed essential to the delivery of safe drinking water can be found in WP-ADMIN-1300. The list typically includes a primary and a secondary supplier to ensure the procurement of essential and critical supplies and services. Standard order quantities and order set points may also be included.

Where applicable, supplies must meet NSF and ANSI standards. Supplies are verified against the order requisition when received. In the case of any discrepancies, the delivery may not be accepted. Integrity of the supplies is also checked at time of delivery.

WP-ADMIN-1300 Essential Supplies and Services

Element 14. Review & Provision of Infrastructure

A procedure has been created to review the adequacy of infrastructure and the resources necessary to operate and maintain the drinking water system safely and effectively.

WP-ADMIN-1400 Review and Provision of Infrastructure

Element 15. Infrastructure Maintenance, Rehabilitation & Renewal

Infrastructure maintenance, rehabilitation, and renewal are addressed by the following:

Planned Maintenance: Planned maintenance is set up by the Operations Staff when possible. Equipment and tasks are scheduled in the computerized maintenance management system (CMMS). Scheduled tasks are typically defined by manufacturer's literature when available and

revised (or created) as needed according to operator experience/observations. Planned maintenance tasks will be communicated via work orders to the operators. Completed tasks are closed out by the operator in the CMMS.

The Operations Manual details scheduled maintenance and maintenance programs regarding drinking water infrastructure.

Unplanned Maintenance: Unplanned maintenance tasks result from equipment malfunction or breakage.

Major and minor unplanned maintenance events are addressed by the Operations Staff. The Operator In Charge typically responds to unplanned maintenance during normal working hours while the on-call operator responds during off-hours. Documentation of unplanned maintenance tasks is recorded in the logbooks and can also be recorded in the CMMS.

Measures to prepare for and expedite unplanned maintenance include equipment redundancy (back-up units), spare parts inventory, as well as documented repair and safety procedures.

Rehabilitation/Renewal/Capital Upgrades: Replacement of aging fixed heavy equipment, as well as upgrades, expansions, and in-ground system improvements are planned by the Owner, Operations Manager, Environmental Services Coordinator in discussion with the Water Operations staff. The Owner is ultimately responsible for all rehabilitation/renewal items and capital upgrades. These are reviewed during pre-budget planning and in the annual management review. Future upgrades are documented in the running Water Works Infrastructure Upgrades Spreadsheet.

Monitoring Maintenance Effectiveness: The effectiveness of the maintenance program is tracked by a computerized maintenance management system (CMMS). The CMMS tracks when equipment is down due to failure. Equipment that is out of service for maintenance is not considered down due to failure.

Element 16. Sampling, Testing & Monitoring

Please refer to WP-ADMIN-1600 for the Sampling, Testing and Monitoring procedure.

WP-ADMIN-1600 Sampling, Testing & Monitoring

Element 17. Measurement & Recording Equipment Calibration & Maintenance

Methods of measurement and recording equipment calibration and maintenance are described in detail in the procedure WP-ADMIN-1700 Measurement & Recording Equipment Calibration & Maintenance.

WP-ADMIN-1700 Measurement & Recording Equipment Calibration & Maintenance

Element 18. Emergency Management

Please refer to procedure WP-ADMIN-1800 for Emergency Management.

WP-ADMIN-1800 Emergency Management

Appendix E Emergency Contact List

Element 19. Internal Audits

The Internal Audit Procedure WP-ADMIN-1900 describes how conformity of the QMS is evaluated on an annual basis. The procedure describes how audit criteria, frequency, scope, methodology and records are identified. It also describes how corrective actions are initiated as a result of an internal audit and provides references to the Continual Improvement.

WP-ADMIN-1900 Internal Audit

WP-ADMIN-1910 Internal Audit Checklist

WP-ADMIN-1920 Continual Improvement

Appendix H Continual Improvement Tracking Spreadsheet

Element 20. Management Review

The Management Review Procedure describes the procedure for management review, including instructions related to all of the required inputs to the meeting. The procedure also describes how Top Management considers results, identifies deficiencies, and records and forwards results to other key personnel.

WP-ADMIN-2000 Management Review Procedure

WP-ADMIN-2010 Management Review Checklist

Element 21. Continual Improvement

The Operating Authority and Owner of the Mitchell Drinking Water System strive to continually improve the Quality Management System through the use of the QMS Policy, Internal Audits, Corrective Actions, Preventative Actions, Management Review, and the Analysis of Process Data.

Once a year the Operating Authority conducts a tabletop exercise where emergency preparedness and processes are tested.

WP-ADMIN-1920 describes how QMS-related corrective and preventative actions are documented, and how steps are followed when implementing those actions. The Continual Improvement Tracking Spreadsheet is used to track and measure continual improvement efforts.

WP-ADMIN-1920 Continual Improvement

Appendix H Continual Improvement Tracking Spreadsheet

Table of Revisions

<i>Date (dd-mmm-yy)</i>	<i>Description of Revision</i>
02-Dec-21	Removed reference to <i>WP-ADMIN-1920</i> , updated <i>Element 15</i> . v17.0
14-Dec-21	Updates to <i>Element 6</i> and <i>Element 15</i> . v18.0
17-Nov-22	Added <i>Calendar Year</i> definition, modified <i>Preventative Action</i> definition, removed <i>primary</i> from D4 description. v19.0