



# Corporation of the City of Sarnia

## OPERATIONAL PLAN

### Sarnia Distribution System

Version 2.8 – January 2025

Drinking Water System Number: 260003136

Municipal Drinking Water License Number: 037-101

Drinking Water Works Permit Number: 037-201



## Corporation of the City of Sarnia Sarnia Water Distribution System OPERATIONAL PLAN

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### Sarnia Water Distribution

Owner: Corporation of the City of Sarnia  
Operating Authority: Sarnia Public Works Division

This Operational Plan commits the City of Sarnia, as Owner of the Sarnia Water Distribution System to the implementation of the Drinking Water Quality Management System (DWQMS) through the Operating Authority designated as Sarnia Public Works Division.

**OPERATIONAL PLAN REVISION HISTORY**

<b>Date</b>	<b>Revision</b>	<b>Description of Revision</b>	<b>Developed / Approved by</b>
21 January 2009	Draft	Operational Plan Submitted for council endorsement	DWQMS Team
04 February 2009	NEW	Operational Plan submission for initial Municipal Drinking-Water License.	DWQMS Team
15 Oct 2010	1.0	Operational Plan Update for submission of Full - integration of CARs CGSB 0030 Element #3 & 0031 Element #6 - occurrences of QMS changed to DWQMS to reflect correct procedure nomenclature Element 15 – Level 2 Procedure correction - renamed to Element 14	S. Bottomley
10 Jan 2011	1.1	Operational Plan System change QMS Element #6 – Listing of: Drinking Water Systems Associated with the Sarnia Water Distribution System (SWDS) change in operating contact for Petrolia Water Treatment Plant	S. Bottomley
Oct 2012	1.2	Revision of CGSB CARs	S. Bottomley
May 2013	1.3	Removal of CGSB CARS General Review.	S. Bottomley
Aug 22, 2013	1.3a	Review and incorporation of CARs from External Audit Element 7- Risk Assessment add meeting review for new Risks Element 21 Continual Improvement – Tracking	S. Bottomley
January 21 2014	1.3b	Element 6 – Description updated to include change in supply from St. Clair	S. Bottomley
Apr 22 2014	1.4	Operational Plan Review and submission to MOE for licence renewal Element 3 – Re-issue of commitment and endorsement due to staffing changes Element 6 - Revision of System description due to recent changes in system feeds	S. Bottomley / DWQMS team
15 MAY 2014	1.5	Operational Plan Review and update for annual review Element 2 – include the word maintain in the policy statement Element 3 – revision of statement to ensure written endorsement reviewed. Element 4 – DWQMS Rep description updated. Element 5 – Addition of list of Docs and Records specified as controlled Element 6 – reference to GIS Element 18 – add statement Sarnia Emergency Management ...	S. Bottomley / DWQMS team
23 Aug 2016	1.6	Change to Element 6 – Drinking Water Description – (St. Clair updated connection 28 July 2016) Element 13 – Essential Supplies and Services Change Rental of Construction & Maintenance Equipment Manual to Contractor Services Book	DWQMS Rep
22 May 2017	1.7	Element 13 – Identified reference responsibility for update and residence.	DWQMS rep

14 May 2018	1.8	Element 9 – Change title of “City Engineer” to “Director of Engineering Update to Element 12 re Flow of information Top Management to Owner and Management Review incorporation into monthly Water Meetings	
2 Oct 2019	1.9	Element 3 – revision of statement to reflect updating written endorsement to – every new council and changes in top management Element 7 – Added the MCEP’s “Potential Hazardous events for Municipal Residential Water Systems “ Element 20 – revised from “at least once every 12 months” to ‘At least once per calendar year’ Element 21 – revised to reflect DWQMS 2017	DWQMS rep
5 Nov 2019	2.0	Element #4 – Changed – Environmental Compliance Officer to Environmental Compliance Coordinator Element #19 – Updated internal audit procedure to reflect schedule of “once per calendar year” Element #14 updated to reflect changes in DWQMS 2017 v 2.0	DWQMS rep
27 Oct 2020	2.1	Element #6 – Added in that Lambton Area Water Supply residual chlorination provides secondary disinfection. Element #7 – changed wording from “three years” to “thirty-six months” as worded in the DWQMS standard. Element #21 – changed to reflect that Best Management Practices are considered at least once every thirty-six months	DWQMS rep
27 Aug 2021	2.2	Added to Cover page Version number, Drinking Water System number, Municipal Drinking Water License number, Drinking Water Works Permit number	DWQMS rep
2 Nov 2021	2.3	Element #4 – Added to point (1) Ensure that current versions of documents required by the DWQMS are being used at all times.	DWQMS rep
2 Nov 2021	2.3	Element #13 – Added into associated documents the Emergency Contact list #012-4444E	DWQMS rep
22 June 2022	2.4	Element #7 – Risk assessment and Risk Assessment Outcomes - Risk ranking was revised to include a “medium” risk category	DWQMS Team
19 December 2023	2.5	Element #14 – Review and provision of infrastructure – added definition and revised procedure	H. Majovsky
16 April 2024	2.6	Element #21 –Continual Improvement - Revised procedure to synchronize with implementation of NEW Continual Improvement Form and Spreadsheet.	H. Majovsky
10 January 2025	2.7	Element #13 Essential Supplies and Services – updated associated document as well as included reference to third party sampling, calibration, laboratory services and chemical requirements. Element #17 Calibration – Included reference to Hach calibration services.	H. Majovsky
29 January 2025	2.8	Element #13 Essential Supplies and Services – updated Essential Supplies and Services document name to “PW-DWQMS-01-013 - Essential Supplies and Services”	H. Majovsky

## **Corporation of the City of Sarnia – Public Works Division Drinking Water Quality Management System (DWQMS) Policy**

The Corporation of the City of Sarnia, as Owner and Sarnia Public Works Division as Operating Authority, its' management and staff are committed to the principles and objectives set out in our Drinking Water Quality Management System (DWQMS) Policy.

### **Policy**

Sarnia Public Works Division, on behalf of the Corporation of the City of Sarnia, is committed to supplying a safe consistent, drinking water supply to the consumer by maintaining strict adherence to all applicable legislative and regulatory requirements.

We strive to achieve these goals through the implementation of a quality management system (DWQMS).

Our management and staff will act to ensure the implementation of this Policy and will maintain, monitor and continually improve the progress of the DWQMS.

## **DWQMS Element #3 - Commitment & Endorsement of Corporation of the City of Sarnia DWQMS & Operational Plan**

### **Purpose:**

To communicate the Owner and Top Management's commitment to and endorsement of the Quality Management System described in this Operational Plan.

### **Scope:**

Commitment & Endorsement refers to the Quality Management System as described in the Operational Plan, for the Sarnia Water Distribution System of the City of Sarnia.

### **Definitions:**

Not Applicable

The Corporation of the City of Sarnia is both Owner and Operating Authority (Public Works Division is designated as the Operating Authority for the purposes of the DWQMS) of the Sarnia Water Distribution System.

The City of Sarnia is committed to ensuring that a Quality Management System is developed and implemented according to the requirements of the Drinking Water Quality Management Standard (DWQMS).

The Corporation will support the implementation, maintenance and continual improvement of the Drinking Water Quality Management System, as documented in this Operational Plan. Commitment and Endorsement of the Operational Plan by the Owner (represented by the Mayor and City Manager) and Top management (represented by the Director of Engineering, the Operations Manager and the Public Works Superintendent) acknowledges the need and supports the provision of sufficient resources to maintain and continually improve the DWQMS.

Written endorsement by the Representative of Council of the Corporation of the City of Sarnia and its Top Management is in the form of a signed Commitment and Endorsement and contained herein and posted in the front lobby of the Sarnia Public Works Division and Operations Manuals. To promote awareness and understanding of the DWQMS, this written endorsement of the Operational Plan will be communicated to relevant parties according to the Communications Procedure. Review of written endorsement shall occur to ensure positions of owner and operating authority remain current. Written endorsement should be reviewed and updated with each new council and/or with changes to top management.

### **Associated Documents:**

Signed Commitment and Endorsement (see following page)

### **Reference:**

Ministry of the Environment - Drinking Water Quality Management Standard (DWQMS)  
DWQMS Element # 1 and # 3

Place holder here

## **DWQMS Element #4 - Quality Management System Representative**

All personnel within the Sarnia Drinking Water System have a role and associated responsibilities within Sarnia Public Works Division's DWQMS.

The role of the DWQMS Representative for the Sarnia Water Distribution is fulfilled by the Public Works Environmental Compliance Coordinator for establishing and maintaining and communicating all policies, processes and procedures required for the overall administration of the City's DWQMS.

The QMS Representative has the following responsibilities

1. Develop and implement procedures, process, programs and timelines for the continual development and improvement of the DWQMS.

- Conduct an annual review and update of the Operational Plan and all procedures;
- Conduct internal audits; and,
- Utilize non-conformance corrective actions and action item requests for continual improvement.
- Ensure that current versions of documents required by the DWQMS are being used at all times.

2. Maintain DWQMS

- Communicate track and update of DWQMS occurs with and between top management and the operators.
- Follow the QMS Schedule to meet timeline requirements;
- Conduct an annual review and update of the Operational Plan and all procedures;
- Conduct internal audits and participate in external audits; and,
- Utilize non-conformance corrective actions and action item requests for continual improvement.

3. Communicate. Report on the effectiveness of the QMS to Top Management through:

- Internal audits;
- External audits; and,
- Management review.
- Communicate the QMS throughout the water distribution system:
  - The QMS policy is posted at the Public Works Office and on the City's website;
  - DWQMS updates are provided at the regular water meetings;
  - QMS update presentations are given to relevant staff after the Operational Plan and/or associated procedures have been updated; and,
  - Relevant QMS information is communicated to the Owner, as per DWQMS Procedure – Communication.



## DWQMS Element #5 - Document and Records Control

### Purpose:

To ensure that all DWQMS related documents and records are maintained and controlled according to established protocols and procedures.

### Scope:

Documents and records, as specified by the Operating Authority through the Document and Record Control procedures, including internal and externally generated documents and records. DWQMS related documents and records are those as per required for compliance to this Operational Plan.

### Definitions:

- |           |  |
|-----------|--|
| Documents | -Policies, System level Documents, Standard Operating Procedures, Work Instructions, Forms, and Regulations  |
| Records   | - Any documents that contain recorded data such as inspection sheets, time logs, training records, meeting minutes, internal auditing results, work orders, etc. |

### Description:

A procedure has been established to describe the methods and activities for ensuring that documents and records are properly:

1. Identified
2. Stored
3. Protected
4. Retained
5. Disposed/Discarded

The Documents and Records maintained and controlled are listed below:

- Operational Plan;
- DWQMS Procedures;
- Standard Operating Procedures;
- Forms;
- Records (including the Risk Assessment Table and training records);
- Templates;
- Equipment Manuals;
- Training Materials;
- Applicable Regulations; and,
- Distribution Drawings.

### Associated Documents:

*PW – DWQMS – 01 – 005.1– Control of Documents*

*PW – DWQMS – 01 – 005.2 – Control of Records*

### Reference:

Not Applicable

## DWQMS Element #6 - Drinking-Water System Description

The Sarnia Water Distribution System (SDWS) services approximately 25,000 customers through water mains ranging in diameter from 50mm to 600mm.

There are no storage or booster pumps within the SDWS, and secondary disinfection is achieved by the Lambton Area Water Supply's (LAWWS) chlorine residual.

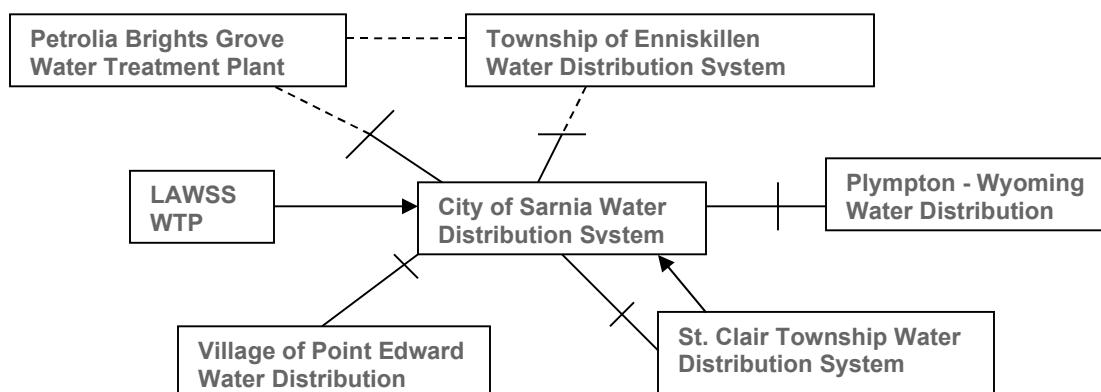
Sarnia Distribution System Assets are tracked in GIS in visual format. Data for the GIS is stored on the City of Sarnia server and protected via back up. This data is provided for access by all Engineering staff for reference. Data is transferred at least annually from field data as per Procedure PW-DWQMS-02-05-01

### Source Water

Water for the Sarnia Water Distribution System is supplied, in whole, by the Lambton Area Water Supply System (LAWSS) which is situated in the City of Sarnia on the southern tip of Lake Huron at the headwaters of the St. Clair River.

Note:

### Sarnia Process Flow Chart



Source water LAWSS WTP —

Source water Petrolia Bright's Grove WTP.....

### Connections to Other Drinking-Water Systems

#### *Petrolia – Brights Grove Water Treatment Plant*

The Sarnia Water Distribution System is connected to the Town of Petrolia Water Distribution System and the Enniskillen Township Water Distribution System. The Town of Petrolia supplies both systems from the Petrolia Bright's Grove

Water Treatment Plant. These inter-connection are through closed valves and serves as emergency preparedness only.

Connection Locations and Descriptions to Petrolia source waters:

- Enniskillen – Telfer & Churchill - Closed Valve
- Petrolia Brights Grove WTP – Maundamin north of Michigan Ave - Closed Valve

### *Lambton Area Water Supply System Treatment Plant*

Intra connections with drinking water systems supplied by LAWSS  
Connections also exist between the Plympton – Wyoming Water Distribution System, Pt. Edward Distribution System and the St. Clair Water Distribution System. These three systems share LAWSS as their source of water supply. These inter-connections are through closed valves and serve as emergency preparedness only.

Connection Locations and Descriptions from LAWSS source waters:

- Pt. Edward Distribution System:
  - Sandy lane – closed valve for emergency feed to Pt. Edward if required
- Plympton- Wyoming Distribution System:
  - Confederation and Mandaumin – closed valve for emergency feed to Plympton-Wyoming if required
- St. Clair Township Distribution System:
  - LaSalle and Tashmoo – backflow and meter was installed to supplement distribution system to ensure proper fire flow (2013)
  - LaSalle and River Road – backflow and meter was installed to supplement distribution system to ensure proper fire flow (2013)
  - LaSalle and Vidal – closed valve for emergency connection
  - Plank Rd at city limits – open connection to keep residual within acceptable range due to previous dead end. (connection upgrade in 2016)

Note: The source water for both water treatment plants is Lake Huron.

### **Upstream and Downstream Processes Outside of SDWS Control**

Water supplied to major water users flows through backflow preventers to protect the Sarnia Water Distribution System from downstream activities. Water quality within the system is sampled, tested and monitored in accordance with the sampling testing and monitoring procedure found in Element 16.

### **Monitoring and Management**

Flows entering the Sarnia Water Distribution System, and all other systems serviced by LAWSS, are metered. Similarly, all residential, commercial and industrial water users

within the Sarnia Water Distribution System are metered. The City's water losses are established using LAWSS' total pumpage and deducting all other municipalities' figures, with an assumed allowance for their losses, and deducting the City's metered usage and estimated non-metered usage (i.e. fire protection, main breaks, etc).

Operating pressures within the Sarnia Water Distribution System range from 480 kPa (70 psi) to 415 kPa (60 psi) with typical pressure at approximately 448 kPa (65 psi).

**QMS Element #6 –Listing of: Drinking Water Systems Associated with the Sarnia Water Distribution System (SWDS)**

Distribution System / DWS Number	Drinking Water Supplied by:	Emergency Connection with SWDS	Owner	Operating Authority	Plant Address	Telephone Number
City of Sarnia Water Distribution System / 260003136	LAWSS		City of Sarnia	City of Sarnia – Public Works	651 Devine Street Sarnia, ON N7T 1W9	519-344-1932 fx 519-332-3020
Village of Point Edward Water Distribution System / 21000924	LAWSS	YES	Village of Point Edward	Village of Point Edward	135 Kendall Street Point Edward, ON N7V 4G6	Tel. 519 337-3021 Fax: 519 337-5963
St. Clair Township Water Distribution System / 260006464	LAWSS	YES	Township of St. Clair	Township of St. Clair	1155 Emily Street Mooretown, ON N0N 1M0	Tel. 519 867-2021 Fax: 519 867-5509
Township of Plympton-Wyoming Water Distribution System / 260006594	LAWSS	YES	Township of Plympton-Wyoming	Township of Plympton-Wyoming	546 Niagara Street, Box 250 Wyoming, ON N0N 1T0	Tel. 519 845-3939 Fax: 519 845-0597
Warwick-Watford Water Distribution System / 260001799	LAWSS	NO	Township of Warwick	Township of Warwick	6332 Nauvoo Road RR 8 Watford, ON N0M 2S0	Tel. 519 849-3926 Fax: 519 849-6136
Enniskillen Water Distribution System / 220004377	(TPBGWTP)	YES	Township of Enniskillen	Township of Enniskillen	4465 Rokeby Line RR 1 Petrolia, ON N0N 1R0	Tel. 519 882-2490 Pager: 519-339-8128 Fax: 519 882-3335
Town Of Petrolia Water Distribution System / 220002903	(TPBGWTP)	YES	Town Of Petrolia	Town Of Petrolia	411 Greenfield Street, Box 1270 Petrolia, ON N0N 1R0	Tel. 519 882-2350 Fax: 519 882-3373
Lambton Shores Water Distribution System / 260006594	LAWSS	NO	Municipality of Lambton Shores	OMI	7883 Amtelecom Parkway Forest, ON N0N 1J0	Tel. 519 786-2335 Fax: 519 786-2135
Community of Alvinston Water Distribution System / 260040170	LAWSS	NO	Township of Brooke-Alvinston	Ontario Clean Water Agency	3236 River Street, Box 28 Alvinston, ON N0N 1A0	Tel. 519 898-2173 Fax: 519 898-5653
Treatment System			Owner	Operating Authority		
Town Of Petrolia, (Bright's Grove) Water Treatment Plant (TPBGWTP) /	N/A	Emergency Connection	Town Of Petrolia	Ontario Clean Water Agency	2701 Lakeshore Road Bright's Grove, ON N0N 1C0	Tel. 519 869-4011 Fax: 519 869-4796 Pager: 519-383-5800
Lambton Area Water Supply System (LAWSS) / 210000906	N/A	SUPPLIER OF ALL TREATED WATER	Lambton Area Water Supply System	Ontario Clean Water Agency	1215 Fort Street Sarnia, ON N7V 1M1	519 344-7429

**QMS Element #6 –Listing of: Locations of Drinking Water Systems with Emergency Connections with the Sarnia Water Distribution System (SWDS)**

<b>Distribution System / DWS Number</b>	<b>Drinking Water Supplied by:</b>	<b>Emergency Connection with SWDS</b>	<b>Location of Emergency Connection</b>
City of Sarnia Water Distribution System / 260003136	LAWSS		
Village of Point Edward Water Distribution System / 21000924	LAWSS	YES	1. Sandy Lane – 250 meters north of Ernest St.
St. Clair Township Water Distribution System / 260006464	LAWSS	YES	1. Tashmoo Av at LaSalle Line 2. 1715 Plank Rd 3. Vidal St at LaSalle Line 4. LaSalle and River Road
Township of Plympton-Wyoming Water Distribution System / 260006594	LAWSS	YES	1. Confederation Street & Mandaumin Rd
Warwick-Watford Water Distribution System / 260001799	LAWSS	NO	n/a
Enniskillen Water Distribution System / 220004377	(TPBGWTP)	YES	1. Telfer Rd & Churchill Line
Town Of Petrolia Water Distribution System / 220002903	(TPBGWTP)	YES	1. 0.5 kilometers north of Michigan Ave on Mandaumin Rd
Lambton Shores Water Distribution System / 260006594	LAWSS	NO	n/a
Community of Alvinston Water Distribution System / 260040170	LAWSS	NO	n/a
<b>Treatment System</b>			
Town Of Petrolia, (Bright's Grove) Water Treatment Plant (TPBGWTP) /	N/A	Emergency Connections	
Lambton Area Water Supply System (LAWSS) / 210000906	N/A	SUPPLIER OF ALL TREATED WATER	

## **Source Waters for Sarnia Water Distribution System:**

### ***Lambton Area Water Supply System - Water Treatment Plant:***

The Lambton Area Water Supply System (LAWSS) is a direct filtration facility with a maximum rated capacity of 181,844m<sup>3</sup>. The Water Treatment Plant uses chemically assisted filtration with disinfection.

The facility consists of an intake system a low lift pumping system, a treatment system and distribution pumping system that supplies water to the above listed drinking water systems. Water is drawn into the plant (a zebra mussel chemical control system is available as needed) via a 1675mm intake pipe, located approx. 100 m into the St. Clair River at a depth of 15 m and screened at the surge wells (pre-disinfection is utilized). Water flows to the Low Lift pump wet wells where a total of 4 vertical turbine pumps are located and used as needed which pump to a common discharge header. Here, coagulant is added, flashed mixed (PAC is also applied at this location when needed for taste and odour ) The raw water is then flocculated (Polymer is added at the flocculation trains when needed) and diverted to filtration (10 dual media filters). The gravity fed filter effluents combine into two clearwells where sodium hypochlorite is injected. To maximize the contact time, the treated water is diverted to the two baffled reservoirs (in series) and fluoridated upon exiting the reservoir(s). Six vertical turbine pumps are available for supplying the distribution demand as needed. The water treatment process and distribution components are controlled by a dedicated SCADA computer system and monitored by certified operators 24 hours a day. Should a power failure occur, generators are available to permit the treatment plant to remain in operation.

The utility serves a large part of Lambton County and has over 250 kilometres of pipeline of various sizes and materials. The LAWSS distribution system has three standpipes and one elevated tower. There is also the East Lambton Booster Station with 9,000 m<sup>3</sup> of storage and a pumping station (West Lambton Pumping Station), with water storage of 90,000m<sup>3</sup>. The pumping/booster station(s) are controlled and monitored from the Lambton WTP via SCADA.

Emergency Water Line connections exist between LAWSS and the following drinking water systems:

Chatham-Kent: A connection at Whitebread Line and Hwy #40

Petrolia: Confederation Line and Ploughing Match Rd.

Grand Bend: Lakeshore Rd. & NW corner of Ipperwash Rd.

Source Water: \*\*Closed Emergency Connection Only

***The Town Of Petrolia, (Bright's Grove) Water Treatment Plant (WTP)***

The Petrolia WTP is located in the City of Sarnia at Bright's Grove, approximately 20 km from the Town of Petrolia. The municipal street address of the plant is 2701 Lakeshore Road.

The Petrolia Water Treatment Plant (WTP) currently supplies potable water to the Town of Petrolia and other service area municipalities including the Township of Enniskillen, Village of Oil Springs and Township of Dawn-Euphemia. The plant also supplies water to portions of Brooke-Alvinston, Sarnia, St. Clair and Plympton-Wyoming. The total population presently served by the Petrolia WTP is reported at 9639. (Note: Feed of Potable water to residents of Sarnia from this system is separate from the Sarnia distribution system)

The Petrolia WTP provides treatment for water drawn from Lake Huron. The main treatment processes in the plant in 2007 were membrane filtration, fluoridation and chlorination. The permitted capacity for the plant to take water from Lake Huron is 15,586 m<sup>3</sup>/d, although the plant is approved for a treatment capacity of 8000 m<sup>3</sup>/d for stage 1 & 12,000 m<sup>3</sup>/d for stage 2. From January 14th to January 18th, 2008, ninety additional modules were added evenly to the three membrane racks to bring the plant capacity to 12,000 m<sup>3</sup>/day or stage 2 flow.

Sarnia Distribution System

Asset management system under development

**Associated Documents:**

Not Applicable

**Reference:**

Not Applicable



## DWQMS Element # 7- Risk Assessment

### **Purpose:**

To describe the method for conducting a drinking water risk assessment to identify. Assess and where possible, mitigate and/or eliminate potential risks within the drinking water system in accordance with the DWQMS.

### **Scope:**

This plan and associated procedures apply to the drinking water distribution system.

The risk assessment process considers, but is not limited to, hazard categories such as:

- i. Biological
- ii. Chemical
- iii. Radiological

And also includes the MECP's "Potential Hazardous Events for Municipal Residential Drinking Water System"

### **Definitions:**

MCEP – Ministry of Environment, Conservation and Parks.

### **Description:**

A risk assessment team is established to collectively identify, assess, rank and prioritize potential drinking water related hazards and related risks. This risk assessment is conducted at least once every thirty-six months.

The Risk Assessment and Risk Assessment Outcome procedures describe in detail the methodologies and approaches taken to conduct these assessments and related activities.

The risk assessment team meets at least once per year to validate the risk assessments and their associated assumptions.

### **Associated Documents:**

*PW – DWQMS – 01 – 007 – Risk Assessment*

*PW – DWQMS – 01 – 007- a – Risk Assessment Table*

### **Reference:**

Not Applicable

## **DWQMS Element # 8 - Risk Assessment Outcomes**

### **Purpose:**

To describe the method for documenting outcomes of the risk assessment activities as per the Risk Assessment procedure

### **Scope:**

This plan and associated procedures apply to the risk assessments conducted as per Element 7 - Risk Assessments.

### **Definitions:**

Not Applicable

### **Description:**

The results of the risk assessments are documented and maintained. All identified risks, their assessed values, control measures, critical control points and associated control limits and responses to instances where control limits have been breached are within the outcome document.

### **Associated Documents:**

*PW – DWQMS – 01 – 007 – Risk Assessment and Risk Assessment Outcomes*

*PW – DWQMS – 01 – 007- b – Risk Assessment Outcomes Table*

### **Reference:**

Not Applicable

## DWQMS Element # 9 - Organizational Structure, Roles, Responsibilities, and Authorities

### Purpose:

To outline the organizational structure of the Sarnia Water Distribution System Operating Authority and associated departments, managers and owners as well as their associated roles, responsibilities and authorities that relate to the operation and performance of Its Drinking Water Quality Management System. (DWQMS)

### Scope:

This policy and associated procedures apply to all personnel of the Sarnia Water Distribution System Operating Authority and associated departments

### Definitions:

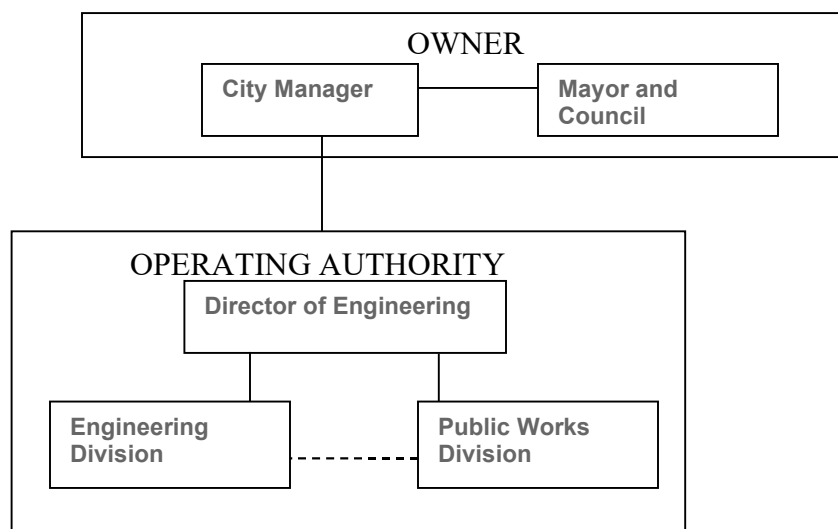
Not applicable

### Description:

The City of Sarnia is identified as the Owner of the Sarnia Drinking Water Distribution System and associated Drinking Water Quality Management System and has delegated authority to the Sarnia Public Works Division of the Engineering Department as the Operating Authority.

For the purpose of the DWQMS the following represent Top Management: Director of Engineering, Operations Manager – Public Works Division, Public Works Superintendent – Public Works Division

Roles and responsibilities of Sarnia Water Distribution System personnel, as related to the DWQMS, are summarized in the procedure for PW – DWQMS – 01 – 009 - Organizational Structure, roles, Responsibilities and Authorities.



**Associated Documents:**

*PW – DWQMS – 01 – 009 – Organizational Structure, Roles, Responsibilities and Authorities*

**Reference:**

Not Applicable

## **DWQMS Element # 10 - Competencies**

### **Purpose:**

To identify how the Sarnia Water Distribution System ensures that personnel whose roles and responsibilities are identified in the Operational Plan as affecting drinking water quality remain competent ensuring conformance to the Drinking Water Quality Management System Policy and Procedures.

### **Scope:**

This policy and associated procedures apply to the knowledge, skills and education of all personnel identified with a role within this Operational Plan in the Corporation of the City of Sarnia.

### **Definitions:**

Not applicable

### **Description:**

The Operating Authority meets and maintains competencies for personnel directly affecting drinking water quality and maintains records a training model to identify, provide and assess the knowledge, skills and abilities of personnel responsible for operating the drinking water system. The model outlines requirements by personnel positions to ensure competency within the Operating Authority and in conformance with this Operational Plan.

The ongoing maintenance of personnel competencies and training that demonstrates employee skills and knowledge will be recorded and tracked through use of documentation that supports the model and in accordance with the Document and Record Controls procedures.

### **Associated Documents:**

*PW – DWQMS – 01 – 010 – Competencies*

### **Reference:**

Operations Job Descriptions

## **DWQMS Element # 11 - Personnel Coverage**

**Purpose:** To identify how the Operating Authority ensures that competent individuals are available to fulfill the responsibilities needed for the ongoing operation of its Drinking Water Quality Management System.

**Scope:** This policy and associated procedures apply to all personnel of the Sarnia Water Distribution System Operating Authority and associated departments

**Definitions:**

Not Applicable

**Description:** The Operating Authority ensures that competent personnel are available at all times to fulfill duties that affect drinking water quality. The Division has developed a system in order to ensure that all positions are adequately supported.

The Operating Authority will ensure that all personnel included in the coverage schedules have the necessary skills and knowledge to perform the required responsibilities.

**Associated Documents:**

*PW-DWQMS-01-011-Personnel Coverage*

**Reference:**

Not applicable

## **DWQMS Element # 12 - Communications**

**Purpose:** To identify the process for communicating information related to the DWQMS Operational Plan to described internal and external parties and outline the method for receiving and processing related communication.

**Scope:** This policy and related procedures apply to all internal and external communication related to the Sarnia Water Distribution System Drinking Water Quality Management System.

This includes communications between top management and the owner, Sarnia Water Distribution System personnel, suppliers and the public.

**Definitions:**

Public – The consumers and stakeholders serviced by the Sarnia Water Distribution System.

**Description:**

Internal Communication

The DWQMS Operational Plan will be made available to all personnel of the Operating Authority and those with responsibilities within the Operational Plan. Access to the Plan will be provided through the intranet and the assigned printed Document Control Locations.

Training to ensure comprehension of the Operational Plan and subsequent changes is outlined in the Competencies procedure of this plan. New employees will receive training on the Operational Plan during orientation sessions.

Communication between the Operating Authority and the Owner will be managed by the be the responsibility of Top Management. Information documented as a result of Management Review Meetings will be forwarded to the Owner in the form of a formal reports derived from the conclusions that includes the details such as updates on progress and actions taken when required.

DWQMS – Water Meetings are held regularly for the Operating Authority to ensure communication of issues pertinent to the Sarnia Drinking water System are communicated throughout the Operating Authority. Management Review items are reviewed at these meetings at least once per year and Review of all Elements of DWQMS.

External Communication

The DWQMS Policy, the Drinking Water Works Permit, Drinking Water Municipal Licence and the Operational Plan Accreditation Certificate will be communicated to the public via the City of Sarnia website

**Associated Documents:** PW-DWQMS-01-012-Communications

**References:** Element #20 – Management Review



## **DWQMS Element # 13 - Essential Supplies and Services**

### **Purpose:**

To describe the approach taken by the Operating Authority to ensure that all supplies and services deemed essential for the delivery of safe drinking water and/or can affect drinking water quality are available and provided for when and where required.

### **Scope:**

This policy and associated procedures apply to all essential supplies and services pertaining to the Sarnia Water Distribution System Operating Authority and associated departments as identified within this procedure.

### **Definitions:**

Supplier – Externally or internally sourced vendors providing products or services, including sub-contracted services, related to drinking water safety and quality.

Supplies and Services – Externally supplied goods and services that are provided to the Operating Authority for the provision of drinking water.

### **Description:**

The list of Essential Supplies and Services describing and/or referencing methods is maintained by the Finance Department and listed below:

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

In addition to the list of Essential Supplies and Services, the Operating Authority is subject to the policies and procedures set forth in the City of Sarnia Purchasing Manual.

Calibrations are conducted by a qualified third-party provider. Qualifications of the service provider are verified during the procurement process. The service provider is responsible for providing a record/certificate of all calibrations conducted.

Third-party sampling is conducted by Ontario Clean Water Agency (OCWA) operators employed by the Lambton Area Water Supply System (LAWSS). Sampling staff require the minimum certification of Water Distribution Operator-in-training.

Chemicals purchased for use in the drinking water system must meet AWWA Standards and be ANSI/NSF certified as per the Municipal Drinking Water License (MDWL).

All third-party drinking water testing services are provided by accredited and licensed laboratories. The Ministry of Environment Conservation and Parks (MECP) has an agreement with The Canadian Association for Laboratory Accreditation (CALA) for accreditation of laboratories testing drinking water. The QMS Representative is

responsible for notifying the MECP of any change to the drinking water testing services being utilized.

**Associated Document:**

PW-DWQMS-01-013 - Essential Supplies and Services

**References:**

City of Sarnia Purchasing Manual (maintained by Purchasing)

Listing of All Purchasing P.O.s by Vendor (maintained by Purchasing)

Contractor Service Book (provided and maintained by Purchasing)

## **DWQMS Element # 14 - Review and Provision of Infrastructure**

**Purpose:** To describe the procedure used by the Sarnia Distribution System Operating Authority to review the adequacy of infrastructure necessary to ensure the ongoing supply of safe drinking water.

**Definitions:**

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, software and supporting services, such as transport or communication.

**Procedure:**

At least once per calendar year, Sarnia Engineering Division prepares capital and operational budgets and presents these to The City of Sarnia. Capital budget items are selected through risk-based decisions made by reviewing: the latest risk assessment outcomes; any issues related to the drinking water system's reliability and redundancy; infrastructure conditions (e.g. age, failure, material, sizing, etc.); and any long-term infrastructure and asset management plans available.

The prioritization of capital budget items is documented through Infrastructure Review Meeting minutes. The results are also considered during the Management Review process. Meeting minutes are then provided to the owner representative.

The program is reviewed with operating authority staff and presented to The City of Sarnia by the General Manager of Engineering during budget deliberations. Upon approval of the plan, the Manager begins the process of implementing the approved recommendations over the course of the fiscal year.

**Associated Document:**

*PW-DWQMS-01-07-Risk Assessments*

*PW-DWQMS-01-08 Risk Assessments Outcomes*

*Procedure – DWQMS-01-007- Risk Assessments and Risk Assessments Outcomes*

*Procedure-DWQMS-01-007a – Risk Assessment Table*

*Procedure – DWQMS-01-014- Review and Provision of Infrastructure Meeting Template*

**References:**

Not Applicable

## **DWQMS Element # 15 - Infrastructure Maintenance and Rehabilitation**

**Purpose:** To identify the processes for the Sarnia Water Distribution System Operating Authority to identify the maintenance, rehabilitation, and renewal programs required to ensure the integrity of the system infrastructure for the ongoing supply of safe drinking water.

**Scope:** This policy and associated procedures apply to the infrastructure within the limits of the Sarnia Water Distribution System Operating Authority and associated departments as identified within this procedure.

**Definitions:**

Not Applicable

**Description:**

The Operating Authority's infrastructure maintenance program includes both planned preventative maintenance activity and unscheduled/unplanned maintenance activity.

**Planned Preventative Maintenance**

The Public Works Superintendent is responsible for ensuring that planned maintenance work is carried out according to this and associated procedures and/or work instructions.

Public Works Superintendent and Public Works Supervisor(s) responsible for water distributions are responsible for planning and administering the programs related to maintenance of the infrastructure. Details of the inspections and methods for this maintenance are in the associated document procedure.

The adequacy and effectiveness of the preventative maintenance program is assessed in the review of Infrastructure, where key performance indicators are reviewed. These are analyzed from recorded data captured during both planned and unplanned maintenance activities.

**Unscheduled/unplanned Maintenance**

The Public Works Superintendent is responsible for ensuring that unscheduled maintenance work is carried out according to the Operational Plan, associated procedures and/or work instructions.

Corrective Maintenance is done in reaction to system failure and/or reported or identified deficiencies.

Public Works Supervisors are responsible for arranging unscheduled maintenance work.

**Rehabilitation & Renewal Program**

The Sarnia Water Distribution System Infrastructure rehabilitation and renewal is the responsibility of the Engineering Division. This division is also responsible for planning, budgeting and ensuring the rehabilitation and renewal work.

Components of the infrastructure renewal programs may include:

- Renewal of Watermains
- Renewal of Appurtenances, Service Connections, Valves, Hydrants, etc

**Associated Document:**

**References:**

Not Applicable

## **DWQMS Element # 16 - Sampling, Testing and Monitoring**

**Purpose:** To describe the sampling, testing and monitoring program undertaken by the Operating Authority to ensure the delivery of safe drinking water.

**Scope:** This policy and associated procedures apply to all sampling and testing, conducted either internally or externally by a third party, pertaining to the Sarnia Water Distribution System Operating Authority.

**Definitions:**

Not applicable

**Description:** The Operating Authority will establish and maintain a regular sampling, testing and monitoring program that, at a minimum, meets regulatory requirements.

Sampling, Testing & Reporting

Regular sampling will be conducted throughout the system as determined by the Safe Drinking Water Act, O.Reg. 170/03 and includes any additional sampling required by the Ministry of the Environment.

**Associated Document:**

*PW-DWQMS-01-016-Sampling, Testing and Monitoring*

**References:**

Not Applicable

## **DWQMS Element # 17 - Calibration of Sampling, Testing and Monitoring Equipment**

### **Purpose:**

To describe the calibration program for all water sampling, monitoring and/or testing equipment used by the Operating Authority to ensure the delivery of safe drinking water.

### **Scope:**

This policy and the associated procedures apply to all devices equipment used within the Operating Authority to take water quality samples and conduct water quality testing.

### **Definitions:**

Not Applicable

### **Description:**

The Operating Authority uses the following list of device(s) for sampling and testing of the distribution water supply.

1. Chlorine Residual Tester Kit

Each device used for sampling and testing will follow the regular checks and calibration set out, at a minimum, by the manufacturer instructions and scheduled accordingly to ensure reliability of testing.

Handheld units are replaced or returned to Hach when calibration is required.

### **Associated Document:**

*PW-DWQMS-01-017-Calibration of Sampling, Testing and Monitoring Equipment*

### **References:**

Equipment Manual(s)

## DWQMS Element # 18 - Emergency Management

### **Purpose:**

Describes the approach taken by the Operating Authority to identify and manage emergency situations and for maintaining a state of preparedness for the delivery of safe drinking water.

### **Scope:**

This policy and associated procedures relate to emergencies that directly relate to the safety of drinking water and the water distribution system.

### **Definitions:**

*City of Sarnia Municipal Emergency Response Plan* – the emergency plan required by the Emergency Management and Civil Protection Act and adopted as a by-law by council, governing the provision of necessary services during an emergency and the procedures and manner in which the employees of the municipality and other persons will respond to the emergency.

*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

### **Description:**

The Operating Authority will utilize the risk assessment process to identify potential emergencies and to consider specific emergency preparedness activities. By assessing risks against process or practice, instances exceeding an acceptable risk threshold will be identified, thereby indicating the need for appropriate controls and an emergency preparedness plan.

In addition, the information and activities prescribed in the City of Sarnia Municipal Emergency Response Plan are also considered when identifying and preparing for emergencies within the Operating Authority. This Response is invoked only for the large scale disaster where water may be a part or in whole unavailable to large parts of the Sarnia Population.

Emergency Response activities and procedures will be developed and implemented in response to the outcomes of the reviews.

Employee training will be conducted on all new and updated emergency response procedures upon development and review of existing procedures will occur as required. The Operating Authority will ensure that personnel are aware of:

- i) Individual roles and responsibilities
- ii) All relevant procedures
- iii) Existing threats and hazards and associated protective actions and;



iv) Details of emergency equipment

Emergency contact lists are maintained to ensure appropriate individuals will be contacted in the event of an emergency. This list is to be updated as soon as changes are known and reviewed.

**Associated Document:**

*PW-DWQMS-01-018-Emergency Management*

**References:**

City of Sarnia Municipal Emergency Response Plan

## DWQMS Element # 19 - Internal Audits

**Purpose:** To describe the Operating Authority's methods of performing internal audits of the DWQMS to ensure that it conforms to the Operational Plan.

**Scope:** This policy and associated procedures apply to all elements of the DWQMS Operational Plan Internal Audits

**Definitions:**

*Audit* – a systematic and documented verification process that involving objectively obtaining and evaluating documents and processes to determine whether the operating authority's quality management system conforms to the requirement of the Standard.

*Non-conformance* – the non-fulfillment of a DWQMS requirement as determined by an internal auditor.

**Description:** The DWQMS Representative, or designate, is appointed as the Lead Auditor. The Lead Auditor is responsible for ensuring that these procedures are followed accordingly and specifically.

- i) An annual Internal Audit Schedule is created and maintained
- ii) Ensuring an Internal Audit team is trained, competent to conduct Audits
- iii) Ensuring that the Operating Authority Top Management is aware of resources required to perform the Audits
- iv) Ensuring that the Audit is conducted according to the procedure at least once per calendar year and documented and communicated ensuring non conformances are addressed, followed up and closed out in a timely manner by the Internal Audit Team

**Associated Document:**

*PW-DWQMS-01-019 – Internal Audits*

**References:**

Ministry of the Environment - Drinking Water Quality Management Standard Guidance Document – July 2007  
Program Handbook for the Accreditation of Operating Authorities – Municipal Drinking Water Systems - 2008

## **DWQMS Element # 20 - Management Review**

### **Purpose:**

The purpose of this Management Review Procedure is to outline the method used to evaluate the continuing suitability, adequacy and effectiveness of the Drinking Water Quality Management System

### **Scope:**

The scope of this procedure includes management activities and water distribution activities identified in the Operational Plan

### **Definitions:**

Not Applicable

### **Description:**

As a minimum, reviews must be conducted at least once per calendar year, covering the minimum required agenda items to provide Top Management of the Operating Authority with the information required to review and evaluate the continued suitability, adequacy, and effectiveness of the DWQMS.

### **Associated Document:**

*PW-DWQMS-01-20 – Management Review*

### **References:**

Not Applicable

## DWQMS Element # 21 - Continual Improvement

### Purpose:

To describe the procedure utilized by the operating authority to track and measure continual improvement of the QMS.

### Definitions:

Continual Improvement – recurring activity to enhance performance

Corrective Action – action to eliminate the cause of detected nonconformity of the QMS with the requirements of the DWQMS or other undesirable situation

Non-conformance – the non-fulfilment of a DWQMS requirement

Preventive Actions – Action to prevent the occurrence of nonconformity of the QMS with the requirements of the DWQMS or other undesirable situation

### Procedure:

We are committed to tracking and measuring continual improvement by:

- a) reviewing and considering applicable **best management practices**,
- b) documenting a process for identification and management of **QMS 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 non-conformity 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 non-conformity.
- c) documenting a process for identifying and implementing **Preventive Actions** to eliminate the occurrence of **potential non-conformities** in the QMS 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.

We have established a spreadsheet to track and measure continual improvement, available as *PW-DWQMS 01-021 Continual Improvement Tracking spreadsheet*. When a non-conformity occurs, we use the *PW-DWQMS 01-021 Continual Improvement Form*, and:

- a) react to the non-conformity and, as applicable:
  1. take action to control and correct it;
  2. deal with the consequences, including mitigating adverse conditions;
- b) evaluate the need for action to eliminate the causes of the non-conformity in order that it does not recur or occur elsewhere, by:
  1. reviewing the non-conformity;
  2. determining the causes of the non-conformity;
  3. determining if similar non-conformities exist, or could potentially occur;
- c) implement any action needed;
- d) review the effectiveness of any corrective action taken;
- e) make changes to the QMS, if necessary.

Corrective actions taken are appropriate to the significance of the effects of the non-conformities encountered, including the adverse impact(s).

We retain documented information as evidence of:

- the nature of the non-conformities and any subsequent actions taken;
- the results of any corrective action.

### **Associated Document**

*PW-DWQMS 01-021.1 Continual Improvement Form*

*PW-DWQMS 01-021.2 Continual Improvement Spreadsheet*

### **References:**

Not Applicable

## Appendix A

### **DWQMS Procedures:**

DWQMS-01-001 – Intentionally left blank  
DWQMS-01-002 – Intentionally left blank  
DWQMS-01-003- Intentionally left blank  
DWQMS-01-004- Intentionally left blank  
DWQMS-01-005.1 – Control of Documents  
DWQMS-01-005.2 – Control of Records  
DWQMS-01-006 – Intentionally left Blank  
DWQMS-01-007 – Risk Assessment and Risk Assessment Outcomes  
DWQMS-01-007-a – Risk Assessment Table  
DWQMS-01-008 – Intentionally left blank  
DWQMS-01-009 – Organizational Structure, Roles, Responsibilities and Authorities  
DWQMS-01-010 - Competencies  
DWQMS-01-011 – Personnel Coverage  
DWQMS-01-012 – Communications  
DWQMS-01-013 – Intentionally left blank  
DWQMS-01-014 – Review of Infrastructure Maintenance, Rehabilitation and Renewal  
DWQMS-01-015 – Intentionally left blank  
DWQMS-01-016 – Sampling, Testing and Monitoring  
DWQMS-01-017 – Calibration of Sampling, Testing and Monitoring Equipment  
DWQMS-01-018 – Emergency Management  
DWQMS-01-019 – Internal Audits  
DWQMS-01-020 – Management Review  
DWQMS-01-021.1 – Continual Improvement Form  
DWQMS-01-021.2 – Continual Improvement Spreadsheet