

# **A G E N D A**

## **THE THIRD MEETING OF THE ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM BOARD OF MANAGEMENT**

**COMMITTEE ROOM #304**  
**ST THOMAS CITY HALL**

**4:00 P.M.**

**OCTOBER 12, 2023**

### **DISCLOSURES OF INTEREST**

### **MINUTES**

Confirmation of the minutes of the meeting held on June 22, 2023.

### **REPORTS**

**STASWSS Drinking Water Quality Management System - Management Review Meeting 2023**

Report SWB-05-23 of the Manager of Development and Compliance. **Pages 2-123**

**2024 STASWSS Operations Budget and Water Rate**

Report SWB-06-23 of the Environmental Compliance Coordinator. **Pages 124-126**

### **CORRESPONDENCE**

### **UNFINISHED BUSINESS**

### **NEXT MEETING**

### **ADJOURNMENT**

**Directed to:** Chairman and Members of the Board of Management of the St. Thomas Area Secondary Water Supply System

**Date Authored:**  
September 25, 2023

**Meeting Date:**  
October 12, 2023

**Department:** Environmental Services

**Attachment**

2023 Management Review Meeting Minutes for the St. Thomas Water Distribution System and St. Thomas Area Secondary Water Supply System

**Prepared By:** Shayne Reitsma, P.Eng.  
Manager of Development and Compliance

**Subject:** STASWSS Drinking Water Quality Management System – Management Review Meeting 2023

**Recommendation:**

THAT: Report No. SWB 05-23, relating to St. Thomas Area Secondary Water Supply System Drinking Water Quality Management System (DWQMS) – Management Review Meeting 2023, be received for information.

**Background:**

As the Operating Authority for the St. Thomas Water Distribution System (STWDS) and St. Thomas Area Secondary Water Supply System (STASWSS), the Environmental Services Department is required to maintain accreditation to the Drinking Water Quality Management Standard (DWQMS). One requirement of the DWQM Standard is to conduct a meeting on an annual basis that evaluates the continuing suitability, adequacy and effectiveness of the Quality Management System, which has been developed in order to meet the DWQM Standard. This annual meeting is labelled the Management Review Meeting and was conducted on August 11, 2023.

As part of the Management Review, information related to 16 mandatory topics of discussion were reviewed pertaining to the DWQMS and the City’s drinking water system operations and maintenance. The Management Review Meeting Minutes are provided as an attachment to this report. Please note that the minutes relate to both the STDWS and the STASWSS for efficiency in reporting. Discussion and decisions made as part of the management review have been recorded and compiled in the meeting minutes, which were recorded by the Environmental Compliance Coordinator.

The management review meeting was held on August 11, 2023, and was attended by Kevin De Leebeeck (OA Owner Representative), Shayne Reitsma (QMS Representative) and Karel Kamerman (Environmental Compliance Coordinator).

Action Items identified as part of the Management Review Meeting have been added to the Corrective and Preventative Action Tracking Spreadsheet. As per the DWQMS Continual Improvement Procedure, the Environmental Compliance Coordinator will follow up on the action items identified to ensure they are addressed within the associated timelines.

In summary, the management review was completed with no major issues to report, and the DWQMS policy and procedures in place contribute to the excellent operation of the STWDS and STASWSS.

**Financial Impact:**

There is no financial impact to the Board related to this report.

Respectfully,



**Shayne Reitsma, P. Eng.**  
Manager of Development and Compliance

**Reviewed By:**   
City Engineer



# DWQMS Management Review

## St. Thomas Water Distribution System and St. Thomas Area Secondary Water Supply System

August 11, 2023  
10:00 AM

St. Thomas City Hall – ES Upper Boardroom

# MEETING MINUTES

### Attendee(s)

- Present:**
- Kevin De Leebeeck** – Director of Environmental & Infrastructure Services and City Engineer, City of St. Thomas
  - Shayne Reitsma** – Manager of Development & Compliance, City of St. Thomas
  - Karel Kamerman** – Environmental Compliance Coordinator, City of St. Thomas

### Previous Minutes

#### Review 2022 minutes and approve 2023 Agenda

The 2023 agenda and the Minutes from the June 2022 Management Review Meeting were reviewed at the meeting. No additional items were presented by the participants.

### Agenda Items

#### a. Incidents Of Regulatory Non-Compliance

The St. Thomas Water Distribution System (STWDS) annual MECP inspection was held on January 19, 2023, for the period of November 1, 2021, to November 30, 2022. The Inspection Report and Inspection Risk Rating documentation, attached, was received on April 11, 2023. The STWDS received a score of 88.75%, noting 3 non-compliance matters. The 3 non-compliances for each system were added to the City’s tracking list for OFI’s and NCR’s and the matters discussed in follow-up correspondence with the Manager of Water and Sewer, QMS Rep, and Compliance Coordinator. The following measures have been implemented to rectify and resolve each matter:

Inspection Finding	Actions Taken:
<p>The secondary disinfectant residual was not measured as required for the large municipal residential distribution system. Ontario Regulation 170/03, Schedule 7-2 (3) requires the owner/operating authority of a large municipal residential system that provides secondary disinfection to ensure that at least seven distribution samples are taken each week and tested immediately for free chlorine residual. At least four of the samples must be taken on one day of the week, and at least three samples must be taken on a second day of the week, at least 48 hours after the samples taken on the first day.</p> <p>Grab samples are collected during different days of the week and tested for free chlorine from different locations within the distribution system. The system also uses process chlorine analyzers located at the Albert Roberts Booster Station, the Southdale meter chamber panel and the Wellington Rd PRV panel to continuously monitor the free chlorine residual within the distribution system. These continuous chlorine analyzers have alarm set points to ensure the free chlorine residual is maintained above 0.05mg/L.</p> <p>Records were reviewed of the grab samples taken in the distribution system by operators who collect manual samples. On a number of occasions during this inspection review</p>	<ul style="list-style-type: none"> <li>- Free Chlorine to meet Schedule 7-2 (3) micro is now collected on Monday with the microbiological samples and on Thursday, as a stand-alone process.</li> <li>- Lucity solution created to record results to specifically meet the requirements of Schedule 7-2.</li> <li>- Updated Sampling Procedure (DW-ADMIN-1000) to reflect changes.</li> <li>- Staff were trained on Lucity entries and new sampling plan.</li> </ul>

<p>period the second set of samples taken in the week were not taken greater than 48hrs after the last samples were taken on the first day.</p> <p>From herein, the owner/operating authority must ensure the secondary disinfection residual is measured as required by O.Reg.170/03 7-2 (3) with the second set of samples taken in the week to be at least 48hrs after the last sample taken on the first day. Compliance with this requirement will be assessed during the next inspection period.</p>	
<p>All haloacetic acid water quality monitoring requirements prescribed by legislation were not conducted within the required frequency and/or at the required location. Haloacetic Acid samples are required to be collected and tested each calendar quarter from the distribution system in accordance with Schedule 13-6.1 of O.Reg. 170/03 with the frequency stipulated in Schedule 6-1.1(4), and shall be taken from a point in the drinking water system's distribution system that is likely to have an elevated potential for the formation of haloacetic acids. Records reviewed indicate the following samples were taken:</p> <p>City of St. Thomas Distribution System</p> <ol style="list-style-type: none"> <li>1) December 27, 2021 = &lt;5.3 ug/L</li> <li>2) March 10, 2022 = &lt;5.3 ug/L</li> <li>3) June 17, 2022 = &lt;5.3 ug/L</li> <li>4) October 17, 2022 = &lt;5.3 ug/L</li> </ol> <p>During the inspection period the Owner/Operating Authority diligently collected Haloacetic Acids (HAA) samples, however the Owner/Operating Authority failed to ensure that samples were collected within the prescribed frequency as per Schedule 6-1.1(4) of O.Reg 170/03. Samples that are required be collected every three (3) months or in each calendar quarter shall be collected at least 60 days apart and not more than 120 days apart. The following samples were not taken within the prescribed frequency: 1) June 17, 2022 to October 17, 2022 = 122 days</p> <p>This is the second inspection period in a row where this non-compliance has been found. The previous MECP inspection report from the previous inspection period, dated January 5, 2022, documented non-compliance with this requirement for sample frequency of HAA samples.</p> <p>From herein, the Owner/Operating Authority shall ensure that Haloacetic Acid samples are collected within the prescribed frequency as stipulated in Schedule 6-1.1(4) of O.Reg 170/03. The Owner/Operating Authority shall review their sampling requirements and their annual sampling schedule to ensure that samples are collected with the required frequency as stipulated in O. Reg 170/03. This annual sampling schedule, including any required changes, shall be submitted to the Inspector no later than 30 days from the date this report is received (April 11, 2023).</p>	<ul style="list-style-type: none"> <li>- A review of the sampling requirements and associated timelines was undertaken.</li> <li>- The THM/HAA and Lead Tracking Spreadsheet has been expanded and pre-populated to include the next few years of sampling dates.</li> <li>- The sampling dates have been entered into our Computerized Maintenance Management System (CMMS) for automated reminders, in addition to entry into the Supervisor of Water and Sewers Outlook Calendar.</li> <li>- A reminder to order the required sample bottles to replace the ones to be used for the quarterly sampling session have been scheduled in the CMMS for the first week of each calendar quarter as a further reminder that the sampling requires completion.</li> <li>- A report on the actions taken was submitted to the Inspector on April 27, 2023. Response was received indicating that no further actions were required.</li> </ul>
<p>All trihalomethane water quality monitoring requirements prescribed by legislation were not conducted within the required frequency and/or at the required location. Trihalomethane samples are required to be collected and tested each calendar quarter from the distribution system in accordance with Schedule 13-6 of O.Reg. 170/03 with the frequency stipulated in Schedule 6-1.1(4) and shall be taken from a point in the drinking water system's distribution system that is likely to have an elevated potential for the formation of trihalomethanes. Records reviewed indicate the following samples were taken:</p> <p>City of St. Thomas Distribution System</p> <ol style="list-style-type: none"> <li>1) December 27, 2021 = 16 ug/L</li> <li>2) March 10, 2022 = 15 ug/L</li> <li>3) June 17, 2022 = 22 ug/L</li> <li>4) October 17, 2022 = 22 ug/L</li> </ol> <p>During the inspection period the Owner/Operating Authority diligently collected Trihalomethane samples, however the Owner/Operating Authority failed to ensure that samples were collected within the prescribed frequency as per Schedule 6-1.1(4) of O.Reg 170/03. Samples that are required be collected every three (3) months or in each calendar quarter shall be collected at least 60 days apart and not more than 120 days apart. The following samples were not taken within the prescribed frequency: 1) June 17, 2022 to October 17, 2022 = 122 days</p> <p>This is the second inspection period in a row where this non-compliance has been found. The previous MECP inspection report from the previous inspection period, dated January 5, 2022, documented non-compliance with this requirement for sample frequency of Trihalomethane samples.</p> <p>From herein, the Owner/Operating Authority shall ensure that Trihalomethane samples are collected within the prescribed frequency as stipulated in Schedule 6-1.1(4) of O.Reg</p>	<ul style="list-style-type: none"> <li>- A review of the sampling requirements and associated timelines was undertaken.</li> <li>- The THM/HAA and Lead Tracking Spreadsheet has been expanded and pre-populated to include the next few years of sampling dates.</li> <li>- The sampling dates have been entered into our Computerized Maintenance Management System (CMMS) for automated reminders, in addition to entry into the Supervisor of Water and Sewers Outlook Calendar.</li> <li>- A reminder to order the required sample bottles to replace the ones to be used for the quarterly sampling session have been scheduled in the CMMS for the first week of each calendar quarter as a further reminder that the sampling requires completion.</li> <li>- A report on the actions taken was submitted to the Inspector on April 27,</li> </ul>

<p>170/03. The Owner/Operating Authority shall review their sampling requirements and their annual sampling schedule to ensure that samples are collected with the required frequency as stipulated in O. Reg 170/03. This annual sampling schedule, including any required changes, shall be submitted to the Inspector no later than 30 days from the date this report is received.</p>	<p>2023. Response was received indicating that no further actions were required.</p>
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For the St. Thomas Area Secondary Water Distribution System (STASWSS), the MECP inspection was held on January 19, 2023, for the period of November 1, 2021, to November 30, 2022. The Inspection Report and Inspection Risk Rating documentation, attached, was received on April 11, 2023. The STASWSS received a score of 92.31%, noting 1 non-compliant matter, which was relating to the timing of Free Chlorine checks, the same as was identified in the STWDS inspection report.

**b. Incidents Of Adverse Drinking-Water Tests**

One (1) adverse drinking water tests was reported for the St. Thomas Water Distribution System. The adverse was related to a low chlorine residual witnessed in the distribution system. Reporting and corrective actions were taken in accordance with regulatory requirements.

AWQI	Actions Taken
<p><b>AWQI 160586: Reported November 8, 2022</b>                      In the City of St. Thomas, on Sunset Drive, when flushing from hydrant HYD822 (nearest street address is #62 Sunset Dr), at approximately 13:00, on Nov. 07/22, the operated had a free chlorine test result of 0.00 mg/L.</p>	<ul style="list-style-type: none"> <li>- Operator continued to flush from the hydrant overnight, until residuals increased to normal levels.</li> <li>- 2 Microbiological Samples taken; returned 0 EC and 0 TC.</li> <li>- Checking residuals from HYD822 weekly. Flushing as required. Adjusting frequency of residual testing and flushing based on testing results observed to ensure adequate FCR is maintained.</li> <li>- Flusher installed at this location.</li> </ul>

**c. Deviations From Critical Control Point Limits And Response Actions**

One (1) deviation from the critical control points (CCP) related to chlorination occurred in 2022. As described in section b. above, the instance involved a low chlorine residual reading. Response was in accordance with regulatory requirements and internal procedures.

**d. Effectiveness Of The Risk Assessment Process**

The Hazard Assessment Team convened on April 6, 2023 and undertook a complete re-assessment of the Hazard Analysis table for each of the drinking water systems operated by the City of St. Thomas. The re-assessment process was comprehensive and ranked all identified hazards based on a present-day risk assessment. One (1) newly identified hazard, being a Cybersecurity Attack on Administrative Servers, was assessed during the meeting. No new critical control points were identified as a result of the exercise.

**e. Internal And Third-Party Audit Results**

Several audits of the DWQMS (reports attached as appendices) were conducted since last management review. All audit findings were placed in the corrective action tracking spreadsheet, discussed in a follow-up meeting, and corresponding actions were taken for each identified non-conformance, as described below. Opportunities for Improvement (OFI's) identified by auditors are also placed in the corrective action tracking spreadsheet and discussed in a follow-up meeting. Actions may or may not be taken in response to OFI's, based on the merit of the finding.

An external audit by SAI Global was carried out on June 29 and 30, 2022. One (1) non-conformance and one (1) OFI were identified. The non-conformance that came from the external audit were:

- **NC#1 Risk Assessment:** The threshold risk ranking value for CCP determination has not been defined within the Risk Assessment procedure.
  - **ACTION(S) TAKEN:** DW-ADMIN-300 \_ Risk Assessment was revised by inserting a threshold ranking of 9 that will indicate that a process step is considered high risk and require assessment for consideration as a CCP. Reviewed Risk Assessment Tables, updated calculations on DWF-ADMIN-304 as they were not calculating correctly. No new CCP's identified as a result of this process..

Internal Audits for 2022 were carried out on April 20-21, 2022 (reported in 2022 Management Review Meeting) and October 19, 2022. From the October 19 audit, there was one (1) non-conformance and one (1) OFI identified. The non-conformance was:

- **NC#1 Measurement and Recording Equipment Calibration and Maintenance:** All Colorimeters provided at the time of the audit were found to have no calibration sticker (1) or a calibration sticker that identified the unit as being beyond its calibration date (5). No records could be provided to demonstrate that they had been calibrated. 10 colorimeters are listed in the equipment listing, however, only 6 were provided for review and 1 was said to be in use. Of those 6, one was not identified on the equipment listing.
  - **ACTION(S) TAKEN:** Units calibrated in October 2022 and again in March/April 2023 by 3<sup>rd</sup> party calibration team. Equipment listing was verified and updated to accurately list equipment in the field. Monthly internal verification exercises are now recorded in a manner that allows for regulatory compliance and the practice was documented in the calibration procedure. The Work Order system now records the monthly internal verification exercise in a compliant manner.

An Internal Audit for 2023 was completed was completed by Acclaims Environmental Inc. on April 20, 2023. From the April 2023 internal audit, there was one (1) non-conformance and five (5) OFI's identified. The non-conformance from the internal audit is noted below:

- **NC#1 Management Review** DWQMS Element 20 PLAN requires that consideration of items a) to p) are included in the management review. DWQMS Element 20 DO d) requires that the results of the management review, the identified deficiencies, decisions and action items are reported to the Owner.
  - The Management Review Meeting minutes documented from meetings held in June 2022 did not include item f) results of emergency response testing, and
  - The results of the Management Review from 2022 have not been reported to the Owners.
  - **ACTION(S) TAKEN:** A management review meeting agenda template has been developed and includes a listing of all topics of discussion required by the DWQMS. Additionally, a management review meeting minutes template has been prepared that includes a listing of all necessary topics of discussion, and a "Actions Identified" section, with a pre-populated action for the QMS Representative to send the minutes to the Owner.

#### **f. Results Of Emergency Response Testing**

At the request of the Ministry of Environment, Conservation and Parks, an event debrief was conducted for the Rogers cellular network outage that occurred on July 8-9, 2022. No action items were identified as a result of the debrief exercise.

**g. Operational Performance**

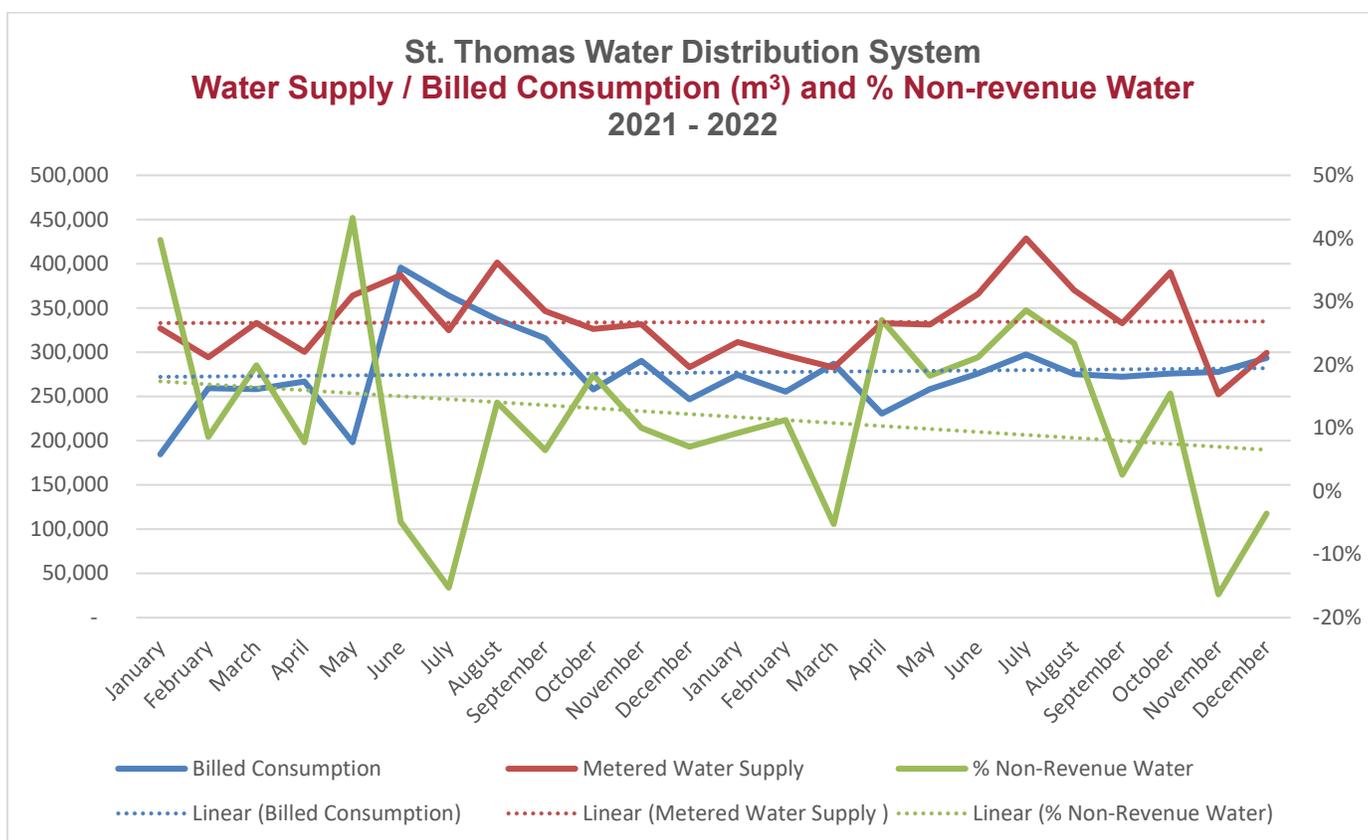
**- 2022 Summary and Annual Reports for St. Thomas WDS and St. Thomas Area Secondary WSS were reviewed.**

**- Supply and Demand Flow Trends – STWDS**

Over the 2022 year, the St. Thomas DWS obtained 65%, or 2,794,828 m<sup>3</sup> of its water supply needs through the Albert Roberts Booster Station. The additional 1,411,445 m<sup>3</sup> was supplied to the system through the St. Thomas Secondary Area Water Supply System. Monthly billed consumption, water supply and non-revenue water trends are presented in the graph below.

The large variation in non-revenue water being experienced month to month is a result of the billing contractor having had to estimate meter reads for an extended period. The contractor has since allocated more resources to providing more accurate reads. Additionally, a project has been initiated to research transitioning to advanced metering infrastructure (AMI).

Total Water Supply decreased in 2022 from 4,022,091 to 3,994,210 m<sup>3</sup>, a 0.7% decrease.



**- Supply and Demand Flow Trends – STASWSS**

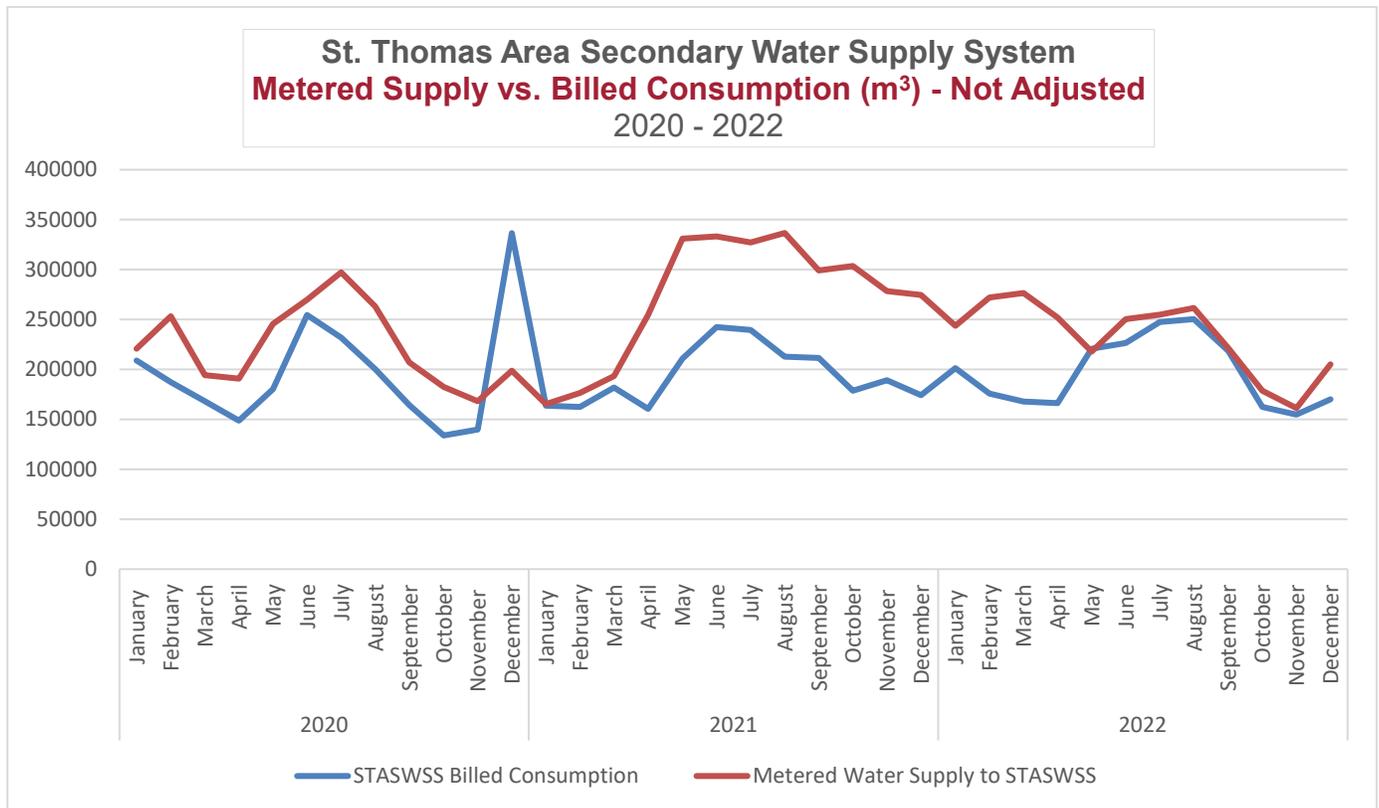
Over the 2022 year, the STASWSS purchased a total of 2,538,459 m<sup>3</sup> of water from the EAPWSS, despite the meter reading indicating a purchase of 2,794,828 m<sup>3</sup>. This discrepancy was related to a valve bypass that was occurring that allowed for recirculation of some of the flow, allowing it to be metered more than once. The valve was replaced in April 2022, and non-revenue water in the STASWSS has since returned to normal levels. Monthly billed consumption and water supply trends are presented in the table below.

Total Water Purchased decreased in 2021 to 2022 from 4,022,091 to 3,994,210 m<sup>3</sup>, a 0.7% decrease.

The STASWSS delivered a total of 2,362,316 m<sup>3</sup> to its customers. The flows delivered to each municipal partner was as shown in table on the following page.

Benefitting Municipality	2022 Billed Consumption from STASWSS (m <sup>3</sup> )
City of St. Thomas	1,411,445
Township of Southwold	890,371
Municipality of Central Elgin	60,500

The graph below demonstrates the STASWSS Metered Supply and Billed Consumption data for 2020 – 2022. This table displays data that has not been adjusted to account for the meter bypass that occurred from March 2021 – April 2022.



**- Maintenance Tasks**

The following table provides a summary of Maintenance tasks completed on the St. Thomas DWS in 2022.

St. Thomas DWS		
Task	Maintenance Standard	2022 Completion
Valve Turning	Ongoing	60%
Hydrant Checks	Annual Maintenance Frost Checks as required	100% 2 complete rounds
Hydrant Painting	As required	None
Fire Flow Testing	On Demand	70%
Directional Flushing	Annually	100% September

The table on the following page provides a summary of maintenance tasks completed on the St. Thomas DWS in 2022



<b>St. Thomas Secondary WSS</b>		
<b>Task</b>	<b>Maintenance Standard</b>	<b>2022 Completion</b>
Valve Checks	Ongoing	100%
Hydrant Checks	Annual Maintenance Frost Checks as required	100% 2 complete rounds
Hydrant Painting	As required	None
Fire Flow Testing	On Demand	None
Directional Flushing	Annually	100% September

**h. Raw Water Supply and Drinking Water Quality Trends**

**Raw Water Supply**

Raw water is supplied through the Elgin Area Primary Water Supply System. In 2022, pre-emptive communications were made to residents advising that raw water quality was becoming a concern and that colour and odour may be experienced. The raw water did not deteriorate beyond the treatment systems capability to continue to provide aesthetically acceptable drinking water, as had occurred during the 2021 event.

**Water Quality Test Results**

Reviewed STDWS and STASWSS Annual and Summary Reports.

**i. Follow-Up Action Items From Previous Management Reviews**

All action items identified in previous management reviews have been addressed. Zero (0) action items were identified in the most recent management review.

**j. The Status Of Management Action Items Identified Between Reviews**

No Management action items were identified between the reviews.

Throughout the year, there are many discussions between the St. Thomas and Secondary System members with regards to the water distribution systems and their performance. Although there might not be any specific action items noted here, many discussions take place to help improve the system.

**k. Changes That Could Affect The DWQMS, QMS Elements, Or Legislative Changes**

Updates were recently completed to implement new titles and new personnel in St. Thomas. No other changes anticipated from St. Thomas, at this time.

**l. Consumer Feedback (Including Any Concerns, Complaints, Or Expectations From Customers)**

Over the 2022 calendar year, staff have responded to a number of service requests with regards to water quality and pressure issues. A summary of these service requests can be seen below:

<b>Category of Complaint</b>	<b>St. Thomas</b>
Water Quality	10
Water Pressure	2

**m. The Resources Needed to Maintain the Quality Management System**

There are adequate resources available to St. Thomas staff to maintain the DWQMS.

**n. The results of the infrastructure review**

Planned projects are listed below in the review. The results of the review allowed for coordination and awareness of planned works within the vicinity.

**St. Thomas and STASWSS Capital Projects**

- Coyne and Simcoe Reconstruction
- Parkside and Bell Avenue Reconstruction
- Talbot Streetscape – Phase 3
- Ford Tower Removal Study
- WM loop for NW Area 1

**o. Operational Plan Currency, Content, And Updates**

The St. Thomas and STASWSS Operational plans were updated effective January 1, 2023 and again in July 2023 to reflect new QMS Representative, Shayne Reitsma. Significant changes made during the 2023 issue include:

1. Introduction of Continuity of Operations Procedure (DW-ERP-700)
2. Introduction of SCADA Failures and Cybersecurity Threat Response Procedure (DW-ERP-800)

Several procedures underwent revision in response to audit findings in June 2023. Updates will be required in response to the system changes discussed in section k.

**p. Staff Suggestions**

No staff suggestions were made at this time about the DWQMS or the water distribution system.

**Identified Action Items**

Item #	Action	Deadline	Responsible Party
1.	Report St. Thomas Management Review Meeting Minutes to Owner.	10-31-2023	SR / KK
2.	Report STASWSS Management Review Meeting Minutes to Owner.	10-31-2023	SR / KK
3.	Research transition to Advanced Metering Infrastructure.	12-31-2023	CA / KDL
4.	Improved access and training on retrieval of info. for water records for ECC.	12-31-2023	CA / KK
5.	Explore putting technology in place for operations level staff to have an efficient and effective record of knowledge transfers.	12-31-2023	KDL / CA

**Next Meeting Date: Spring 2024 (TBD)**

These minutes were completed by Karel Kamerman and reviewed by Shayne Reitsma, P.Eng.. Any changes or discrepancies should be forwarded to [kkamerman@stthomas.ca](mailto:kkamerman@stthomas.ca).

**Ministry of the Environment,  
Conservation and Parks****Ministère de l'Environnement, de la  
Protection de la nature et des Parcs**Drinking Water and Environmental  
Compliance DivisionDivision de la conformité en matière d'eau  
potable et d'environnementSouthwest Region  
733 Exeter Road  
London, ON N6E 1L3  
Phone: 519-873-5000*Région Sud-Ouest*  
*733 rue Exeter*  
*London, ON N6E 1L3*  
Tél: 519-873-5000

April 11, 2023

The Corporation of the City of St Thomas  
545 Talbot Street  
St Thomas, ON N5P 3V7Attention: Justin Lawrence, Director of Environmental Services  
Re: City of St Thomas Distribution System Final Inspection Report (#260002187)

The enclosed Drinking Water Inspection Report outlines non-compliance, if any, with Ministry legislation, and policies for the above noted water system. Violations noted in this report, if any, have been evaluated based on community risk. These violations will be monitored for compliance with the minimum standards for drinking water in Ontario as set forth under the *Safe Drinking Water Act* and associated regulations. Where risk is deemed to be high and/or compliance is an ongoing concern, violations will be forwarded to this Ministry's Investigation and Enforcement Branch.

In order to measure individual inspection results, the Ministry has established an inspection compliance risk framework based on the principles of the Inspection, Investigation & Enforcement (II&E) Secretariat and advice of internal/external risk experts. The Inspection Summary Rating Record (IRR) provides the Ministry, the system owner and the local Public Health Units with a summarized quantitative measure of the drinking water system's annual inspection and regulated water quality testing performance.

Section 19 of the *Safe Drinking Water Act* (Standard of Care) creates a number of obligations for individuals who exercise decision-making authority over municipal drinking water systems. Please be aware that the Ministry has encouraged such individuals, particularly municipal councillors, to take steps to be better informed about the drinking water systems over which they have decision-making authority. These steps could include asking for a copy of this inspection report and a review of its findings. Further information about Section 19 can be found in "*Taking Care of Your Drinking Water: A guide for members of municipal council*" found under "Resources" on the Drinking Water Ontario website at [www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater).

Please note the attached IRR methodology memo describing how the risk rating model has improved to better reflect the health related and administrative non-compliance found in an inspection report. IRR ratings are published (for the previous inspection year) in the Ministry's Chief Drinking Water Inspector's Annual Report. **Please note that due to a change in IT systems, the Inspection Rating Report (IRR) cannot be generated at the same time as the inspection report. The IRR will be sent separately and prior to any public release (typically within 1-2 month of the completion of the inspection).** If you have any questions regarding the report, please feel free to call me at (226) 926-1785.

Sincerely,

Meghan Morgan  
Provincial Officer, Water Inspector  
London District Office  
[Meghan.Morgan@ontario.ca](mailto:Meghan.Morgan@ontario.ca)cc. Southwestern Public Health Unit  
Kettle Creek Conservation Authority



CITY OF ST. THOMAS DISTRIBUTION SYSTEM  
490 SOUTH EDGEWARE RD, ST. THOMAS, ON,  
**Inspection Report**

System Number:

Entity: CORPORATION OF THE CITY OF  
ST THOMAS

Inspection Start Date: 01/19/2023 (mm/dd/yyyy)

Inspection End Date: 04/06/2023 (mm/dd/yyyy)

Inspected By: Meghan Morgan

Badge #: 1315



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(signature)

**NON-COMPLIANCE/NON-CONFORMANCE ITEMS**

The following item(s) have been identified as non-compliance/non-conformance, based on a "No" response captured for a legislative or best management practice (BMP) question (s), respectively.

**Question Group:** Other Inspection Findings

<b>Question ID</b>	MRDW1033001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Is the secondary disinfectant residual measured as required for the large municipal residential distribution system?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   7-2   (3); SDWA   O. Reg. 170/03   7-2   (4);		
<b>Observation/Corrective Action(s)</b>			
<p>The secondary disinfectant residual was not measured as required for the large municipal residential distribution system. Ontario Regulation 170/03, Schedule 7-2 (3) requires the owner/operating authority of a large municipal residential system that provides secondary disinfection to ensure that at least seven distribution samples are taken each week and tested immediately for free chlorine residual. At least four of the samples must be taken on one day of the week, and at least three samples must be taken on a second day of the week, at least 48 hours after the samples taken on the first day.</p> <p>Grab samples are collected during different days of the week and tested for free chlorine from different locations within the distribution system. The system also uses process chlorine analyzers located at the Albert Roberts Booster Station, the Southdale meter chamber panel and the Wellington Rd PRV panel to continuously monitor the free chlorine residual within the distribution system. These continuous chlorine analyzers have alarm set points to ensure the free chlorine residual is maintained above 0.05mg/L.</p> <p>Records were reviewed of the grab samples taken in the distribution system by operators who collect manual samples. On a number of occasions during this inspection review period the second set of samples taken in the week were not taken greater than 48hrs after the last samples were taken on the first day.</p> <p><b>ACTIONS REQUIRED</b> From herein, the owner/operating authority must ensure the secondary disinfection residual is measured as required by O.Reg.170/03 7-2 (3) with the second set of samples taken in the week to be at least 48hrs after the last sample taken on the first day. Compliance with this requirement will be assessed during the next inspection period.</p>			

<b>Question ID</b>	MRDW1086001	<b>Question Type</b>	Legislative
<p><b>Question:</b> Are all haloacetic acid water quality monitoring requirements prescribed by legislation conducted within the required frequency and at the required location?</p>			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   13-6.1   (1); SDWA   O. Reg. 170/03   13-6.1   (2); SDWA   O. Reg. 170/03   13-6.1   (3); SDWA   O. Reg. 170/03   13-6.1   (4); SDWA   O. Reg. 170/03   13-6.1   (5); SDWA   O. Reg. 170/03   13-6.1   (6);		
<p><b>Observation/Corrective Action(s)</b></p>			
<p>All haloacetic acid water quality monitoring requirements prescribed by legislation were not conducted within the required frequency and/or at the required location. Haloacetic Acid samples are required to be collected and tested each calendar quarter from the distribution system in accordance with Schedule 13-6.1 of O.Reg. 170/03 with the frequency stipulated in Schedule 6-1.1(4), and shall be taken from a point in the drinking water system's distribution system that is likely to have an elevated potential for the formation of haloacetic acids.</p> <p>Records reviewed indicate the following samples were taken: City of St. Thomas Distribution System</p> <ol style="list-style-type: none"> <li>1) December 27, 2021 = &lt;5.3 ug/L</li> <li>2) March 10, 2022 = &lt;5.3 ug/L</li> <li>3) June 17, 2022 = &lt;5.3 ug/L</li> <li>4) October 17, 2022 = &lt;5.3 ug/L</li> </ol> <p>During the inspection period the Owner/Operating Authority diligently collected Haloacetic Acids (HAA) samples, however the Owner/Operating Authority failed to ensure that samples were collected within the prescribed frequency as per Schedule 6-1.1(4) of O.Reg 170/03. Samples that are required be collected every three (3) months or in each calendar quarter shall be collected at least 60 days apart and not more than 120 days apart. The following samples were not taken within the prescribed frequency:</p> <ol style="list-style-type: none"> <li>1) June 17, 2022 to October 17, 2022 = 122 days</li> </ol> <p><b>ACTIONS REQUIRED</b></p> <p>This is the second inspection period in a row where this non-compliance has been found. The previous MECP inspection report from the previous inspection period, dated January 5, 2022, documented non-compliance with this requirement for sample frequency of HAA samples.</p> <p>From herein, the Owner/Operating Authority shall ensure that Haloacetic Acid samples are collected within the prescribed frequency as stipulated in Schedule 6-1.1(4) of O.Reg 170/03. The Owner/Operating Authority shall review their sampling requirements and their annual sampling schedule to ensure that samples are collected with the required frequency as stipulated in O. Reg 170/03. This annual sampling schedule, including any required changes, shall be submitted to the Inspector no later than 30 days from the date</p>			

this report is received.

<b>Question ID</b>	MRDW1087001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Have all trihalomethane water quality monitoring requirements prescribed by legislation been conducted within the required frequency and at the required location?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   13-6   (1); SDWA   O. Reg. 170/03   13-6   (2); SDWA   O. Reg. 170/03   13-6   (3); SDWA   O. Reg. 170/03   13-6   (4); SDWA   O. Reg. 170/03   13-6   (5); SDWA   O. Reg. 170/03   13-6   (6);		
<b>Observation/Corrective Action(s)</b>			
<p>All trihalomethane water quality monitoring requirements prescribed by legislation were not conducted within the required frequency and/or at the required location. Trihalomethane samples are required to be collected and tested each calendar quarter from the distribution system in accordance with Schedule 13-6 of O.Reg. 170/03 with the frequency stipulated in Schedule 6-1.1(4), and shall be taken from a point in the drinking water system's distribution system that is likely to have an elevated potential for the formation of trihalomethanes.</p> <p>Records reviewed indicate the following samples were taken: City of St. Thomas Distribution System</p> <ol style="list-style-type: none"> <li>1) December 27, 2021 = 16 ug/L</li> <li>2) March 10, 2022 = 15 ug/L</li> <li>3) June 17, 2022 = 22 ug/L</li> <li>4) October 17, 2022 = 22 ug/L</li> </ol> <p>During the inspection period the Owner/Operating Authority diligently collected Trihalomethane samples, however the Owner/Operating Authority failed to ensure that samples were collected within the prescribed frequency as per Schedule 6-1.1(4) of O.Reg 170/03. Samples that are required be collected every three (3) months or in each calendar quarter shall be collected at least 60 days apart and not more than 120 days apart. The following samples were not taken within the prescribed frequency:</p> <ol style="list-style-type: none"> <li>1) June 17, 2022 to October 17, 2022 = 122 days</li> </ol> <p><b>ACTIONS REQUIRED</b></p> <p>This is the second inspection period in a row where this non-compliance has been found. The previous MECP inspection report from the previous inspection period, dated January 5, 2022, documented non-compliance with this requirement for sample frequency of Trihalomethane samples.</p> <p>From herein, the Owner/Operating Authority shall ensure that Trihalomethane samples are collected within the prescribed frequency as stipulated in Schedule 6-1.1(4) of O.Reg 170/03. The Owner/Operating Authority shall review their sampling requirements and their</p>			

annual sampling schedule to ensure that samples are collected with the required frequency as stipulated in O. Reg 170/03. This annual sampling schedule, including any required changes, shall be submitted to the Inspector no later than 30 days from the date this report is received.



### INSPECTION DETAILS

This section includes all questions that were assessed during the inspection.

**Ministry Program:** DRINKING WATER | **Regulated Activity:** DW Municipal Residential

Question ID	MRDW1001001	Question Type	Information
<b>Question:</b>			
What was the scope of this inspection?			
<b>Legislative Requirement</b>	Not Applicable		
<b>Observation</b>			
<p>The primary focus of this inspection is to confirm compliance with Ministry of the Environment, Conservation and Parks (MECP) legislation as well as evaluating conformance with ministry drinking water policies and guidelines during the inspection period. The ministry utilizes a comprehensive, multi-barrier approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as management practices.</p> <p>This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O. Reg. 170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.</p> <p>This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements. A site visit was performed on February 2, 2023 by Water Inspector Meghan Morgan.</p> <p>Several documents were reviewed as part of the inspection, these documents include but are not limited to:</p> <ol style="list-style-type: none"> <li>1. Operations and Procedures Manual most recently updated January 2022.</li> <li>2. Drinking Water Works Permit #057-201 – Issue #3 dated June 30, 2021.</li> <li>3. Municipal Drinking Water Licence #057-101 – Issue #3 dated June 30, 2021.</li> <li>4. Certificates of analysis and operational documents maintained by the owner/operator for the inspection period.</li> </ol> <p>It should be noted that this inspection covers the period from November 1, 2021 to November 30, 2022.</p>			

Question ID	MRDW1000001	Question Type	Information
<b>Question:</b>			

Does this drinking water system provide primary disinfection?	
<b>Legislative Requirement</b>	Not Applicable
<b>Observation</b>	
This Drinking Water System provides for only secondary disinfection and distribution of water. Primary disinfection is undertaken by another regulated Drinking Water System which provides treated water to this Drinking Water System.	

<b>Question ID</b>	MRDW1018001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Has the owner ensured that all equipment is installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit?			
<b>Legislative Requirement</b>	SDWA   31   (1);		
<b>Observation</b>			
The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit.			

<b>Question ID</b>	MRDW1020001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Is the owner/operating authority able to demonstrate that, when required during the inspection period, Form 1 documents were prepared in accordance with their Drinking Water Works Permit?			
<b>Legislative Requirement</b>	SDWA   31   (1);		
<b>Observation</b>			
The owner/operating authority was in compliance with the requirement to prepare Form 1 documents as required by their Drinking Water Works Permit during the inspection period. The owner completed sixteen (16) "Form 1 – Record of Watermains Authorized as a Future Alteration" documents for proposed new watermains or replacement of existing watermains.			

<b>Question ID</b>	MRDW1114001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Does the owner have evidence that, when required, all legal owners associated with the DWS were notified of the requirements of the Licence & Permit?			

<b>Legislative Requirement</b>	SDWA   31   (1);
<b>Observation</b>	
The owner had evidence that required notifications to all legal owners associated with the Drinking Water System had been made during the inspection period. The owner/operating authority has procedures in place that require DWQMS sign-off from new developments, this includes a sign-off that the developers have reviewed the MDWL and DWWP.	

<b>Question ID</b>	MRDW1025001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Were all parts of the drinking water system that came in contact with drinking water (added, modified, replaced or extended) disinfected in accordance with a procedure listed in Schedule B of the Drinking Water Works Permit?			
<b>Legislative Requirement</b>	SDWA   31   (1);		
<b>Observation</b>			
All parts of the drinking water system were disinfected in accordance with a procedure listed in Schedule B of the Drinking Water Works Permit.			

<b>Question ID</b>	MRDW1024001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Do records confirm that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated as required?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   1-2   (2);		
<b>Observation</b>			
Records confirmed that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/l free or 0.25 mg/l combined.			

<b>Question ID</b>	MRDW1037001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Are all continuous monitoring equipment utilized for sampling and testing required by O. Reg. 170/03, or MDWL or DWWP or order, equipped with alarms or shut-off mechanisms that satisfy the standards described in Schedule 6?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   6-5   (1)1-4; SDWA   O. Reg.		

	170/03   6-5   (1)5-10; SDWA   O. Reg. 170/03   6-5   (1.1);
<b>Observation</b>	
All continuous monitoring equipment utilized for sampling and testing required by O. Reg. 170/03, or Municipal Drinking Water Licence or Drinking Water Works Permit or order, were equipped with alarms or shut-off mechanisms that satisfy the standards described in Schedule 6.	

<b>Question ID</b>	MRDW1040000	<b>Question Type</b>	Legislative
<b>Question:</b> Are all continuous analysers calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   6-5   (1)1-4; SDWA   O. Reg. 170/03   6-5   (1)5-10;		
<b>Observation</b>			
All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.			

<b>Question ID</b>	MRDW1108001	<b>Question Type</b>	Legislative
<b>Question:</b> Where continuous monitoring equipment used for the monitoring of free chlorine residual, total chlorine residual, combined chlorine residual or turbidity, required by O. Reg. 170/03, an Order, MDWL, or DWWP issued under Part V, SDWA, has triggered an alarm or an automatic shut-off, did a qualified person respond in a timely manner and take appropriate actions?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   6-5   (1)1-4; SDWA   O. Reg. 170/03   6-5   (1)5-10; SDWA   O. Reg. 170/03   6-5   (1.1);		
<b>Observation</b>			
Where required continuous monitoring equipment used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person responded in a timely manner and took appropriate actions. A review of the documentation submitted for the inspection review period indicated that when an alarm was triggered a qualified person responded in a timely manner.			

<b>Question ID</b>	MRDW1033001	<b>Question Type</b>	Legislative
<b>Question:</b>			

Is the secondary disinfectant residual measured as required for the large municipal residential distribution system?	
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   7-2   (3); SDWA   O. Reg. 170/03   7-2   (4);
<b>Observation</b>	
<p>The secondary disinfectant residual was not measured as required for the large municipal residential distribution system. Ontario Regulation 170/03, Schedule 7-2 (3) requires the owner/operating authority of a large municipal residential system that provides secondary disinfection to ensure that at least seven distribution samples are taken each week and tested immediately for free chlorine residual. At least four of the samples must be taken on one day of the week, and at least three samples must be taken on a second day of the week, at least 48 hours after the samples taken on the first day.</p> <p>Grab samples are collected during different days of the week and tested for free chlorine from different locations within the distribution system. The system also uses process chlorine analyzers located at the Albert Roberts Booster Station, the Southdale meter chamber panel and the Wellington Rd PRV panel to continuously monitor the free chlorine residual within the distribution system. These continuous chlorine analyzers have alarm set points to ensure the free chlorine residual is maintained above 0.05mg/L.</p> <p>Records were reviewed of the grab samples taken in the distribution system by operators who collect manual samples. On a number of occasions during this inspection review period the second set of samples taken in the week were not taken greater than 48hrs after the last samples were taken on the first day.</p> <p><b>ACTIONS REQUIRED</b> From herein, the owner/operating authority must ensure the secondary disinfection residual is measured as required by O.Reg.170/03 7-2 (3) with the second set of samples taken in the week to be at least 48hrs after the last sample taken on the first day. Compliance with this requirement will be assessed during the next inspection period.</p>	

Question ID	MRDW1099001	Question Type	Information
<b>Question:</b>			
Do records show that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O. Reg. 169/03)?			
<b>Legislative Requirement</b>	Not Applicable		
<b>Observation</b>			
Records showed that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O. Reg. 169/03).			

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Question ID	MRDW1081001	Question Type	Legislative
<b>Question:</b> For LMR systems, are all microbiological water quality monitoring requirements for distribution samples being met?			
Legislative Requirement	SDWA   O. Reg. 170/03   10-2   (1); SDWA   O. Reg. 170/03   10-2   (2); SDWA   O. Reg. 170/03   10-2   (3);		
<b>Observation</b>			
All microbiological water quality monitoring requirements prescribed by legislation for distribution samples in a large municipal residential system were being met. Ontario Regulation 170/03 - Schedule 10-2 stipulates that distribution water samples are required to be collected for testing every week within the frequency prescribed by the Regulation. Based on the service population the Owner/Operating Authority is required to take a minimum of 50 distribution samples every month. Every distribution system sample must be analyzed for: E.coli; total coliforms; and 25% of the required samples must be tested for general bacteria population expressed as colony counts on a heterotrophic plate count. A review of the records for the inspection period indicate the number of microbiological samples collected ranged from 52-65 per month.			

Question ID	MRDW1096001	Question Type	Legislative
<b>Question:</b> Do records confirm that chlorine residual tests are being conducted at the same time and at the same location that microbiological samples are obtained?			
Legislative Requirement	SDWA   O. Reg. 170/03   6-3   (1);		
<b>Observation</b>			
Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.			

Question ID	MRDW1086001	Question Type	Legislative
<b>Question:</b> Are all haloacetic acid water quality monitoring requirements prescribed by legislation conducted within the required frequency and at the required location?			
Legislative Requirement	SDWA   O. Reg. 170/03   13-6.1   (1); SDWA   O. Reg. 170/03   13-6.1   (2); SDWA   O. Reg. 170/03   13-6.1   (3); SDWA   O. Reg. 170/03   13-6.1   (4); SDWA   O. Reg.		

	170/03   13-6.1   (5); SDWA   O. Reg. 170/03   13-6.1   (6);
<b>Observation</b>	
<p>All haloacetic acid water quality monitoring requirements prescribed by legislation were not conducted within the required frequency and/or at the required location. Haloacetic Acid samples are required to be collected and tested each calendar quarter from the distribution system in accordance with Schedule 13-6.1 of O.Reg. 170/03 with the frequency stipulated in Schedule 6-1.1(4), and shall be taken from a point in the drinking water system's distribution system that is likely to have an elevated potential for the formation of haloacetic acids.</p> <p>Records reviewed indicate the following samples were taken: City of St. Thomas Distribution System</p> <ol style="list-style-type: none"> <li>1) December 27, 2021 = &lt;5.3 ug/L</li> <li>2) March 10, 2022 = &lt;5.3 ug/L</li> <li>3) June 17, 2022 = &lt;5.3 ug/L</li> <li>4) October 17, 2022 = &lt;5.3 ug/L</li> </ol> <p>During the inspection period the Owner/Operating Authority diligently collected Haloacetic Acids (HAA) samples, however the Owner/Operating Authority failed to ensure that samples were collected within the prescribed frequency as per Schedule 6-1.1(4) of O.Reg 170/03. Samples that are required be collected every three (3) months or in each calendar quarter shall be collected at least 60 days apart and not more than 120 days apart. The following samples were not taken within the prescribed frequency:</p> <ol style="list-style-type: none"> <li>1) June 17, 2022 to October 17, 2022 = 122 days</li> </ol> <p><b>ACTIONS REQUIRED</b></p> <p>This is the second inspection period in a row where this non-compliance has been found. The previous MECP inspection report from the previous inspection period, dated January 5, 2022, documented non-compliance with this requirement for sample frequency of HAA samples.</p> <p>From herein, the Owner/Operating Authority shall ensure that Haloacetic Acid samples are collected within the prescribed frequency as stipulated in Schedule 6-1.1(4) of O.Reg 170/03. The Owner/Operating Authority shall review their sampling requirements and their annual sampling schedule to ensure that samples are collected with the required frequency as stipulated in O. Reg 170/03. This annual sampling schedule, including any required changes, shall be submitted to the Inspector no later than 30 days from the date this report is received.</p>	

<b>Question ID</b>	MRDW1087001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Have all trihalomethane water quality monitoring requirements prescribed by legislation been conducted within the required frequency and at the required location?			

<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   13-6   (1); SDWA   O. Reg. 170/03   13-6   (2); SDWA   O. Reg. 170/03   13-6   (3); SDWA   O. Reg. 170/03   13-6   (4); SDWA   O. Reg. 170/03   13-6   (5); SDWA   O. Reg. 170/03   13-6   (6);
<b>Observation</b>	
<p>All trihalomethane water quality monitoring requirements prescribed by legislation were not conducted within the required frequency and/or at the required location. Trihalomethane samples are required to be collected and tested each calendar quarter from the distribution system in accordance with Schedule 13-6 of O.Reg. 170/03 with the frequency stipulated in Schedule 6-1.1(4), and shall be taken from a point in the drinking water system's distribution system that is likely to have an elevated potential for the formation of trihalomethanes.</p> <p>Records reviewed indicate the following samples were taken: City of St. Thomas Distribution System</p> <ol style="list-style-type: none"> <li>1) December 27, 2021 = 16 ug/L</li> <li>2) March 10, 2022 = 15 ug/L</li> <li>3) June 17, 2022 = 22 ug/L</li> <li>4) October 17, 2022 = 22 ug/L</li> </ol> <p>During the inspection period the Owner/Operating Authority diligently collected Trihalomethane samples, however the Owner/Operating Authority failed to ensure that samples were collected within the prescribed frequency as per Schedule 6-1.1(4) of O.Reg 170/03. Samples that are required be collected every three (3) months or in each calendar quarter shall be collected at least 60 days apart and not more than 120 days apart. The following samples were not taken within the prescribed frequency:</p> <ol style="list-style-type: none"> <li>1) June 17, 2022 to October 17, 2022 = 122 days</li> </ol> <p><b>ACTIONS REQUIRED</b></p> <p>This is the second inspection period in a row where this non-compliance has been found. The previous MECP inspection report from the previous inspection period, dated January 5, 2022, documented non-compliance with this requirement for sample frequency of Trihalomethane samples.</p> <p>From herein, the Owner/Operating Authority shall ensure that Trihalomethane samples are collected within the prescribed frequency as stipulated in Schedule 6-1.1(4) of O.Reg 170/03. The Owner/Operating Authority shall review their sampling requirements and their annual sampling schedule to ensure that samples are collected with the required frequency as stipulated in O. Reg 170/03. This annual sampling schedule, including any required changes, shall be submitted to the Inspector no later than 30 days from the date this report is received.</p>	

<b>Question ID</b>	MRDW1101001	<b>Question Type</b>	Legislative
<b>Question:</b>			



For LMR Systems, have corrective actions (as per Schedule 17 of O. Reg. 170/03) been taken to address adverse conditions, including any other steps as directed by the Medical Officer of Health?

**Legislative Requirement**

SDWA | O. Reg. 170/03 | 17-1; SDWA | O. Reg. 170/03 | 17-10 | (1); SDWA | O. Reg. 170/03 | 17-11; SDWA | O. Reg. 170/03 | 17-12; SDWA | O. Reg. 170/03 | 17-13; SDWA | O. Reg. 170/03 | 17-14; SDWA | O. Reg. 170/03 | 17-2; SDWA | O. Reg. 170/03 | 17-3; SDWA | O. Reg. 170/03 | 17-4; SDWA | O. Reg. 170/03 | 17-5; SDWA | O. Reg. 170/03 | 17-6; SDWA | O. Reg. 170/03 | 17-9;

**Observation**

Corrective actions (as per Schedule 17), including any other steps that were directed by the Medical Officer of Health, had been taken to address adverse conditions.

The owner/operating authority reported low chlorine residual in the distribution system, the residual was 0mg/L measured at a hydrant on a dead-end street on November 7, 2022. O. Reg. 170/03, Schedule 17-4 requires the owner/operating authority for a drinking water system to immediately flush and restore secondary disinfection. The Public Health Unit recommended the operating authority continue to flush and test until adequate chlorine residual is achieved, and to notify potentially affected users downstream of the hydrant. According to documentation reviewed for this event, the corrective actions were performed as required.

<b>Question ID</b>	MRDW1104000	<b>Question Type</b>	Legislative
<b>Question:</b>			
Were all required verbal notifications of adverse water quality incidents immediately provided as per O. Reg. 170/03 16-6?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   16-6   (1); SDWA   O. Reg. 170/03   16-6   (2); SDWA   O. Reg. 170/03   16-6   (3); SDWA   O. Reg. 170/03   16-6   (3.1); SDWA   O. Reg. 170/03   16-6   (3.2); SDWA   O. Reg. 170/03   16-6   (4); SDWA   O. Reg. 170/03   16-6   (5); SDWA   O. Reg. 170/03   16-6   (6);		
<b>Observation</b>			
All required notifications of adverse water quality incidents were immediately provided as per O. Reg. 170/03 16-6.			

<b>Question ID</b>	MRDW1113000	<b>Question Type</b>	Legislative
<b>Question:</b>			
Have all changes to the system registration information been provided to the Ministry within			

ten (10) days of the change?	
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   10.1   (3);
<b>Observation</b>	
All changes to the system registration information were provided within ten (10) days of the change.	

<b>Question ID</b>	MRDW1059000	<b>Question Type</b>	Legislative
<b>Question:</b>			
Do the operations and maintenance manuals contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the system?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 128/04   28;		
<b>Observation</b>			
The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system. A review of the City of St Thomas Water Distribution System Operations and Maintenance manual found that it contains relevant, adequate and up-to date descriptions of processes employed in the system as well as plans/drawings to meet the requirements of O. Reg. 128.			

<b>Question ID</b>	MRDW1060000	<b>Question Type</b>	Legislative
<b>Question:</b>			
Do the operations and maintenance manuals meet the requirements of the DWWP and MDWL issued under Part V of the SDWA?			
<b>Legislative Requirement</b>	SDWA   31   (1);		
<b>Observation</b>			
The operations and maintenance manuals met the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA.			

<b>Question ID</b>	MRDW1061001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Are logbooks properly maintained and contain the required information?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 128/04   27   (1); SDWA   O. Reg. 128/04   27   (2); SDWA   O. Reg. 128/04   27   (3); SDWA   O. Reg. 128/04   27   (4); SDWA   O. Reg. 128/04   27   (5); SDWA   O. Reg. 128/04   27   (6); SDWA   O. Reg. 128/04   27   (7);		

<b>Observation</b>
Logbooks were properly maintained and contained the required information. A review of the logbooks found that log entries did not include a time the chlorine residuals were taken. The operating authority is reminded of the requirement in O.Reg.170/03 6-10, for every required operational test and for every required sample, a record is required to be made of the date, time, location, and name of the person conducting the test and result of the test. Compliance with these requirements will be assessed during the next MECP inspection.

<b>Question ID</b>	MRDW1062001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Do records or other record keeping mechanisms confirm that operational testing not performed by continuous monitoring equipment is being done by a certified operator, water quality analyst, or person who meets the requirements of O. Reg. 170/03 7-5?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   7-5;		
<b>Observation</b>			
Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.			

<b>Question ID</b>	MRDW1071000	<b>Question Type</b>	BMP
<b>Question:</b>			
Has the owner provided security measures to protect components of the drinking water system?			
<b>Legislative Requirement</b>	Not Applicable		
<b>Observation</b>			
The owner had provided security measures to protect components of the drinking water system.			

<b>Question ID</b>	MRDW1073001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Has the overall responsible operator been designated for all subsystems which comprise the drinking water system?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 128/04   23   (1);		
<b>Observation</b>			

The overall responsible operator had been designated for each subsystem.

<b>Question ID</b>	MRDW1074001	<b>Question Type</b>	Legislative
<b>Question:</b> Have operators-in-charge been designated for all subsystems for which comprise the drinking water system?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 128/04   25   (1);		
<b>Observation</b> Operators-in-charge had been designated for all subsystems which comprise the drinking water system.			

<b>Question ID</b>	MRDW1075001	<b>Question Type</b>	Legislative
<b>Question:</b> Do all operators possess the required certification?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 128/04   22;		
<b>Observation</b> All operators possessed the required certification.			

<b>Question ID</b>	MRDW1076001	<b>Question Type</b>	Legislative
<b>Question:</b> Do only certified operators make adjustments to the treatment equipment?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   1-2   (2);		
<b>Observation</b> Only certified operators made adjustments to the treatment equipment.			



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**Stakeholder References**

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# Key Reference and Guidance Material for Municipal Residential Drinking Water Systems

Many useful materials are available to help you operate your drinking water system. Below is a list of key materials owners and operators of municipal residential drinking water systems frequently use.

To access these materials online click on their titles in the table below or use your web browser to search for their titles. Contact the Ministry if you need assistance or have questions at 1-866-793-2588 or [waterforms@ontario.ca](mailto:waterforms@ontario.ca).

For more information on Ontario's drinking water visit [www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater)



PUBLICATION TITLE	PUBLICATION NUMBER
<b>FORMS:</b> Drinking Water System Profile Information Laboratory Services Notification Adverse Test Result Notification	012-2149E 012-2148E 012-4444E
Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils	Website
Procedure for Disinfection of Drinking Water in Ontario	Website
Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids	Website
Filtration Processes Technical Bulletin	Website
Ultraviolet Disinfection Technical Bulletin	Website
Guide for Applying for Drinking Water Works Permit Amendments, & License Amendments	Website
Certification Guide for Operators and Water Quality Analysts	Website
Guide to Drinking Water Operator Training Requirements	9802E
Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption	Website
Drinking Water System Contact List	7128E01
Ontario's Drinking Water Quality Management Standard - Pocket Guide	Website
Watermain Disinfection Procedure	Website
List of Licensed Laboratories	Website

# Principaux guides et documents de référence sur les réseaux résidentiels municipaux d'eau potable

De nombreux documents utiles peuvent vous aider à exploiter votre réseau d'eau potable. Vous trouverez ci-après une liste de documents que les propriétaires et exploitants de réseaux résidentiels municipaux d'eau potable utilisent fréquemment. Pour accéder à ces documents en ligne, cliquez sur leur titre dans le tableau ci-dessous ou faites une recherche à l'aide de votre navigateur Web. Communiquez avec le ministère au 1-866-793-2588, ou encore à [waterforms@ontario.ca](mailto:waterforms@ontario.ca) si vous avez des questions ou besoin d'aide.



Pour plus de renseignements sur l'eau potable en Ontario, consultez le site [www.ontario.ca/eaupotable](http://www.ontario.ca/eaupotable)

TITRE DE LA PUBLICATION	NUMÉRO DE PUBLICATION
Renseignements sur le profil du réseau d'eau potable	012-2149F
Avis de demande de services de laboratoire	012-2148F
Avis de résultats d'analyse insatisfaisants et de règlement des problèmes	012-4444F
Prendre soin de votre eau potable - Un guide destiné aux membres des conseils municipaux	Site Web
Marche à suivre pour désinfecter l'eau potable en Ontario	Site Web
Stratégies pour minimiser les trihalométhanes et les acides haloacétiques de sous-produits de désinfection	Site Web
Filtration Processes Technical Bulletin (en anglais seulement)	Site Web
Ultraviolet Disinfection Technical Bulletin (en anglais seulement)	Site Web
Guide de présentation d'une demande de modification du permis d'aménagement de station de production d'eau potable	Site Web
Guide sur l'accréditation des exploitants de réseaux d'eau potable et des analystes de la qualité de l'eau de réseaux d'eau potable	Site Web
Guide sur les exigences relatives à la formation des exploitants de réseaux d'eau potable	9802F
Échantillonnage et analyse du plomb dans les collectivités : échantillonnage normalisé ou réduit et admissibilité à l'exemption	Site Web
Liste des personnes-ressources du réseau d'eau potable	Site Web
L'eau potable en Ontario - Norme de gestion de la qualité - Guide de poche	Site Web
Procédure de désinfection des conduites principales	Site Web
Laboratoires autorisés	Site Web

# APPLICATION OF THE RISK METHODOLOGY USED FOR MEASURING MUNICIPAL RESIDENTIAL DRINKING WATER SYSTEM INSPECTION RESULTS



The Ministry of the Environment (MOE) has a rigorous and comprehensive inspection program for municipal residential drinking water systems (MRDWS). Its objective is to determine the compliance of MRDWS with requirements under the Safe Drinking Water Act and associated regulations. It is the responsibility of the municipal residential drinking water system owner to ensure their drinking water systems are in compliance with all applicable legal requirements.

This document describes the risk rating methodology, which has been applied to the findings of the Ministry's MRDWS inspection

results since fiscal year 2008-09. The primary goals of this assessment are to encourage ongoing improvement of these systems and to establish a way to measure this progress.

MOE reviews the risk rating methodology every three years.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains 15 inspection modules consisting of approximately 100 regulatory questions. Those protocol questions are also linked to definitive guidance that ministry inspectors use when conducting MRDWS inspections.

[ontario.ca/drinkingwater](http://ontario.ca/drinkingwater)



The questions address a wide range of regulatory issues, from administrative procedures to drinking water quality monitoring. The inspection protocol also contains a number of non-regulatory questions.

A team of drinking water specialists in the ministry assessed each of the inspection protocol regulatory questions to determine the risk (not complying with the regulation) to the delivery of safe drinking water. This assessment was based on established provincial risk assessment principles, with each question receiving a risk rating referred to as the Question Risk Rating. Based on the number of areas where a system is deemed to be non-compliant during the inspection, and the significance of these areas to administrative, environmental, and health consequences, a risk-based inspection rating is calculated by the ministry for each drinking water system.

It is important to be aware that an inspection rating less than 100 per cent does not mean the drinking water from the system is unsafe. It shows areas where a system's operation can improve. The ministry works with owners and operators of systems to make sure they know what they need to do to achieve full compliance.

The inspection rating reflects the inspection results of the specific drinking water system for the reporting year. Since the methodology is applied consistently over a period of years, it serves as a comparative measure both provincially and in relation to the individual system. Both the drinking water system and the public are able to track the performance over time, which encourages continuous improvement and allows systems to identify specific areas requiring attention.

The ministry's annual inspection program is an important aspect of our drinking water safety net. The ministry and its partners share a common commitment to excellence and we continue to work toward the goal of 100 per cent regulatory compliance.

### 33 Determining Potential to Compromise the Delivery of Safe Water

The risk management approach used for MRDWS is aligned with the Government of Ontario's Risk Management Framework. Risk management is a systematic approach to identifying potential hazards, understanding the likelihood and consequences of the hazards, and taking steps to reduce their risk if necessary and as appropriate.

The Risk Management Framework provides a formula to be used in the determination of risk:

$$\text{RISK} = \text{LIKELIHOOD} \times \text{CONSEQUENCE}$$

(of the consequence)

Every regulatory question in the inspection protocol possesses a likelihood value (L) for an assigned consequence value (C) as described in **Table 1** and **Table 2**.

TABLE 1:	
Likelihood of Consequence Occurring	Likelihood Value
0% - 0.99% (Possible but Highly Unlikely)	L = 0
1 – 10% (Unlikely)	L = 1
11 – 49% (Possible)	L = 2
50 – 89% (Likely)	L = 3
90 – 100% (Almost Certain)	L = 4

TABLE 2:	
Consequence	Consequence Value
Medium Administrative Consequence	C = 1
Major Administrative Consequence	C = 2
Minor Environmental Consequence	C = 3
Minor Health Consequence	C = 4
Medium Environmental Consequence	C = 5
Major Environmental Consequence	C = 6
Medium Health Consequence	C = 7
Major Health Consequence	C = 8

The consequence values (0 through 8) are selected to align with other risk-based programs and projects currently under development or in use within the ministry as outlined in **Table 2**.

The Question Risk Rating for each regulatory inspection question is derived from an evaluation of every identified consequence and its corresponding likelihood of occurrence:

- All levels of consequence are evaluated for their potential to occur
- Greatest of all the combinations is selected.

<sup>34</sup>The Question Risk Rating quantifies the risk of non-compliance of each question relative to the others. Questions with higher values are those with a potentially more significant impact on drinking water safety and a higher likelihood of occurrence. The highest possible value would be 32 (4×8) and the lowest would be 0 (0×1).

**Table 3** presents a sample question showing the risk rating determination process.

TABLE 3:							
Does the Operator in Charge ensure that the equipment and processes are monitored, inspected and evaluated?							
Risk = Likelihood × Consequence							
C=1	C=2	C=3	C=4	C=5	C=6	C=7	C=8
Medium Administrative Consequence	Major Administrative Consequence	Minor Environmental Consequence	Minor Health Consequence	Medium Environmental Consequence	Major Environmental Consequence	Medium Health Consequence	Major Health Consequence
L=4 (Almost Certain)	L=1 (Unlikely)	L=2 (Possible)	L=3 (Likely)	L=3 (Likely)	L=1 (Unlikely)	L=3 (Likely)	L=2 (Possible)
R=4	R=2	R=6	R=12	R=15	R=6	R=21	R=16

## Application of the Methodology to Inspection Results

Based on the results of a MRDWS inspection, an overall inspection risk rating is calculated. During an inspection, inspectors answer the questions related to regulatory compliance and input their “yes”, “no” or “not applicable” responses into the Ministry’s Laboratory and Waterworks Inspection System (LWIS) database. A “no” response indicates non-compliance. The maximum number of regulatory questions asked by an inspector varies by: system (i.e., distribution, stand-alone); type of inspection (i.e., focused, detailed); and source type (i.e., groundwater, surface water).

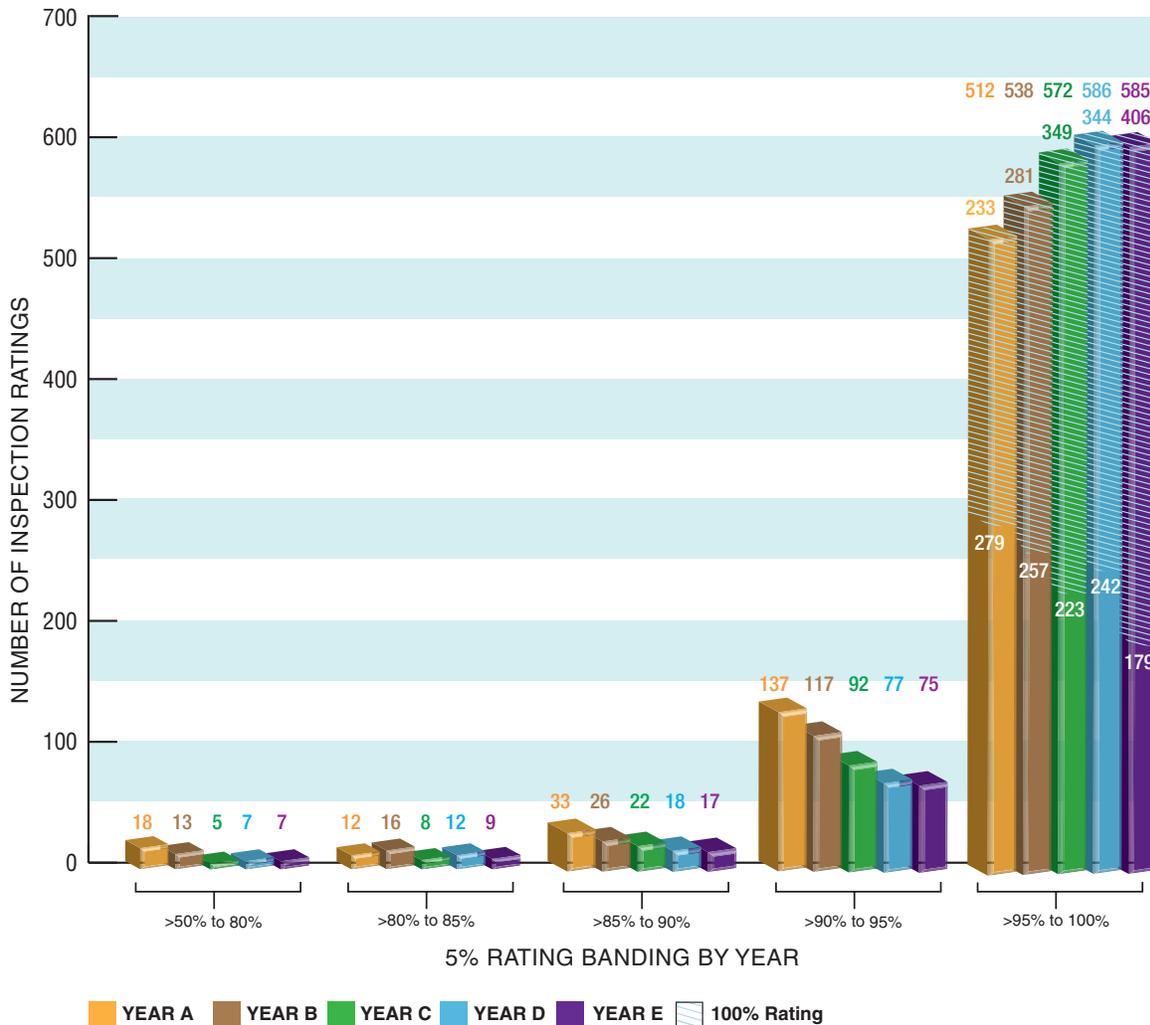
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

## Application of the Methodology for Public Reporting <sup>35</sup>

The individual MRDWS Total Inspection Ratings are published with the ministry's Chief Drinking Water Inspector's Annual Report.

**Figure 1** presents the distribution of MRDWS ratings for a sample of annual inspections. Individual drinking water systems can compare against all the other inspected facilities over a period of inspection years.

**Figure 1: Year Over Year Distribution of MRDWS Ratings**



## Reporting Results to MRDWS Owners/Operators

A summary of inspection findings for each system is generated in the form of an Inspection Rating Record (IRR). The findings are grouped into the 15 possible modules of the inspection protocol,

which would provide the system owner/operator with information on the areas where they need to improve. The 15 modules are:

- |                         |                                 |  |  |
|-------------------------|---------------------------------|--|--|
| 1. Source               | 5. Treatment Process Monitoring | 9. Logbooks                            | 13. Water Quality Monitoring                       |
| 2. Permit to Take Water | 6. Process Wastewater           | 10. Contingency and Emergency Planning | 14. Reporting, Notification and Corrective Actions |
| 3. Capacity Assessment  | 7. Distribution System          | 11. Consumer Relations                 | 15. Other Inspection Findings                      |
| 4. Treatment Processes  | 8. Operations Manuals           | 12. Certification and Training         |  |

For further information, please visit [www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater)

**DWS Name:** CITY OF ST. THOMAS DISTRIBUTION SYSTEM  
**DWS Number:** 260002187  
**DWS Owner:** CORPORATION OF THE CITY OF ST THOMAS  
**Municipal Location:** ST. THOMAS

**Regulation:** O.REG. 170/03  
**DWS Category:** DW Municipal Residential  
**Type of Inspection:** Focused  
**Inspection Date:** Jan-19-2023  
**Ministry Office:** London District Office

**Maximum Risk Rating:** 329

Inspection Module	Non Compliance Rating
Treatment Processes	0 / 14
Operations Manuals	0 / 28
Reporting & Corrective Actions	0 / 25
Other Inspection Findings	37 / 262
<b>Overall - Calculated</b>	<b>37 / 329</b>

**Inspection Risk Rating:** 11.25%

**Final Inspection Rating:** 88.75%

**DWS Name:** CITY OF ST. THOMAS DISTRIBUTION SYSTEM  
**DWS Number:** 260002187  
**DWS Owner Name:** CORPORATION OF THE CITY OF ST THOMAS  
**Municipal Location:** ST. THOMAS

**Regulation:** O.REG. 170/03  
**DWS Category:** DW Municipal Residential  
**Type of Inspection:** Focused  
**Inspection Date:** Jan-19-2023  
**Ministry Office:** London District Office

Non-Compliant Question(s)	Question Rating
<b>Other Inspection Findings</b>	
Is the secondary disinfectant residual measured as required for the large municipal residential distribution system?	21
Are all haloacetic acid water quality monitoring requirements prescribed by legislation conducted within the required frequency and at the required location?	8
Have all trihalomethane water quality monitoring requirements prescribed by legislation been conducted within the required frequency and at the required location?	8
<b>Overall - Total</b>	<b>37</b>

**Maximum Question Rating:** 329

<b>Inspection Risk Rating:</b>	<b>11.25%</b>
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<b>FINAL INSPECTION RATING:</b>	<b>88.75%</b>
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**Ministry of the Environment,  
Conservation and Parks****Ministère de l'Environnement, de la  
Protection de la nature et des Parcs**Drinking Water and Environmental  
Compliance DivisionDivision de la conformité en matière d'eau  
potable et d'environnementSouthwest Region  
733 Exeter Road  
London, ON N6E 1L3  
Phone: 519-873-5000*Région Sud-Ouest*  
*733 rue Exeter*  
*London, ON N6E 1L3*  
Tél: 519-873-5000

April 11, 2023

The Corporation of the City of St Thomas  
545 Talbot Street  
St Thomas, ON N5P 3V7Attention: Justin Lawrence, Director of Environmental Services  
Re: St Thomas Area Secondary Water Supply System Final Inspection Report (#260078897)

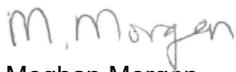
The enclosed Drinking Water Inspection Report outlines non-compliance, if any, with Ministry legislation, and policies for the above noted water system. Violations noted in this report, if any, have been evaluated based on community risk. These violations will be monitored for compliance with the minimum standards for drinking water in Ontario as set forth under the *Safe Drinking Water Act* and associated regulations. Where risk is deemed to be high and/or compliance is an ongoing concern, violations will be forwarded to this Ministry's Investigation and Enforcement Branch.

In order to measure individual inspection results, the Ministry has established an inspection compliance risk framework based on the principles of the Inspection, Investigation & Enforcement (II&E) Secretariat and advice of internal/external risk experts. The Inspection Summary Rating Record (IRR) provides the Ministry, the system owner and the local Public Health Units with a summarized quantitative measure of the drinking water system's annual inspection and regulated water quality testing performance.

Section 19 of the Safe Drinking Water Act (Standard of Care) creates a number of obligations for individuals who exercise decision-making authority over municipal drinking water systems. Please be aware that the Ministry has encouraged such individuals, particularly municipal councillors, to take steps to be better informed about the drinking water systems over which they have decision-making authority. These steps could include asking for a copy of this inspection report and a review of its findings. Further information about Section 19 can be found in "*Taking Care of Your Drinking Water: A guide for members of municipal council*" found under "Resources" on the Drinking Water Ontario website at [www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater).

Please note the attached IRR methodology memo describing how the risk rating model has improved to better reflect the health related and administrative non-compliance found in an inspection report. IRR ratings are published (for the previous inspection year) in the Ministry's Chief Drinking Water Inspector's Annual Report. **Please note that due to a change in IT systems, the Inspection Rating Report (IRR) cannot be generated at the same time as the inspection report. The IRR will be sent separately and prior to any public release (typically within 1-2 month of the completion of the inspection).** If you have any questions regarding the report, please feel free to call me at (226) 926-1785.

Sincerely,

Meghan Morgan  
Provincial Officer, Water Inspector  
London District Office  
[Meghan.Morgan@ontario.ca](mailto:Meghan.Morgan@ontario.ca)cc. Southwestern Public Health Unit  
Kettle Creek Conservation Authority



ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM  
490 SOUTH EDGEWARE, ST. THOMAS, ON,  
**Inspection Report**

System Number: 260078897  
Entity: CORPORATION OF THE CITY OF  
ST THOMAS  
ST. THOMAS AREA SECONDARY  
WATER SUPPLY SYSTEM JOINT  
BOARD OF MANAGEMENT  
Inspection Start Date: 01/19/2023 (mm/dd/yyyy)  
Inspection End Date: 04/06/2023 (mm/dd/yyyy)  
Inspected By: Meghan Morgan  
Badge #: 1315

*M. Morgan*

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(signature)

**NON-COMPLIANCE/NON-CONFORMANCE ITEMS**

The following item(s) have been identified as non-compliance/non-conformance, based on a "No" response captured for a legislative or best management practice (BMP) question (s), respectively.

**Question Group:** Other Inspection Findings

<b>Question ID</b>	MRDW1033001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Is the secondary disinfectant residual measured as required for the large municipal residential distribution system?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   7-2   (3); SDWA   O. Reg. 170/03   7-2   (4);		
<b>Observation/Corrective Action(s)</b>			
<p>The secondary disinfectant residual was not measured as required for the large municipal residential distribution system. Ontario Regulation 170/03, Schedule 7-2 (3) requires the owner/operating authority of a large municipal residential system that provides secondary disinfection to ensure that at least seven distribution samples are taken each week and tested immediately for free chlorine residual. At least four of the samples must be taken on one day of the week, and at least three samples must be taken on a second day of the week, at least 48 hours after the samples taken on the first day.</p> <p>Grab samples are collected during different days of the week and tested for free chlorine from different locations within the distribution system. The system also uses process chlorine analyzers located at the East Chamber, West Chamber, Southwold Meter Chamber and the Ford Meter Chamber to continuously monitor the free chlorine residual within the distribution system. These continuous chlorine analyzers have alarm set points to ensure the free chlorine residual is maintained above 0.05mg/L.</p> <p>Records were reviewed of the grab samples taken in the distribution system by operators who collect manual samples. The operating authority diligently took chlorine residual samples throughout the distribution system, however during this inspection review period there was one week where the second set of samples taken in the week were not taken greater than 48hrs after the last samples were taken on the first day.</p> <p><b>ACTIONS REQUIRED</b></p> <p>From herein, the owner/operating authority must ensure the secondary disinfection residual is measured as required by O.Reg.170/03 7-2 (3) with the second set of samples taken in the week to be at least 48hrs after the last sample taken on the first day. Compliance with this requirement will be assessed during the next inspection period.</p>			



### INSPECTION DETAILS

This section includes all questions that were assessed during the inspection.

**Ministry Program:** DRINKING WATER | **Regulated Activity:** DW Municipal Residential

Question ID	MRDW1001001	Question Type	Information
<b>Question:</b>			
What was the scope of this inspection?			
<b>Legislative Requirement</b>	Not Applicable		
<b>Observation</b>			
<p>The primary focus of this inspection is to confirm compliance with Ministry of the Environment, Conservation and Parks (MECP) legislation as well as evaluating conformance with ministry drinking water policies and guidelines during the inspection period. The ministry utilizes a comprehensive, multi-barrier approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as management practices.</p> <p>This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O. Reg. 170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.</p> <p>This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements. A site visit was performed on February 16, 2023 by Water Inspector Meghan Morgan.</p> <p>Several documents were reviewed as part of the inspection, these documents include but are not limited to:</p> <ol style="list-style-type: none"> <li>1. Operations and Procedures Manual most recently updated January 2022.</li> <li>2. Drinking Water Works Permit #190-201 – Issue #3 dated September 30, 2021.</li> <li>3. Municipal Drinking Water Licence #190-101 – Issue #5 dated September 30, 2021.</li> <li>4. Certificates of analysis and operational documents maintained by the owner/operator for the inspection period.</li> </ol> <p>It should be noted that this inspection covers the period from November 1, 2021 to November 30, 2022.</p>			

Question ID	MRDW1000001	Question Type	Information
<b>Question:</b>			

Does this drinking water system provide primary disinfection?	
<b>Legislative Requirement</b>	Not Applicable
<b>Observation</b>	
<p>This Drinking Water System provides for only secondary disinfection and distribution of water. Primary disinfection is undertaken by another regulated Drinking Water System which provides treated water to this Drinking Water System. The St. Thomas Secondary Area Secondary Water Supply System is owned by the St. Thomas Area Secondary Water Supply System Joint Board of Management which includes the City of St. Thomas, the Municipality of Central Elgin, and the Township of Southwold. Operational duties and maintenance are provided by two accredited Operating Authorities, the City of St. Thomas Environmental Services, Operations Division, Water Section, and the Ontario Clean Water Agency (OCWA). The City of St. Thomas is responsible for the operations and maintenance of the secondary water supply system and OCWA is responsible for the operations and maintenance for the St. Thomas Booster Station which is located in the Elgin Middlesex Pumping Station Building.</p>	

<b>Question ID</b>	MRDW1018001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Has the owner ensured that all equipment is installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit?			
<b>Legislative Requirement</b>	SDWA   31   (1);		
<b>Observation</b>			
The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit.			

<b>Question ID</b>	MRDW1114001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Does the owner have evidence that, when required, all legal owners associated with the DWS were notified of the requirements of the Licence & Permit?			
<b>Legislative Requirement</b>	SDWA   31   (1);		
<b>Observation</b>			
<p>The owner had evidence that required notifications to all legal owners associated with the Drinking Water System had been made during the inspection period. The owner/operating authority has procedures in place that require DWQMS sign-off from new developments, this includes a sign-off that the developers have reviewed the MDWL and DWWP.</p>			

<b>Question ID</b>	MRDW1025001	<b>Question Type</b>	Legislative
<b>Question:</b> Were all parts of the drinking water system that came in contact with drinking water (added, modified, replaced or extended) disinfected in accordance with a procedure listed in Schedule B of the Drinking Water Works Permit?			
<b>Legislative Requirement</b>	SDWA   31   (1);		
<b>Observation</b>			
All parts of the drinking water system were disinfected in accordance with a procedure listed in Schedule B of the Drinking Water Works Permit.			

<b>Question ID</b>	MRDW1024001	<b>Question Type</b>	Legislative
<b>Question:</b> Do records confirm that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated as required?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   1-2   (2);		
<b>Observation</b>			
Records confirmed that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/l free or 0.25 mg/l combined. Re-chlorination occurs at the St. Thomas Booster Station which is located within the Elgin- Middlesex Pumping Station, to ensure an acceptable level of chlorine throughout the distribution system.			

<b>Question ID</b>	MRDW1035001	<b>Question Type</b>	Legislative
<b>Question:</b> Are operators examining continuous monitoring test results and are they examining the results within 72 hours of the test?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   6-5   (1)1-4; SDWA   O. Reg. 170/03   6-5   (1)5-10;		
<b>Observation</b>			
Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test.			

<b>Question ID</b>	MRDW1040000	<b>Question Type</b>	Legislative
<b>Question:</b> Are all continuous analysers calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   6-5   (1)1-4; SDWA   O. Reg. 170/03   6-5   (1)5-10;		
<b>Observation</b>			
All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation. The City of St. Thomas retains a contractor to perform regular calibrations on their equipment and the Ontario Clean Water Agency utilizes internal staff to calibrate the equipment at the EMPS. In addition to the aforementioned, operators from both Operating Authorities often conduct manual verification checks on the chlorine analyzers utilizing handheld colorimeters and will adjust them accordingly to ensure accuracy.			

<b>Question ID</b>	MRDW1108001	<b>Question Type</b>	Legislative
<b>Question:</b> Where continuous monitoring equipment used for the monitoring of free chlorine residual, total chlorine residual, combined chlorine residual or turbidity, required by O. Reg. 170/03, an Order, MDWL, or DWWP issued under Part V, SDWA, has triggered an alarm or an automatic shut-off, did a qualified person respond in a timely manner and take appropriate actions?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   6-5   (1)1-4; SDWA   O. Reg. 170/03   6-5   (1)5-10; SDWA   O. Reg. 170/03   6-5   (1.1);		
<b>Observation</b>			
Where required continuous monitoring equipment used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person responded in a timely manner and took appropriate actions.			

<b>Question ID</b>	MRDW1033001	<b>Question Type</b>	Legislative
<b>Question:</b> Is the secondary disinfectant residual measured as required for the large municipal residential distribution system?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   7-2   (3); SDWA   O. Reg. 170/03   7-2   (4);		
<b>Observation</b>			

The secondary disinfectant residual was not measured as required for the large municipal residential distribution system. Ontario Regulation 170/03, Schedule 7-2 (3) requires the owner/operating authority of a large municipal residential system that provides secondary disinfection to ensure that at least seven distribution samples are taken each week and tested immediately for free chlorine residual. At least four of the samples must be taken on one day of the week, and at least three samples must be taken on a second day of the week, at least 48 hours after the samples taken on the first day.

Grab samples are collected during different days of the week and tested for free chlorine from different locations within the distribution system. The system also uses process chlorine analyzers located at the East Chamber, West Chamber, Southwold Meter Chamber and the Ford Meter Chamber to continuously monitor the free chlorine residual within the distribution system. These continuous chlorine analyzers have alarm set points to ensure the free chlorine residual is maintained above 0.05mg/L.

Records were reviewed of the grab samples taken in the distribution system by operators who collect manual samples. The operating authority diligently took chlorine residual samples throughout the distribution system, however during this inspection review period there was one week where the second set of samples taken in the week were not taken greater than 48hrs after the last samples were taken on the first day.

**ACTIONS REQUIRED**

From herein, the owner/operating authority must ensure the secondary disinfection residual is measured as required by O.Reg.170/03 7-2 (3) with the second set of samples taken in the week to be at least 48hrs after the last sample taken on the first day. Compliance with this requirement will be assessed during the next inspection period.

<b>Question ID</b>	MRDW1099001	<b>Question Type</b>	Information
<b>Question:</b>			
Do records show that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O. Reg. 169/03)?			
<b>Legislative Requirement</b>	Not Applicable		
<b>Observation</b>			
Records showed that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O. Reg. 169/03).			

<b>Question ID</b>	MRDW1081001	<b>Question Type</b>	Legislative
<b>Question:</b>			

For LMR systems, are all microbiological water quality monitoring requirements for distribution samples being met?	
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   10-2   (1); SDWA   O. Reg. 170/03   10-2   (2); SDWA   O. Reg. 170/03   10-2   (3);
<b>Observation</b>	
All microbiological water quality monitoring requirements prescribed by legislation for distribution samples in a large municipal residential system were being met. Ontario Regulation 170/03 - Schedule 10-2 stipulates that distribution water samples are required to be collected for testing every week within the frequency prescribed by the Regulation. Based on the service population the Owner/Operating Authority is required to take a minimum of 8 distribution samples every month. Every distribution system sample must be analyzed for: E.coli; total coliforms; and 25% of the required samples must be tested for general bacteria population expressed as colony counts on a heterotrophic plate count. A review of the records for the inspection period indicate the number of microbiological samples collected ranged from 10-15 per month.	

<b>Question ID</b>	MRDW1096001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Do records confirm that chlorine residual tests are being conducted at the same time and at the same location that microbiological samples are obtained?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   6-3   (1);		
<b>Observation</b>			
Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.			

<b>Question ID</b>	MRDW1086001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Are all haloacetic acid water quality monitoring requirements prescribed by legislation conducted within the required frequency and at the required location?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   13-6.1   (1); SDWA   O. Reg. 170/03   13-6.1   (2); SDWA   O. Reg. 170/03   13-6.1   (3); SDWA   O. Reg. 170/03   13-6.1   (4); SDWA   O. Reg. 170/03   13-6.1   (5); SDWA   O. Reg. 170/03   13-6.1   (6);		
<b>Observation</b>			
All haloacetic acid water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location. Haloacetic Acid samples are required to be collected and tested each calendar quarter from the distribution			

system in accordance with Schedule 13-6.1 of O.Reg. 170/03 with the frequency stipulated in Schedule 6-1.1(4), and shall be taken from a point in the drinking water system's distribution system that is likely to have an elevated potential for the formation of haloacetic acids.

A review of sample records for the inspection period indicated that this requirement has been met. The following samples were taken:

**St Thomas Pipeline**

January 5, 2022 = 5.5 ug/L

April 6, 2022 = 5.3 ug/L

July 5, 2022 = 7.5 ug/L

October 11, 2022 = 13.9 ug/L

**East Chamber**

December 22, 2021 = 6 ug/L

March 10, 2022 = 5.3 ug/L

June 17, 2022 = 5.4 ug/L

October 17, 2022 = 6.8 ug/L

Question ID	MRDW1087001	Question Type	Legislative
<p><b>Question:</b> Have all trihalomethane water quality monitoring requirements prescribed by legislation been conducted within the required frequency and at the required location?</p>			
<p><b>Legislative Requirement</b></p>	<p>SDWA   O. Reg. 170/03   13-6   (1); SDWA   O. Reg. 170/03   13-6   (2); SDWA   O. Reg. 170/03   13-6   (3); SDWA   O. Reg. 170/03   13-6   (4); SDWA   O. Reg. 170/03   13-6   (5); SDWA   O. Reg. 170/03   13-6   (6);</p>		
<p><b>Observation</b></p>			
<p>All trihalomethane water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location. Trihalomethane samples are required to be collected and tested each calendar quarter from the distribution system in accordance with Schedule 13-6 of O.Reg. 170/03 with the frequency stipulated in Schedule 6-1.1(4), and shall be taken from a point in the drinking water system's distribution system that is likely to have an elevated potential for the formation of trihalomethanes.</p> <p>A review of sample records for the inspection period indicated that this requirement has been met. The following samples were taken:</p> <p>St Thomas Pipeline January 5, 2022 = 14 ug/L</p>			

April 6, 2022 = 13 ug/L  
July 5, 2022 = 19 ug/L  
October 11, 2022 = 22 ug/L

Ford Meter Pit  
December 22, 2021 = 23 ug/L  
March 10, 2022 = 21 ug/L  
June 17, 2022 = 30 ug/L  
October 17, 2022 = 37 ug/L

Question ID	MRDW1113000	Question Type	Legislative
<b>Question:</b> Have all changes to the system registration information been provided to the Ministry within ten (10) days of the change?			
Legislative Requirement	SDWA   O. Reg. 170/03   10.1   (3);		
<b>Observation</b> All changes to the system registration information were provided within ten (10) days of the change.			

Question ID	MRDW1059000	Question Type	Legislative
<b>Question:</b> Do the operations and maintenance manuals contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the system?			
Legislative Requirement	SDWA   O. Reg. 128/04   28;		
<b>Observation</b> The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.			

Question ID	MRDW1060000	Question Type	Legislative
<b>Question:</b> Do the operations and maintenance manuals meet the requirements of the DWWP and MDWL issued under Part V of the SDWA?			
Legislative Requirement	SDWA   31   (1);		
<b>Observation</b>			



The operations and maintenance manuals met the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA. Municipal Drinking Water Licence #190-101 – Issue #5, Section 16 of Schedule B outline the minimum requirements for the Operation and Maintenance Manuals. A review of each of the Operation and Maintenance Manuals that submitted by both Operating Authorities indicate that the manuals contain the aforementioned requirements as stated in the MDWL including but not limited to; contingency plans, procedures to deal with emergencies and procedures for dealing with complaints associated with the drinking water system.

Question ID	MRDW1061001	Question Type	Legislative
<p><b>Question:</b> Are logbooks properly maintained and contain the required information?</p>			
<p><b>Legislative Requirement</b></p>	<p>SDWA   O. Reg. 128/04   27   (1); SDWA   O. Reg. 128/04   27   (2); SDWA   O. Reg. 128/04   27   (3); SDWA   O. Reg. 128/04   27   (4); SDWA   O. Reg. 128/04   27   (5); SDWA   O. Reg. 128/04   27   (6); SDWA   O. Reg. 128/04   27   (7);</p>		
<p><b>Observation</b></p>			
<p>Logbooks were properly maintained and contained the required information. A review of the logbooks found that most entries contained the required information however some entries were missing information that is required to be recorded, such as who the designated OIC was on certain days, the ORO and operator sign-in. As a reminder for the operating authority, O.Reg.128, Section 27 (5) An operator-in-charge or a person authorized by an operator-in-charge shall record the following information in the logs or other record-keeping mechanisms in respect of each operating shift:</p> <ol style="list-style-type: none"> <li>1. The date, the time of day the shift began and ended and the number or designation of the shift.</li> <li>2. The names of all operators on duty during the shift.</li> <li>3. Any departures from normal operating procedures that occurred during the shift and the time they occurred.</li> <li>4. Any special instructions that were given during the shift to depart from normal operating procedures and the person who gave the instructions.</li> <li>5. Any unusual or abnormal conditions that were observed in the subsystem during the shift, any action that was taken and any conclusions drawn from the observations.</li> <li>6. Any equipment that was taken out of service or ceased to operate during the shift and any action taken to maintain or repair equipment during the shift. O. Reg. 128/04, s. 27 (5).</li> </ol> <p>A review of the logbooks also found that all log entries did not include a time the chlorine residuals were taken. The operating authority is reminded of the requirement in O.Reg. 170/03 6-10, for every required operational test and for every required sample, a record is required to be made of the date, time, location, and name of the person conducting the test and result of the test.</p> <p>Compliance with these requirements will be assessed during the next MECP inspection.</p>			

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<b>Question ID</b>	MRDW1062001	<b>Question Type</b>	Legislative
<b>Question:</b> Do records or other record keeping mechanisms confirm that operational testing not performed by continuous monitoring equipment is being done by a certified operator, water quality analyst, or person who meets the requirements of O. Reg. 170/03 7-5?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   7-5;		
<b>Observation</b>			
Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.			

<b>Question ID</b>	MRDW1071000	<b>Question Type</b>	BMP
<b>Question:</b> Has the owner provided security measures to protect components of the drinking water system?			
<b>Legislative Requirement</b>	Not Applicable		
<b>Observation</b>			
The owner had provided security measures to protect components of the drinking water system. The Elgin Middlesex Pumping Station is equipped with door alarms and motion detectors which are transmitted through SCADA to the Elgin Area Primary Water Supply which is monitored 24 hours a day by the Ontario Clean Water Agency (OCWA). The Elgin Middlesex Pumping is also enclosed with security fencing and visited regularly by operators from OCWA. The East Chamber is located on the property of the Elgin Middlesex Pumping Station and therefore also enclosed by security fencing. The West Chamber, Southwold Meter Chamber and the Ford Meter Chamber are all kept locked.			

<b>Question ID</b>	MRDW1073001	<b>Question Type</b>	Legislative
<b>Question:</b> Has the overall responsible operator been designated for all subsystems which comprise the drinking water system?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 128/04   23   (1);		
<b>Observation</b>			
The overall responsible operator had been designated for each subsystem.			

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<b>Question ID</b>	MRDW1074001	<b>Question Type</b>	Legislative
<b>Question:</b> Have operators-in-charge been designated for all subsystems for which comprise the drinking water system?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 128/04   25   (1);		
<b>Observation</b> Operators-in-charge had been designated for all subsystems which comprise the drinking water system.			

<b>Question ID</b>	MRDW1075001	<b>Question Type</b>	Legislative
<b>Question:</b> Do all operators possess the required certification?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 128/04   22;		
<b>Observation</b> All operators possessed the required certification.			

<b>Question ID</b>	MRDW1076001	<b>Question Type</b>	Legislative
<b>Question:</b> Do only certified operators make adjustments to the treatment equipment?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   1-2   (2);		
<b>Observation</b> Only certified operators made adjustments to the treatment equipment.			

<b>Question ID</b>	MRDW1117001	<b>Question Type</b>	Information
<b>Question:</b> Are there any other DWS related items that should be recognized in this report?			
<b>Legislative Requirement</b>	Not Applicable		
<b>Observation</b> The following items are noted as being relevant to the Drinking Water System:			

At the time of the site inspection the Ford Water Tower was leaking. The leak is allowing chlorinated water to constantly flow out of the overflow pipe and into the natural environment. There are no plans to fix this leak in the near future as the owner plans to decommission this water tower in approximately the next two years.

This discharge of potable water from the storage facility to the water course should be de-chlorinated.



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**Stakeholder References**

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# Key Reference and Guidance Material for Municipal Residential Drinking Water Systems

Many useful materials are available to help you operate your drinking water system. Below is a list of key materials owners and operators of municipal residential drinking water systems frequently use.

To access these materials online click on their titles in the table below or use your web browser to search for their titles. Contact the Ministry if you need assistance or have questions at 1-866-793-2588 or [waterforms@ontario.ca](mailto:waterforms@ontario.ca).

For more information on Ontario's drinking water visit [www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater)



PUBLICATION TITLE	PUBLICATION NUMBER
<b>FORMS:</b> Drinking Water System Profile Information Laboratory Services Notification Adverse Test Result Notification	012-2149E 012-2148E 012-4444E
Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils	Website
Procedure for Disinfection of Drinking Water in Ontario	Website
Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids	Website
Filtration Processes Technical Bulletin	Website
Ultraviolet Disinfection Technical Bulletin	Website
Guide for Applying for Drinking Water Works Permit Amendments, & License Amendments	Website
Certification Guide for Operators and Water Quality Analysts	Website
Guide to Drinking Water Operator Training Requirements	9802E
Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption	Website
Drinking Water System Contact List	7128E01
Ontario's Drinking Water Quality Management Standard - Pocket Guide	Website
Watermain Disinfection Procedure	Website
List of Licensed Laboratories	Website

# Principaux guides et documents de référence sur les réseaux résidentiels municipaux d'eau potable

De nombreux documents utiles peuvent vous aider à exploiter votre réseau d'eau potable. Vous trouverez ci-après une liste de documents que les propriétaires et exploitants de réseaux résidentiels municipaux d'eau potable utilisent fréquemment. Pour accéder à ces documents en ligne, cliquez sur leur titre dans le tableau ci-dessous ou faites une recherche à l'aide de votre navigateur Web. Communiquez avec le ministère au 1-866-793-2588, ou encore à [waterforms@ontario.ca](mailto:waterforms@ontario.ca) si vous avez des questions ou besoin d'aide.



Pour plus de renseignements sur l'eau potable en Ontario, consultez le site [www.ontario.ca/eaupotable](http://www.ontario.ca/eaupotable)

TITRE DE LA PUBLICATION	NUMÉRO DE PUBLICATION
Renseignements sur le profil du réseau d'eau potable	012-2149F
Avis de demande de services de laboratoire	012-2148F
Avis de résultats d'analyse insatisfaisants et de règlement des problèmes	012-4444F
Prendre soin de votre eau potable - Un guide destiné aux membres des conseils municipaux	Site Web
Marche à suivre pour désinfecter l'eau potable en Ontario	Site Web
Stratégies pour minimiser les trihalométhanes et les acides haloacétiques de sous-produits de désinfection	Site Web
Filtration Processes Technical Bulletin (en anglais seulement)	Site Web
Ultraviolet Disinfection Technical Bulletin (en anglais seulement)	Site Web
Guide de présentation d'une demande de modification du permis d'aménagement de station de production d'eau potable	Site Web
Guide sur l'accréditation des exploitants de réseaux d'eau potable et des analystes de la qualité de l'eau de réseaux d'eau potable	Site Web
Guide sur les exigences relatives à la formation des exploitants de réseaux d'eau potable	9802F
Échantillonnage et analyse du plomb dans les collectivités : échantillonnage normalisé ou réduit et admissibilité à l'exemption	Site Web
Liste des personnes-ressources du réseau d'eau potable	Site Web
L'eau potable en Ontario - Norme de gestion de la qualité - Guide de poche	Site Web
Procédure de désinfection des conduites principales	Site Web
Laboratoires autorisés	Site Web

# APPLICATION OF THE RISK METHODOLOGY USED FOR MEASURING MUNICIPAL RESIDENTIAL DRINKING WATER SYSTEM INSPECTION RESULTS



The Ministry of the Environment (MOE) has a rigorous and comprehensive inspection program for municipal residential drinking water systems (MRDWS). Its objective is to determine the compliance of MRDWS with requirements under the Safe Drinking Water Act and associated regulations. It is the responsibility of the municipal residential drinking water system owner to ensure their drinking water systems are in compliance with all applicable legal requirements.

This document describes the risk rating methodology, which has been applied to the findings of the Ministry's MRDWS inspection

results since fiscal year 2008-09. The primary goals of this assessment are to encourage ongoing improvement of these systems and to establish a way to measure this progress.

MOE reviews the risk rating methodology every three years.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains 15 inspection modules consisting of approximately 100 regulatory questions. Those protocol questions are also linked to definitive guidance that ministry inspectors use when conducting MRDWS inspections.

[ontario.ca/drinkingwater](http://ontario.ca/drinkingwater)



The questions address a wide range of regulatory issues, from administrative procedures to drinking water quality monitoring. The inspection protocol also contains a number of non-regulatory questions.

A team of drinking water specialists in the ministry assessed each of the inspection protocol regulatory questions to determine the risk (not complying with the regulation) to the delivery of safe drinking water. This assessment was based on established provincial risk assessment principles, with each question receiving a risk rating referred to as the Question Risk Rating. Based on the number of areas where a system is deemed to be non-compliant during the inspection, and the significance of these areas to administrative, environmental, and health consequences, a risk-based inspection rating is calculated by the ministry for each drinking water system.

It is important to be aware that an inspection rating less than 100 per cent does not mean the drinking water from the system is unsafe. It shows areas where a system's operation can improve. The ministry works with owners and operators of systems to make sure they know what they need to do to achieve full compliance.

The inspection rating reflects the inspection results of the specific drinking water system for the reporting year. Since the methodology is applied consistently over a period of years, it serves as a comparative measure both provincially and in relation to the individual system. Both the drinking water system and the public are able to track the performance over time, which encourages continuous improvement and allows systems to identify specific areas requiring attention.

The ministry's annual inspection program is an important aspect of our drinking water safety net. The ministry and its partners share a common commitment to excellence and we continue to work toward the goal of 100 per cent regulatory compliance.

## 57 Determining Potential to Compromise the Delivery of Safe Water

The risk management approach used for MRDWS is aligned with the Government of Ontario's Risk Management Framework. Risk management is a systematic approach to identifying potential hazards, understanding the likelihood and consequences of the hazards, and taking steps to reduce their risk if necessary and as appropriate.

The Risk Management Framework provides a formula to be used in the determination of risk:

$$\text{RISK} = \text{LIKELIHOOD} \times \text{CONSEQUENCE}$$

(of the consequence)

Every regulatory question in the inspection protocol possesses a likelihood value (L) for an assigned consequence value (C) as described in **Table 1** and **Table 2**.

TABLE 1:	
Likelihood of Consequence Occurring	Likelihood Value
0% - 0.99% (Possible but Highly Unlikely)	L = 0
1 - 10% (Unlikely)	L = 1
11 - 49% (Possible)	L = 2
50 - 89% (Likely)	L = 3
90 - 100% (Almost Certain)	L = 4

TABLE 2:	
Consequence	Consequence Value
Medium Administrative Consequence	C = 1
Major Administrative Consequence	C = 2
Minor Environmental Consequence	C = 3
Minor Health Consequence	C = 4
Medium Environmental Consequence	C = 5
Major Environmental Consequence	C = 6
Medium Health Consequence	C = 7
Major Health Consequence	C = 8

The consequence values (0 through 8) are selected to align with other risk-based programs and projects currently under development or in use within the ministry as outlined in **Table 2**.

The Question Risk Rating for each regulatory inspection question is derived from an evaluation of every identified consequence and its corresponding likelihood of occurrence:

- All levels of consequence are evaluated for their potential to occur
- Greatest of all the combinations is selected.

The Question Risk Rating quantifies the risk of non-compliance of each question relative to the others. Questions with higher values are those with a potentially more significant impact on drinking water safety and a higher likelihood of occurrence. The highest possible value would be 32 (4x8) and the lowest would be 0 (0x1).

**Table 3** presents a sample question showing the risk rating determination process.

**TABLE 3:**

**Does the Operator in Charge ensure that the equipment and processes are monitored, inspected and evaluated?**

**Risk = Likelihood × Consequence**

C=1	C=2	C=3	C=4	C=5	C=6	C=7	C=8
<b>Medium</b> Administrative Consequence	<b>Major</b> Administrative Consequence	<b>Minor</b> Environmental Consequence	<b>Minor</b> Health Consequence	<b>Medium</b> Environmental Consequence	<b>Major</b> Environmental Consequence	<b>Medium</b> Health Consequence	<b>Major</b> Health Consequence
L=4 (Almost Certain)	L=1 (Unlikely)	L=2 (Possible)	L=3 (Likely)	L=3 (Likely)	L=1 (Unlikely)	L=3 (Likely)	L=2 (Possible)
<b>R=4</b>	<b>R=2</b>	<b>R=6</b>	<b>R=12</b>	<b>R=15</b>	<b>R=6</b>	<b>R=21</b>	<b>R=16</b>

### Application of the Methodology to Inspection Results

Based on the results of a MRDWS inspection, an overall inspection risk rating is calculated. During an inspection, inspectors answer the questions related to regulatory compliance and input their “yes”, “no” or “not applicable” responses into the Ministry’s Laboratory and Waterworks Inspection System (LWIS) database. A “no” response indicates non-compliance. The maximum number of regulatory questions asked by an inspector varies by: system (i.e., distribution, stand-alone); type of inspection (i.e., focused, detailed); and source type (i.e., groundwater, surface water).

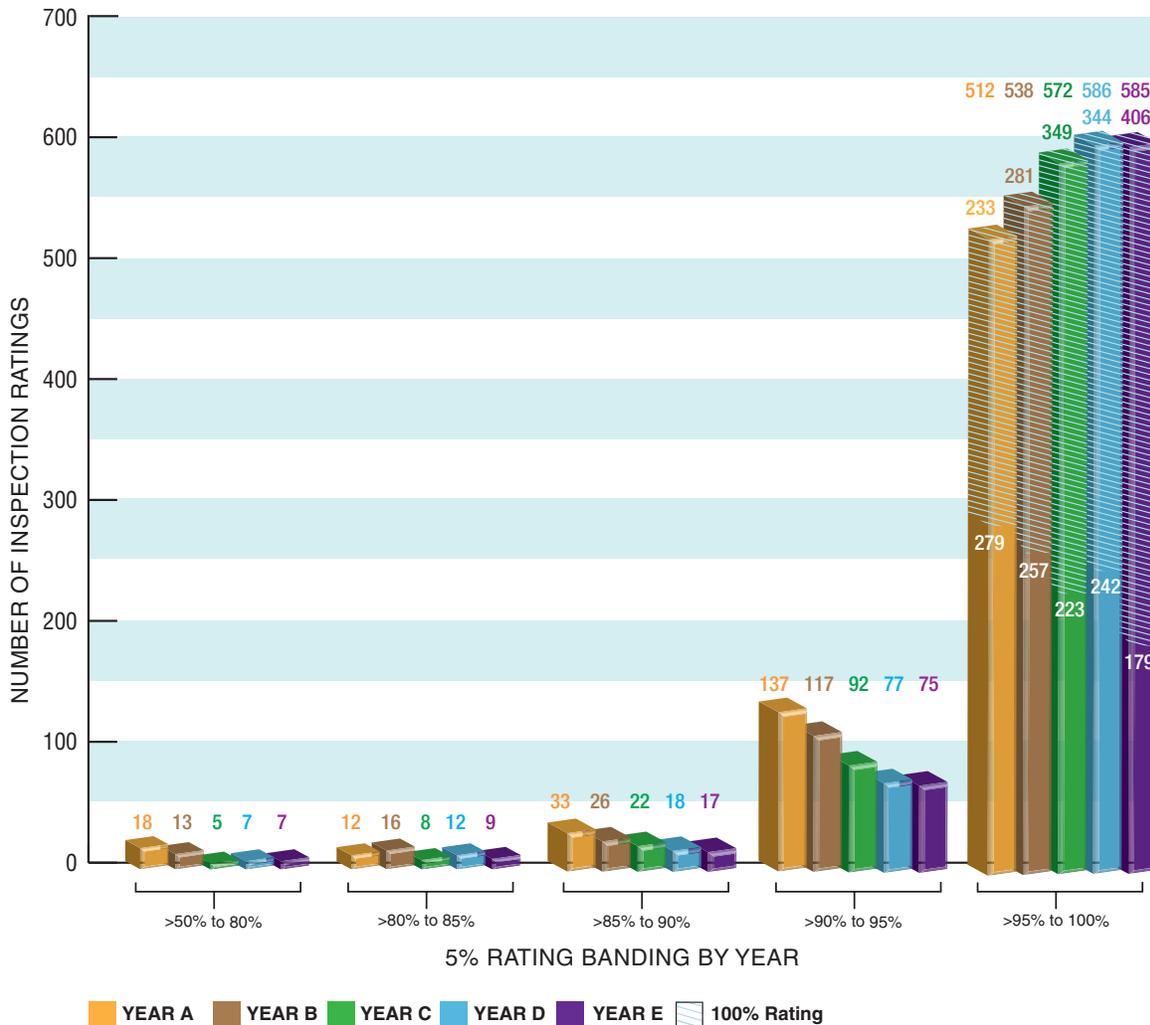
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

## Application of the Methodology for Public Reporting <sup>59</sup>

The individual MRDWS Total Inspection Ratings are published with the ministry's Chief Drinking Water Inspector's Annual Report.

**Figure 1** presents the distribution of MRDWS ratings for a sample of annual inspections. Individual drinking water systems can compare against all the other inspected facilities over a period of inspection years.

**Figure 1: Year Over Year Distribution of MRDWS Ratings**



## Reporting Results to MRDWS Owners/Operators

A summary of inspection findings for each system is generated in the form of an Inspection Rating Record (IRR). The findings are grouped into the 15 possible modules of the inspection protocol,

which would provide the system owner/operator with information on the areas where they need to improve. The 15 modules are:

- |                         |                                 |  |  |
|-------------------------|---------------------------------|--|--|
| 1. Source               | 5. Treatment Process Monitoring | 9. Logbooks                            | 13. Water Quality Monitoring                       |
| 2. Permit to Take Water | 6. Process Wastewater           | 10. Contingency and Emergency Planning | 14. Reporting, Notification and Corrective Actions |
| 3. Capacity Assessment  | 7. Distribution System          | 11. Consumer Relations                 | 15. Other Inspection Findings                      |
| 4. Treatment Processes  | 8. Operations Manuals           | 12. Certification and Training         |  |

For further information, please visit [www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater)

**DWS Name:** ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM  
**DWS Number:** 260078897  
**DWS Owner:** CORPORATION OF THE CITY OF ST THOMAS  
**Municipal Location:** ST. THOMAS

**Regulation:** O.REG. 170/03  
**DWS Category:** DW Municipal Residential  
**Type of Inspection:** Focused  
**Inspection Date:** Jan-19-2023  
**Ministry Office:** London District Office

**Maximum Risk Rating:** 273

Inspection Module	Non Compliance Rating
Treatment Processes	0 / 14
Operations Manuals	0 / 28
Reporting & Corrective Actions	0 / 4
Other Inspection Findings	21 / 227
<b>Overall - Calculated</b>	<b>21 / 273</b>

**Inspection Risk Rating:** 7.69%

**Final Inspection Rating:** 92.31%

**DWS Name:** ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM  
**DWS Number:** 260078897  
**DWS Owner Name:** CORPORATION OF THE CITY OF ST THOMAS  
**Municipal Location:** ST. THOMAS

**Regulation:** O.REG. 170/03  
**DWS Category:** DW Municipal Residential  
**Type of Inspection:** Focused  
**Inspection Date:** Jan-19-2023  
**Ministry Office:** London District Office

Non-Compliant Question(s)	Question Rating
<b>Other Inspection Findings</b>	
Is the secondary disinfectant residual measured as required for the large municipal residential distribution system?	21
<b>Overall - Total</b>	<b>21</b>

**Maximum Question Rating:** 273

**Inspection Risk Rating:** 7.69%

**FINAL INSPECTION RATING:** 92.31%

**Audit Date(s): October 19, 2022**

**Audit Objective:**

The objective of the internal audit was to verify and evaluate the degree of conformance of the City of St. Thomas' Quality Management System (QMS), utilized in the operation and maintenance of the St. Thomas Secondary, St. Thomas Distribution, Southwold (Lynhurst Area) and Central Elgin (St. Thomas Suburban Area) Drinking Water Systems, to Ontario's Drinking Water Quality Management Standard, Version 2.0. The internal audit will provide an opportunity to identify process variations within the QMS by auditing all elements. By identifying these sources of variation and by eliminating them through the application of effective corrective action, the operating authority can begin to focus on preventative action and continual improvement.

**Audit Scope:**

The internal audit was conducted on October 19, 2022. A physical inspection of the Albert Roberts Pump Station was undertaken as part of this audit. The internal audit was conducted as outlined in DW- ADMIN-1200, Rev. 2.4 of the QMS manual. The internal audit was carried out through a review of a sampling of documents and records, interviews and observations by the auditors to demonstrate conformance with the standard by auditing all elements. The review and audit should not be construed as a complete and comprehensive review of all aspects, documents and records.

**Internal Auditor(s):**

- LEAD: Karel Kamerman, Compliance Coordinator

Auditor Qualifications can be found in Appendix A to this report.

**Audit Criteria:**

Elements 5, 7, 8, and 17 of Ontario's Drinking Water Quality Standard – Version 2.0 as released in February 2017.

**Definitions:**

- A non-conformance (NC) is a non-fulfillment of the QMS Operational Plan.
- An opportunity for improvement (OFI) describes a requirement that can be more effectively addressed.

**Audit Findings:**

The following is a summary of the audit findings, including non-conformances and opportunities for improvement. The detailed checklist can be found in Appendix B of this report.

**Non-Conformances:**

**NC#1 Measurement and Recording Equipment Calibration and Maintenance**

All Colorimeters provided at the time of the audit were found to have no calibration sticker (1) or a calibration sticker that identified the unit as being beyond its calibration date (5). No records could be provided to demonstrate that they had been calibrated. 10 colorimeters are listed in the equipment listing, however, only 6 were provided for review and 1 was said to be in use. Of those 6, one was not identified on the equipment listing.

**Opportunities for Improvement**

**OFI#1: Document and Record Control**

An opportunity for improvement exists to review the use of the Ministry inspection folder as a long term record storage location and formalize record-keeping mechanisms in light of the implementation of FileHold program.



<sup>64</sup>**DRINKING WATER QUALITY  
MANAGEMENT SYSTEM  
INTERNAL AUDIT REPORT**

## **Appendix A**





# CERTIFICATE OF ACHIEVEMENT

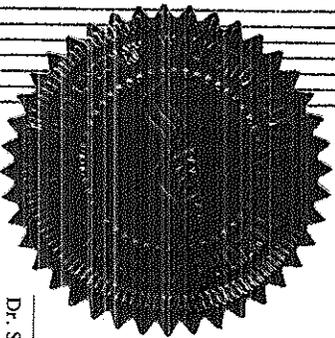
**KAREL KAMERMAN**

*has successfully completed the*

*Internal Auditing for the Drinking Water Quality Management Standard Course*

**November 5 & 6, 2009**

**Director Approved Continuing Education Units: 1.4**



*[Handwritten Signature]*

Dr. Saad Jastim, P. Eng.  
Chief Executive Officer

November 6, 2009

Date

WWW.WCWC.CA



<sup>66</sup>**DRINKING WATER QUALITY  
MANAGEMENT SYSTEM  
INTERNAL AUDIT REPORT**

## **Appendix B**



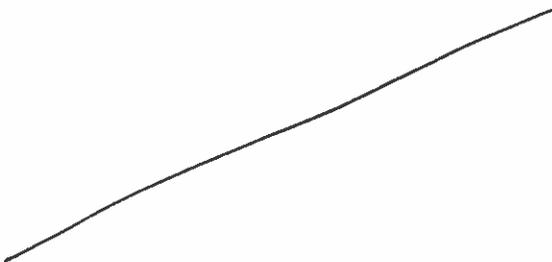
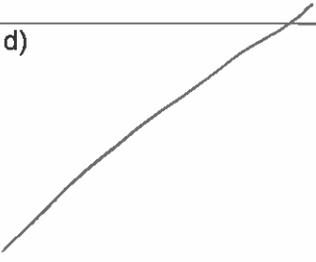
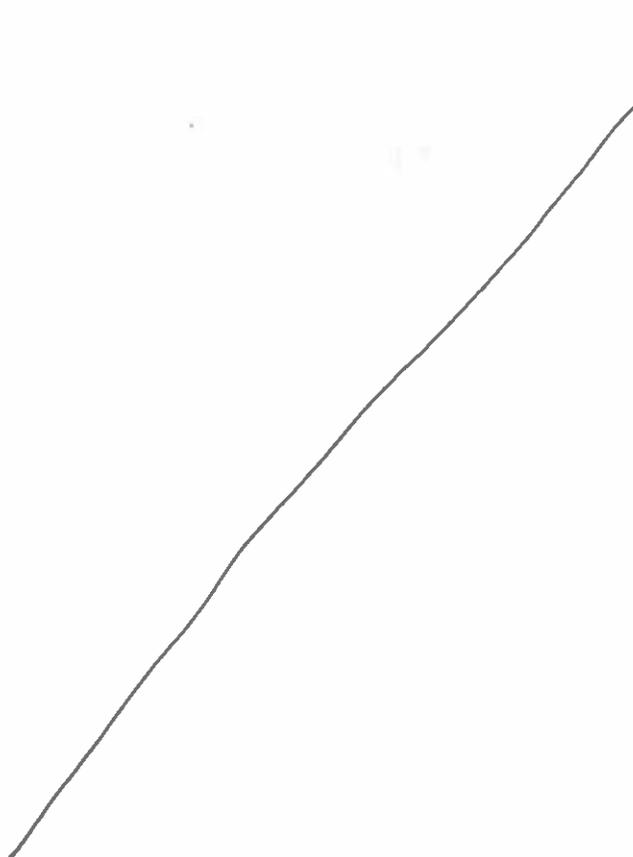
## Drinking Water Quality Management System

PROCEDURE TITLE: INTERNAL AUDIT CHECKLIST		PROCEDURE NO.: DWF-ADMIN-1202	
EFFECTIVE DATE: JUNE 6, 2022		DWQMS REFERENCE: 19	
REVISION #: 2.4		REVIEW FREQUENCY: ANNUALLY	
APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE			
ST. THOMAS SECONDARY	X	ST. THOMAS DISTRIBUTION	X
		SOUTHWOLD DISTRIBUTION	X
		CENTRAL ELGIN DISTRIBUTION	X

DATE OF INTERNAL AUDIT:	OCT. 17, 2022.
AUDITOR NAMES:	KAREL KAMERMAN
DRINKING WATER SYSTEM(S):	ST. THOMAS DWS STASWSS.
AREA(S)/FACILITY VISITED:	B PW BUILDING.
PEOPLE INTERVIEWED:	S. FLANNAGAN C. ANDREW G. JOHNSON
DOCUMENTS VIEWED:	<ul style="list-style-type: none"> <li>→ INTERNAL AUDIT REPORT (2022 - <del>APRIL</del> APRIL 1920)</li> <li>→ SBI GLOBAL AUDIT REPORT (JULY 2022)</li> <li>→ CALIBRATION RECORDS</li> <li>→ HAZ. ANALYSIS SPREADSHEETS (REV. 2.5)</li> <li>→ VARIOUS W.O. (HISTORICAL) <del>THAT ARE</del> IN FILEFOLD.</li> <li>→ MGLP FOLDER (ANALYSIS/SAMPLE RESULTS, ETC.)</li> </ul>

DWQMS Requirement	Notes	Findings (see footer for definitions)
<p><b>1. Quality Management System PLAN</b> - The Operational Plan shall document a Quality Management System that meets the requirements of this Standard.</p>		
<p><b>DO</b> - The Operating Authority shall establish and maintain the Quality Management System in accordance with the requirements of this Standard and the policies and procedures documented in the Operational Plan.</p>		
<p><b>2. Quality Management System Policy PLAN</b> - The Operational Plan shall document a Quality Management System Policy that provides the foundation for the Quality Management System, and:</p> <ul style="list-style-type: none"> <li>a) includes a commitment to the maintenance and continual improvement of the Quality Management System,</li> <li>b) includes a commitment to the consumer to provide safe drinking water,</li> <li>c) includes a commitment to comply with applicable legislation and regulations, and</li> <li>d) is in a form that provides for ready communication to all Operating Authority personnel, the Owner and the public.</li> </ul>		<ul style="list-style-type: none"> <li>a)</li> <li>b)</li> <li>c)</li> <li>d)</li> </ul>
<p><b>DO</b> - The Operating Authority shall establish and maintain a Quality Management System that is consistent with the Policy.</p>		
<p><b>3. Commitment and Endorsement PLAN</b> - The Operational Plan shall contain a written endorsement of its contents by Top Management and the Owner.</p>		
<p><b>DO</b> - Top Management shall provide evidence of its commitment to an effective Quality Management System by:</p> <ul style="list-style-type: none"> <li>a) ensuring that a Quality Management System is in place that meets the requirements of this Standard,</li> <li>b) ensuring that the Operating</li> </ul>		<ul style="list-style-type: none"> <li>a)</li> <li>b)</li> </ul>

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<p>Authority is aware of all applicable legislative and regulatory requirements,                  c) communicating the Quality Management System according to the procedure for communications, and                  d) determining, obtaining or providing the resources needed to maintain and continually improve the Quality Management System.</p>		<p>c) d)</p> 
<p><b>4. Quality Management System Representative</b>  <b>PLAN</b> - The Operational Plan shall identify a Quality Management System representative.</p>		
<p><b>DO</b> - Top Management shall appoint, and authorize a Quality Management System representative who, irrespective of other responsibilities, shall:                  a) administer the Quality Management System by ensuring that processes and procedures needed for the Quality Management System are established and maintained,                  b) report to Top Management on the performance of the Quality Management System and any need for improvement,                  c) ensure that current versions of documents required by the Quality Management System are being used at all times,                  d) 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                  e) promote awareness of the Quality Management System throughout the Operating Authority.</p>		<p>a) b) c) d) e)</p>
<p><b>5. Document and Records Control</b>  <b>PLAN</b> - The Operational Plan shall document a procedure for document and records control that describes how:                  a) documents required by the Quality Management System are:                  i. kept current, legible and readily identifiable                  ii. retrievable                  iii. stored, protected, retained and</p>	<p>DW-ADMIN-100 R.2.4                  DW-ADMIN-200 R.2.5</p>	<p>a)i. C                  a)ii. C                  a)iii. C</p>

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<p>disposed of, and                  b) records required by the Quality Management System are:                  i. kept legible, and readily identifiable                  ii. retrievable                  iii. stored, protected, retained and disposed of.</p>		<p>b)i. C                  b)ii. C                  b)iii. C</p>
<p><b>DO</b> - The Operating Authority shall implement and conform to the procedure for document and records control and shall ensure that the Quality Management System documentation for the subject system includes:                  a) the Operational Plan and its associated policies and procedures,                  b) documents and records determined by the Operating Authority as being needed to ensure the effective planning, operation and control of its operations, and                  c) the results of internal and external audits and management reviews.</p>	<p>→ FILEHOLD W.O. RECORDS                  → CALIBRATION RECORDS.                  → MIECP FOLDER.                  → FILEHOLD PROGRAM.                    * REVIEW USE OF "INSPECTION" FOLDER AS FOR LONG TERM STORAGE OF RECORDS, ESP. IN LIGHT OF FILEHOLD IMPLEMENTATION.</p>	<p>a) C                  b) OFI                  c) C</p>
<p><b>6. Drinking-Water System PLAN</b> – The Operational Plan shall document, as applicable:                  a) for the Subject System:                  i. the name of the Owner and Operating Authority,                  ii. if the system includes equipment that provides Primary Disinfection and/or Secondary Disinfection:                  A. a description of the system including all applicable Treatment System processes and Distribution System components,                  B. a Treatment System process flow chart,                  C. a description of the water source, including:                  I. general characteristics of the raw water supply,                  II. common event-driven fluctuations, and                  III. any resulting operational challenges and threats.                  iii. if the system does not include equipment that provides Primary Disinfection or Secondary Disinfection:                  A. a description of the system including all Distribution System components, and</p>	<p><i>(This section is crossed out with a diagonal line)</i></p>	<p>a) i.                  a) ii.                  A.                  B.                  C. I.                  C. II.                  C. III.</p>

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<p>B. a description of any procedures that are in place to maintain disinfection residuals.                  b) if the Subject System is an Operational Subsystem, a summary description of the Municipal Residential Drinking Water System it is a part of including the name of the Operating Authority(ies) for the other Operational Subsystems.                  c) if the Subject System is connected to one or more other Drinking Water Systems owned by different Owners, a summary description of those systems which:                  i. indicates whether the Subject System obtains water from or supplies water to those systems,                  ii. names the Owner and Operating Authority(ies) of those systems, and                  iii. identifies which, if any, of those systems that the Subject System obtains water from are relied upon to ensure the provision of safe drinking water.</p>		a) iii. A.
		a) iii. B.
		b)
		c) i.
		c) ii.
		c) iii.
<p>DO - The Operating Authority shall ensure that the description of the drinking-water system is kept current.</p>		
<p><b>7. Risk Assessment PLAN</b> – The Operational Plan shall document a risk assessment process that:                  a) Considers potential hazardous events and associated hazards, as identified in the Ministry of the Environment and Climate Change document titled Potential Hazardous Events for Municipal Residential Drinking Water Systems, dated February 2017 as it may be amended. A copy of this document is available at <a href="http://www.ontario.ca/drinkingwater">www.ontario.ca/drinkingwater</a>.                  b) identifies additional potential hazardous events and associated hazards,                  c) assesses the risks associated with the occurrence of hazardous events,                  d) ranks the hazardous events according to the associated risk,                  e) identifies control measures to address the potential hazards and</p>	<p>DUFADMIN-301-304 (R.2.5)                  DW-ADMIN-300 (R.2.5)</p>	a)
		C
		b)
		C
		c)
		C
d)		
C		
e)		
C		
f)		
C		

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<p>hazardous events,                  f) identifies Critical Control Points,                  g) identifies a method to verify, at least once every calendar year, the currency of the information and the validity of the assumptions used in the risk assessment,                  h) ensures that the risks are assessed at least once every thirty-six months, and                  i) considers the reliability and redundancy of equipment.</p>		<p>g) C</p>
<p>DO - The Operating Authority shall perform a risk assessment consistent with the documented process.</p>	<p>DWF-ADMIN-301-304 (R 2.5)</p>	<p>h) C</p>
<p><b>8. Risk Assessment Outcomes PLAN</b> - The Operational Plan shall document:                  a) the identified potential hazardous events and associated hazards,                  b) the assessed risks associated with the occurrence of hazardous events,                  c) the ranked hazardous events,                  d) the identified control measures to address the potential hazards and hazardous events,                  e) the identified critical control points and their respective critical control limits,                  f) procedures and/or processes to monitor the critical control limits,                  g) procedures to respond to deviations from the critical control limits, and                  h) procedures for reporting and recording deviations from the critical control limits.</p>	<p>* SAME AS ABOVE                  CORRECTIVE ACTION SPREADSHEET.                  *                  CA'S EXIST TO REVISE CCL'S &amp; FURTHER DESCRIBE REPORTING OF DEVIATION MECHANISMS.                  COMPLETE BY DEADLINE</p>	<p>i) C</p> <p>a) C</p> <p>b) C</p> <p>c) C</p> <p>d) C</p> <p>e) C</p> <p>f) C</p> <p>g) C</p> <p>h) <del>OFF</del> C</p>
<p>DO - The Operating Authority shall implement and conform to the procedures.</p>		<p>C</p>
<p><b>9. Organizational Structure, Roles, Responsibilities and Authorities PLAN</b> - The Operational Plan shall:                  a) describe the organizational structure of the Operating Authority including respective roles,</p>	<p><del>_____</del></p>	<p>a)</p>

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<p>responsibilities and authorities,                  b) delineate corporate oversight roles, responsibilities and authorities in the case where the Operating Authority operates multiple subject systems,                  c) identify the person, persons or group of people within the management structure of the organization responsible for undertaking the Management Review,                  d) identify the person, persons or group of people, having Top Management responsibilities required by this Standard, along with their responsibilities, and                  e) Identify the Owner of the subject system.</p>		<p>b)</p> <hr/> <p>c)</p> <hr/> <p>d)</p> <hr/> <p>e)</p>
<p><b>DO</b> - The Operating Authority shall keep current the description of the organizational structure including respective roles, responsibilities and authorities, and shall communicate this information to Operating Authority personnel and the Owner.</p>		
<p><b>10. Competencies</b>  <b>PLAN</b> - The Operational Plan shall document:                  a) competencies required for personnel performing duties directly affecting drinking water quality,                  b) activities to develop and/or maintain competencies for personnel performing duties directly affecting drinking water quality, and                  c) activities to ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water.</p>		<p>a)</p> <hr/> <p>b)</p> <hr/> <p>c)</p>
<p><b>DO</b> - The Operating Authority shall undertake activities to:                  a) meet and maintain competencies for personnel directly affecting drinking water quality and shall maintain records of these activities, and                  b) ensure that personnel are aware of the relevance of their duties and how they affect safe drinking water, and shall maintain records of these activities.</p>		<p>a)</p> <hr/> <p>b)</p>

<p><b>11. Personnel Coverage</b>  <b>PLAN</b> - The Operational Plan shall document a procedure to ensure that sufficient personnel meeting identified competencies are available for duties that directly affect drinking water quality.</p>		
<p><b>DO</b> - The Operating Authority shall implement and conform to the procedure.</p>		
<p><b>12. Communications</b>  <b>PLAN</b> - The Operational Plan shall document a procedure for communications that describes how the relevant aspects of the Quality Management System are communicated between Top Management and:  a) the Owner,  b) Operating Authority personnel,  c) Suppliers that have been identified as essential under Plan (a) of Element 13 of this Standard, and,  d) the public.</p>		<p>a)  b)  c)  d)</p>
<p><b>DO</b> - The Operating Authority shall implement and conform to the procedure.</p>		
<p><b>13. Essential Supplies and Services</b>  <b>PLAN</b> - The Operational Plan shall:  a) identify all supplies and services essential for the delivery of safe drinking water and shall state, for each supply or service, the means to ensure its procurement, and  b) include a procedure by which the Operating Authority ensures the quality of essential supplies and services, in as much as they may affect drinking water quality.</p>		<p>a)  b)</p>
<p><b>DO</b> - The Operating Authority shall implement the procedure.</p>		
<p><b>14. Review and Provision of Infrastructure</b>  <b>PLAN</b> - The Operational Plan shall document a procedure for reviewing the adequacy of the infrastructure necessary to operate and maintain the Subject System that:  a) Considers the outcomes of the risk assessment documented under</p>		<p>a)</p>

<p>Element 8, and b) Ensures that the adequacy of the infrastructure necessary to operate and maintain the Subject System is reviewed at least once every Calendar Year.</p>		b)
<p><b>DO</b> - The Operating Authority shall implement and conform to the procedure and communicate the findings of the review to the Owner.</p>		
<p><b>15. Infrastructure Maintenance, Rehabilitation and Renewal PLAN</b> – The Operational Plan shall document: a) a summary of the Operating Authority’s infrastructure maintenance, rehabilitation and renewal programs for the Subject System, and b) a long term forecast of major infrastructure maintenance, rehabilitation and renewal activities.</p>		a) b)
<p><b>DO</b> – The Operating Authority shall: a) keep the summary of the infrastructure maintenance, rehabilitation and renewal programs current, b) ensure that the long term forecast is reviewed at least once every Calendar Year, c) communicate the programs to the Owner, and d) monitor the effectiveness of the maintenance program.</p>		a) b) c) d)
<p><b>16. Sampling, Testing and Monitoring PLAN</b> - The Operational Plan shall document: a) a sampling, testing and monitoring procedure for process control and finished drinking water quality including requirements for sampling, testing and monitoring at the conditions most challenging to the subject system, b) a description of relevant sampling, testing or monitoring activities that take place upstream of the subject system, and c) a procedure that describes how sampling, testing and monitoring results are recorded and shared between the Operating Authority and the Owner, where applicable.</p>		a) b) c)

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<p><b>DO</b> - The Operating Authority shall implement and conform to the procedures.</p>		
<p><b>17. Measurement and Recording Equipment Calibration and Maintenance</b>  <b>PLAN</b> - The Operational Plan shall document a procedure for the calibration and maintenance of measurement and recording equipment.</p>	<p>- HACH Cert. of Analysis LR spec check standards exp. 2024                  - COLDRIMETERS (SEE ATTACHED LISTING)</p>	
<p><b>DO</b> - The Operating Authority shall implement and conform to the procedure.</p>	<p>NC - NO (OFL) COLDRIMETERS REFLECT THAT THEY HAVE BEEN CALIBRATED TO IN TIME</p>	<p>NC.</p>
<p><b>18. Emergency Management</b>  <b>PLAN</b> - The Operational Plan shall document a procedure to maintain a state of emergency preparedness that includes:                  a) a list of potential emergency situations or service interruptions,                  b) processes for emergency response and recovery,                  c) emergency response training and testing requirements,                  d) Owner and Operating Authority responsibilities during emergency situations,                  e) references to municipal emergency planning measures as appropriate, and                  f) an emergency communication protocol and an up-to-date list of emergency contacts.</p>	<p>1) PROVIDED.</p>	<p>a) b) c) d) e) f)</p>
<p><b>DO</b> - The Operating Authority shall implement and conform to the procedure.</p>		
<p><b>19. Internal Audits</b>  <b>PLAN</b> - The Operational Plan shall document a procedure for internal audits that:                  a) evaluates conformity of the QMS with the requirements of this Standard,                  b) identifies internal audit criteria, frequency, scope, methodology and record- keeping requirements,                  c) considers previous internal and external audit results, and                  d) describes how Quality Management System corrective actions are identified and initiated.</p>		<p>a) b) c) d)</p>

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<p><b>DO</b> - The Operating Authority shall implement and conform to the procedure and shall ensure that internal audits are conducted at least once every calendar year.</p>		
<p><b>20. Management Review</b>  <b>PLAN</b> - The Operational Plan shall document a procedure for management review that evaluates the continuing suitability, adequacy and effectiveness of the Quality Management System and that includes consideration of:                  a) incidents of regulatory non-compliance,                  b) incidents of adverse drinking-water tests,                  c) deviations from critical control point limits and response actions,                  d) the effectiveness of the risk assessment process,                  e) internal and third-party audit results,                  f) results of emergency response testing,                  g) operational performance,                  h) raw water supply and drinking water quality trends,                  i) follow-up on action items from previous management reviews,                  j) the status of management action items identified between reviews,                  k) changes that could affect the Quality Management System,                  l) consumer feedback, m) the resources needed to maintain the Quality Management System,                  n) the results of the infrastructure review,                  o) Operational Plan currency, content and updates, and                  p) staff suggestions.</p>		<p>a) b) c) d) e) f) g) h) i) j) k) l) m) n) o) p)</p>
<p><b>DO</b> - Top Management shall implement and conform to the procedure and shall:                  a) ensure that a management review is conducted at least once every calendar,                  b) consider the results of the</p>		<p>a)</p>

<p>management review and identify deficiencies and actions items to address the deficiencies,                  c) provide a record of any decisions and action items related to the management review including the personnel responsible for delivering the action items and the proposed timelines for their implementation,                  d) report the results of the management review, the identified deficiencies, decisions and action items to the Owner.</p>		<p>b)</p> <p>c)</p> <p>d)</p>
<p><b>21. Continual Improvement PLAN</b> – The Operating Authority shall develop a procedure for tracking and measuring continual improvement of its Quality Management System by:</p> <p>a) reviewing and considering applicable best management practices, including any published by the Ministry of the Environment and Climate Change and available on <a href="http://www.ontario.ca/drinkingwater">www.ontario.ca/drinkingwater</a>, at least once every thirty-six months;</p> <p>b) documenting a process for identification and management of Quality Management System Corrective Actions that includes:</p> <p>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.</p> <p>c) documenting a process for identifying and implementing Preventive Actions to eliminate the occurrence of potential non-conformities in the Quality Management System that includes:</p> <p>i. reviewing potential non-conformities that are identified to determine if preventive actions may</p>		<p>a)</p> <p>b) i.</p> <p>b) ii.</p> <p>b) iii.</p> <p>c) i.</p>

<p>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.</p>		<p>c) ii.</p>
<p><b>DO-</b> The Operating Authority shall strive to continually improve the effectiveness of its Quality Management System through the use of corrective actions.</p>		<p>c) iii.</p>

Drinking Water Quality Management Standard (DWQMS 2.0)

# Internal Audit Report

For the period of:

April 22, 2022 to April 20, 2023

For:

City of St. Thomas Environmental Services

St. Thomas Area Secondary Water Supply System

City of St. Thomas Water Distribution System

Township of Southwold Water Distribution System (Lynhurst Area)

Municipality of Central Elgin Water Distribution System (St. Thomas Suburban Area)

Conducted by:



Audit dates: April 17 and 20, 2023

Report date: April 23, 2023



## 1.0 Overview & Objectives

Acclaims Environmental Inc. was retained to conduct an internal audit of the City of St. Thomas's quality management system (QMS) on April 17 and 20, 2023 to determine whether it conforms to the requirements of the Drinking Water Quality Management Standard (DWQMS 2.0); and to assess whether the QMS is effectively implemented.

This report summarizes the audit results in section 2.0 Audit Findings, categorizing positive findings, non-conformities and opportunities for improvement.

### 1.1 Risks and Opportunities

The risk-based approach was used in conducting this audit; which considers risks and opportunities to ensure that the audit focuses on matters that are significant for the auditee and for achieving the audit program objectives.

In any audit, potential risks can include those related to *ineffective*: planning / identification of external and internal issues; resources; audit team; communication; audit program implementation / monitoring / improvement; control of documented information; and availability of auditee and/or evidence.

Also, opportunities can include *efficiencies* such as: allowing multiple audits to be conducted in a single visit; minimizing time and distances travelling to sites; matching competencies of audit team to competencies needed; and aligning audit dates with the availability of auditee's staff.

### 1.2 Scope

The internal audit was performed at the City of St. Thomas Environmental Services facility located 100 Burwell Road and at St. Thomas City Hall located at 545 Talbot Street.

The Operational Plan for City of St. Thomas was reviewed for conformity to the DWQMS 2.0. This audit also reviewed the City of St. Thomas's planned processes and programs to evaluate how well QMS requirements are integrated into them.

Process audits examine the resources (equipment, materials and people) used to transform the inputs into outputs, the methods (procedures and instructions) followed and the measures collected to determine process performance. Process audits check the adequacy and effectiveness of the process controls established by procedures, work instructions, training and process specifications.

As the last internal audit was conducted on April 20-21, 2022, this audit focused on the period between April 22, 2022 and April 20, 2023.

### 1.3 Methodology

The audit was conducted in accordance with ISO 19011:2018 – Guidelines for auditing management systems.

The list of all auditing criteria is included in Appendix "A" – Audit Plan. Appendix "B" – Interviews, Documents and Records lists persons interviewed, along with documents and processes reviewed. Appendix "C" – Audit Checklists includes the checklists used to conduct the audit.

In order to conduct audits within scope, time and budgetary constraints, audit evidence is based on a sampling of processes, programs, and information available. The size of the sample selected is appropriate to the size and scale of the operation and information available. Objective evidence collected is based upon the sampling.

The conclusions presented in this report are based on information presented during the internal audit.

## 1.4 Audit Program Monitoring and Reviewing

The implementation of the audit program was monitored and, at appropriate intervals, reviewed to assess whether the objectives have been met and to identify opportunities for improvement. The results of this review will be included in this report, if applicable.

Performance indicators were used to monitor characteristics such as:

- conformity with the audit program, schedules and audit objectives,
- the ability to implement the audit plan,
- feedback from top management, auditees, auditors and other interested parties, and
- adequacy of documented information in the whole audit process.

The audit program review considered:

- a) results and trends from monitoring,
- b) conformity with procedures,
- c) evolving needs and expectations of relevant interested parties,
- d) audit program records,
- e) alternative or new auditing methods / practices,
- f) effectiveness of the actions to address the risks and opportunities, and internal and external issues associated with the audit program, and
- g) confidentiality and information security issues relating to the audit program.

Corrective actions and opportunities for improvement from the results of audit program reviews, if any, are included in the internal audit report's section 2.0 Audit Findings.

## 1.5 Auditors

The Lead Auditor was Brigitte Roth, who has extensive auditing experience and is a certified auditor with the Environmental Careers Organization of Canada (ECO Canada). Anita Petrov was also part of the internal audit team for the desktop review of documented information. Auditor qualifications are included in Appendix "D" – Auditor CV and Training Certificates.

## 1.6 Confidentiality

The information gathered by Acclaims Environmental Inc. is the property of The City of St. Thomas only and will not be transmitted to any third party without the prior written consent of an authorized representative.

All documents provided by the organization prior to and during the assessment are kept only for the purpose of audit review and audit report preparation.

## 2.0 Audit Findings

### 2.1 Positive Findings

The following positive audit findings were noted during the audit

#### **Commitment**

- Staff interviewed were knowledgeable about their processes and programs and their roles' impacts on achieving the commitments included in the QMS Policy.
- All staff interviewed felt they had the support from management and resources they needed to carry out their jobs well.

#### **Culture of continual improvement**

- Consistently throughout the audit, improvements were noted with regards to achieving intended outcomes of drinking water system programs.
- Debrief sessions are held following the occurrence of failures, emergencies and other issues encountered with the goal of continual improvement.
- All opportunities for improvement identified in the previous internal and external audits have been verified as completed or are in progress.

### 2.2 Non-Conformities

The following non-conformity was noted during the audit:

#### **Management Review**

*DWQMS Element 20 PLAN requires that consideration of items a) to p) are included in the management review. DWQMS Element 20 DO d) requires that the results of the management review, the identified deficiencies, decisions and action items are reported to the Owner.*

- The Management Review Meeting minutes documented from meetings held in June 2022 did not include item f) results of emergency response testing, and
- The results of the Management Review from 2022 have not been reported to the Owners.

### 2.3 Opportunities for Improvement

The following is a list of opportunities for improvement noted in conducting this audit:

Reference	Opportunity for Improvement – Description
Director's Directions	Consider including a statement on each owner's water webpage about the availability of the Operational Plan (OP) on request and who to contact.
QMS Representative (El. 4)	Consider noting in the OP that duties of the QMS Rep are shared and list which of the duties are carried-out by each person.
Critical Control Limits (El. 8)	Consider implementing the sector best practice of aligning the minimum chlorine residual critical control limits for secondary disinfection with the "Acceptable Disinfectant Concentration" definition included in the latest Watermain Disinfection Procedure, of 0.20 mg/L free chlorine (as identified in

Reference	Opportunity for Improvement – Description
	the hazard analysis spreadsheets and in the Disinfection Control (DW-CCP-3000) procedure).
Risk Assessment & Cybersecurity (El. 8/18)	<p>Consider incorporating cybersecurity threats for the distribution system impacts (e.g. corporate network access to work orders, GIS information, locates program, etc.) – impacting compliance requirements.</p> <p>The risk assessment records reference Responding to SCADA Failures procedure (DW-ERP-800), dated January 1, 2023 that only references impacts to SCADA.</p>
Emergency contact lists (El. 13/18)	Consider referencing from El. 13 to the emergency contact list contained in the emergency response plan for one centralized contact list for essential supplies & services. ( <i>Note:</i> maintain the description of quality requirements for each type of essential supply / service in El. 13).

### 3.0 Conclusions

The results of the internal audit performed at the City of St. Thomas for the St. Thomas Area Secondary Water Supply System, City of St. Thomas Water Distribution System, Township of Southwold Water Distribution System (Lynhurst Area), and Municipality of Central Elgin Water Distribution System confirm that the quality management system established is effective in conforming with the requirements of the Drinking Water Quality Management Standard (DWQMS 2.0).

While a non-conformity and opportunities for improvement are cited in this audit report, they do not undermine the positive programs and attitudes already in place among City of St. Thomas staff.



Brigitte Roth, BES, EP(EMSLA)



Anita Petrov, Internal Auditor

## Appendix “A” – Audit Plan

Internal Audit Start Date:		April 17, 2023				Internal Audit End Date:		April 20, 2023																	
Date	Time	Auditor	Auditee	Process / Program	DWQMS Element – Standard and version: DWQMS 2.0																				
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
04-17	8:00 – 4:00	BR / AP	Doc. Info.	Desktop review - remotely	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
04-20	8:00	BR	ALL	Opening meeting	x																		x	x	
04-20	8:15	BR	KK	QMS Coordination		x		x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	
04-20	10:00	BR	CA / CK	Distribution O&M		x			x	x	x	x	x	x	x			x	x	x	x			x	
04-20	11:00	BR	SF / CK	Sampling, testing, monitoring programs		x			x		x	x	x	x	x				x	x	x			x	
04-20	1:00	BR	NB	QMS Rep's responsibilities		x		x	x	x	x	x			x						x	x	x	x	
04-20	2:30	BR	JL	Top Management's responsibilities		x	x				x	x	x			x		x				x		x	
04-20	4:00	BR	ALL	Closing Meeting	x																		x	x	

**Legend for QMS Elements:** 1-Quality Management System, 2-Quality Management System Policy, 3-Commitment and Endorsement, 4-QMS Representative, 5-Document and Records Control, 6-Drinking Water System, 7-Risk Assessment, 8-Risk Assessment Outcomes, 9-Organizational Structure, Roles, Responsibilities and Authorities, 10-Competencies, 11-Personnel Coverage, 12-Communications, 13-Essential Supplies and Services, 14-Review and Provision of Infrastructure, 15-Infrastructure Maintenance, Rehabilitation and Renewal, 16-Sampling, Testing and Monitoring, 17-Measurement and Recording Equipment Calibration and Maintenance, 18-Emergency Management, 19-Internal Audits, 20-Management Review, 21-Continual Improvement

**Auditee initials:** CA-Chris Andrew, SF-Simon Flanagan, CK-Chris Kenny, KK-Karel Kamerman, NB-Nathan Bokma, JL-Justin Lawrence, ALL-anyone interested.

## Appendix “B” – Documents and Records

The list of documents and records were reviewed and observations made during the audit include:

- City of St. Thomas staff interviews April 20, 2023
  - Chris Andrew, ORO
  - Nathan Bokma, Manager of Development & Compliance
  - Karel Kamerman, Compliance Coordinator (notes are included in the DWQMS checklist)
  - Chris Kenny, Water / Sewer Lead Hand
  - Justin Lawrence, City Engineer
- Operational Plans for the St. Thomas Area Secondary Water Supply System, City of St. Thomas Water Distribution System, Township of Southwold Water Distribution System (Lynhurst Area) and Municipality of Central Elgin Water Distribution System (St. Thomas Suburban Area), dated January 1, 2023
- OP s. 2 Quality Management System Policy
- QMS Policy statements are available online at: [https://www.stthomas.ca/city\\_hall/environmental\\_services/water\\_services/Drinking\\_Water\\_Quality\\_Management\\_Standards](https://www.stthomas.ca/city_hall/environmental_services/water_services/Drinking_Water_Quality_Management_Standards) : accessed on April 17, 2023
- OP s.3 Commitment and Endorsement
- OP Endorsement by OA (Nathan Bokma signed on January 13, 2023 and on March 22, 2023)
  - OP Endorsement by Municipality of Central Elgin (Geoff Brooks, Director), signed January 16, 2023
  - OP Endorsement by City of St. Thomas (Justin Lawrence, Director), signed January 17, 2023 (for St. Thomas systems)
  - OP Endorsement by Township of Southwold (Aaron Van Oorspronk, Director), signed March 22, 2023 (accessed online)
- OP s.4 QMS Representative
- OP s.5 Document and Records Control
  - Document Control Procedure (DW-ADMIN-100), dated January 1, 2023
  - The Record Control Procedure (DW-ADMIN-200), dated January 1, 2023
- OP s.6 Drinking Water System
  - St. Thomas Area Water Supply System Map, dated November 16, 2023
  - City of St. Thomas Water Distribution Map, dated 2020
  - Township of Southwold Map, dated November 6, 2018
  - Municipality of Central Elgin Water Distribution – Old Lynhurst, dated May 2020
  - Municipality of Central Elgin Water Distribution – Southeast Area, dated May 2020
- OP s.7 Risk Assessment
  - Risk Assessment procedure (DW-ADMIN-300), dated January 1, 2023
  - Hazard Analysis Spreadsheet (Secondary), dated March 7, 2023
  - Hazard Analysis Spreadsheet (Distribution), dated March 7, 2023
  - Hazard Analysis Spreadsheet (Southwold-Lynhurst Area), dated March 7, 2023
  - Hazard Analysis Spreadsheet (Central Elgin – St. Thomas Suburban Area), dated March 7, 2023
  - Responding to SCADA Failures procedure (DW-ERP-800), dated January 1, 2023
  - Low Pressure Control (DW-CCP-1000), dated January 1, 2023
  - Discolouration Prevention and Control (DW-CCP-2000), dated January 1, 2023
  - Disinfection Control (DW-CCP-3000), dated January 1, 2023
  - Backflow Prevention Control (DW-CCP-4000), dated January 1, 2023

- OP s.9 Organizational Structure, Roles, Responsibilities and Authorities
- Roles, Responsibilities and Authorities – Secondary (DW-ADMIN-400), dated January 1, 2023
- Roles, Responsibilities and Authorities – St. Thomas Distribution (DW-ADMIN-401), dated January 1, 2023
- Roles, Responsibilities and Authorities – Southwold (DW-ADMIN-402), dated January 1, 2023
- Roles, Responsibilities and Authorities – Central Elgin (DW-ADMIN-403), dated January 1, 2023
- OP s.10 Competencies
- Competency and Training Procedure (DW-ADMIN-500), dated January 1, 2023
- 2022-08-16 Water Training Tracker Spreadsheet
- Operator Competence Form (DWF-ADMIN-501), dated January 1, 2023
- Training Needs Matrix (DWF-ADMIN-502), dated January 1, 2023
- OP s.11 Personnel Coverage
- Personnel Coverage Procedure (DW-ADMIN-600), dated January 1, 2023
- Continuity of Operations Procedure (DW-ERP-700), dated January 1, 2023
- OP s.12 Communications
- Communications (DW-ADMIN-700) procedure, dated January 1, 2023
- New Construction Sign-off Form (DWF-ADMIN-800), dated January 1, 2023
- E-mail re: St. Thomas ORO, dated July 15, 2022
- Emergency Response Plan training record, dated April 11, 2023
- Sampling of public communications through Facebook,  
<https://www.facebook.com/profile/100080909905396/search/?q=water>, accessed on April 17, 2023
- St. Thomas Water webpage,  
[https://www.stthomas.ca/city\\_hall/environmental\\_services/water\\_services](https://www.stthomas.ca/city_hall/environmental_services/water_services), accessed on April 17, 2023
- OP s.13 Essential Supplies and Services
- Essential Supplies and Services Procedure (DW-ADMIN-800), dated January 1, 2023
- OP s.14 Review and Provision of Infrastructure
- Review and Provision of Infrastructure Procedure (DW-ADMIN-850), dated January 1, 2023
- Watermain Risk of Failure Map 2022
- OP s.15 Infrastructure Maintenance, Rehabilitation and Renewal
- Infrastructure Maintenance, Rehabilitation and Renewal Procedure (DW-ADMIN-900) dated January 1, 2023
- Work Order reminder e-mails that Chris Kenny and Simon Flanagan have received, for week relevant to April 20, 2023
- CMMS Chlorine Residuals Entries OTJ training records
- work orders created for THM's and HAA's
- OP s.16 Sampling, Testing and Monitoring
- Sampling, Testing and Monitoring Procedure (DW-ADMIN-1000), dated January 1, 2023
- Sampling plan, dated January 1, 2023
  - Annual & Summary Reports available online at.  
[https://www.stthomas.ca/city\\_hall/environmental\\_services/water\\_services/annual\\_water\\_distribution\\_reports](https://www.stthomas.ca/city_hall/environmental_services/water_services/annual_water_distribution_reports), accessed on April 17, 2023
- OP s.17 Measurement and Recording Equipment Calibration and Maintenance
- Equipment Calibration Procedure. (DW-ADMIN-1100), dated January 1, 2023
- Equipment Listing (DWF-ADMIN-1100), dated January 1, 2023
  - Pocket Colorimeter Instrument Calibration Sheets by Bids Technical Services, October 26, 2022
  - Treated Water Flow Meter at Albert Roberts Booster Station by SCG Flowmetrix, April 12, 2022

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- Free chlorine Analyzer at Albert Roberts Booster Station by Bids Technical Services, August 18, 2022 and March 27, 2023
  - Free chlorine Analyzer at Ford Chamber by Bids Technical Services, August 18, 2022 and March 27, 2023
  - Free chlorine Analyzer at Southdale Chamber by Bids Technical Services, August 18, 2022 and March 27, 2023
  - Free chlorine Analyzer at Southwold Chamber by Bids Technical Services, August 18, 2022 and March 27, 2023
  - Free chlorine Analyzer at Wellington Road PRV by Bids Technical Services, August 18, 2022 and March 27, 2023
  - Free chlorine Analyzer at West Chamber by Bids Technical Services, August 18, 2022 and March 27, 2023
  - Pressure Transmitters at Albert Roberts Booster Station Inlet and Outlet by Bids Technical Services, June 23, 2022
  - Pressure Transmitter at East Chamber Discharge by Bids Technical Services, June 23, 2022
  - Pressure Transmitter at West Chamber Discharge by Bids Technical Services, June 23, 2022
  - Pressure Transmitter at Southdale Chamber Discharge by Bids Technical Services, June 23, 2022
  - Pressure Transmitter at Southwold Chamber Discharge by Bids Technical Services, June 23, 2022
  - Pressure Transmitter at Ford Chamber Discharge by Bids Technical Services, June 23, 2022
  - Pressure Transmitter at Wellington Road PRV Discharge by Bids Technical Services, June 23, 2022
  - Flowmeter Verification Certificate at East Chamber by Endress + Hauser, August 30, 2022
  - Flowmeter Verification Certificate at Southwold Meter Pit by Endress + Hauser, August 30, 2022
  - Flowmeter Verification Certificate at Waterworks Park by Endress + Hauser, Aug. 30, 2022
  - Badger ModMag Sensor Verification at Fingal Line Meter Pit by S. Pate, dated August 30, 2022
  - Badger ModMag Sensor Verification at Ford Meter Pit by S. Pate, dated August 30, 2022
  - DPD Free Chlorine Reagents in use, expiring 2024, 2025 and 2027
  - SpecCheck DPD-Chlorine-LR Secondary Standard (Lot #A2027), expiring February 2024
  - pH buffer solutions in storage / in use
  - OP s.18 Emergency Management
  - Drinking Water Operations Emergency Response Plan, dated January 2023
  - Emergency contact list DW-ERP-1 dated April 17, 2023
  - Low Pressure St. Thomas debrief e-mails from May 2022
  - Low Pressure Response procedure (DW-ERP-500), dated January 1, 2023
  - OP s.19 Internal Audits
  - Internal Audits procedure (DW-ADMIN-1200), dated January 1, 2023
  - Surveillance Audit Report by SAI Global, dated June 30, 2022
  - Internal Audit Report by City of St. Thomas, April 20 – 21, 2022
  - Internal Audit Report by City of St. Thomas, October 19, 2022
  - OP s.20 Management Review
  - Management Review procedure (DW-ADMIN-1300), dated January 1, 2023
  - Management Review Meeting Minutes, dated June 14-16, 2022
  - OP s.21 Continual Improvement
  - Continual Improvement and Corrective Action procedure (DW-ADMIN-1400), dated January 1, 2023
  - Hazard Analysis Team Meeting agenda dated April 6, 2023



## Appendix “C” – Audit Checklists

DOCUMENT REVIEW – DWQMS 2.0 (Condition Expected)	DOCUMENT REVIEW – Auditor Comments (Condition Found)
<p><b>1. Quality Management System (QMS)</b>  <b>PLAN</b> – The OP shall <i>document a QMS</i> that <i>meets the requirements</i> of this Standard.  <b>DO</b> – The OA shall <i>establish and maintain the QMS</i> in accordance with the requirements of this Standard and the <i>policies and procedures</i> documented in the OP.</p> <p><b>Director's Directions – Minimum Requirements for Operational Plans</b> (updated May 2021, no later than April 1, 2022) also specifies:</p> <ul style="list-style-type: none"> <li>- Each municipal residential drinking water system shall have OP's that <i>apply to all parts of the DWS</i>, that can <i>incorporate by reference</i> other documents deemed necessary by the owner or OA.</li> <li>- A <i>single OP</i> may be prepared for multiple DWS that have <i>same owner</i> and operated by <i>same OA</i>.</li> <li>- For <i>Limited Scope – Transitional</i> (if applicable), shall contain Schedule B parts of DWQMS PLAN.</li> <li>- All OP's shall have: <ul style="list-style-type: none"> <li>a. <i>procedure for version control</i> – ensuring <i>version # and/or revision date</i> on every page of any <i>physical</i> copy; <i>version # and/or revision date</i> recorded on or <i>otherwise embedded</i> in every <i>electronic</i> copy; or if in <i>separate files</i>, up-to-date <i>list or index</i> maintained of <i>all OP documents</i>, including <i>version #'s and dates</i>.</li> <li>b. <i>a title</i> that generally describes the <i>municipal DWS('s)</i> to which the OP's apply.</li> <li>c. <i>A completed copy of Subject System Description Form in Schedule “C”</i> that includes name of DWS's, MDWL #'s, operational subsystem to which plans apply</li> </ul> </li> <li>- OP's submitted to Director shall be submitted <i>electronically as a single file in PDF or other format acceptable</i> to the Director; and be <i>copied to the OA</i> in charge of the DWS, if the OA is not the owner.</li> <li>- OP's subject to an audit by an accreditation auditor shall be <i>retained for a minimum of 10 years</i> by the <i>owner</i> of the OP's and the <i>accredited OA</i>.</li> </ul> <p>Owners shall make OP's <i>current version</i> (hard copy) or reflecting <i>“major revision”</i> (electronic on website) of <i>available for viewing</i> by the public – at <i>principal office</i> of owner within the area served by the DWS and/or <i>on a website</i> that is accessible to the public (but not any part that could threaten H&amp;S of an individual or safety and quality of drinking water, competitive position, or trade secrets, etc.)</p>	<p>Reviewed the <i>Operational Plans for the St. Thomas Area Secondary Water Supply System, City of St. Thomas Water Distribution System, Township of Southwold Water Distribution System (Lynhurst Area) and Municipality of Central Elgin Water Distribution System (St. Thomas Suburban Area)</i>, dated January 1, 2023 (OP). Confirmed documented information meets the requirements of the DWQMS with supporting information provided in each of the sections of this checklist.</p> <p>Streamlined operational plans are user-friendly, minimize documented information required and easily identify to which system each of the documents apply.</p> <p>Reviewed the OP's conformity against the Director's Directions, and confirmed the following:</p> <ul style="list-style-type: none"> <li>- Procedure for version control is available</li> <li>- The OP's title page describes the municipal DWS to which it applies</li> <li>- Includes a completed Subject System Description Form (in latest format, as available at <a href="https://forms.mgcs.gov.on.ca/en/dataset/012-2153">https://forms.mgcs.gov.on.ca/en/dataset/012-2153</a>)</li> <li>- Single PDF / acceptable format</li> <li>- OP is retained for a minimum of 10 years (version audited by accreditation auditor)</li> <li>- Current version is available in hard copy.</li> </ul> <p><b>OFI:</b> Consider including a statement on each owner's water webpage about the availability of the OP on request and who to contact.</p> <p>The documented QMS conforms to the requirements of the standard with noted <b>positive audit findings (POS)</b>, <b>non-conformities (NC's)</b> and <b>opportunities for improvement (OFI's)</b> within the designated areas of this checklist.</p>
<p><b>2. QMS Policy</b>  <b>PLAN</b> – The OP shall <i>document a QMS Policy</i> that provides the foundation for the QMS, and:  a) includes a <i>commitment to the maintenance and continual improvement of the QMS</i>,  b) includes a commitment to the <i>Consumer to provide safe drinking water</i>,  c) includes a commitment to <i>comply with applicable legislation and regulations</i>, and  d) is in a form that <i>can be communicated</i> to all OA <i>personnel</i>, the <i>Owner</i> and the <i>Public</i>.  <b>DO</b> – The OA shall <i>establish and maintain a QMS</i> that is consistent with the QMS Policy.</p>	<p><b>OP s. 2 Quality Management System Policy</b> links to Appendix A that includes QMS policies describing commitments to maintenance and continual improvement of the QMS, and safe drinking water to the consumer. A commitment to comply with all applicable legislative and regulatory requirements. This is communicated to personnel the owner and the public. and includes required commitments.</p> <p>Confirmed the <b>QMS Policy statements are available online at:</b> <a href="https://www.stthomas.ca/city_hall/environmental_services/water_services/Drinking_Water_Quality_Management_Standards">https://www.stthomas.ca/city_hall/environmental_services/water_services/Drinking_Water_Quality_Management_Standards</a>: accessed on April 17, 2023.</p>
<p><b>3. Commitment and Endorsement</b>  <b>PLAN</b> – The OP shall contain a <i>written endorsement</i> of its contents by <i>Top Management</i> and the <i>Owner</i>.  <b>DO</b> – Top Management shall provide <i>evidence</i> of its <i>commitment</i> to an effective QMS by:  a) ensuring that a <i>QMS is in place that meets</i> the requirements of this Standard,  b) <i>ensuring</i> that the OA is aware of all applicable <i>legislative and regulatory requirements</i>,  c) <i>communicating</i> the <i>QMS</i> according to the procedure for communications,  d) <i>determining, obtaining or providing the resources needed</i> to maintain and continually improve the QMS.</p>	<p><b>OP s.3 Commitment and Endorsement</b> describes that the owner and operating authority are committed to ensuring a regularly assessed QMS that meets all requirements, OA is aware of all applicable legislative and regulatory requirements, QMS is communicated according to Communication Procedure (Appendix 1), and providing the resources needed to maintain and improve the QMS.</p> <p>Viewed signed Drinking Water Quality Management System Policies included in Appendix A signed by the following owner representatives and the OP Endorsement by OA (Nathan Bokma signed on January 13, 2023 and on March 22, 2023):</p> <ul style="list-style-type: none"> <li>- OP Endorsement by Municipality of Central Elgin (Geoff Brooks, Director), signed January 16, 2023</li> <li>- OP Endorsement by City of St. Thomas (Justin Lawrence, Director), signed January 17, 2023 (for St. Thomas systems)</li> <li>- OP Endorsement by Township of Southwold (Aaron Van Oorspronk, Director), signed March 22, 2023 (accessed online)</li> </ul>

DOCUMENT REVIEW – DWQMS 2.0 (Condition Expected)	DOCUMENT REVIEW – Auditor Comments (Condition Found)
<p><b>4. QMS Representative</b>  <b>PLAN</b> – The OP shall <i>identify a QMS representative</i>.  <b>DO</b> – Top Management shall <i>appoint and authorize</i> a QMS representative who, irrespective of other responsibilities, shall:</p> <ul style="list-style-type: none"> <li>a) <i>administer</i> the QMS by <i>ensuring that processes and procedures needed</i> for the QMS are <i>established and maintained</i>,</li> <li>b) <i>report to Top Management</i> on the <i>performance</i> of the QMS and any need for <i>improvement</i>,</li> <li>c) ensure that <i>current versions of documents</i> required by the QMS are being <i>used at all times</i>,</li> <li>d) ensure that <i>personnel</i> are <i>aware</i> of all applicable <i>legislative and regulatory requirements</i> that pertain to their duties for the operation of the Subject System, and</li> <li>e) promote <i>awareness of the QMS</i> throughout the OA.</li> </ul>	<p><b>OP s.4 QMS Representative</b> appointed and authorized by Top Management and Owner representative</p> <p><b>OFI:</b> Consider noting in the OP that duties of the QMS Rep are shared and list which of the duties are performed by each.</p>
<p><b>5. Document and Records Control</b>  <b>PLAN</b> – The OP shall document a procedure for Document and Records control that describes how:</p> <ul style="list-style-type: none"> <li>a) <b>Documents required</b> by QMS are: <ul style="list-style-type: none"> <li>i. kept <i>current, legible</i> and readily <i>identifiable</i></li> <li>ii. <i>retrievable</i></li> <li>iii. <i>stored, protected, retained and disposed of</i>, and</li> </ul> </li> <li>b) <b>Records required</b> by the QMS are: <ul style="list-style-type: none"> <li>i. kept <i>legible</i>, and readily <i>identifiable</i></li> <li>ii. <i>retrievable</i></li> <li>iii. <i>stored, protected, retained and disposed of</i>.</li> </ul> </li> </ul> <p><b>DO</b> – The OA shall implement and conform to the procedure for Document and Records control and shall ensure that QMS documentation for the Subject System includes:</p> <ul style="list-style-type: none"> <li>a) the <b>OP</b> and its associated <i>policies and procedures</i>,</li> <li>b) Documents and Records determined by the OA as <i>being needed</i> to ensure the effective <i>planning, operation and control</i> of its operations, and</li> <li>c) the results of <i>internal and external Audits</i> and <i>management reviews</i>.</li> </ul>	<p><b>OP s.5 Document and Records Control</b> describes the activities required to ensure that all documents are identifiable, kept current, legible, retrievable, stored, protected, retained and disposed of. Documents that are required by the DWQMS are within the scope of this procedure.</p> <p>The Record Control Procedure has been established and maintained to identify the controls needed for the identification, legible, retrievable, storage, protection, retention time and disposition of records. Records that are required by the DWQMS are within the scope of this procedure.</p> <p>The <b>Document Control Procedure (DW-ADMIN-100), dated January 1, 2023</b> can be found in Appendix B. <b>The Record Control Procedure (DW-ADMIN-200), dated January 1, 2023</b> can be found in Appendix C – which describe care and control of all documents required by QMS. The procedure describes that documents are current, legible, identifiable, retrievable, stored, protected, retained and disposed of.</p> <p>Confirmed the requirements of this element are appropriately described in OP s. 5 Appendix B and C</p> <p>During this internal audit, the auditor noted current versions of documents are in use; documents and records reviewed during this audit were legible, identifiable, retrievable, stored, protected, retained etc...</p>
<p><b>6. Drinking Water System (DWS)</b>  <b>PLAN</b> – The OP shall <i>document</i>, as applicable:</p> <ul style="list-style-type: none"> <li>a) for the Subject System: <ul style="list-style-type: none"> <li>i. the name of the <b>Owner</b> and <b>OA</b>,</li> <li>ii. if the system includes equipment that provides <i>Primary Disinfection</i> and/or <i>Secondary Disinfection</i>: <ul style="list-style-type: none"> <li>A. a <i>description of the system</i> including all applicable <i>Treatment System processes</i> and <i>Distribution System components</i>,</li> <li>B. a Treatment System <i>process flow chart</i>,</li> <li>C. a description of the <i>water source</i>, including: <ul style="list-style-type: none"> <li>I. general <i>characteristics of the raw water</i> supply,</li> <li>II. <i>common event-driven fluctuations</i>, and</li> <li>III. any resulting <i>operational challenges and threats</i>.</li> </ul> </li> </ul> </li> <li>iii. if the system does not include equipment that provides Primary Disinfection or Secondary Disinfection: <ul style="list-style-type: none"> <li>A. a description of the system including all Distribution System components, and</li> <li>B. a description of any <i>procedures</i> that are in place to <i>maintain disinfection residuals</i>.</li> </ul> </li> </ul> </li> <li>b) if the Subject System is an Operational Subsystem, a summary <i>description</i> of the <i>Municipal Residential Drinking Water System it is a part of</i> including the name of the <i>OA(OA's)</i> for the other Operational Subsystems.</li> <li>c) if the Subject System is <i>connected to one or more</i> other Drinking Water Systems owned by different <b>Owners</b>, a summary description of those systems which: <ul style="list-style-type: none"> <li>i. indicates whether the Subject System <i>obtains water from or supplies water to</i> those systems,</li> <li>ii. names the <b>Owner</b> and <b>OA(OA's)</b> of those systems, and</li> </ul> </li> </ul>	<p><b>OP s.6 Drinking Water System</b> in each OP identifies Owner and Operating Authority for the systems, description of water sources, schematics, common event fluctuations, threats to ongoing water quality, challenges (low chlorine residual, backflow, discoloration, low pressure control), treatment system processes and distribution system components.</p> <p>Each of the OP s.6 sections also describe the interconnections between drinking water systems owned by different owners (with great graphical depiction included to help describe these interconnections with colour coding and descriptions in the legend provided).</p> <p>Appendix D includes each system's distribution system map:</p> <ul style="list-style-type: none"> <li>- <b>St. Thomas Area Water Supply System Map, dated November 16, 2023</b> – indicating watermain locations and diameters; locations of EMPS and chambers (with and without meters), location of Ford Tower and municipal boundaries</li> <li>- <b>City of St. Thomas Water Distribution Map, dated 2020</b> – indicating watermain locations and diameters, locations of valves, PRV's, hydrants, booster station, and municipal boundaries</li> <li>- <b>Township of Southwold Map, dated November 6, 2018</b> – indicating locations of watermains, valves, hydrants, water sample test sites and municipal boundaries</li> <li>- <b>Municipality of Central Elgin Water Distribution – Old Lynhurst, dated May 2020</b> – indicating watermain locations and diameters, which watermains are "City of St. Thomas", locations of valves, hydrants, water sample test sites and municipal boundaries</li> <li>- <b>Municipality of Central Elgin Water Distribution – Southeast Area, dated May 2020</b> – indicating watermain locations and diameters, which watermains are "City of St. Thomas", locations of valves, hydrants, water sample test sites and municipal boundaries</li> </ul>

DOCUMENT REVIEW – DWQMS 2.0 (Condition Expected)	DOCUMENT REVIEW – Auditor Comments (Condition Found)
<p>iii. identifies which, if any, of those systems that the Subject System <i>obtains</i> water from are relied upon to <i>ensure the provision of safe drinking water</i>.</p> <p>DO – The OA shall ensure that the <i>description</i> of the Drinking Water System is <i>kept current</i>.</p>	
<p><b>7. Risk Assessment</b>  <b>PLAN</b> – The OP shall document a risk assessment process that:            a) Considers potential hazardous events and associated hazards, as identified in MOECC document titled <i>Potential Hazardous Events for Municipal Residential Drinking Water Systems</i>, dated February 2017 as it may be amended. A copy of this document is available at <a href="http://www.ontario.ca/drinkingwater">www.ontario.ca/drinkingwater</a>.            b) ID's <i>additional potential</i> hazardous events &amp; associated hazards,            c) <i>assesses</i> the <i>risks</i> assoc. w/ the <i>occurrence</i> of hazardous events,            d) <i>ranks</i> the hazardous events according to the <i>associated risk</i>,            e) <i>identifies control measures</i> to address the potential hazards and hazardous events,            f) identifies <i>Critical Control Points</i>,            g) identifies a method to <i>verify, at least once every calendar year</i>, the <i>currency</i> of the information and the <i>validity of the assumptions</i> used in the risk assessment,            h) ensures that the risks are <i>assessed at least once every thirty-six months</i>, and            i) considers the <i>reliability and redundancy of equipment</i>.</p> <p>DO – The OA shall <i>perform</i> a risk assessment <i>consistent with the documented</i> process.</p>	<p>OP s.7 Risk Assessment links to the <i>Risk Assessment procedure (DW-ADMIN-300)</i>, dated <i>January 1, 2023</i> that describes the process used by the assessment team to identify potential hazardous events and hazards, assess the risks associated with the occurrence of these, rank potential hazards according to associated risks. It describes the frequency for annual reviews and 36-month re-assessments.</p> <p>Control measures are defined and procedures for critical control points (CCP's) include measures to: monitor, respond to document and to limit exceedances. The Risk Assessment Procedure also describes the process for staff to bring forward real or perceived risks to water quality for consideration.</p> <p>Confirmed the applicable requirements of this element are appropriately described in the procedure.</p> <p>Confirmed the "Potential Hazardous Events for Municipal Residential Drinking Water Systems" document considered is the version that now includes "Cybersecurity threats" now available at <a href="https://prod-environmental-registry.s3.amazonaws.com/2022-04/2022Apr%20-%20Potential%20Hazardous%20Events%20EN.pdf">https://prod-environmental-registry.s3.amazonaws.com/2022-04/2022Apr%20-%20Potential%20Hazardous%20Events%20EN.pdf</a>.</p>
<p><b>8. Risk Assessment Outcomes</b>  <b>PLAN</b> – The OP shall document:            a) the <i>identified potential hazardous events and associated hazards</i>,            b) the <i>assessed risks associated with the occurrence</i> of hazardous events,            c) the <i>ranked</i> hazardous events,            d) the <i>identified control measures</i> to address the potential hazards and hazardous events,            e) the identified <i>Critical Control Points</i> and their respective <i>Critical Control Limits</i>,            f) procedures and/or processes to <i>monitor the Critical Control Limits</i>,            g) procedures to <i>respond to deviations from the Critical Control Limits</i>, and            h) procedures for <i>reporting and recording deviations</i> from the Critical Control Limits.</p> <p>DO – The OA shall <i>implement and conform</i> to the procedures.</p>	<p>Reviewed the latest risk assessment outcomes listed below and noted that all items required by this element are covered:</p> <ul style="list-style-type: none"> <li>- <i>Hazard Analysis Spreadsheet (Secondary)</i>, dated <i>March 7, 2023</i> last reviewed March 7, 2023 and re-assessment last completed April 21, 2020</li> <li>- <i>Hazard Analysis Spreadsheet (Distribution)</i>, dated <i>March 7, 2023</i> last reviewed March 7, 2023 and re-assessment last completed April 21, 2020</li> <li>- <i>Hazard Analysis Spreadsheet (Southwold-Lynhurst Area)</i>, dated <i>March 7, 2023</i> last reviewed March 7, 2023 and re-assessment last completed April 21, 2020</li> <li>- <i>Hazard Analysis Spreadsheet (Central Elgin – St. Thomas Suburban Area)</i>, dated <i>March 7, 2023</i> last reviewed March 7, 2023 and re-assessment last completed April 21, 2020</li> </ul> <p><b>OFI:</b> Consider implementing the sector best practice of aligning the minimum chlorine residual critical control limits for secondary disinfection with the "Acceptable Disinfectant Concentration" definition included in the latest Watermain Disinfection Procedure, of 0.20 mg/L free chlorine (as identified in the hazard analysis spreadsheets and in the Disinfection Control (DW-CCP-3000) procedure).</p> <p>The latest risk assessment outcomes included consideration of cybersecurity threats. Cybersecurity threats have been assessed in each of the risk assessments.</p> <p><b>OFI:</b> Consider incorporating cybersecurity threats for the distribution system impacts (e.g. corporate network access to work orders, GIS information, locates program, etc.) – impacting compliance requirements. The risk assessment records reference <i>Responding to SCADA Failures procedure (DW-ERP-800)</i>, dated <i>January 1, 2023</i> that only references impacts to SCADA.</p> <p>The following CCP response procedures are available:</p> <ul style="list-style-type: none"> <li>- <i>Low Pressure Control (DW-CCP-1000)</i>, dated <i>January 1, 2023</i> describes the monitoring, testing, critical limits, operator control and emergency conditions and response requirements.</li> <li>- <i>Discolouration Prevention and Control (DW-CCP-2000)</i>, dated <i>January 1, 2023</i> describes contributing factors, critical limits, emergency conditions, response requirements, reporting and review and maintenance</li> <li>- <i>Disinfection Control (DW-CCP-3000)</i>, dated <i>January 1, 2023</i> describes contributing factors, critical limits (for secondary disinfection and for new construction or repair), responses, operating authority control, emergency conditions response, reporting and review, maintenance, monitoring and testing.</li> <li>- <i>Backflow Prevention Control (DW-CCP-4000)</i>, dated <i>January 1, 2023</i> describes contributing factors, critical limits, operator control, emergency conditions and response requirements, maintenance and monitoring and testing.</li> </ul>

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<p><b>9. Org. Structure, Roles, Responsibilities and Authorities</b>  <b>PLAN</b> – The OP shall:</p> <p>a) describe the <b>organizational structure</b> of the OA including <b>respective roles, responsibilities and authorities</b>,  b) delineate <b>corporate oversight</b> roles, responsibilities, authorities in the case where the OA operates multiple Subject Systems,  c) identify the <b>person, persons or group of people</b> within the management structure of the org. responsible for undertaking the <b>Management Review</b> described in Element 20,  d) identify the person, persons or group of people, having <b>Top Management responsibilities</b> required by this Standard, along with their responsibilities, &amp;  e) identify the <b>Owner</b> of the Subject System.  <b>DO</b> – The OA shall <b>keep current</b> the description of the organizational structure including respective roles, responsibilities and authorities, and shall <b>communicate</b> this information to OA <b>personnel</b> and the <b>Owner</b>.</p>	<p><b>OP s.9 Organizational Structure, Roles, Responsibilities and Authorities</b> describes the organizational structure of the operating authority.</p> <p>Each of the items a) to e) of this element are appropriately described in OP s. 9 Appendix F dated January 1, 2023:</p> <ul style="list-style-type: none"> <li>- <b>Roles, Responsibilities and Authorities – Secondary (DW-ADMIN-400), dated January 1, 2023</b> that outlines the <b>owner</b> (Board of Management, Administrating Municipality: City of St. Thomas) and OA (Environmental Services Dept.). The <b>members of top management</b> include Owner Rep/Director of Environmental Services &amp; City Engineer and the Manager Development and Compliance (also QMS Rep); who participates in management Reviews and all other roles of the OA.</li> <li>- <b>Roles, Responsibilities and Authorities – St. Thomas Distribution (DW-ADMIN-401), dated January 1, 2023</b> that outlines the <b>owner</b> (Mayor and Council of City of St. Thomas) and OA (Environmental Services Dept.). The <b>members of top management</b> include Owner Rep/Director of Environmental Services &amp; City Engineer and the Manager Development and Compliance (also QMS Rep); who participates in management Reviews and all other roles of the OA.</li> <li>- <b>Roles, Responsibilities and Authorities – Southwold (DW-ADMIN-402), dated January 1, 2023</b> that outlines the <b>owner</b> (Mayor and Council of Township of Southwold and Owner Rep: Director of Infrastructure and Development Services) and OA (Environmental Services Dept.). The <b>members of top management</b> include Owner Rep/Director of Environmental Services &amp; City Engineer and the Manager Development and Compliance (also QMS Rep); who participates in management Reviews and all other roles of the OA.</li> <li>- <b>Roles, Responsibilities and Authorities – Central Elgin (DW-ADMIN-403), dated January 1, 2023</b> that outlines the <b>owner</b> (Mayor and Council of Municipality of Central Elgin and Owner Rep: Director of Infrastructure and Community Services) and OA (Environmental Services Dept.). The <b>members of top management</b> include Owner Rep/Director of Environmental Services &amp; City Engineer and the Manager Development and Compliance (also QMS Rep); who participates in management Reviews and all other roles of the OA.</li> </ul> <p>Confirmed the organizational structure is current, has been communicated to staff and to the owner.</p> <p>Confirmed in interview with K. Kamerman that Standard of Care is offered through the water supplier, Regional Water Supply, multiple sessions were held since the last election.</p> <p>Discussed with Nathan Bokma re: communicating how owner roles are communication and about owner orientation. Every new council attends council orientation – brief rundown of owner responsibilities. Justin educates council once every 4 years.</p>
<p><b>10. Competencies</b>  <b>PLAN</b> – The OP shall <b>document</b>:</p> <p>a) <b>competencies</b> required for personnel performing duties directly <b>affecting drinking water quality</b>,  b) activities to <b>develop and/or maintain competencies</b> for personnel performing duties directly affecting drinking water quality, and  c) activities to ensure that personnel are <b>aware of the relevance of their duties</b> and <b>how they affect</b> safe drinking water.</p> <p><b>DO</b> – The OA shall undertake <b>activities</b> to:</p> <p>a) <b>meet and maintain competencies</b> for personnel directly affecting drinking water quality and shall <b>maintain records</b> of these activities, and  b) <b>ensure that personnel are aware</b> of the relevance of their duties and how they affect safe drinking water and shall <b>maintain records</b> of these activities.</p>	<p><b>OP s.10 Competencies</b> references the <b>Competency and Training Procedure (DW-ADMIN-500), dated January 1, 2023</b> that describes the required and desired competencies established for each role within the Owners and Operating Authorities structure whose duties may have the ability to directly affect drinking water quality. The procedure also describes the process for requesting/scheduling and tracking training, as well as methods used to ensure staff members establish and/or maintain a satisfactory level of competence in their duties.</p> <p>Highest class of system operated by the OA is Class III: Chris Andrew is appointed ORO with back-ups by staff with Class III.</p> <p>Training tracking process reviewed with Chris Andrew (ORO) – viewed <b>2022-08-16 Water Training Tracker Spreadsheet</b> (spreadsheet version date is noted in the title). John Marrs is noted as expired – he’s on leave. Dane Garber – requires Mandatory Renewal Course for renewal.</p> <p>For the operators with expiring certificates in 2023, confirmed with the ORO that the competency requirements are on-track for renewal.</p> <p>Confirmed personnel who have ORO (Class III required) and OIC roles (Class I and higher required) have the required competencies. Language re: on-call coverage and OIC or ORO designations is in line with regs.</p> <p>Discussed new staff person – Jennifer Smorowski – 2-3 hour review of DWQMS, roles and responsibilities, overview of systems, emergency procedures; on-the-job is achieved through buddy system with various staff members who describe how they each carry-out tasks. As distribution-only system, only have Class I operators being hired.</p>

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	<p>Confirmed how OIT's and newly hired operators from other systems are onboarded – it is described in the <a href="#">Operator Competence Form (DWF-ADMIN-501)</a>, dated January 1, 2023. The <a href="#">Training Needs Matrix (DWF-ADMIN-502)</a>, dated January 1, 2023 identifies the training required, optional or not required by role within the organization.</p>
<p><b>11. Personnel Coverage</b>  <b>PLAN</b> – The OP shall document a procedure to ensure that <i>sufficient personnel meeting identified competencies</i> are available for duties that <i>directly affect</i> drinking water quality.  <b>DO</b> – The OA shall <i>implement and conform</i> to the procedure.</p>	<p><a href="#">OP s.11 Personnel Coverage</a> describes how sufficient personnel meeting identified competencies are available for duties that may directly affect drinking water quality. The <a href="#">Personnel Coverage Procedure (DW-ADMIN-600)</a>, dated January 1, 2023 can be found in Appendix H – describes 24/7 operator availability, coverage for: on-call, ORO, OIC and in the event of possible labour disruption.</p> <p>Confirmed references to on-call rotation, links to coverage in emergency situations, including pandemics, etc. - the <a href="#">Continuity of Operations Procedure (DW-ERP-700)</a>, dated January 1, 2023 links to OnWARN and describes how emergency substitute operators (ESO's, a provision by MECP under certain short-staffing conditions (<a href="https://ero.ontario.ca/notice/019-3513">https://ero.ontario.ca/notice/019-3513</a>)) can be used: MECP requires reports to SAC, training to be provided, certain records to be kept, etc.</p>
<p><b>12. Communications</b>  <b>PLAN</b> – The OP shall document a <i>procedure</i> for communications that describes <i>how</i> the <i>relevant aspects of the QMS</i> are <i>communicated</i> between Top Management and:  a) the <i>Owner</i>,  b) OA <i>personnel</i>,  c) <i>Suppliers</i> that have been identified as essential under Plan (a) of Element 13 of this Standard, and  d) the <i>Public</i>.  <b>DO</b> – The OA shall <i>implement and conform</i> to the procedure.</p>	<p><a href="#">OP s.12 Communications</a> links to the <a href="#">Communications (DW-ADMIN-700) procedure</a>, dated January 1, 2023 that describes how the DWQMS is communicated between Top Management and the Owner, Operating Authority personnel, Suppliers, and the public. describes how sufficient personnel meeting identified competencies are available for duties that may directly affect drinking water quality.</p> <p>Viewed examples of communications with each of the groups a) to d) as a part of this audit.</p> <ul style="list-style-type: none"> <li>– <a href="#">New Construction Sign-off Form (DWF-ADMIN-800)</a>, dated January 1, 2023 (viewed example PV-EX Construction Ltd. Signed March 30, 2023)</li> <li>– <a href="#">E-mail re: St. Thomas ORO</a>, dated July 15, 2022 (example e-mail to Owner Representatives, OCWA and lab, SGS)</li> <li>– DWQMS Management Review meeting minutes June 30, 2022 (Owner)</li> <li>– <a href="#">Emergency Response Plan training record</a>, dated April 11, 2023 (re: review of emergency response plan procedures for water, spill (sewage response plan, MECP inspection report and new ECA's for sewer systems)</li> <li>– <a href="#">Sampling of public communications through Facebook</a>, <a href="https://www.facebook.com/profile/100080909905396/search?q=water">https://www.facebook.com/profile/100080909905396/search?q=water</a>, accessed on April 17, 2023 (e.g. water well samples, annual hydrant flushing notice, seasonal water quality advisory re: colour / odour due to seasonal weather and lake changes, staff hiring, road closures re: infrastructure installations, etc.)</li> <li>– <a href="#">St. Thomas Water webpage</a>, <a href="https://www.stthomas.ca/city_hall/environmental_services/water_services">https://www.stthomas.ca/city_hall/environmental_services/water_services</a>, accessed on April 17, 2023 (e.g. annual reports, FAQ pages, by-laws, DWQMS, financial plan, etc.)</li> </ul> <p>Communications with suppliers of essential supplies and services include appropriate information (e.g. MDWL / NSF requirements for parts and chemicals that come into contact with water, requiring labs to be accredited and licensed, DWWP requirements regarding Watermain Disinfection Procedure communicated to contractors and developers effectively – and verified by competent operators; and disinfection requirements related to capital infrastructure upgrades, etc.)</p>
<p><b>13. Essential Supplies and Services</b>  <b>PLAN</b> – The OP shall:  a) identify all <i>supplies and services essential</i> for the delivery of <i>safe drinking water</i> and shall state, for each supply or service, the <i>means to ensure its procurement</i>, and  b) include a procedure by which the OA <i>ensures the quality</i> of essential supplies and services, in as much as they may affect drinking water quality.  <b>DO</b> – The OA shall implement and conform to the procedure.</p>	<p><a href="#">OP s.13 Essential Supplies and Services</a> links to <a href="#">Essential Supplies and Services Procedure (DW-ADMIN-800)</a>, dated January 1, 2023 that identifies supplies and services deemed essential to the delivery of safe drinking water. The list includes the means to ensure the procurement of critical supplies and services and methods used by the Operating Authority to ensure the quality of essential services and supplies.</p> <p>Confirmed during the on-site audit that no supply chain disruptions were experienced, although long lead times for water meters – more planning ahead required. Some repair clamps have been delayed but could go to alternate supplier (e.g. Wollesley if Emco did not have what was needed).</p> <p>Order from EMCO supplier, NSF 61 parts and chemicals – walked through parts storage area and noted labelling on parts, boxes and chemical containers. Noted NSF 61 and NSF 372 on Cambridge Brass labels. Confirmed grease in use is food grade. Confirmed Anchem Anchor 12 is NSF 60 certified.</p> <p>In interview with City Engineers, confirmed projects go out for tender – contractors are given City standards to follow – Engineering inspectors verify what's going in the ground. When superchlorination, pressure testing, backflow device, bacti sampling, any tie-ins once bacti's come back – documented proof, super-chlorination through to commissioning processes.</p>

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<p><b>14. Review and Provision of Infrastructure</b>  <b>PLAN</b> – The OP shall document a procedure for <i>reviewing the adequacy of the infrastructure necessary</i> to operate and maintain the Subject System that:                      a) <i>Considers the outcomes of the risk assessment</i> documented under Element 8, and                      b) <i>Ensures that the adequacy of the infrastructure necessary</i> to operate and maintain the Subject System is reviewed <i>at least once every Calendar Year</i>.</p> <p><b>DO</b> – The OA shall <i>implement and conform</i> to the procedure and <i>communicate the findings</i> of the review to the <i>Owner</i>.</p>	<p><b>OP s.14 Review and Provision of Infrastructure</b> links to the <b>Review and Provision of Infrastructure Procedure (DW-ADMIN-850), dated January 1, 2023</b> that describes the programs in place to help assess the adequacy of infrastructure and how funds are secured for infrastructure related projects.</p> <p>Discussed with the QMS Rep how risk assessment outcomes are considered as a part of this process: informal process for flagging any changing risks – as soon as possible, as an issue is known – e.g. upgraded booster pumps, due to many noted failures – wasn't previously accounted for but implemented the upgrades as required.</p> <p>The <b>Watermain Risk of Failure Map 2022</b> identifies by colour-coding the risk of failure and the thickness of the colouring helps identify the watermain diameters.</p>
<p><b>15. Infrastructure Maintenance, Rehabilitation and Renewal</b>  <b>PLAN</b> – The OP shall document:                      a) a <i>summary</i> of the OA's <i>infrastructure maintenance, rehabilitation and renewal programs</i> for the Subject System, and                      b) a <i>long term forecast of major infrastructure maintenance, rehabilitation and renewal activities</i>.</p> <p><b>DO</b> – The OA shall:                      a) <i>keep the summary</i> of the infrastructure maintenance, rehabilitation and renewal programs <i>current</i>,                      b) ensure that the <i>long term forecast</i> is <i>reviewed at least once every Calendar Year</i>,                      c) <i>communicate</i> the programs <i>to the Owner</i>, and                      d) <i>monitor the effectiveness</i> of the maintenance program.</p>	<p><b>OP s.15 Infrastructure Maintenance, Rehabilitation and Renewal</b> links to the <b>Infrastructure Maintenance, Rehabilitation and Renewal Procedure (DW-ADMIN-900) dated January 1, 2023</b> that describes the various programs in place to maintain/rehabilitate and replace aging infrastructure: scheduled maintenance through the work order management system; life cycle maintenance (SCADA) and station pumps; watermain flushing, hydrant inspection and valve exercising programs undertaken on an annual basis. A leak detection program is ongoing and backflow prevention program is addressed through the City's Water Use by-law.</p> <p>Viewed <b>Work Order reminder e-mails that Chris Kenny and Simon Flanagan have received, for week relevant to April 20, 2023</b> received – e.g. – WO 009762 overdue – annual inspection of sample stations. Also new work order notification on a weekly – reminder re: record 3 chlorine residuals from distribution and 3 from secondary systems on Thursday if samples drawn on M and W – on Friday if samples drawn on Tuesday and Wednesday.</p> <p>Viewed <b>CMMS Chlorine Residuals Entries OTJ training records</b> (drafted forms with training to be completed) initiated for each staff member to review the change in requirements.</p> <p>Viewed <b>work orders created for THM's and HAA's</b> – same day, different locations – chains of custody – specific to likely elevated locations for each. Lead / alkalinity - Alkalinity next due July 12/23 (6 months at start of sample period) – work orders exist as well.</p> <p>Hydrant inspections are tracked through a City-owned application on tablets.</p> <p>Regarding long-term major maintenance... tracked through work orders, tower inspection last year. Water tower plan to decommission – engineering reviews. Owner reports to provide updates on upgrades and major maintenance and decommissioning projects. Inspections are carried-out, have reported on these – flagged many of the major maintenance through water rates study.</p> <p>Long-term major maintenance is also tracked through 10-year capital planning that is updated on an annual basis by reviewing indicators of system performance (e.g. mainbreaks, pressure, risk assessment outcomes, water quality complaints). Prior to finalizing budgets each year, the Manager of Water and Sewer is involved in discussions with owner representatives regarding areas of concern.</p>
<p><b>16. Sampling, Testing and Monitoring</b>  <b>PLAN</b> – The OP shall document:                      a) a <i>sampling, testing and monitoring procedure</i> for <i>process control and finished drinking water quality</i> including requirements for sampling, testing and monitoring at the <i>conditions most challenging</i> to the Subject System,                      b) a description of <i>relevant sampling, testing or monitoring</i> activities, if <i>any</i>, that take place <i>upstream</i> of the Subject System, and                      c) a procedure that describes how sampling, testing and monitoring results are <i>recorded and shared</i> between the <i>OA</i> and the <i>Owner</i>, where applicable.</p> <p><b>DO</b> – The OA shall implement and conform to the procedures.</p>	<p><b>OP s.16 Sampling, Testing and Monitoring</b> links to the <b>Sampling, Testing and Monitoring Procedure (DW-ADMIN-1000), dated January 1, 2023</b> that describes the sampling, testing and monitoring in place for drinking water process control based on the most challenging conditions and how results are recorded and shared between the Operating Authority and the Owner.</p> <p>Upstream testing and monitoring is through the EAPWSS water treatment plant (water supply operated by OCWA) provided through the Elgin Middlesex Pumping Station (EMPS). OCWA's monitoring and control of primary and secondary disinfection is relied-upon.</p> <p>Continuous monitoring via SCADA is available at the City of St. Thomas's PW building. Trend reports regarding chlorine residuals, flows, pressures are reviewed at least every 72 hours at the East and West chambers; Albert Roberts Booster Station, Southdale Panel, Southwold Panel, Wellington Road Panel and the Ford Meter Pit.</p> <p>Reviewed the <b>Sampling plan, dated January 1, 2023</b> and confirmed it reflects O. Reg. 170/03 requirements (reflects population served, cross-referenced number of samples, tests, and required monitoring requirements are reflected). The number of bacteriological samples taken is in line with the population served requirements and at the same time, residuals are taken. A second day is tracked (min. 48 hours apart) for the second set of chlorine residuals each week. Adjustments are made in weeks with statutory holidays.</p>

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	<p>Confirmed most recent <a href="https://www.stthomas.ca/city_hall/environmental_services/water_services/annual_water_distribution_reports">Annual &amp; Summary Reports</a> available online at <a href="https://www.stthomas.ca/city_hall/environmental_services/water_services/annual_water_distribution_reports">https://www.stthomas.ca/city_hall/environmental_services/water_services/annual_water_distribution_reports</a>. Accessed on April 17, 2023</p>
<p><b>17. Measurement and Recording Equipment Calibration and Maintenance</b>  <b>PLAN</b> – The OP shall document a <i>procedure</i> for the <i>calibration and maintenance of measurement and recording</i> equipment.   <b>DO</b> – The OA shall <i>implement and conform</i> to the procedure.</p>	<p><b>OP s.17 Measurement and Recording Equipment Calibration and Maintenance</b> links to the <b>Equipment Calibration Procedure (DW-ADMIN-1100)</b>, dated January 1, 2023 that describes the calibration and maintenance of measurement and recording equipment.</p> <p>Equipment requiring calibration is listed in the <b>Equipment Listing (DWF-ADMIN-1100)</b>, dated January 1, 2023 – including the analyzer type, model #, serial #, range, frequency of calibration and indication of which OA is responsible for the equipment’s calibration. WO system is used to track. Staff verify online chlorine residual analyzers regularly by grab sample and compared against the pocket colorimeter. If drifted out of calibration, the operator adjusts the analyzer to meet the results of the pocket colorimeters. Logbook entries are made re: “as found” and “as left” conditions.</p> <p>Viewed the following calibration / verification records:</p> <ul style="list-style-type: none"> <li>- Pocket Colorimeter Instrument Calibration Sheets by Bids Technical Services, dated October 26, 2022</li> <li>- Treated Water Flow Meter at Albert Roberts Booster Station by SCG Flowmetrix, dated April 12, 2022</li> <li>- Free chlorine Analyzer at Albert Roberts Booster Station by Bids Technical Services, dated August 18, 2022 and March 27, 2023</li> <li>- Free chlorine Analyzer at Ford Chamber by Bids Technical Services, dated August 18, 2022 and March 27, 2023</li> <li>- Free chlorine Analyzer at Southdale Chamber by Bids Technical Services, dated August 18, 2022 and March 27, 2023</li> <li>- Free chlorine Analyzer at Southwold Chamber by Bids Technical Services, dated August 18, 2022 and March 27, 2023</li> <li>- Free chlorine Analyzer at Wellington Road PRV by Bids Technical Services, dated August 18, 2022 and March 27, 2023</li> <li>- Free chlorine Analyzer at West Chamber by Bids Technical Services, dated August 18, 2022 and March 27, 2023</li> <li>- Pressure Transmitters at Albert Roberts Booster Station Inlet and Outlet by Bids Technical Services, dated June 23, 2022</li> <li>- Pressure Transmitter at East Chamber Discharge by Bids Technical Services, dated June 23, 2022</li> <li>- Pressure Transmitter at West Chamber Discharge by Bids Technical Services, dated June 23, 2022</li> <li>- Pressure Transmitter at Southdale Chamber Discharge by Bids Technical Services, dated June 23, 2022</li> <li>- Pressure Transmitter at Southwold Chamber Discharge by Bids Technical Services, dated June 23, 2022</li> <li>- Pressure Transmitter at Ford Chamber Discharge by Bids Technical Services, dated June 23, 2022 (new transmitter required)</li> <li>- Pressure Transmitter at Wellington Road PRV Discharge by Bids Technical Services, dated June 23, 2022</li> <li>- Flowmeter Verification Certificate at East Chamber by Endress + Hauser, dated August 30, 2022</li> <li>- Flowmeter Verification Certificate at Southwold Meter Pit by Endress + Hauser, dated August 30, 2022</li> <li>- Flowmeter Verification Certificate at Waterworks Park by Endress + Hauser, dated August 30, 2022</li> <li>- Badger ModMag Sensor Verification at Fingal Line Meter Pit by S. Pate, dated August 30, 2022</li> <li>- Badger ModMag Sensor Verification at Ford Meter Pit by S. Pate, dated August 30, 2022</li> </ul> <p>On the site tour that took place April 20, 2023 confirmed <b>DPD Free Chlorine Reagents in use, expiring 2024, 2025 and 2027</b> and the <b>SpecCheck DPD-Chlorine-LR Secondary Standard (Lot #A2027)</b>, expiring February 2024. Confirmed Certificate of Analysis sheet for the SpecCheck verification standards is used to compare results against tolerances.</p> <p>Confirmed <b>pH buffer solutions in storage / in use</b> have valid dates (not expired).</p>
<p><b>18. Emergency Management</b>  <b>PLAN</b> – The OP shall document a <i>procedure</i> to <i>maintain a state of emergency preparedness</i> that includes:  a) a <i>list of potential emergency situations</i> or service interruptions,  b) <i>processes</i> for emergency <i>response and recovery</i>,  c) emergency response <i>training and testing</i> requirements,  d) <i>Owner and OA responsibilities</i> during emergency situations,  e) <i>references to municipal</i> emergency planning measures as appropriate, and  f) an <i>emergency communication protocol</i> and an <i>up-to-date list</i> of emergency <i>contacts</i>.</p>	<p><b>OP s.18 Emergency Management</b> describes how Emergency preparedness is achieved by following requirements described in the Emergency Response Plan. In the Emergency Response Plan, the table of contents lists response procedures for the potential emergency situations or service interruptions. The response procedures describe planned responses for the identified potential emergencies, including Owner and Operating Authority responsibilities. A protocol for notification of customers and adjacent municipalities supplied by the system, initiates the necessary municipal emergency planning measure described in the Emergency Response Plan. A protocol for all emergency notification is also included, along with an up-to-date contact list.</p> <p>Reviewed the <b>Drinking Water Operations Emergency Response Plan, dated January 2023</b> that now includes an up-to-date contact list (including the newest employee) - <b>Emergency contact list DW-ERP-1 dated April 17, 2023</b>. Discussed with Karel Kamerman that the contact list can be centralized in the emergency response plan (while keeping the description of quality requirements within</p>

DOCUMENT REVIEW – DWQMS 2.0 (Condition Expected)	DOCUMENT REVIEW – Auditor Comments (Condition Found)
<p>DO – The OA shall <i>implement and conform</i> to the procedure.</p>	<p>Essential Supplies and Services procedure (DW-ADMIN-800) so that only one document is kept up-to-date related to contact information.</p> <p><b>OFI:</b> Consider referencing from El. 13 to the emergency contact list contained in the emergency response plan for one centralized contact list for essential supplies &amp; services (<u>Note</u>: maintain the description of quality requirements for each type of essential supply / service in El. 13).</p> <p>Noted the emergency response plans reflect the systems' highest risks, including:</p> <ul style="list-style-type: none"> <li>- Potentially unsafe water (low chlorine, AWQI's, BWA's)</li> <li>- Power failure</li> <li>- Low pressure (watermain break or tower rupture)</li> <li>- Unauthorized entry or vandalism (at various stations)</li> <li>- Continuity of operations (situations when ESO's may be necessary)</li> <li>- SCADA failures and cybersecurity threats</li> </ul> <p>Reviewed the <u>Low Pressure St. Thomas debrief e-mails from May 2022</u> – summarizing possible root causes:</p> <ul style="list-style-type: none"> <li>- EAPWSS transmission system pressures were typical and plant discharge pressures were within normal ranges</li> <li>- St. Thomas EMPS pumps not operating during the valve replacement work and possible that 2 pumps at Albert Roberts under the static system pressure causes lower than normal NPSH at pumps</li> <li>- Plant shutdown at approximately 20:00 Sunday, Cell 2 level was at 5.71M at 19:58 and at 4.00M 09:05, normal reservoir operating ranges and providing typical static head pressure into transmission system</li> <li>- The scenario whereby this could occur again:             <ul style="list-style-type: none"> <li>a. EMPS St. Thomas pumps and related downstream systems are not operational</li> <li>b. Elgin plant unable to operate</li> <li>c. Reservoir levels at approximately 4.25M or lower</li> </ul> </li> </ul> <p>Updates were made to the <u>Low Pressure Response procedure (DW-ERP-500), dated January 1, 2023</u> to include items a., b., c. and added ORO duty to notify the fire department, customer service, city manager and council members, Central Elgin and/or Southwold (depending on if impacted), social media and website updates. Discussed with Karel Kamerman that the 2023 emergency training and test exercise is planned for November this year.</p>
<p><b>19. Internal Audits</b></p> <p><b>PLAN</b> – The OP shall document a <i>procedure for internal Audits</i> that:</p> <ol style="list-style-type: none"> <li>a) <i>evaluates conformity of the QMS</i> with the requirements of this Standard,</li> <li>b) identifies internal Audit <i>criteria, frequency, scope, methodology and record-keeping</i> requirements,</li> <li>c) considers <i>previous internal and external Audit results</i>, and</li> <li>d) describes <i>how QMS Corrective Actions are identified and initiated</i>.</li> </ol> <p>DO – The OA shall <i>implement and conform</i> to the procedure and shall ensure that internal Audits are conducted at <i>least once every Calendar Year</i>.</p>	<p><u>OP s.19 Internal Audits</u> references the <u>Internal Audits procedure (DW-ADMIN-1200), dated January 1, 2023</u> that describes how conformity of the DWQMS is evaluated on an annual basis. The procedure describes how audit criteria, frequency, scope, methodology and records are identified, referencing previous internal and external audits. It also describes how corrective actions are initiated as a result of an internal audit and provides references to the Continual Improvement and Corrective Action Procedure (DWADMIN-1400).</p> <p>Reviewed the <u>Surveillance Audit Report by SAI Global, dated June 30, 2022</u>. One non-conformity and one opportunity for improvement were identified (<u>updates are underlined</u>):</p> <ul style="list-style-type: none"> <li>- <b>El. 7 – NCR</b> – Risk Assessment – The threshold risk ranking value for CCP determination has not been defined within the Risk Assessment Procedure. <u>The Risk Assessment procedure (DW-ADMIN-300) was revised by inserting a ranking threshold of 9 indicating which process step / hazard is considered high risk.</u></li> <li>- <b>El. 8 – OFI</b> – Risk Assessment Outcomes – ensure cybersecurity threats are included in your risk assessment outcome table as a potential risk. <u>(Cybersecurity is considered for water supply related threats. <b>OFI</b> identified for cybersecurity impacting distribution operations compliance)</u></li> </ul> <p>Reviewed the <u>Internal Audit Report by City of St. Thomas, April 20 – 21, 2022</u> that identified 4 non-conformities, 6 OFI's (<u>updates are underlined</u>):</p> <ul style="list-style-type: none"> <li>- <b>El. 5- NC-</b> Document and Records Control – Several records listed in the records control procedure were found in alternate locations or were not being maintained up to date. <u>(Chris hired a coop student who helped organize the information – verified CAF Tracker marked it closed)</u></li> <li>- <b>El. 5 -NC-</b> Document and Records Control DW-ADMIN-100 identifies several internal controlled documents exist in paper format. These documents have not been kept up to date. <u>(All hard copy documents updated. Controlled Copy from CC office moved to Forepersons office – verified CAF Tracker marked it closed.)</u></li> </ul>



DOCUMENT REVIEW – DWQMS 2.0 (Condition Expected)	DOCUMENT REVIEW – Auditor Comments (Condition Found)
	<ul style="list-style-type: none"> <li>– <b>El. 7-NC-</b> Risk Assessment – Cybersecurity has not been addressed in the risk assessment for the systems. This has become a specific requirement recently as the MECP has issued an update to their document entitled "Potential Hazardous Events for Municipal Residential Drinking Water Systems to consider in the DWQMS Risk Assessment" in April of 2022. (RA Team met on June 14 to assess the risk of cybersecurity threats – verified CAF Tracker marked it closed).</li> <li>– <b>El. 17-NC-</b> Measurement and Recording Equipment Calibration and Maintenance – Colorimeter S/N 20110B003723 was found to have a calibration sticker that identified the unit as being beyond its calibration date. (Unit calibrated and returned to service per CA – verified CAF Tracker marked it closed).</li> <li>– <b>El. 5 OFI -</b>Document and Record Control – An opportunity for improvement exists to correct the page numbering on DW-SOF-340, which indicates the form consists of 3 pages, however, only 2 pages exist. (page numbering corrected).</li> <li>– <b>El. 11 OFI -</b>Personnel Coverage – An OFI exists to make reference to the Continuity of Operations Procedure (DW-ERP-700) within the Personnel Coverage Procedure (DW-ADMIN-600). (Reference was made to the new procedure).</li> <li>– <b>El. 18 OFI -</b> Critical Control Outcomes – An opportunity exists to review record-keeping requirements surrounding deviations from CCP's to ensure all events that result in a deviation are suitably recorded and assessed for possible continual improvement initiatives. (Discussion on use of a trigger value deemed not effective tool for this purpose. Discussed CCP's and CCL's this audit to align with actual practices, and not aligned on how to avoid record-keeping – not all CCP deviations need to be recorded – though acknowledgement on reporting on CCP deviations at Management Reviews are required. Discussed how trends can be reported re: free chlorine residuals at Management Reviews).</li> <li>– <b>El. 9 OFI -</b> Organizational Structure, Roles, Responsibilities and Authorities – An opportunity for improvement exists to reflect on how the elimination of the WT position and the introduction of the Foreman position will affect the DWQMS roles, responsibilities and other reporting relationships that may take place. (Procedures updated and released on start date of Foreperson (2022-06-06)).</li> <li>– <b>El. 10 – OFI –</b> Competencies – An opportunity for improvement exists to consider implementation of a training approval workflow that would allow operators to have more control over fulfilling their training needs. (No action decision).</li> <li>– <b>El. 13 – OFI -</b> Essential Supplies and Services An OFI exists to review the ES&amp;S listing to the ERP contact listing to ensure the listings match (Noted the CA taken involved ensuring the information was the same in the two spots. Discussed with K. Kamerma during the audit and issued an OFI to streamline and have emergency contacts centralized in one location – such as the Emergency Response Plan – while keeping the quality requirements information within El. 13 listing).</li> </ul> <p>The <b>Internal Audit Report by City of St. Thomas, October 19, 2022</b> identified 1 non-conformance and 1 OFI (updates are underlined):</p> <ul style="list-style-type: none"> <li>– <b>El. 17 NC -</b> Measurement and Recording Equipment Calibration and Maintenance – All Colorimeters provided at the time of the audit were found to have no calibration sticker (1) or a calibration sticker that identified the unit as being beyond its calibration date (5). No records could be provided to demonstrate that they had been calibrated. 10 colorimeters are listed in the equipment listing, however, only 6 were provided for review and 1 was said to be in use. Of those 6, one was not identified on the equipment listing. (Units calibrated in October).</li> <li>– <b>El. 5 OFI -</b> Document and Record Control – An opportunity for improvement exists to review the use of the Ministry inspection folder as a long term record storage location and formalize record-keeping mechanisms in light of the implementation of FileHold program.             <ul style="list-style-type: none"> <li>o no action, continue with development of record keeping with FileHold and reflect in procedrues when workflows relating to record-keeping are decided upon. (no action, continue with development of record keeping with FileHold and reflect in procedures when workflows relating to record-keeping are decided upon – decision to continue with existing practice of shared drive folder structure).</li> </ul> </li> </ul>
<p><b>20. Management Review</b>  <b>PLAN</b> – The OP shall document a <i>procedure for management review</i> that <i>evaluates</i> the continuing <i>suitability, adequacy and effectiveness</i> of the QMS and that includes consideration of:</p> <ul style="list-style-type: none"> <li>a) incidents of <i>regulatory non-compliance</i>,</li> <li>b) incidents of <i>adverse drinking water tests</i>,</li> <li>c) <i>deviations from Critical Control Point limits</i> and <i>response actions</i>,</li> <li>d) the <i>effectiveness of the risk assessment</i> process,</li> <li>e) <i>internal and third-party Audit</i> results,</li> <li>f) <i>results of emergency response testing</i>,</li> <li>g) <i>operational performance</i>,</li> <li>h) <i>raw water supply and drinking water quality trends</i>.</li> </ul>	<p><b>OP s.20 Management Review</b> references the <b>Management Review procedure (DW-ADMIN-1300), dated January 1, 2023</b> that describes the procedure for management reviews, which are to occur at least once per calendar year, including instructions related to all of the required inputs to the meeting. The procedure also describes how Top Management considers results, identifies deficiencies, and record and forwards results to the Owner and to other key personnel.</p> <p>Reviewed the latest <b>Management Review Meeting Minutes, dated June 14-16, 2022</b> (Central Elgin on June 14, 2022; Southwold on June 15, 2022 and STWDS/STASWSS on June 16, 2022) – confirmed owner representative(s) and designated members of top management were in attendance, and the following discussed for each of the items a) to p):</p> <ul style="list-style-type: none"> <li>a) 2 incidents of non-compliance – 1 for legislative testing requirements of haloacetic acid (HAA) and 1 for trihalomethane (THM) timing between testing exceeded legislated standard.</li> <li>b) 0 AWQI's for the DWS.</li> </ul>

DOCUMENT REVIEW – DWQMS 2.0 (Condition Expected)	DOCUMENT REVIEW – Auditor Comments (Condition Found)
<p>i) follow-up on <i>action items</i> from <i>previous management reviews</i>,                      j) the <i>status</i> of management <i>action items</i> identified between reviews,                      k) <i>changes that could affect</i> the QMS,                      l) <i>Consumer feedback</i>,                      m) the <i>resources needed</i> to maintain the QMS,                      n) the <i>results of the infrastructure review</i>,                      o) <i>OP currency, content and updates</i>, and                      p) <i>staff suggestions</i>.</p> <p>DO – Top Management shall <i>implement and conform</i> to the procedure and shall:                      a) ensure that a management review is conducted <i>at least once every Calendar Year</i>,                      b) consider the <i>results of the management review</i> and identify <i>deficiencies and actions</i> items to address the <i>deficiencies</i>,                      c) provide a <i>record of any decisions and action items</i> related to the management review including the <i>personnel responsible</i> for delivering the action items and the <i>proposed timelines</i> for their implementation, and                      d) <i>report the results of the management review, the identified deficiencies, decisions and action items to the Owner</i>.</p>	<p>c) There were no deviations from the critical control points (CCP) in 2021. Therefore, no response actions were required.                      d) Participants discussed the risk assessment process March 9, 2021 and March 4, 2022, which St. Thomas staff refer to as the Hazard Analysis Procedure. The review of the hazard analysis spreadsheet was recently completed by City staff. The review was comprehensive and reviewed all hazards based on a present-day risk assessment.                      e) Internal Audit for 2022 was completed on April 20-21, 2022 and External audit by SAI Global on July 23, 2021.                          a. From the July 2021 external audit – two NC’s (watermain break forms not fully completed and emergency testing exercise not completed as required annually) and 2 OFI’s identified.                          b. From the April 2022 internal audit, there were 4 nonconformances and 6 OFI’s. NC#1 Document and Records Control: Records listed in records control procedure were found in alternate locations or were not being maintained up to date. • NC#2 Document and Records Control: DW-ADMIN-100 identifies several internal controlled documents exist in paper format. These documents have not been kept up to date. • NC#3 Risk Assessment: Cybersecurity has not been addressed in the risk assessment procedure. Prior to the time of the audit, MECP asked for a specific requirement to assess this risk in a recently issued document. • NC#4 Measurement and Recording Equipment, Calibration and Maintenance: A colorimeter was found to have a calibration sticker that identified the unit being beyond its calibration date. All OFI’s implemented where deemed appropriate. (updates on each are also noted in section 19 of this audit checklist).                      f) Results of emergency response testing. <b>NO INFO</b>                      g) CE Reps was satisfied with the overall operational performance. One item to note that if work is being done on CE residents services, excavation, maintenance, etc. that CE staff should be notified so they can follow up with residents, if needed; other owner reps were satisfied with overall operational performance.                      h) Raw water is supplied through the Elgin Area Primary Water Supply System. No issues with the water supply                      i) No follow-up action items from the previous management review meetings                      j) There was an arranged replacement of large valves controlling flow out of EMPS in April 2022. Work scheduled and completed on Sunday overnight to Monday morning. Work was carefully planned for 6 months including partners Southwold and MCE. Backup water supplied via Dutton Dunwich and tankers on standby. During restart of systems, an unanticipated pressure drop occurred waiting for ramp up of pumps at Elgin Primary Water Treatment Plant. Customer service and front line informed and answered large volume of calls. Water pressure was eventually restored by mid-morning of Monday, April 18, 2022. From this event, some City public notification processes were changed, and better coordination will be required for future issues with EAPWSS.                      k) No other significant changes to date.                      l) Summary of water quality and water pressure complaints were summarized in a table.                      m) There are adequate resources available to St. Thomas staff to maintain the DWQMS.                      n) Planned projects for all owners: Ford Tower Removal Study and WM loop for NW Area 1, and the following by area:                          a. CE: • Lyndale Avenue WM Replacement (2027) • Beck Line Water Service • Nathan Street, Vineden Drive, Ryan Street WM Replacement (2025).                          b. Southwold: Lynhurst Park Dr. Reconstruction, and                          c. St. Thomas and STAWSS: Forest Avenue Construction, Stanley and St. Anne’s Construction, Pullen Avenue Construction.                      Also distribution system tasks (e.g. valve turning, hydrant inspections, hydrant painting, fireflow testing, directional flushing, and service repairs (as applicable) are summarized by area for 2021).                      o) The Operational plans are up to date and does not require any immediate updates.                      p) CE Staff noted to always to work on improving communication for future maintenance between CE and STT staff.</p> <p><b>NC:</b> DWQMS Element 20 PLAN requires that consideration of items a) to p) are included in the management review. DWQMS Element 20 DO d) requires that the results of the management review, the identified deficiencies, decisions and action items are reported to the Owner.</p> <ul style="list-style-type: none"> <li>- The Management Review Meeting minutes documented from meetings held in June 2022 did not include item f) results of emergency response testing, and</li> <li>- The results of the Management Review from 2022 have not been reported to the Owners.</li> </ul>

DOCUMENT REVIEW – DWQMS 2.0 (Condition Expected)	DOCUMENT REVIEW – Auditor Comments (Condition Found)
<p><b>21. Continual Improvement</b>  <b>PLAN</b> – The OA shall develop a <i>procedure</i> for <i>tracking and measuring continual improvement</i> of its QMS by:</p> <p>a) <i>reviewing and considering</i> applicable <i>best management practices</i>, including any published by the Ministry of the Environment and Climate Change and available on www.ontario.ca/drinkingwater, at least once every thirty-six months;</p> <p>b) documenting a process for <i>identification and management</i> of QMS <i>Corrective Actions</i> that includes:</p> <ul style="list-style-type: none"> <li>i. <i>investigating the cause(s)</i> of an identified non-conformity,</li> <li>ii. <i>documenting the action(s) that will be taken</i> to correct the non-conformity and prevent the non-conformity from re-occurring, and</li> <li>iii. <i>reviewing the action(s) taken</i> to correct the non-conformity, <i>verifying that they are implemented</i> and <i>are effective in correcting and preventing</i> the re-occurrence of the non-conformity.</li> </ul> <p>c) documenting a process for identifying and implementing <i>Preventive Actions</i> to eliminate the occurrence of potential non-conformities in the QMS that includes:</p> <ul style="list-style-type: none"> <li>i. <i>reviewing potential non-conformities</i> that are identified to determine if preventive actions may be necessary,</li> <li>ii. <i>documenting the outcome of the review</i>, including the action(s), if any, that will be taken to prevent a non-conformity from occurring, and</li> <li>iii. <i>reviewing the action(s) taken to prevent</i> a non-conformity, <i>verifying that they are implemented and are effective</i> in preventing the occurrence of the non-conformity.</li> </ul> <p><b>DO</b> – The OA shall <i>strive to continually improve the effectiveness of its QMS</i> by implementing and conforming to the procedure.</p>	<p><b>OP s.21 Continual Improvement</b> references the <b>Continual Improvement and Corrective Action procedure (DW-ADMIN-1400)</b>, dated <b>January 1, 2023</b>. This procedure describes how the Operating Authority responds to identified non-conformances/non-compliances, opportunities for improvement and preventive actions. The procedure also requires that the OA take into consideration industry best practices, as published by the MECP, or discovered through interaction with industry contacts.</p> <p>Confirmed continual improvement is tracked and measured using an excel spreadsheet on April 17, 2023</p> <p>Noted consideration of BMP's in the <b>Hazard Analysis Team Meeting agenda dated April 6, 2023</b>, a meeting established for the preparation of the hazard re-assessment exercise the following week.</p> <p>Reviewed CA's and PA's initiated during the time of this audit's scope and noted that all past internal and external audit findings are logged (status updates of which are documented under Element 19 section of this checklist).</p>

Process:	Auditee(s):	Audit Date:
<p><b>1.0 Adequate Resources?</b> (s. 9, 11, 13, 14-15)</p> <p>1.1 What are the different roles and responsibilities involved?</p> <p>1.2 What are the resources required to carry out this/these tasks? Such as:</p> <ul style="list-style-type: none"> <li>a. Staff (and adequate staff coverage)</li> <li>b. Supplies</li> <li>c. Equipment</li> <li>d. Facilities / space</li> </ul> <p>1.3 Are there enough resources?</p> <p>1.4 Are there special requirements for the resources?</p> <ul style="list-style-type: none"> <li>a. How do we ensure the quality of supplies / equipment?</li> </ul>	<p><b>4.0 Process Under Control?</b> (s. 5, 17)</p> <p>4.1 Do you rely on documents to provide details of what tasks are required?</p> <ul style="list-style-type: none"> <li>a. SOPs? Forms? WO's? MRF's? Standards or Guidelines?</li> <li>b. Are they current / legible / identifiable / retrievable / stored / protected / retained?</li> </ul> <p>4.2 Are documents disposed of? Why? When?</p> <p>4.3 Does the work area appear safe, organized and clean?</p>	<p><b>6.0 Who?</b> (s. 2, 3-4, 10)</p> <p>6.1 What are the competencies for these duties?</p> <p>6.2 What types of activities can develop competencies / experience?</p> <p>6.3 Do staff involved know how their duties affect drinking water quantity / quality?</p> <p>6.4 Do staff know what the quality policy states?</p> <p>6.5 How do staff know what legal requirements apply to their tasks?</p>
<p><b>2.0 Process Input?</b></p> <p>2.1 What are your process inputs?</p> <ul style="list-style-type: none"> <li>a. Legal/other requirements</li> <li>b. Work orders or maintenance requests</li> <li>c. Internal or external customers</li> </ul> <p>2.2 Is there a "previous process step" that feeds into this one?</p> <p>2.3 Are you happy with the supplies / data / information provided by the previous step?</p>	<p>4.4 If resources include measurement and recording equipment, is this equipment calibrated and maintained? How?</p>	<p><b>7.0 Output?</b> (s. 5)</p> <p>7.1 What is the output of your process?</p> <p>7.2 What records do you produce?</p> <ul style="list-style-type: none"> <li>a. Are they legible / identifiable / retrievable / stored / protected / retained?</li> <li>b. Are they complete?</li> </ul> <p>7.3 Are records disposed of? Why? When?</p>
<p><b>3.0 Measured?</b> (s. 8, 12, 16)</p> <p>3.1 What things do you check, sample, monitor or test?</p> <p>3.2 Where do you record results? Are records complete?</p> <p>3.3 Is the information reviewed, analyzed or checked for effectiveness (in meeting requirements)?</p> <p>3.4 Do you communicate results? To whom? verbally? In Writing?</p>	<p><b>5.0 What If Out-of-Control?</b> (s. 7-8, 12, 18)</p> <p>5.1 What types of things can go wrong? (out-of-ordinary / emergencies / service interruptions)</p> <p>5.2 What actions are taken when they do go wrong?</p> <p>5.3 What notifications? To whom?</p> <p>5.4 What do you document? Where?</p> <p>5.5 Is there an emergency contact list? Is it maintained?</p>	<p><b>8.0 Stakeholder Satisfaction?</b> (s. 12, 20)</p> <p>8.1 Are relevant stakeholders satisfied with this work?</p> <ul style="list-style-type: none"> <li>a. internal / external customers,</li> <li>b. government agencies,</li> <li>c. public,</li> <li>d. owner,</li> <li>e. top management</li> </ul> <p>8.2 How do you know?</p> <p><b>9.0 Evidence of Continual Improvement?</b> (s. 21)</p> <p>9.1 What are some improvements related to this process that you have seen / implemented in the past year?</p> <p>9.2 Is there anything you'd like to change about this process?</p>

<b>Process:</b> Distribution O&M	<b>Auditee(s):</b> Chris Andrew, ORO and Chris Kenny, Water / Sewer Lead Hand	<b>Audit Date:</b> April 20, 2023 10:30 AM
<p><b>1.0 Adequate Resources?</b> (s. 9, 11, 13, 14-15)                      Have adequate resources – the city is growing, people ok for the size of the system, and considering all projects underway. Staff coverage went well in recent years (COVID).</p> <p>Essential suppliers – stock rooms – no significant issues with stock, some delays experienced on minor stock. Standardized sizes of parts, etc.</p> <p>Review of infrastructure – many streets with many breaks, 10-year capital plan, shuffle the plan to meet the needs better. Meet a couple of times per year, will communicate for capital plan prioritization changes.</p>	<p><b>4.0 Process Under Control?</b> (s. 5, 17)</p> <p>Work order driven – following long weekends take residuals, samples to take (Mondays, Wednesdays – depending on long weekends)</p> <p>On-the-job training</p> <p>Expectations – re: when fully independently</p> <p>A couple of weeks with operators through buddy training</p> <p>Try on-call after 30 days – week prior to on-call – will discuss with new operator re: their comfort level prior to going on-call independently</p>	<p><b>6.0 Who?</b> (s. 2, 3-4, 10)                      LH is day-to-day – maintenance, following procedures, proper disinfection, flushing, activities carried-out.</p> <p>ORO responsible to get parts and tools are available to complete the job, ensure compliance – monthly and quarterly scanning of records, annual reviews prior to inspections.</p> <p>Staff are aware of AWQI response procedure.</p> <p>Class III system, have Class III (ORO and LH).</p>
<p><b>2.0 Process Input?</b></p> <p>Dedicated staff for all activities – rotated through Conditions-related – e.g. watermain breaks – 25-30/yr</p> <p>Valve maintenance – valve turner – follow routes – any deficiencies noted in the controller (if break, will initiate immediate repairs)</p> <p>Flushing programs – regular, total city (seasonally for water)</p> <p>Daily checks (sites visited – booster station and chambers); monthly alarm checks</p> <p>Sampling program</p> <p>Meters</p> <p>Chambers</p>	<p>Forms prompting for information</p> <p>Verifications of devices – colorimeters, turbidimeters, pH</p> <p>SCADA computer – alarms – pressure, chlorine – alarms throughout the system , panels monitoring</p> <p>Communication faults</p>	<p><b>7.0 Output?</b> (s. 5)</p> <p>Disinfection records</p> <p>Residuals monitoring</p> <p>Station logbooks</p> <p>Training records</p> <p>Operator certification</p> <p>Commissioning</p> <p>Watermain break</p> <p>Taps and tie-ins</p> <p>Sample test results</p> <p>Completed work orders – notices if overdue – repeat until cleared</p>
<p><b>3.0 Measured?</b> (s. 8, 12, 16)</p> <p>Entire system – how it’s running, improvements we can make to make things better, keep things maintained</p>	<p><b>5.0 What If Out-of-Control?</b> (s. 7-8, 12, 18)</p> <p>Rogers outage did not impact</p> <p>Low pressure event – primary was down for work at EMPS, supposed to charge the line, turn pumps back on. Were on good pressure, but were running out of time.</p>	<p><b>8.0 Stakeholder Satisfaction?</b> (s. 12, 20)</p> <p>Top management, owners, the public – few consumer complaints</p>

<p><b>Process:</b> Distribution O&amp;M</p>	<p><b>Auditee(s):</b> Chris Andrew, ORO and Chris Kenny, Water / Sewer Lead Hand</p>	<p><b>Audit Date:</b> April 20, 2023 10:30 AM</p>
<p>Jobs issued / tasked to staff – trends in breaks and system deficiencies – alert engineering re: capital needs</p> <p>Discussed chlorine residuals – ensure minimum 0.15 mg/L free throughout.</p>		<p><b>9.0 Evidence of Continual Improvement?</b> (s. 21)</p> <p>Re: low pressure – improvements to communications</p> <p>Discussed with staff – emergency response plan training last week – re: scenario and lessons learned</p>

<b>Process:</b> QMS Rep / Top management	<b>Auditee(s):</b> Nathan Bokma, Manager of Development & Compliance	<b>Audit Date:</b> April 20, 2023 1:15 PM
<p><b>1.0 Adequate Resources?</b> (s. 9, 11, 13, 14-15)</p> <p>Adequate resources – if any required, can get resources – top management, council, owners</p> <p>e.g. two new pumping stations- PLC’s delayed, generator ordered last spring, not planned to come in November 2023.</p>	<p><b>4.0 Process Under Control?</b> (s. 5, 17)</p> <p>Infrastructure Form 1’s Director Notifications</p> <p>City Design Guidelines</p> <p>Review of all standards and guidelines are met Contractors have DWQMS sign-off – forms in capital works with new development</p>	<p><b>6.0 Who?</b> (s. 2, 3-4, 10)</p> <p>Direct QMS rep – maintain policies, procedures, emergency response plans</p> <p>Contractors</p> <p>Owner orientations on their duties and responsibilities</p>
<p><b>2.0 Process Input?</b></p> <p>Once internal audit and accreditation audit complete – get ready for Management Reviews</p>	<p>Temporary watermains – pressure, chlorine tests</p> <p>Watermain commissioning plan available online for contractors to complete (“plug and play”) – text prompting for key aspects to be entered (e.g. superchlorination)</p> <p>New Construction Sign-Off Form</p>	<p><b>7.0 Output?</b> (s. 5)</p> <p>ORO files Compliance files Design briefs Engineer reports QMS documentation – contractor sign-offs Water tests Commissioning procedures for temporary and permanent watermains Project files</p>
<p><b>3.0 Measured?</b> (s. 8, 12, 16)</p> <p>Water tower condition</p> <p>Secondary water supply system – a lot of work coming up due to VW coming to town</p> <p>Replacements due to new infrastructure</p> <p>MECP inspection results</p>	<p><b>5.0 What If Out-of-Control?</b> (s. 7-8, 12, 18)</p> <p>NC’s / OFI’s</p> <p>Construction related activities can cause watermain / service breaks</p> <p>Directional drilling</p> <p>Low pressure event in 2022, power lines down from ice storm – had to run off diesel generator for a week, roads closed, etc.</p> <p>Portable generator ran the booster pump station – 200L tank – had to refill. Plans to implement a permanent generator at the booster station.</p>	<p><b>8.0 Stakeholder Satisfaction?</b> (s. 12, 20)</p> <p>MECP (requirements, design guidelines) Contractors (have to meet requirements) Developers Residents / owners</p> <p><b>9.0 Evidence of Continual Improvement?</b> (s. 21)</p> <p>CAF improvements for DWQMS</p> <p>Back-up generator planned for booster station</p> <p>Sampling plans, responding to non-compliances / non-conformances, consider BMP’s and OFI’s.</p>

<b>Process:</b> Top management /owner rep	<b>Auditee(s):</b> Justin Lawrence, City Engineer	<b>Audit Date:</b> April 20, 2023 2:30 PM
<p><b>1.0 Adequate Resources?</b> (s. 9, 11, 13, 14-15)                      Adequate resources are provided, this past council and the one before – supportive of funding. Great people in place. Happy with various representatives and employees. “employee market”, “operators”. Lucky to not have operator turnover. Key is retention.</p> <p>Supply chain disruptions – had discussed / prepared some scenarios during COVID. Construction projects – e.g. equipment / pump deliveries – not for concrete / asphalt. Transformers have been an issue in the</p>	<p><b>4.0 Process Under Control?</b> (s. 5, 17)</p> <p>Planned subdivisions – multiple phases coming in, coming online faster.</p> <p>Plans already laid out. Trunk mains are in, some looping requirements – loop and edge phase.</p> <p>EMPS 55 mega gallons (or mega litres) – planning to double – shared project – owned by primary, St. Thomas is one of the members</p> <p>Subdivision agreements – development agreements</p>	<p><b>6.0 Who?</b> (s. 2, 3-4, 10)</p> <p>Providing resources, proper organizational structure for resources to function, communication to council, through party municipalities, general oversight of entire process on a monthly basis, ensure people are in right places.</p>
<p><b>2.0 Process Input?</b></p> <p>Expanding 25% St. Thomas in a few years due to the VW – new pressure zone to be created. Interest in higher pressure (82 psi) – industrial process related.</p> <p>Conceptual at beginning – design, subdivision phases, subdivision agreement process</p> <p>Collaborative review of specifications annually</p>	<p>Design specifications contain all infrastructure requirements – laid out in development agreements – ongoing reviews ensure everything meet specs</p> <p>Generally consistent between municipalities (e.g. OPS, considering St. Thomas-specific specifications re: appurtenances) – in-house design (with some consultant support) – but mostly internal staff-led projects (have technicians, technologists, engineers)</p>	<p><b>7.0 Output?</b> (s. 5)</p> <p>Shared files                      Network drives – backed up                      FileHold – shared / backed-up for files                      Project manager files and project records                      QMS records – A&amp;S reports, Management Review, operating records (electronic and hard copy)</p>
<p><b>3.0 Measured?</b> (s. 8, 12, 16)</p> <p>People are in right places and trained                      Asset management plan and related funding                      Annual review – continuous improvement, lessons learned from shutdowns</p> <p>AMI metering – regular reads previously, planning to now implement – employment issues have impacted this decisions (not enough employees, estimates, unhappy customers from large water bills in between).</p> <p>Flow and hydraulic studies and performance metrics.</p>	<p><b>5.0 What If Out-of-Control?</b> (s. 7-8, 12, 18)</p> <p>e.g. shutdown went late, communication in time – second time, communicated more effectively</p> <p>contingency plan communicated now as well – allowing people time to adjust</p> <p>back-up power for a project a certain period of time</p> <p>Ice storm in February 2023 – back-up power at EMPS for multiple days.</p>	<p><b>8.0 Stakeholder Satisfaction?</b> (s. 12, 20)</p> <p>VW coming to town – large water user – inquired about water supply</p> <p>Residents</p> <p><b>9.0 Evidence of Continual Improvement?</b> (s. 21)                      Water meter program – project charter initiated – 2-3 year project. Installation will be done in batches, requires communication with owners.</p> <p>Procurement and installation requires time. Requires transition between old system and new one – requires two operated in parallel.</p> <p>Infrastructure investments from the industry coming to the City.</p>



## Appendix "D" – Auditor CV and Training Certificates

### Curriculum Vitae: Brigitte Roth, BES, EP(EMSLA)

#### SUMMARY:

A management systems, compliance and risk management professional with over 25 years' experience in:

- achieving legislative compliance,
- optimizing and integrating management systems,
- conducting risk assessments and analysis,
- preparing and improving emergency response plans,
- planning and executing annual emergency test exercises and debrief sessions,
- leading and carrying out compliance and management system audits, and
- developing and delivering training related to the above areas of expertise.

A certified environmental professional with ECO Canada, as EP(CEA) from 2005-2015 and currently as EP(EMSLA) since 2015; she has conducted environmental compliance, pollution prevention and management system audits at over 95 unique organizations of various industries in Ontario and at 66 golf courses under the Integrated Pest Management Accreditation Program. She has overseen the implementation and integration of management systems in conformity with ISO 14001, ISO 9001, ISO 17025, OHSAS 18001 and Ontario's Drinking Water Quality Management Standard.

Also experienced as an alternate Community Emergency Management Coordinator (CEMC) for the City of Guelph from 2015 to 2017 and a Planning Section Chief in the City's Emergency Operations Centre from 2014 to 2017.

#### PROFESSIONAL DESIGNATIONS:

2015, Environmental Professional – Environmental Management Systems Lead Auditor, ECO Canada  
2005-2015, Environmental Professional – Compliance Auditor, ECO Canada

#### EDUCATION & KEY TRAINING:

2018, ISO/IEC 17025:2017, Waher Consulting Services  
2016, Community Emergency Management Coordinator, Emergency Management Ontario  
2014-2017, Emergency Management Certificate program courses, Justice Institute of British Columbia  
2013, Project Management Certificate (with High Honours), Sheridan College  
1998, Environmental Management System Lead Auditor, KPMG (Certificate No. E0034)  
1997, Quality Management System Lead Auditor, KPMG (Certificate No. K193)  
1996, Certificate of Environmental Assessment, University of Waterloo  
1996, Bachelor of Environmental Studies (Honours Geography), University of Waterloo

#### EMPLOYMENT HISTORY:

**Principal Consultant** at [Acclaims Environmental Inc.](#)

January 2018 - present

Helping optimize the effectiveness of customers' integrated management systems through audits and facilitated sessions to improve:

- legislative compliance (e.g. emissions reporting, approvals and environmental protection plans)
- conformance to management system standards (e.g. DWQMS, ISO 14001, ISO 9001, ISO 45001)
- risk assessment and management
- emergency preparedness and business continuity

**Trainer** at [Walkerton Clean Water Centre](#)

October 2016 - present

Contract trainer for the following courses:

- Drinking Water Quality Management Standard (DWQMS)
- Internal Auditing for DWQMS
- Responsibilities under the Statutory Standard of Care
- Risk Assessment & Emergency Preparedness

**Program Coordinator – Project and Program Management** at [City of Guelph](#)

March 2017 – January 2018

For the City's Corporate Project Management Office (CPMO):

- Developed and promoted methodologies and standards,
- Reported to the Executive Team and city Council on the CPMO's performance,
- Promoted and trained on project management processes,
- Implemented project document and records control, and
- Researched and implemented best practices.

**Quality Assurance Coordinator** at [City of Guelph](#)

October 2008 – March 2017

Managed the processes related to:

- Municipal Drinking Water Licensing,
- Drinking Water Quality Management Standard (DWQMS) accreditation,
- Leading the audit team in internal audits and coordinating external audits,
- Risk assessment, analysis and emergency response plans, and
- Regular compliance reports to Top Management and city Council.

**Pollution Prevention Coordinator / Senior Environmental Auditor** at [CASF](#)

2001 – 2008

- Conducted over fifty pollution prevention and/or compliance audits at metal finishing sites.
- Designed and delivered Advanced Environmental Management Series of courses (Auditing 101; Pollution Prevention Planning & Materials Accounting; Regulatory Compliance; Spills Prevention, Emergency Preparedness and Response).
- Chaired annual Metal Finishing Conference committee from 2000-2008.

**Environmental Management System Specialist** at [WESA Group Inc.](#) (BluMetric Environmental Inc.)

2004 – 2006

- Conducted compliance and management system audits at industrial and municipal drinking water sites.
- Assisted with management system implementations (ISO 9001, ISO 14001, OHSAS 18001, DWQMS).
- Assisted industrial clients with Canada's National Pollutant Release Inventory annual reporting.
- Assisted in the application process for industrial facilities' Certificates of Approval (Air & Noise).

**Quality and Environmental Coordinator** at [Kuntz Electroplating Inc.](#)

1996 – 2001

- Project manager for ISO 9001, ISO 14001 and ISO 17025 implementation and maintenance.
- Facilitated annual reviews of quality policies, risk assessments and emergency response plans.
- Kept up-to-date on all changes in regulatory / customer requirements and reported to management.
- Developed and delivered various quality and environmental management system training programs.
- Managed external and internal audit plans for all management systems and functioned as lead auditor.

**ENVIRONMENTAL CAREERS ORGANIZATION OF CANADA**

hereby certifies that

**Brigitte Roth**

has been awarded the title of

**Environmental Professional - Environmental  
Management Systems Lead Auditor EP(EMSLA)**

in the following specialization(s)

Environmental Management Systems

Ratified by the Canadian Environmental Certification Approvals Board (CECAB), and in accordance with the EP Code of Conduct and the current Occupational Standards, for a certification term of five (5) years, from:

11/10/2020 to 11/09/2025

Brigitte Roth has been a certified member since  
07/12/2005



Chair, CECAB

Registrar

# 70855



**CERTIFICATE OF ACHIEVEMENT**

**BRIGITTE ROTH**

*has successfully completed the*

**Internal Auditing for the Drinking Water Quality Management Standard course**

WWOCS Course ID # 8194

September 24, 2020 to September 25, 2020

Director Approved Continuing Education Units: 1.4

Carl Kuhke  
CEO

[www.wcwc.ca](http://www.wcwc.ca)

September 25, 2020

Date

## Curriculum Vitae: Anita Petrov

### SUMMARY:

A Certification and Training Specialist, with both the Certification Office and various municipalities, with 34 years' experience in:

- evaluating and issuing certificate/licence upgrades for operators in Ontario
- evaluating and renewing certificates/licences for operators in Ontario
- reviewing operators' files for exam eligibility, corresponding with operators, sourcing examination sites scheduling exams annually and preparing and couriering exams to proctors
- proctoring exams
- assisting in developing database for the Certification Program as well as for various municipalities to maintain records pertaining to O. Reg. 128/04 and O. Reg.129/04
- achieving legislative compliance
- developing succession plans
- training on O. Reg 128/04 and O. Reg. 129/04
- developing individual training plans for operator certification upgrading
- planning annual training calendars for both operational and H&S training
- budgeting
- reporting to MECP inspectors and external auditors
- maintaining all regulatory records pertaining to certification
- participated in all internal/external audits and MECP inspections over a 16-year period

As a Business Administration professional, Anita has multiple years of experience with OWWCO (previously OETC) performing all positions; and as a consultant, has assisted numerous municipalities in developing a training and certification program to maintain compliance and for 16 years as the Training and Certification Specialist with the City of Guelph.

### EDUCATION & KEY TRAINING:

1996, Business Administration – Mohawk College

2023, Operator Ethics – WCWC

2022, Entry Level Course for Drinking Water Operators – WCWC

2022, Operation of WWT Plants Vol. 1 – California State

2022, Operation and Maintenance of WWC Systems – California State

2020, DWQMS – Acclaims Environmental

2018, ISO 14001:2015 EMS for Water and Wastewater Utilities – Acclaims Environmental

2017, Responsibilities Under the Statutory Standard of Care – Safe Drinking Water Act – WCWC

2013, Safe Drinking Water Act & Related Regulations

2011, Safe Drinking Water – Lessons from Outbreaks - WCWC

2011, Source and Distribution Water Sampling – Maxxam

2009, Water Distribution 1&2 Exam Prep course – WWOTC

2009, Water Treatment 1&2 Exam Prep course – WWOTC

**EMPLOYMENT HISTORY:****Principal Consultant** at AP Environmental

February 2023 – present

- contract internal auditor for the Drinking Water Quality Management Standard (2017).
- training development on O. Reg. 128/04 and O. Reg. 129/04.
- client support for Operator Certification and Licensing program requirements.
- set-up systems for Operator onboarding, training, and competency tracking programs.

**Water/Wastewater Certification Specialist** at City of Guelph

October 2005 (as a consultant until May 2011) – August 2022

Maintained compliance with O. Reg. 128/04 and O. Reg. 129/04:

- monitored, reviewed, interpreted, summarized and implemented all legislative requirements regarding MECP Water licensing/compliance for all staff.
- coordinated training operational programs for all staff including H&S and corporate policy review.
- identified training needs for new and existing staff.
- advised managers and supervisors on training options.
- completed and submitted all required documentation for licensing of operational staff.
- performed training audits.
- developed individual progress plans for operators' upgrades.
- prepared annual training budget.
- developed succession plan for business continuity.
- participated in all internal audits and MECP inspections.
- prepared and presented bi-annual reports to management on operator training progress.
- updated and maintained division's database to ensure compliance with all legislation and regulations.

**Consultant** at AP Environmental (City of Vaughan/Town of Whitchurch-Stouffville)

September 2005 – 2010

- developed and implemented a plan for training and maintaining records to ensure compliance with regulations pertaining to licensing of operators.
- trained staff on O. Reg. 128/04 and O. Reg. 129/04.
- trained staff and completed all applications for licensing.
- developed a database for the purpose of all record keeping pertaining to licensing.
- advised on training requirements and scheduled all operator training.

**Renewal/Exam and Upgrade Coordinator** at OETC (now OWWCO)

July 1989 – July 2005

- evaluated and issued renewed certificates/licences to operators in Ontario.
- evaluated and issued upgraded certificates/licences to operators in Ontario.
- evaluated applications for all exams OIT – level 4 in all 4 categories.
- corresponded with operators/management/training providers/inspectors and MECP.
- scheduled exams throughout province/prepared exams and couriered to proctors.
- proctored exams.



# Audit Report

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DWQMS Audit (S2) for

City of St. Thomas Environmental Services Department/Operations  
Division Operating Authority for City of St. Thomas Owner

**ACTY-2023-628742**

Audited Address: 545 Talbot Street, St. Thomas, Ontario N5P 3V7

Start Date: June 26, 2023 End Date: June 27, 2023

Type of audit - Surveillance System Audit (S2)

Issue Date: June 28, 2023

Revision Level: *Final*



## Audit Report

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### BACKGROUND INFORMATION

Intertek - SAI Global conducted an audit of City of St. Thomas Environmental Services Department/Operations Division Operating Authority for City of St. Thomas Owner beginning on June 26, 2023 and ending on June 27, 2023 to the DWQMS, ver 2 (2017).

The purpose of this audit report is to summarise the degree of compliance with relevant criteria, as defined on the cover page of this report, based on the evidence obtained during the audit of your organization. This audit report considers your organization's policies, objectives, and continual improvement processes. Comments may include how suitable the objectives selected by your organization appear to be in regard to maintaining customer satisfaction levels and providing other benefits with respect to policy and other external and internal needs. We may also comment regarding the measurable progress you have made in reaching these targets for improvement.

Intertek - SAI Global audits are carried out within the requirements of Intertek - SAI Global procedures that also reflect the requirements and guidance provided in the international standards relating to audit practice such as ISO/IEC 17021-1, ISO 19011 and other normative criteria. Intertek - SAI Global Auditors are assigned to audits according to industry, standard or technical competencies appropriate to the organization being audited. Details of such experience and competency are maintained in our records.

In addition to the information contained in this audit report, Intertek - SAI Global maintains files for each client. These files contain details of organization size and personnel as well as evidence collected during preliminary and subsequent audit activities (Documentation Review and Scope) relevant to the application for initial and continuing certification of your organization.

Please take care to advise us of any change that may affect the application/certification or may assist us to keep your contact information up to date, as required by Intertek - SAI Global Terms and Conditions.

This report has been prepared by Intertek - SAI Global Limited (Intertek - SAI Global) in respect of a Client's application for assessment by Intertek - SAI Global. The purpose of the report is to comment upon evidence of the Client's compliance with the standards or other criteria specified. The content of this report applies only to matters, which were evident to Intertek - SAI Global at the time of the audit, based on sampling of evidence provided and within the audit scope. Intertek - SAI Global does not warrant or otherwise comment upon the suitability of the contents of the report or the certificate for any particular purpose or use. Intertek - SAI Global accepts no liability whatsoever for consequences to, or actions taken by, third parties as a result of or in reliance upon information contained in this report or certificate.

Please note that this report is subject to independent review and approval. Should changes to the outcomes of this report be necessary as a result of the review, a revised report will be issued and will supersede this report.

<b>Standard:</b>	DWQMS, ver 2 (2017)
<b>Applicable codes:</b>	DWQMS01/ ACTY-2023-641260
<b>Scope of Certification:</b>	DWQMS (version 2, November 2017)
<b>Drinking Water System Owner:</b>	City of St. Thomas
<b>Operating Authority:</b>	City of St. Thomas Environmental Services Department/Operations Division
<b>Population Services:</b>	42840
<b>Activities:</b>	<b>Treatment Distribution</b>
<b>Drinking Water Systems</b>	
	<b><i>St. Thomas Secondary Area WSS</i></b>
	<b><i>Township of Southwold WDS</i></b>
	<b><i>St. Thomas WDS</i></b>
	<b><i>Municipality of Central Elgin WDS</i></b>

**Total audit duration:** Person(s):1 Day(s): 1.5

**Audit Team Member(s):** Janet McKenzie

**Other Participants:** n/a



## Audit Report

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### Definitions and action required with respect to audit findings

#### Major Non-conformance:

Based on objective evidence, the absence of, or a significant failure to implement and/or maintain conformance to requirements of the applicable standard. Such issues may raise significant doubt as to the capability of the management system to achieve its intended outputs (i.e. the absence of or failure to implement a complete Management System clause of the standard); or

A situation which would on the basis of available objective evidence, raise significant doubt as to the capability of the Management System to achieve the stated policy and objectives of the customer.

NOTE: The "applicable Standard" is the Standard which Intertek - SAI Global are issuing certification against, and may be a Product Standard, a management system Standard, a food safety Standard or another set of documented criteria.

Action required: This category of findings requires Intertek - SAI Global to issue a formal NCR; to receive and approve client's proposed correction and corrective action plans; and formally verify the effective implementation of planned activities. Correction and corrective action plan should be submitted to Intertek - SAI Global prior to commencement of follow-up activities as required. Follow-up action by Intertek - SAI Global must 'close out' the NCR or reduce it to a lesser category **within 90 days for initial certification and within 60 days for surveillance or re-certification audits, from the last day of the audit.**

If significant risk issues (e.g. safety, environmental, food safety, product legality/quality, etc.) are detected during an audit these shall be reported immediately to the Client and more immediate or instant correction shall be requested. If this is not agreed and cannot be resolved to the satisfaction of Intertek - SAI Global, immediate suspension shall be recommended.

In the case of initial certification, failure to close out NCR within the time limits means that the Certification Audit may be repeated.

If significant risk issues (e.g. safety, environmental, food safety, product legality/quality, etc.) are detected during an audit these shall be reported immediately to the Client and more immediate or instant correction shall be requested. If this is not agreed and cannot be resolved to the satisfaction of Intertek - SAI Global, immediate suspension shall be recommended.

In the case of an already certified client, failure to close out NCR within the time limits means that suspension proceedings may be instituted by Intertek - SAI Global.

Follow-up activities incur additional charges.

#### Minor Non-conformance:

Represents either a management system weakness or minor issue that could lead to a major nonconformance if not addressed. Each minor NC should be considered for potential improvement and to further investigate any system weaknesses for possible inclusion in the corrective action program

Action required: This category of findings requires Intertek - SAI Global to issue a formal NCR; to receive and approve client's proposed correction and corrective action plans; and formally verify the effective implementation of planned activities at the next scheduled audit.

#### Opportunity for Improvement:

A documented statement, which may identify areas for improvement however shall not make specific recommendation(s).

Action required: Client may develop and implement solutions in order to add value to operations and management systems. Intertek - SAI Global is not required to follow-up on this category of audit finding.

**Audit Type and Purpose****Surveillance Audit:**

A systems desktop audit in accordance with the systems audit procedure as it applies to Full Scope accreditation. The audit also included consideration of the results of the most recent audit undertaken in accordance with this Accreditation Protocol and any of the following that have occurred subsequent to that audit including but limited to;

- (a) the results of any audits undertaken in accordance with element 19 of the DWQMS V2;
- (b) historical responses taken to address corrective action requests made by an Accreditation Body;
- (c) the results of any management reviews undertaken in accordance with element 20 of the DWQMS V2; and,
- (d) any changes to the documentation and implementation of the QMS.

**Audit Objectives**

The objective of the audit was to determine whether the drinking water Quality Management System (QMS) of the subject system conforms to the requirements of the Ontario Ministry of the Environment & Climate Change (MOECC) Drinking Water Quality Management Standard (DWQMS V2).

The audit was also intended to gather the information necessary for Intertek - SAI Global to assess whether accreditation can continue or be offered or to the operating authority.

**Audit Report**

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**Audit Scope**

The facilities and processes associated with the operating authority's QMS were objectively evaluated to obtain audit evidence and to determine a) whether the quality management activities and related results conform with DWQMS V2 requirements, and b) if they have been effectively implemented and/or maintained.

**Audit Criteria:**

- The Drinking Water Quality Management Standard Version 2
- Current QMS manuals, procedures and records implemented by the Operating Authority
- Intertek - SAI Global Accreditation Program Handbook

**Confidentiality and Documentation Requirements**

The Intertek - SAI Global stores their records and reports to ensure their preservation and confidentiality. Unless required by law, the Intertek - SAI Global will not disclose audit records to a third party without prior written consent of the applicant. The only exception will be that the Intertek - SAI Global will provide audit and corrective action reports to the Ontario Ministry of the Environment. For more information, please refer to the Intertek - SAI Global Accreditation Program Handbook.

As part of the Intertek - SAI Global Terms, it is necessary for you to notify Intertek - SAI Global of any changes to your Quality Management System that you believe are significant enough to risk non-conformity with DWQMS V2: For more information, please refer to the Intertek - SAI Global Accreditation Program Handbook.

**Review of any changes**

Changes to the company since last audit include: n/a

**EXECUTIVE OVERVIEW**

Based on the results of this surveillance system audit the management system remains effectively implemented and meets the requirements of the standard relative to the scope of certification; therefore, a recommendation for continued certification will be submitted.

**Audit Report**

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**Recommendation**

Based on the results of this audit it has been determined that the management system is effectively implemented and maintained and meets the requirements of the standard relative to the scope of certification identified in this report; therefore, a recommendation for (continued) certification will be submitted to Intertek - SAI Global review team.

**Opportunities for Improvement:**

No opportunities for improvement have been identified as part of this audit.

**Audit Report**

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**Management System Documentation**

The management systems operational plan(s) was reviewed and found to be in conformance with the requirements of the standard.

**Management Review**

Records of the most recent management review meetings were verified and found to meet the requirements of the standard. All inputs were reflected in the records, and appear suitably managed as reflected by resulting actions and decisions.

**Internal Audits**

Internal audits are being conducted at planned intervals to ensure conformance to planned arrangements, the requirements of the standard and the established management system.

**Corrective, Preventive Action & Continual Improvement Processes**

The company is implementing an effective process for the continual improvement of the management system through the use of the quality policy, quality objectives, audit results, data analysis, the appropriate management of corrective and preventive actions and management review.

**Summary of Findings**

1. Quality Management System	Conforms
2. Quality Management System Policy	Conforms
3. Commitment and Endorsement	Conforms
4. Quality Management System Representative	Conforms
5. Document and Records Control	Conforms
6. Drinking-Water System	Conforms
7. Risk Assessment	Conforms
8. Risk Assessment Outcomes	Conforms
9. Organizational Structure, Roles, Responsibilities and Authorities	NANC

**Audit Report**

10. Competencies	Conforms
11. Personnel Coverage	NANC
12. Communications	Conforms
13. Essential Supplies and Services	Conforms
14. Review and Provision of Infrastructure	NANC
15. Infrastructure Maintenance, Rehabilitation & Renewal	Conforms
16. Sampling, Testing and Monitoring	Conforms
17. Measurement & Recording Equipment Calibration and Maintenance	Conforms
18. Emergency Management	Conforms
19. Internal Audits	Conforms
20. Management Review	Conforms*
21. Continual Improvement	Conforms
<b>Major NCR #</b>	Major non-conformity. The auditor has determined one of the following: (a) a required element of the DWQMS has not been incorporated into a QMS; (b) a systemic problem with a QMS is evidenced by two or more minor non-conformities; or (c) a minor non-conformity identified in a corrective action request has not been remedied.
<b>Minor NCR #</b>	Minor non-conformity. In the opinion of the auditor, part of a required element of the DWQMS has not been incorporated satisfactorily into a QMS.
<b>OFI</b>	Opportunity for improvement. Conforms to the requirement, but there is an opportunity for improvement.
<b>Conforms</b>	Conforms to requirement.
<b>NANC</b>	Not applicable/Not Covered during this audit.
<b>****</b>	Additional comment added by auditor in the body of the report.

**Audit Report****PART D. Audit Observations, Findings and Comments**

DWQMS Reference:	1 Quality Management System
Client Reference:	St. Thomas Area Secondary Water Supply System (Excluding the Elgin-Middlesex Pumping Station) rev 2.5 Jan1/23 The City of St. Thomas Water Distribution System, rev 2.5, Jan1/23 Township of Southwold Water Distribution System (Lynhurst Area), rev 2.5 Jan1/23 The Municipality of Central Elgin Water Distribution System (St. Thomas Suburban Area), rev 2.5 Jan1/23
Details: Conforms.	

DWQMS Reference:	2 Quality Management System Policy
Client Reference:	Separate policies for each of the 4 subsystems: STASWSS – Jan 17/23, Director, Environmental Services & City Engineer STWDS – Jan 17/23, signed Director, Environmental Services & City Engineer SWDS - march 22, 2023, sign Director, Infrast and develop CEWDS – Jan 16, 2023, signed Director, Infrast and develop
Details: Conforms.	

DWQMS Reference:	3 Commitment and Endorsement
Client Reference:	See Element 2 above for updated signatures
Details: Conforms.	

DWQMS Reference:	4 Quality Management System Representative
Client Reference:	Section 4 of each Operational Plan
Details: Conforms. Manager of Development and Compliance is appointed as the QMS Representative as of December 7, 2018.	

DWQMS Reference:	5 Document and Record Control
Client Reference:	DW-ADMIN-100 Document control ,rev 2.5 Jan 2023 <i>DW-ADMIN -200 Record Control rev 2.6 Jan 2023</i>
Details: Conforms.	

DWQMS Reference:	6 Drinking Water System
Client Reference:	Section 6 of each Operational Plan Maps in Appendix D of each Operational Pan
Details: Conforms.	



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DWQMS Reference	7 Risk Assessment
Client Reference:	Risk Assessment Procedure (DW-ADMIN-300), rev 2.6, Jan.2023
Details: Conforms. Risk ranking threshold is defined at 9 as of August 2022.	

DWQMS Reference:	8 Risk Assessment Outcomes
Client Reference:	<p>St. Thomas Secondary Area WSS - Hazard Analysis Spreadsheet (DWF-ADMIN-301) – HA spreadsheet, May 24, 2023, rev 2.7 (annual review with no changes to rankings)</p> <p>~ St. Thomas WDS - Hazard Analysis Spreadsheet (DWF-ADMIN-302), HA spreadsheet, May 24, 2023, rev 2.7 (annual review with no changes to rankings)</p> <p>~ Twp. of Southwold WDS (Lynhurst Area) - Hazard Analysis Spreadsheet (DWF-ADMIN-303), HA spreadsheet, May 24, 2023, rev 2.7 (annual review with no changes to rankings)</p> <p>~ Munc. of Central Elgin WDS (St. Thomas Suburban Area) - Hazard Analysis Spreadsheet (DWF-ADMIN-304), HA spreadsheet, May 24, 2023, rev 2.7 (annual review with no changes to rankings)</p>
Details: Conforms.	

DWQMS Reference:	10 Competencies
Client Reference:	<p>COMPETENCY AND TRAINING PROCEDURE NO.: DW-ADMIN-500, EFFECTIVE DATE: MAY 24, 2023 REVISION #: 2.8</p> <p>ON-SITE TRAINING FORM, DWF-ADMIN-500, MAY 24, 2023 REVISION #: 2.8</p> <p>OPERATOR COMPETENCE FORM, DWF-ADMIN-501, MAY 24, 2023 REVISION #: 2.8</p> <p>Training Needs Matrix REVISION #: 2.8, MAY 24, 2023 DWF-ADMIN-502</p> <p>MEETING RECORD, DWF-ADMIN-503, MAY 24, 2023, REVISION #: 2.8</p>
Details: Conforms.	

DWQMS Reference:	12 Communications
Client Reference:	DW-ADMIN-700, Communications, rev 2.5, Jan 2023
Details: Conforms. Procedure updated how ORO designation changes are communicated via e-mail and posted at PW.	

DWQMS Reference:	13 Essential Supplies and Services
Client Reference:	DW-ADMIN-800. ESS, rev 2.5, Jan 2023
Details: Conforms.	

**Audit Report**

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DWQMS Reference:	15 Infrastructure Maintenance, Rehabilitation and Renewal
Client Reference:	MAINTENANCE, REHABILITATION AND RENEWAL, DW-ADMIN-900, JANUARY 1, 2023 - REVISION #: 2.5
Details: Conforms.	

DWQMS Reference:	16 Sampling, Testing and Monitoring
Client Reference:	DW-ADMIN-1000 Sampling, Testing and Monitoring, rev 2.8, May 24 2023 THMs-HAAs and Lead-Alkl Tracking spreadsheet, last updated April 2023 MECP inspection entries in Corrective Action Tracking form
Details: Conforms.	

DWQMS Reference:	17 Measurement and Recording Equipment Calibration and Maintenance
Client Reference:	EQUIPMENT CALIBRATION PROCEDURE, DW-ADMIN-1100, JUNE 8, 2023, REVISION: 2.7 Equipment Listing, DWF-ADMIN-1100, June 8, 2023, rev 2.7 Internal Audit -October 2022 non-conformance
Details: Conforms.	

DWQMS Reference:	18 Emergency Management
Client Reference:	AWQI REPORTING PROCEDURE, DW-ERP-300, JANUARY 1, 2023, REVISION #: 2.2 LOW PRESSURE RESPONSE PROCEDURE, DW-ERP-500, JANUARY 1, 2023, REVISION #: 2.2 SCADA FAILURES, DW-ERP-800, JANUARY 1, 2023, REVISION #: 2.1 Emergency testing /training records, April 2023.
Details: Conforms.	

DWQMS Reference:	19 Internal Audits
Client Reference:	DW-ADMIN-1200 Internal Audits, rev 2.6, May 2023 2022 Internal Audit report: October 19, 2022 by Compliance Coordinator 2023 Internal Audit report: April 17 & 20/23, Acclaims environmental for April 22/22 – April 20/23 timeframe
Details: Conforms. Findings from each reviewed audit report are addressed in the CAF Tracker	

**Audit Report**

spreadsheet, with most either completed or awaiting the 90 day effectiveness check.

DWQMS Reference:	20 Management Review
Client Reference:	DW-ADMIN-1300, Management Review, rev 2.5, Jan 2023 DWQMS Management Review Meeting, Meeting Minutes, Central Elgin, June 14, 2022 DWQMS Management Review Meeting, Meeting Minutes, Township of Southwold, June 15, 2022 DWQMS Management Review Meeting, Meeting Minutes, STWDS/STASWSS, June 16, 2022
<p>Details: Conforms.</p> <p>*Note: At the time of this audit, the 2023 Management Review meeting had not yet occurred. The issue of item f) "results of emergency response testing" missing from the 2022 meeting minutes for each subsystem has already been addressed in the 2023 internal audit report and observed on the CAF tracker spreadsheet. This correction will be verified during the next audit.</p>	

DWQMS Reference:	21 Continual Improvement
Client Reference:	DW-ADMIN-1400, Continual Improvement and Corrective Action, rev.2.6, Jan 2023 2023-06-22 CAF Tracker spreadsheet
<p>Details: Conforms. Good system that includes non-conformances, OFIs, Ministry inspection findings and BMPs.</p>	

Details regarding the personnel interviewed and objective evidence reviewed are maintained on file at Intertek - Intertek - SAI Global.

This report was prepared by:



Intertek - Intertek - SAI Global Management Systems Auditor

The audit report is distributed as follows:

- Intertek - Intertek - SAI Global
- Operating Authority
- Owner
- MOECC

**Notes**

Copies of this report distributed outside the organization must include all pages.



Report No.

SWB 06-23

File No.

**Directed to:** Chairman and Members of the Board of Management of the St. Thomas Area Secondary Water Supply System

**Date Authored:**

**Meeting Date:**  
October 12, 2023

**Department:** Environmental and Infrastructure Services

**Attachment**

**Prepared By:** Karel Kamerman, B.Sc., C.Tech.  
Environmental Compliance Coordinator

2024 Draft Secondary  
Operations Budget

**Subject:** 2024 STASWSS Operations Budget and Water Rate

**Recommendation:**

**THAT:** Report SWB 06-23 2024 STASWSS Water Rates be received for information, and;

**THAT:** The St. Thomas Area Secondary Water Supply System 2024 Draft Operations Budget, as attached to this report, be approved, and further;

**THAT:** The Secondary Rate for the St. Thomas Area Secondary Water Supply System of \$0.6416/m<sup>3</sup>, effective January 1, 2024, be approved.

**Background:**

The St. Thomas Area Secondary Water Supply System (STASWSS), which obtains water from the Elgin Area Primary Water Supply System (EAPWSS) and provides wholesale drinking water directly to the City of St. Thomas, the Municipality of Central Elgin, the Township of Southwold and indirectly to the Municipality of Dutton-Dunwich.

The water rate charged to the STASWSS benefiting municipalities for each cubic meter of wholesale drinking water includes charges for direct cost recovery of the EAPWSS water supply expense and the Secondary Water Rate, which aims to recover the costs of maintenance and operations activities as well as build an adequate reserve balance to help fund future rehabilitation and renewal projects to ensure the ongoing reliability of the STASWSS.

Each of the benefitting municipalities then charges each of their users a consumption rate that is set such that each municipality may recover the expenses arising from the use of the EAPWSS, STASWSS and the operation, maintenance, rehabilitation, and renewal of their own local water distribution systems.

**Analysis:**

**2024 Operating Budget**

Water supply and demand projections have been reviewed as part of the 2024 operating budget development process to further refine revenue and water purchase expenses, based on recent system performance metrics. The 2024 budgeted volumes have been established by incorporating the principles and recommendations from the approved 2021 - 2031 Rate Study along with some adjustments to reflect the current volume projections, corresponding revenues, and water supply expenses. The long-term volume projections will be reviewed during revisions of the next water rate study, proposed to be undertaken in 2025, and compared to the long-term growth projections for each municipality.

**2024 Capital Budget**

There are no capital projects scheduled for 2024 at this time.

**2024 Water Rate**

It is recommended that the Secondary Water Rate for the St. Thomas Area Secondary Water Supply System be set at \$0.6416 per cubic meter (64.16¢ per cubic meter). In response to regulatory, operational, and inflationary pressures this proposed 2024 rate represents a 3.0% increase from the current rate. This recommended Secondary Water Rate increase also matches the rate increase identified in the 2021 – 2031 STASWSS Water Rate Study.

**Future Rate Adjustments**

As identified in the approved 2021 - 2031 Rate Study and Financial Plan, an annual increase of 2.0% is projected in the STASWSS Water Rate beyond 2024. This water rate projection may be subject to revision as the update to the Water Rate Study is completed in 2025.

**Reserve Funds**

The Secondary Water Reserve Fund is required to provide a stable funding source for capital programs designed to maintain, renew and/or replace existing secondary system assets. Accordingly, annual contributions to the Secondary Water Reserve Fund should be relatively consistent and align with the projected lifecycle needs of the system. On average and over the long-term, the annual Secondary Water Reserve Fund contribution should be in the order of \$880,000. When considering the potential interest earned, the 2024 operating budget approaches this target. The 2022 year ending Secondary Water Reserve Fund balance is \$4,033,968.

**Financial Considerations:**

In order to meet the requirements of provincial water legislation and build an adequate reserve balance to help fund future rehabilitation and renewal projects, the Secondary Water Rate is recommended to increase from \$0.6229/m<sup>3</sup> to \$0.6416/m<sup>3</sup>, a 3.0% increase. The recommended Secondary Water Rate increase aligns with the 2021 – 2031 STASWSS Water Rate Study.

The proposed rate increase would result in a water bill increase for the average customer (167 m<sup>3</sup>/year) of 0.16% (\$0.94), 0.49% (\$3.12) and 0.31% (\$3.12) for customers located in St. Thomas, Southwold, and Central Elgin, respectively.

Respectfully,



Karel Kamerman, B.Sc., C.Tech  
Environmental Compliance Coordinator

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Reviewed By:  \_\_\_\_\_  
City Engineer

## 2024 Draft Secondary Operations Budget

Program	Rev/Exp	Description	2022 Actuals	YTD Actuals	2022 Budget	2023 Budget	2024	2024	% Change
							Rate Study Forecast	Proposed Budget	
412 Secondary Water Operations	Revenue	Water Billing Recovery	(3,727,484)	(2,466,978)	(3,250,000)	(3,620,000)	(3,382,168)	(3,720,000)	2.76%
		Interest Earned	(50,897)						0.00%
	Revenue Total		(3,778,381)	(2,466,978)	(3,250,000)	(3,620,000)	(3,382,168)	(3,720,000)	2.76%
	Expense	Distributed Wages	41,287	20,422	48,000	50,460	50,084	58,700	16.33%
		Job Costing Labour	69,166	67,165	48,000	55,000	51,957	60,000	9.09%
		Audit Fees	3,740		3,500			4,000	100.00%
		Secondary Water System - Contractor	465	107,322	100,000	100,000	108,243	110,000	10.00%
		Misc. Contracted Services	11,900	2,826	35,000	35,000	37,885	30,000	-14.29%
		SCADA Maintenance	13,863	29,750	15,000	15,000	10,824	15,000	0.00%
		Job Costing Subcontractors	18,327	21,689	20,000	20,000	21,649	20,000	0.00%
		Occupancy Fee	58,756	58,756		60,000	63,672	60,000	0.00%
		Job Costing Equipment	6,771	6,456	8,500	8,500	9,201	8,500	0.00%
		City Own Property Taxes	4,969	5,048	4,900	5,000	5,304	5,100	2.00%
		Insurance	24,012		23,000	27,610	18,856	32,600	18.07%
		CMMS Support Fee	4,488	1,387	3,200	3,300	3,193	3,300	0.00%
		Communications SCADA	33,366	8,064	20,340	20,340	21,649	23,300	14.55%
		Purchase of Water	2,236,694	1,508,625	1,875,000	2,086,750	2,043,689	2,360,000	13.09%
		Electricity (Hydro)	199,342	43,571	215,000	250,000	164,093	100,000	-60.00%
		Chemicals	6,742		5,090	15,000	5,412	10,000	-33.33%
		Job Costing Materials	4,419	2,884	1,000	1,100	1,082	2,000	81.82%
		Transfer to Secondary Water Reserve Fund	1,040,074		824,470	866,940	759,962	817,500	-5.70%
	Expense Total		3,778,381	1,883,965	3,250,000	3,620,000	3,382,168	3,720,000	2.76%