



PORT COLBORNE

Port Colborne Distribution System Summary QMS Report for the Management Review

Report Prepared on:
December 7, 2023

For the period of:
November 1, 2022- October 31, 2023

Executive Summary

- This management review summary covers the period from November 1, 2022 to October 31, 2023.
- Two Ministry Inspections occurred during this period. Regulatory non-compliances were noted during the 2022 inspection but were all cleared in 2023. There were no new incidents of regulatory non-compliance in 2023.
- There were no adverse samples during this reporting period.
- The 2023 Internal Audit was completed on September 28, 2023.
- The external audit will occur on December 11, 2023.
- There were 21 main breaks reported in 2022 and 7 to date in 2023.
- The City's Municipal Drinking Water Licence (MDWL) and Drinking Water Works Permit were renewed in October 2019. The MDWL is due for renewal in 2024.
- Water quality complaints totaled 7 in 2022 and 14 so far in 2023. Where the source of the complaint could be determined, activities in the distribution system, such as fire flow testing, were the most common sources.

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Introduction

Purpose

The purpose of this report is to summarize the activities of the Port Colborne Distribution System (PCDS) Operating Authority so that Top Management can ensure the continuing effectiveness of the Quality Management System (QMS) at scheduled Management Reviews.

Scope

This Summary Report for the Management Review covers key operational elements of the Drinking Water Quality Management Standard (DWQMS) from November 1, 2022 to October 31, 2023.

Top Management reviews the information specified in Procedure QMS-SOP20-1 Management Review.

This review will include, but is not limited to, the following:

- a. Incidents of regulatory non-compliance
- b. Incidents of adverse drinking water tests
- c. Deviations from critical control point limits and response actions
- d. Effectiveness of the risk assessment process
- e. Results of internal and third party audits, including best management practices
- f. Results of relevant emergency response testing
- g. Operational performance
- h. Raw water supply and water quality trends
- i. Follow up on action items from previous management reviews
- j. Status of management action items identified between reviews
- k. Changes in resource requirements, infrastructure, process, personnel, the Standard or regulations that could affect the QMS
- l. Consumer feedback
- m. Resources needed to maintain the QMS
- n. Results of infrastructure review
- o. Operational plan currency, content and updates
- p. Staff suggestions

Summary of Items

a. Incidents of Regulatory Non-Compliance

During the Ministry inspection in December 2022, the following incidents of regulatory non-compliances were found:

- The operations and maintenance manuals did not meet the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA (Safe Drinking Water Act)
- The City did not take the required lead samples during the winter 2021-22 sampling session. This was a contravention of item (b) of Schedule 15.1-5 (10) of O. Reg 170/03. (This was previously reported to this Management group)

Staff addressed the non-compliance findings and followed up with the Ministry with subsequent submissions.

The Ministry inspection completed in October 2023 found no incidents of reportable regulatory non-compliances.

b. Incidents of Adverse Drinking Water Tests

No adverse incidents occurred during the period for this report.

c. Deviations from Critical Control Point Limits and Response Actions

Critical Control Limits (CCL) for the PCDS are, where applicable, higher than the regulated limits, which then trigger a response procedure. During this period, Staff responded appropriately to low free chlorine levels (<0.20 mg/L but >0.04 mg/L) by flushing the distribution system to bring the chlorine levels up. Routine dead-end flushing aided in ensuring free chlorine levels remained adequate. Minimum regulatory requirements were always being met.

d. Risk Assessment

A full risk assessment must be completed every 3 years. A full a risk assessment took place in October 2022. The new addition of cybersecurity threats was evaluated and all other risks were also re-evaluated. Meeting outcomes will be reviewed at this meeting.

e. Results of Internal and Third-Party Audits

Internal Audit

The 2023 Internal Audit was completed on September 28, 2023. The audit was completed by an auditor from Acclaims Environmental. The Operational Plan and supporting documents were reviewed for conformity to the DWQMS 2.0. The auditor identified opportunities for improvement (OFIs), which will be discussed at the Management Meeting.

OFIs:

- Review watermain break form and commissioning documentation for administrative updates and include section on chemical and consumable expiry dates.
- Consider seasonal training reviews of commissioning and construction processes
- Consider referencing Emergency Substitute Operators in Operational Plan in Section 11 or 18
- Lab consumables' expiry dates (e.g. secondary gel standards, DPD's, pH buffer solutions, chemicals) should be tracked and staff should verify non-expiry prior to use.
- Documented information should be available when measurement and recording equipment is taken out-of-service.
- Consideration should be given to logging Management Review action items in the NCAR log, tracking personnel responsible and timelines.

External Audits/Accreditation Status

The City's auditor from SAI Global completed the last external full re-accreditation audit on December 12, 2022. The external surveillance audit is scheduled for December 11, 2023.

The auditor identified 2 OFIs during the 2022 audit and 1 non-conformance. The non-conformance was addressed, and documentation was resubmitted to the auditor.

OFIs:

- Ensure sampling records are accurately recorded in the electronic database.
- Consider requiring additional/more frequent training on emergency response in addition to the emergency test completed every five years.

Non-Conformance:

- Audit findings from 2019 & 2020 were left outstanding and have not been added to the latest version of the NCAR Log.

Ministry Inspections

The Ministry of the Environment, Conservation and Parks (Ministry) performed a document review inspection of the PCDS on December 13, 2022. The inspection period covered November 1st, 2021, to November 30th, 2022. PCDS was assigned a rating of 93.64%. On October 6, 2023, the Ministry conducted an on-site unannounced focused inspection which covered the period of December 1st, 2022 – October 6th, 2023.

f. Results of Relevant Emergency Response Testing

The last Emergency Response training and debrief was for the January 24, 2022 watermain break event, which occurred in February 2022.

g. Operational Performance

Table 1 summarizes Operational statistics for the PCDS 2022 and 2023.

Table 1: PCDS Activity Report

ITEM	AMOUNT	
	2022	2023 (to date)
Distribution Samples		
Bacteriological (approx.)	350	352
Operational (free chlorine)	1956	2281
Adverse Samples	0	0
Lead Samples		
Distribution – Alkalinity and pH	4	8
Distribution – Lead (Exempt from plumbing sampling as of Dec/09)	0	0
Sample results > 10 ppb	0	0
Watermain breaks	21	7

A summary of the 2022 and 2023 (end of October) operational performance indicators (OPI) are provided in Table 2 below. Targets and OPIs are periodically reviewed to make sure they reflect all the efforts made by staff.

Table 2: PCDS Maintenance and Operational Performance Indicators (OPI)

Maintenance Activity	Target/OPI	Status 2022	Status 2023 (to end of October)
Watermain Breaks	Meet response times in SOP	21	7
Valve Exercising, Inspections	25% annually/< 5 inoperable	302 valves of 1193=25%	649 Valves of 1193= 54%
Hydrant Inspections	100% annually/< 5 inoperable	1,631 (100% more than once)	1,844 (100% more than once)
Winter Hydrant Inspection	2 inspections (Nov 1-Dec 31 and Jan 1-Apr 1)/0 frozen	Target met	Target met
Fire flow testing	100% Completed over ten (10) yrs/<2 out of service, marked within 60 days	110	229
Curb stop/curb box repairs	Repair < 2 weeks	44	43
Emergency service repairs	Meet response times in Watermain Break SOP	Target met	Target met
Inspect bulk water stations	Annual/< 2 service disruptions	Part of routine sampling as required	Part of routine sampling as required
Dead end flushing	Weekly, May-Oct, autoflush stations/0 AWQIs, <10 complaints	684	570
Backflow inspections	Annually or as required/<40% failure	14	6

Total water purchased from the Region over the past 10 years is included in Figure 1 below. Annual water sales for the past 10 years is included in Figure 2. Figure 3 compares both trends.

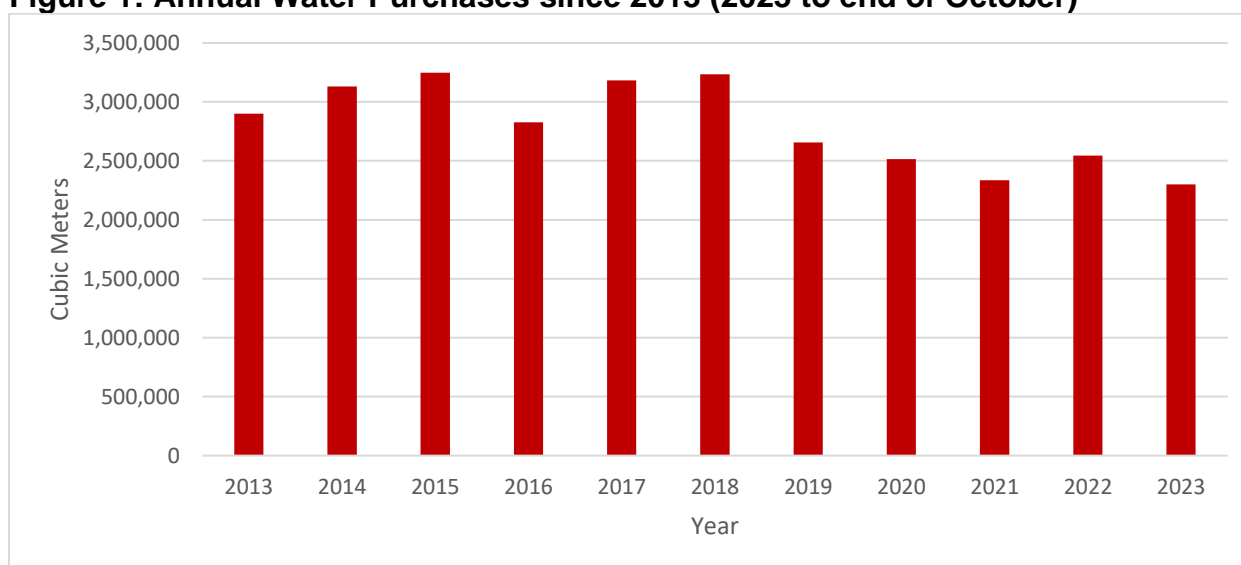
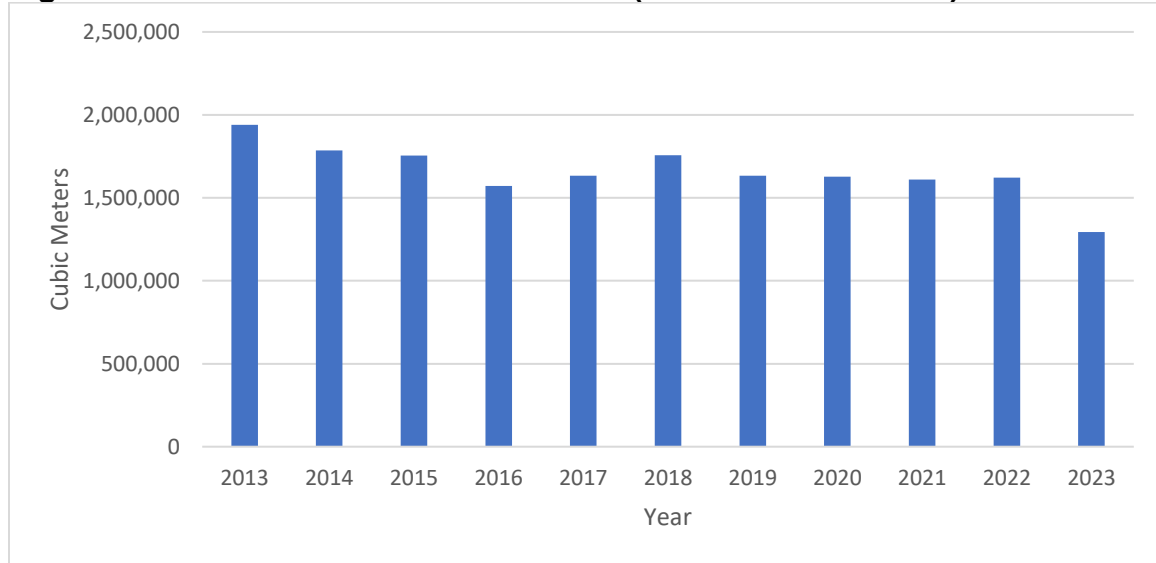
Figure 1: Annual Water Purchases since 2013 (2023 to end of October)

Figure 2: Annual Water Sales since 2013 (2023 to end October)

Since obtaining the ability to read all the water meters within the City monthly, staff have tracked actual metered volumes against monthly purchases from the Region. Figure 3 below compares the monthly metered volumes from 2019 to October 2023. There is generally a good correlation between the amount of water purchased vs. the amount of water metered.

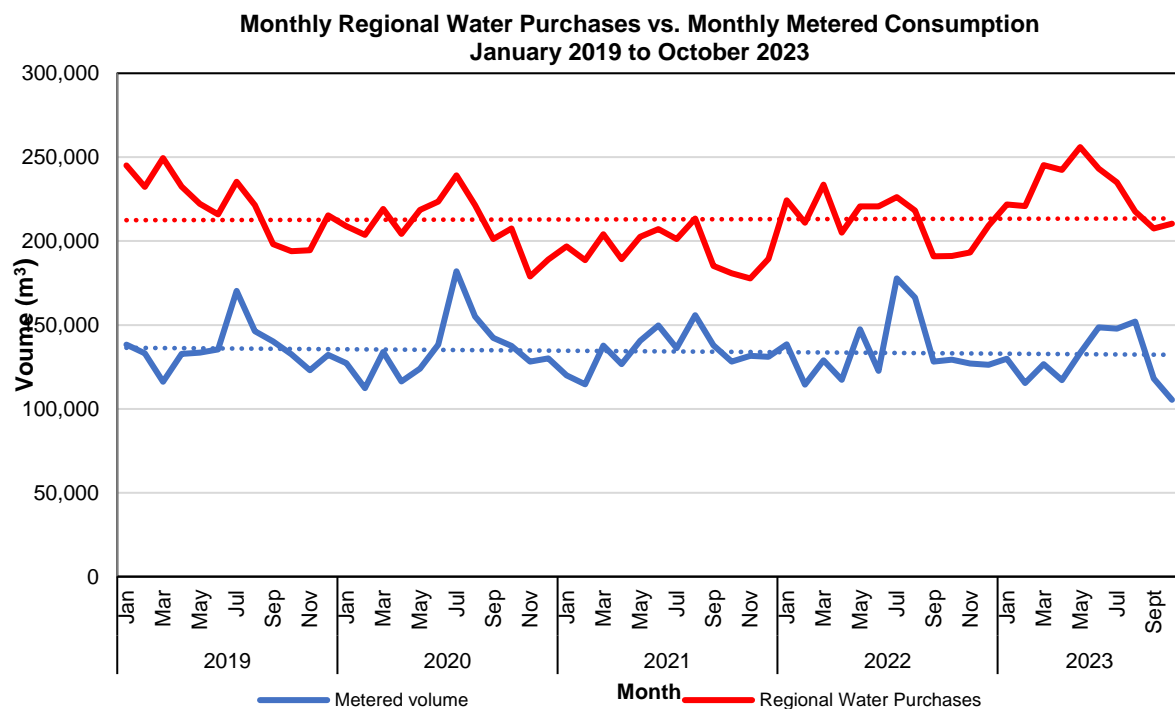
Figure 3: Monthly Purchased Volume vs. Monthly Metered Consumption

Table 3: Total water purchased from the Region and metered consumption from 2017 to 2023 (end of October).

	2017	2018	2019	2020	2021	2022	2023*
Purchased from Region	3,182,370	3,233,180	2,656,040	2,515,060	2,335,980	2,543,630	2,300,020
Metered Consumption	1,678,488	1,754,042	1,632,548	1,625,882	1,607,686	1,622,345	1,294,155

Staff have had several challenges collecting and estimating unbilled water quantities. A new water loss group will be formed to implement the latest water loss budget and audit techniques, as well as water loss detection strategies. Maintenance water for flushing and watermain break calculators will be reviewed and tracked monthly starting in 2024. Operations staff are optimizing autoflushers and flushing activities to conserve water while maintaining water quality. During summer months, flushing activities may need to increase to maintain water quality as required.

Non-revenue water usage includes: flushing and maintenance water, watermain break, service leaks, water theft, water for construction, and water not properly captured through water meters.

Operations staff are already conducting a proactive leak detection program and will also utilize new tools to better identify leaks throughout the City.

Staff are committed to a holistic approach for improving water loss tracking and finding and repairing leaks and other sources of non-revenue water.

Starting in 2024, a new water balance approach will be used that's in line with American Water Works Association (AWWA) standards. Staff will be completing training on these new standard approaches.

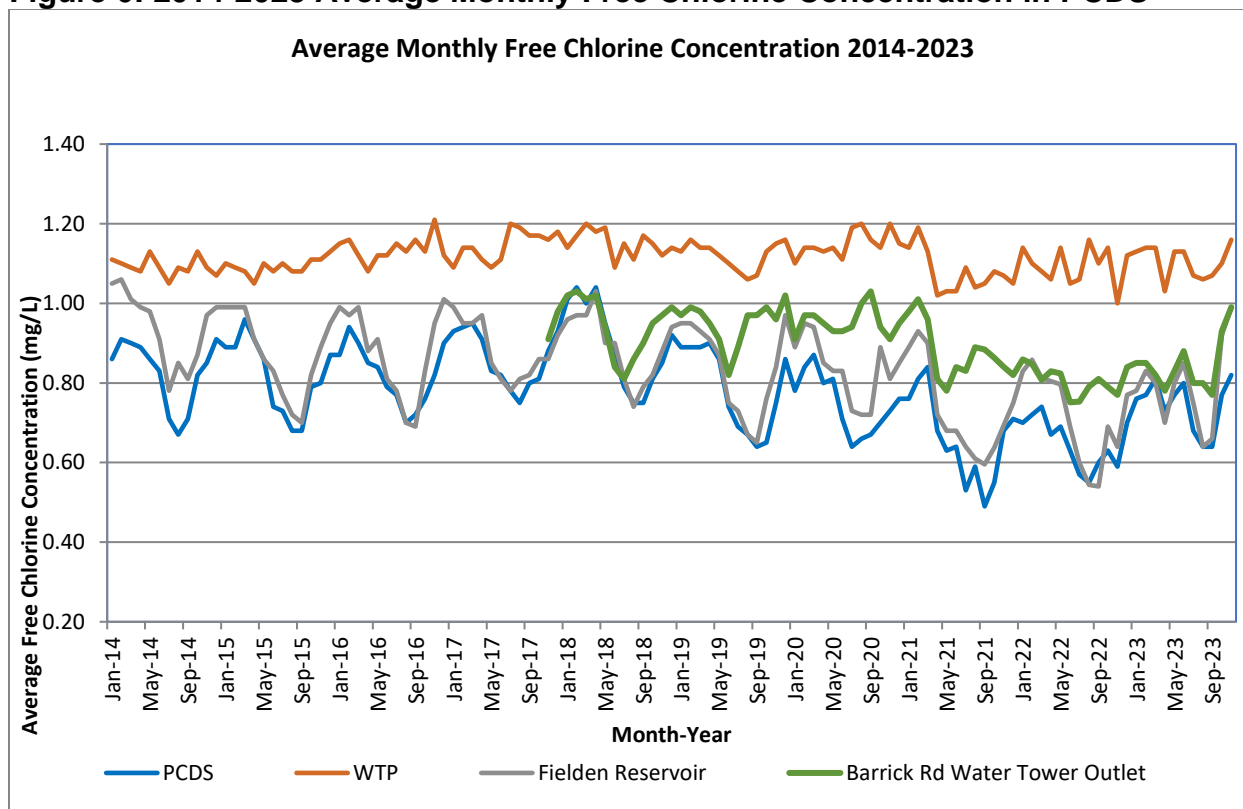
h. Raw Water Supply and Water Quality Trends

The Regional Municipality of Niagara (Region) supplies all drinking water to the PCDS, and as such, is responsible for all testing of the raw water supply (Welland Canal). Results of the testing are provided annually to the City in the Region's annual report.

Within the PCDS, the City is required to collect samples on a routine basis and evaluate them for several parameters. Microbiological samples, in addition to free chlorine samples are the best indicators of water quality trends within the PCDS.

Figure 6 shows the average monthly free chlorine measured in the PCDS and from the Region locations. Chlorine trends in the PCDS follow the concentrations in the Fielden reservoir closely. Seasonal variation is apparent. In 2021, there were some concerns about decreasing trends in chlorine from the plant. In 2022, due to quality concerns, staff approached Niagara Region and requested an increase in chlorine at the water tower. Operations staff noted that in the summer months of 2023, water quality did not appear to be impacted, indicating the Region continues to target chlorination at the tower and optimizing chemical dosing for seasonal fluctuations.

Figure 6: 2014-2023 Average Monthly Free Chlorine Concentration in PCDS



Quarterly trihalomethanes (THM) have remained relatively stable since 2013 (Table 4).

Table 4: Average Annual Trihalomethanes Concentrations – 2009-2023

Year	Average Trihalomethanes (µg/L)
2009	31.00
2010	25.25
2011	7.50
2012	16.75
2013	26.00
2014	25.50
2015	19.12
2016	26.08
2017	22.30

2018	29.04
2019	26.88
2020	31.50
2021	20.75
2022	21.00
2023	16.78

The City began sampling for Haloacetic Acids (HAAs), as required by the regulation, on a quarterly basis in 2017. HAAs have remained far below the Ministry's maximum acceptable concentration of 0.08 mg/L. In 2022, the average was 0.0077 mg/L and in 2023 the average was 0.0073 mg/L. These results indicate that HAAs are not a water quality issue in the distribution system.

i. Follow up on Action Items from Previous Management Reviews

Action Items:

- Water loss calculations and assumptions need to be firmed up
 - STATUS: spreadsheet to estimate water loss for flushing activities and main breaks has been created
- Leak detection on Region's trunk watermain – the Region does not do active leak detection on their trunk watermain, however, it has been indicated that there is an appetite to pursue program(s).
 - STATUS: Ongoing
- Asset Management Planning Regulation – O. Reg. 588/17 came into force on January 1, 2018.
 - STATUS: Ongoing. INS not yet complete.
- It was discussed that when buildings are demolished, that the Utilities group needs to be kept in the loop to ensure that the water service and sewer lateral are correctly decommissioned to ensure the service is not leaking and that the sewer lateral is not allowing infiltration into the wastewater collection system.
 - STATUS: Still in progress. Meetings with Building Staff have been underway to finalize a process. CityWide may be a tool that can help facilitate the process and data tracking.

j. Status of Management Action Items Identified Between Reviews

There were no Management Action Items identified between management reviews.

k. Changes That Could Affect the QMS or the PCDS

Staff are not expecting any major changes to impact the QMS or PCDS at this time.

I. Consumer Feedback

There were 7 water quality complaints 2022 and 14 so far in 2023. Where the source of the complaint could be determined, fire flow testing was the most common source. Other distribution activities that may result in complaints are also valve turning activities and hydrant flushing.

m. Resources Needed to Maintain the QMS

There are currently adequate resources to maintain the Quality Management System. The Climate Change Coordinator will act as the backup QMS representative and will take on more responsibilities after job shadowing.

n. Results of Infrastructure Review

The Infrastructure Review must be completed once every calendar year. The last Infrastructure review was completed in December 2022 and the next one will occur in December 2023. The Infrastructure Needs Study and Asset Management Plan will assist staff with capital planning.

o. Operational Plan Currency, Content and Updates

The Operational Plan was endorsed by the new City Council in 2023. Other than administrative changes and staffing updates, no major updates were completed.

p. Staff Suggestions

Staff suggestions, where applicable, are captured under the Corrective Action Logs with Source identified as "other."

q. New or Other Business

To be determined during the meeting.

r. Next Scheduled Review

The next Management Review will be scheduled for November 2024.