

Port Colborne Distribution System Annual Drinking Water Quality Report

Prepared on February 4, 2019
In Accordance with O.Reg. 170/03
January 1, 2018 to December 31, 2018

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Drinking Water System number: 260001643
Drinking Water System category: Large Municipal Residential
Owned and operated by: The Corporation of the City of Port Colborne

Port Colborne Distribution System Annual Drinking Water Quality Report

Introduction

The City of Port Colborne is required, under O.Reg.170/03 - *Drinking Water Systems*, to prepare an annual report detailing the operation of the Port Colborne Distribution System. The regulation specifies in Section 11 what the report must contain, and sets a February 28 deadline for having the report prepared and made available to the public.

Therefore, to ensure compliance with the regulation, this report is prepared in accordance with Section 11, and is available to the public on the City's website at www.portcolborne.ca, under the Water Quality link

Water Supply and Distribution

The Corporation of the City of Port Colborne (City) is the Owner and Operating Authority of the Port Colborne Distribution System (PCDS), which serves approximately 16,000 residents. The PCDS is a stand-alone, Class 1, distribution system, with no downstream connections, and obtains water from the Regional Municipality of Niagara's (RMON) Port Colborne Drinking Water System (water treatment plant - WTP). Treated water is purchased from RMON on a volume basis and distributed through the City owned distribution system via Region owned trunk mains. The WTP draws water from the Welland Canal, treats it at the WTP, and RMON is responsible for sampling, testing and monitoring water at and leaving the WTP.

The City of Port Colborne does not perform any secondary disinfection, as the WTP sufficiently chlorinates the water to meet the minimum requirement of >0.05 mg/L free chlorine residual. The only water treatment chemical used by the City is 12% sodium hypochlorite, and this is used solely when making repairs to or performing maintenance on the distribution system to perform the required disinfection to protect the drinking water. The distribution system has an average pressure of 58 psi, with pressure maintained by the Barrick Road Water Tower together with the Fielden Avenue Reservoir, which are owned, operated and maintained by RMON.

The Regional Municipality of Niagara prepares an annual report for the Port Colborne Drinking Water System, providing information on the treatment methodology, the type of chemicals used, water quality reports and any significant maintenance, repair or upgrades to the WTP. RMON is also required to make their reports available on the internet.

Contact information is provided under the section entitled “Where to Obtain Additional Information”.

Water Quality Monitoring

The City of Port Colborne is required to supply safe drinking water that meets the requirements of the Safe Drinking Water Act and associated regulations. To ensure the City meet these requirements, the City has assigned the following individuals as responsible persons for the distribution system:

Table 1: Port Colborne Distribution System Responsible Persons

Position	Name	Phone number
Director of Engineering and Operations	Chris Lee	905-835-2901 ext. 223
Manager of Operations (Overall Responsible Operator)	Richard Daniel	905-835-2901 ext. 234
Utilities Supervisor (Primary Operator-in-Charge)	Peter Paget	905-835-2901 ext. 255
Environmental Compliance Supervisor	Darlene Suddard	905-835-2901 ext. 256

The City has identified the Engineering and Operations Department as the Operating Authority for the Port Colborne Distribution System (PCDS). The Water Department operates under the Engineering and Operations Department, and is specifically responsible for the daily operation of the distribution system. As such, the Water Department is responsible for assigning Certified Water Operators to conduct both the routine, weekly water quality sampling and testing and to conduct non-routine sampling (i.e., during and after watermain breaks). These activities ensure the water quality meets the Ontario Drinking Water Quality Standards (O.Reg. 169/03) at all times and under all conditions. The Water Department also ensures that the Operational Checks, Sampling and Testing requirements specified in the Drinking Water Systems Regulation (O.Reg. 170/03) are conducted and recorded. If it is determined that the water quality or an operational parameter does not meet the regulated requirements or exceeds the regulated limits, Certified Operators immediately implement corrective action to ensure the continued supply of safe drinking water. The operational checks, sampling and testing requirements, which the City must conduct, are outlined in Table 4.

The Region operates the Port Colborne Water Treatment Plant, the Fielden Avenue Reservoir and Barrick Road Water Tower, and as such, is required to conduct operational checks, sampling, and testing activities. Details regarding the Region’s requirements are summarized in their Annual Report; information on how to obtain a copy of their report is provided under the section entitled “Where to Obtain Additional Information”.

Water Quality Test Results

As per the sampling and testing requirements detailed in Table 4, the City conducted the following sampling in the period of January 1, 2018 to December 31, 2018:

Microbiological Analysis

In accordance with the requirements of Schedule 10, section 10-2 (1) of O.Reg.170/03, samples are collected and submitted for analysis on a weekly basis. Additionally, samples are also collected and submitted for analysis after watermain breaks, during hydrant flushing activities and in response to some water quality complaints etc.

In 2018, a total of 627 samples were collected and analyzed for the presence of *E.coli* and Total Coliforms. (618 routine samples, 19 non-routine samples) Laboratory results indicated that *E.coli* was detected on one (1) occasion and Total Coliforms were detected on three (3) occasions (*Table 5*). Details about the adverse results are discussed below.

To monitor the potential deterioration of the water quality, 301 samples were collected and analyzed for Heterotrophic Plate Count (HPC). Laboratory results indicated that, in 2018, HPC was detected at very low levels, between 0-39 colonies/mL, with one exception where HPC levels exceeded 500 colonies/mL (*Table 5*).

Operational Parameters

The City monitors the operational parameters, chlorine and turbidity, on a twice weekly basis, and on an as-required basis in response to watermain breaks, hydrant flushing, and complaints etc. In 2018, this resulted in the collection and analysis of 2,112 chlorine samples (1,266 routine and 846 non-routine) and 1,749 turbidity samples (1,253 routine and 496 non-routine). There was one (1) adverse free chlorine sample in 2018, with overall free chlorine levels ranging between 0.04 to 1.43 mg/L (*Table 5*). Details about the adverse results are discussed below.

Turbidity levels ranged from 0.05 to 4.95 NTU (*Table 5*).

Lead Testing (Schedule 15.1) Results

The City is no longer required to collect samples from plumbing systems and is only required to collect samples from the distribution system. Under O.Reg. 170/03 distribution system samples are required to be collected twice annually, with one set collected during the winter sampling cycle (December 15 to April 15) and another set during the summer sampling cycle (June 15 to October 15). The

collected samples are tested for alkalinity and pH in year one and two, with lead sampled in year three. 2018 was year three; therefore, samples were collected from four locations in the distribution system and analyzed for lead, alkalinity and pH. In total, eight samples were collected. Lead results ranged below the minimum detection limit (0.00001 mg/L) to a maximum concentration of 0.00163 mg/L. Alkalinity values ranged from 82 to 86 mg/L, while pH values ranged from 7.14 to 7.62. Lead results were well below the maximum acceptable concentration of 0.010 mg/L and alkalinity and pH were well within the recommended guidelines (*Table 5*).

The City is not required under the Regulation to collect plumbing samples to be analyzed for lead concentrations, unless requested by a homeowner; in 2018, the City received one (1) request from a homeowner to have their water tested for lead. The results from both samples collected were well under the regulatory limit of 0.010 mg/L (*Table 5*).

Organic Parameters

Up until January 1, 2017, the only organic parameter the City was required to monitor in the distribution system was trihalomethanes, or THMs. New regulatory requirements came into effect in 2017, and the City was required to begin sampling for Haloacetic Acids (HAAs).

THM results from 2018 continue to indicate that THMs are not a concern in the distribution system, as the running annual average concentration was 0.029 mg/L, much less than the 0.10 mg/L regulated limit (*Table 5*). None of the individual samples exceeded half the standard prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards.

Although HAA results are not reportable until January 1, 2020, results from the 8 samples collected in 2018 indicate that HAAs are not a concern in the distribution system, as HAAs were less than the method detection limit of 5.3 µg/L (*Table 5*).

In 2018, there were four (4) reportable adverse water quality incidents. Three (3) adverse results were due to the presence of total coliforms, along with *E.coli* in one (1) occasion. The final adverse result was due to a free chlorine level less than 0.05 mg/L. Details about the adverse samples are discussed below.

Regulatory Non-Compliances

There were four (4) reportable adverse water quality incidents in 2018.

Table 2 below summarizes the date the adverse occurred, the adverse parameter, the corrective action taken by the City and the date the corrective action was taken:

Table 2: Summary of Adverse Test Results - 2018

Sample Date	Date Adverse Reported to City	Parameter	Result	Corrective Action Date	Corrective Action
Feb 20, 2018	Feb 22, 2018	<i>E. coli</i>	>200 cfu/100mL	Feb 22, 2018	Immediately flush and resample (two consecutive sets 24 and 48 hours apart). Total coliforms were absent from the resamples and free chlorine residuals >0.20 mg/L were maintained at all points in the affected part of the distribution system.
		Total Coliforms	>200 cfu/100mL		
May 22, 2018	May 24, 2018	Total Coliforms	2 cfu/100mL	May 24, 2018	
July 23, 2018	July 25, 2018	Total Coliforms	1 cfu/100mL	July 25, 2018	
Sep 5, 2018	Sep 5, 2018	Free Chlorine	0.04 mg/L	Sep 5, 2018	

While it was concerning to have *E.coli* and Total Coliforms appear in a sample from the distribution system, the free chlorine level at the time the sample was collected, 1.15 mg/L, coupled with the lack of *E.coli* and/or Total Coliforms in any of the nearby samples collected that day, made it highly unlikely that the sample was representative of the quality of the water in the distribution system. Results of the resampling indicated that *E.coli* and Total Coliforms were non-detectable at the sample point and upstream and downstream of the sample point. Therefore, Ministry staff, Public Health staff and City staff were confident that the adverse result was caused by a contaminated sample bottle.

It is important to note that although three (3) adverse microbiological results, and one adverse free chlorine sample, were observed in 2018, (representing less than 0.1% of the total samples collected), the immediate action by the City's certified Operators ensured that the adverse incidents were addressed in a timely manner. This timely response ensured that the safety of the drinking water was maintained, as indicated by the results of special follow up sampling and evaluation, which found the water to be safe.

Our Commitment to Providing Safe Drinking Water

To ensure that residents, businesses and visitors to our community continue to receive the safest drinking water, the City has incorporated the following practices into the routine operations of the Distribution System:

- Exceed the minimum regulatory sampling requirements, by sampling additional sites for both operational and microbiological parameters
- Comprehensive flushing program targeting “dead ends”, where water use is not very high, to ensure chlorine levels are at least 0.10 mg/L
- Prompt response to watermain breaks and customer complaints
- Increase the number of samples collected following a main break or distribution system improvements

In addition, the City has the following plans for 2019:

- Decommissioning of Elm Street Bulk water station and construction of a new bulk water station on Stonebridge Drive at an estimated cost of \$300,000.
- Installation of a fire service water meter and chamber at two facilities, to ensure water usage of fire services is metered, at an estimated total cost of \$160,000.
- Watermain replacements on Carter Avenue and Janet Street, at an approximate cost of \$1,000,000. The City received federal funding for this project.

There were no major expenditures in 2018, as the City delayed all 2018 projects to 2019.

What's New?

The City's Municipal Drinking Water Licence and Drinking Water Works Permit will expire in September 2019, with the renewal package due to be submitted to the Province by April 23, 2019; in order to submit a renewal, the City must prepare and Council must approve a new Financial Plan. It is expected the Plan will be before Council in early April 2019 to meet the deadline.

With the election of a new Mayor and Council, the City's Operational Plan must be endorsed by Council within one (1) year of the election. Council endorsed the Operational Plan at their February 25, 2019 meeting. Additionally, the City's Drinking Water Quality Management System must be accredited to the new Drinking Water Quality Management Standard, version 2.0, in 2019. The City's accreditation body, SAI Global, is anticipated to be on-site to perform the external audit in May 2019. The City's Operational Plan is available on the City's website at:

http://www.portcolborne.ca/page/drinking_water_quality_management_system

Where to Obtain Additional Information

Copies of this annual report are available, free of charge, at the Engineering and Operations Centre, 1 Killaly Street West. It can also be downloaded from the internet at http://portcolborne.ca/page/water_quality_reports. Copies may also be obtained by contacting the City numbers listed below.

Additionally, all laboratory test results are available at the Engineering and Operations Centre, 1 Killaly Street West. Copies may also be obtained by contacting the City numbers listed below.

The Regional Municipality of Niagara provides an annual report for the Port Colborne Water Treatment Plant, and it can be downloaded from the Region's website: <https://www.niagararegion.ca/living/water/water-quality-reports/default.aspx> Copies may also be obtained by contacting any of the numbers listed below:

Table 3: Contact Information for the City and Region

Organization	Department	Phone Number
City of Port Colborne	Engineering and Operations Centre	905-835-2900
Regional Municipality of Niagara	Water and Wastewater Division	905-685-1571

Table 4: Distribution System Water Quality Sampling and Testing Requirements

Parameter	Sampling and Analysis	Distribution System Standards	Comments
Microbiological	Minimum of 48 samples per month collected and tested for total coliforms and/or <i>E.coli</i> . Minimum 25% of all samples collected weekly analyzed for heterotrophic plate count	<ul style="list-style-type: none"> • <i>E.coli</i> – NONE detected • Total Coliforms – NONE detected • Heterotrophic plate count - <500 cfu/mL 	<ul style="list-style-type: none"> • 12 samples collected each week • Samples sent to an accredited laboratory for analysis • Adverse results are immediately reported by the lab to the City
Free Chlorine Residual	Minimum of 70 samples per month collected and tested for free chlorine. Collected twice weekly (at least 48 hours apart) from representative areas of the distribution system	<ul style="list-style-type: none"> • Minimum residual chlorine 0.05 mg/L • City targets 0.20 mg/L • City's acceptable low limit is 0.10 mg/L 	<ul style="list-style-type: none"> • City flushes all hydrants annually and known dead ends on a regular basis to ensure at least 0.10 mg/L is maintained at all areas of the distribution system
Turbidity	Frequency of sampling not specified, however, City collects minimum of 70 samples per month and tests for turbidity. Collected twice weekly from representative areas of the distribution system	<ul style="list-style-type: none"> • 5.0 NTU maximum aesthetic objective 	<ul style="list-style-type: none"> • Turbidity generally not an issue in the distribution system, however City flushes on a regular basis to ensure turbidity levels remain low.
Trihalomethanes (THMs)	Required to collect at least one sample quarterly, however the City collects 2 samples per month and submits for analysis	<ul style="list-style-type: none"> • 0.10 mg/L maximum acceptable concentration 	<ul style="list-style-type: none"> • Based on a four-quarter progressive annual average of test results (average of all test results each quarter) at points that are likely to have an elevated potential for the formation of THMs

ND = non-detectable

MDL = Minimum Detection Limit

NTU = nephelometric turbidity unit

Table 4: Distribution System Water Quality Sampling and Testing Requirements (*continued*)

Parameter	Sampling and Analysis	Distribution System Standards	Comments
Haloacetic Acids (HAAs)	Sampled quarterly. Required to collect one (1) sample per quarter. City collects 2 samples per quarter.	<ul style="list-style-type: none"> • 0.08 mg/L maximum acceptable concentration (comes into effect January 1, 2020) 	<ul style="list-style-type: none"> • Based on a four-quarter progressive annual average of test results (average of all test results each quarter) at points that are likely to have an elevated potential for the formation of HAAs
Lead	<p>Regulatory amendments late in 2009 and the City's historical results from 2008/09 resulted in the City qualifying for exemption from having to collect samples from plumbing.</p> <p>Required to collect 4 samples twice annually (between Dec 15 and Apr 15 and between Jun 15 and Oct 15) from 4 locations in the distribution system and analyze the samples for pH and alkalinity for two years, and then in the third year, perform the pH and alkalinity analysis and lead analysis.</p>	<ul style="list-style-type: none"> • No standard for alkalinity or pH, these parameters are monitored so that, should they change, the potential for lead levels to increase is analyzed • Maximum acceptable concentration for lead is 0.010 mg/L 	<ul style="list-style-type: none"> • Distribution system samples are generally collected from water sampling stations and/or fire hydrants • If a lead exceedance occurs in future, the City would be required to resume standard sampling.

Table 5: Distribution System Water Quality Sampling and Testing Results – January 1 to December 31, 2017

Parameter	Requirement	Number of samples		Results			Comments
		Routine	Non-Routine	Range	Unit	# of Adverse	
Microbiological Analysis							
<i>E. coli</i>	ND	618*	19	ND- >200	cfu/100 mL	1	Presence of <i>E.coli</i> indicates presence of fecal matter
Total Coliforms	ND	618*	19	ND- >200	cfu/100 mL	3	Presence of Total Coliforms indicates possible presence of pathogenic bacteria
Heterotrophic Plate Count	<500	301*	2	ND- >500	colonies/mL	N/A	Presence of HPC indicates water quality deterioration
Operational Parameters							
Free Chlorine	Minimum 0.05	1266*	846	0.04 – 1.43	mg/L	1	Level of disinfectant present
Turbidity	5.0	1253*	496	0.05 – 4.95	NTU	N/A	Not a reportable parameter; 5.0 NTU is aesthetic guideline
Lead Testing Results							
Alkalinity	30 - 500	8		82 – 86	mg/L	N/A	Neither are reportable parameters; guidelines are the recommended operational level. Low alkalinity and/or low pH may accelerate corrosion, which may cause lead from soldering or lead lines to be released into drinking water.
pH	6.5 – 8.5	8		7.14 – 7.62		N/A	
Lead	Plumbing	0.010 mg/L	2	0.00023-0.00056	mg/L	0	Corrosion of lead or lead soldered plumbing/distribution systems may cause lead to be released into drinking water
	Distribution		8				
Organic Parameters							
Trihalomethanes	0.10	24		(Running Annual Avg) 0.029	mg/L	0	By-product of chlorination; forms when chlorine reacts with suspended organics.
Haloacetic Acids	0.08 (Jan 1, 2020)	8		(Running Annual Avg) <MDL	mg/L	N/A	By-product of chlorination; forms when chlorine reacts with suspended organics.

*Note – operational checks are routine samples. Only routine microbiological samples, collected in accordance with Schedule 10, section 10-2 (1) of O.Reg. 170/03, are analyzed for Heterotrophic Plate Count (HPC) to meet the required 25%. Non-routine sampling includes sampling after watermain breaks, complaints, annual hydrant flushing and dead end flushing.

ND = non-detectable

MDL = Minimum Detection Limit

NTU = nephelometric turbidity unit