Port Colborne Distribution System
Annual Drinking Water Quality Report

Prepared on February 25, 2016
In Accordance with O.Reg. 170/03
January 1, 2015 to December 31, 2015

Prepared by:

Darlene Suddard
Environmental Compliance Supervisor

Approved by:

Doug Cressey
Utilities Supervisor

Approved by:

Ron Hanson
Director of Engineering and Operations

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 King Street Water Tower and the Fielden Avenue Reservoir, both of 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	Ron Hanson	905-835-2900 ext. 222
Utilities Supervisor (Overall Responsible Operator)	Doug Cressey	905-835-5079
Environmental Compliance Supervisor	Darlene Suddard	905-835-5079

The City has identified the Engineering and Operations Department as the Operating Authority for the Port Colborne Distribution System (PCDS). The Public Works, 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 the King Street 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, 2015 to December 31, 2015:

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 and/or dead end flushing activities, and in response to some water quality complaints etc.

In 2015, a total of 676 samples were collected and analyzed for the presence of *E.coli* and Total Coliforms (624 routine samples, 52 non-routine samples). Laboratory results indicated that *E.coli* was non-detectable throughout the entire year and Total Coliforms were detected on two occasions *(Table 5)*. Details about the adverse results are discussed below.

To monitor the potential deterioration of the water quality, 313 samples were collected and analyzed for Heterotrophic Plate Count (HPC). While there is no regulated limit for HPC, the general acceptable standard is <500 colonies/mL. Laboratory results indicated that HPC was detected at very low levels, between 0-14 colonies/mL in 2015 *(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, dead end flushing, and complaints etc. In 2015, this resulted in the collection and analysis of 1,260 routine chlorine samples, 1,260 routine turbidity samples, 1,024 non-routine chlorine samples and 1,024 non-routine turbidity samples. Turbidity levels ranged from 0.06 – 1.21 NTU, while free chlorine levels ranged from 0.00 – 1.37 mg/L. There was one instance in 2015 where free chlorine levels were below the minimum level of 0.05 mg/L required under O.Reg. 170/03 *(Table 5).*

Lead Testing (Schedule 15.1) Results

The City is no longer required to collect samples for lead from plumbing systems, only 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. 2015 was the third year of the cycle; 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 concentrations ranged between 0.00009 – 0.00041 mg/L, well below the regulated limit of 0.010 mg/L. Alkalinity values ranged from 82 – 101 mg/L, while pH values ranged from 7.45 – 7.71. Both of these parameters were well within the recommended guidelines (*Table 5).*

The City is not required under the Regulation to collect samples from plumbing and analyze for lead concentration, unless requested by a homeowner. The City did not receive any requests to have water tested for lead in 2014.

Organic Parameters

The only organic parameter the City is required to monitor in the distribution system is trihalomethanes, or THMs. Results from 2015 continue to indicate that THMs are not a concern in the distribution system, as the average concentration was 0.0233 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.

In 2015, there were three (3) reportable adverse water quality incidents. The adverse results were due to the presence of total coliforms (1cfu/100 mL) and low free chlorine. Details about the adverse samples are discussed below.

Regulatory Non-Compliances

There were three (3) reportable adverse water quality incidents in 2015.

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:

It is important to note that although one adverse free chlorine sample and two adverse microbiological results were observed in 2015, (representing less than 0.1% of the total number of free chlorine or microbiological samples collected); the immediate action by the City's licensed 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 microbiologically safe.

Table 2: Summary of Adverse Test Results - 2015

Sample Date	Date Adverse Reported to City	Parameter	Result	Corrective Action Date	Corrective Action
July 2, 2015	July 2, 2015	Free Chlorine	0.00 mg/L	July 2, 2015	Immediately flush the water mains and restore secondary disinfection to ensure that a free chlorine residual of 0.05 mg/L or higher was achieved at all points in the affected parts of the distribution system. Microbiological samples collected.
July 23, 2015	July 25, 2015	Total Coliforms	7 cfu/ 100 mL	July 26, 2015	Flush and resample as soon as reasonably possible. 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.
Oct 13, 2105	Oct 15, 2015		1 cfu/ 100ml	Oct 15 & 22, 2015	

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
- Participation in the Region’s trihalomethanes (THMs) study, by increasing sampling frequency for THMs from quarterly to monthly. The Region is using monthly THMs results from participating municipalities to monitor and potentially refine operational practices at their water treatment plants.

In addition, the City has the following plans for 2016:

- Complete retrofit of approximately 5,300 water meters with RF technology, providing the capability to datalog and provide historical data in the event of a high bill complaint. Approximately cost of this project is $2.1 million.

- Lowering of all 162 water services that froze in the Service Pipe portion of the water service, at an estimated cost of $600,000.
- Continued enhancement of current flow monitoring activities to allow real-time monitoring of flows within the distribution system and aid City staff in locating leaks and episodes of “unauthorized” water use. The City was successful in securing funding from the Province to share the cost for this project, which will be fully operational in 2016.
- Purchase and installation of four (4) additional dedicated water sampling stations at a cost of $6,400.

  The installation of additional dedicated water sampling stations ensures that the City’s Operators are able to collect samples that are truly representative of the quality of the water in the distribution system, as these stations are specifically designed for sampling and can be flushed and disinfected thoroughly.

Major expenditures for 2015 included the following:

- Construction of a new watermain to loop the distribution system from Clarence Street, south along Cement Plant Road to connect to the western end of Lakeshore Road. This project is ongoing into 2016, and expenditures for 2015 totalled approximately $2.5 million with approximately $500,000 to be completed in 2016.
- Purchase of minivan for water meter reading and repair, at an approximate cost of $30,000.

What’s New?

The Region will be constructing a new water tower in the northern part of the City, near Barrick Road off Elm Street. This tower, which is larger than the King Street water tower and the Fielden Avenue reservoir combined, will increase fire flow capacity for the City’s distribution system. Construction is expected to begin in 2016, and the City and Region are working closely together to minimize the impacts on the City’s drinking water system when the new tower is commissioned, and the King Street tower is decommissioned.

The City’s Drinking Water Quality Management System (QMS) underwent a surveillance audit by SAI Global in June 2015, and the auditor found that all areas audited were in conformance with the Drinking Water Quality Management Standard. The City’s Operational Plan is available on the City's website at:
http://www.portcolborne.ca/page/drinking_water_quality_management_system

The City’s QMS will be re-accredited in 2016. The on-site audit, to be completed by QMI-SAI Global is scheduled for April 28, 2016.

Where to Obtain Additional Information

Copies of this annual report are available, free of charge, at the Engineering and Operations Department, 2nd Floor, City Hall - 66 Charlotte Street. It can also be downloaded from the internet at www.portcolborne.ca, under the "Water Quality" link. Copies may also be obtained by contacting the City numbers listed below.

Additionally, all laboratory test results are available either at the Engineering and Operations Department or at the Public Works office at 11 King Street. 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: http://www.niagararegion.ca/living/water/ptcolborne.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 Department	905-835-2900
	Public Works	905-835-5079
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 *E.coli.* Minimum 25% of all samples collected weekly analyzed for heterotrophic plate count	• *E.coli* – NONE detected • Total Coliforms – NONE detected • Heterotrophic plate count - <500 colonies per mL sample	• 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 96 samples per month collected and tested for free chlorine. Collected twice weekly (at least 48 hours apart) from representative areas of the distribution system	• Minimum residual chlorine 0.05 mg/L • City targets 0.20 mg/L • City's acceptable low limit is 0.10 mg/L	• City flushes 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 96 samples per month and tests for turbidity. Collected twice weekly from representative areas of the distribution system	• 5.0 NTU maximum aesthetic objective	• Turbidity generally not an issue in the distribution system, however City flushes on a regular basis to ensure turbidity levels remain low.
Trihalomethanes (THMs)	Sampled quarterly. Quantity of samples not specified in regulations. City collects 2 samples per quarter and submits for analysis. In 2015, moving to monthly sampling to assist Region with THMs study.	• 0.10 mg/L maximum acceptable concentration	• Based on a four-quarter progressive annual average of test results (highest value per sampling event) at points that are likely to have an elevated potential for the formation of THMs

ND = non-detectable

NTU = nephelometric turbidity unit

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

Parameter	Sampling and Analysis	Distribution System Standards	Comments
Lead	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. 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.	• 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	• 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.

ND = non-detectable

NTU = nephelometric turbidity unit

Table 5: Distribution System Water Quality Sampling and Testing Results – January 1 to December 31, 2013

Parameter		Requirement	Number of samples		Results			Comments
			Routine	Non-Routine	Range	Unit	# of Adverse	
Microbiological Analysis								
E. coli		ND	624*	52*	ND	cfu/ 100 mL	0	Presence of *E.coli* indicates presence of fecal matter
Total Coliforms		ND	624*	52*	ND-1	cfu/ 100 mL	2	Presence of Total Coliforms indicates possible presence of pathogenic bacteria
Heterotrophic Plate Count		<500	313*		0-14	colonies/mL	0	Presence of HPC indicates water quality deterioration
Operational Parameters								
Free Chlorine		Minimum 0.05	1260*	1024*	0.00 – 1.37	mg/L	1	Level of disinfectant present
Turbidity		5.0	1260*	1024*	0.06 – 1.21	NTU	N/A	Not a reportable parameter; 5.0 NTU is aesthetic guideline
Lead Testing Results								
Alkalinity		30 - 500	8		82 – 101	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		7.45 – 7.71		N/A	
Lead	Plumbing	0.010 mg/L	N/A			mg/L	N/A	Corrosion of lead or lead soldered plumbing/distribution systems may cause lead to be released into drinking water
	Distribution		8		0.00009 – 0.00041			
Organic Parameters								
Trihalomethanes		0.10	24		(Annual Average) 0.0233	mg/L	0	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

NTU = nephelometric turbidity unit