Richmond West Well System

The following report summarizes the drinking water quality results, adverse water quality notifications, and other operating information related to the **Richmond West Well System** (waterworks# 260096343) for the period January 1 to December 31, 2020. It was prepared in accordance with Section 11 of O.Reg.170/03 under the Safe Drinking Water Act (SDWA, 2002).

The Annual Report for each municipal water system operated by the City of Ottawa is posted on the web site www.ottawa.ca. Copies of each Annual Report and Summary Report prepared in accordance with Schedule 22 of O.Reg.170/03, are available to the public at 951 Clyde Avenue (telephone 3-1-1), the Britannia Water Purification Plant (2731 Cassels Street), and the Lemieux Island Water Purification Plant (1 Onigam Street).

Description of Drinking Water System

The Richmond West water supply provides drinking water to the Fox Run subdivision in Richmond (currently <100 homes) and was commissioned on **April 23rd**, 2019. The system draws ground water from two artesian wells located near the treatment plant. The source wells are considered to be of high quality, although they have a moderate level of iron (0.22 mg/L) and a moderate to high level of hardness (approx. 297 mg/L as $CaCO_3$).

The treatment process for the Richmond West Well System consists of the following steps:

- chlorine disinfection
- chlorine contact chamber
- water storage
- high-lift pumping

The only treatment chemical used is a chlorine solution of sodium hypochlorite (liquid – 6%) for disinfection purposes. The treatment process results in water that is clear, palatable and safe to drink.

Treated water is pumped via a combination of five high lift pumps into the distribution system with a target chlorine concentration of 1.0 mg/L. On-line analyzers are

used to monitor the chlorine concentration immediately after the addition of chlorine, following chlorine disinfection, and as treated water enters the distribution system. The treated water leaving the station is also monitored for flow, pressure, and turbidity. The chlorine level in the distribution system is monitored in a dedicated analyzer station located in the north-west area of the subdivision.

All treatment, pumping, and storage systems are controlled by a dedicated computer control system and are monitored by water treatment operators 24 hours per day. A water treatment operator visits the well system twice per week to collect water samples and conduct on-site water quality tests.

Monetary expenses incurred during this reporting period

In order to maintain the safe and efficient operation of the waterworks, maintenance and capital projects are undertaken from time to time.

During 2020, baseline operating and maintenance expenses were covered under warranty by the constructor. No major repairs or upgrades were carried out during this period.

Water Quality test results

The Ontario Drinking Water System Regulation O.Reg.170/03 defines water quality sampling and testing requirements in several categories: microbiological, operational, inorganic, and organic test parameters. The sections below describe the 2020 test results for samples required by O.Reg.170/03. In addition to required regulatory testing, the City of Ottawa analyzes its drinking water for hundreds of other trace substances and test parameters in order to ensure the safety of the water supply. A complete table of water quality test results is posted on the City website www.ottawa.ca for each water system.

Microbiological

Total Coliform and E.coli bacteria tests are performed on the raw, treated and distributed drinking water. These types of bacteria are considered to be “indicator” organisms since they do not directly cause illness, but their presence indicates the potential for other pathogenic organisms to be present.

"Raw" water refers to untreated water that is drawn into the treatment plant from the two source wells. During 2020, Total Coliform bacteria were detected in 3 out of 107 samples taken from Well #1 and none were detected in samples taken from Well #2. None of the samples indicated the presence of E.coli bacteria..

Treated water is tested weekly as it leaves the plant and enters the distribution system. Routine samples are also taken within the distribution system to verify water quality throughout the supply network. During 2020, there were no (0) samples of Richmond West treated or distributed water that indicated the presence of Total Coliform bacteria or E.coli bacteria.

Table 1a Summary of microbiological test results for Richmond West treated and distributed water during 2020

Parameter	Number of treated water samples taken	Number of positive test results	Number of distribution samples taken	Number of positive test results
Total coliform bacteria (cfu/100mL)	106	0	106	0
E. coli bacteria (cfu/100mL)	106	0	106	0

cfu=colony forming units

HPC (heterotrophic plate count) bacteria represent a broad spectrum of environmental aerobic bacteria that indicate biological growth. They are not harmful to humans and are therefore not considered to represent adverse drinking water quality. However, they are useful as operational indicators for the presence of biological (ie. biofilm) growth on the inside surface of a pipe or watermain. An operational limit of 500 (cfu/mL) has been established as a target for drinking water systems in Ontario. During 2020, there was 1

out of 105 distribution samples and 1 out of 105 treated water samples that exceeded the operational target. The treated and distribution water microbiological results for HPC bacteria are summarized in the table below.

Table 1b Summary of the heterotrophic plate count (HPC) bacteria test results for Richmond West treated and distribution samples taken during 2020.

Parameter	Number of treated water samples taken	Range of test results	Number of distribution samples taken	Range of test results
HPC bacteria (cfu/mL)	105	0 – 3000	105	0 – 750

cfu=colony forming units

Operational: For the Richmond West Well System, continuous on-line analyzers are used to measure and record important process parameters such as chlorine and turbidity. In addition, a water treatment operator visits the site twice per week to conduct routine operational tests in order to verify water quality and make adjustments to the treatment process. The 2020 test results for turbidity and chlorine are summarized in the table below. During 2020, all operational tests of treated water complied with safe drinking water standards.

Table 2 Summary of operational testing performed for Richmond West treated water during 2020

Parameter	Average value	Range of values (min - max)	Number of samples
Turbidity	0.32 NTU	0.17 – 1.06 NTU	106

Total Chlorine	1.11 mg/L	0.77 – 1.89 mg/L	106

Inorganics: Inorganic substances include heavy metals and dissolved minerals that may be present in treated drinking water and are tested monthly including the individual source wells. The table below summarizes the 2020 test results for treated water, expressed as annual average concentrations in mg/L. All inorganic test results during 2020 were safely within the Maximum Acceptable Concentration (MAC) as per Ontario Drinking Water Standards. The MAC concentrations for drinking water are listed in the right column for reference.

Table 3 Summary of inorganic test results for Richmond West treated water during 2020

Parameter	Unit of Measure	Result	Ontario Drinking Water Standard (MAC)
Antimony	mg/L	0	0.006
Arsenic	mg/L	0	0.010
Barium	mg/L	0.14	1
Boron	mg/L	0.13	5
Cadmium	mg/L	0	0.005
Chromium	mg/L	0	0.05
Lead	mg/L	0	0.01

Parameter	Unit of Measure	Result	Ontario Drinking Water Standard (MAC)
Mercury	mg/L	0	0.001
Selenium	mg/L	0	0.05
Uranium	mg/L	0.0009	0.02
Sodium	mg/L	37.1	20*
Fluoride	mg/L	0.27	1.5
Nitrate	mg/L	0	10
Nitrite	mg/L	0	1

0 denotes that the chemical was not detected.

NOTE*: Sodium health advisory level of 20 mg/L for people on sodium-restricted diets only.

Sodium occurs naturally in groundwater and is present in the Richmond West treated water at a concentration of 37.1 mg/L, which is above the health advisory limit of 20 mg/L for people on sodium-restricted diets. Notification of the sodium level exceedance was made to the Ministry (MECP) and Ottawa Public Health on April 3, 2019 for this water system. Notification for sodium is required every 5 years.

Organics: Trace organic substances include: volatile organic compounds, pesticides, herbicides, industrial solvents, and disinfection by-products. Trace organics are tested annually in the treated water and individual source wells. The table below shows the 2020 test results for the treated water. None of the trace organic substances were detected

with the exception of Trihalomethanes (THM) and Haloacetic Acids (HAA), which are tested monthly to monitor seasonal trends. THMs and HAAs are organic compounds that form during the treatment process when chlorine reacts with natural organic matter dissolved in the water. All trace organic test results during 2020 were safely within the Maximum Acceptable Concentration (MAC) as per Ontario Drinking Water Standards. The MAC concentrations for drinking water are listed in the right column for reference.

Table 4 Summary of trace organic test results for Richmond West treated water during 2020

Parameter	Unit of Measure	Result	Ontario Drinking Water Standard (MAC)
Alachlor	mg/L	0	0.005
Atrazine + N-dealkylated metabolites	mg/L	0	0.005
Azinphos-methyl	mg/L	0	0.02
Benzene	mg/L	0	0.001
Benzo(a)pyrene	mg/L	0	0.00001
Bromoxynil	mg/L	0	0.005
Carbaryl	mg/L	0	0.09
Carbofuran	mg/L	0	0.09
Carbon Tetrachloride	mg/L	0	0.002

Parameter	Unit of Measure	Result	Ontario Drinking Water Standard (MAC)
Chlorpyrifos	mg/L	0	0.09
Diazinon	mg/L	0	0.02
Dicamba	mg/L	0	0.12
1,2-Dichlorobenzene	mg/L	0	0.2
1,4-Dichlorobenzene	mg/L	0	0.005
1,2-Dichloroethane	mg/L	0	0.005
1,1-Dichloroethylene	mg/L	0	0.014
Dichloromethane	mg/L	0	0.05
2-4 Dichlorophenol	mg/L	0	0.9
2,4-Dichlorophenoxy acetic acid (2,4D)	mg/L	0	0.1
Diclofop-methyl	mg/L	0	0.009
Dimethoate	mg/L	0	0.02
Diquat	mg/L	0	0.07

Parameter	Unit of Measure	Result	Ontario Drinking Water Standard (MAC)
Diuron	mg/L	0	0.15
Glyphosate	mg/L	0	0.28
Haloacetic Acids*	mg/L	0.004	0.080
Malathion	mg/L	0	0.19
2-Methyl-4-chlorophenoxyacetic Acid (MCPA)	mg/L	0	0.10
Metolachlor	mg/L	0	0.05
Metribuzin	mg/L	0	0.08
Monochlorobenzene	mg/L	0	0.08
Paraquat	mg/L	0	0.007
Pentachlorophenol	mg/L	0	0.06
Phorate	mg/L	0	0.002
Picloram	mg/L	0	0.19

Parameter	Unit of Measure	Result	Ontario Drinking Water Standard (MAC)
Polychlorinated Biphenyls (PCB)	mg/L	0	0.003
Prometryne	mg/L	0	0.001
Simazine	mg/L	0	0.01
Terbufos	mg/L	0	0.001
Tetrachloroethylene	mg/L	0	0.01
2,3,4,6-Tetrachlorophenol	mg/L	0	0.1
Triallate	mg/L	0	0.23
Trichloroethylene	mg/L	0	0.005
2,4,6-Trichlorophenol	mg/L	0	0.005
Trifluralin	mg/L	0	0.045
Trihalomethanes*	mg/L	0.024	0.1
Vinyl Chloride	mg/L	0	0.001

0 denotes that the chemical was not detected.

NOTE*: The reported Trihalomethane (THM) and Haloacetic acid (HAA) results represent the average concentration measured in the distribution system.

Adverse Water Quality Incidents (AWQI) Requiring Notification

The drinking water regulations identify several “Indicators of Adverse Water Quality” for which the waterworks must immediately notify health officials and the Ministry (MECP). These refer to any sample of treated or distributed drinking water that does not meet a provincial water quality standard or a situation where disinfection of the water may be compromised. For each Adverse Water Quality Incident (AWQI), City of Ottawa staff immediately notifies Ottawa Public Health Department and the Ministry of the Environment, Conservation and Parks (MECP) as required by regulations. Corrective actions, re-sampling, and reporting are required in each case.

During 2020 there was (0) AWQI events for the Richmond West Well System.

Community Lead Testing Program

The treated water produced by the Richmond West Well System is lead-free. However, trace amounts of lead can potentially be dissolved in the water as it comes in contact with household plumbing components such as lead solder and brass fittings. The current Ontario standard for lead in drinking water is 10 ppb (parts per billion), expressed as a Maximum Acceptable Concentration (MAC) measured at the customer’s tap. During 2019, Health Canada lowered the acceptable concentration to 5 ppb for lead in drinking water, due to increasing concerns for adverse health effects in children. To date, the Ontario standard for lead has not yet been revised to align with the new Health Canada guideline.

In July 2007, a new provincial regulation (amendment to O.Reg.170/03) was initiated in response to concerns about potential lead levels in provincial water supplies. The Community Lead Testing Program requires each water system to test tap water lead levels in representative homes during both winter and summer conditions. Ottawa’s test results have consistently passed the Provincial lead testing criteria for drinking water. In order to meet compliance standards, 90% of the tap water samples must have a lead concentration below 10 ppb (parts per billion) following a 30-minute period of stagnation in the plumbing system.

As a new water supply, the Richmond West well system must complete the regulatory lead testing as per O. Reg 170/03 Sch 15.1.

In March of 2020, as a result of the COVID-19 pandemic, all in-home lead sampling was suspended in order to protect both the homeowner and our employees. Since the MECP lead sampling requires water operators to enter the resident's home to conduct testing, the City of Ottawa applied for and received relief for both the winter and summer rounds of lead sampling in 2020.

Summary

The results demonstrate that the quality of drinking water treated and distributed from the Richmond West Well System was high during 2020 and met all Ontario Drinking Water Standards.

If you have any questions or concerns regarding the quality of your drinking water, please contact the City of Ottawa at 3-1-1 or email at info-water@ottawa.ca.

For more information on the City of Ottawa drinking water, please visit our website at www.ottawa.ca.