



**OPTIONAL ANNUAL REPORT TEMPLATE**

<b>Drinking-Water System Number:</b>	220003582
<b>Drinking-Water System Name:</b>	Cardinal Water System
<b>Drinking-Water System Owner:</b>	Township of Edwardsburgh Cardinal
<b>Drinking-Water System Category:</b>	Large Municipal, Residential
<b>Period being reported:</b>	January 1, 2019 to December 31, 2019

<p align="center"><b><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></b></p> <p>Does your Drinking-Water System serve more than 10,000 people? Yes [ ] No [ X ]</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes [ X ] No [ ]</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Cardinal Wastewater Treatment Plant 4000 John St Cardinal, Ontario K0E 1E0</p> </div>	<p align="center"><b><u>Complete for all other Categories.</u></b></p> <p>Number of Designated Facilities served: <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [ ] No [ ]</p> <p>Number of Interested Authorities you report to: <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [ ] No [ ]</p>
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Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Drinking Water System Name	Drinking Water System Number

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?  
Yes [ ] No [ ]



Indicate how you notified system users that your annual report is available, and is free of charge.

- Public access/notice via the web
- Public access/notice via Government Office
- Public access/notice via a newspaper
- Public access/notice via Public Request
- Public access/notice via a Public Library
- Public access/notice via other method \_\_\_\_\_

**Describe your Drinking-Water System**

This is a surface water treatment plant that receives its source water supply from the St. Lawrence River. Treatment consists of pre-chlorination, basket screens, chemically assisted coagulation and flocculation, 4 rapid dual media filters (anthracite coal and sand) for physical removal of turbidity, ultraviolet irradiation (primary disinfection) followed by post chlorination (secondary disinfection). Parameters such as uv intensity, chlorine residual, pH, filter and potable turbidity are continuously monitored. All process and security alarms are monitored 24/7 by Falcon Security. The distribution system includes an elevated storage tank, 6 sample stations, 82 hydrants and a mix of distribution material piping.

List all water treatment chemicals used over this reporting period:

Sodium Hypochlorite – ANSI/NSF 60  
 SternPAC (Aluminum chloride hydroxide sulphate) –ANSI/NSF 60

Were any significant expenses incurred to?

- Install required equipment
- Repair required equipment
- Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred

Annual inspection of chlorine injection ring and raw intake structure.  
 Semi-annual servicing of Trojan UV Swift 12.  
 Semi-annual servicing of backup generator.  
 Annual backflow testing.  
 Annual servicing and calibration of lab equipment/portable chlorine analyzers.  
 Semi-annual servicing of SCADA systems.  
 Annual servicing of fire alarm system.  
 Re-installed one high lift pump after servicing.  
 Serviced one Golden Anderson Check Valve at water plant.  
 Re-installed one low lift pump after servicing.  
 Repaired backflow preventer at water plant.  
 Replaced portable pH meter probe.  
 Replaced lamp in UV # 1 and UV # 2  
 Replaced mixing system in water tower (Capital Project)



Berm installed around south side of water plant for flood mitigation control.  
 Repaired two leaking water services  
 Repaired two fire hydrants.  
 Repaired two curb stops.

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre:

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period:

	Number of Samples	Range of E.Coli Or Fecal Results (min )-(max)	Range of Total Coliform Results (min )-(max)	Number of HPC Samples	Range of HPC Results (min )-(max)
<b>Raw</b>	53	0 – 14	2-86	N/A	N/A
<b>Treated</b>	53	0-0	0-0	53	<2- >500
<b>Distribution</b>	159	0-0	0-0	159	<2-14

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report:

Parameter	Number of Grab Samples	Range of Results (min #)-(max #)
<b>Potable Turbidity</b>		
Continuous	8760	0.06 – 0.25
Grab	365	0.04 – 0.16
<b>Filter 1A Turbidity</b>		
Continuous	8760	0.05 - 0.25
Grab	730	0.04 – 0.18
<b>Filter 1B Turbidity</b>		
Continuous	8760	0.03 - 0.23
Grab	723	0.04 – 0.16
<b>Filter 2A Turbidity</b>		
Continuous	8760	0.03 – 0.44
Grab	729	0.04 - 0.14
<b>Filter 2B Turbidity</b>		
Continuous	8760	0.06 – 0.22
Grab	726	0.04 – 0.17

**NOTE:** For continuous monitors use 8760 as the number of samples.



<b>Chlorine (Primary)</b>		
Continuous	8760	0.28 – 3.12
Grab	730	0.10 - 3.40
<b>Chlorine(Point of Entry)</b>		
Continuous	8760	1.33 – 3.18
Grab	730	1.3 – 3.3
<b>Chlorine(Distribution)</b>		
Grab: Free:	842	0.27 – 2.20
Total:	728	0.47 – 2.6
UV Disinfection	8760	47.05 -78.32
Fluoride	N/A	N/A

**NOTE:** Units of measures include:

- Chlorine – mg/L
- Turbidity – NTU
- UV – mj/cm<sup>2</sup>

**Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.**

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
N/A	N/A	N/A	N/A	N/A

**Summary of Inorganic parameters tested during this reporting period or the most recent sample results:**

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
<b>Antimony</b>	09-Oct-19	0.0001	mg/L	No
<b>Arsenic</b>	09-Oct-19	0.0006	mg/L	No
<b>Barium</b>	15-Oct-19	0.020	mg/L	No
<b>Boron</b>	15-Oct-19	0.019	mg/L	No
<b>Cadmium</b>	09-Oct-19	<0.000015	mg/L	No
<b>Chromium</b>	15-Oct-19	<0.002	mg/L	No
<b>*Lead</b>	07-Jan-19	<0.00002	mg/L	No
<b>Mercury</b>	11-Oct-19	<0.00002	mg/L	No
<b>Selenium</b>	09-Oct-19	<0.001	mg/L	No
<b>Sodium</b>	02-Dec-19	18.2	mg/L	No
<b>Uranium</b>	09-Oct-19	0.00025	mg/L	No
<b>Fluoride</b>	05-Dec-19	<0.1	mg/L	No
<b>Nitrite</b>	05-Dec-19	<0.1	mg/L	No
<b>Nitrate</b>	05-Dec-19	<0.1	mg/L	No

\*only for drinking water systems testing under Schedule 15.2; this includes large municipal non-residential systems, small municipal non-residential systems, non-municipal seasonal residential systems, large non-municipal non-residential systems, and small non-municipal non-residential systems

**Summary of lead testing under Schedule 15.1 during this reporting period**  
 (applicable to the following drinking water systems; large municipal residential systems, small municipal residential systems, and non-municipal year-round residential systems)

Location Type	Number of Samples	Range of Lead Results (min) – (max)	Number of Exceedances
Plumbing	N/A	N/A	N/A
Distribution	4	0.00008-0.00047	0

**Summary of Organic parameters sampled during this reporting period or the most recent sample results**

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	21-Oct-19	<0.3	ug/L	No
Atrazine + N-dealkylated metabolites	21-Oct-19	<0.5	ug/L	No
Azinphos-methyl	21-Oct-19	<1	ug/L	No
Benzene	15-Oct-19	<0.5	ug/L	No
Benzo(a)pyrene	21-Oct-19	<0.005	ug/L	No
Bromoxynil	21-Oct-19	<0.5	ug/L	No
Carbaryl	21-Oct-19	<3	ug/L	No
Carbofuran	21-Oct-19	<1	ug/L	No
Carbon Tetrachloride	15-Oct-19	<0.2	ug/L	No
Chlorpyrifos	21-Oct-19	<0.5	ug/L	No
Diazinon	21-Oct-19	<1	ug/L	No
Dicamba	21-Oct-19	<10	ug/L	No
1,2-Dichlorobenzene	15-Oct-19	<0.5	ug/L	No
1,4-Dichlorobenzene	15-Oct-19	<0.5	ug/L	No
1,2-Dichloroethane	15-Oct-19	<0.5	ug/L	No
1,1-Dichloroethylene (vinylidene chloride)	15-Oct-19	<0.5	ug/L	No
Dichloromethane	15-Oct-19	<5	ug/L	No
2,4 Dichlorophenol	21-Oct-19	<0.1	ug/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	21-Oct-19	<10	ug/L	No
Diclofop-methyl	21-Oct-19	<0.9	ug/L	No
Dimethoate	21-Oct-19	<1	ug/L	No
Diquat	11-Oct-19	<5	ug/L	No
Diuron	21-Oct-19	<5	ug/L	No
Glyphosate	17-Oct-19	<25	ug/L	No
Malathion	21-Oct-19	<5	ug/L	No
MCPA	25-Oct-19	<10	Ug/L	No
Metolachlor	21-Oct-19	<3	ug/L	No
Metribuzin	21-Oct-19	<3	ug/L	No
Monochlorobenzene	15-Oct-19	<0.5	ug/L	No
Paraquat	11-Oct-19	<1	ug/L	No



Pentachlorophenol	21-Oct-19	<0.1	ug/L	No
Phorate	21-Oct-19	<0.3	ug/L	No
Picloram	21-Oct-19	<5	ug/L	No
Polychlorinated Biphenyls(PCB)	11-Oct-19	<0.05	ug/L	No
Prometryne	21-Oct-19	<0.1	ug/L	No
Simazine	21-Oct-19	<0.5	ug/L	No
THM (Running Annual average)	2019	51.3	ug/L	No
HAA (Running annual average)	2019	35.4	ug/L	No
Terbufos	21-Oct-19	<0.3	ug/L	No
Tetrachloroethylene	15-Oct-19	<0.5	ug/L	No
2,3,4,6-Tetrachlorophenol	21-Oct-19	<0.1	ug/L	No
Triallate	21-Oct-19	<10	ug/L	No
Trichloroethylene	15-Oct-19	<0.5	ug/L	No
2,4,6-Trichlorophenol	21-Oct-19	<0.1	ug/L	No
Trifluralin	21-Oct-19	<0.5	ug/L	No
Vinyl Chloride	15-Oct-19	<0.2	ug/L	No

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	Date of Sample