



OPTIONAL ANNUAL REPORT TEMPLATE

Drinking-Water System Number:	220003582
Drinking-Water System Name:	Cardinal Water System
Drinking-Water System Owner:	Township of Edwardsburgh Cardinal
Drinking-Water System Category:	Large Municipal, Residential
Period being reported:	January 1, 2021 to December 31, 2021

<p><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></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><p>Cardinal Wastewater Treatment Plant 4000 John St Cardinal, Ontario K0E 1E0</p></div>	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served: <input 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 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 []



Ontario Drinking-Water Systems Regulation O. Reg. 170/03

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.
Installed a new Golden Anderson Pump Director.
Fall arrest system replaced and upgraded in the Cardinal Water Tower.
Replaced Filter 2B turbidity analyzer and backwash valves.
Replaced media in filter 1A.
Replaced two UV lamps.
Purchased two spare dosimeter boards for UV Systems.



Replaced chlorine transfer pump.
Upgraded the Falcon Security communicator system.
Replaced pH probes in clearwell and post chlorine analyzers.

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
N/A	N/A	N/A	N/A	N/A	N/A

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)
Raw	52	0 – 17	0 - 53	N/A	N/A
Treated	52	0 - 0	0 - 0	52	<2 - 2
Distribution	156	0 - 0	0 - 0	156	<2 - 500

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 #)
Potable Turbidity		
Continuous	8760	0.07 – 0.18
Grab	365	0.05 - 0.18
Filter 1A Turbidity		
Continuous	8760	0.01 – 0.20
Grab	724	0.05 – 0.13
Filter 1B Turbidity		
Continuous	8760	0.01 – 0.13
Grab	730	0.04 - 0.16
Filter 2A Turbidity		
Continuous	8760	0.05 – 0.40
Grab	730	0.04 - 0.18
Filter 2B Turbidity		
Continuous	8760	0.01 – 0.27
Grab	729	0.04 - 0.21

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

Chlorine (Primary)		
Continuous	8760	0.36 -2.96
Grab	730	0.4 - 3.1
Chlorine(Point of Entry)		
Continuous	8760	0.98 – 4.05
Grab	730	1.7 – 3.3
Chlorine(Distribution)		
Grab: Free:	826	0.40 – 2.20
Total:	730	0.60 - 2.20
UV Disinfection	8760	0.40 – 73.63
Fluoride	N/A	N/A

NOTE: Units of measures include:

Chlorine – mg/L

Turbidity – NTU

UV – mj/cm²

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
Antimony	Oct 12, 2021	0.0001	mg/L	No
Arsenic	Oct 12, 2021	0.0006	mg/L	No
Barium	Oct 5, 2021	0.022	mg/L	No
Boron	Oct 5, 2021	0.021	mg/L	No
Cadmium	Oct 12, 2021	<0.000015	mg/L	No
Chromium	Oct 5, 2021	< 0.002	mg/L	No
*Lead	Jan 4, 2021	<0.00002	mg/L	No
Mercury	Oct 8, 2021	<0.00002	mg/L	No
Selenium	Oct 12, 2021	<0.001	mg/L	No
Sodium	Nov 1, 2021	19.7	mg/L	No
Uranium	Oct 12, 2021	0.00016	mg/L	No
Fluoride	Dec 6, 2021	0.2	mg/L	No
Nitrite	Dec 6, 2021	<0.1	mg/L	No
Nitrate	Dec 6, 2021	0.2	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 (mg/L) (min) – (max)	Number of Exceedances
Plumbing	N/A	N/A	N/A
Distribution	4	0.00009-0.00017	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	Oct 15, 2021	< 0.3	ug/L	No
Atrazine + N-dealkylated metabolites	Oct 15, 2021	< 0.6	ug/L	No
Azinphos-methyl	Oct 15, 2021	< 0.1	ug/L	No
Benzene	Oct 12, 2021	< 0.5	ug/L	No
Benzo(a)pyrene	Oct 15, 2021	< 0.006	ug/L	No
Bromoxynil	Oct 15, 2021	< 0.5	ug/L	No
Carbaryl	Oct 15, 2021	< 3	ug/L	No
Carbofuran	Oct 15, 2021	< 1	ug/L	No
Carbon Tetrachloride	Oct 12, 2021	< 0.2	ug/L	No
Chlorpyrifos	Oct 15, 2021	< 0.6	ug/L	No
Diazinon	Oct 15, 2021	< 1	ug/L	No
Dicamba	Oct 15, 2021	< 10	ug/L	No
1,2-Dichlorobenzene	Oct 12, 2021	< 0.5	ug/L	No
1,4-Dichlorobenzene	Oct 12, 2021	< 0.5	ug/L	No
1,2-Dichloroethane	Oct 12, 2021	< 5	ug/L	No
1,1-Dichloroethylene (vinylidene chloride)	Oct 12, 2021	< 0.5	ug/L	No
Dichloromethane	Oct 12, 2021	< 5	ug/L	No
2-4 Dichlorophenol	Oct 15, 2021	< 0.2	ug/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	Oct 15, 2021	< 10	ug/L	No
Diclofop-methyl	Oct 15, 2021	< 0.9	ug/L	No
Dimethoate	Oct 15, 2021	< 1	ug/L	No
Diquat	Oct 15, 2021	< 5	ug/L	No
Diuron	Oct 15, 2021	< 5	ug/L	No
Glyphosate	Oct 14, 2021	< 25	ug/L	No
Malathion	Oct 15, 2021	< 6	ug/L	No
MCPA	Oct 18, 2021	< 10	Ug/L	No
Metolachlor	Oct 15, 2021	< 3	ug/L	No
Metribuzin	Oct 15, 2021	< 3	ug/L	No
Monochlorobenzene	Oct 12, 2021	< 0.5	ug/L	No



Paraquat	Oct 15, 2021	< 1	ug/L	No
Pentachlorophenol	Oct 15, 2021	< 0.2	ug/L	No
Phorate	Oct 15, 2021	< 0.3	ug/L	No
Picloram	Oct 15, 2021	< 15	ug/L	No
Polychlorinated Biphenyls(PCB)	Oct 15, 2021	< 0.05	ug/L	No
Prometryne	Oct 15, 2021	< 0.1	ug/L	No
Simazine	Oct 15, 2021	< 0.6	ug/L	No
THM (Running Annual average)	2021	70.75	ug/L	No
HAA (Running annual average)	2021	33.5	ug/L	No
Terbufos	Oct 15, 2021	< 0.5	ug/L	No
Tetrachloroethylene	Oct 12, 2021	< 0.5	ug/L	No
2,3,4,6-Tetrachlorophenol	Oct 15, 2021	< 0.2	ug/L	No
Triallate	Oct 15, 2021	< 10	ug/L	No
Trichloroethylene	Oct 12, 2021	< 0.5	ug/L	No
2,4,6-Trichlorophenol	Oct 15, 2021	< 0.2	ug/L	No
Trifluralin	Oct 15, 2021	< 0.6	ug/L	No
Vinyl Chloride	Oct 12, 2021	< 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