



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, 2024 to December 31, 2024

<p align="center"><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 style="border: 1px solid black; padding: 5px; margin-top: 10px;"> Cardinal Water Control Pollution Plant 4000 John St Cardinal, Ontario K0E 1E0 </div>	<p align="center"><u>Complete for all other Categories.</u></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
N/A	N/A

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.

- [X] Public access/notice via the web
- [] Public access/notice via Government Office
- [X] 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, 85 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. (\$2035)
 Semi-annual servicing of Trojan UV Swift 12. (\$4147)
 Semi-annual servicing of backup generator. (\$1642.50)
 Annual backflow testing. (\$847.50)
 Annual servicing and calibration of lab equipment/portable chlorine analyzers. (\$4745)
 Semi-annual servicing of SCADA systems. (\$6000)
 Annual Fire System inspection. (\$557.09)
 UV communication upgrade. (\$10,436)
 Interior ROV inspection of water tower. (\$5749)
 Replaced entry door keypad and door contactor. (\$550)
 Purchased new Dr 3900 HACH Benchtop spectrophotometer (\$8654)
 Repaired radiator in portable generator. (\$7887.60)
 Replaced FBM communication card. (\$1200)
 IECBL replaced two high lift pump starter panels. (\$8000)
 IECBL replaced three low lift pump starter panels (\$7746)
 Purchased new chlorine pump (\$2,221)
 Purchased new turbidity analyzer (\$10,248.91)
 Upgraded ceiling mounted light fixtures to LED. (\$3969)
 Repaired four fire hydrants. (\$3,400.66)
 Purchased and replaced HDMI screen in UV # 1. (\$3099)
 Purchased spare components for chlorine analyzer. (\$1888)
 Replaced 12 water services on Reid Street. (\$77,820)
 Replaced sample hydrant. (\$2000)
 Replaced UPS battery backup unit at water tower. (\$300)



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

Repair boiler at water plant. (\$822.64)
 Replaced potable chlorine analyzer pH probe. (\$623.87)
 Replaced MAC valve controller on filter 2A. (\$314.60).

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	53	0-13	0-300	N/A	N/A
Treated	53	0-0	0-0	53	<2-2
Distribution	159	0-0	0-0	159	<2-6

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	0.02-0.06
Grab	366	0.06-0.15
Filter 1A Turbidity		
Continuous	8760	0.01-0.15
Grab	731	0.06-0.13
Filter 1B Turbidity		
Continuous	8760	0.01-0.10
Grab	730	0.03-0.13
Filter 2A Turbidity		
Continuous	8760	0.05-0.35
Grab	732	0.05-0.15
Filter 2B Turbidity		
Continuous	8760	0.01-0.16
Grab	732	0.06-0.18
Chlorine (Primary)		
Continuous	8760	0.50-5.00
Grab	366	0.28 - 2.01

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



Chlorine(Point of Entry)		
Continuous	8760	1.48-3.21
Grab	732	1.54-3.25
Chlorine(Distribution)		
Grab: Free:	850	0.42-2.20
Total:	732	0.61-2.44
UV Disinfection	8760	46.18-73.05
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.

Microcystin detected in raw water sample collected on September 9, 2024. Spills Action Reference # # 1-AQJAM4. Harmful Algal bloom sampling plan initiated as per Municipal Drinking Water Licence # 155-102.

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Raw)	June 3, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Raw)	July 8, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Raw)	August 12, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Raw)	September 9, 2024	0.79	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Raw)	September 16, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Potable)	September 16, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Shoreline)	September 16, 2024	0.21	ug/L



Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Raw)	September 23, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Potable)	September 23, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Shoreline)	September 23, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Raw)	October 1, 2024	0.18	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Potable)	October 1, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Shoreline)	October 1, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Raw)	October 3, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Potable)	October 3, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Shoreline)	October 3, 2024	0.72	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Raw)	October 7, 2024	0.19	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Potable)	October 7, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Shoreline)	October 7, 2024	0.18	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Raw)	October 15, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Potable)	October 15, 2024	<0.15	ug/L

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Shoreline)	October 15, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Raw)	October 21, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Potable)	October 21, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Shoreline)	October 21, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Raw)	October 28, 2024	0.23	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Potable)	October 28, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Shoreline)	October 28, 2024	<0.15	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Raw)	November 4, 2024	<0.10	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Potable)	November 4, 2024	<0.10	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Shoreline)	November 4, 2024	<0.10	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Raw)	November 11, 2024	<0.10	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Potable)	November 11, 2024	<0.10	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Shoreline)	November 11, 2024	<0.10	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Raw)	November 18, 2024	<0.10	ug/L
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Potable)	November 18, 2024	<0.10	ug/L

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
Municipal Drinking Water Licence (October 22, 2021)	Microcystin (Shoreline)	November 18, 2024	<0.10	ug/L

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	October 7, 2024	0.0001	mg/L	No
Arsenic	October 7, 2024	0.0006	mg/L	No
Barium	October 7, 2024	0.020	mg/L	No
Boron	October 7, 2024	0.017	mg/L	No
Cadmium	October 7, 2024	<0.000015	mg/L	No
Chromium	October 7, 2024	< 0.0010	mg/L	No
*Lead	January 2, 2024	<0.00002	mg/L	No
Mercury	October 7, 2024	<0.00002	mg/L	No
Selenium	October 7, 2024	<0.001	mg/L	No
Sodium	March 4, 2024 October 7, 2024	17.8 17.1	mg/L mg/L	No No
Uranium	October 7, 2024	0.00024	mg/L	No
Fluoride	December 2, 2024	<0.1	mg/L	No
Nitrite	December 2, 2024	0.10	mg/L	No
Nitrate	December 2, 2024	0.18	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 system

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	0
Distribution	2	0.00005-0.00006	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	October 7, 2024	< 0.3	ug/L	No
Atrazine + N-dealkylated metabolites	October 7, 2024	< 0.5	ug/L	No



Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Azinphos-methyl	October 7, 2024	< 1	ug/L	No
Benzene	October 7, 2024	< 0.5	ug/L	No
Benzo(a)pyrene	October 7, 2024	< 0.006	ug/L	No
Bromoxynil	October 7, 2024	< 0.5	ug/L	No
Carbaryl	October 7, 2024	< 3	ug/L	No
Carbofuran	October 7, 2024	< 1	ug/L	No
Carbon Tetrachloride	October 7, 2024	< 0.2	ug/L	No
Chlorpyrifos	October 7, 2024	< 0.5	ug/L	No
Diazinon	October 7, 2024	< 1	ug/L	No
Dicamba	October 7, 2024	< 1	ug/L	No
1,2-Dichlorobenzene	October 7, 2024	< 0.5	ug/L	No
1,4-Dichlorobenzene	October 7, 2024	< 0.5	ug/L	No
1,2-Dichloroethane	October 7, 2024	<0.5	ug/L	No
1,1-Dichloroethylene (vinylidene chloride)	October 7, 2024	< 0.5	ug/L	No
Dichloromethane	October 7, 2024	< 5	ug/L	No
2-4 Dichlorophenol	October 7, 2024	< 0.2	ug/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	October 7, 2024	< 1	ug/L	No
Diclofop-methyl	October 7, 2024	< 0.9	ug/L	No
Dimethoate	October 7, 2024	< 1	ug/L	No
Diquat	October 7, 2024	< 5	ug/L	No
Diuron	October 7, 2024	< 5	ug/L	No
Glyphosate	October 7, 2024	< 25	ug/L	No
Malathion	October 7, 2024	< 5	ug/L	No
MCPA	October 7, 2024	< 10	Ug/L	No
Metolachlor	October 7, 2024	< 3	ug/L	No
Metribuzin	October 7, 2024	< 3	ug/L	No
Monochlorobenzene	October 7, 2024	< 0.5	ug/L	No
Paraquat	October 7, 2024	< 1	ug/L	No
Pentachlorophenol	October 7, 2024	< 0.2	ug/L	No
Phorate	October 7, 2024	< 0.3	ug/L	No
Picloram	October 7, 2024	< 5	ug/L	No
Polychlorinated Biphenyls(PCB)	October 7, 2024	< 0.05	ug/L	No
Prometryne	October 7, 2024	< 0.1	ug/L	No
Simazine	October 7, 2024	< 0.5	ug/L	No
THM (Running Annual average)	2024	63.5	ug/L	No
HAA (Running annual average)	2024	33.4	ug/L	No
Terbufos	October 7, 2024	< 0.5	ug/L	No
Tetrachloroethylene	October 7, 2024	< 0.5	ug/L	No
2,3,4,6-Tetrachlorophenol	October 7, 2024	< 0.2	ug/L	No



Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Triallate	October 7, 2024	< 10	ug/L	No
Trichloroethylene	October 7, 2024	< 0.5	ug/L	No
2,4,6-Trichlorophenol	October 7, 2024	< 0.2	ug/L	No
Trifluralin	October 7, 2024	< 0.5	ug/L	No
Vinyl Chloride	October 7, 2024	< 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