



Kincardine Drinking Water System

2020 Annual Water Summary Report

1. INTRODUCTION AND BACKGROUND

The municipality owns and operates drinking water systems to provide residents with safe, potable water. These municipal drinking water systems are regulated under various legislation and legal documents including the Safe Drinking Water Act and Ontario Regulation 170/03 Drinking Water Systems. O. Reg. 170 requires that the municipality complete an annual water report (Section 11) and an annual summary report (Schedule 22). The information required for each of these reports has been combined into this one report.

The reports are available free of charge on the municipal website at www.kincardine.ca or by contacting the Water Services Department at waterservice@kincardine.ca. Requests will also be received in person or by telephone at the Municipal Administration Centre (1475 Concession 5, 519-396-3468) or the Water Services Office (155 Durham Street, Kincardine, 519-396-4660).

1.1. System Description

Drinking-Water System Number:	220002716
Drinking-Water System Name:	Kincardine Drinking Water System
Drinking-Water System Owner:	Municipality of Kincardine
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	Year 2020

The Kincardine Drinking Water System (DWS) takes water from Lake Huron and treats it using a surface water treatment plant. The water treatment plant provides conventional filtration and consists of two Actiflo clarifiers, four filters, a chlorination system and an underground reservoir. The intake capacity is 18,750 m³/d and the treatment plant rated capacity is 11,563 m³/d. The chemicals used for treatment are Clar+ion A5, Magnafloc LT27AG, Actisand and chlorine gas. The distribution system serves the town of Kincardine and residents north of the town via a pipeline, plus the Huronville Subdivision Distribution System owned by the Township of Huron-Kinloss, with a total of over 3800 connections. There is a 3,360 m³ standpipe to provide water storage, pressure and fire protection for the distribution system. A Booster Chlorination Facility is located at the north end of the distribution system for the Inverhuron Provincial Park. In 2018, a Booster Station was commissioned for monitoring and increasing pressure and chlorination for lands to the north of Gary Street.

1.2. Major Expenses

The system incurred expenses necessary to install, repair or replace required equipment as follows:

Treatment Equipment (\$5,239.00)

Monitoring Equipment (\$12,235.00)

Distribution Repairs and Replacement (\$321,353.00)

Standpipe upgrades (\$603,428.00)

2. WATER QUALITY MONITORING

Each municipal drinking water system is required to do testing to ensure that the water supplied to consumers is safe for consumption. Some of these tests such as chlorine residuals are done on site while others, like microbiological testing, must be performed by a licenced laboratory.

2.1. Microbiological Testing

O. Reg. 170 Schedule 10, requires the Kincardine DWS to take a minimum of one sample per week of raw, treated and distribution water with a minimum of eighteen distribution samples required every month. All raw, treated and distribution samples must be tested for Escherichia coli (E. coli) and total coliforms (TC). All the treated samples and twenty five percent of the distribution samples must also be tested for heterotrophic plate count (HPC). Our internal sampling schedule exceeds the minimum requirements by having operations staff collect one raw, one treated and five distribution sample every week and have them tested for E. coli, total coliform and HPC.

Any E. coli or total coliform results above zero (0) in treated or distribution water must be reported to the Ministry of Environment, Conservation and Parks (MECP) and the Medical Officer of Health (MOH).

Heterotrophic plate count is a colony count of general bacteria population. There is no adverse limit for HPC samples. Results over 500 colonies per 1 mL may indicate a change in water quality but it is not considered an indicator of unsafe water.

The results from the 2020 sampling program are shown in the table below. Samples taken in addition to our sampling program for things like watermain repairs or construction projects are not included here.

Water Source	Number of Samples	Range of Total Coliform Results (#-#)	Range of E. coli Results (#-#)	Number of HPC Samples	Range of HPC Results (#-#)
Raw	53	0 – 1960	0 – 20	53	5 – 740
Treated	53	0 – 0	0 – 0	53	0 – 1
Distribution	265	0 – 3	0 – 0	265	0 – 151

2.2. Chemical Testing

The Safe Drinking Water Act Reg 170 Schedule 13 requires periodic testing of the water for chemical parameters. The Kincardine DWS is required to test for nitrite/nitrate, trihalomethanes and haloacetic acids on a quarterly basis. The tables below outline these as well as other inorganic and organic parameters that are required to be tested for annually and include the date and result of the most recent test. Any result displayed as less than (<) are below the method detection limit of the licenced lab.

Sodium and fluoride are not found in significant levels in the treated water and fluoride is not added to the drinking water. Sodium and fluoride are only required to be tested for every five years and were last tested for in 2018.

If the concentration of a parameter is above half of the Maximum Acceptable Concentration (MAC) under the Ontario Drinking Water Quality Standards, an increased testing frequency of once every three months is required by O. Regulation 170. There were no parameters above the half MAC that were required to be tested for quarterly in 2020.

Inorganic Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	October 13/20	<0.09	µg/L	No
Arsenic	October 13/20	0.2	µg/L	No
Barium	October 13/20	14.4	µg/L	No
Boron	October 13/20	10	µg/L	No
Cadmium	October 13/20	0.003	µg/L	No
Chromium	October 13/20	0.21	µg/L	No
Mercury	October 13/20	<0.01	µg/L	No
Selenium	October 13/20	0.10	µg/L	No
Sodium	November 5/18	4.46	mg/L	No
Uranium	October 13/20	0.022	µg/L	No
Fluoride	October 15/18	< 0.06	mg/L	No
Nitrite	January 13/20 April 20/20 July 13/20 October 13/20	<0.003 <0.003 <0.003 <0.003	mg/L	No
Nitrate	January 13/20 April 20/20 July 13/20 October 13/20	0.473 0.298 0.255 0.289	mg/L	No

Organic Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	October 13/20	< 0.02	µg/L	No
Atrazine + N-dealkylated metabolites	October 13/20	0.03	µg/L	No
Azinphos-methyl	October 13/20	< 0.05	µg/L	No
Benzene	October 13/20	< 0.32	µg/L	No
Benzo(a)pyrene	October 13/20	< 0.004	µg/L	No
Bromoxynil	October 13/20	< 0.33	µg/L	No
Carbaryl	October 13/20	< 0.05	µg/L	No
Carbofuran	October 13/20	< 0.01	µg/L	No
Carbon Tetrachloride	October 13/20	< 0.17	µg/L	No
Chlorpyrifos	October 13/20	< 0.02	µg/L	No
Diazinon	October 13/20	< 0.02	µg/L	No
Dicamba	October 13/20	< 0.20	µg/L	No
1,2-Dichlorobenzene	October 13/20	< 0.41	µg/L	No
1,4-Dichlorobenzene	October 13/20	< 0.36	µg/L	No
1,2-Dichloroethane	October 13/20	< 0.35	µg/L	No
1,1-Dichloroethylene	October 13/20	< 0.33	µg/L	No
Dichloromethane	October 13/20	< 0.35	µg/L	No
2,4 Dichlorophenol	October 13/20	< 0.15	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	October 13/20	< 0.19	µg/L	No
Diclofop-methyl	October 13/20	< 0.40	µg/L	No
Dimethoate	October 13/20	< 0.06	µg/L	No
Diquat	October 13/20	< 1	µg/L	No
Diuron	October 13/20	< 0.03	µg/L	No
Glyphosate	October 13/20	< 1	µg/L	No
Malathion	October 13/20	< 0.02	µg/L	No
2 methyl-4-chlorophenoxyacetic acid	October 13/20	<	µg/L	No
Metolachlor	October 13/20	< 0.01	µg/L	No
Metribuzin	October 13/20	< 0.02	µg/L	No
Monochlorobenzene	October 13/20	< 0.3	µg/L	No
Paraquat	October 13/20	< 1	µg/L	No
Pentachlorophenol	October 13/20	< 0.15	µg/L	No
Phorate	October 13/20	< 0.01	µg/L	No
Picloram	October 13/20	< 1	µg/L	No
Polychlorinated Biphenyls (PCB)	October 13/20	< 0.04	µg/L	No
Prometryne	October 13/20	< 0.03	µg/L	No
Simazine	October 13/20	< 0.01	µg/L	No
Terbufos	October 13/20	< 0.01	µg/L	No
Tetrachloroethylene	October 13/20	< 0.35	µg/L	No
2,3,4,6-Tetrachlorophenol	October 13/20	< 0.20	µg/L	No
Triallate	October 13/20	< 0.01	µg/L	No
Trichloroethylene	October 13/20	< 0.44	µg/L	No
2,4,6-Trichlorophenol	October 13/20	< 0.25	µg/L	No
Trifluralin	October 13/20	< 0.02	µg/L	No
Vinyl Chloride	October 13/20	< 0.17	µg/L	No

Trihalomethane (THM) distribution sampling is required quarterly and must also be expressed as a running annual average. The limit as set in the Ontario Drinking Water Quality Standards is 100 ug/L. Trihalomethanes are a by-product of the disinfection process.

Date Sampled	THM Result Value (µg/L)	Running Annual Average (µg/L)	Exceedance
January 13/20	24	25.0	No
April 20/20	25	24.8	No
July 13/20	19	24.8	No
October 13/20	27	23.8	No

Sampling and testing for haloacetic acids (HAA) in the distribution system was a new requirement as of 2017. The limit as set in the Ontario Drinking Water Quality Standards is 80 ug/L and starting in 2020 must also be expressed as a running annual average. Haloacetic acids are a by-product of the disinfection process.

Date Sampled	HAA Result Value (µg/L)	Running Annual Average (µg/L)	Exceedance
January 13/20	6.2	5.5	No
April 20/20	<5.3	5.5	No
July 13/20	7.9	6.2	No
October 13/20	<5.3	6.2	No

The Kincardine DWS does not have significant levels of lead and so is currently under a reduced-sampling program. Under this sampling program, O. Reg 170 Schedule 15.1 requires sampling for lead every three years and lead-related parameters (pH and alkalinity) every year. Lead was not required to be sampled in 2020. In 2018, the lead results in the distribution water ranged from 0.03 to 0.56 ug/L.

Date Sampled	Location Type	Number of Samples	Parameter	Range of Results
March 16, 2020	Distribution	4	pH	7.3 – 7.8
			Alkalinity (mg/L)	73 – 79
August 17, 2020	Distribution	4	pH	7.35 – 7.48
			Alkalinity (mg/L)	63 – 67

2.3. Operational Monitoring

The free chlorine residual must be monitored continuously on the treated water at the point of entry into the distribution system. A minimum of seven distribution grab samples are taken weekly and tested for free chlorine residual. In addition, free chlorine levels are monitored continuously within the treatment process and at two locations in the distribution system.

As a target, free chlorine residual within the distribution system should be above 0.20 mg/L. A free chlorine level lower than 0.05 mg/L must be reported to the Ministry of the Environment, Conservation and Parks Spills Action Centre and corrective action taken.

At the Kincardine Water Treatment Plant, turbidity is monitored continuously on the raw water, after each Actiflo unit, after each filter and at the point of entry into the distribution system. Turbidity is measured in nephelometric turbidity units (NTU).

Filter and point of entry turbidity is reported to the ministry's Spills Action Centre if it is greater than 1 NTU for greater than 15 minutes. There were no reportable turbidity events in 2020.

Treated Water at the Point of Entry into the Distribution System	Number of Grab Samples	Range of Results (#-#)
Turbidity	Continuous monitoring	0.0570 – 1.6864
Chlorine	Continuous monitoring	1.03 – 2.00

Distribution Water	Number of Grab Samples	Range of Results (#-#)
Free Chlorine Residual	366	0.30 – 1.35
Inverhuron Booster Station Free Chlorine Residual	Continuous Monitoring	0.45 – 1.37

The Ministry of the Environment, Conservation and Parks *Procedure for Disinfection of Drinking Water in Ontario* requires that the turbidity on each filter effluent line is less than or equal to 0.3 NTU at least 95% of the time each month.

Month	Filter #1	Filter #2	Filter #3	Filter #4
January	99.94%	99.90%	Out of service	99.88%
February	99.89%	99.95%	Out of service	100.00%
March	99.76%	99.93%	99.64%	99.95%
April	100.00%	99.99%	100.00%	99.81%
May	99.99%	99.93%	99.95%	99.87%
June	99.95%	100.00%	99.99%	99.63%
July	100.00%	100.00%	100.00%	99.86%
August	100.00%	99.93%	100.00%	99.85%
September	100.00%	100.00%	99.99%	99.69%
October	99.99%	100.00%	99.99%	99.94%
November	99.98%	100.00%	99.99%	99.68%
December	Out of service	99.98%	99.81%	99.75%

3. WATER QUANTITY

The following tables list the quantities and flow rates of the water supplied to the distribution system during the reporting period covered by this report, including monthly average and maximum daily flows, and a comparison to the rated capacity specified in the system Municipal Drinking Water Licence. The rated capacity is 11,563 m³/day. There is no maximum flow rate specified for water supplied to the distribution system.

Month	Average Daily Flow (m³/day)	% Average Day Flow/ Rated Capacity	Maximum Daily Flow (m³/day)	% Maximum Day Flow/ Rated Capacity
January	2,228.77	19%	2,562.590	22%
February	2,280.38	20%	2,507.080	22%
March	2,276.26	20%	2,536.610	22%
April	2,391.25	21%	2,989.820	26%
May	2,943.42	25%	4,545.690	39%
June	4,313.13	37%	5,697.270	49%
July	5,209.39	45%	6,420.590	56%
August	4,085.23	35%	4,906.330	42%
September	3,325.24	29%	4,811.430	42%
October	2,735.37	24%	3,046.260	26%
November	2,721.06	24%	3,256.890	28%
December	2,577.94	22%	3,148.730	27%
Annual	3,090.62	27%	6,420.590	56%

Month	Average Daily Flow Rate (L/s)	Maximum Daily Flow Rate (L/s)
January	25.8043	142.3130
February	25.4914	142.4440
March	26.3591	142.7810
April	27.6861	146.1380
May	34.0789	144.7500
June	49.9360	147.6190
July	60.3141	146.8500
August	47.2991	148.0310
September	38.4991	149.9810
October	31.6700	145.5750
November	31.5040	146.8690
December	29.8473	143.2310
Annual	35.7075	149.9810

4. ADVERSE WATER QUALITY INCIDENTS AND NON-COMPLIANCE FINDINGS

Any adverse results from microbiological samples, chemical samples or observations of operational conditions that indicate adverse water quality are reported to the Spills Action Centre (SAC) of the Ministry of the Environment, Conservation and Parks (MECP) and the Medical Officer of Health (MOH). All adverse conditions are responded to immediately and corrective actions taken. There were no adverse water quality incidents in 2020.

An annual Ministry of the Environment, Conservation and Parks Inspection was not completed in 2020. The ministry's inspection year extends from April 1, 2020 to March 31, 2021.

O. Reg 170 Schedule 22 requires the municipality to identify any requirements of the Act, Regulations, Drinking Water Works Permit, Municipal Drinking Water Licence and any Order that the system failed to meet during the reporting period.

Drinking Water Legislation	Requirements the System Failed to Meet	Duration	Corrective Actions
O. Reg. 170, Schedule 6.5. (1) 3.	Gary Street Booster data was not reviewed at a minimum of every 72 hours	Four times between March 9 to April 20	A data review checklist was created so that no site would be missed
O. Reg. 170, Section 13. (1)	Continuous monitoring data was not kept for at least two years. There was a loss of trending data from Filters 1 & 2 when the other was backwashing	Approximately one week around March 18	SCADA contractor corrected the problem
O. Reg. 170, Section 13. (1)	Continuous monitoring data was not kept for at least two years. There was a loss of trending data from Filter 2	June 6 to 7	SCADA contractor corrected the problem
O. Reg. 170, Schedule 6.5. (1.1) 1.	The continuous monitoring equipment did not cause an alarm to signal immediately at the Gary Street Booster Station	Corrected on June 12	Troubleshooting of system
MDWL 088-102 Schedule C Section 4.2	A monthly sample was not collected and tested for Total Suspended Solids when backwash water was directed to Lake Huron	May and June	A sample was collected in July and backwash water was redirected to the sanitary system
O. Reg. 170, Section 13. (1)	Continuous monitoring data was not kept for at least two years. There was a loss of trending data from Filter 4	July 27	Proximity switch adjustment made

Drinking Water Legislation	Requirements the System Failed to Meet	Duration	Corrective Actions
O. Reg. 170, Section 13. (1)	Continuous monitoring data was not kept for at least two years. The Inverhuron Booster Station data logger did not continuously collect data	February 18, 19, 21 to 24, August 19 to 31, September 21 to 24	A new data logger was installed