THE MUNICIPALITY OF

KINCARDINE

great energy. balanced life.

Underwood Drinking Water System

2025 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. This annual water summary report will be made available for inspection as per O. Reg. 170 subsection 12 (4).

The reports are available free of charge on the municipal website at www.kincardine.ca or by contacting the Environmental 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 Environmental Services Office (155 Durham Street, Kincardine, 519-396-4660).

1.1. System Description

Drinking-Water System Number:	220007052
Drinking-Water System Name:	Underwood Drinking Water System
Drinking-Water System Owner:	Municipality of Kincardine
Drinking-Water System Category:	Small Municipal Residential
Period being reported:	Year 2025

The Underwood Drinking Water System (DWS) is a non-GUDI system (which means that it is a secure well and not under the influence of surface water) consisting of a single well located in the hamlet of Underwood. The well is a drilled type with a 200 mm (8 in.) casing and is 122 m (400 ft) deep. It was drilled in August 1972 and is equipped with a submersible pump. Raw and treated water are each metered by mag meters. Sodium hypochlorite (NSF certified) is used for disinfection. There is on-line monitoring of chlorine. There are hydropneumatic tanks located in the control building that provide continuous pressure in the distribution system and allow for intermittent operation of the well pump. A chlorine contact chamber consisting of an 8.3 m length of 600 mm diameter pipe provides the required contact time. This system has a standby generator.

1.2. Major Expenses

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

Consultants	$5,198
Distribution Repairs	$9,021
Building Maintenance	$643

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 11, requires the Underwood DWS to take a minimum of one sample per month of raw water from the well, and one sample every two weeks of distribution water, and have them tested for Escherichia coli (E. coli) and total coliforms (TC). 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 treated and one distribution sample every week and have them tested for E. coli, total coliform and HPC. In addition, the raw water sampling was increased to weekly to monitor for the presence of microorganisms in the raw water. The water was disinfected adequately such that there were no E. coli or total coliform present in the treated or distribution water.

Any E. coli or total coliform results above zero in treated or distribution water must be reported to the Ministry of Environment, Conservation and Parks (MECP) and 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 2025 sampling program are shown in the table below.

Water Source	Number of TC/EC Samples	Range of Total Coliform Results (#-#)	Range of E. coli Results (#-#)	Number of HPC Samples	Range of HPC Results (#-#)
Raw	52	0 – 7	0 – 0	0	--
Treated	52	0 – 0	0 – 0	52	0 – 10
Distribution	52	0 – 0	0 – 0	52	0 – 10

2.2. Chemical Testing

O. Reg. 170 Schedule 13 requires periodic testing of the water for chemical parameters. The Underwood DWS is required to test for nitrite/nitrate and trihalomethanes on a quarterly basis. Haloacetic acid is required to be tested on a quarterly basis every third year due to its low levels in the system. The tables below outline other inorganic and organic parameters that are required to be tested every five years 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 lab.

Sodium and fluoride levels exceed the Ontario Drinking Water Quality Standards, but they are naturally occurring in the groundwater and do not need to be tested more frequently than every five years.

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. Arsenic is naturally occurring in the raw water and is tested for quarterly. The maximum acceptable concentration of arsenic in drinking water is 10 µg/L.

Inorganic Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	July 10/23	0.6	µg/L	No
Arsenic	January 13/25 April 14/25 July 14/25 October 6/25	6.2 5.6 5.9 5.1	µg/L	No
Barium	July 10/23	20.1	µg/L	No
Boron	July 10/23	239	µg/L	No
Cadmium	July 10/23	0.008	µg/L	No
Chromium	July 10/23	0.17	µg/L	No
Mercury	July 10/23	< 0.01	µg/L	No
Selenium	July 10/23	0.04	µg/L	No
Sodium	October 12/22 October 18/22	69.6 57.3	mg/L	Yes
Uranium	July 10/23	0.516	µg/L	No
Fluoride	April 11/23 April 17/23	1.75 1.61	mg/L	Yes
Nitrite	January 13/25 April 14/25 July 14/25 October 6/25	< 0.003 < 0.003 < 0.003 < 0.003	mg/L	No
Nitrate	January 13/25 April 14/25 July 14/25 October 6/25	0.008 0.011 0.008 0.012	mg/L	No

Organic Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	July 10/23	< 0.02	µg/L	No
Atrazine + N-dealkylated metabolites	July 10/23	< 0.01	µg/L	No
Azinphos-methyl	July 10/23	< 0.05	µg/L	No
Benzene	July 10/23	< 0.32	µg/L	No
Benzo(a)pyrene	July 10/23	< 0.004	µg/L	No
Bromoxynil	July 10/23	< 0.33	µg/L	No
Carbaryl	July 10/23	< 0.05	µg/L	No
Carbofuran	July 10/23	< 0.01	µg/L	No
Carbon Tetrachloride	July 10/23	< 0.17	µg/L	No
Chlorpyrifos	July 10/23	< 0.02	µg/L	No
Diazinon	July 10/23	< 0.02	µg/L	No
Dicamba	July 10/23	< 0.20	µg/L	No
1,4-Dichlorobenzene	July 10/23	< 0.36	µg/L	No
1,2-Dichlorobenzene	July 10/23	< 0.41	µg/L	No
1,2-Dichloroethane	July 10/23	< 0.35	µg/L	No
1,1-Dichloroethylene (vinylidene chloride)	July 10/23	< 0.33	µg/L	No
Dichloromethane	July 10/23	< 0.35	µg/L	No
2-4 Dichlorophenol	July 10/23	< 0.15	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	July 10/23	< 0.19	µg/L	No
Diclofop-methyl	July 10/23	< 0.40	µg/L	No
Dimethoate	July 10/23	< 0.06	µg/L	No
Diquat	July 10/23	< 1	µg/L	No
Diuron	July 10/23	< 0.03	µg/L	No
Glyphosate	July 10/23	< 1	µg/L	No
Malathion	July 10/23	< 0.02	µg/L	No
2 methyl-4-chlorophenoxyacetic acid (MCPA)	July 10/23	<0.00012	µg/L	No
Metolachlor	July 10/23	< 0.01	µg/L	No
Metribuzin	July 10/23	< 0.02	µg/L	No
Monochlorobenzene	July 10/23	< 0.3	µg/L	No
Paraquat	July 10/23	< 1	µg/L	No
Pentachlorophenol	July 10/23	< 0.15	µg/L	No
Phorate	July 10/23	< 0.01	µg/L	No
Picloram	July 10/23	< 1	µg/L	No
Polychlorinated Biphenyls (PCB)	July 10/23	<0.04	µg/L	No
Prometryne	July 10/23	< 0.03	µg/L	No
Simazine	July 10/23	< 0.01	µg/L	No
Terbufos	July 10/23	< 0.01	µg/L	No
Tetrachloroethylene	July 10/23	< 0.35	µg/L	No
2,3,4,6-Tetrachlorophenol	July 10/23	< 0.20	µg/L	No
Triallate	July 10/23	< 0.01	µg/L	No
Trichloroethylene	July 10/23	< 0.44	µg/L	No
2,4,6-Trichlorophenol	July 10/23	< 0.25	µg/L	No
Trifluralin	July 10/23	< 0.02	µg/L	No
Vinyl Chloride	July 10/23	< 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. Below are the THM results for 2025.

Date Sampled	THM Result Value (µg/L)	Running Annual Average (µg/L)	Exceedance
January 13/25	43	46.5	No
April 14/25	37	49.5	No
July 14/25	64	51.5	No
October 6/25	47	47.8	No

Sampling and testing for haloacetic acids (HAA) in the distribution system is a new requirement as of 2017. They are also required quarterly every third year as long as the results are below the limit. 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. Haloacetic acids sampling was not required in 2025.

Date Sampled	HAA Result Value (µg/L)	Running Annual Average (µg/L)	Exceedance
January 9/23	11.2	11.2	No
April 11/23	6.4	8.8	No
July 10/23	< 5.3	7.6	No
October 10/23	< 5.3	7.1	No

The Underwood 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. Only PH and Alkalinity sampling was performed in 2025, below are the results.

Date Sampled	Location Type	Number of Samples	Parameter	Results
March 24, 2025	Distribution	1	Lead (ug/L)	--
			pH	7.8
			Alkalinity (mg/L)	114
August 11, 2025	Distribution	1	Lead (ug/L)	--
			pH	8.1
			Alkalinity (mg/L)	117

2.3. Operational Monitoring

Sodium hypochlorite is used for primary and secondary disinfection. The free chlorine residual is monitored continuously on the treated water and must be checked a minimum of twice per week in the distribution system.

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

Our internal sampling schedule exceeds the minimum requirements by having operations staff collect one distribution free chlorine residual every day.

Free Chlorine Residual	Number of Grab Samples	Range of Results (#-#)
Treated Water	Continuous monitoring	0.00 – 10.00
Distribution Water	365	0.39 – 2.07

Notes:

1. Monthly lockout valve testing causes false min residuals to be recorded for treated water.
2. January 16-Analyzer maintenance caused a false min residual of 0mg/L and a false max of 10mg/L to be recorded.
3. March 2-Low cl2 alarm caused a min residual of 0.12mg/L to be recorded.
4. April 2-Analyzer maintenance caused a false max residual of 4.85mg/L to be recorded.
5. April 16-Analyzer maintenance caused a false min residual of 0mg/L and a false max of 10mg/L to be recorded.
6. June 27-Low cl2 alarm caused a min residual of 0.05mg/L to be recorded.
7. July 30-Low cl2 alarm caused a min residual of 0.12mg/L to be recorded.
8. July 31-Low cl2 alarm caused a min residual of 0.25mg/L to be recorded.
9. October 4-Low cl2 alarm and analyzer maintenance caused a false min residual of 0mg/L and a false max residual of 10mg/L to be recorded.
10. Nov 18-Low cl2 alarm caused a min residual of 0.5mg/L to be recorded
11. Nov 19-Low cl2 alarm caused a min residual of 0.11mg/L to be recorded.
12. Nov 27-Low cl2 alarm caused a min residual of 0.46mg/L.

O. Reg 170 Schedule 7 requires that turbidity in the raw water is tested at least once every month. Consistent turbidity results greater than 5 NTU could indicate surface water influence on the well.

Raw Water	Number of Grab Samples	Range of Results (#-#)
Turbidity	51	0.14 – 0.83

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 of the treatment system is 90.8 m^3/day. There is no maximum flow rate specified for water supplied to the distribution system.

Month	Total Treated Flow (m3)	Average Daily Flow (m^3/day)	% Average Day/Rated Capacity (m^3/day)	Maximum Daily Flow (m^3/day)	% Maximum Day/Rated Capacity (m^3/day)
January	428	14	18%	17	22%
February	460	16	21%	31	40%
March	466	15	19%	19	25%
April	461	15	20%	24	31%
May	471	15	20%	23	30%
June	515	17	22%	23	29%
July	511	16	21%	31	40%
August	522	17	22%	44	56%
September	460	15	20%	28	36%
October	449	14	19%	22	28%
November	478	16	20%	30	39%
December	526	17	22%	37	47%
Annual	**5,745**	**16**	**20%**	**44**	**56%**

Month	Average Daily Flow Rate (L/s)	Maximum Daily Flow Rate (L/s)
January	0.16	3.03
February	0.19	1.97
March	0.17	3.03
April	0.18	3.03
May	0.18	3.03
June	0.20	3.03
July	0.19	3.03
August	0.20	3.03
September	0.18	3.03
October	0.17	3.03
November	0.18	3.03
December	0.20	2.29
Annual	**0.18**	**3.03**

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 and the Medical Officer of Health (MOH). All adverse conditions are responded to immediately and corrective actions taken. There were no reportable incidents in 2025.

The annual MECP Inspection took place on November 6, 2025, for the period of May 8, 2024, to October 31, 2025. The inspection report did not identify non-compliance issues.

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. There were no issues identified in 2025.