2021 ANNUAL QUALITY REPORT

WATER SYSTEM NAME :

THE COLBORNE DRIKING WATER SYSTEM

SYSTEM OWNER :

THE CORPORATION OF THE TOWNSHIP OF CRAMAHE

Aquatech Canadian Water Services Inc.
7-2 Church Street West, Colborne, ON, K0K 1S0

THE COLBORNE WATER SUPPLY AND DISTRIBUTION SYSTEMS

2021 ANNUAL WATER QUALITY REPORT

R	DATE	PREPARED	VERIFIED	APPROVED
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DEFINITIONS

"Colborne DWS" refers to the Colborne Drinking Water System;

"Aquatech Canadian Water Services Inc. (ACWS)" refers to the Colborne DWS operating authority for the Township of Cramahe;

"2021 reporting period" refers to August 1st, 2021 to December 31st, 2021;

"Large municipal residential system" means a municipal drinking-water system that serves a major residential development and serves more than 100 private residences;

"O.Reg. 170/03" refers to the Ontario Regulation 170/03 made under the Safe Drinking Water Act, 2002 for Drinking-Water Systems;

"Permit to take Water No. 8612-BNENBH (PTTW)" refers to the permit to take water given by the Ontario Water Resources Act, R.S.O.1990 (OWRA) to the Township of Cramahe (Owner of the Colborne DWS);

"Ontario Municipal Water Licence No. 138-101" refers to the permit given to ACWS to operate the Colborne DWS;

"Sampling and testing requirements for large municipal residential systems" refers to schedule 1,6,7,10,13,15.1,16,17,22,23 and 24 of the O.Reg. 170/03;

"MECP" refers to the Ministry of the Environment and Conservation and Parks;

1.0 PURPOSE

1.1 SCOPE

Aquatech Canadian Water Services Inc. (ACWS) is mandated by the Township of Cramahe to take charge of the operation of the Colborne Drinking Water System (Colborne DWS).

The purpose of this Annual Water Quality Report is to provide information about the Colborne DWS operations and performance during the period of August 1st, 2021, to December 31st, 2021, to residents and stakeholders of the Township of Cramahe. The operating period from January 1st, 2021, to July 31st, 2021 was covered by the previous operating authority LakeFront Utilities Services Inc (LUSI). Highlights of this report contain summaries of plant operations, maintenance, sampling activities, and compliance with Ontario regulatory requirements.

The Annual Water Quality Report satisfies the regulatory requirements of the Safe Drinking Water Act , 2002 including the Drinking Water Quality Management Standard (DWQMS) reports to the owner, and regulatory requirements described in Section 11 and Schedule 22 of the Ontario Regulation 170/03 (O. Reg 170/03).

The Annual Water Quality Report is prepared by ACWS (operating authority) on behalf of the Township of Cramahe.

1.2 AVAILABILITY

ANNUAL WATER QUALITY REPORT

In compliance with the O. Reg 170/03, a copy of this Annual Water Quality Report is to be provided no later than February 28, 2022 to:

- Drinking Water System Owners (Township of Cramahe Mayor and Council)
- Owner and Operating Authority Top Management (ACWS)
- The Public

The Colborne DWS is a large municipal residential system that serves approximately 1,035 metered dwellings. Copies of this annual quality report are available online at https://cramahewateroperations.utilmate.com. Hard copies are also available upon request at ACWS's office at 2 Church Street, P.O. Box 474 Colborne, ON K0K 1S0.

SUMMARY REPORT

In compliance with schedule 22 of O. Reg 170/03, a copy of the summary reports is to be provided no later than March 31, 2022 to the municipal council of the Township of Cramahe. The Township of Cramahe must provide ACWS with a copy of the council resolution indicating the report has been accepted.

2.0 DESCRIPTION OF **DRINKING WATER SYSTEM**

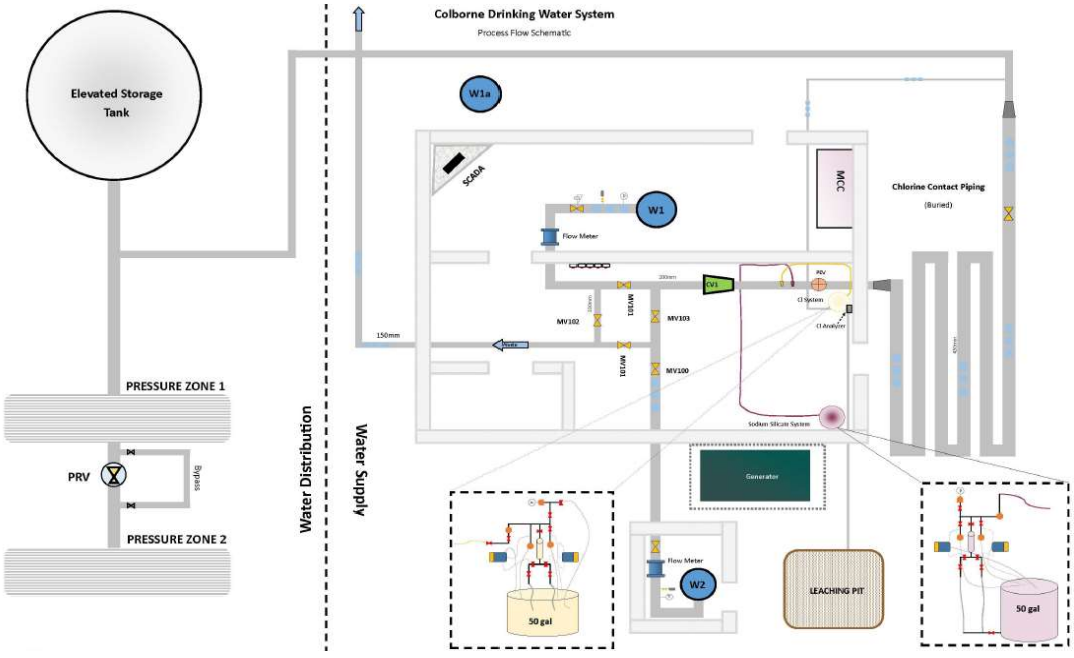
2.1 WATER SYSTEM

The Colborne DWS consists of two onsite groundwater wells (Well 1 and Well 2), two pump houses with one water treatment facility (Class 3), one storage reservoir, and approximately 27 km of distribution mains. The water usage at the Colborne DWS is considered a large municipal residential system used for domestic purposes and rated to a maximum daily flow of 3,283 m³.

The Colborne Water Treatment Plant (Colborne WTP) is located at 321 Purdy Road, Colborne, ON. The water supply for the Colborne WTP is obtained from Well 2 (Well 1 was used only for sampling and emergency use) Sodium hypochlorite is injected for primary disinfection and sodium silicate is added to sequester iron in the system. Primary disinfection is achieved then through the 215 m chlorine contact pipe (buried east of Colborne WTP).

As seen in figure 1, the distribution system consists of two regulated pressure zones regulated by two pressures reducing valves that maintain pressures ranging 20-90 PSI, the 2,342 m³ water storage tank (located north of Hwy. 401), 27 km of water mains, and 130 fire hydrants. After meeting the required contact time for primary disinfection, the treated water reaches the distribution system and the water storage tank. Water is then conveyed to each dwelling by the water mains. As of December 31, 2021, there are a total of 1,046 metered reads.

Figure 1. Colborne Drinking Water System



[Source: Drinking Water Works Permit No. 138-201, Issue 3, February 02, 2022)

3.0 COMPLIANCE **2021**

3.1 APPLICABLE LEGISLATIONS & REQUIREMENTS

During the 2021 reporting period, the Colborne DWS (Class 3 WTP) has been operated by ACWS in accordance with O. Reg 170/03, Permit to take Water No. 8612-BNENBH (PTTW), Drinking Water Works Permit 138-201, and Ontario Municipal Water Licence No. 138-101.

3.2 ADVERSE TEST RESULTS

During the 2021 reporting period, ACWS did not record any adverse quality incident described in Schedule 16 of O.Reg 170/03.

4.0 SAMPLING **AND TESTING**

4.1 MICROBIOLOGICAL TESTING

As presented in table 1 and table 2, the Colborne DWS complies with all sampling and testing requirements for large municipal residential systems as prescribed in section 4 of the O.Reg 170/03.

Table 1 summarizes microbiological testing done by ACWS during the 2021 reporting period under schedule 10 of O.Reg 170/03. ACWS did not record any adverse quality results because of a microbiological parameter exceeding its respective maximum acceptable concentration.

Table 1. Colborne DWS Microbiological Analysis

	E.COLI, (CFU/100 ML)		TOTAL COLIFORM, (CFU/100 ML)		HPC, (CFU/ 1ML)	
	# of Samples	Range of Results (min #- max#)	# of Samples	Range of Results (min #- max#)	# of Samples	Range of Results (min #- max#)
RAW	41	0-0	41	0-0	0	N/A
TREATED	23	0-0	23	0-1	21	0-7
DISTRIBUTION	71	0-0	71	0-0	64	0-5

4.2 OPERATIONAL TESTING

Table 2 summarizes operational testing done by ACWS during the 2021 period of operation under schedule 7 of O.Reg 170/03. ACWS did not record any adverse quality results because of an operational parameter exceeding its respective maximum acceptable value.

Table 2. Colborne DWS Operational Monitoring Samples

	NUMBER OF GRAB SAMPLES	RANGE OF RESULTS (MIN #-MAX #)
TURBIDITY, RAW WATER (NTU)	30	0.15-0.9
TURBIDITY, TREATED WATER (NTU)	15	0.17-0.3
TURBIDITY, DISTRIBUTION WATER (NTU)	50	0.2-0.9
TREATED WATER FREE CHLORINE RESIDUAL (mg/L)	3650 (continuous monitoring during the 2021 reporting period)	0.6-2.6

4.3 CHEMICAL TESTING

During the 2021 period of operation, sampling and testing for chemical, inorganic and organic parameters were not required as prescribed by section 13.2 (b) of O.Reg 170/03. A summary of the 2020 chemical, inorganic, and organic sampling and testing results performed by the previous operating authority (Lakefront Utilities Services Inc.) is presented in table 3,4:

Table 3. Colborne DWS Inorganic Testing

PARAMETER	SAMPLE DATE	RESULT VALUE	UNIT OF MEASURE	EXCEEDANCE
Antimony	13-Jan-20	6	µg/ L	N/A
Arsenic		10	µg/ L	N/A

Barium	13-Jan-20	1000	µg/ L	N/A
Boron		5000	µg/ L	N/A
Cadmium		5	µg/ L	N/A
Chromium		50	µg/ L	N/A
Mercury		1	µg/ L	N/A
Selenium		50	µg/ L	N/A
Uranium		20	µg/ L	N/A
Nitrite	05-Oct-21	100	µg/ L	N/A
Nitrate		3480	µg/ L	N/A
Sodium	13-Jan-20	20	µg/ L	N/A
Fluoride		1.5	µg/ L	N/A

Table 4. Colborne DWS Organic Testing

PARAMETER	SAMPLE DATE	RESULT VALUE	UNIT OF MEASURE	EXCEEDANCE
Benzene	13-Jan-20	1	µg/ L	N/A
2-Dichlorobenzene		200	µg/ L	N/A

4-Dichlorobenzene	13-Jan-20	5	µg/ L	N/A
1-Dichloroethylene (vinylidene chloride)		14	µg/ L	N/A
2-Dichloroethane		5	µg/ L	N/A
Dichloromethane		50	µg/ L	N/A
Monochlorobenzene		80	µg/ L	N/A
Tetrachloroethylene (perchloroethylene)		10	µg/ L	N/A
Trichloroethylene		5	µg/ L	N/A
Vinyl Chloride		1	µg/ L	N/A
Diquat		70	µg/ L	N/A
Paraquat		10	µg/ L	N/A
Glyphosate		280	µg/ L	N/A
Polychlorinated Biphenyls		3	µg/ L	N/A
Benzo(a)pyrene		0.01	µg/ L	N/A
Alachlor		5	µg/ L	N/A
Atrazine + N-dealkylated metabolites		5	µg/ L	N/A

4.4 LEAD TESTING

During the 2021 period of operation, sampling and testing for lead was not required as prescribed by section 4 (2) of schedule 15.1 of O.Reg 170/03 because of an exemption made by the MECP. Nevertheless, ACWS performed a supplementary sampling and testing for lead as shown in the table 5:

Table 5. Colborne DWS Lead Testing

	LEAD			
	SAMPLE DATE	RESULT VALUE	UNIT OF MEASURE	EXCEEDANCE
RAW	21-Sep-21	<1	(µg /L)	N/A
TREATED		<1	(µg /L)	N/A
DISTRIBUTION		<1	(µg /L)	N/A

4.5 TRIHALOMETHANES AND HALOACETIC ACID TESTING

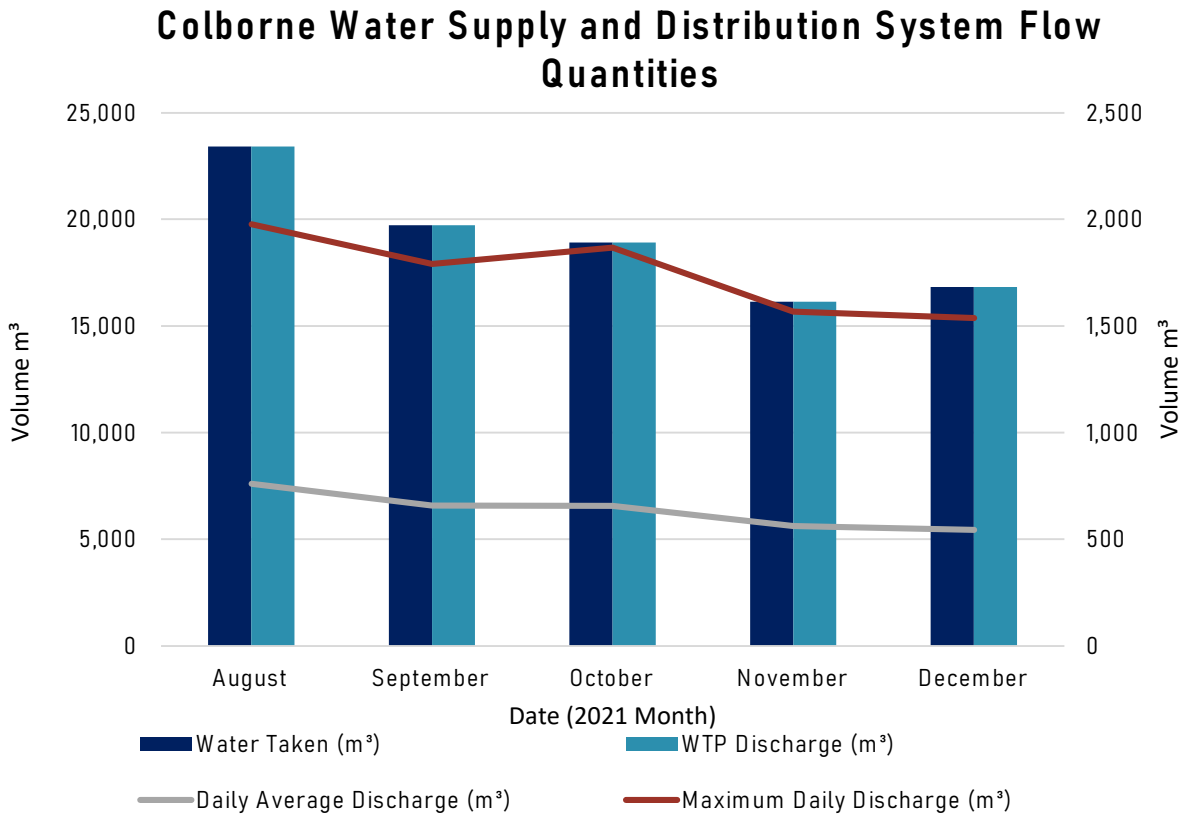
During the 2021 period of operation, sampling and testing for trihalomethanes and haloacetic acid testing was required as prescribed by section 13(6) of schedule 13 of O.Reg 170/03 .Sampling and testing for THM and HAA is summarized in the table 6:

Table 6. Colborne HAA & THM Testing

PARAMETER	THM & HAA			
	SAMPLE DATE	RESULT VALUE	UNIT OF MEASURE	EXCEEDANCE
Bromodichloromethane	21-Oct-05	<2	(µg /L)	N/A
	21-Dec-29	<2	(µg /L)	N/A
Bromoform	21-Oct-05	<2	(µg /L)	N/A
	21-Dec-29	<0.4	(µg /L)	N/A
Chloroform	21-Oct-05	<2	(µg /L)	N/A
	21-Dec-29	<3	(µg /L)	N/A
Dibromochloromethane	21-Oct-05	<2	(µg /L)	N/A
	21-Dec-29	<1.1	(µg /L)	N/A
Trihalomethanes (total)	21-Oct-05	<2	(µg /L)	N/A
	21-Dec-29	<5.9	(µg /L)	N/A

5.0 SUMMARY OF **FLOW QUANTITIES & FLOW RATE CAPACITY**

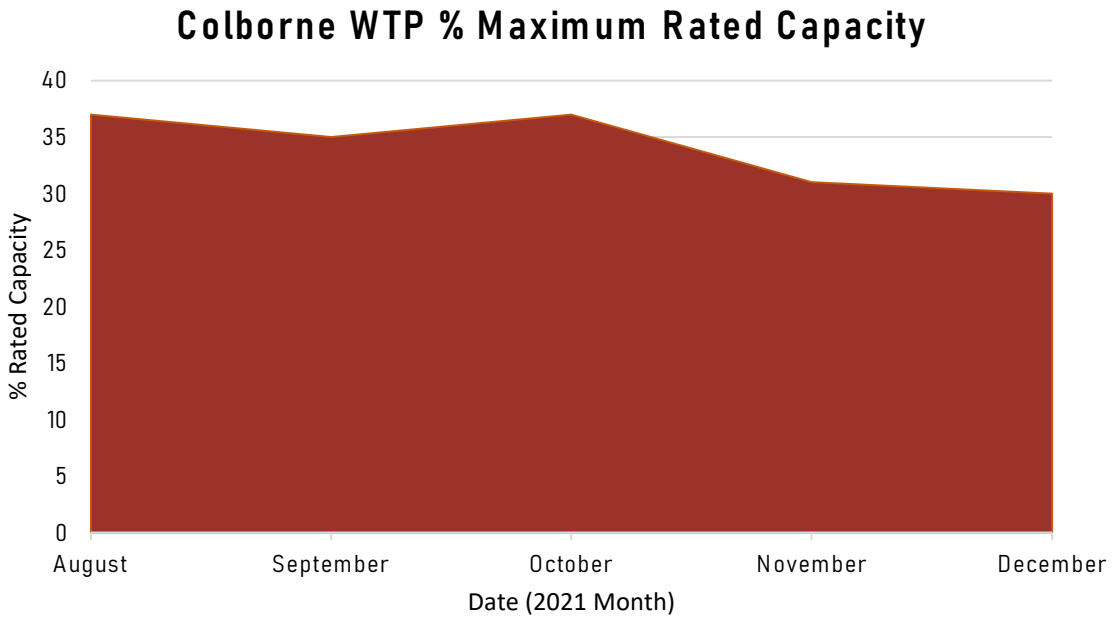
Figure 2. Colborne DWS Flow Quantities



	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Water Taken (m³)	23,419	19,715	18,916	16,128	16,833
WTP Discharge (m³)	23,419	19,715	18,916	16,128	16,833
Daily Average Discharge (m³)	760	657	657	562	544
Maximum Daily Discharge (m³)	1,218	1,133	1,210	1,006	1,000

Table 7. The Colborne DWS 2021 Flow Quantities

Figure 3. Colborne DWS % Maximum Rated Capacity



The total quantities of water taken and discharged from the WTP is illustrated in Figure 2. During the 2021 reporting period, ACWS did not record any incidents related to surpassing the maximum volume of water permitted to take as illustrated in Figure 3. The labels presented in Figure 3 are a percentage representative of the maximum daily discharge observed in table 5.

6.0 CORRECTIVE ACTIONS & **ADDITIONAL EXPENSES**

To ensure safe and efficient operations of the Colborne DWS during the 2021 reporting period, ACWS performed the necessary repairs, replacements, and installations to improve the quality of all water processes. Table 6 summarizes all the corrective actions and major expenses which occurred during the 2021 reporting period.

Table 8. 2021 Flow Quantities

SYSTEM	ITEM DESCRIPTION	TYPE OF ACTION (CORRECTIVE/PREVENTIVE)	COST
Colborne Water Supply System	Rowley Electric Ltd- Repair of Chlorine Analyzer	Corrective	$466
	Rowley Electric Ltd- Repair of Heater in MCC Room	Corrective	$1,695
	Rowley Electric Ltd- Repair of Hotspots	Corrective	$687
	Rowley Electric Ltd- Replacement of coolant and clean radiator of Diesel Generator	Corrective	$565
	Rowley Electric Ltd- Replacement of the Well 2 Control Switch on MCC Panel	Corrective	$1,210
	Vissers Sales Corp- Installation of Dice Duplex Chemical Dosing System	Corrective	$4,841
	Vissers Sales Corp- Replacement of Injection Quills	Corrective	$904
	Evoqua-Replacement of Depolox 400M Analyzer	Corrective	$10,104
	Well 1A Upgrades- Connection of Well 1A to the DWS	Corrective	$355,837