

# Killaloe Drinking Water System

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Waterworks # **220006026**  
System Category – Large Municipal Residential

## Annual Water Report

Prepared For: Township of Killaloe, Hagarty and Richards



Reporting Period of January 1<sup>st</sup> – December 31<sup>st</sup> 2020

Issued: February 19<sup>th</sup>, 2021

Revision: 0

Operating Authority:



This report has been prepared to satisfy the annual reporting requirements in O.Reg 170/03 Section 11 and Schedule 22

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## Report Availability

This system does not serve more than 10,000 residence and the annual reports will be available to residents at the Township of Killaloe, Hagarty and Richards Municipal Office. Notification will be at the Municipal Office and copies provided free of charge if requested. The Township of Killaloe, Hagarty and Richards is located at, 1 John Street in the Village of Killaloe.

Compliance Event	# of Events
Ministry of Environment Inspections	<ul style="list-style-type: none"> <li>- Inspection February 28, 2020. Inspection rating 100%.</li> <li>- Inspection on November 4, 2020. Report not yet received</li> </ul>
Ministry of Labour Inspections	There were no events during the reporting period.
QEMS External Audit	SAI Global external audit on January 27, 2020. No major or minor non-conformances were identified.
AWQI's/BWA	There were no events during the reporting period.
Non-Compliance	There were no events during the reporting period.
Community Complaints	There were no events during the reporting period.
Spills	There were no events during the reporting period.
Watermain Breaks	There were no events during the reporting period.

## System Process Description

### Raw Source

Raw water source for the Killaloe Drinking Water System is a well located at the Treatment Plant.



## Treatment

Killaloe Water Treatment Plant is a single well, groundwater system equipped with greensand contactors that provide iron and manganese removal.



Primary disinfection is provided using sodium hypochlorite and ultraviolet light. Secondary disinfection is being provided using stabilized hydrogen peroxide. The peroxide is injected prior to the clearwells and a residual is maintained through the distribution system.



Treatment Chemicals used during the reporting year:

Chemical Name	Use	Supplier
Potassium Permanganate	Contactora	Cariox
Sodium Hypochlorite	Disinfection	Brenntag
Hydrogen Peroxide (Huwa San)	Disinfection	San Eco Tech

**Distribution**

The distribution system consists of an assortment of plastic piping. Various valves are installed on the distribution lines to allow for isolation and flow direction control. The distribution piping runs as far north as Mill Street, east as Coll Street, south as Cameron Street and west as Angus Street. Fire hydrants are located throughout the distribution system.

The entire treatment process, distribution pressure, free chlorine residuals and peroxide residuals are monitored 24 hrs/day by a SCADA computer. This system has trending and alarm capabilities.

**Summary of Non-Compliance****Adverse Water Quality Incidents**

Date	AWQI #	Location	Details	Legislation	Corrective Action Taken
There were no adverse water quality incidents during the reporting period.					

**Non-Compliance**

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
There were no incidents of non-compliance during the reporting period.				

**Non-Compliance Identified in a Ministry Inspection:**

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
There were no incidents of non-compliance identified during the Ministry inspection.				



## Flows

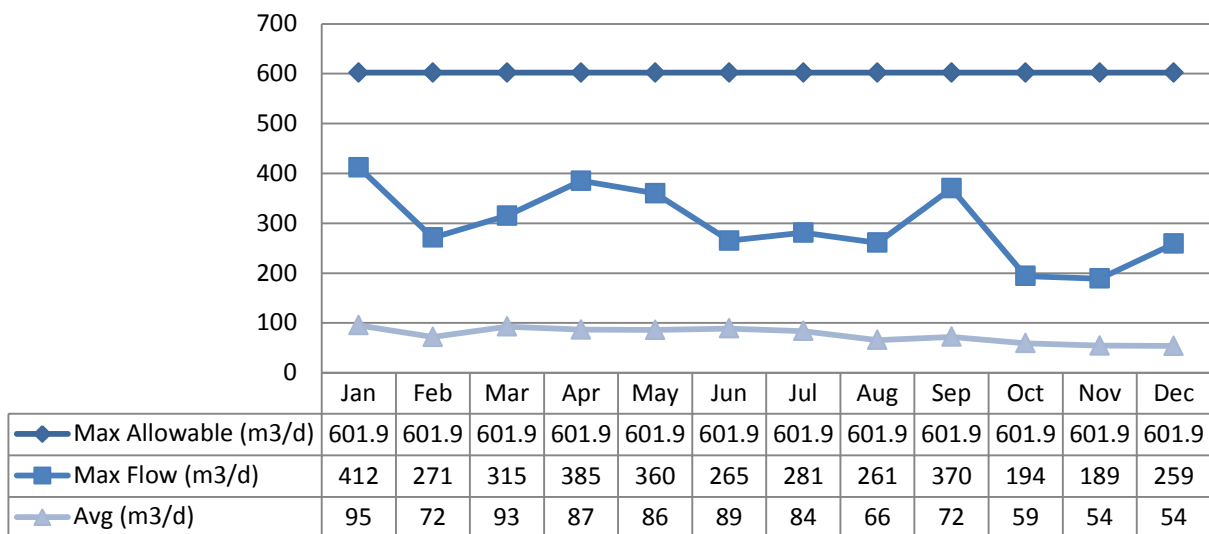
The Killaloe Drinking Water System is operating on average under half the rated capacity.

### Raw Water Flows

The Raw Water flows are regulated under the Permit to Take Water. 2020 Raw Flow Data was submitted to the Ministry electronically under permit #2835-9LMRUZ. The confirmation and a copy of the data that was submitted are attached in Appendix A.

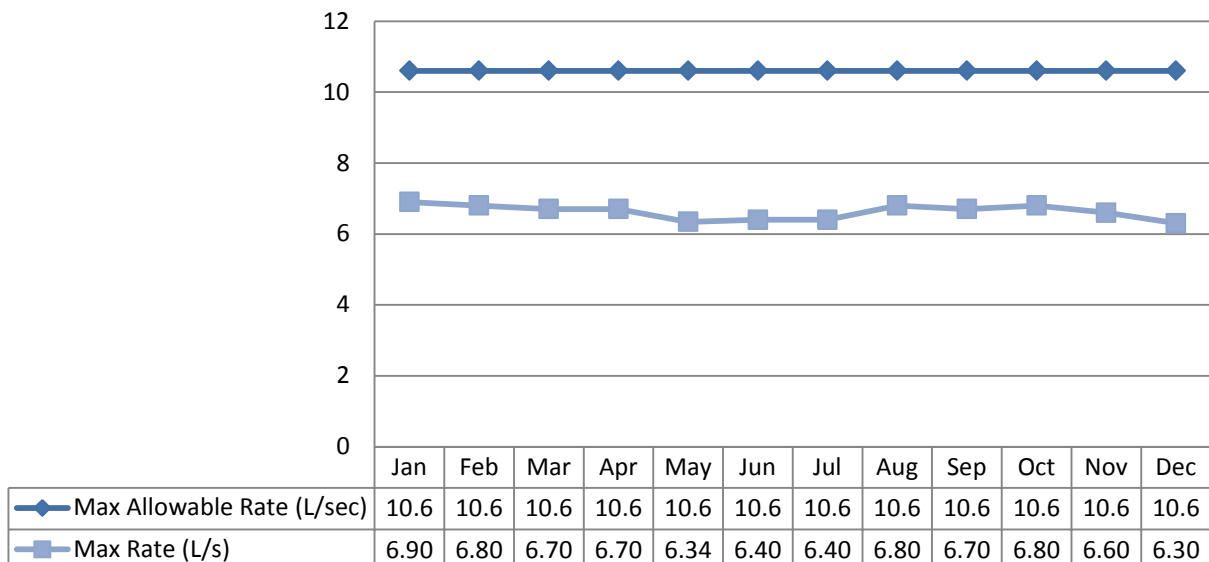
#### Total Monthly Flows (m3/d)

Max Allowable PTTW



#### Monthly Rated Flows (L/s)

Max allowable rate - PTTW

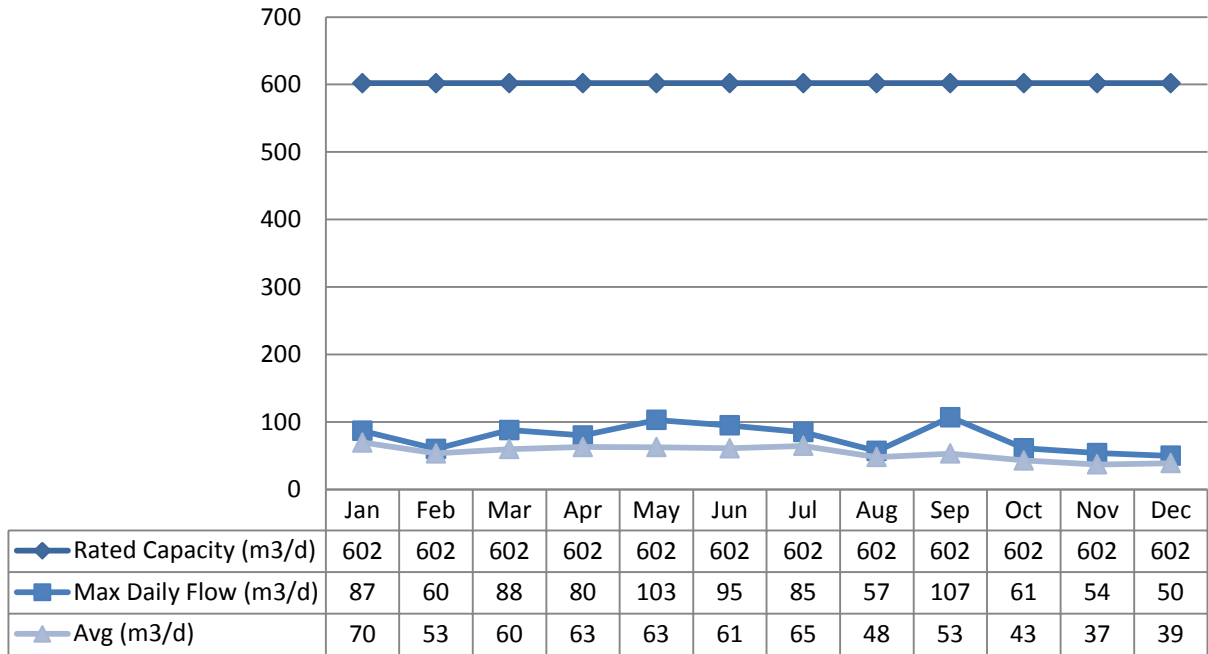


**Treated Water Flows**

The Treated Water flows are regulated under the Municipal Licence.

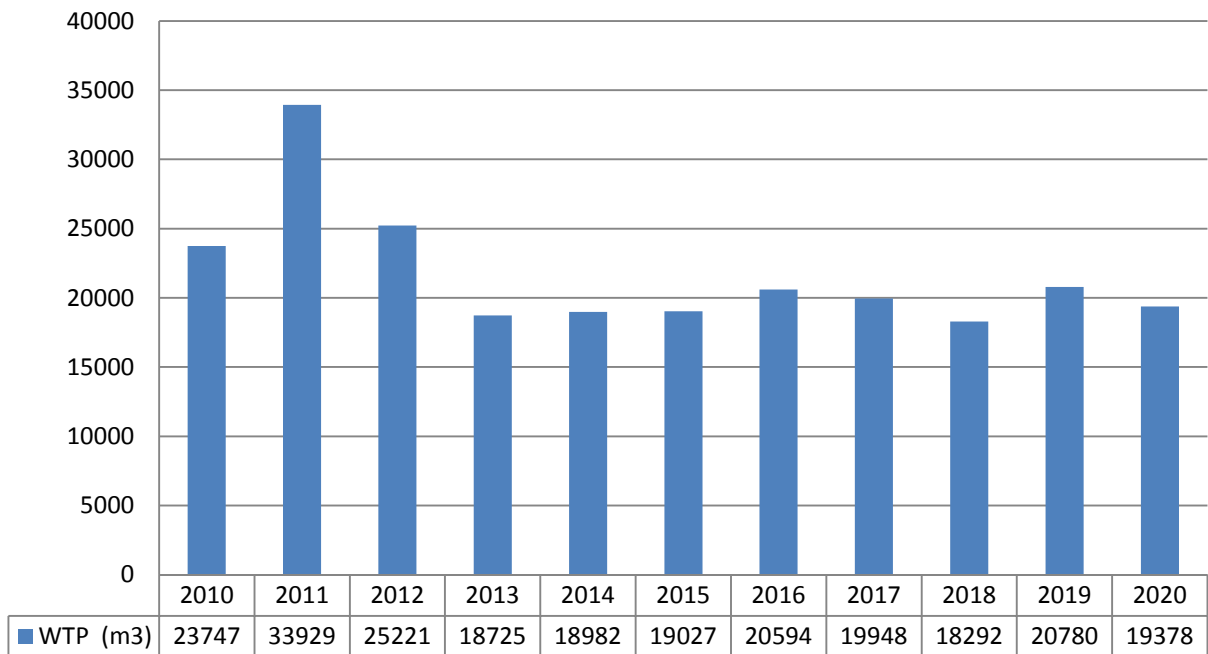
**Monthly Rated Flows**

Rated Capacity - MDWL



**Annual Total Flow Comparison**

Total Annual m3



## Regulatory Sample Results Summary

### Microbiological Testing

	No. of Samples Collected	Range of E.Coli Results		Range of Total Coliform Results		Range of HPC Results	
		Min	Max	Min	Max	Min	Max
Raw Water	52	0	0	0	0		
Treated Water	52	0	0	0	0	0	1300
Distribution Water	109	0	0	0	0	0	820

### Operational Testing

#### Online

Parameter	Range of Results (min # - max #)
Primary Free Chlorine	0.55 – 1.0 mg/L
Post Clearwell Peroxide	3.06 – 11.88 ppm
Distribution Peroxide	2.12 – 5.50ppm

NOTE: spikes recorded by on-line instrumentation were a result of air bubbles and various maintenance/calibration activities. All spikes are reviewed for compliance with O.Reg 170/03

#### In-House

Parameter	# of grab samples taken	Range of Results (min # - max #)
Primary Free Chlorine	244	0.5 – 1.32 mg/L
Raw Colour	104	0 - 49 TCU
Raw Iron	103	0.061 – 0.298 mg/L
Raw Manganese	103	0.023 – 0.289 mg/L
Raw Turbidity	240	0.12 -0.49 ntu
Raw pH	105	6.69 – 8.1
Treated Turbidity	246	0.1 – 0.25 ntu
Treated Colour	105	0 – 12 TCU
Treated pH	104	8.13 – 8.18
Treated Iron	105	0 – 0.105 mg/L
Treated Manganese	104	0.001 - 0.088 mg/L
Distribution pH	45	6.7 – 8.08
Distribution Peroxide Residual	57	1.5 – 4.2 ppm

#### Laboratory

Parameter	# of Samples	Range of Results (min # - max #)
Raw Alkalinity	12	211 - 268 mg/L
Raw Colour	12	6 - 10 TCU
Raw pH	12	7.83 – 8.2



Parameter	# of Samples	Range of Results (min # - max #)
Raw Total Dissolved Solids	12	246 – 274 mg/L
Raw Hardness	12	299 – 448 mg/L
Distribution Alkalinity	16	248-276 mg/L
Distribution Colour	12	3 - 9 TCU
Distribution Total Dissolved Solids	12	409 – 460 mg/L
Distribution Hardness	12	314 – 368 mg/L
Production Well Benzene	1	<0.32 ug/L
Production Well Ethylbenzene	1	<0.33 ug/L
Production Well m/p-xylene	1	<0.43 ug/L
Production Well o-xylene	1	<0.17 ug/L
Production Well Xylene: Total	1	<0.43 mg/L
Production Well Toluene	1	<0.36 ug/L
Test Well Benzene	1	<0.32 ug/L
Test Well Ethylbenzene	1	<0.33 ug/L
Test Well m/p-xylene	1	<0.43 ug/L
Test Well o-xylene	1	<0.17 ug/L
Test Well Xylene: Total	1	<0.43 mg/L
Test Well Toluene	1	<0.36 ug/L

### Additional Legislated Samples

Appendix C has monthly summary data for the Additional Legislated Samples.

Legal Document	Date of Issuance	Parameter	Date Sampled	Result	Unit of measure
Municipal License #259-101	30-Nov-2020	Backwash Effluent Suspended Solids	Annual Avg	2.58	mg/L
		Backwash Effluent pH	Annual Avg	7.89	no units
		Backwash Effluent Total Chlorine Residual	Annual Avg	0.02	mg/L
		Distribution Copper	January 2020	91.5	ug/L
			July 2020	95.8	ug/L
		Distribution Lead	January 2020	0.44	ug/L
July 2020	1.11		ug/L		

- Hydrogen peroxide residuals see Operational Testing
- HPC Testing Results see Microbiological testing
- pH testing results see Operational Testing

### Inorganic Parameters

These parameters are tested as a requirement under 170/03. Sodium and Fluoride are required to be tested every 5 years. Nitrate and Nitrite are tested quarterly and the metals are tested annually as required under 170/03. In the event any of the parameters exceed half of the maximum allowable concentration the parameter is required to be sampled quarterly.

- MAC = Maximum Allowable Concentration as per O.Reg 169/03
- BDL = Below the laboratory detection level

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
<b>Treated Water</b>					
Antimony: Sb (ug/L) - TW	2020/01/08	<MDL 0.09	6.0	No	No
Arsenic: As (ug/L) - TW	2020/01/08	<MDL 0.2	10.0	No	No
Barium: Ba (ug/L) - TW	2020/01/08	174.0	1000.0	No	No
Boron: B (ug/L) - TW	2020/01/08	102.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2020/01/08	<MDL 0.003	5.0	No	No
Chromium: Cr (ug/L) - TW	2020/01/08	0.16	50.0	No	No
Mercury: Hg (ug/L) - TW	2020/01/08	<MDL 0.01	1.0	No	No
Selenium: Se (ug/L) - TW	2020/01/08	0.05	50.0	No	No
Uranium: U (ug/L) - TW	2020/01/08	2.2	20.0	No	No
<b>Additional Inorganics</b>					
Fluoride (mg/L) - TW	2018/01/09	0.26	1.5	No	No
Nitrite (mg/L) - TW	2020/01/06	0.003	1.0	No	No
Nitrite (mg/L) - TW	2020/04/06	0.004	1.0	No	No
Nitrite (mg/L) - TW	2020/07/06	<MDL 0.003	1.0	No	No

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Nitrite (mg/L) - TW	2020/10/05	0.006	1.0	No	No
Nitrate (mg/L) - TW	2020/01/06	0.011	10.0	No	No
Nitrate (mg/L) - TW	2020/04/06	0.01	10.0	No	No
Nitrate (mg/L) - TW	2020/07/06	0.01	10.0	No	No
Nitrate (mg/L) - TW	2020/10/05	0.012	10.0	No	No
Sodium: Na (mg/L) - TW	2018/01/16	26.5	20*	Yes	Yes

\*There is no "MAC" for Sodium. The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified mg/L when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.

### Schedule 15 Sampling:

The Schedule 15 Sampling is required under O.Reg 170/03. This system is under reduced sampling. No plumbing samples were collected.

Distribution System	Number of Sampling Points	Number of Samples	Range of Results		MAC (ug/L)	Number of Exceedances
			Minimum	Maximum		
Alkalinity (mg/L)	2	16	248	276	n/a	n/a
pH	2	12	8.07	8.39	n/a	n/a
Lead (ug/l)	2	2	0.44	1.11	10	0

### Organic Parameters

These parameters are tested annually as a requirement under O.Reg 170/03. In the event any of the parameters exceed half of the maximum allowable concentration the parameter is required to be sampled quarterly.

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
<b>Treated Water</b>					
Alachlor (ug/L) - TW	2020/01/08	<MDL 0.02	5.0	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2020/01/08	<MDL 0.01	5.0	No	No
Azinphos-methyl (ug/L) - TW	2020/01/08	<MDL 0.05	20.0	No	No
Benzene (ug/L) - TW	2020/01/08	<MDL 0.32	1.0	No	No
Benzo(a)pyrene (ug/L) - TW	2020/01/08	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW	2020/01/08	<MDL 0.33	5.0	No	No
Carbaryl (ug/L) - TW	2020/01/08	<MDL 0.05	90.0	No	No
Carbofuran (ug/L) - TW	2020/01/08	<MDL 0.01	90.0	No	No
Carbon Tetrachloride (ug/L) - TW	2020/01/08	<MDL 0.17	2.0	No	No
Chlorpyrifos (ug/L) - TW	2020/01/08	<MDL 0.02	90.0	No	No
Diazinon (ug/L) - TW	2020/01/08	<MDL 0.02	20.0	No	No
Dicamba (ug/L) - TW	2020/01/08	<MDL 0.2	120.0	No	No
1,2-Dichlorobenzene (ug/L) - TW	2020/01/08	<MDL 0.41	200.0	No	No
1,4-Dichlorobenzene (ug/L) - TW	2020/01/08	<MDL 0.36	5.0	No	No
1,2-Dichloroethane (ug/L) - TW	2020/01/08	<MDL 0.35	5.0	No	No
1,1-Dichloroethylene (ug/L) - TW	2020/01/08	<MDL 0.33	14.0	No	No

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Dichloromethane (Methylene Chloride) (ug/L) - TW	2020/01/08	<MDL 0.35	50.0	No	No
2,4-Dichlorophenol (ug/L) - TW	2020/01/08	<MDL 0.15	900.0	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2020/01/08	<MDL 0.19	100.0	No	No
Diclofop-methyl (ug/L) - TW	2020/01/08	<MDL 0.4	9.0	No	No
Dimethoate (ug/L) - TW	2020/01/08	<MDL 0.06	20.0	No	No
Diquat (ug/L) - TW	2020/01/08	<MDL 1.0	70.0	No	No
Diuron (ug/L) - TW	2020/01/08	<MDL 0.03	150.0	No	No
Glyphosate (ug/L) - TW	2020/01/08	<MDL 1.0	280.0	No	No
Malathion (ug/L) - TW	2020/01/08	<MDL 0.02	190.0	No	No
Metolachlor (ug/L) - TW	2020/01/08	<MDL 0.01	50.0	No	No
Metribuzin (ug/L) - TW	2020/01/08	<MDL 0.02	80.0	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2020/01/08	<MDL 0.3	80.0	No	No
Paraquat (ug/L) - TW	2020/01/08	<MDL 1.0	10.0	No	No
PCB (ug/L) - TW	2020/01/08	<MDL 0.04	3.0	No	No
Pentachlorophenol (ug/L) - TW	2020/01/08	<MDL 0.15	60.0	No	No
Phorate (ug/L) - TW	2020/01/08	<MDL 0.01	2.0	No	No
Picloram (ug/L) - TW	2020/01/08	<MDL 1.0	190.0	No	No
Prometryne (ug/L) - TW	2020/01/08	<MDL 0.03	1.0	No	No
Simazine (ug/L) - TW	2020/01/08	<MDL 0.01	10.0	No	No
Terbufos (ug/L) - TW	2020/01/08	<MDL 0.01	1.0	No	No
Tetrachloroethylene (ug/L) - TW	2020/01/08	<MDL 0.35	10.0	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2020/01/08	<MDL 0.2	100.0	No	No
Triallate (ug/L) - TW	2020/01/08	<MDL 0.01	230.0	No	No
Trichloroethylene (ug/L) - TW	2020/01/08	<MDL 0.44	5.0	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2020/01/08	<MDL 0.25	5.0	No	No
Trifluralin (ug/L) - TW	2020/01/08	<MDL 0.02	45.0	No	No
Vinyl Chloride (ug/L) - TW	2020/01/08	<MDL 0.17	1.0	No	No
Alachlor (ug/L) - TW	2020/01/08	<MDL 0.02	5.0	No	No
<b>Distribution Water</b>					
Trihalomethane: Total (ug/L) Annual Average - DW	2020/01/01	31.5	100.0	No	No
HAA Total (ug/L) Annual Average - DW	2020/01/01	10.225	80.0*	No	No

MAC = Maximum Allowable Concentration as per O.Reg 169/03

BDL = Below the laboratory detection level

\* This limit comes into force January 2020. It will be calculated as an annual rolling average.

## Evaluation of the Effectiveness of Secondary Disinfectant

The hydrogen peroxide continues to work well as a secondary disinfectant while producing reduced THM's within the distribution system. All parameters that are being monitored are remaining within

compliance and normal operating limits. There have been no significant anomalies in any tested levels. A trend is becoming evident in which we receive HPC results that are unusually high on approximately a yearly basis. Hydrogen peroxide residuals taken during the sampling are within the normal range and no connections are evident to these high HPC results in regards to operational activities, time of year, operational performance, or weather. In the week following these unusual HPC results, the samples collected from the Killaloe system result in HPC results of 0 cfu/1mL on all samples. Upon review of the 2020 HPC data this sample did not appear to be representative of the overall system.

It should be noted that no regulatory limits were exceeded.

### **Major Maintenance Summary**

<b>WO #</b>	<b>Description</b>
1961143	Generator water pump replacement
1663988	Coll Street valve repairs
1834431	Burkert solenoids
1872032	AVIVA analyzer solenoid valve replacements
1873200	Replacement probe membrane for Prominent H2O2 analyzers
2000811	Killaloe Analyzer updates and calibrations
2039537	Pneumatic filter control solenoid valves
2039558	Reference sensor for UV'S

# Appendix A

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## WTRS Data and Submission Confirmation





Location: [WTRS](#) / [WT DATA](#) / [Input WT Record](#)

WTRS-WT-008

**Water Taking Data submitted successfully.**

**Confirmation:**

Thank you for submitting your water taking data online.

Permit Number: 2835-9LMRUZ

Permit Holder: THE CORPORATION OF THE TOWNSHIP OF KILLALOE, HAGARTY AND RICHARDS.

Received on: Jan 13, 2021 9:47 AM

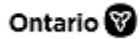
This confirmation indicates that your data has been received by the Ministry, but should not be construed as acceptance of this data if it differs from that specified on the Permit Number, assigned to the Permit Holder stated above.

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TOWNSHIP2 KILLALOE2 | 2021/01/13

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