



## ANNUAL SUMMARY REPORT

### THE CORPORATION OF TOWNSHIP OF ALNWICK/HALDIMAND

#### *GRAFTON DRINKING WATER SYSTEM*

Prepared by Lakefront Utility Services Inc. (2020)

## CONTENTS

<b>1.</b>	<b>PURPOSE .....</b>	<b>3</b>
<b>2.</b>	<b>GRAFTON DRINKING WATER SYSTEM OVERVIEW .....</b>	<b>4</b>
<b>3.</b>	<b>2019 COMPLIANCE .....</b>	<b>4</b>
	3.1 MECP Inspection .....	4
	3.2 License & Permit Compliance .....	5
	3.3 Adverse Water Quality Incident(s).....	8
<b>4.</b>	<b>CONTINUAL IMPROVEMENT .....</b>	<b>8</b>
<b>5.</b>	<b>SAMPLING AND ANALYSIS .....</b>	<b>9</b>

## 1. PURPOSE

The purpose of the Annual Water Quality Report is to provide information to residents and stakeholders of the Township of Alnwick/Haldimand. Furthermore, satisfying the regulatory requirements of the *Safe Drinking Water Act, 2002* including the Drinking Water Quality Management Standard (DWQMS) reports to owner, and regulatory reporting required under *Ontario Regulation 170/03*. This annual water quality report fulfills all requirements of *Ontario Regulation 170/03* Section 11 Annual Reports and Schedule 22 Summary Reports for Municipalities.

The annual water quality report is prepared by Lakefront Utility Services Inc. (operating authority) on behalf of the Township of Alnwick/Haldimand (owner).

### Scope

This annual water quality report includes information pertaining to the Village of Grafton's Drinking Water System (Grafton DWS) for the period of January 1, 2019 to December 31, 2019. *Ontario Regulation 170/03* requires reported information be provided to:

- **Drinking Water System Owners (Mayor and Council)**
- **Owner and Operating Authority Top Management**
- **The Public**

### Availability

The Grafton DWS is a large municipal residential system that serves approximately 370 people. Copies of this annual water quality report are available online at <https://www.lakefrontutilities.com/regulatory-water/>. Hard copies are also available at the LUSI's office at 207 Division St, Cobourg ON, K9A 4L3.

Customers of the Grafton DWS are notified that the annual water quality report is available via "What's New" <https://www.lakefrontutilities.com/whats-new/>, social media posts and "Stay Connected" LUSI bill insert.

### Council Resolution

*Ontario Regulation 170/03* requires Summary Reports be distributed to municipal council no later than March 31 of each year. The Township of Alnwick/Haldimand must provide LUSI with a copy of council resolution indicating the report has been accepted.

## 2. GRAFTON DRINKING WATER SYSTEM OVERVIEW

The Grafton Water Treatment Plant (WTP) takes water from two wells, Well #1 and Well #2. Well #1 is the standby well, operation is limited to sampling and emergencies only, as it is influenced by a natural source of ammonia. Well #2 is the duty well and has a rated capacity of 14.5L/s.

**Sodium hypochlorite** is injected for primary and secondary disinfection purposes. The WTP has two buried clear wells, and two high lift pumping wells, where water achieves the appropriate contact time. **Sodium silicate** is added as an iron sequestering agent.

Treated water is conveyed to the distribution system, and to a bulk water truck fill system installed on the exterior of the WTP.

The distribution system is split into four pressure zones that are regulated by four pressure reducing valves that maintain the pressure between 40 and 90 PSI. As of December 31, 2019, there are 370 metered customers. Water is conveyed to customers by approximately 13km of watermain ranging from 150mm to 300mm, made of PVC. There are 130 fire hydrants located within the system.

## 3. 2019 COMPLIANCE

### 3.1 MECP INSPECTION

The MECP began an unannounced focused inspection of the Grafton DWS on November 28, 2019. A final inspection rating of 95.79% was achieved. Condition 2.3 of the Permit requires all parts of the system in contact with drinking water which are added, modified, replaced, extended or taken out of service for inspection, repair or other activities that may lead to contamination, be disinfected before being put into service in accordance with the provision of the AWWA C651 – Standard for Disinfecting Watermains, or an equivalent procedure.

On November 20, 2019, LUSI retained the services of IWS to replace the pump in well #2. On November 20, 2019 well #2 was taken offline while the pump was being replaced; the well was chlorinated and left for 12 hours.

The AWWA C654 – Standards for Disinfection of Wells requires a minimum of two water samples be taken and tested for the presence of coliform, in accordance with Standard Methods for the Examination of Water and Wastewater.

The required samples were not collected prior to the well being placed back in service. In response to the noncompliance, LUSI developed a new standard operating procedure for Well Inspection, Maintenance and Refurbishment in accordance with AWWA C654 – Standards for Disinfection of Wells.

No further action is required from LUSI to fulfill the requirements of the noncompliance.

There were no recommendations or issues related to best practices identified during the inspection.

### 3.2 LICENSE & PERMIT COMPLIANCE

The Grafton DWS maintained compliance with all applicable legislation, and all terms and conditions of the Municipal Drinking Water License, Drinking Water Works Permit and Permit to Take Water in 2019.

The Grafton DWS Permit to Take Water (Permit No. 5086-9BPM4A) allows the taking of 1,253 m<sup>3</sup> of water from each well per day at a rate of 870L/min. The average flow rate from production well #2 was 138L/min.

The total quantity of water taken and discharged from the WTP is illustrated in Figure 1. In 2019 there were no incidents related to surpassing the maximum volume of water permitted to take. In June 2019, the WTP operated at 58% of its maximum rated capacity, as shown in Figure 2. The labels presented in Figure 2 are representative of the maximum flow observed for the respective month (m<sup>3</sup>).

Figure 1 - Flow Quantities Grafton Drinking Water System

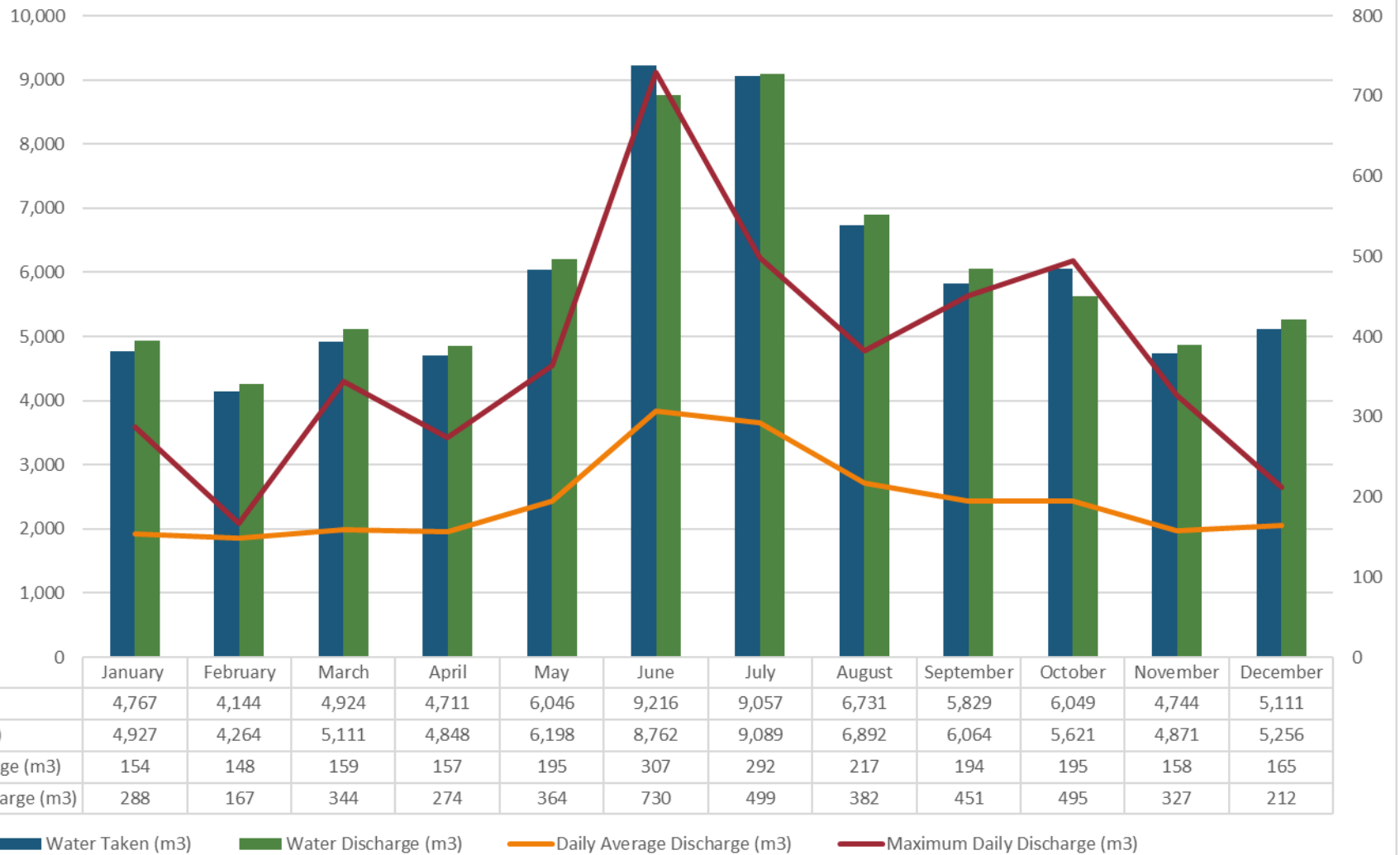
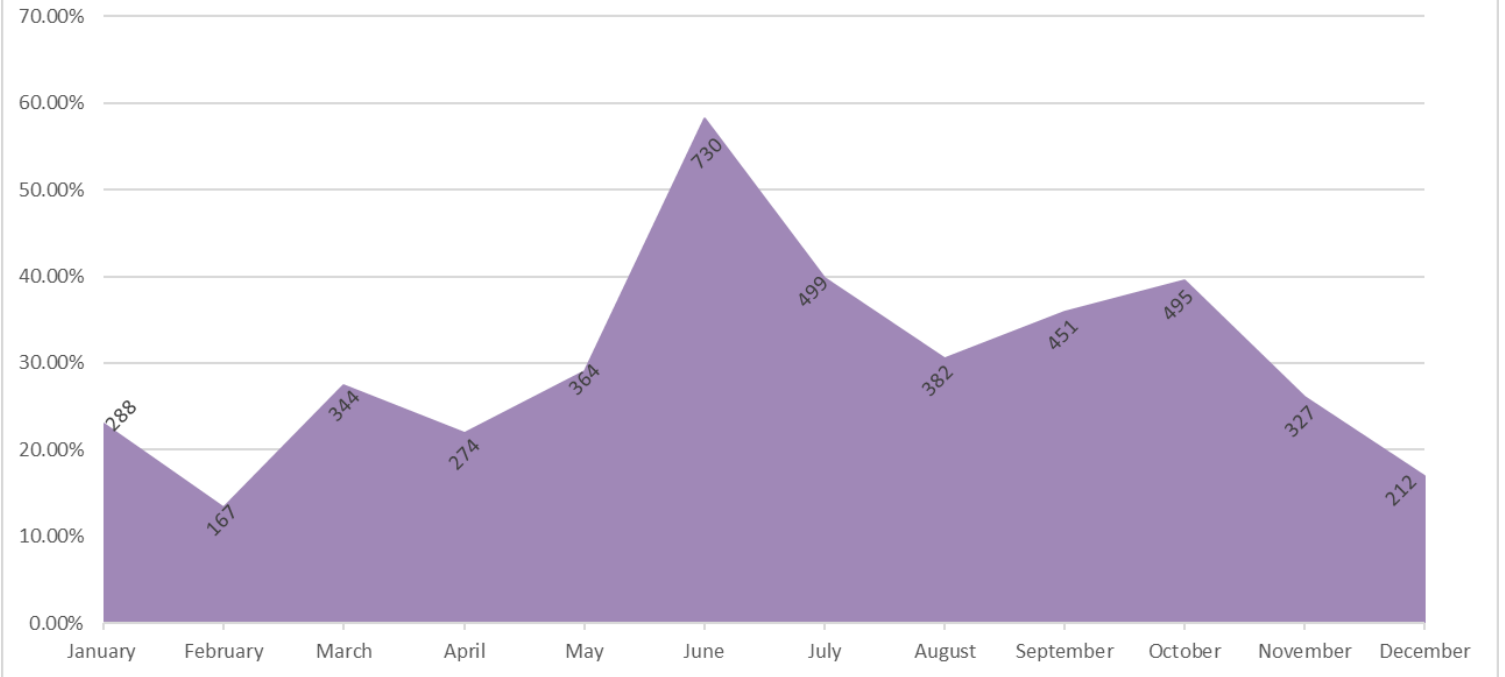


Figure 2 - Grafton WTP % Maximum of Rated Capacity



### 3.3 ADVERSE WATER QUALITY INCIDENT(S)

#### Incident #1 – March 26, 2019

Tuesday March 26, 2019 a loss of pressure occurred in pressure Zone 1 during routine lead sampling, where hydrants were being flushed to conduct sampling. Hydrant flushing caused an increased demand at the WTP, initiating the fire pump to start. The fire pump started, however the solenoid valve failed to open, therefore no water was being pumped. When the fire pump started, the pumps that were previously running turned off. No water was being pumped to the distribution system, resulting in a loss of pressure. The loss of pressure occurred at 13:19 and pressure was restored at 13:33. Operators flushed pressure zone 1 until a free chlorine residual of 0.75mg/L and a turbidity of 1.3 NTU was achieved. No further action from LUSI was required.

#### Incident #2 – November 14, 2019

The bacti sample collected from 10869 Hwy 2 on November 11, 2019 came back adverse, with a total coliform of 5 cfu/100mL. In consultation with the Public Health Unit and the local MECPC office, the corrective actions required were to resample the original adverse location, in addition to samples upstream and downstream. On November 14, 2019 samples were collected at 10869 Hwy 2, 10873 Hwy 2 and 10843 Hwy 2. Results from November 14, 2019 indicated that the water quality was not adverse. No further action from LUSI was required.

## 4. CONTINUAL IMPROVEMENT

LUSI's commitment to continual improvement requires investigating and investing in, where appropriate, methods and technologies to improve

- The quality of processes used to ensure production of ample clean water, and
- The quality and effectiveness of the distribution system.

During the 2019 reporting year, LUSI demonstrated this commitment by completing all the activities listed in Table 1. Table 1 also satisfies O. Reg 170/03 requirement to describe major expenses occurred during the reporting period.

<b>Grafton Water Treatment Plant</b>	High Lift #2 Check Valve Replacement	\$8,000
	Ammonia Investigation – Engineering Services	\$15,200
	Production Well #1 Inspection and Pump Refurbishment	\$11,500
	Production Well #2 Inspection and Pump/Motor Replacement	\$16,300
	Test Well #3 Inspection and Sampling	\$4,000
<b>Grafton Distribution System</b>	Station St PRV Replacement	\$14,400
<b>Miscellaneous</b>	Security Camera System	\$2,800
	SCADA Upgrade	\$5,600
	Bulk Water System Cards	\$2,000



## 5. SAMPLING AND ANALYSIS

The Grafton DWS exhibited compliance with all sampling and testing as required by *Ontario Regulation 170/03* in the 2019 calendar year. Table 2 illustrates all microbiological testing done under Schedule 10 of *Ontario Regulation 170/03*. There were no instances of adverse water quality results as a result of a parameter exceeding its respective maximum acceptable concentration.

	<b>E. Coli, (cfu/100mL)</b>		<b>Total Coliform, (cfu/100mL)</b>		<b>HPC, (cfu/1mL)</b>	
	<b># of Samples</b>	<b>Range of Results (min # - max #)</b>	<b># of Samples</b>	<b>Range of Results (min # - max #)</b>	<b># of Samples</b>	<b>Range of Results (min # - max #)</b>
<b>Raw</b>	106	0 - 0	104	0 - 360	0	N/A
<b>Treated</b>	53	0 - 0	52	0 - 0	53	0 - 1
<b>Distribution</b>	162	0 - 0	162	0 – 5	106	0 - 65

Operational testing done under Schedule 7 of Ontario Regulation 170/03 during the 2019 reporting period are tabulated in Table 3.

	<b>Number of Grab Samples</b>	<b>Range of Results (min # - max #)</b>
<b>Turbidity, Raw Water (NTU)</b>	12	0.06 – 1.39
<b>Turbidity, Treated Water (NTU)</b>	12	0.18 – 0.30
<b>Treated Water Free Chlorine Residual (mg/L)</b>	8760 (continuous monitoring)	0.0 – 4.64

In addition to the microbiological sampling and testing requirements, sampling and testing is required for chemical, inorganic and organic parameters. Table 4 illustrates Schedule 13, Schedule 23 and Schedule 24 requirements. If there were multiple samples taken during the reporting period, the most recent sample result is provided. A parameter below the method detection limit indicated by (<), cannot be detected as the concentration is lower than minimum concentration that can be measured and reported with 99% certainty.

<b>Table 4 – Grafton DWS Schedule 13, 23 and 24 Sampling</b>			
<b>PARAMETER</b>	<b>STANDARD (µg/L)</b>	<b>SAMPLE RESULT (µg/L)</b>	<b>SAMPLE DATE</b>
Fluoride	1.5	0.09	16-Sept-19
Sodium	20	6.87	
Nitrite	1	< 0.003 MDL	
Nitrate	10	1.64	28-Oct-19
THM: Annual Average	100	10.18	
HAA: Annual Average	80	5.3 < MDL	
Antimony	6	0.06	
Arsenic	25	1	07-Jan-19
Barium	1000	130	
Boron	5000	9	
Cadmium	5	0.003	
Chromium	50	0.16	
Mercury	1	0.01 <MDL	
Selenium	10	0.07	
Uranium	20	3.5	
Benzene	5	0.32 <MDL	
Carbon tetrachloride	5	0.16 <MDL	
2-Dichlorobenzene	200	0.41 <MDL	
4-Dichlorobenzene	5	0.36 <MDL	
1-Dichloroethylene (vinylidene chloride)	14	0.33 <MDL	
2-Dichloroethane	5	0.35 <MDL	
Dichloromethane	50	0.35 <MDL	
Monochlorobenzene	80	0.3 <MDL	
Tetrachloroethylene (perchloroethylene)	30	0.35 <MDL	
Trichloroethylene	5	0.44 <MDL	
Vinyl Chloride	2	0.17 <MDL	
Diquat	70	1 <MDL	
Paraquat	10	1 <MDL	
Glyphosate	280	1 <MDL	
Polychlorinated Biphenyls (PCBs) - Total	3	0.04 <MDL	
Benzo(a)pyrene	0.01	0.004 <MDL	
Alachlor	5	0.02 <MDL	
Atrazine + N-dealkylated metabolites	5	0.02 <MDL	
Atrazine	-	0.01 <MDL	
Desethyl atrazine	-	0.01 <MDL	
Azinphos-methyl	20	0.05 <MDL	
Carbaryl	90	0.05 <MDL	
Carbofuran	90	0.01 <MDL	

**Table 4 – Grafton DWS Schedule 13, 23 and 24 Sampling**

PARAMETER	STANDARD (µg/L)	SAMPLE RESULT (µg/L)	SAMPLE DATE
Chlorpyrifos	90	0.02 <MDL	
Diazinon	20	0.02 <MDL	
Dimethoate	20	0.03 <MDL	
Diuron	150	0.03 <MDL	
Malathion	190	0.02 <MDL	
Metolachlor	50	0.01 <MDL	
Metribuzin	80	0.02 <MDL	
Phorate	2	0.01 <MDL	
Prometryne	1	0.03 <MDL	
Simazine	10	0.01 <MDL	
Terbufos	1	0.01 <MDL	
Triallate	230	0.01 <MDL	
Trifluralin	45	0.02 <MDL	
4-dichlorophenoxyacetic acid (24-D)	100	0.19 <MDL	
Bromoxynil	5	0.33 <MDL	
Dicamba	120	0.20 <MDL	
Diclofop-methyl	9	0.40 <MDL	
MCPA	-	0.00012 <MDL	
Picloram	190	1 <MDL	
4-dichlorophenol	900	0.15 <MDL	
6-trichlorophenol	5	0.25 <MDL	
6-tetrachlorophenol	100	0.20 <MDL	
Pentachlorophenol	60	0.15 <MDL	