

Lakeshore Annual and Summary Report

For the 2020 Operating Year

PREPARED BY:

Veolia Water Canada
100 Cove Road, Box 185
Goderich, ON
N7A 3Z2
Author: Nancy Mayhew

TO:

Township of Huron-Kinloss
Box 130
21 Queen Street
Ripley, ON
N0G 2R0



Table of Contents

No.	<u>Heading Title</u>	<u>Page No.</u>
1.0	EXECUTIVE SUMMARY	5
	<ul style="list-style-type: none"> ● Safe Drinking Water Act ● Figure 1 - Legislative Framework 	
2.0	REPORTING REQUIREMENTS	7
	<ul style="list-style-type: none"> ● O. Reg. 170/03, Section 11 - Annual Report ● O. Reg. 170/03, Schedule 22 - Summary Report for Municipalities ● Ministry of the Environment, Conservation and Parks Inspection Report ● Municipal Drinking Water Management Review ● QMS Operational Plan 	
3.0	DESCRIPTION OF WATER SYSTEM (O. Reg. 170/03, s. 11 (6) (a))	9
4.0	SUMMARY OF REPORTS MADE TO THE MINISTRY (O. Reg. 170/03, s. 11 (6) (b))	12
5.0	SUMMARY OF WATER QUALITY MONITORING (O. Reg. 170/03, s. 11 (6) (c))	12
	<ul style="list-style-type: none"> ● Table 1 - Water Quality Monitoring Requirements ● Communications When Adverse Water Samples Are Identified <ul style="list-style-type: none"> ● Requirement - Laboratory ● Requirement - Drinking Water System Owner/Operating Authority 	
5.1	Water Treatment Equipment Operation and Monitoring	13
5.1.1	Treated Water (Point of Entry) Chlorine Residuals (Grab Samples)	13
5.1.2	Distribution Free Chlorine Residuals (Grab Samples)	13
	<ul style="list-style-type: none"> ● Table 2 - Average Treated and Distribution Free Chlorine Residuals (Grab Samples) ● Table 3 - Average Treated Free Chlorine Residuals (On-line Continuous from SCADA) 	
5.1.3	Raw and Treated Water Turbidity	14
	<ul style="list-style-type: none"> ● Table 4 - Raw Water Turbidity Results ● Table 5 - Treated Water Turbidity Results 	
5.2	Microbiological Sampling as per Schedule 10, Ontario Regulation 170/03	15
5.2.1	Raw Water Samples	15
	<ul style="list-style-type: none"> ● Microbiological Results for Raw Water <ul style="list-style-type: none"> ○ Table 6 - BLAIRS GROVE ○ Table 7 - HURONVILLE SOUTH ○ Table 8 - MURDOCH GLEN ○ Table 9 - POINT CLARK WELL # 2 ○ Table 10 - POINT CLARK WELL # 3 	

5.2.2	Treated Water (Point of Entry) Samples	17
	
	● Microbiological Results for Treated Water (Point of Entry)	
	○ Table 11 - BLAIRS GROVE	
	○ Table 12 - HURONVILLE SOUTH	
	○ Table 13 - MURDOCH GLEN	
	○ Table 14 - POINT CLARK	
5.2.3	Distribution Samples	20
	
	● Table 15 - Microbiological Results for Distribution System	

<u>No.</u>	<u>Heading Title</u>	<u>Page No.</u>
5.3	Chemical Sampling and Testing as per Schedule 13, O. Reg. 170/03	20
	
5.3.1	Inorganics (Schedule 13, s. 13-2; Schedule 23)	20
	
	• Table 16 - Inorganics (Schedule 13, s. 13-2; Schedule 23) Results	
5.3.2	Organics (Schedule 13, Section 13-4; Schedule 24)	21
	
	• Table 17 - Organics (Schedule 13, Section 13-4; Schedule 24) Results	
5.3.3	Trihalomethanes (Schedule 13, Section 13-6)	22
	
	• Trihalomethane (Schedule 13, Section 13-6) Results	
	○ Table 18 - BLAIRS GROVE	
	○ Table 19 - HURONVILLE SOUTH	
	○ Table 20 - MURDOCH GLEN	
	○ Table 21 - POINT CLARK	
5.3.4	Haloacetic Acids (Schedule 13, Section 13-6.1)	24
	
	• Haloacetic Acid (Schedule 13, Section 13-6.1) Results	
	○ Table 22 - BLAIRS GROVE	
	○ Table 23 - HURONVILLE SOUTH	
	○ Table 24 - MURDOCH GLEN	
	○ Table 25 - POINT CLARK	
	• Table 26 - THMs and HAAs - Rolling Annual Average Summary	
5.3.5	Nitrate and Nitrite (Schedule 13, Section 13-7)	26
	
	• Nitrate and Nitrite (Schedule 13, Section 13-7) Results	
	○ Table 27 - BLAIRS GROVE	
	○ Table 28 - HURONVILLE SOUTH	
	○ Table 29 - MURDOCH GLEN	
	○ Table 30 - POINT CLARK	
5.3.6	Sodium (Schedule 13, Section 13-8)	28
	
5.3.7	Fluoride (Schedule 13, Section 13-9)	28
	
	• Table 31 - Sodium (Schedule 13, s. 13-8) and Fluoride (Schedule 13, s. 13-9) Results	
5.3.8	Lead (Schedule 15.1 - O. Reg. 170/03, s. 11 (6) (g))	28
	
	• Table 32 - Lead Sampling Program (Schedule 15.1) Results	
5.3.9	Non-Regulatory Testing - Aesthetic Objectives and Operational Guidelines (AO/OG)	29
	
	• Table 33 - Aesthetic Objectives and Operational Guideline Results	
6.0	WATER AND CHEMICAL USE (O. Reg. 170/03, s. 11 (6) (a); Schedule 22-2 (3))	30
	
6.1	Chemical Usage (O. Reg. 170/03, s. 11 (6) (a))	30
	
	• Table 34 - Sodium Hypochlorite Usage	
	• Table 35 - Sodium Silicate Usage	

6.2 Summary of Flow Rates, Annual Volumes and Capacities (O. Reg. 170/03, Schedule 22-2 (3)) 31

.....

- Flow Rates, Annual Volumes and Capacities
 - Table 36 - BLAIRS GROVE
 - Table 37 - HURONVILLE SOUTH
 - Table 38 - MURDOCH GLEN
 - Table 39 - POINT CLARK

<u>No.</u>	<u>Heading Title</u>	<u>Page No.</u>
6.3	System Capacity (O. Reg. 170/03, Schedule 22-2(3) Continued)	34
	<ul style="list-style-type: none"> ● Table 40 - Total Volumes of All Well Supplies ● Figures 2, 3, 4, 5 and 6 	
7.0	IMPROVEMENTS TO SYSTEM AND ROUTINE AND PREVENTATIVE MAINTENANCE (s. 11 (6) (e))	35
8.0	MINISTRY OF THE ENVIRONMENT , CONSERVATIONS AND PARKS INSPECTIONS AND REGULATORY ISSUES (Schedule 22-2 (2))	36
9.0	REGULATORY CHANGES	37
9.1	Arsenic Sampling (O. Reg. 170/03, Schedule 13-5 (1), ss. 13-2 and ss. 13-4)	37
	<ul style="list-style-type: none"> ● Table 41 - Arsenic Results 	
10.0	WELL LEVELS (PTTW)	37
	<ul style="list-style-type: none"> ● Table 42 - Static Well Levels (PTTW) 	
11.0	SOURCE WATER PROTECTION (<i>Clean Water Act, 2006</i>)	38
	<ul style="list-style-type: none"> ● Table 43 - Lakeshore WHPA: Summary of Significant Drinking Water Threats 	
12.0	OBSERVATIONS AND HISTORICAL TRENDS	39
	<ul style="list-style-type: none"> ● Raw Water Quality <ul style="list-style-type: none"> ● Microbiological <ul style="list-style-type: none"> ○ Table 44 - 10-Year Historical Results ● Chemical Parameters <ul style="list-style-type: none"> ○ Table 45 - 10-Year Historical Results ● Arsenic: Point Clark <ul style="list-style-type: none"> ○ Table 46 - 10-Year Historical Results ○ Figure 7 - Point Clark - Historical Arsenic (µg/L) ● Raw Turbidity <ul style="list-style-type: none"> ○ Table 47 - 10-Year Historical Results ○ Figure 8 - Lakeshore Historical Turbidity (NTU) ● Well Levels <ul style="list-style-type: none"> ○ Table 48 - 10-Year Historical Results ○ Figure 9 - Lakeshore Historical Well Levels (m) ● Well Flow and Pump Performance <ul style="list-style-type: none"> ○ Table 49 - 5-Year Historical Results ○ Figure 10 - BLAIRS GROVE ○ Figure 11 - HURONVILLE SOUTH ○ Figure 12 - MURDOCH GLEN ○ Figure 13 - POINT CLARK 	

1.0 EXECUTIVE SUMMARY

The purpose of this report is to provide information to system Owners and Stakeholders to satisfy the regulatory requirements of the following:

- *Safe Drinking Water Act (SDWA)*
- Drinking Water Quality Management Standard (DWQMS)
- Section 81 of the Clean Water Act (CWA)
- Reporting required under Ontario Regulation (O. Reg.) 170/03, Section 11
- Reporting required under O. Reg. 170/03, Schedule 22

The Operating Authority (Veolia), on behalf of the Owner (Township of Huron-Kinloss), has prepared this report as a compilation of information that demonstrates the ongoing provision of a safe, consistent supply of high quality drinking water to customers supplied by the Lakeshore Drinking Water System.

SAFE DRINKING WATER ACT

Following the Walkerton Tragedy in 2000, the Ontario Government developed a new, comprehensive legislative paradigm based on a source-to-tap, multi-barrier approach to the protection of drinking water. The *Safe Drinking Water Act (SDWA)*, 2002, and its Regulations, contain requirements for Municipalities that provide potable water to their residents.

Under Section 19 (Standard of Care of the *SDWA*), Owners of a Drinking Water System are required to:

- a) exercise the level of care, diligence and skill in respect of a Municipal Drinking Water System that a reasonably prudent person would be expected to exercise in a similar situation; and
- b) act honestly, competently and with integrity, with a view to ensuring the protection and safety of the users of the Municipal Drinking Water System.

2002, c. 32, s. 19(1).

The following chart outlines key aspects of the *SDWA* that relate to the Lakeshore Drinking Water System:

Legislative Framework for the Lakeshore Drinking Water System

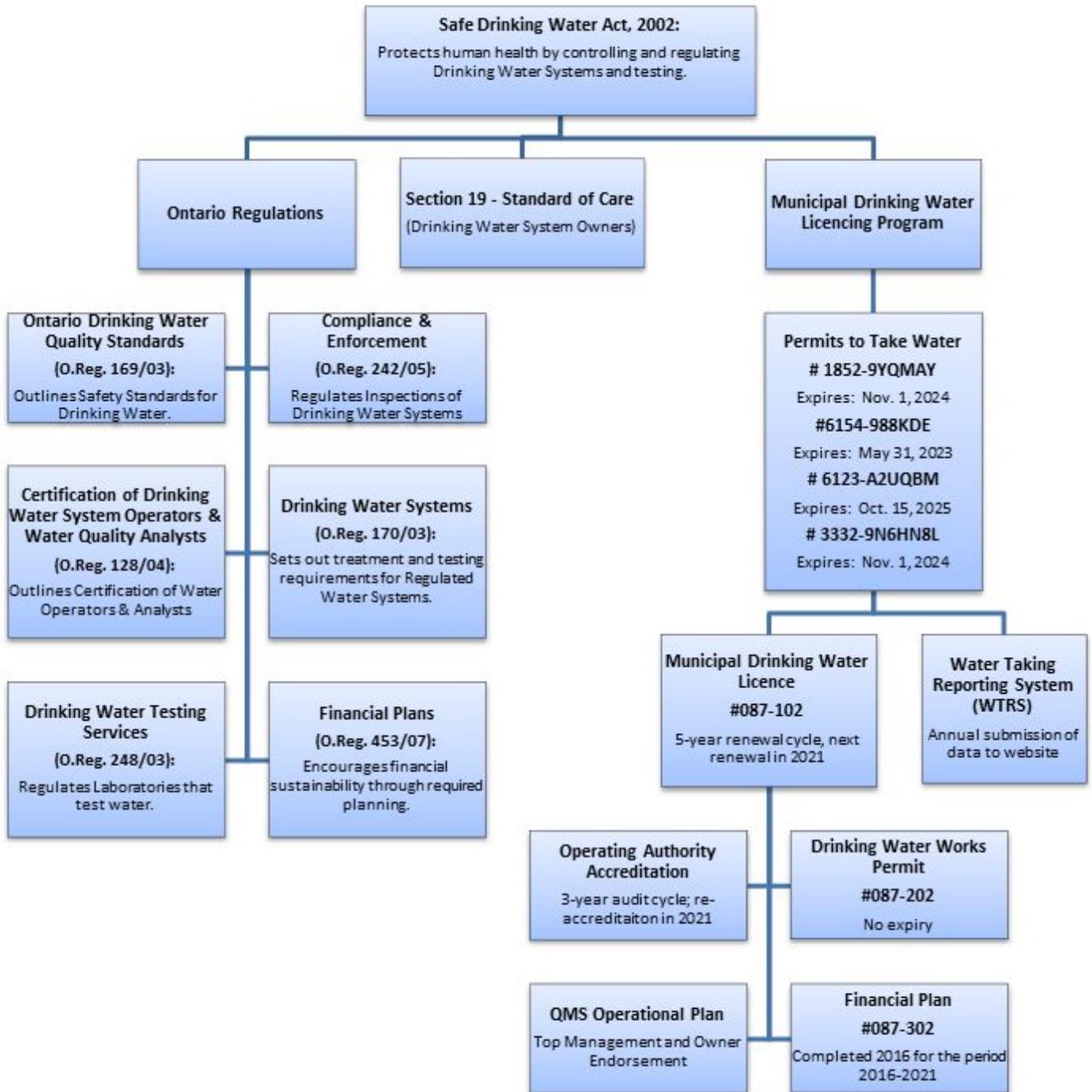


Figure 1

2.0 REPORTING REQUIREMENTS:

This report intends to provide relevant information to help the Township of Huron-Kinloss, its Council, as Owners of the Lakeshore Drinking Water System, meet the Standard of Care. Its contents are organized as follows, according to specific reporting requirements under the *SDWA*:

O. REG. 170/03, SECTION 11 - ANNUAL REPORT

- The Owner shall ensure an annual report is prepared as per O. Reg. 170/03, s. 11(1)
- The Owner of a Drinking Water System (DWS) that supplies water to another DWS shall provide a copy of the annual report to the system that receives the water (Courtney Subdivision - Ashfield-Colborne-Wawanosh)
- The annual report must cover the period of January 1 to December 31 in a year and must be prepared not later than February 28 of the following year
- The annual report must:
 - Contain a brief description of the DWS, including a list of water treatment chemicals used
 - Summarize any reports made to the Ministry under s.s. 18(1) of the *Act*, or Sch. 16 (16-4)
 - Summarize the results of tests made under O. Reg. 170/03 and the Municipal Drinking Water Licence (MDWL)
 - Describe any corrective actions taken under Sch. 17
 - Describe any major expenses to install, repair or replace required equipment
 - Include a statement of where a report prepared as per Sch. 22 will be available for inspection under s.s. 12(4)
 - Specify the number of points sampled as per s.s. 15.1-4(2) or s.s. 15.1-5(5), the number of samples taken, and the number of points where a sample exceeded the prescribed standard for lead
- The Owner shall ensure that a copy of an annual report for a system is given, without charge, to every person who requests a copy
- If a DWS is connected to and receives all of its drinking water from another DWS, the Owner of the system that receives the water shall ensure that a copy of an annual report for the DWS that supplies water is given, without charge, to every person who requests a copy
- Every time that an annual report is prepared for a DWS, the Owner of the system shall ensure that effective steps are taken to advise users of water from the system that copies of the report are available, without charge, and of how a copy may be obtained.

O. REG. 170/03, SCHEDULE 22 - SUMMARY REPORT FOR MUNICIPALITIES

- The Owner of a DWS shall ensure that, not later than March 31 of each year, a report is prepared as per s.s. (2) and (3) for the preceding year and is given to:
 - in the case of a DWS owned by a Municipality, the members of the Municipal Council;
 - in the case of a DWS owned by a Municipal Service Board established under s. 195 of the *Municipal Act, 2001*, the members of the Municipal Service Board; or
 - in the case of a DWS owned by a Corporation, the Board of Directors of the Corporation
- The summary report must,
 - list the requirements of the *Act*, the Regulations, the system's approval, Drinking Water Works Permit (DWWP), MDWL, and any Orders applicable to the system that were not met at any time during the period covered by the report; and
 - for each requirement referred to above that was not met, specify the duration of the failure and the measures that were taken to correct the failure.
- The summary report must also include the following information for the purpose of enabling the Owner of the DWS to assess the capability of the system to meet existing and planned uses of the system:
 - A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows;
 - A comparison of the summary referred to above to the rated capacity and flow rates approved in the system's approval, DWWP or MDWL, or if the system is receiving all of its water from another system under an agreement pursuant to subsection 5(4), to the flow rates specified in the written agreement.
- If a report is prepared under s.s. (1) for a system that supplies water to a Municipality under the terms of the contract, the Owner of the DWS shall give a copy of the report to the Municipality by March 31.

MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS (MECP) INSPECTION REPORT

- In 2006, the MECP introduced a comprehensive inspection program for Municipal Residential Drinking Water Systems. The objectives of this program are to determine compliance with the *SDWA* and associated regulations; to encourage the continuous improvement of the Drinking Water System; and to establish a process to measure these improvements.

MUNICIPAL DRINKING WATER MANAGEMENT REVIEW

- The *SDWA*, through Municipal Drinking Water System Licensing Program, requires that the Township maintain an accredited Quality Management System (QMS) for its drinking water system. This review communicates to Council the key information related to the QMS and the Municipal Drinking Water Licensing Program.

QMS OPERATIONAL PLAN

- The *SDWA*, through the Municipal Drinking Water Licensing Program, requires that a Municipal Drinking Water System Owner (Council) endorse the most current version of the QMS Operational Plan. This document, once endorsed, is posted on the Township of Huron-Kinloss website and is available at the Operations Centre.

The Township of Huron-Kinloss is approved by the MECP to operate a Class 3 Distribution and Supply System through its MDWL # 087-102, and to alter the system through it DWWP # 087-202.

The MECP “Municipal Drinking Water Systems” web portal provides the most current version of the *Act* and its regulations and can be found:

<https://www.ontario.ca/page/municipal-drinking-water-systems-licencing-registration-and-permits>

3.0 DESCRIPTION OF WATER SYSTEM (O. Reg. 170/03, s. 11 (6) (a))

A summary of the Lakeshore Drinking Water System description is outlined below:

Drinking Water System Number:	220000425
Drinking Water System Name:	Lakeshore Well Water Distribution and Supply
Drinking Water System Owner:	Corporation of the Township of Huron-Kinloss
Drinking Water System Category:	Large Municipal Residential
Drinking Water System Classification:	Water Distribution and Supply Subsystem Class 3
Drinking Water System Certificate No.:	1808
Daily Maximum Water Supply Capacity:	11,636.26 m ³
Disinfection Chemicals:	Sodium Hypochlorite, 12%
Iron Sequestering Chemicals:	Sodium Silicate (N), undiluted
Population (as per Engineer’s Design notes):	3,200
Total Number of Service Connections:	2,324
Estimated Seasonal Population:	6,042 (based on Census data of 2.6 persons per household)
Average Day Demand:	1,925.33 m ³
Peak Day Demand:	5,263.06 m ³ (July 5, 2020)
Average Capacity:	16.59%
Peak Capacity:	45.23%
Distribution Network:	64 km
Fire Hydrants:	198
Blow-offs:	43

The Lakeshore Drinking Water Distribution and Supply Subsystem (LDWDSS) is characterized as a “secure groundwater system”. It consists of four sub-systems (well supplies), that deliver potable water to the Huron-Kinloss Lakeshore Community, extending from Point Clark in the south, to Huronville in the north, and to the Courtney/Amberley Beach subdivision in the Township of Ashfield-Colborne-Wawanosh. The Township of Huron-Kinloss has an agreement with The Township of Ashfield-Colborne-Wawanosh, where the Courtney/Amberley Beach Subdivision is treated as part of the Lakeshore Drinking Water System.

The four sub-systems are: Point Clark, Blairs Grove, Huronville South, and Murdoch Glen. All of these sites are located within the Township of Huron-Kinloss along Lake Huron. All sites are controlled, monitored, and alarmed through a Supervisory Control and Data Acquisition (SCADA) system which is connected to the main controller, autodialer, and server at the Ripley Municipal Office. The desktop computer used by the system's operators is located at the Ripley Township Shed and is connected remotely to the SCADA server. As a redundancy, each site is also equipped with an auto-dialer that is independent of the SCADA system, and is used to call out alarms in the event of communications/SCADA failure. This SCADA system provides the operator with the ability to monitor current operating status of the supply and treatment equipment throughout the water system at any given time via remote access by computer or Smartphone, and to have control over operations.

The Township of Huron-Kinloss also has an agreement with the Municipality of Kincardine, where Kincardine is the Operating Authority for a small area of Huron-Kinloss known as the Huronville Subdivision Distribution System (Plan M28). This subdivision received all their water from the Municipality of Kincardine Water System. There is an interconnecting valve between the LDWDSS and Huronville Subdivision Distribution System, and the Town of Kincardine. This valve is normally closed and is used for emergency purposes only.

The four well supplies are detailed as follows:

Site: Point Clark - 603 Tuscarora Road

- Water Source: Groundwater, Non-GUDI
- Number of Production Wells: 2 (Well # 2 - 1994; Well # 3 - 2015)
- Depth of Wells: 75.6 m; 82.3 m
- Well Pumps: 15 hp each (submersible)
- Disinfection: Sodium hypochlorite (12%)
- CT Requirement: 2-log, 5°C, baffled reservoir (0.5 BF)
- Iron Sequestering: Sodium silicate (undiluted)
- High Lift Pumps: 2 (25 hp each)
- Reservoir: 65 m³
- Permit To Take Water: 1852-9YQMAY, expires November 1, 2024

Site: Blairs Grove - 28 Cathcart Street

- Water Source: Groundwater, Non-GUDI
- Number of Production Wells: 1 (1982, flowing artesian)
- Depth of Well: 69.5 m
- Well Pump: 10 hp (submersible)
- Disinfection: Sodium hypochlorite (12%)
- CT Requirement: 2-log, 5°C, baffled reservoir (0.5 BF)
- Iron Sequestering: Sodium silicate (undiluted)
- High Lift Pump: 1 (30 hp)
- Reservoir: 83 m³
- Permit To Take Water: 6154-988KDE, expired December 17, 2020

NOTE: The Blairs Grove production well (Well 2) casing failed in August 2020. The well supply was taken off-line for the remainder of the year, and the monitoring well (Well 3) was approved as the new supply (new PTTW # 5776-BW6SKS, expires December 17, 2030) in December 2020, but was not equipped in 2020.

Site: Murdoch Glen - 815 Parkplace

- Water Source: Groundwater, Non-GUDI
- Number of Production Wells: 1 (1992)
- Depth of Well: 80.5 m
- Well Pump: 25 hp (submersible)
- Disinfection: Sodium hypochlorite (12%)
- CT Requirement: 2-log, 5°C, contact watermain (BF 1.0)
- Iron Sequestering: Sodium silicate (undiluted)
- High Lift Pumps: 4 total; 2 (15 hp each), 2 (50 hp each)
- Reservoir: 400 m³
- Standby Power: 130 kW Diesel Generator (1,100 L fuel storage)
- Permit To Take Water: 6123-A2UQBM, expires October 15, 2025

Site: Huronville South - 39 Penetangore Row South

- Water Source: Groundwater, Non-GUDI
- Number of Production Wells: 1 (1994)
- Depth of Well: 93.3 m
- Well Pump: 30 hp (submersible, soft-start)
- Disinfection: Sodium hypochlorite (12%)
- CT Requirement: 2-log, 5°C, baffled reservoir (BF 0.5)
- Iron Sequestering: Sodium silicate (undiluted)
- High Lift Pumps: 2 (30 hp each)
- Reservoir: 65 m³
- Permit To Take Water: 3332-9N6H8L, expires November 1, 2024

The LDWDSS currently (December 2020) has a distribution network with a combination of PVC and polyethylene water mains, in sizes varying between 1-inch and 10-inch diameter. The Lakeshore area has a large seasonal population of potentially 6,042 (based on Census data of 2.6 people per household connection x 2,324 connections), and therefore, the demands are significantly higher during the cottage season.

All the Lakeshore wells are secure, deep bedrock wells that penetrate limestone aquifers. Due to the depth and structure of the aquifers, the water temperature is relatively constant (< 10°C), turbidity is low, and the water is relatively hard. The raw water is also relatively **high in naturally-occurring sodium, fluoride and iron**, but the lead content of the raw water is well below the half-MAC (Maximum Allowable Concentration). Iron sequestering is achieved by means of treating the water with sodium silicate. Sequestering does not remove iron, but instead it prevents the dissolved iron from precipitating. When iron is precipitated, it can lead to stained plumbing fixtures and appear as discolouration in the water. Sodium silicate can leave a slight metallic taste in the water. Those who are supplied from the LDWDSS are made aware of the various concentrations in their drinking water by numerous means of communication from the Township of Huron-Kinloss.

A 130 kW diesel generator, located at the Murdoch Glen pumphouse, includes a 1,100 L capacity fuel storage tank and is used for emergency power supply. A standpipe is situated in the Point Clark area at 3405 Concession 2, and is constructed of bolted steel (1996). The 31 m (102 ft) high and 9.45 m (31 ft) diameter standpipe has an effective storage of approximately 1,500 m³ to supply the entire Lakeshore System in emergency situations. Periodic inspections of the standpipe (exterior and interior) are conducted. In 2017, the standpipe was isolated, drained, cleaned, and had some minor repairs. After repairs, it was disinfected, flushed, sampled, and put back into service.

4.0 SUMMARY OF REPORTS MADE TO THE MINISTRY (O. Reg. 170/03, s. 11 (6) (b))

- There were no Adverse Water Quality Indicators (AWQIs) in 2020.

5.0 SUMMARY OF WATER QUALITY MONITORING (O. Reg. 170/03, s. 11 (6) (c))

The purpose of sampling and testing is to confirm that water is safe for human consumption and to provide a comprehensive track record.

Table 1 - Water Quality Monitoring Requirements:

Parameter	Description	Required # of Samples	Requirement Source
Chlorine Residual (grab)	For monitoring amount of residual in system, and confirming of water quality following maintenance	365/year (1 daily)	O. Reg. 170/03, Sch. 7
Chlorine Residual (continuous monitoring)	Continuous monitoring equipment used to sample and test treated water at the location where intended contact time has been completed	5 minute intervals, minimum	O. Reg. 170/03, Sch. 7
E. Coli (EC) Total Coliform (TC) Heterotrophic Plate Count (HPC)	For testing presence of microbiological activity	168/year (Dist) 260/year (Raw) 208/year (Treated)	O. Reg. 170/03, Sch. 10
Inorganics and Organics	For testing presence of metals, pesticides and herbicides	36 month interval	O. Reg. 170, Sch 13, s. 13-2 (Sch 23), and s. 13-4 (Sch 24)
Trihalomethanes (THMs)	For testing presence of disinfection by-products (DBPs)	4/year (quarterly)	O. Reg. 170/03, Sch. 13, s. 13-6
Lead (Pb)	For testing presence of lead in the distribution system only - not private side	36 month interval (pH and alkalinity annually)	O. Reg. 170/03, Sch. 15; MDWL #087-102, Sch. D
Haloacetic Acids (HAAs)	For monitoring the formation of disinfection by-products (DBPs)	4/year (quarterly)	O. Reg. 170/03, Sch. 13, s. 13-6.1
Nitrate and Nitrite	For testing presence of nitrates and nitrites in the treated water at Point-of-Entry	4/year (quarterly)	O. Reg. 170/03, Sch. 13, s. 13-7
Sodium	For testing presence of sodium in the treated water at Point-of-Entry	60 month interval	O. Reg. 170/03, Sch. 13, s. 13-8
Fluoride	For testing presence of fluoride in the treated water at Point-of-Entry	60 month interval	O. Reg. 170/03, Sch. 13, s. 13-9

COMMUNICATIONS WHEN ADVERSE WATER SAMPLES ARE IDENTIFIED

Requirement - Laboratory

A water sample that does not meet Provincial water quality standards is considered “adverse”. When adverse water quality is detected, the accredited laboratory conducting the testing will immediately notify the Operating Authority, the Spills Action Centre (SAC), and the office of Grey Bruce Health Services, and occasionally the office of Huron-Perth Public Health (as necessary, if applicable). This notification is made by telephone through live communication to a person in authority. In addition to the phone calls, a fax of the sample results is sent to these agencies to verify the live communication made earlier.

Requirement - Drinking Water System Owner/Operating Authority

The SDWA also requires the Drinking Water System Owner/Operating Authority to immediately notify the MECP and the Grey Bruce Health Services office and the Huron-Perth Public Health office (if applicable), that the laboratory notice has been received and that “corrective actions” are being initiated. The method of contact is by telephone to a person of authority. The Operating Authority also faxes Form 2A - Notices of Adverse Test Results and Issue Resolution (Schedule 16) within 24 hours to both agencies first to verify previous live communication. Once the issue has been resolved and to confirm that corrective actions have been completed, the Operating Authority also faxes Form 2B - Notices of Adverse Test Results and Issue Resolution (Schedule 16) within 7 days to the agencies. This reporting system provides assurance that the DWS Owner is complying with the applicable regulations and that appropriate corrective actions are being taken and are being reported.

5.1 Water Treatment Equipment Operation and Monitoring

5.1.1 Treated Water (Point of Entry) Free Chlorine Residuals (Grab Samples)

In 2020, a total of 1,332 treated water grab samples were collected and analyzed for free chlorine residual at the point of entry (POE) using a Hach pocket chlorine colorimeter. **Table 2** shows the grab samples monthly average of free chlorine residual values. **Table 3** shows the on-line continuous samples monthly average (as collected by SCADA) of the free chlorine residual values. NOTE: Roads were closed on February 28th due to inclement conditions so TW residuals were not taken that day.

5.1.2 Distribution Free Chlorine Residuals (Grab Samples)

In 2020, a total of 680 distribution residuals were collected: 366 daily grab residuals and an additional 314 weekly grab residuals were taken in conjunction with the required weekly microbiological sampling. A summary of all the residuals collected is presented in **Table 2**.

Table 2 - Average Treated and Distribution Free Chlorine Residuals (Grab Samples)

Month	Blairs Grove	Huronville South	Murdoch Glen	Point Clark	Distribution
Jan	1.33	1.58	1.74	1.52	1.36
Feb	1.29	1.53	1.53	1.47	1.35
Mar	1.26	1.51	1.2	1.48	1.31
Apr	1.37	1.52	1.56	1.54	1.26
May	1.49	1.64	1.58	1.51	1.28
Jun	1.47	1.63	1.62	1.53	1.29
Jul	1.55	1.62	1.69	1.52	1.36
Aug	1.52	1.47	1.70	1.64	1.38
Sep	off-line	1.61	1.73	1.55	1.32
Oct	off-line	1.56	1.76	1.56	1.32
Nov	off-line	1.51	1.76	1.59	1.28
Dec	off-line	1.57	1.61	1.61	1.29
CT Requirement	0.22	0.40	0.26	0.32	0.20
Annual Min	1.08	1.35	1.10	1.32	0.86
Annual Max	2.20	1.88	1.91	1.81	1.75
Annual Avg	1.41	1.56	1.66	1.54	1.35
# Samples	237	365	365	365	680

Table 3 - Average Treated Free Chlorine Residuals (On-Line Continuous from SCADA)

Month	Blairs Grove	Huronville South	Murdoch Glen	Point Clark
Jan	1.33	1.59	1.77	1.52
Feb	1.29	1.52	1.56	1.48
Mar	1.29	1.51	1.64	1.50
Apr	1.37	1.52	1.58	1.57
May	1.54	1.64	1.60	1.53
Jun	1.55	1.63	1.64	1.54
Jul	1.59	1.62	1.71	1.53
Aug	1.54	1.46	1.70	1.65
Sep	1.35	1.59	1.77	1.55
Oct	1.32	1.56	1.79	1.57
Nov	off-line	1.51	1.79	1.60
Dec	off-line	1.57	1.63	1.62
CT Requirement	0.22	0.40	0.26	0.32
Annual Min	0.82	1.40	1.50	1.21
Annual Max	1.95	1.87	1.94	1.77
Annual Avg	1.42	1.56	1.68	1.56

5.1.3 Raw and Treated Water Turbidity

Raw water and treated water grab samples were collected and analyzed for turbidity using a portable turbidity analyzer. **Table 4** provides a summary of raw water turbidity results and **Table 5** provides a summary of treated water turbidity results.

Table 4 - Raw Water Turbidity Results

Month	Blairs Grove	Huronville South	Murdoch Glen	Point Clark W2	Point Clark W3
Jan	0.91	0.11	0.19	0.18	0.23
Feb	0.97	0.12	0.23	0.25	0.20
Mar	0.90	0.15	0.23	0.50	0.19
Apr	0.84	0.12	0.29	0.27	0.24
May	0.92	0.12	0.29	0.28	0.22
Jun	0.46	0.13	0.27	0.24	0.26
Jul	0.80	0.22	0.33	0.26	0.26
Aug	1.12	0.20	0.25	0.27	0.22
Sep	off-line	0.20	0.32	0.31	0.26
Oct	off-line	0.28	0.29	0.31	0.31
Nov	off-line	0.31	0.32	0.40	0.27
Dec	off-line	0.28	0.28	0.35	0.31
Annual Min	0.38	0.10	0.13	0.18	0.11
Annual Max	1.63	0.32	0.43	0.92	0.32
Annual Avg	0.87	0.19	0.27	0.30	0.25
# Samples	30	47	47	47	46

Table 5 - Treated Water Turbidity Results

Month	Blairs Grove	Huronville South	Murdoch Glen	Point Clark
Jan	0.26	0.11	0.19	0.20
Feb	0.59	0.12	0.22	0.20
Mar	0.40	0.19	0.25	0.20
Apr	0.44	0.17	0.24	0.20
May	0.50	0.16	0.25	0.27
Jun	0.28	0.17	0.25	0.22
Jul	0.90	0.21	0.30	0.25
Aug	0.74	0.22	0.28	0.27
Sep	off-line	0.27	0.32	0.29
Oct	off-line	0.28	0.32	0.30
Nov	off-line	0.36	0.32	0.31
Dec	off-line	0.31	0.32	0.32
Annual Min	0.19	0.11	0.19	0.17
Annual Max	0.93	0.38	0.36	0.34
Annual Avg	0.51	0.21	0.27	0.25
# Samples	29	45	44	44

5.2 Microbiological Sampling per Schedule 10, O. Reg. 170/03

5.2.1 Raw Water Samples

Raw water samples are collected every week. In 2020, a total of 246 samples were collected and analyzed for E. Coli and Total Coliform. **Tables 6, 7, 8, 9 and 10** provide summaries of microbiological results performed on the raw water.

Microbiological Results for Raw Water

Table 6 - BLAIRS GROVE - RAW

Month	Total Coliform			E. Coli		
	# Samples	# Samples "0"	# Samples ≥ 1	# Samples	# Samples "0"	# Samples ≥ 1
Jan	4	4	0	4	4	0
Feb	4	4	0	4	4	0
Mar	5	5	0	5	5	0
Apr	4	4	0	4	4	0
May	4	4	0	4	4	0
Jun	5	5	0	5	5	0
Jul	4	4	0	4	4	0
Aug	4	4	0	4	4	0
Sep	offline	offline	offline	offline	offline	offline
Oct	offline	offline	offline	offline	offline	offline
Nov	offline	offline	offline	offline	offline	offline
Dec	offline	offline	offline	offline	offline	offline
TOTAL	34	34	0	34	34	0

Microbiological Results for Raw Water Continued

Table 7 - HURONVILLE SOUTH - RAW

Month	Total Coliform			E. Coli		
	# Samples	# Samples "0"	# Samples ≥ 1	# Samples	# Samples "0"	# Samples ≥ 1
Jan	4	4	0	4	4	0
Feb	4	4	0	4	4	0
Mar	5	5	0	5	5	0
Apr	4	4	0	4	4	0
May	4	4	0	4	4	0
Jun	5	5	0	5	5	0
Jul	4	4	0	4	4	0
Aug	4	4	0	4	4	0
Sep	5	5	0	5	5	0
Oct	4	4	0	4	4	0
Nov	4	4	0	4	4	0
Dec	5	5	0	5	5	0
TOTAL	52	52	0	52	52	0

Table 8 - MURDOCH GLEN - RAW

Month	Total Coliform			E. Coli		
	# Samples	# Samples "0"	# Samples ≥ 1	# Samples	# Samples "0"	# Samples ≥ 1
Jan	4	4	0	4	4	0
Feb	4	4	0	4	4	0
Mar	5	5	0	5	5	0
Apr	4	4	0	4	4	0
May	4	4	0	4	4	0
Jun	5	5	0	5	5	0
Jul	4	4	0	4	4	0
Aug	4	4	0	4	4	0
Sep	5	5	0	5	5	0
Oct	4	4	0	4	4	0
Nov	4	4	0	4	4	0
Dec	5	5	0	5	5	0
TOTAL	52	52	0	52	52	0

Microbiological Results for Raw Water Continued

Table 9 - POINT CLARK WELL # 2 - RAW

Month	Total Coliform			E. Coli		
	# Samples	# Samples "0"	# Samples ≥ 1	# Samples	# Samples "0"	# Samples ≥ 1
Jan	4	4	0	4	4	0
Feb	6	6	0	6	6	0
Mar	5	5	0	5	5	0
Apr	4	4	0	4	4	0
May	4	4	0	4	4	0
Jun	5	5	0	5	5	0
Jul	4	4	0	4	4	0
Aug	4	4	0	4	4	0
Sep	5	5	0	5	5	0
Oct	4	4	0	4	4	0
Nov	4	4	0	4	4	0
Dec	5	5	0	5	5	0
TOTAL	54	54	0	54	54	0

Table 10 - POINT CLARK WELL # 3 - RAW

Month	Total Coliform			E. Coli		
	# Samples	# Samples "0"	# Samples ≥ 1	# Samples	# Samples "0"	# Samples ≥ 1
Jan	4	4	0	4	4	0
Feb	4	4	0	4	4	0
Mar	5	5	0	5	5	0
Apr	4	4	0	4	4	0
May	4	4	0	4	4	0
Jun	5	5	0	5	5	0
Jul	4	4	0	4	4	0
Aug	4	4	0	4	4	0
Sep	5	5	0	5	5	0
Oct	4	4	0	4	4	0
Nov	4	4	0	4	4	0
Dec	5	5	0	5	5	0
TOTAL	52	52	0	52	52	0

5.2.2 Treated Water (Point of Entry) Samples

One (1) treated water sample from each point of entry is taken every week and analyzed for E. Coli, Total Coliform, and Heterotrophic Plate Count (HPC). In 2020, a total of 212 treated water samples were collected and analyzed for the above parameters. Each EC and TC result from the treated water was 0 cfu/100 mL. The range of HPC results were 0 - 44 cfu/100 mL. **Table 11, 12, 13, and 14** provide summaries of all microbiological results performed on treated water.

Microbiological Results for Treated Water (Point of Entry)

Table 11 - BLAIRS GROVE

Month	Total Coliform			E. Coli			HPC		
	# Samples	# Samples "0"	# Samples ≥1	# Samples	# Samples "0"	# Samples ≥1	# Samples	# Samples "0"	# Samples ≥44
Jan	4	4	0	4	4	0	4	4	0
Feb	4	4	0	4	4	0	4	3	1
Mar	5	5	0	5	5	0	5	2	3
Apr	4	4	0	4	4	0	4	4	0
May	4	4	0	4	4	0	4	3	1
Jun	5	5	0	5	5	0	5	5	0
Jul	4	4	0	4	4	0	4	3	1
Aug	4	4	0	4	4	0	4	3	1
Sep	offline	offline	offline	offline	offline	offline	offline	offline	offline
Oct	offline	offline	offline	offline	offline	offline	offline	offline	offline
Nov	offline	offline	offline	offline	offline	offline	offline	offline	offline
Dec	offline	offline	offline	offline	offline	offline	offline	offline	offline
TOTAL	34	34	0	34	34	0	34	27	7

Table 12 - HURONVILLE SOUTH

Month	Total Coliform			E. Coli			HPC		
	# Samples	# Samples "0"	# Samples ≥1	# Samples	# Samples "0"	# Samples ≥1	# Samples	# Samples "0"	# Samples ≥44
Jan	4	4	0	4	4	0	4	0	4
Feb	4	4	0	4	4	0	4	3	1
Mar	5	5	0	5	5	0	5	2	3
Apr	4	4	0	4	4	0	4	4	0
May	4	4	0	4	4	0	4	4	0
Jun	5	5	0	5	5	0	5	2	3
Jul	4	4	0	4	4	0	4	4	0
Aug	4	4	0	4	4	0	4	2	2
Sep	5	5	0	5	5	0	5	5	0
Oct	4	4	0	4	4	0	4	4	0
Nov	4	4	0	4	4	0	4	4	0
Dec	5	5	0	5	5	0	5	0	5
TOTAL	52	52	0	52	52	0	52	34	18

Microbiological Results for Treated Water (Point of Entry)

Table 13 - MURDOCH GLEN

Month	Total Coliform			E. Coli			HPC		
	# Samples	# Samples "0"	# Samples ≥ 1	# Samples	# Samples "0"	# Samples ≥ 1	# Samples	# Samples "0"	# Samples ≥ 44
Jan	4	4	0	4	4	0	4	1	3
Feb	4	4	0	4	4	0	4	3	1
Mar	5	5	0	5	5	0	5	2	3
Apr	4	4	0	4	4	0	4	3	1
May	4	4	0	4	4	0	4	4	0
Jun	5	5	0	5	5	0	5	5	0
Jul	4	4	0	4	4	0	4	4	0
Aug	4	4	0	4	4	0	4	3	1
Sep	5	5	0	5	5	0	5	3	2
Oct	4	4	0	4	4	0	4	3	1
Nov	4	4	0	4	4	0	4	3	1
Dec	5	5	0	5	5	0	5	0	5
TOTAL	52	52	0	52	52	0	52	35	12

Table 14 - POINT CLARK

Month	Total Coliform			E. Coli			HPC		
	# Samples	# Samples "0"	# Samples ≥ 1	# Samples	# Samples "0"	# Samples ≥ 1	# Samples	# Samples "0"	# Samples ≥ 44
Jan	4	4	0	4	4	0	4	1	3
Feb	4	4	0	4	4	0	4	3	1
Mar	5	5	0	5	5	0	5	3	2
Apr	4	4	0	4	4	0	4	4	0
May	4	4	0	4	4	0	4	4	0
Jun	5	5	0	5	5	0	5	4	1
Jul	4	4	0	4	4	0	4	4	0
Aug	4	4	0	4	4	0	4	2	2
Sep	5	5	0	5	5	0	5	3	2
Oct	4	4	0	4	4	0	4	4	0
Nov	4	4	0	4	4	0	4	3	1
Dec	5	5	0	5	5	0	5	0	5
TOTAL	52	52	0	52	52	0	52	35	12

5.2.3 Distribution Samples

Distribution samples are collected every week and tested for E. Coli, Total Coliform, and 25% of the samples are also analyzed for Heterotrophic Plate Count (HPC). Ontario Regulation 170/03 requires 8 distribution samples plus one additional sample for every 1,000 people served by the system. In 2020, a total of 364 distribution samples were collected and analyzed for TC and EC, which is above the required number of samples (n=168, based on 6,042 potential residents). A total of 207 distribution samples were analyzed for HPC (n=42, 25% of 168). Each TC and EC result from the distribution water was 0 cfu/100 mL. The range of HPC results were 0 - 10 cfu/100 mL. **Table 15** provides a summary of all microbiological samples taken in the distribution system.

Table 15 - Microbiological Results for Distribution System

Month	Total Coliform			E. Coli			HPC		
	# Samples	# Samples "0"	# Samples ≥ 1	# Samples	# Samples "0"	# Samples ≥ 1	# Samples	# Samples "0"	# Samples 1 - 12
Jan	28	28	0	28	28	0	16	11	5
Feb	28	28	0	28	28	0	16	13	3
Mar	35	35	0	35	35	0	20	12	8
Apr	28	28	0	28	28	0	16	13	3
May	28	28	0	28	28	0	16	14	2
Jun	35	35	0	35	35	0	20	19	1
Jul	28	28	0	28	28	0	16	12	4
Aug	28	28	0	28	28	0	16	15	1
Sep	28	28	0	28	28	0	16	15	1
Oct	35	35	0	35	35	0	20	14	6
Nov	28	28	0	28	28	0	16	13	3
Dec	35	35	0	35	35	0	20	0	20
TOTAL	364	364	0	364	364	0	207	151	56

5.3 Chemical Sampling and Testing as per Schedule 13, O. Reg. 170/03

5.3.1 Inorganics (Schedule 13, s. 13-2; Schedule 23)

Treated water samples are collected every 36 months and analyzed for inorganics. The most recent samples for the Lakeshore Drinking Water System were collected on June 4, 2018 and submitted to the laboratory for analysis of inorganics as listed in Schedule 23 (see **Table 16**). All parameters were found to be within compliance, however, the Arsenic level at Point Clark exceeded the Half-Maximum Allowable Concentration (half-MAC). Any half-MAC exceedance must be sampled on a quarterly basis to comply with O. Reg. 170/03, Schedule 13-5(1) - Increased frequency under s.s 13-2 and 13-4. Inorganics will be sampled and analyzed again in June 2021.

Table 16 - Inorganics (Schedule 13, s. 13-2; Schedule 23) Results

Parameter	Blairs Grove (µg/L)	Huronville South (µg/L)	Murdoch Glen (µg/L)	Point Clark (µg/L)	Maximum Allowable Concentration (µg/L)	Exceedance
Antimony	0.03	0.02<MDL	0.02	0.03	6	No
Arsenic	0.4	0.4	1.6	5.6	10	No
Barium	4.65	24.6	27.1	26.3	1000	No
Boron	155	170	154	78	5000	No
Cadmium	0.004	0.003<MDL	0.018	0.003<MDL	5	No
Chromium	0.57	0.09	0.57	0.08	50	No
Mercury	0.01<MDL	0.01<MDL	0.01<MDL	0.01<MDL	1	No
Selenium	0.04<MDL	0.04<MDL	0.04<MDL	0.04<MDL	50	No
Uranium	0.359	0.269	1.27	0.437	20	No

*MDL = Laboratory Minimum Detection Limit

5.3.2 Organics (Schedule 13, s. 13-4; Schedule 24)

Treated water samples are collected every 36 months and tested for Schedule 24 organic parameters. The most recent samples were collected on June 4, 2018. All parameters were found to be within compliance. Organics will be sampled and analyzed again in June 2021. Samples results can be found in **Table 17**.

Table 17 - Organics (Schedule 13, s. 13-4; Schedule 24) Results

Parameter	Blairs Grove (µg/L)	Huronville South (µg/L)	Murdoch Glen (µg/L)	Point Clark (µg/L)	Maximum Allowable Concentration (µg/L)	Exceedance
Benzene	0.32<MDL	0.32<MDL	0.32<MDL	0.32<MDL	1	No
Carbon Tetrachloride	0.16<MDL	0.16<MDL	0.16<MDL	0.16<MDL	2	No
1,2-Dichlorobenzene	0.41<MDL	0.41<MDL	0.41<MDL	0.41<MDL	200	No
1,4-Dichlorobenzene	0.36<MDL	0.36<MDL	0.36<MDL	0.36<MDL	5	No
1,1-Dichloroethylene	0.33<MDL	0.33<MDL	0.33<MDL	0.33<MDL	14	No
1,2-Dichloroethane	0.35<MDL	0.35<MDL	0.35<MDL	0.35<MDL	5	No
Dichloromethane	0.35<MDL	0.35<MDL	0.35<MDL	0.35<MDL	50	No
Monochlorobenzene	0.3<MDL	0.3<MDL	0.3<MDL	0.3<MDL	80	No
Tetrachloroethylene	0.35MDL	0.35MDL	0.35MDL	0.35MDL	10	No
Trichloroethylene	0.44<MDL	0.44<MDL	0.44<MDL	0.44<MDL	5	No
Vinyl Chloride	0.17<MDL	0.17<MDL	0.17<MDL	0.17<MDL	1	No
Diquat	1<MDL	1<MDL	1<MDL	1<MDL	70	No
Paraquat	1<MDL	1<MDL	1<MDL	1<MDL	10	No
Glyphosate	1<MDL	1<MDL	1<MDL	1<MDL	280	No
Polychlorinated Biphenyls	0.04<MDL	0.04<MDL	0.04<MDL	0.04<MDL	3	No
Benzo(a)pyrene	0.004<MDL	0.004<MDL	0.004<MDL	0.004<MDL	0.01	No

*MDL = Laboratory Minimum Detection Limit

Table 17 - Organics (Schedule 13, s. 13-4; Schedule 24) Results - Continued

Parameter	Blairs Grove (µg/L)	Huronville South (µg/L)	Murdoch Glen (µg/L)	Point Clark (µg/L)	Maximum Allowable Concentration (µg/L)	Exceedance
Alachlor	0.02<MDL	0.02<MDL	0.02<MDL	0.02<MDL	5	No
Atrazine+N-dealkylated metabolites	0.01<MDL	0.01<MDL	0.01<MDL	0.01<MDL	5	No
Atrazine	0.01<MDL	0.01<MDL	0.01<MDL	0.01<MDL	--	No
Desethyl Atrazine	0.01<MDL	0.01<MDL	0.01<MDL	0.01<MDL	--	No
Azinphos-methyl	0.05<MDL	0.05<MDL	0.05<MDL	0.05<MDL	20	No
Carbaryl	0.05<MDL	0.05<MDL	0.05<MDL	0.05<MDL	90	No
Carbofuran	0.01<MDL	0.01<MDL	0.01<MDL	0.01<MDL	90	No
Chlorpyrifos	0.02<MDL	0.02<MDL	0.02<MDL	0.02<MDL	90	No
Diazinon	0.02<MDL	0.02<MDL	0.02<MDL	0.02<MDL	20	No
Dimethoate	0.03<MDL	0.03<MDL	0.03<MDL	0.03<MDL	20	No
Diuron	0.03<MDL	0.03<MDL	0.03<MDL	0.03<MDL	150	No
Malathion	0.02<MDL	0.02<MDL	0.02<MDL	0.02<MDL	190	No
Metolachlor	0.01<MDL	0.01<MDL	0.01<MDL	0.01<MDL	50	No
Metribuzin	0.02<MDL	0.02<MDL	0.02<MDL	0.02<MDL	80	No
Phorate	0.01<MDL	0.01<MDL	0.01<MDL	0.01<MDL	2	No
Prometryne	0.03<MDL	0.03<MDL	0.03<MDL	0.03<MDL	1	No
Simazine	0.01<MDL	0.01<MDL	0.01<MDL	0.01<MDL	10	No
Terbufos	0.01<MDL	0.01<MDL	0.01<MDL	0.01<MDL	1	No
Triallate	0.01<MDL	0.01<MDL	0.01<MDL	0.01<MDL	230	No
Trifluralin	0.02<MDL	0.02<MDL	0.02<MDL	0.02<MDL	45	No
2,4-Dichlorophenoxyacetic acid	0.19<MDL	0.19<MDL	0.19<MDL	0.19<MDL	100	No
Bromoxynil	0.33<MDL	0.33<MDL	0.33<MDL	0.33<MDL	5	No
Dicamba	0.20<MDL	0.20<MDL	0.20<MDL	0.20<MDL	120	No
Diclofop-methyl	0.40<MDL	0.40<MDL	0.40<MDL	0.40<MDL	9	No
MCPA	0.00012<MDL	0.00012<MDL	0.00012<MDL	0.00012<MDL	0.1	No
Picloram	1<MDL	1<MDL	1<MDL	1<MDL	190	No
2,4-Dichlorophenol	0.15<MDL	0.15<MDL	0.15<MDL	0.15<MDL	900	No
2,4,6-Trichlorophenol	0.25<MDL	0.25<MDL	0.25<MDL	0.25<MDL	5	No
2,3,4,6-Tetrachlorophenol	0.20<MDL	0.20<MDL	0.20<MDL	0.20<MDL	100	No
Pentachlorophenol	0.15<MDL	0.15<MDL	0.15<MDL	0.15<MDL	60	No

*MDL = Laboratory Minimum Detection Limit

5.3.3 Trihalomethanes (Schedule 13, s. 13-6)

Distribution samples are taken every three months from representative points in the distribution system and tested for Trihalomethanes (THMs). In 2020, samples were collected during the months of February, May, August, and November. The Ontario Drinking Water Quality Standards (ODWQS) have set a Maximum Allowable Concentration (MAC) of 100 µg/L for this parameter and it is expressed as a running annual average (RAA). Refer to **Tables 18, 19, 20, and 21** for the summary of Trihalomethane results and **Table 26** for the RAA.

Trihalomethane (Schedule 13, s. 13-6) Results

Table 18 - BLAIRS GROVE

Month	THMs (µg/L)	Bromodichloro methane (µg/L)	Bromoform (µg/L)	Chloroform (µg/L)	Dibromochloro methane (µg/L)
Feb	9.8	3.3	<0.34	4.3	2.2
May	15.0	5.1	<0.34	6.8	3.2
Aug	15.0	5.2	<0.34	6.9	3.2
Nov	20.0	6.3	<0.34	11.0	3.1
RAA	15.0	5.0	<0.34	7.3	2.9
Maximum	20.0	6.3	<0.34	11.0	3.2
MAC (µg/L)	100				
Exceedance	No				

Table 19 - HURONVILLE SOUTH

Month	THMs (µg/L)	Bromodichloro methane (µg/L)	Bromoform (µg/L)	Chloroform (µg/L)	Dibromochloro methane (µg/L)
Feb	6.9	2.2	<0.34	3.0	1.7
May	6.3	1.9	<0.34	2.8	1.6
Aug	4.9	1.5	<0.34	2.4	0.99
Nov	6.6	2.0	<0.34	3.2	1.5
RAA	6.2	1.9	<0.34	2.9	1.4
Maximum	6.9	2.2	<0.34	3.2	1.7
MAC (µg/L)	100				
Exceedance	No				

Table 20 - MURDOCH GLEN

Month	THMs (µg/L)	Bromodichloro methane (µg/L)	Bromoform (µg/L)	Chloroform (µg/L)	Dibromochloro methane (µg/L)
Feb	12.0	4.1	0.51	3.9	3.6
May	14.0	4.8	0.74	4.3	4.3
Aug	11.0	3.7	0.36	3.5	3.1
Nov	15.0	5.3	0.70	5.2	4.0
RAA	13.0	4.5	0.58	4.2	3.8
Maximum	15.0	5.3	0.74	5.2	4.3
MAC (µg/L)	100				
Exceedance	No				

Trihalomethane (Schedule 13, s. 13-6) Results Continued

Table 21 - POINT CLARK

Month	THMs (µg/L)	Bromodichloro methane (µg/L)	Bromoform (µg/L)	Chloroform (µg/L)	Dibromochloro methane (µg/L)
Feb	8.0	2.8	<0.34	3.5	1.7
May	9.7	3.3	<0.34	4.0	2.4
Aug	11.0	3.5	<0.34	5.1	2.0
Nov	10.0	3.3	<0.34	4.9	1.9
RAA	9.7	3.2	<0.34	4.4	2.0
Maximum	11.0	3.5	<0.34	5.1	2.4
MAC (µg/L)	100				
Exceedance	No				

5.3.4 Haloacetic Acids (Schedule 13, s. 13-6.1)

Ontario Regulation 170/03 has been amended to include quarterly testing for Haloacetic Acids (HAAs). Four (4) distribution samples are taken every three months from representative points in the distribution system and tested for Haloacetic Acids (HAAs). In 2020, samples were collected during the months of February, May, August, and November and results are expressed as a running annual average (RAA). Results are summarized in **Tables 22, 23, 24, and 25** and the RAA can be found in **Table 26**.

Haloacetic Acid (Schedule 13, s. 13-6.1) Results

Table 22 - BLAIRS GROVE

Month	Total HAAs (µg/L)	Bromoacetic acid (µg/L)	Chloroacetic acid (µg/L)	Dichloroacetic acid (µg/L)	Dibromoacetic acid (µg/L)	Trichloroacetic acid (µg/L)
Feb	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
May	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
Aug	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
Nov	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
RAA	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
Max	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
MAC (µg/L)	80					
Exceedance	No					

Haloacetic Acid (Schedule 13, s. 13-6.1) Results Continued

Table 23 - HURONVILLE SOUTH

Month	Total HAAs (µg/L)	Bromoacetic acid (µg/L)	Chloroacetic acid (µg/L)	Dichloroacetic acid (µg/L)	Dibromoacetic acid (µg/L)	Trichloroacetic acid (µg/L)
Feb	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
May	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
Aug	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
Nov	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
RAA	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
Max	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
MAC (µg/L)	80					
Exceedance	No					

Table 24 - MURDOCH GLEN

Month	Total HAAs (µg/L)	Bromoacetic acid (µg/L)	Chloroacetic acid (µg/L)	Dichloroacetic acid (µg/L)	Dibromoacetic acid (µg/L)	Trichloroacetic acid (µg/L)
Feb	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
May	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
Aug	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
Nov	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
RAA	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
Max	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
MAC (µg/L)	80					
Exceedance	No					

Table 25 - POINT CLARK

Month	Total HAAs (µg/L)	Bromoacetic acid (µg/L)	Chloroacetic acid (µg/L)	Dichloroacetic acid (µg/L)	Dibromoacetic acid (µg/L)	Trichloroacetic acid (µg/L)
Feb	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
May	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
Aug	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
Nov	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
RAA	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
Max	<5.3	<2.9	<4.7	<2.6	<2.0	<5.3
MAC (µg/L)	80					
Exceedance	No					

Table 26 - THMs and HAAs - Rolling Annual Average Summary

Location	Sample Date	RAA - THMs (µg/L)	RAA - HAAs (µg/L)
BLAIRS GROVE	Feb	9.8	<5.3
	May	15.0	<5.3
	Aug	15.0	<5.3
	Nov	20.0	<5.3
HURONVILLE SOUTH	Feb	6.9	<5.3
	May	6.3	<5.3
	Aug	4.9	<5.3
	Nov	6.6	<5.3
MURDOCH GLEN	Feb	12.0	<5.3
	May	14.0	<5.3
	Aug	11.0	<5.3
	Nov	15.0	<5.3
POINT CLARK	Feb	8.0	<5.3
	May	6.3	<5.3
	Aug	4.9	<5.3
	Nov	10.0	<5.3
RAA		10.36	<5.3
MAC		100 (RAA)	80 (RAA)

5.3.5 Nitrate and Nitrite (Schedule 12, s. 13-7)

Four treated water samples are taken every three months and tested for nitrate and nitrite. In 2020, samples were collected during the months of February, May, August, and November. The Ontario Drinking Water Quality Standards (ODWQS) have set a Maximum Allowable Concentration (MAC) of 10 mg/L for nitrates and 1 mg/L for nitrites. The results were found to be within compliance. Refer to **Tables 27, 28, 29, and 30**.

Nitrate and Nitrite (Schedule 13, s. 13-7) Results

Table 27 - BLAIRS GROVE

Month	Nitrite (mg/L)	Nitrate (mg/L)
Feb	<0.003	<0.006
May	<0.003	<0.006
Aug	<0.003	<0.006
Nov *2019	<0.003	<0.006
Average	<0.003	<0.006
Maximum	<0.003	<0.006
MAC	1	10
Exceedance	No	No

*Note: Blairs Grove was off-line in November, so Nitrate and Nitrite samples could not be taken.

Nitrate and Nitrite (Schedule 13, s. 13-7) Results Continued

Table 28 - HURONVILLE SOUTH

Month	Nitrite (mg/L)	Nitrate (mg/L)
Feb	<0.003	<0.006
May	<0.003	<0.006
Aug	<0.003	<0.006
Nov	<0.003	<0.006
Average	<0.003	<0.006
Maximum	<0.003	<0.006
MAC	1	10
Exceedance	No	No

Table 29 - MURDOCH GLEN

Month	Nitrite (mg/L)	Nitrate (mg/L)
Feb	<0.003	<0.006
May	<0.003	<0.006
Aug	<0.003	<0.006
Nov	<0.003	<0.006
Average	<0.003	<0.006
Maximum	<0.003	<0.006
MAC	1	10
Exceedance	No	No

Table 30 - POINT CLARK

Month	Nitrite (mg/L)	Nitrate (mg/L)
Feb	<0.003	<0.006
May	<0.003	<0.006
Aug	<0.003	<0.006
Nov	<0.003	<0.006
Average	<0.003	<0.006
Maximum	<0.003	<0.006
MAC	1	10
Exceedance	No	No

5.3.6 Sodium (Schedule 13, s. 13-8)

One (1) water sample is collected from each of the four (4) Points of Entry (treated water) every 60 months and analyzed for Sodium. The *Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines, PIBS 4449e01, June 2006*, states: “The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified 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.” These samples were collected on June 21, 2016. Three (3) of the samples exceeded 20 mg/L and were reported to the Grey Bruce Health Unit and the Ministry’s Spills Action Centre (AWQI # 129989). Results can be found in **Table 31**. The next sampling date for Sodium will be on or before June 21, 2021.

5.3.7 Fluoride (Schedule 13, s. 13-9)

One (1) water sample is collected from each of the four (4) Points of Entry (treated water) every 60 months and analyzed for Fluoride. The Ontario Drinking Water Quality Standards (ODWQS) have set a Maximum Allowable Concentration (MAC) of 1.5 mg/L. On August 15, 2017, samples were collected for this analysis. All four samples exceeded the MAC due to naturally occurring fluoride in the aquifers. These exceedances were reported to the Grey Bruce Health Unit and the Ministry’s Spills Action Centre (AWQI # 135640). The results are summarized in **Table 31**. The next sampling date for Fluoride will be on or before August 15, 2022.

Table 31 - Sodium (Schedule 13, s. 13-8) and Fluoride (Schedule 13, s. 13-9) Results

Location	Sodium	Fluoride
	Result (mg/L)	Result (mg/L)
Blairs Grove	101	2.20
Huronville South	52.7	2.24
Murdoch Glen	68.4	2.14
Point Clark	19.8	2.20
MAC (mg/L)	20	1.50
Exceedance	Yes	Yes

5.3.8 Lead (Schedule 15.1) - (O. Reg. 170/03, s. 11 (6) (g))

Schedule 15.1 of Ontario Regulation 170/03 requires that samples be taken during two seasons: once between December 15 and April 15, and once between June 15 and October 15. In 2020, the Lakeshore Drinking Water System was sampled for lead, pH and alkalinity. Three (3) samples were collected on January 27, 2020 and three (3) were collected on July 13, 2020. The next sampling seasons are reduced, with only pH and alkalinity parameters required between December 2020 and April 2021, and again between June and October 2021. Results for 2020 can be found in **Table 32**.

Table 32 - Lead Sampling Program (Schedule 15.1) Results

Season	Alkalinity (mg/L)	pH	Lead (mg/L)
Dec-Apr	163	7.83	0.08
	176	7.79	0.12
	183	7.58	0.34
Jun-Oct	158	7.39	0.06
	173	7.33	0.52
	181	7.16	0.29
MAC (µg/L)	---	---	10
Exceedance	---	---	No

5.3.9 Non-Regulatory Testing - Aesthetic Objectives and Operational Guidelines (AO/OG)

Samples were collected from each of the four (4) Points of Entry (treated water) on November 21, 2016 and tested for parameters listed in the *MOECC Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines, June 2006, PIBS 4449e01*. These results are included in **Table 33** for information purposes.

Table 33 - Aesthetic Objectives and Operational Guideline Results

Parameter	AO/OG	Blairs Grove	Huronville South	Murdoch Glen	Point Clark
pH	6.5 - 8.5	7.89	8.10	8.17	8.07
Alkalinity (mg/L as CaCO ₃)	30 - 500	174	156	171	190
Conductivity (µS/cm)	---	1,720	694	771	709
Colour (TCU)	5	3 <MDL	3 <MDL	3 <MDL	7
Total Dissolved Solids (mg/L)	500	1,350	494	511	534
Organic Nitrogen (mg/L)	0.15	0.05 <MDL	0.05 <MDL	0.05 <MDL	0.05 <MDL
Total Kjeldahl Nitrogen (mg/L)	---	0.05 <MDL	0.07	0.05 <MDL	0.05 <MDL
Ammonia + Ammonium (mg/L)	---	0.04 <MDL	0.04	0.07	0.05
Hydrogen Sulphide (mg/L)	0.05	<0.006	<0.006	<0.006	<0.006
Sulphide (mg/L)	0.05	0.006 <MDL	0.006 <MDL	0.006 <MDL	0.006 <MDL
Chloride (mg/L)	250	150	18	37	13
Sulphate (mg/L)	500	620	170	170	170
Hardness (mg/L as CaCO ₃)	80 - 100	765	237	246	308
Aluminum (µg/L)	100	25.5	1.0	2.8	3.3
Copper (µg/L)	1000	0.08	0.12	5.80	0.22
Iron (µg/L)	300	581	150	102	311
Manganese (µg/L)	50	3.70	2.02	3.07	4.11
Zinc (µg/L)	5000	2	4	20	4
Dissolved Organic Carbon (mg/L)	5	1 <MDL	1 <MDL	1 <MDL	1 <MDL
Methane (L/m ³)	3	0.02 <MDL	0.02 <MDL	0.02 <MDL	0.02 <MDL
Ethylbenzene (µg/L)	2.4	0.33 <MDL	0.33 <MDL	0.33 <MDL	0.33 <MDL
Toluene (µg/L)	24	0.36 <MDL	0.36 <MDL	0.36 <MDL	0.36 <MDL
Xylene (µg/L)	300	0.43 <MDL	0.43 <MDL	0.43 <MDL	0.43 <MDL
m/p-xylene (µg/L)	---	0.43 <MDL	0.43 <MDL	0.43 <MDL	0.43 <MDL
o-xylene (µg/L)	---	0.17 <MDL	0.17 <MDL	0.17 <MDL	0.17 <MDL

*MDL = Laboratory Minimum Detection Limit

6.0 WATER AND CHEMICAL USE (O. Reg. 170/03, s. 11 (6) (a); Schedule 22-2 (3))

6.1 Chemical Usage (O. Reg. 170/03, s. 11 (6) (a))

In 2020, the total amount of 12% sodium hypochlorite (NaOCl) used to treat the water supplied by the five wells in the Lakeshore Drinking Water System is tabulated in **Table 34** with the average chlorine dosage. During the same period, the total amount of undiluted sodium silicate (Na₂SiO₃) for iron sequestering is tabulated in **Table 35** with the average silicate dosage.

Table 34 - Sodium Hypochlorite Usage

Month	BLAIRS GROVE		HURONVILLE SOUTH		MURDOCH GLEN		POINT CLARK	
	Usage (kg)	Average Dosage (mg/L)	Usage (kg)	Average Dosage (mg/L)	Usage (kg)	Average Dosage (mg/L)	Usage (kg)	Average Dosage (mg/L)
Jan	3.08	5.17	36.72	3.28	11.35	3.64	95.31	3.13
Feb	5.89	4.09	23.27	3.12	7.99	3.33	83.96	2.97
Mar	3.78	4.58	27.89	3.17	8.69	3.51	106.80	3.07
Apr	6.45	3.96	31.54	3.20	7.01	3.63	102.74	3.11
May	20.88	3.93	62.09	3.35	9.11	3.35	124.74	3.00
Jun	25.51	2.61	109.89	3.39	17.24	3.66	142.12	3.00
Jul	97.83	3.70	143.94	3.36	42.75	3.52	160.62	3.06
Aug	30.55	4.11	98.95	3.23	23.41	3.63	164.27	3.29
Sep	0	0	72.04	3.41	15.42	4.22	133.29	3.06
Oct	0	0	44.15	3.38	12.47	3.78	120.26	3.15
Nov	0	0	31.26	3.38	8.41	3.82	125.72	3.19
Dec	0	0	33.78	3.40	7.01	3.59	112.97	3.13
TOTAL	193.98	---	715.52	---	170.86	---	1,472.80	---
Average	---	4.02	---	3.30	---	3.64	---	3.10

Sodium Hypochlorite Grand Total Usage: **2,553.15 kg**

Sodium Hypochlorite Average Dosage: **3.52 mg/L**

Table 35 - Sodium Silicate Usage

Month	BLAIRS GROVE		HURONVILLE SOUTH		MURDOCH GLEN		POINT CLARK	
	Usage (kg)	Average Dosage (mg/L)	Usage (kg)	Average Dosage (mg/L)	Usage (kg)	Average Dosage (mg/L)	Usage (kg)	Average Dosage (mg/L)
Jan	2.79	4.68	25.52	2.28	15.15	4.86	79.74	2.62
Feb	8.37	5.81	18.74	2.51	11.16	4.65	67.78	2.40
Mar	3.99	4.83	19.14	2.17	11.56	4.67	81.73	2.35
Apr	9.17	5.64	22.72	2.30	8.77	4.54	77.34	2.34
May	25.91	4.88	35.48	1.92	12.36	4.55	97.68	2.35
Jun	51.03	5.22	83.72	2.58	21.53	4.57	116.81	2.47
Jul	140.34	5.31	94.49	2.20	59.80	4.92	124.39	2.37
Aug	40.67	5.48	76.15	2.48	31.10	4.83	126.38	2.53
Sep	0	0	51.03	2.41	17.94	4.91	112.03	2.58
Oct	0	0	32.29	2.47	15.95	4.83	89.31	2.34
Nov	0	0	26.31	2.84	10.37	4.70	93.69	2.38
Dec	0	0	23.12	2.32	9.57	4.90	83.72	2.32
TOTAL	282.27	---	508.72	---	225.26	---	1,150.60	---
Average	---	5.23	---	2.38	---	4.74	---	2.42

Sodium Silicate Grand Total Usage: 2,166.85 kg

Sodium Silicate Average Dosage: 3.69 mg/L

6.2 Summary of Flow Rates, Annual Volumes and Capacities (O. Reg. 170/03, Schedule 22-2 (3))

A summary of the water supplied to the distribution system in 2020 from each well supply is provided in **Tables 36, 37, 38, and 39**. The volumes reported for each well supply are taken from the SCADA continuous monitoring system. The flow meters were calibrated on the following dates:

Blairs Grove:	Raw water flow meter	June 30, 2020
Huronville South:	Treated water flow meter	June 30, 2020
Murdoch Glen:	Raw water flow meter	June 30, 2020
Murdoch Glen:	Treated water flow meter - Zone 2	June 30, 2020
Murdoch Glen:	Treated water flow meter - Zone 3	June 30, 2020
Point Clark:	Raw water flow meter	June 30, 2020

NOTE: The company that performed the annual verifications did not follow the manufacturer's instructions for testing at three different flow rates within the operating range of the meter, but rather they measured the operational flow using a magnetic clamp-on device. This was identified as a Non-Compliance during the MECP Drinking Water Inspection. When contacted, the Flow Meter Manufacturer (Sensus) did not have a procedure for verifying the mechanical flow meters used at the Ripley Pumphouse, as it is deemed obsolete. Due to the COVID-19 Pandemic, we were unable to arrange for another flow meter company to perform the retest of the meter verifications. This testing will be conducted in 2021 as COVID restrictions are lifted.

Flow Rates, Annual Volumes, and Capacities

Table 36 - BLAIRS GROVE

Month	Raw Flow Daily Max (L/s)	Raw Flow Monthly Avg (L/s)	Raw Volume Monthly Total (m ³)	Raw Volume Daily Max (m ³)	Raw Volume Monthly Avg (m ³)	Capacity Monthly Max (%)
Jan	30.03	25.04	603.03	237.76	19.50	9.07%
Feb	29.90	23.93	1,453.12	562.76	50.15	21.47%
Mar	29.73	27.33	117.68	23.54	3.83	0.90%
Apr	29.70	27.27	1,615.75	463.92	53.86	17.70%
May	29.95	26.89	5,347.55	703.95	172.50	26.86%
Jun	29.16	26.55	10,633.15	1,155.62	354.44	44.09%
Jul	30.88	25.87	26,364.79	1,702.35	850.48	64.95%
Aug	29.66	25.44	6,910.14	655.30	222.91	25.00%
Sep	0.00	0.00	0.00	0.00	0.00	0.00%
Oct	0.00	0.00	0.00	0.00	0.00	0.00%
Nov	0.00	0.00	0.00	0.00	0.00	0.00%
Dec	0.00	0.00	0.00	0.00	0.00	0.00%
PTTW Max	30.33	30.33	79,722.08	2,621.00	---	---
Annual Max	30.88	---	26,364.79	1,702.35	---	64.95%
Annual Avg	---	26.04	4,420.43	---	143.97	5.53%
Annual Total	---	---	53,045.21	---	---	---

*Note: Blairs Grove was taken off-line on August 24, 2020.

Table 37 - HURONVILLE SOUTH

Month	Raw Flow Daily Max (L/s)	Raw Flow Monthly Avg (L/s)	Raw Volume Monthly Total (m ³)	Raw Volume Daily Max (m ³)	Raw Volume Monthly Avg (m ³)	Capacity Monthly Max (%)
Jan	16.99	2.53	6,773.06	566.35	218.49	14.42%
Feb	7.04	1.65	4,100.73	228.55	141.40	5.82%
Mar	12.07	1.87	5,010.45	212.39	161.63	5.41%
Apr	8.15	2.37	6,149.59	275.28	204.99	7.01%
May	18.29	5.10	13,644.30	900.71	440.14	22.93%
Jun	19.99	9.63	24,943.91	1,089.23	831.46	27.73%
Jul	18.91	12.43	32,774.26	1,298.66	1,057.23	33.06%
Aug	18.89	8.58	22,970.97	1,003.88	741.00	25.56%
Sep	18.50	6.06	15,606.98	648.01	520.23	16.50%
Oct	22.26	3.46	9,055.75	393.23	292.12	10.01%
Nov	14.30	2.22	5,711.49	313.94	190.38	7.99%
Dec	20.31	2.23	5,964.72	221.10	192.41	5.63%
PTTW Max	45.47	45.47	119,468.76	3,927.74	---	---
Annual Max	22.26	---	32,774.26	1,298.66	---	33.06%
Annual Avg	---	4.84	12,725.52	---	415.96	10.62%
Annual Total	---	---	152,706.21	---	---	---

Flow Rates, Annual Volumes and Capacities Continued

Table 38 - MURDOCH GLEN

Month	Raw Flow Daily Max (L/s)	Raw Flow Monthly Avg (L/s)	Raw Volume Monthly Total (m ³)	Raw Volume Daily Max (m ³)	Raw Volume Monthly Avg (m ³)	Capacity Monthly Max (%)
Jan	20.01	17.90	3,135.98	507.64	101.16	27.98%
Feb	20.09	18.73	2,434.66	145.27	83.95	8.01%
Mar	20.00	18.67	2,414.39	123.49	77.88	6.81%
Apr	19.76	18.66	1,993.98	126.70	66.47	6.98%
May	21.00	18.71	2,872.77	360.77	92.67	19.88%
Jun	19.86	18.21	4,854.85	351.74	161.83	19.39%
Jul	19.67	17.80	12,156.39	730.17	392.14	40.24%
Aug	19.40	17.73	6,427.06	396.04	207.32	21.83%
Sep	19.66	17.50	3,645.22	222.45	121.51	12.26%
Oct	19.94	17.70	3,317.20	286.52	107.01	15.79%
Nov	18.96	17.74	2,152.50	137.30	71.75	7.57%
Dec	19.17	17.79	1,961.94	132.54	63.29	7.30%
PTTW Max	21.00	21.00	55,188.00	1,814.40	---	---
Annual Max	21.00	---	12,156.39	730.17	---	40.24%
Annual Avg	---	18.10	3,947.25	---	128.92	7.13%
Annual Total	---	---	47,366.94	---	---	---

Table 39 - POINT CLARK

Month	Raw Flow Daily Max (L/s)	Raw Flow Monthly Avg (L/s)	Raw Volume Monthly Total (m ³)	Raw Volume Daily Max (m ³)	Raw Volume Monthly Avg (m ³)	Capacity Monthly Max (%)
Jan	31.99	28.42	28,299.55	1,079.82	912.89	32.99%
Feb	34.69	18.29	27,079.84	1,183.81	833.79	36.17%
Mar	33.16	17.11	32,835.88	1,434.57	1,059.22	43.83%
Apr	32.58	18.59	31,219.75	1,221.62	1,040.66	37.32%
May	32.10	19.62	39,946.29	1,466.75	1,288.59	44.81%
Jun	20.82	19.53	44,160.93	1,639.68	1,472.03	50.10%
Jul	22.73	20.31	49,696.70	1,672.24	1,603.12	51.09%
Aug	22.39	19.98	47,480.73	1,696.28	1,531.64	51.82%
Sep	30.69	19.90	40,818.93	1,673.18	1,360.63	51.12%
Oct	30.69	19.89	36,737.97	1,481.65	1,185.10	45.27%
Nov	21.82	20.03	36,751.94	1,709.37	1,225.06	52.22%
Dec	22.19	20.00	34,379.64	1,313.42	1,109.02	40.13%
PTTW Max	37.88	37.88	99,557.40	3,273.12	---	---
Annual Max	34.69	---	49,696.70	1,709.37	---	52.22%
Annual Avg	---	20.14	37,450.68	---	1,226.81	37.51%
Annual Total	---	---	449,408.15	---	---	---

6.3 System Capacity (O. Reg. 170/03, Schedule 22-2 (3) Continued)

The following is a comparison of the annual volumes to the rated capacity and flow rates approved in the systems' PTTW, DWWP and MDWL. The total system capacity represents the percentage capacity of the sum of all the water produced in relation to the total system volume permitted. A summary of the totals for all the well supplies is presented in **Table 40**. The visual representations of each well and the Lakeshore total capacity are presented in Figures 2 through 6.

Table 40 - Total Volumes of All Well Supplies

Location (Well Supply)	Total Volume for 2020 (m ³)
Blairs Grove	53,045.21
Huronville South	152,706.21
Murdoch Glen	47,366.94
Point Clark	449,408.15
Total Rated Capacity, PTTW (m³)	4,247,234.90
Grand Total (all well supplies), Actual (m ³)	702,526.51
Overall Operating Capacity, Actual %	16.50%

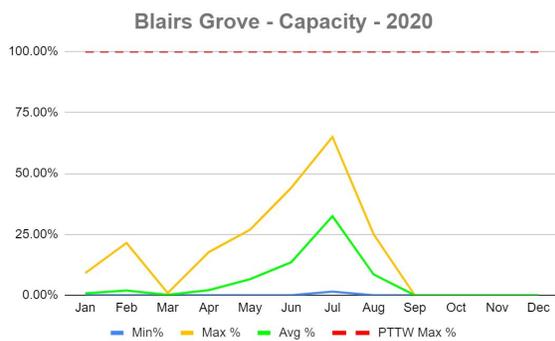


Figure 2

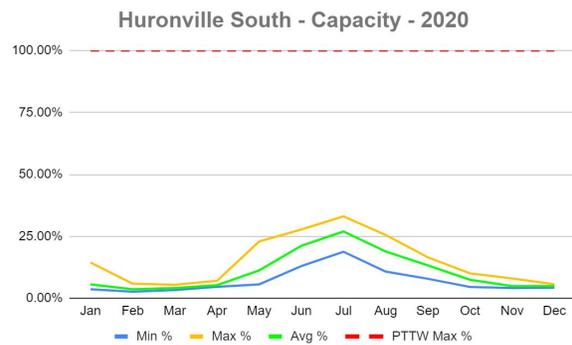


Figure 3

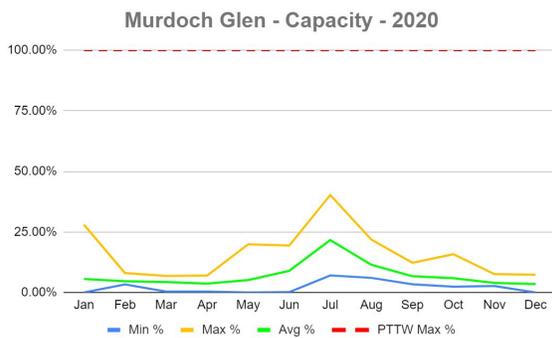


Figure 4

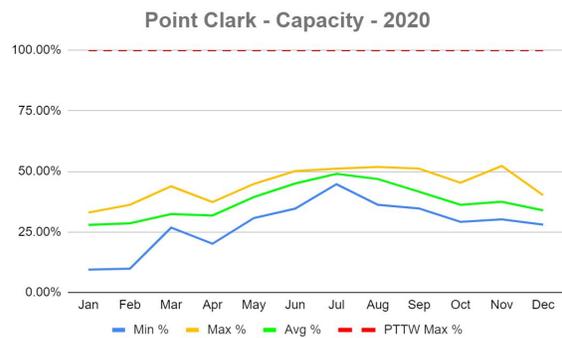


Figure 5

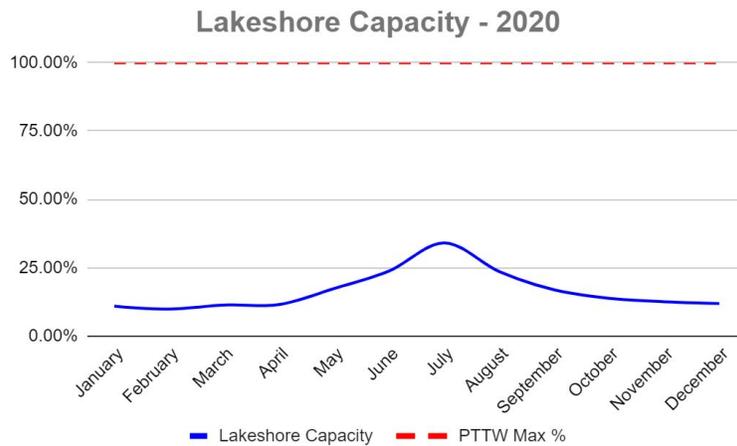


Figure 6

7.0 IMPROVEMENTS TO SYSTEM AND ROUTINE AND PREVENTATIVE MAINTENANCE (s. 11 (6) (e))

The following summarizes water system improvements and routine and preventative maintenance for the Lakeshore Drinking Water System Supply:

All Sites:

Routine and preventative maintenance performed as per Jobs Plus schedule.
Flow meter calibrations completed.
Georgian Bay Fire and Safety inspections completed.
Semi-annual flushing and annual valve turning completed.
Backflow preventer testing completed.

Blairs Grove:

February: Repair to thermostat for building heater.
Installation of safety screen on HLP.
Installation of new air relief valve at wellhead.
April: Installation of protective screen over exhaust fan.
August: Issues with flow and chlorine, which was identified as well casing failure. Well off-line.
Hopper installed a temporary pump and performed flow test on monitoring well.
September: Hopper performing extensive flow test on monitoring well.

Huronville South:

January: Repaired chlorine analyzer bypass line.
Repaired and tested autodialer alarms.
February: Replaced chlorine alarm relay.
July: Replaced well pump contactor.
September: High lift pump 2 overload was tripped due to a power interruption.

Murdoch Glen:

January: New tubing on chlorine analyzer.
March: Repaired cracks in concrete near diesel generator.
May: Flow meter signal error; wiring issue (May 22-26); connection repaired (MECP notified).
June: Control valve # 6 (CV6) diaphragm leaking; valve isolated.
Replaced leaking Tee on chlorine board.
July: Diaphragm replaced on CV6.

Point Clark:

January: Replaced chlorine analyzer.
February: Well pump # 2 burned out; well pump motor was replaced.
Well pump failed again and was taken offline.
Well pump was pulled, and pump was replaced.
March: Hydro monitoring equipment was installed.
April: Hydro monitoring equipment was removed.
Replaced chlorine flow sensor.
June: Tee was replaced on WP 3 chlorine board.
Hydro issues; Sepoy Electric onsite for troubleshooting.
August: Hydro One onsite for meter base replacement.
September: Extended power outage tripped out HLPs and WPs.
Hydro meter was hit by lawnmower; Sepoy Electric onsite to make repairs to meter.
HLPs and WPs faulted; SCADA server was offline; Eramosa rebooted server.

8.0 MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS INSPECTIONS AND REGULATORY ISSUES (Schedule 22-2 (2))

- MECP Drinking Water Inspection was conducted on October 28, 2020 and awarded a rating of 98.80% (previous rating was 98.27%).
- A list of Capital Items for 2021 was submitted to the Township of Huron-Kinloss on November 1, 2020.
- DWQMS Management Review was conducted on June 3, 2020.
- DWQMS Internal Audit was conducted between May 8 - 11, 2020.
- DWQMS External Audit (off-site) was conducted on May 26, 2020.
- DWQMS Complete Risk Assessment was conducted on October 29, 2020.
- Emergency Response Exercise was not required in 2020 due to the State of Emergency declaration regarding the COVID-19 Pandemic.

9.0 REGULATORY CHANGES

Changes to Ontario Regulation 170/03 and Ontario Regulation 169/03 that strengthen standards and clarify testing requirements, new sampling and testing parameters, reporting and resampling requirements, and the removal of the 13 pesticides came into effect January 1, 2016. Updates to the standards and reporting requirements for Arsenic came into effect January 1, 2018. In 2020,, the following amendment was added:

- Effective **January 1, 2020**, a standard for HAAs is introduced. The standard is 0.08 mg/L (80 µg/L) and must be expressed as a Running Annual Average (RAA).

9.1 Arsenic Sampling

In January 2018, O. Reg. 169/03 - Ontario Drinking Water Quality Standard for Arsenic was changed to 0.010 mg/L from 0.025 mg/L, making the new Half-MAC (Maximum Allowable Concentration) 0.005 mg/L. Point Clark is the only Lakeshore well supply that has an Arsenic level in exceedance of the Half-MAC and therefore must be sampled on a quarterly basis to satisfy O. Reg. 170/03, Schedule 13-5(1) - Increased frequency under s.s 13-2 and 13-4. See **Table 41** for Point Clark Arsenic results.

Table 41 - Arsenic Results

Sample Date	Arsenic Concentration (µg/L)
Feb 10, 2020	5.9
May 11, 2020	5.6
Aug 10, 2020	4.9
Nov 16, 2020	4.7
MAC (µg/L)	10
Exceedance	No

NOTE:

O. Reg. 170/03, Schedule 13: Increased frequency under s.s 13-2 and 13-4

*13-5. (1) If a test result obtained under section 13-2 or 13-4 for a parameter **exceeds half of the standard prescribed** for the parameter in Schedule 2 to the Ontario Water Quality Standards, the frequency of sampling and testing for that parameter under that section shall be **increased** so that at least one sample is taken and tested **every three months**.*

10.0 WELL LEVELS (PTTW)

Each of the four sub-systems have a Permit To Take Water (PTTW), which dictates the capacity that each well is permitted to supply, as well as specific monitoring parameters. In addition to flow, static well levels are taken on a monthly basis to monitor the performance of the aquifer. **Table 42** provides a summary of the static well levels recorded in 2020. It should be noted that four (4) of the wells have static levels that are below grade. One of the wells, Blairs Grove, is a flowing artesian well that has a well level that is above grade and the well level is a calculation based on its corresponding pressure reading.

Table 42 - Static Well Levels (PTTW)

Month	Blairs Grove (above grade, m)	Huronville South (m)	Murdoch Glen (m)	Point Clark Well 2 (m)	Point Clark Well 3 (m)
Jan	2.64	10.05	8.85	4.27	7.31
Feb	2.46	9.75	8.20	4.27	7.31
Mar	2.46	9.75	8.10	4.57	7.65
Apr	2.64	9.75	8.10	4.26	7.31
May	2.46	9.75	8.40	4.26	7.31
Jun	2.20	10.05	9.15	3.96	7.01
Jul	1.97	10.05	9.95	4.26	7.31
Aug	1.41	10.05	9.87	4.87	7.92
Sep	Well casing failure	10.05	9.85	5.18	8.23
Oct	Well casing failure	10.05	9.57	5.48	8.53
Nov	Well casing failure	10.97	9.54	3.96	7.01
Dec	Well casing failure	10.66	9.10	4.26	7.31
Min	1.41	9.75	8.10	3.96	7.01
Max	2.64	10.97	9.95	5.48	8.53
Avg	2.27	10.08	9.06	4.47	7.52

11.0 SOURCE WATER PROTECTION (*Clean Water Act, 2006*)

A Drinking Water Source Protection Assessment (DWSPA) Report was generated for the Saugeen Valley Source Protection Area by the Conservation Authority Source Protection Office. This report identifies vulnerable areas, recharge areas, and potential threats to help protect existing and future sources of drinking water from contamination and overuse. This report can be found on-line at:

<http://home.waterprotection.ca/source-protection-plan/assessment-reports/saugeen-valley/>

The Well Head Protection Areas (WHPAs) within the Lakeshore Drinking Water System have 4 designations:

- WHPA-A: 100 m radius around the well head
- WHPA-B: 2-year time-of-travel capture zone
- WHPA-C: 5-year time-of-travel capture zone
- WHPA-D: 25-year time-of-travel capture zone

The Lakeshore wells are NOT classified as groundwater under direct influence of surface water (GUDI).

The DWSPA report states: “The WHPAs within the Township of Huron-Kinloss vary significantly in their vulnerability to contamination. A large percentage of the total area within the Blairs Grove, Murdoch Glen and Point Clark WHPAs has a low intrinsic vulnerability to contamination. Blairs Grove and Point Clark have low vulnerability in over 94% of their area. Huronville South has a slightly higher vulnerability to contamination and a larger portion of moderate vulnerability.” **Table 43** shows a summary of significant drinking water threats within the Lakeshore Drinking Water System.

Table 43 - Lakeshore WHPA: Summary of Significant Drinking Water Threats

WHPA A-D	Number of “are or would be significant” threats				Number of properties with “are or would be significant” threats			
	Chemical	DNAPL	Pathogen	Total	Agricultural	Residential	Others	Total
Blairs Grove	32	0	22	54	0	22	0	22
Huronville South	84*	0	2*	86	0	82	2**	84
Murdoch Glen	12	4	10	26	1	10	0	11
Point Clark	22	4	15	41	0	14	1	15

* One threat of the stated threat count is found in the Municipality of Kincardine.

** One property of the stated property count is found in the Municipality of Kincardine.

In conclusion, as stated in the DWSPA Report: “Based on available data and knowledge on raw water quality, no drinking water quality issues were identified for this water system that would result from ongoing or past activities. Also, no conditions resulting from past activities were identified within the WHPA.”

12.0 OBSERVATIONS AND HISTORICAL TRENDS

Raw Water Quality

- Microbiological: There were no positive microbiological test results in 2020.

Table 44 - 10-Year Historical Results:

Year	Well Source	Positive microbiological Result
2013	Point Clark Well # 2	1 Total Coliform
2015	Huronville South	4 Total Coliforms
2015	Point Clark Well # 2	1 Total Coliform
2017	Huronville South	1 Total Coliform
2018	Blairs Grove	1 Total Coliform

Due to the infrequent historical results, there are no concerns at this time.

- Chemical Parameters: There were no exceedances for any of the chemical parameters tested in 2020. Sodium and Fluoride are tested every 60 months and were not required in 2020. These parameters will be sampled again in 2021.

Table 45 - 10-Year Historical Results:

Year	Blairs Grove		Huronville South		Murdoch Glen		Point Clark	
	Sodium	Fluoride	Sodium	Fluoride	Sodium	Fluoride	Sodium	Fluoride
2006	98.0	2.01	43.9	2.07	43.7	2.06	17.9	2.12
2011	86.4	1.83	46.6	2.32	49.7	2.15	16.0	2.22
2016	101.0	1.71	52.7	2.19	68.4	2.12	19.8	2.04

12.0 OBSERVATIONS AND HISTORICAL TRENDS - Continued

- Arsenic: Point Clark

Arsenic is being monitored at Point Clark quarterly, since it is just above half of the maximum allowable concentration (MAC).

Table 46 - 10-Year Historical Results:

Year	Arsenic (µg/L)
2008	5.2
2009	6.7
2010	5.6, 5.6
2011	5.5, 5.7
2012	5.2, 5.8
2013	5.5, 5.1
2014	5.9, 6.0
2015	5.5

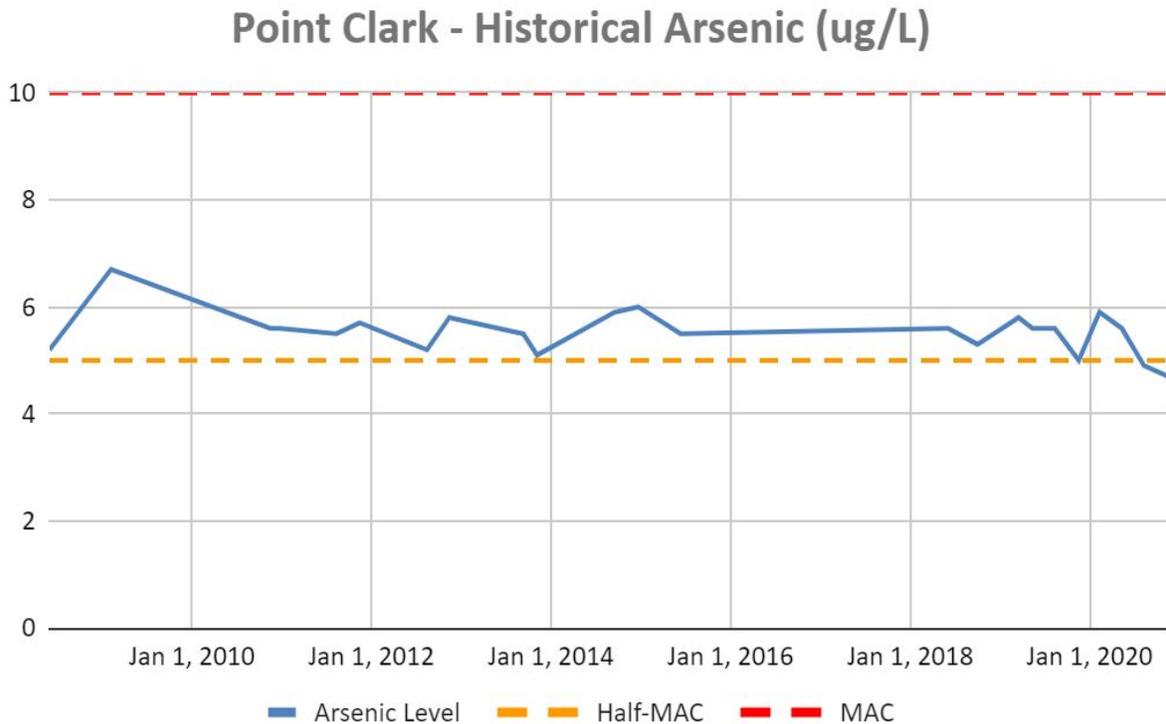


Figure 7

12.0 OBSERVATIONS AND HISTORICAL TRENDS - Continued

- Raw Turbidity:

Table 47 - 10-Year Historical Results:

Well Source	10-Year Historical Average (2010 to 2019) (NTU)	2020 Average (NTU)	Comments
Blairs Grove	0.53	0.87	Blairs Grove Well 2 had a casing failure in August. The monitoring well was tested and will be equipped as the production well in 2021.
Huronville South	0.27	0.19	The raw turbidity has remained consistent based on the 10-year historical average. There is no concern at this time.
Murdoch Glen	0.24	0.27	The raw turbidity has remained consistent based on the 10-year historical average. There is no concern at this time.
Point Clark Well # 2	0.22	0.30	The raw turbidity is slightly elevated from the 10-year historical average, but is still relatively low.. There is no concern at this time.
Point Clark Well # 3	0.22	0.25	The raw turbidity has remained consistent based on the 10-year historical average. There is no concern at this time. (PC 3 was new in 2015).

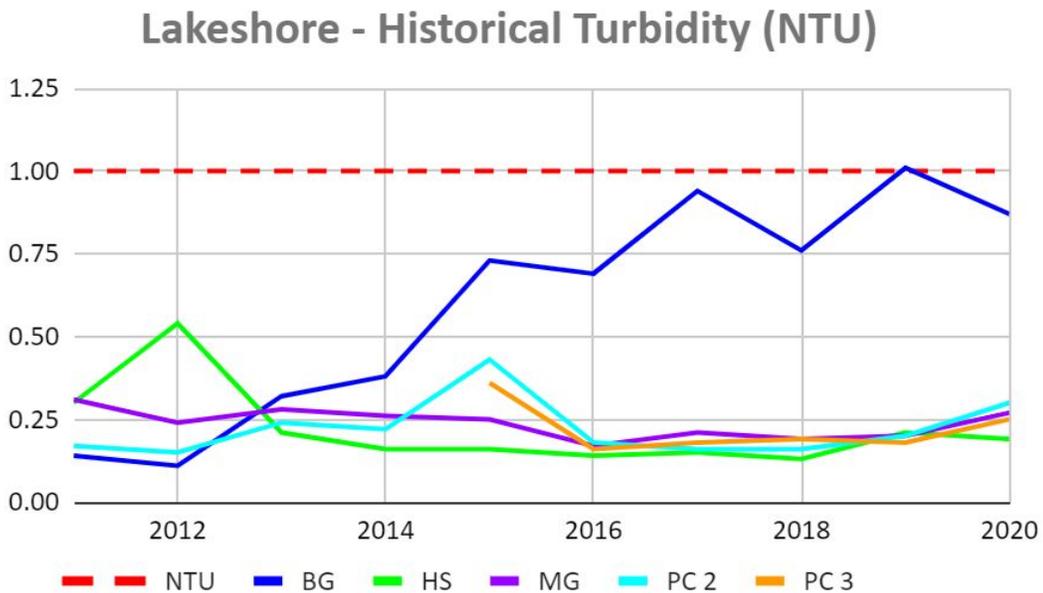


Figure 8

12.0 OBSERVATIONS AND HISTORICAL TRENDS - Continued

- Well Levels:

Table 48 - 10-Year Historical Results:

Well Source	10-Year Historical Average (2010 to 2019) (m)	2020 Average (m)	Comments
Blairs Grove	3.45 m above grade	2.28 m above grade	Blairs Grove Well 2 had a casing failure in August. The monitoring well was tested and will be equipped as the production well in 2021.
Huronville South	10.78 m below grade	10.08 m below grade	The well level has remained consistent based on the 10-year historical average. There is no concern at this time.
Murdoch Glen	9.38 m below grade	9.07 m below grade	The well level has remained consistent based on the 10-year historical average. There is no concern at this time.
Point Clark Well # 2	6.70 m below grade	4.47 m below grade	The well level has remained consistent based on the 10-year historical average. There is no concern at this time.
Point Clark Well # 3	9.13 m below grade	7.52 m below grade	The well level has remained consistent based on the 10-year historical average. There is no concern at this time.

Lakeshore - Historical Well Levels (m)

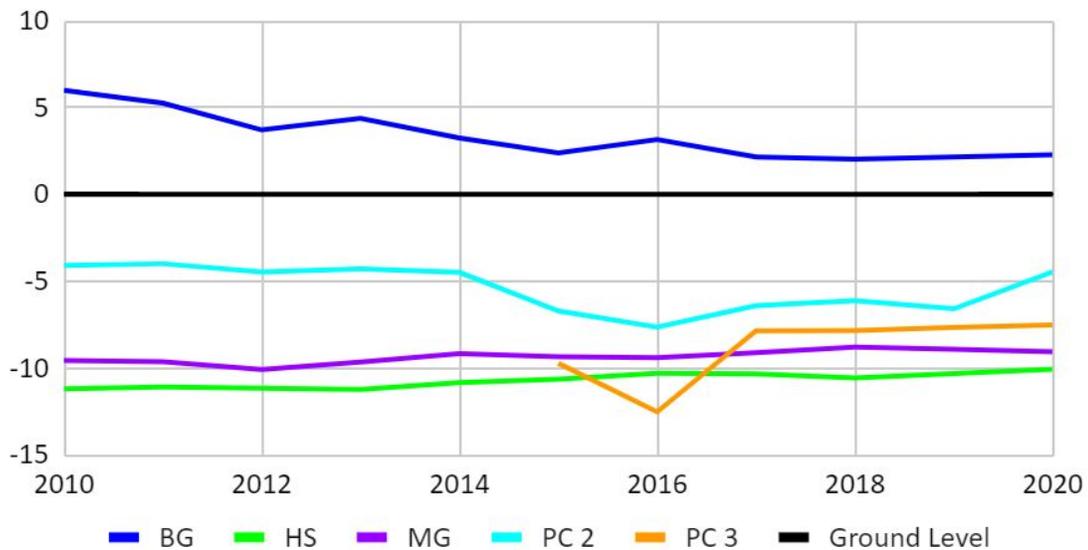


Figure 9

12.0 OBSERVATIONS AND HISTORICAL TRENDS - Continued

- Well Flows and Pump Performance:

Table 49 - 5-Year Historical Results:

Well Source	5-Year Historical Average (2015 to 2019)	2020 Average	Comments
Blairs Grove	Avg flow: 22.09 L/s Capacity: 2.95%	Avg flow: 26.04 L/s Capacity: 5.53%	Blairs Grove Well 2 had a casing failure in August. The monitoring well was tested and will be equipped as the production well in 2021.
Huronville South	Avg flow: 5.97 L/s Capacity: 13.08%	Avg flow: 4.84 L/s Capacity: 10.62%	Flows are consistent based on the 5-year historical average. There are no concerns at this time.
Murdoch Glen	Avg flow: 17.94 L/s Capacity: 5.74%	Avg flow: 18.10 L/s Capacity: 7.13%	Flows are consistent based on the 5-year historical average. There are no concerns at this time.
Point Clark Wells	Avg flow: 19.41 L/s Capacity: 26.48%	Avg flow: 20.14 L/s Capacity: 37.51%	Flows are consistent based on the 5-year historical average, however, the total volumes pumped from 2015 until 2020 have been increasing each year. In 2015, the capacity was 18.63% and has increased by an average of 3.7% each year, with 2020 being 37.51% capacity. This trend illuminates an increasing demand in Zone 1 , due to additional full time residents and/or possible undetected leaks in the distribution system.

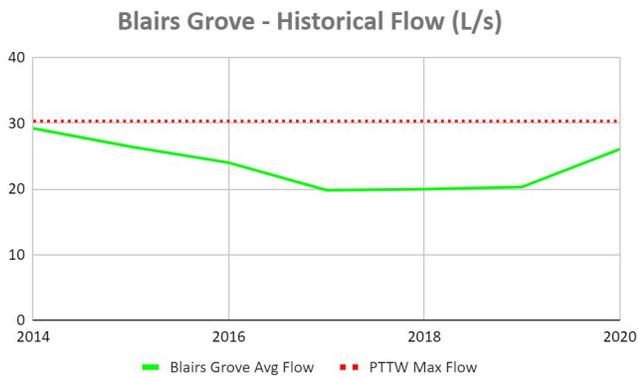


Figure 10

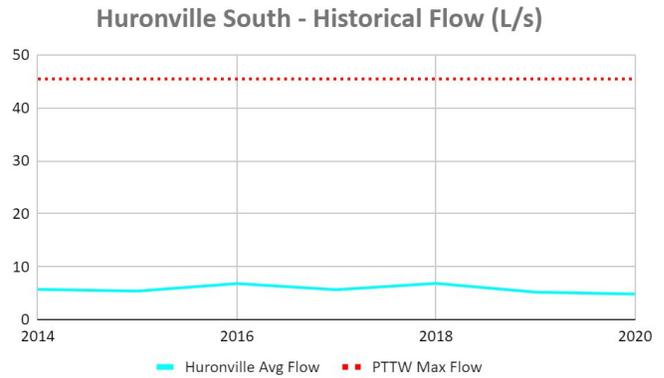


Figure 11

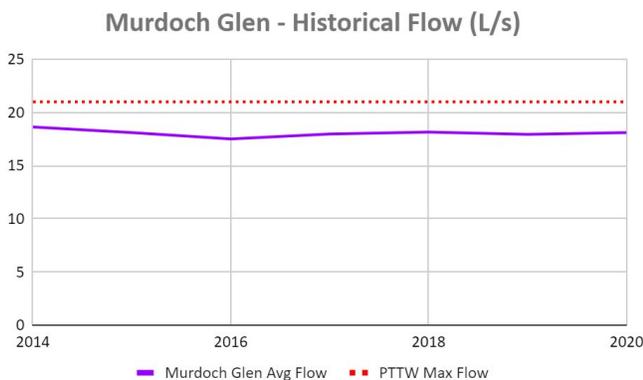


Figure 12

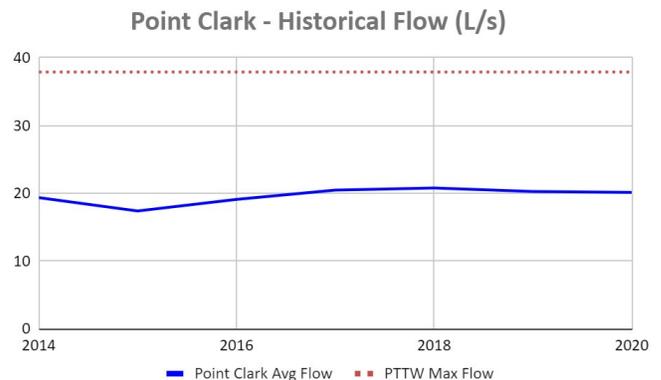


Figure 13