



**Ontario Clean Water Agency**  
**Agence Ontarienne Des Eaux**

New Liskeard Drinking Water System

# 2020 ANNUAL/SUMMARY REPORT

Prepared by the Ontario Clean Water Agency  
on behalf of the City of Temiskaming Shores



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## INTRODUCTION

Municipalities throughout Ontario are required to comply with Ontario Regulation 170/03 made under the *Safe Drinking Water Act* (SDWA) since June 2003. The Act was passed following recommendations made by Commissioner O'Conner after the Walkerton Inquiry. The Act's purpose is to protect human health through the control and regulation of drinking-water systems. O. Reg. 170/03 regulates drinking water testing, use of licensed laboratories, treatment requirements and reporting requirements.

Section 11 of Regulation 170/03 requires the owner to produce an Annual Report. This report must include the following:

1. Description of system & chemical(s) used
2. Summary of any adverse water quality reports and corrective actions
3. Summary of all required testing
4. Description of any major expenses incurred to install, repair or replace equipment

This Annual Report must be completed by February 28 of each year.

The regulation also requires a Summary Report which must be presented and accepted by Council by March 31 of each year for the preceding calendar year reporting period.

The report must list the requirements of the Act, its regulations, the system's Drinking Water Works Permit (DWWP), Municipal Drinking Water Licence (MDWL), Certificate of Approval (if applicable), and any regulatory requirement the system failed to meet during the reporting period. The report must also specify the duration of the failure, and for each failure referred to, describe the measures that were taken to correct the failure.

The *Safe Drinking Water Act*, 2002 and the drinking water regulations can be viewed at the following website: <http://www.e-laws.gov.on.ca>.

To enable the Owner to assess the rated capacity of their system to meet existing and future planned water uses, the following information is also required in the report.

1. A summary of the quantities and flow rates of water supplied during the reporting period, including the monthly average and the maximum daily flows.
2. A comparison of the summary to the rated capacity and flow rates approved in the systems approval, drinking water works permit or municipal drinking water licence or a written agreement if the system is receiving all its water from another system under an agreement.

The reports have been prepared by the Ontario Clean Water Agency (OCWA) on behalf of the Owner and presented to council as the 2020 Annual/Summary Report.



New Liskeard Drinking Water System

Section 11

# 2020 ANNUAL REPORT



## Section 11 - ANNUAL REPORT

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### 1.0 INTRODUCTION

<b>Drinking-Water System Name</b>	<b>New Liskeard Drinking Water System</b>
<b>Drinking-Water System Number</b>	220000344
<b>Drinking-Water System Owner</b>	The Corporation of the City of Temiskaming Shores
<b>Drinking-Water System Category</b>	Large Municipal, Residential System
<b>Reporting Period</b>	January 1, 2020 to December 31, 2020

**Does your Drinking-Water System serve more than 10,000 people?** No

**Is your annual report available to the public at no charge on a web site on the Internet?**

Yes at: <http://www.temiskamingshores.ca/en/index.asp>

**Location where the report required under O. Reg. 170/03 Schedule 22 will be available for inspection:**

City of Temiskaming Shores  
325 Farr Drive, P.O. Box 2050  
Haileybury, ON P0J 1K0

### **Drinking-Water Systems that receive drinking water from the New Liskeard Drinking Water System**

The New Liskeard Drinking Water System provides all of its drinking water to the communities of New Liskeard and Dymond within the City of Temiskaming Shores.

### **The Annual Report was not provided to any other Drinking Water System Owners**

The Ontario Clean Water Agency prepared the 2020 Annual Report for the New Liskeard Drinking Water System and provided a copy to the system owner; the City of Temiskaming Shores. The New Liskeard Drinking Water System is a stand-alone system that does not receive water from or send water to another system.

**Notification to system users that the Annual Report is available for viewing is accomplished through:**

- Notice on the city's Facebook page
- Notice via a Community Bulletin in the local newspaper



## **2.0 NEW LISKEARD DRINKING WATER SYSTEM (DWS No. 220000344)**

The New Liskeard Drinking Water System is owned by The Corporation of the City of Temiskaming Shores and consists of a Class 1 water treatment system and a Class 3 water distribution subsystem. The system is a communal ground water well supply that services the communities of New Liskeard and Dymond. The Ontario Clean Water Agency is the accredited operating authority and is designated as the Overall Responsible Operator for both the water treatment and water distribution facilities.

### ***Raw Water Supply***

The New Liskeard water treatment plant, located at 301 McCamus Avenue and is supplied by two main production wells; Well 3 and Well 4. Well No. 3 was originally constructed on December 2, 1950. It is a 54.9 m deep drilled well equipped with a magnetic flow meter and a vertical turbine pump rated at 2700 L/min. It consists of a 660 mm diameter outer casing and 406 mm inner steel casing with a 7.6 m long stainless steel (shutter style) screen. The well is housed in a secure building located directly across from the water plant.

Well No. 4 was originally constructed on August 13, 1977. It is a 54.9 m deep drilled well also equipped a magnetic flow meter and with a vertical turbine pump rated at 2700 L/min. It consists of a 762 mm diameter outer steel casing, to a depth of 27.4 m and 356 mm inner steel casing, to a depth of 46.3 m with a 7.6 m long stainless steel screen, 30.5 cm in diameter. This well is located inside the water treatment plant building.

There is approximately 23 m of low permeability clay between the ground surface and the aquifer protecting the groundwater from surface spills.

### ***Water Treatment***

The production wells feed the main water treatment plant that has a maximum rated capacity of 7865 cubic meters per day (m<sup>3</sup>/d).

The treatment process consists of two iron and manganese removal/pressure filtration systems rated at 94.6 L/s that are filled with Filtronic's Electromedia®, a proprietary media. The configuration allows either filter to be supplied with raw water from either of the two wells and the filter effluent is continuously monitored for turbidity and free chlorine residual. The two pressurized filters are automatically backwashed, based on high filter turbidity or maximum filter runtime. Manual backwashes can also be initiated when required. The backwash wastewater is discharged into the municipal sanitary sewage system which flows into the New Liskeard Lagoon.

Prior to filtration, chlorine gas is injected into the water to aid the oxidation process and precipitate the iron and manganese. After filtration, the treated water is re-chlorinated and directed into a contact tank comprised of two clearwells. The clearwells are continuously monitored for free chlorine residual levels, level and temperature.



### ***Water Storage and Pumping Capabilities***

The clearwells are located directly below the water treatment plant and have a total storage capacity of 271 m<sup>3</sup> (clearwell No. 1: 126 m<sup>3</sup>; clearwell No. 2: 145 m<sup>3</sup>). The baffles in the clearwell help to ensure sufficient chlorine contact time (CT). The free chlorine residual, pH and flow are continuously monitored to ensure adequate primary disinfection before the water enters the distribution system. The two clearwells are connected via an isolation valve to enable either clearwell to be drained for maintenance without compromising a continuous supply of water to users.

Two vertical turbine high lift pumps, equipped with variable frequency drives (VFDs) are each rated at 3272 L/min. They direct the treated water from the clear well to the Shepherdson Road reservoir and the Dymond reservoirs. If the high lifts are off then the Dymond Reservoir is fed by the Shepherdson Road reservoir.

The Shepherdson Road Reservoir is located at 117102 Shepherdson Road in New Liskeard and has a storage capacity of 1818 m<sup>3</sup>. Three vertical turbine pumps, all equipped with variable frequency drives (VFDs), supply water to pressure zones 2 and 3 in the system. A secondary disinfection system is in place at the reservoir using sodium hypochlorite to boost the chlorine levels leaving the reservoir if required.

The Dymond Reservoir is located at 284 Raymond Street and has a capacity of 1395 m<sup>3</sup>. The reservoir is a single story building with an underground clearwell consisting of four interconnected baffled cells. A second building houses a sodium hypochlorite feed system, if boosting is required and four vertical turbine pumps (equipped with VFDs) two rated at 70 L/s and two rated at 28.1 L/s.

### ***Control System***

The New Liskeard Water Treatment System is controlled by a dedicated Programmable Logic Controller (PLC) and monitored through a Control System Supervisory Control and Data Acquisition (SCADA) system. All analyzing, monitoring and control module equipment information is routed through the SCADA system for operator monitoring and control. Control of equipment can be accomplished locally using the Human Machine Interface (HMI) touch screen at the New Liskeard water treatment plant or remotely via the SCADA computer located at the Haileybury water treatment plant. Operators can also access the system using their computers and cell phones. Alarm capability and set point adjustment along with trend monitoring are also available through SCADA system controls.

### ***Emergency Power***

An emergency 300 KW stand-by power generator is available at the Well 3 pumphouse to ensure continued operation of the water supply treatment and facility during a power outage. A 230 kW diesel generator is on-site at the Shepherdson Street Reservoir and a 260 kW standby diesel generator is available at the Dymond Reservoir in case of power failures.



## ***Distribution System***

The New Liskeard Drinking Water System is classified as a Large Municipal Residential Drinking Water System that provides water to the communities of New Liskeard and Dymond. The distribution system consists of approximately 5750 residents and 2300 service connections and is comprised of various pipe materials including cast iron, ductile iron and PVC ranging from 4 to 16 " in New Liskeard and 6 to 12 " in Dymond. Approximately 535 m of 150 mm diameter HDPE feeder main to the Dymond Reservoir was installed in May 2020. There are several isolation valves to allow for the repair and maintenance of selected sections of the distribution system, three air relief valves and five pressure reducing valves. Approximately 313 fire hydrants are connected to the system to aid in fire protection.

This distribution system is broken down into three (3) service zones. It should be noted that the feeder main from the McCamus water treatment plant to the storage reservoir on Shepherdson Road also acts as a distribution line within Zone I. The three zones are supplied with potable water in the following manner:

Zone I – Gravity Zone is supplied with water through a distribution line (also the feeder main to the reservoir from the WTP) from the Shepherdson Road reservoir. Zone I is also isolated from Zones II and III via natural topography and closed valves. Zone I also supplies water from Shepherdson Road to the Dymond Reservoir which feeds the Dymond Distribution System.

Zone II – Intermediate Zone is fed through a separate distribution line from the Shepherdson Road reservoir through pumping. The area is generally comprised of residential units as well as the recently developed (2011) Dymond Industrial Park. The interconnected distribution piping between this zone and Zone I (gravity) is isolated via closed gate valves.

Zone III – High Zone is fed through a separate distribution line from the Shepherdson Road reservoir through pumping. The area is generally comprised of limited industrial users and is the main feed for Temiskaming Hospital.

### **3.0 LIST OF WATER TREATMENT CHEMICALS USED OVER THE REPORTING PERIOD**

The following chemicals were used in the New Liskeard Drinking Water System treatment process:

- Chlorine Gas – Primary Disinfection
- Sodium Hypochlorite – Secondary Disinfection

All treatment chemicals meet AWWA and NSF/ANSI standards.





#### **4.0 SIGNIFICANT EXPENSES INCURRED TO THE DRINKING WATER SYSTEM**

OCWA is committed to maintaining the assets of the drinking water system and sustains a program of scheduled inspection and maintenance activities using a computerized Work Management System (WMS).

Significant expenses incurred in the drinking water system include the following:

##### *Water Treatment System*

- Repaired Well No. 4 pump motor
- Replaced Well No. flow meter
- Replaced chlorine injection solenoids
- Repaired blown PLC cards
- Replaced compressor switch and regulator
- Replaced peristaltic pump
- Pull Pump No. 1 at the Shepherdson Road Reservoir
- Replaced pump head for pre-chlorine analyzer
- Replaced backflow preventer on Well No. 4 feed water
- Repaired Filter No. 2 chlorine feed line
- Changed leaking solenoid on No. 1 chlorine injector
- Replaced chlorine analyzer membrane, KCL solution & probe

##### *Distribution System*

- The replacement of approximately 70 m of 250 mm dia. D.I. WM with 250 mm dia. PVC CL1 50 WM and approximately 110 m of 150 mm dia. D.I. WM with 200 mm dia. PVC CL150 WM on Drive In Theatre Rd. from the intersection of Drive In Theatre Rd. and Highway 11 to the intersection of Drive In Theatre Rd. and Raymond St. in Dymond.
- The addition of approximately 535 m of 150mm dia. HDPE DR11 WM on Raymond St. from the intersection of Drive In Theatre Rd. and Raymond St. to the Dymond Reservoir.
- The replacement of approximately 25 m of 250 mm dia. DI. WM with 250 mm dia. PVC CL1 50 WM on Raymond St. from the Dymond Reservoir to the intersection of Raymond St. and Crystal Ores.
- The addition of approximately 120 m of 250 mm dia. PVC CL1 50 WM on Crystal Cres. from the intersection of Crystal Cres. and Raymond St. to the intersection of Laurette St. and Crystal Ores.
- The addition of approximately 180 m of 200mm dia. PVC CLI 50 WM on Drive In Theatre Rd. from the intersection of Drive In Theatre Rd. and Highway 11 to the intersection of Drive In Theatre Rd. and Raymond St.

#### **5.0 DETAILS ON NOTICES OF ADVERSE TEST RESULTS AND OTHER PROBLEMS REPORTED TO & SUBMITTED TO THE SPILLS ACTION CENTER**

Based on information kept on record by OCWA, two (2) adverse water quality incidents were reported to the Ministry's Spills Action Centre in 2020.



1. **AWQI 150066 – Category 2 Watermain Break/LOP/BWA, May 28, 2020:** The City was operating a valve when it broke. The break occurred at Wilson Avenue and Hwy 66 in the community of Dymond. In order to conduct the repair the main was isolated which resulted in a loss of pressure to 6 businesses. A Boil Water Advisory (BWA) was issued by the Health Unit. Bacteriological samples were collected upstream, downstream and at the site of the adverse result on May 28<sup>th</sup> and 29<sup>th</sup>. Sample results for May 28<sup>th</sup> were acceptable having no total coliforms or E.coli. Results from May 29<sup>th</sup> showed one (1) total coliform from the sample collected at Wendy's restaurant. Incident reported as an AWQI on May 30<sup>th</sup> (AWQI No. 150086)

2. **AWQI 150086 – Total Coliform, May 30, 2020 -** One (1) total coliform was detected in a drinking water sample collected at the Wendy's restaurant on Hwy 65 in Dymond (883332). The sample was collected on May 29<sup>th</sup> at 1205 hours in response to a watermain repair and BWA issued but the Health Unit. The free chlorine residual was 0.86 mg/L. The affected area was flushed and the free chlorine residual was maintained above 0.20 mg/L. Re-samples were collected upstream, downstream and at the site of the adverse result on May 30<sup>th</sup> & 31<sup>st</sup> as per the Health Unit (HU needs two consecutive sets of samples to have acceptable results to lift the BWA). Re-sample results indicated zero total coliforms and *E. coli*. BWA lifted on June 1<sup>st</sup> at approximately 5:40PM. AWQI 150066 and 150086 were resolved on June 3, 2020.

## 6.0 MICROBIOLOGICAL TESTING PERFORMED DURING THE REPORTING PERIOD

### Summary of Microbiological Data

Sample Type	# of Samples	Range of <i>E.coli</i> Results (min to max)	Range of Total Coliform Results (min to max)	# of HPC Samples	Range of HPC Results (min to max)
Raw – Well 3	52	0 to 0	0 to 1	N/A	N/A
Raw – Well 4	45*	0 to 0	0 to 0	N/A	N/A
Treated	52	0 to 0	0 to 0	52	< 10 to > 2000**
Distribution	208	0 to 0	0 to 0	104	< 10 to 180

Maximum Acceptable Concentration (MAC) for *E. coli* = 0 Counts/100 mL

MAC for Total Coliforms = 0 Counts/100 mL

"<" denotes less than the laboratory's method detection limit

">" denotes greater than the laboratory's method detection limit.

#### Notes:

- One microbiological sample is collected and tested each week from the raw and treated water supply. A total of four microbiological samples are collected and tested each week from the New Liskeard distribution system. At least 25% of the distribution samples must be tested for HPC bacteria.
- \*Well No. 4 – samples were not collected from January 13<sup>th</sup> to March 10<sup>th</sup> when the pump motor failed. The unit was repaired and installed on January 24<sup>th</sup>. When putting Well No. 4 back into service, the flow meter failed and had to be replaced. A new flow meter was installed on March 10<sup>th</sup> and the well was put back into service on March 18<sup>th</sup>.
- \*\*High HPC count detected in a treated water sample collected on March 16<sup>th</sup>. Laboratory confirmed quality control data.

Refer to [Appendix A](#) for a monthly summary of microbiological test results.



## 7.0 OPERATIONAL TESTING PERFORMED DURING THE REPORTING PERIOD

### Summary of Raw Water Turbidity Data

Parameter	Number of Samples	Range of Results (min to max)	Unit of Measure
Turbidity – Well 3	51	0.13 to 1.23	NTU
Turbidity – Well 4	42*	0.09 to 2.81	NTU

**Notes:**

1. Turbidity samples are required once every month.
2. \*Well No. 4 – raw turbidity samples were not collected in February after the well pump motor failed. The unit was repaired and installed on January 24th. A new flow meter was installed on March 10<sup>th</sup> and the well was put back into service on March 18<sup>th</sup> after which sampling resumed.

### Continuous Monitoring in the Treatment Process

Parameter	# of Samples	Range of Results (min to max)	Unit of Measure	Standard
Free Chlorine Residual	8760	0.21 to 4.08	mg/L	CT*

**Notes:**

1. For continuous monitors use 8760 as the number samples for one year
- 2.\*CT is the concentration of chlorine in the water times the time of contact that the chlorine has with the water. It is used to demonstrate the level of disinfection treatment in the water. CT calculations are performed for the New Liskeard water plant if the free chlorine residual level drops below 0.40 mg/L. On August 20, a low chlorine residual of 0.21 mg/L was measured in the treated water. CT calculation done and primary disinfection achieved.

### Summary of Chlorine Residual Data in the Distribution System

Number of Samples	Free Chlorine (min to max)	Unit of Measure	Standard
378	0.09 to 1.78	mg/L	≥ 0.05

**Note:** Four (4) chlorine residual samples are collected one day and three (3) on a second day of each week. The sample sets must be collected at least 48-hours apart and samples collected on the same day must be from different locations.

### Summary of Nitrate & Nitrite Data (sampled at the plant’s point of entry into the distribution every quarter)

Date of Sample	Nitrate Result	Nitrite Result	Unit of Measure	Exceedance
January 13	< 0.05	< 0.05	mg/L	No
April 14	< 0.05	< 0.05	mg/L	No
July 13	< 0.05	< 0.05	mg/L	No
October 5	< 0.05	< 0.05	mg/L	No

**Maximum Allowable Concentration (MAC) for Nitrate = 10 mg/L**

**MAC for Nitrite = 1 mg/L**



**Summary of Total Trihalomethane Data** (sampled in the distribution system every quarter)

Date of Sample	THM Result	Unit of Measure	Running Average	Exceedance
January 13	42.5	ug/L		
April 14	50.2	ug/L		
July 13	16.3	ug/L	38.9	No
October 5	46.7	ug/L		

Maximum Allowable Concentration (MAC) for Total Trihalomethanes = 100 ug/L (Four Quarter Running Average)

**Summary of Total Haloacetic Acid Data** (sampled in the distribution system every quarter)

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
January 13	35	ug/L		
April 14	18	ug/L		
July 13	12	ug/L	23	No
October 5	27	ug/L		

Maximum Allowable Concentration (MAC) for Total Haloacetic Acid = 80 ug/L (Four Quarter Running Average)

**Summary of Most Recent Lead Data under Schedule 15.1**

(applicable to the following drinking water systems; large municipal residential systems, small, municipal residential systems, and non-municipal year-round residential systems)

The New Liskeard Drinking Water System qualified for the ‘Exemption from Plumbing Sampling’ as described in section 15.1-5 (9-10) of Ontario Regulation 170/03. The exemption applies to a drinking water system if; in two consecutive periods at reduced sampling, not more than 10% of all samples from plumbing exceed the maximum allowable concentration of 10 ug/L for lead. As such, the system was required to test for total alkalinity and pH in three distribution samples collected during the periods of December 15 to April 15 (winter period) and June 15 to October 15 (summer period). This testing is required in every 12-month period with lead testing in every third 12-month period.

Two rounds of alkalinity and pH testing were carried out on April 14<sup>th</sup> and September 23<sup>rd</sup> of 2020. Results are summarized in the table below.

**Summary of Lead Data** (sampled in the distribution system)

Date of Sample	# of Samples	Field pH (min to max)	Field Temperature (°C) (min to max)	Alkalinity (mg/L) (min to max)	Lead (ug/L) (min to max)
April 14	3	7.57 to 7.77	5.9 to 13.9	240 to 247	N/A
September 23	3	7.2 to 7.3	9 to 12	222 to 229	N/A

**Note:** Next lead sampling scheduled for 2021



**Most Recent Schedule 23 Inorganic Data Tested at the Water Treatment Plant**

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Antimony	< 0.5	ug/L	6	No	No
Arsenic	< 1.0	ug/L	10	No	No
Barium	98.0	ug/L	1000	No	No
Boron	88.0	ug/L	5000	No	No
Cadmium	< 0.1	ug/L	5	No	No
Chromium	< 1.0	ug/L	50	No	No
Mercury	< 0.1	ug/L	1	No	No
Selenium	0.4	ug/L	50	No	No
Uranium	< 1.0	ug/L	20	No	No

**Note:** Sample required every 36 months (sample date = *October 5, 2020*). Next sampling scheduled for October 2023

**Most Recent Schedule 24 Organic Data Tested at the Water Treatment Plant**

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Alachlor	< 0.354	ug/L	5	No	No
Atrazine + N-dealkylated metabolites	< 0.5	ug/L	5	No	No
Azinphos-methyl	< 0.265	ug/L	20	No	No
Benzene	< 0.1	ug/L	1	No	No
Benzo(a)pyrene	< 0.01	ug/L	0.01	No	No
Bromoxynil	< 0.092	ug/L	5	No	No
Carbaryl	< 1.0	ug/L	90	No	No
Carbofuran	< 2.0	ug/L	90	No	No
Carbon Tetrachloride	< 0.2	ug/L	2	No	No
Chlorpyrifos	< 0.265	ug/L	90	No	No
Diazinon	< 0.265	ug/L	20	No	No
Dicamba	< 0.08	ug/L	120	No	No
1,2-Dichlorobenzene	< 0.3	ug/L	200	No	No
1,4-Dichlorobenzene	< 0.3	ug/L	5	No	No
1,2-Dichloroethane	< 0.3	ug/L	5	No	No
1,1-Dichloroethylene (vinylidene chloride)	< 0.3	ug/L	14	No	No
Dichloromethane	< 1.0	ug/L	50	No	No
2-4 Dichlorophenol	< 0.2	ug/L	900	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	< 0.343	ug/L	100	No	No
Diclofop-methyl	< 0.114	ug/L	9	No	No
Dimethoate	< 0.265	ug/L	20	No	No
Diquat	< 0.2	ug/L	70	No	No
Diuron	< 7.0	ug/L	150	No	No
Glyphosate	< 20.0	ug/L	280	No	No
Malathion	< 0.265	ug/L	190	No	No



**Most Recent Schedule 24 Organic Data Tested at the Water Treatment Plant**

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Metolachlor	< 0.177	ug/L	50	No	No
Metribuzin	< 0.177	ug/L	80	No	No
Monochlorobenzene	< 0.5	ug/L	80	No	No
Paraquat	1.9	ug/L	10	No	No
Polychlorinated Biphenyls (PCBs)	< 0.06	ug/L	3.0	No	No
Pentachlorophenol	< 0.3	ug/L	60	No	No
Phorate	< 0.177	ug/L	2	No	No
Picloram	< 0.08	ug/L	190	No	No
Prometryne	< 0.089	ug/L	1	No	No
Simazine	< 0.265	ug/L	10	No	No
Terbufos	< 0.177	ug/L	1	No	No
Tetrachloroethylene	< 0.3	ug/L	10	No	No
2,3,4,6-Tetrachlorophenol	< 0.2	ug/L	100	No	No
Triallate	< 0.177	ug/L	230	No	No
Trichloroethylene	< 0.2	ug/L	5	No	No
2,4,6-Trichlorophenol	< 0.2	ug/L	5	No	No
2-methyl-4-chlorophenoxyacetic acid (MCPA)	< 5.72	ug/L	100	No	No
Trifluralin	< 0.177	ug/L	45	No	No
Vinyl Chloride	< 0.1	ug/L	1	No	No

**Note:** Sample required every 36 months (sample date = October 5, 2020). Next sampling scheduled for October 2023

**Inorganic or Organic Parameter(s) that Exceeded Half the Standard Prescribed in Schedule 2 of Ontario Drinking Water Quality Standards**

No inorganic or organic parameter(s) listed in Schedule 23 and 24 of Ontario Regulation 170/03 exceeded half the standard found in Schedule 2 of the Ontario Drinking Water Standard (O. Reg.169/03) during the reporting period.

**Most Recent Sodium Data at the Water Treatment Plant**

Date of Sample	# of Samples	Result Value	Unit of Measure	Standard	Exceedance
October 9, 2018	1	14.7	mg/L	20	Yes

**Note:** Sample required every 60 months. Next sampling scheduled for October 2023.

**Most Recent Fluoride Data at the Water Treatment Plant**

Date of Sample	# of Samples	Result Value	Unit of Measure	Standard	Exceedance
October 9, 2018	1	0.718	mg/L	1.5	No

**Note:** Sample required every 60 months. Next sampling scheduled for October 2023.



**Additional Testing Performed in Accordance with a Legal Instrument**

Schedule D, Section 2.0 of Municipal Drinking Water Licence #218-103 issued on August 15, 2016 provides relief from regulatory requirements Schedule 1-2(2) and 16-3(1)4 which states that:

Notwithstanding the provisions of Ontario Reg. 170/03, the Owner is not required to comply with the following:

- The free chlorine residual at 399 Radley Hill Road is never less than 0.05 mg/L.
- A result indicating that the free chlorine residual is less than 0.05 mg/L in a sample of drinking water at 399 Radley Hill Road is an adverse result of a drinking water test for the purpose of section 18 of the Ontario Safe Drinking Water Act (SDWA, 2002) if a report under subsection 18(1) of the SDWA has not been made in respect of free chlorine residual in the preceding 24 hours.

In exchange, the following conditions apply:

- An ultraviolet light (UV) point of entry treatment unit owned or leased by the owner of the system is connected to the plumbing of every building and other structure that is served by the drinking water system at 399 Radley Hill Road.
- The UV unit(s) is validated through biosimetry testing for a dose of 40 mJ/cm<sup>2</sup>.
- In the event that the UV unit malfunctions, loses power or ceases to provide the appropriate level of disinfection:
  - The UV unit has a feature that ensures that no water is directed to users of water treated by the unit and a certified operator takes appropriate action at the location where the unit is installed if such an event occurs before water is again directed to users of water treated by the unit, or
  - The UV unit has a feature that causes an alarm to sound immediately at the building or structure where the point of entry treatment unit is installed and a location where a certified operator is present, if a certified operator is not always present at the building or structure where the point of entry treatment unit is installed. If an alarm sounds, a certified operator must take appropriate action as soon as possible.

**Ultraviolet Dosage**

UV System	# of Samples	Range of Results <i>(min to max)</i>	Unit of Measure	Limit
UV Unit	97	161 to 370	mJ/cm <sup>2</sup>	40



New Liskeard Drinking Water System

Schedule 22

# 2020 SUMMARY REPORT FOR MUNICIPALITIES





## Schedule 22 - SUMMARY REPORTS FOR MUNICIPALITIES

### 1.0 INTRODUCTION

<b>Drinking-Water System Name</b>	<b>New Liskeard Drinking Water System</b>
<b>Municipal Drinking Water Licence (MDWL)</b>	218-103-2 (issued August 15, 2016)
<b>Drinking Water Works Permit (DWWP)</b>	218-203-3 (issued April 21, 2017)
<b>Permit to Take Water (PTTW)</b>	4417-AF2JAM (issued November 2, 2016)
<b>Reporting Period</b>	January 1, 2020 to December 31, 2020

### 2.0 REQUIREMENTS THE SYSTEM FAILED TO MEET

According to information kept on record by OCWA, the New Liskeard Drinking Water System failed to meet the following requirements during the 2020 reporting period:

<b>Drinking Water Legislation</b>	<b>Requirement(s) the System Failed to Meet</b>	<b>Duration</b>	<b>Corrective Action(s)</b>	<b>Status</b>
Condition 2 of Schedule C of the Municipal Drinking Water License.	In March 2020 for approximately 14 hours, the treated flowmeter was reading a false maximum flow rate of 150 L/sec. The correct treated water flow rate is unknown for this period.	March 8, 2020 from 6:00 PM to March 9, 2020 at 8:00 AM.	Operators took appropriate corrective action and notified the Ministry on March 10 <sup>th</sup> , 2020. OCWA's Instrumentation Technician was able to repair the meter.  The City purchased a portable flow meter so that if a flow meter malfunctions or fails and cannot not be repaired in a reasonable period of time, the portable unit can be installed to continue collecting and recording flow measurements	Complete

It should also be mentioned that, two (2) adverse water quality incidents were reported to the Ministry's Spills Action Center during the reporting period. Refer to Section 5.0 – *Details on Notices of Adverse Test Results and Other Problems Reported to & Submitted to the Spills Actions Center* on page 7 of this report for details.

### 3.0 SUMMARY OF QUANTITIES & FLOW RATES

#### ***Flow Monitoring***

Municipal Drinking Water Licence (MDWL) #218-103 requires the owner to install a sufficient number of flow measuring devices to permit the continuous measurement and recording of:



- the flow rate and daily volume of water conveyed from the treatment system to the distribution system, and
- the flow rate and daily volume of water conveyed into the treatment system.

The flow monitoring equipment identified in the MDWL is present and operating as required. These flow meters are calibrated on an annual basis as specified in the manufacturers’ instructions.

### Water Usage

The following Water Usage Tables summarize the quantities and flow rates of water taken and produced during the 2020 reporting period, including average monthly volumes, maximum monthly volumes, total monthly volumes and maximum flow rates.

### Raw Water

#### 2020 - Monthly Summary of Water Takings from the Source (Well No. 3 and Well No. 4)

Regulated by Permit to Take Water (PTTW) #4417-AF2JAM, issued November 2, 2016

#### Well No. 3

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m <sup>3</sup> )	68891	74236	62126	37830	41868	52705	53088	53589	40074	41593	39139	35193	600333
Average Volume (m <sup>3</sup> /d)	2222	2560	2004	1261	1351	1757	1713	1729	1336	1342	1305	1135	1640
Maximum Volume (m <sup>3</sup> /d)	2697	2786	2827	1621	1893	2830	2802	2803	1676	1734	2762	1418	2830
PTTW - Maximum Allowable Volume (m <sup>3</sup> /day)	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Maximum Flow Rate (L/min)	3583	3830	4031	4252	4322	4108	4090	4139	3669	4059	4341	4344	4344
PTTW - Maximum Allowable Flow Rate (L/min)	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500

#### Well No. 4

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m <sup>3</sup> )	21245	0	39458	69896	78403	78586	80679	85171	83534	86607	82349	82687	788616
Average Volume (m <sup>3</sup> /d)	685	0	1273	2330	2529	2620	2603	2747	2784	2794	2745	2667	2154
Maximum Volume (m <sup>3</sup> /d)	2685	0	2825	2596	2631	2637	2615	2838	2832	2841	2803	2743	2841
PTTW - Maximum Allowable Volume (m <sup>3</sup> /day)	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Maximum Flow Rate (L/min)	1649	0	1634	1799	2621	3389	2963	2513	2049	1909	1635	2128	3389
PTTW - Maximum Allowable Flow Rate (L/min)	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500

Well No. 4 removed from service on January 7th to repair the well pump motor and replace the flow meter. Well put back into service on March 18th.



**Combined Raw Water Taking (Well No. 3 and Well No. 4)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m <sup>3</sup> )	77555	74236	79779	77010	90906	107503	109836	107221	85435	83912	76256	75868	1045516
Average Volume (m <sup>3</sup> /d)	2502	2560	2574	2567	2932	3583	3543	3459	2848	2707	2542	2447	2856
Maximum Volume (m <sup>3</sup> /d)	2718	2786	2827	2902	4186	5921	4829	4764	3222	3260	3427	2701	5921
MDWL - Rated Capacity (m <sup>3</sup> /day)	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000

The system’s Permit to Take Water #4417-AF2JAM, issued November 2, 2016, allows the City to withdraw water at the following rates:

Well No. 3:	4000 m <sup>3</sup> /day	4,500 L/minute
Well No. 4:	4000 m <sup>3</sup> /day	4,500 L/minute
Total Combined Daily Volume:	8000 m <sup>3</sup> /day	

A review of the raw water flow data indicates that the wells did not exceed the maximum allowable volumes or maximum flow rates during the reporting period.

Treated Water

**2020 - Monthly Summary of Treated Water Supplied to the Distribution System**

Regulated by Municipal Drinking Water Licence (MDWL) #218-103 - Issue 2, dated August 15, 2016

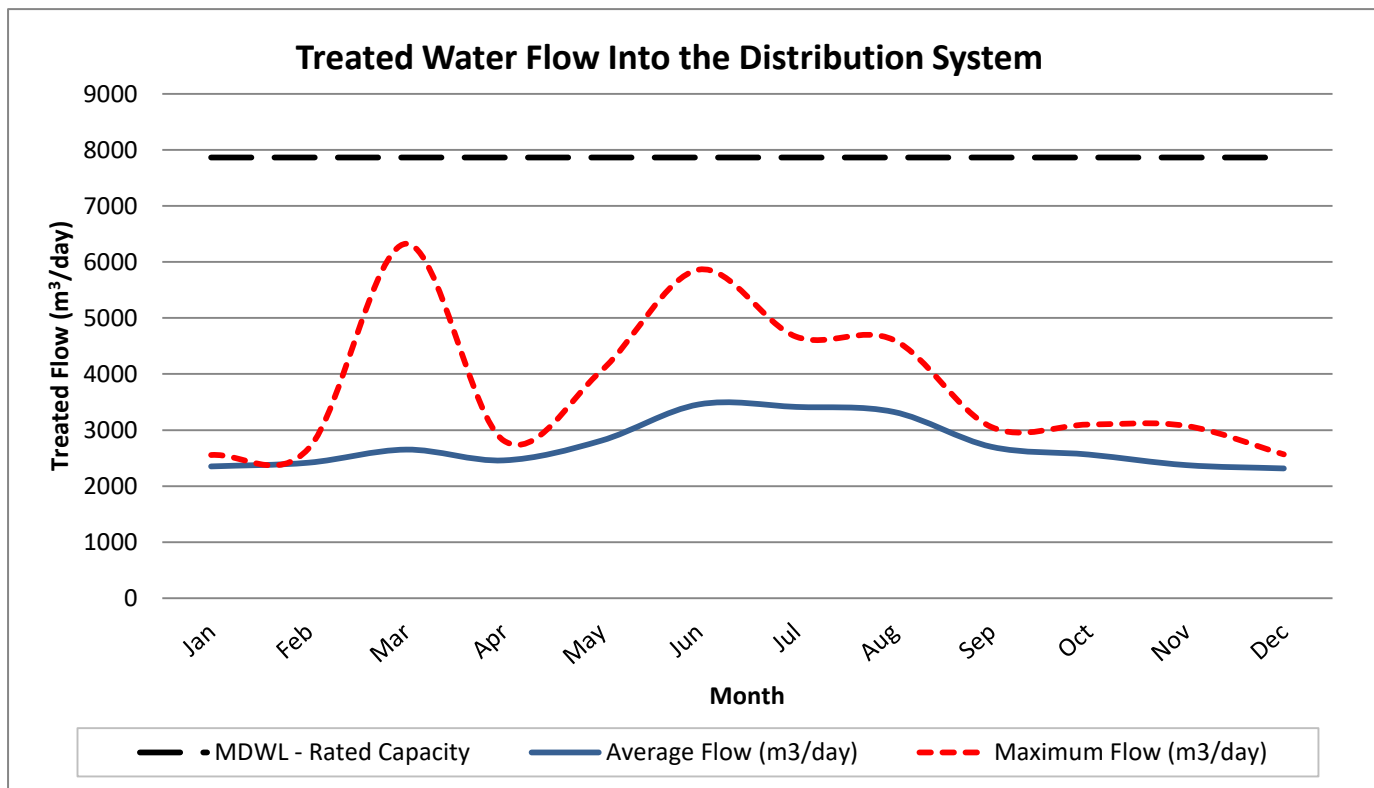
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m <sup>3</sup> )	72892	70130	82197	73770	87125	103728	105815	103038	81059	79446	71227	71772	1002200
Average Volume (m <sup>3</sup> /d)	2351	2418	2652	2459	2810	3458	3413	3324	2702	2563	2374	2315	2738
Maximum Volume (m <sup>3</sup> /d)	2555	2672	6326	2813	4058	5863	4666	4608	3056	3099	3073	2566	6326
MDWL - Rated Capacity (m <sup>3</sup> /day)	7865	7865	7865	7865	7865	7865	7865	7865	7865	7865	7865	7865	7865

Schedule C, Section 1.0 (1.1) of MDWL No. 218-103 states that the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed 7865 m<sup>3</sup> on any calendar day. The New Liskeard DWS complied with this limit having a recorded maximum volume of 6326 m<sup>3</sup>/day on March 9th, which represents 80.4 % of the rated capacity.

Figure 1 compares the average and maximum flow rates into the distribution system to the approved rated capacity of the system as identified in the MDWL.

**Figure 1: 2020 - Comparison of Treated Water Flows to the Rated Capacity**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Flow (m <sup>3</sup> /day)	2351	2418	2652	2459	2810	3458	3413	3324	2702	2563	2374	2315
Maximum Flow (m <sup>3</sup> /day)	2555	2672	6326	2813	4058	5863	4666	4608	3056	3099	3073	2566
MDWL - Rated Capacity	7865	7865	7865	7865	7865	7865	7865	7865	7865	7865	7865	7865
% Rated Capacity	32	34	80	36	52	75	59	59	39	39	39	33





The following information is provided to enable the Owner to assess the capability of the system to meet existing and future water usage needs:

Rated Capacity of the Plant (MDWL)	7865 m <sup>3</sup> /day	
Average Daily Flow for 2020	2738 m <sup>3</sup> /day	34.8 % of the rated capacity
Maximum Daily Flow for 2020	6326 m <sup>3</sup> /day	80.4 % of the rated capacity
Total Treated Water Produced in 2020	1,002,200 m <sup>3</sup>	

**Historical Flows**

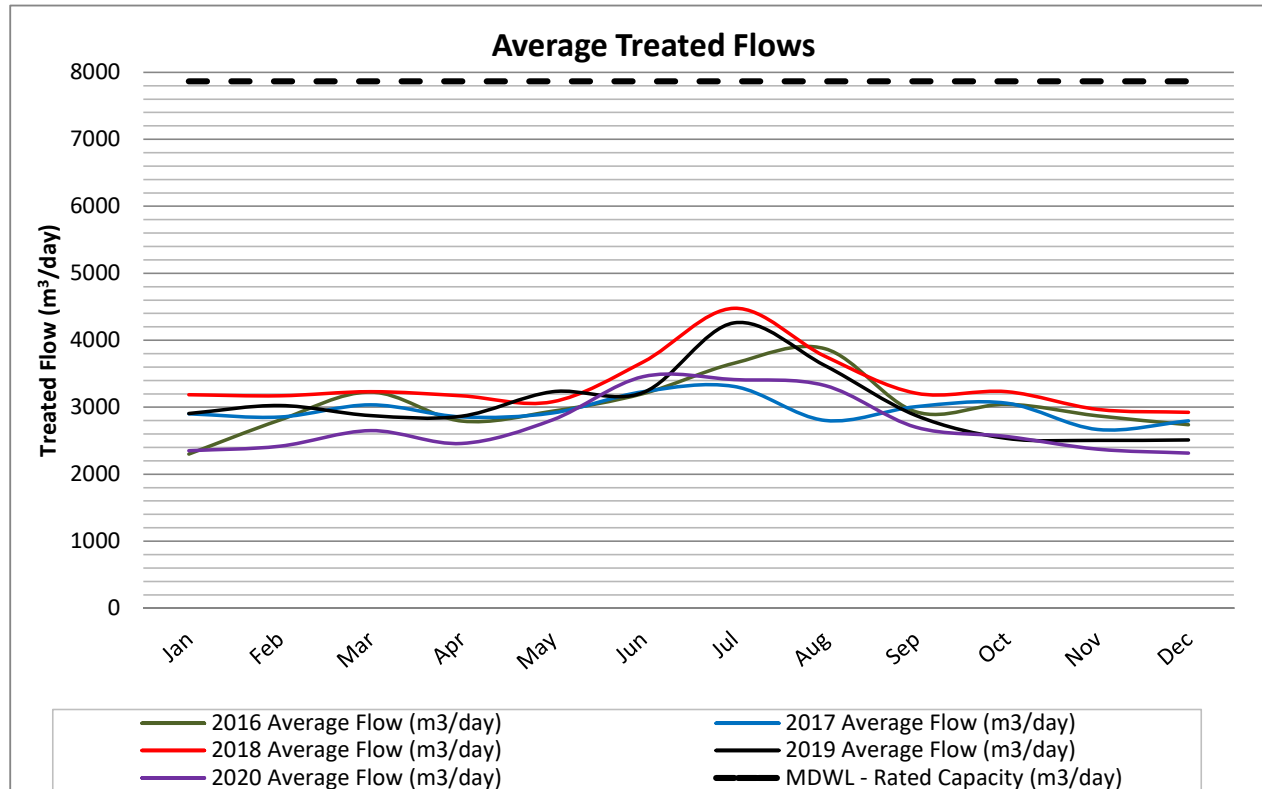
**New Liskeard Water Treatment Plant – Flow Comparison**

Year	Maximum Treated Flow (m <sup>3</sup> /d)	Average Daily Flow (m <sup>3</sup> /d)	Average Day % of Rated Capacity (7865 m <sup>3</sup> /d)
<b>2020</b>	<b>6326</b>	<b>2738</b>	<b>34.8%</b>
2019	6112	3036	38.6%
2018	5993	3341	42.5%
2017	4511	2953	37.5%
2016	5667	3033	42.0%

Figure 2 compares the average treated water flows from 2016 to 2020.

**Figure 2 - Historical Water Usage Trends (2016 to 2020)**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016 Average Flow (m <sup>3</sup> /day)	2301	2808	3226	2794	2940	3203	3657	3874	2932	3045	2871	2739
2017 Average Flow (m <sup>3</sup> /day)	2902	2854	3036	2856	2914	3232	3310	2803	3008	3060	2668	2796
2018 Average Flow (m <sup>3</sup> /day)	3187	3171	3232	3171	3081	3676	4477	3761	3210	3232	2968	2924
2019 Average Flow (m <sup>3</sup> /day)	2906	3026	2875	2866	3231	3220	4260	3622	2878	2535	2505	2512
2020 Average Flow (m <sup>3</sup> /day)	2351	2418	2651	2459	2810	3457	3413	3324	2702	2563	2374	2315
MDWL - Rated Capacity (m <sup>3</sup> /day)	7865	7865	7865	7865	7865	7865	7865	7865	7865	7865	7865	7865





## CONCLUSION

The water quality data collected in 2020 demonstrates that the New Liskeard drinking water system provided high quality drinking water to its users. During a watermain break repair in May, an adverse water quality event occurred. Total Coliforms were detected in drinking water samples collected after the repair. The adverse results were reported to the Ministry's Spills Action Center and the local Health Unit as required under Schedule 16 of O. Reg. 170/03. A precautionary boil water advisory was issued for the affected area until acceptable sample results achieved.

The New Liskeard Drinking Water System was able to operate in accordance with the terms and conditions of the Permit to Take Water and in accordance with the rated capacity of the licence while meeting the community's demand for water use.



# **APPENDIX A**

Monthly Summary of Microbiological  
Test Results



**NEW LISKEARD DRINKING WATER SYSTEM  
2020 SUMMARY OF MICROBIOLOGICAL TEST RESULTS**

Facility Works Number: 220000344  
 Municipality: City of Temiskaming Shores  
 Facility Classification: Class 1 Water Treatment

RAW WATER	01/2020	02/2020	03/2020	04/2020	05/2020	06/2020	07/2020	08/2020	09/2020	10/2020	11/2020	12/2020	Total	Avg	Max	Min
<b>Well 3 / Total Coliform: TC - cfu/100mL</b>																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	1	0	0	0	1	0	0	0			1	
Mean Lab	0	0	0	0	0.25	0	0	0	0.5	0	0	0		0.058		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
<b>Well 3 / E. Coli: EC - cfu/100mL</b>																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
<b>Well 4 / Total Coliform: TC - cfu/100mL</b>																
Count Lab	2*	0*	4*	4	4	5	4	5	4	4	5	4	45*			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
<b>Well 4 / E. Coli: EC - cfu/100mL</b>																
Count Lab	2*	0*	4*	4	4	5	4	5	4	4	5	4	45*			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
<b>TREATED WATER</b>																
<b>Treated Water POE / Total Coliform: TC - cfu/100mL</b>																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
<b>Treated Water POE / E. Coli: EC - cfu/100mL</b>																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
<b>Treated Water POE / HPC - cfu/mL</b>																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	< 10	< 10	> 2000**	< 10	< 10	< 10	80	50	< 10	< 50	< 50	< 20			> 2000**	
Mean Lab	< 10	< 10	> 408	< 10	< 10	< 10	< 27.5	< 18	< 10	< 30	< 24	< 12.5	<	53.462		<
Min Lab	< 10	< 10	> 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10
<b>DISTRIBUTION WATER</b>																
<b>1st Bacti/Residual / Total Coliform: TC - cfu/100mL</b>																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
<b>1st Bacti/Residual / E. Coli - cfu/100mL</b>																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
<b>2nd Bacti/Residual / Total Coliform: TC - cfu/100mL</b>																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
<b>2nd Bacti/Residual / E. Coli - cfu/100mL</b>																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
<b>2nd Bacti/Residual / HPC - cfu/mL</b>																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	< 10	< 10	< 10	< 10	< 10	< 40	80	< 180	< 10	< 40	< 60	< 10			180	
Mean Lab	< 10	< 10	< 10	< 10	< 10	< 20	< 35	< 76	< 10	< 17.5	< 22	< 10	<	20.962		<
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10
<b>3rd Bacti/Residual / Total Coliform: TC - cfu/100mL</b>																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
<b>3rd Bacti/Residual / E. Coli - cfu/100mL</b>																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
<b>4th Bacti/Residual / Total Coliform: TC - cfu/100mL</b>																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
<b>4th Bacti/Residual / E. Coli - cfu/100mL</b>																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
<b>4th Bacti/Residual / HPC - cfu/mL</b>																
Count Lab	4	4	5	4	4	5	4	5	4	4	5	4	52			
Max Lab	< 10	< 10	< 10	< 10	< 10	< 70	< 50	< 10	< 20	< 10	< 20	< 30			70	
Mean Lab	< 10	< 10	< 10	< 10	< 10	< 25	< 26	< 10	< 12	< 10	< 12.5	< 15	<	13.654		<
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10

**NOTES:**  
 \* Well No. 4 – microbiological samples were not collected from January 13th to March 10th when the pump motor failed. The unit was repaired and installed on January 24th. When putting Well No. 4 back into service, the flow meter failed and had to be replaced. A new flow meter was installed on March 10th and sampling resumed.  
 \*\* High HPC count detected in a treated water sample collected on March 16th. Laboratory confirmed quality control data.



# **APPENDIX B**

Monthly Summary of Operational Data

**NEW LISKEARD DRINKING WATER SYSTEM  
2020 SUMMARY OF OPERATIONAL RESULTS**

Facility Works Number: 220000344  
 Facility Name: NEW LISKEARD DRINKING WATER SYSTEM  
 Facility Classification: Class 1 Water Treatment

	01/2020	02/2020	03/2020	04/2020	05/2020	06/2020	07/2020	08/2020	09/2020	10/2020	11/2020	12/2020	Total	Avg	Max	Min
<b>RAW WATER</b>																
Well 3 / Turbidity - NTU																
Count IH	4	4	5	4	4	5	3	5	4	4	5	4	51			
Total IH	0.77	1.07	3.68	3.05	2.82	3.49	1.54	2.03	1.91	2.16	1.52	1.69	25.73			
Max IH	0.36	0.4	0.96	1.23	0.81	1.08	0.58	0.83	0.61	0.71	0.55	0.78			1.23	
Mean IH	0.193	0.268	0.736	0.763	0.705	0.698	0.513	0.406	0.478	0.54	0.304	0.423		0.505		
Min IH	0.13	0.2	0.42	0.35	0.59	0.52	0.47	0.18	0.35	0.45	0.16	0.19				0.13
Well 4 / Turbidity - NTU																
Count IH	1	0*	3	4	4	5	3	5	4	4	5	4	42			
Total IH	0.18		3.85	9.38	3.2	2.12	1.66	3.25	2.06	2.41	1.33	1.16	30.6			
Max IH	0.18		2.06	2.81	1.06	0.78	0.62	0.83	0.61	0.66	0.41	0.42			2.81	
Mean IH	0.18		1.283	2.345	0.8	0.424	0.553	0.65	0.515	0.603	0.266	0.29		0.729		
Min IH	0.18		0.6	1.87	0.55	0.14	0.49	0.55	0.43	0.51	0.09	0.17				0.09
<b>TREATED WATER</b>																
Treated Water POE / Cl Residual: Free (0.40 mg/L) - mg/L																
Count OL	1.55	1.71	2.38	4.08	2.49	1.51	1.99	3.16	2.15	1.99	2.36	1.61			4.08	
Mean OL	1.154	1.153	1.216	1.242	1.179	1.273	1.355	1.421	1.51	1.459	1.396	1.424		1.315		
Min OL	0.85	0.93	0.88	0.91	0.86	0.79	0.98	0.21**	1.12	1.07	0.95	1.03				0.21
<b>DISTRIBUTION WATER</b>																
1st Bacti/Residual / Cl Residual: Free - mg/L																
Count IH	9	8	9	10	10	9	9	9	8	9	9	10	109			
Max IH	0.91	0.89	0.77	1.05	1.22	1.27	1.73	0.93	0.97	1.05	0.94	1.1			1.73	
Mean IH	0.706	0.714	0.631	0.675	0.799	0.859	0.926	0.807	0.799	0.83	0.76	0.866		0.781		
Min IH	0.6	0.59	0.44	0.46	0.61	0.45	0.5	0.66	0.56	0.092	0.53	0.67				0.092
2nd Bacti/Residual / Cl Residual: Free - mg/L																
Count IH	9	8	9	10	10	9	9	9	8	9	9	9	108			
Max IH	1.01	1.01	0.98	1.78	1.28	1	1.22	1.09	1.07	1.01	1.22	1.05			1.78	
Mean IH	0.732	0.743	0.844	0.944	0.804	0.736	0.909	0.88	0.939	0.831	0.859	0.826		0.838		
Min IH	0.34	0.59	0.62	0.52	0.6	0.55	0.74	0.42	0.73	0.47	0.47	0.71				0.34
3rd Bacti/Residual / Cl Residual: Free - mg/L																
Count IH	9	8	9	10	9	9	9	9	8	9	9	9	107			
Max IH	0.92	1.23	1.04	1.03	1.18	1.29	1.39	1.03	1.18	1.07	1.14	1.05			1.39	
Mean IH	0.708	0.985	0.72	0.771	0.789	0.83	1.036	0.829	1.009	0.9	0.767	0.839		0.845		
Min IH	0.39	0.68	0.36	0.49	0.64	0.32	0.87	0.54	0.6	0.81	0.37	0.63				0.32
4th Bacti/Residual / Cl Residual: Free - mg/L																
Count IH	4	4	5	4	5	5	5	5	4	4	5	4	54			
Max IH	1.01	1.12	1	0.75	1.01	1.32	1.25	1.18	1.1	0.94	1.03	1.01			1.32	
Mean IH	0.79	0.87	0.708	0.668	0.772	0.918	0.952	0.976	0.98	0.778	0.874	0.763		0.841		
Min IH	0.66	0.57	0.58	0.6	0.61	0.74	0.65	0.67	0.82	0.57	0.8	0.63				0.57
<b>RADLEY HILL ROAD</b>																
Manitoulin Transport / UV Dosage - mJ/cm <sup>2</sup>																
Count IH	9	6	9	9	8	8	7	8	8	9	7	9	97			
Max IH	370	353.9	334.9	311.2	273.8	340	329	300	283.6	270	315	284			370	
Mean IH	326.211	342.567	319.533	291.711	267.888	273.588	305.229	277.1	263.475	253.467	269.443	269.167		287.374		
Min IH	161	327.8	287	271.8	253	250	287	255.4	245.5	243	228	245				161

**NOTES:**  
 \* Well No. 4 – raw turbidity samples were not collected in February after the well pump motor failed. The unit was repaired and installed on January 24th. When putting Well No. 4 back into service, the flow meter failed and had to be replaced. The new flow meter was installed on March 10th and sampling resumed.  
 \*\* August 20 - a low free chlorine residual of 0.21 mg/L was measured in the treated water. CT calculation done and primary disinfection achieved.