



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

New Liskeard Drinking Water System

2018 ANNUAL/SUMMARY REPORT

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



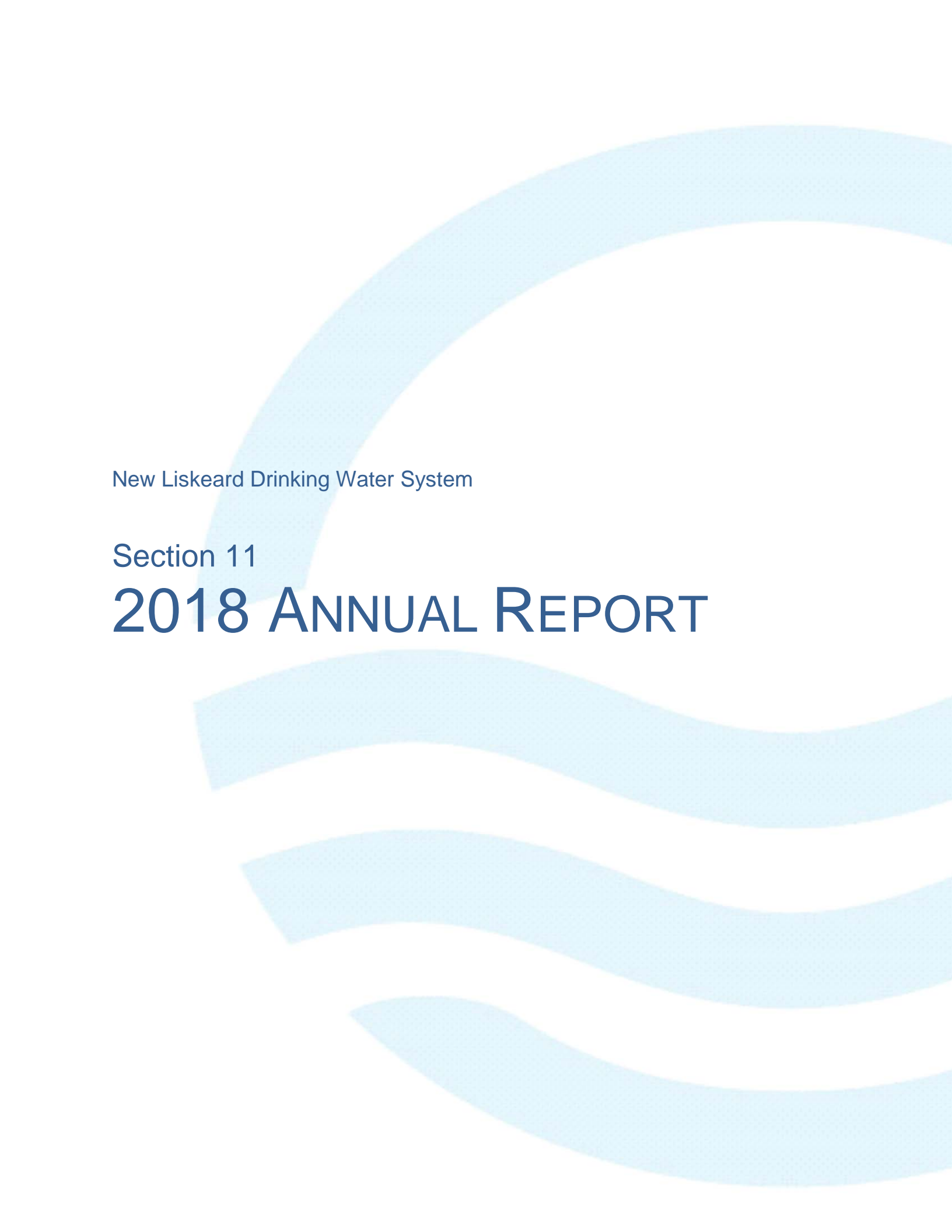
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New Liskeard Drinking Water System

Section 11

2018 ANNUAL REPORT



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 2018 Annual/Summary Report.



Section 11 - ANNUAL REPORT

1.0 INTRODUCTION

Drinking-Water System Name	New Liskeard Drinking Water System
Drinking-Water System Number	220000344
Drinking-Water System Owner	The Corporation of the City of Temiskaming Shores
Drinking-Water System Category	Large Municipal, Residential System
Reporting Period	January 1, 2018 to December 31, 2018

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 2018 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:

- Public access/notice via the web
- Public access/notice via City’s Facebook page
- Public access/notice via a community bulletin



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 and is supplied by two main production wells; Well 3 and Well 4. Well 3 is a 54.9 m deep drilled well equipped with a vertical turbine pump rated at 2700 L/min. The well is housed in a secure building located directly across from the water plant. Well 4 is a 54.9 m deep drilled well also equipped with a vertical turbine pump rated at 2700 L/min. 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 (m³/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. 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.

Water Storage and Pumping Capabilities

The clearwells are located directly below the water treatment plant and have a total storage capacity of 271 m³. The baffles in the clearwell help to ensure sufficient chlorine contact time (CT). This is continuously monitored by a chlorine analyzer to ensure adequate primary disinfection before 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, each rated at 3272 L/min, 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 has a storage capacity of 1818 m³. 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 m³. The reservoir is a single story building with an underground clearwell consisting of four interconnected baffled cells. The building houses a sodium hypochlorite feed system, if boosting is required and four vertical turbine pumps two rated at 70 L/s and two rated at 28.1 L/s.

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 which consists of approximately 5750 residents and 2300 service connections.

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 Plant

- Commissioned new iron and manganese removal filter system in June.
- Replaced Depolox chlorine analyzer with a Hach CL17
- Installed flow control valves on each turbidimeter to reduce flow
- Replaced defective solenoid valve on post #2 chlorination system.
- Replaced blown bulbs (pilot lights) in VFD panels.
- New back-up compressor

Shepherson Street Pumping Station

- Replaced graduated sodium hypochlorite tank to a 60L plastic tank with level transmitter
- Repaired leaking pressure reducing valve (zone 2)
- Replaced security system keypad

Dymond Pumping Station

- Replaced chemical pump panel
- Replaced faulty pressure transmitter
- Repaired faulty chlorine analyzer
- Repaired broken plumbing on the sodium hypochlorite system



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, the New Liskeard Drinking Water System was in full compliance in 2018 with no adverse water quality incidents reported to the Ministry’s Spills Action Centre.

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(INT/NDOGN)	0 to 0 (INT/NDOGN)	N/A	N/A
Raw – Well 4	52	0 to 0	0 to 1	N/A	N/A
Treated	52	0 to 0	0 to 0	52	< 10 to 30
Distribution	208	0 to 0	0 to 0	104	< 10 to 70

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

MAC for Total Coliforms = 0 Counts/100 mL

INT - interference, bacti colonies cannot be properly counted

NDOGN - no data, overgrown with non-target

Notes:

1. 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.
2. Well No. 3 taken off-line during plant upgrade. Results of INT and NDOGN were detected in Well No. 3 when the well was started up to collect regulatory bacteriological and turbidity samples.

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	50	0.11 to 275	NTU
Turbidity – Well 4	53	0.21 to 2.8	NTU

Note:

1. Turbidity samples required once every month.
2. Well No. 3 taken off-line during plant upgrade. High turbidity results caused when the well was started up to collect regulatory bacteriological and turbidity samples.



Continuous Monitoring in the Treatment Process

Parameter	# of Samples	Range of Results <i>(min to max)</i>	Unit of Measure	Standard
Free Chlorine Residual	8760	0.30 to 3.72	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 to ensure primary disinfection is achieved.

On May 31st, the Deplox CL17 chlorine analyzer was replaced and the free chlorine level dropped to 0.30 mg/L. CT calculation was performed and passed.

Summary of Chlorine Residual Data in the Distribution System

Number of Samples	Free Chlorine <i>(min to max)</i>	Unit of Measure	Standard
369	0.19 to 1.13	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 water treatment plant every quarter)*

Date of Sample	Nitrate Result	Nitrite Result	Unit of Measure	Exceedance
January 8	< 0.1	< 0.03	mg/L	No
April 9	< 0.1	< 0.03	mg/L	No
July 3	< 0.1	< 0.03	mg/L	No
October 9	< 0.02	< 0.008	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 8	57.5	ug/L		
April 9	54.1	ug/L		
July 3	45.4	ug/L	54.7	No
October 9	61.6	ug/L		

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

Haloacetic Acid (HAAs) Sampling and Testing Required under Schedule 13-6.1

New sampling requirements for Haloacetic Acids (HAAs) came into effect on January 1st, 2017. At least one distribution must sample taken in each calendar quarter, from a point in the drinking water system’s distribution system, or plumbing that is likely to have an elevated potential for the formation of HAAs.



The maximum allowable concentration (MAC) of 80 ug/L is effective January 1st, 2020 and is based on a running annual average of quarterly results (similar to THMs). Results that exceed the MAC must be reported as an adverse water quality incident (AWQI) starting January 1st, 2020. HAA results for 2018 are summarized below.

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

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
January 8	< 8	ug/L		
April 9	14.1	ug/L	< 11.2	N/A
July 3	10.7	ug/L		
October 9	12.0	ug/L		

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.

In 2018, the New Liskeard Drinking Water System completed its third 12-month period of the lead testing. Two rounds of lead, alkalinity and pH testing were conducted on April 4th and October 10th. 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 4	3	6.80 to 7.20	1.6 to 6.4	223 to 229	< 0.1 to 0.24
October 11	3	6.54 to 7.54	12.3 to 17.1	234 to 239	< 0.1 to 1.2

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	ug/L	10	No	No
Barium	108	ug/L	1000	No	No
Boron	116	ug/L	5000	No	No



Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Cadmium	< 0.1	ug/L	5	No	No
Chromium	< 1	ug/L	50	No	No
Mercury	< 0.1	ug/L	1	No	No
Selenium	< 1	ug/L	50	No	No
Uranium	< 1	ug/L	20	No	No

Note: Sample required every 36 months (sample date = *October10, 2017*). Next sampling scheduled for October 2020

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	< 0.2	ug/L	5	No	No
Atrazine + N-dealkylated metabolites	< 0.5	ug/L	5	No	No
Azinphos-methyl	< 0.2	ug/L	20	No	No
Benzene	< 0.1	ug/L	1	No	No
Benzo(a)pyrene	< 0.005	ug/L	0.01	No	No
Bromoxynil	< 0.09	ug/L	5	No	No
Carbaryl	< 1	ug/L	90	No	No
Carbofuran	< 1	ug/L	90	No	No
Carbon Tetrachloride	< 0.2	ug/L	2	No	No
Chlorpyrifos	< 0.2	ug/L	90	No	No
Diazinon	< 0.2	ug/L	20	No	No
Dicamba	< 0.08	ug/L	120	No	No
1,2-Dichlorobenzene	< 0.2	ug/L	200	No	No
1,4-Dichlorobenzene	< 0.3	ug/L	5	No	No
1,2-Dichloroethane	< 0.2	ug/L	5	No	No
1,1-Dichloroethylene (vinylidene chloride)	< 0.3	ug/L	14	No	No
Dichloromethane	< 1	ug/L	50	No	No
2-4 Dichlorophenol	< 0.2	ug/L	900	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	< 0.08	ug/L	100	No	No
Diclofop-methyl	< 0.08	ug/L	9	No	No
Dimethoate	< 0.2	ug/L	20	No	No
Diquat	< 0.6	ug/L	70	No	No
Diuron	< 6	ug/L	150	No	No
Glyphosate	< 20	ug/L	280	No	No
MCPA	< 10	ug/L	100	No	No
Malathion	< 0.2	ug/L	190	No	No
Metolachlor	< 0.1	ug/L	50	No	No
Metribuzin	< 0.1	ug/L	80	No	No
Monochlorobenzene	< 0.5	ug/L	80	No	No
Paraquat	< 0.3	ug/L	10	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
Pentachlorophenol	< 0.3	ug/L	60	No	No
Phorate	< 0.1	ug/L	2	No	No
Picloram	< 0.08	ug/L	190	No	No
Polychlorinated Biphenyls (PCBs)	< 0.06	ug/L	3	No	No
Prometryne	< 0.06	ug/L	1	No	No
Simazine	< 0.2	ug/L	10	No	No
Terbufos	< 0.1	ug/L	1	No	No
Tetrachloroethylene	< 0.3	ug/L	10	No	No
2,3,4,6-Tetrachlorophenol	< 0.3	ug/L	100	No	No
Triallate	< 0.1	ug/L	230	No	No
Trichloroethylene	< 0.2	ug/L	5	No	No
2,4,6-Trichlorophenol	< 0.2	ug/L	5	No	No
Trifluralin	< 0.1	ug/L	45	No	No
Vinyl Chloride	< 0.1	ug/L	1	No	No

Note: Sample required every 36 months (sample date = October 10, 2017). Next sampling scheduled for October 2020

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/cm².
- 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	90	25.7 to 301	mJ/cm ²	40

Notes:

1. July 3 - UV system faulted and shutdown. Unit flushed and put back into service reading 285.4 mJ/cm².
2. August 7, 13, 20 & 27 - Low UV dosage caused unit to shut down and alarm. System flushed and dosage readings increased to 214, 201, 315 & 295 mJ/cm².



New Liskeard Drinking Water System

Schedule 22

2018 SUMMARY REPORT FOR MUNICIPALITIES



Schedule 22 - SUMMARY REPORTS FOR MUNICIPALITIES

1.0 INTRODUCTION

Drinking-Water System Name	New Liskeard Drinking Water System
Municipal Drinking Water Licence (MDWL)	218-103-2 (issued August 15, 2016)
Drinking Water Works Permit (DWWP)	218-203-3 (issued April 21, 2017)
Permit to Take Water (PTTW)	4417-AF2JAM (issued November 2, 2016)
Reporting Period	January 1, 2018 to December 31, 2018

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 2018 reporting period:

Drinking Water Legislation	Requirement(s) the System Failed to Meet	Duration	Corrective Action(s)	Status
Condition 2.3 of Schedule B of Drinking Water Works Permit No 218-203, Issue No. 3, (Permit) Condition 3.2.5 and 3.2.6 of the Watermain Disinfection Procedure	<p>The system failed to follow the ministry's Watermain Disinfection Procedure which states that all parts of the drinking water system in contact with drinking water which are added, modified, replaced, extended or taken out of service for inspection, repair or other activities that may lead to contamination shall be disinfected before being put into service in accordance with a procedure approved by the Director or in accordance with the Procedure.</p> <p>The Procedure requires that for emergency repairs the operating authority must:</p> <p>a) conduct post repair flushing until the discharged water is free from discoloration, and secondary disinfection has been restored and that flushing shall continue until the disinfectant concentration at the point of flushing reaches at least 0.2 mg/L free chlorine. Upon restoration of secondary disinfection, the system can be returned to normal service, defined as having all valves returned to normal operating position.</p>	March to October 2018.	<p>The City of Temiskaming Shores has certified operators that respond to and repair water main breaks results and record activities performed as required by the Ministry's Watermain Disinfection Procedure on a Water Report form.</p> <p>OCWA met with the City to review and update the form to ensure the requirements of the procedure are being met.</p> <ul style="list-style-type: none"> - Added a section for the OIC categorizing the break to sign - Added a section to clarify what the size of pipe being repaired (so operators will know if disinfection and residuals are required) <p>The Distribution and Maintenance Repair form that OCWA developed and uses for water main repairs is currently under revision. Once revised, the City has agreed to use the form after training is provided in early 2019.</p>	In Progress



Drinking Water Legislation	Requirement(s) the System Failed to Meet	Duration	Corrective Action(s)	Status
	On March 4th, 2018 post flushing was not completed after repairing a watermain and, on March 4th 2018 and June 7th, 2018, no chlorine residuals were taken prior to placing the watermain into service after a repair.			

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 2018 reporting period, including average monthly volumes, maximum monthly volumes, total monthly volumes and maximum flow rates.

Raw Water

2018 - 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 ³)	41550	6522	0	180	3115	88711	76416	63528	49855	52015	43257	45646	470794
Average Volume (m ³ /d)	1340	233	0	6	100	2957	2465	2049	1662	1678	1442	1472	1284
Maximum Volume (m ³ /d)	2428	1953	0	99	1866	3656	3179	2774	2327	2335	2095	1768	3656
PTTW - Maximum Allowable Volume (m ³ /day)	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Maximum Flow Rate (L/min)	2705	2677	2	2275	4064	4001	3713	3629	3809	3798	4247	3719	4247
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 ³)	58781	83979	102413	97685	95427	25782	69497	59900	52057	53870	50951	50599	800939
Average Volume (m ³ /d)	1896	2999	3304	3256	3078	859	2242	1932	1735	1738	1698	1632	2198
Maximum Volume (m ³ /d)	3245	3526	3461	3520	3602	2840	3080	2434	2133	2493	2005	2166	3602
PTTW - Maximum Allowable Volume (m ³ /day)	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
Maximum Flow Rate (L/min)	2778	2776	2742	2707	2777	3041	2989	2967	2976	2982	2993	2964	3041
PTTW - Maximum Allowable Flow Rate (L/min)	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500

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 ³)	100331	90501	102413	97864	98542	114493	145913	123428	101912	105885	92810	96244	1270336
Average Volume (m ³ /d)	3236	3232	3304	3262	3179	3816	4707	3982	3397	3416	3094	3105	3477
Maximum Volume (m ³ /d)	3811	3536	3461	3520	3824	6014	6163	4783	3898	3971	3514	3246	6163
MDWL - Rated Capacity (m ³ /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 m³/day / 4,500 L/minute

Well No. 4: 4000 m³/day / 4,500 L/minute

Total Combined Daily Volume: 8000 m³/day

A review of the raw water flow data indicates that the total daily volume of water taken from each well never exceeded the allowable limits. The maximum water taking from Well No. 3 was 3656 m³ on June 13th, from Well No. 4 was 3602 m³ on May 23rd and the combined maximum was 6163 m³ on July 4th.

Well No. 3 and Well No. 4 operated within their allowable flow rates having a maximum flow rate of 4247 and 3041 L/minute respectively.

Well No. 3 was removed from service at the end of January to the end of May to allow the installation of the new iron and manganese removal filtration system.



Treated Water

2018 - 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

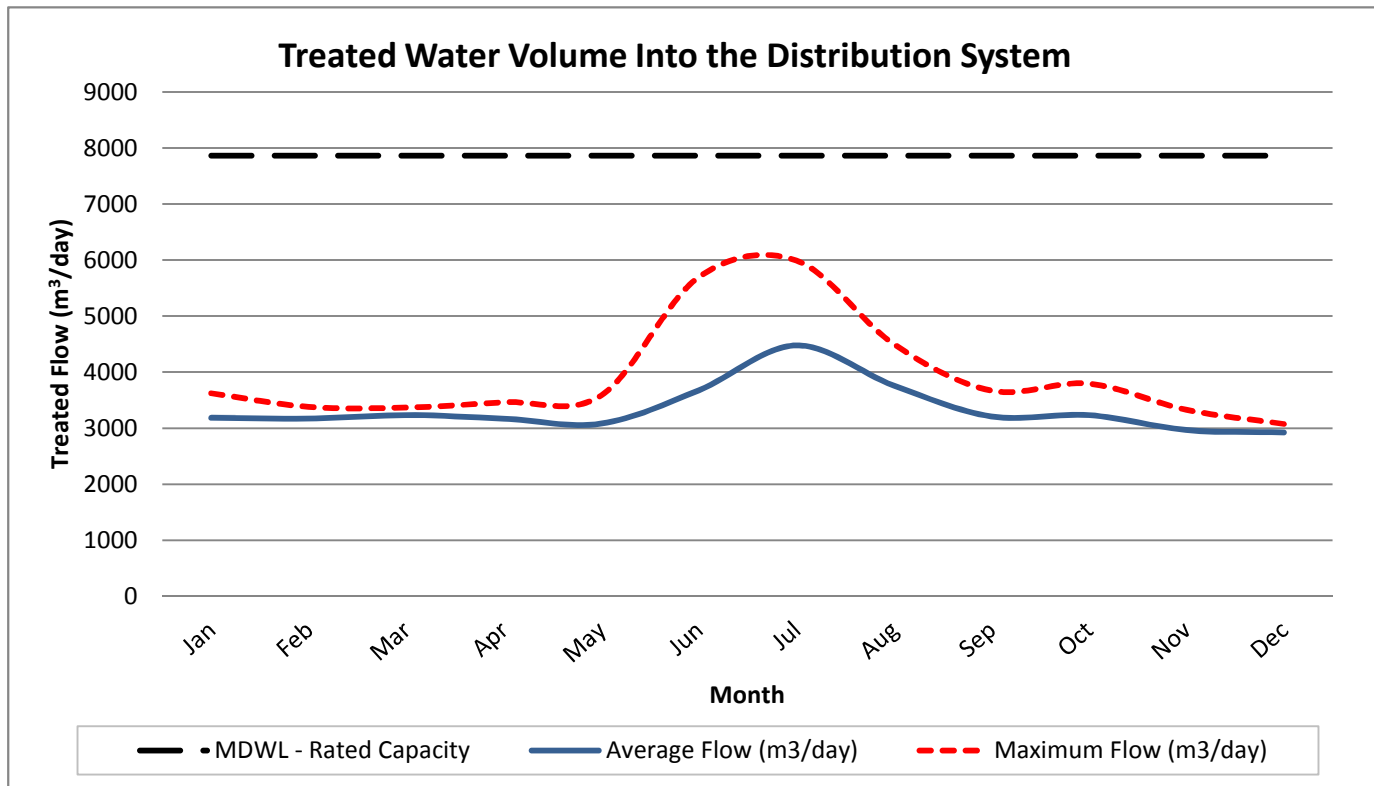
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	98786	88776	100200	95127	95518	110275	138792	116589	96295	100202	89042	90639	1220239
Average Volume (m ³ /d)	3187	3171	3232	3171	3081	3676	4477	3761	3210	3232	2968	2924	3341
Maximum Volume (m ³ /d)	3624	3379	3368	3463	3584	5695	5993	4501	3669	3795	3328	3075	5993
MDWL - Rated Capacity (m³/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 m³ on any calendar day. The New Liskeard DWS complied with this limit having a recorded maximum volume of 5993 m³/day on July 4th, which represents 71.2 % of the rated capacity.

The following table and graph (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: 2018 - Monthly Volume of Treated Water into the Distribution System

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Flow (m ³ /day)	3187	3171	3232	3171	3081	3676	4477	3761	3210	3232	2968	2924
Maximum Flow (m ³ /day)	3624	3379	3368	3463	3584	5695	5993	4501	3669	3795	3328	3075
MDWL - Rated Capacity	7865	7865	7865	7865	7865	7865	7865	7865	7865	7865	7865	7865
% Rated Capacity	46	43	43	44	46	72	76	57	47	48	42	39





Summary of System Performance

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 ³ /day	
Average Daily Flow for 2018	3341 m ³ /day	42.5 % of the rated capacity
Maximum Daily Flow for 2018	5993 m ³ /day	76.2 % of the rated capacity
Total Treated Water Produced in 2018	1,220,239 m ³	

CONCLUSION

The New Liskeard drinking water system operated well in 2018 complying with the regulatory requirements of the Safe Drinking Water Act and its Regulations and meeting the terms and conditions outlined in its site specific Drinking Water Works Permit

The 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.

The system addressed the following non-compliance with its Municipal Drinking Water Licence and the Ministry's Watermain Disinfection procedure.

The Owner/operating authority failed to conduct post repair flushing and test for chlorine residuals after watermain repairs. The Owner and operating authority discussed the procedure and reviewed and updated the City's form to ensure the requirements of the procedure are being met. Additional training is planned for both City and OCWA operators.



APPENDIX A

Monthly Summary of Microbiological
Test Results

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

Facility Works Number: 22000344
 Facility Owner: Municipality: City of Temiskaming Shores
 Facility Classification: Class 1 Water Treatment

RAW WATER	01/2018	02/2018	03/2018	04/2018	05/2018	06/2018	07/2018	08/2018	09/2018	10/2018	11/2018	12/2018	Total	Avg	Max	Min
Well 3 / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	4	52			
Max Lab	0	0	0/INT	0/NDOGN/INT	0	0	0	0	0	0	0	0			0/NDOGN/INT	
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
Well 3 / E. Coli: EC - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	4	52			
Max Lab	0	0	0/INT	0/NDOGN/INT	0	0	0	0	0	0	0	0			0/NDOGN/INT	
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
Well 4 / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	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
Well 4 / E. Coli: EC - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	4	52			
Max Lab	0	0	0	0	0	0	1	0	0	0	0	0			1	
Mean Lab	0	0	0	0	0	0	0.2	0	0	0	0	0		0.019		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
TREATED WATER																
Treated Water POE / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	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
Treated Water POE / E. Coli: EC - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	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
Treated Water POE / HPC - cfu/mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	4	52			
Max Lab	< 10	< 10	< 30	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10			30	
Mean Lab	< 10	< 10	< 15	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10		10.385		
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10
DISTRIBUTION WATER																
1st Bacti/Residual / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	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
1st Bacti/Residual / E. Coli - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	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
2nd Bacti/Residual / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	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
2nd Bacti/Residual / E. Coli - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	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
2nd Bacti/Residual / HPC - cfu/mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	4	52			
Max Lab	< 10	< 10	< 70	< 10	< 10	< 20	< 10	< 10	< 10	< 10	< 10	< 10			70	
Mean Lab	< 10	< 10	< 25	< 10	< 10	< 12.5	< 10	< 10	< 10	< 10	< 10	< 10		11.346		
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10
3rd Bacti/Residual / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	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
3rd Bacti/Residual / E. Coli - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	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
4th Bacti/Residual / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	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
4th Bacti/Residual / E. Coli - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	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
4th Bacti/Residual / HPC - cfu/mL																
Count Lab	5	4	4	5	4	4	5	4	4	5	4	4	52			
Max Lab	< 20	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	30	< 10	< 10			30	
Mean Lab	< 12	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 15	< 10	< 10		10.577		
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10

NOTES:
 Well No. 3 was not in used in March or April during filter upgrades. It was started each week to collect bacteriological samples.

INT - interference, bacti colonies cannot be properly counted
 NDOGN - no data, overgrown with non-target



APPENDIX B

Monthly Summary of Operational Data

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

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

RAW WATER	01/2018	02/2018	03/2018	04/2018	05/2018	06/2018	07/2018	08/2018	09/2018	10/2018	11/2018	12/2018	Total	Avg	Max	Min
Well 3 / Turbidity - NTU																
Count IH	5	2	3	5	3	4	5	4	4	5	4	6	50			
Max IH	0.45	0.64	0.85	275	1.43	0.66	0.65	0.38	0.7	0.43	0.51	0.95			275	
Mean IH	0.39	0.565	0.817	114.042	0.853	0.408	0.334	0.305	0.493	0.346	0.428	0.568		11.833		
Min IH	0.31	0.49	0.79	0.55	0.52	0.2	0.11	0.22	0.28	0.28	0.36	0.31				0.11
Well 4 / Turbidity - NTU																
Count IH	5	4	4	5	3	4	5	4	4	5	4	6	53			
Max IH	0.46	0.64	0.45	1.07	0.63	1.76	2.8	1.91	0.68	0.71	0.78	0.5			2.8	
Mean IH	0.398	0.48	0.403	0.738	0.473	1.27	1.002	1.055	0.388	0.556	0.617	0.363		0.64		
Min IH	0.33	0.38	0.36	0.41	0.36	0.91	0.33	0.26	0.21	0.39	0.53	0.29				0.21
TREATED WATER																
Treated Water POE / CI Residual: Free (0.40 mg/L) - mg/L	01/2018	02/2018	03/2018	04/2018	05/2018	06/2018	07/2018	08/2018	09/2018	10/2018	11/2018	12/2018	Total	Avg	Max	Min
Max OL	1.45	1.6	1.66	1.6	2.31	1.73	1.51	1.71	3.72	2.06	1.79	2.08			3.72	
Mean OL	1.084	1.068	1.069	1.084	1.125	1.169	1.26	1.285	1.428	1.246	1.081	1.059		1.163		
Min OL	0.60	0.55	0.51	0.60	0.30	0.46	0.79	0.98	0.53	0.43	0.86	0.82				0.30
DISTRIBUTION WATER																
1st Bacti/Residual / CI Residual: Free - mg/L	01/2018	02/2018	03/2018	04/2018	05/2018	06/2018	07/2018	08/2018	09/2018	10/2018	11/2018	12/2018	Total	Avg	Max	Min
Count IH	9	8	9	9	9	8	9	9	8	9	9	9	105			
Max IH	1.22	0.7	0.96	0.89	0.83	0.75	1.06	1.34	1.07	1.03	0.82	0.75			1.34	
Mean IH	0.641	0.564	0.721	0.799	0.734	0.656	0.726	0.854	0.794	0.704	0.621	0.538		0.697		
Min IH	0.24	0.29	0.25	0.62	0.66	0.25	0.44	0.45	0.42	0.31	0.44	0.35				0.24
2nd Bacti/Residual / CI Residual: Free - mg/L																
Count IH	9	8	9	9	9	8	9	9	8	9	9	9	105			
Max IH	1.12	0.86	1.05	0.83	0.78	0.83	1.13	1.13	0.91	1.08	1.01	0.89			1.13	
Mean IH	0.709	0.653	0.636	0.742	0.636	0.741	0.606	0.732	0.695	0.852	0.721	0.781		0.709		
Min IH	0.43	0.19	0.25	0.55	0.43	0.57	0.24	0.29	0.6	0.64	0.49	0.73				0.19
3rd Bacti/Residual / CI Residual: Free - mg/L																
Count IH	9	8	9	9	9	8	9	9	8	9	9	9	105			
Max IH	0.97	0.82	0.8	0.81	0.9	1.07	0.93	1.13	1.63	1.33	0.83	1.21			1.63	
Mean IH	0.692	0.678	0.654	0.656	0.666	0.723	0.71	0.718	0.864	0.786	0.691	0.744		0.714		
Min IH	0.49	0.58	0.45	0.4	0.36	0.28	0.39	0.36	0.31	0.29	0.61	0.44				0.28
4th Bacti/Residual / CI Residual: Free - mg/L																
Count IH	5	4	4	5	4	4	5	4	4	5	4	6	54			
Max IH	1	0.84	0.99	0.86	0.72	0.79	1.14	1	2.15	1.32	0.75	0.96			2.15	
Mean IH	0.68	0.645	0.76	0.684	0.563	0.703	0.978	0.768	1.343	0.948	0.648	0.7		0.784		
Min IH	0.21	0.54	0.45	0.55	0.45	0.52	0.88	0.64	0.71	0.47	0.55	0.36				0.21
RADLEY HILL ROAD																
Manitoulin Transport / UV Dosage - mJ/cm ²	01/2018	02/2018	03/2018	04/2018	05/2018	06/2018	07/2018	08/2018	09/2018	10/2018	11/2018	12/2018	Total	Avg	Max	Min
Count IH	7	5	5	8	9	6	7	9	9	9	8	8	90			
Max IH	148	219	129	201.5	158.8	301	127.4	149	265	260.3	213.1	288.1			301	
Mean IH	113.486	175.5	103.4	120.5	113.844	210.867	93.314	80.067	232.522	234.044	185.875	277.563		163.59		
Min IH	97.3	132.5	52	42.4	88.7	136.6	25.7	39	211.6	222	165.2	256				25.7

NOTES:

- Well #3 taken off-line during plant upgrade. High turbidity results caused when the well was started up to collect samples.
- On May 31st, the Deplox CL17 was replaced and chlorine level dropped to 0.30 mg/L. CT calculation done and passed.
- July 3 - UV system faulted and shutdown. Unit flushed and put back into service reading 285.4 mJ/cm2
- August 7, 13, 20 & 27 - Low UV dosage caused unit to shutdown and alarm. System flushed and dosage readings increased to 214, 201, 315 & 295 mJ/cm2.