



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

LION'S HEAD WATER TREATMENT

Large Municipal Residential Drinking Water System

SECTION 11 ANNUAL REPORT

**For the period of
JANUARY 1, 2015 TO DECEMBER 31, 2015**

Prepared by the Ontario Clean Water Agency
For The Municipality of Northern Bruce Peninsula

Drinking Water System Number:	220002672
Drinking Water System Name:	Lion's Head Water Supply and Distribution System
Drinking Water System Owner:	Municipality of Northern Bruce Peninsula
Drinking Water System Category:	Large Municipal Residential
Reporting Period:	January 1, 2015 to December 31, 2015

Does the 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.

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

Municipality of Northern Bruce Peninsula
 R.R. 2, 56 Lindsay Road #5
 Lion's Head, Ontario
 N0G 1W0
 519-793-3522

Drinking-Water Systems (if any), which receive all of their drinking water from your system:

n/a

Did you provide a copy of the annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

n/a

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
n/a	n/a

How system users are notified that the annual report is available, and is free of charge:

- Public access/notice via the web
- Public access/notice via Government Office
- Public access/notice via a newspaper
- Public access/notice via Public Request
- Public access/notice via a Public Library
- Public access/notice via other method: _____

Description of Drinking Water System:

The Lion's Head Water Treatment Plant (WTP) and Distribution System is a Class 2 Treatment and Class 1 Distribution System.

This facility was commissioned in May 19, 2005 under an Ontario Ministry of the Environment C of A approval (4272-5YAK6U). The official open house occurred on July 22, 2005.

The new plant, with an approximate footprint of 18 x 23m, is located at the intersection of Ida and Helen Streets in the Village of Lion's Head. It contains a combined 150 mm diameter of raw water header hydraulically connected to two membrane filtration package systems (in parallel), with a total design capacity of 15.63 L/s. Each package system consists of a set of rack-mounted 10 hollow-fiber filter modules (with room for expansion to 12), one filter feed pump, one filter backwash pump with a rated capacity of 14.2 L/s, one turbidity analyzer and one particle counter, located on the effluent side of the membrane filters using a chemical wash. A compressed air system is used for air scrubbing of the membrane filters. There are two concrete chlorine contact tanks (in parallel), located below the filters, each tank 96 cubic meters in size and with an overflow weir allowing water to flow to baffled reservoir tanks. The concrete reservoir tanks have a storage capacity of 576 cubic meters. Water flows from the water reservoirs to a common high-lift well header container, 384 cubic meters in size. Five variable speed vertical turbine high lift pumps draw water out of the well header, each discharging to a combined 150 mm diameter treated water header connected to the distributions system.

A target distribution pressure of around 560 kPa (80 psi) is maintained by the continuous monitoring and operation of the variable speed pumps. No storage reservoirs are used in the distribution system. Online instrumentation includes continuous free chlorine residual, turbidity, pH, and flow measurement located on the treated water header.

The treatment process includes a sodium hypochlorite feed system consisting of two chemical feed pumps (duty, standby) for injection at the raw water intake for mussel control and a sodium hypochlorite feed system with 4 pumps each with a rated capacity of at least 680 L/hr, with two pumps (duty, standby) for injection at the backwash supply to each membrane filter and the other two pumps (duty, standby) for injection at the filtered discharge of each filter and two 200 L day tanks, spill containment, piping, appurtenances, and associated controls, an acid feed system complete with two metering pumps each with a rated capacity of at least 680 L/hr, one 200 L day tank, spill containment, piping, appurtenances, and associated controls, a caustic feed system complete with two metering pumps each with a rated capacity of at least 680 L/hr, one 200 L day tank, spill containment, piping, appurtenances, and associated controls, one 250 kVA standby diesel generator set, complete with fuel containment, and associated controls, backwash/wastewater handling facilities consisting of a 120 cubic meter backwash settling tank and two supernatant pumps each rated at 2.63 L/s at 6.1 m TDH, transferring supernatant to the storm sewer, all other controls, electrical equipment, instrumentation, piping, and appurtenances essential for the proper operation of the above-noted works.

A dedicated back-up power supply is used to maintain the necessary electrical supply to operate the filtration plant during power outages.

List of water treatment chemicals used during the reporting period:

- Sodium Hypochlorite 12%

Significant expenses were incurred to:

- Install required equipment
- Repair required equipment
- Replace required equipment
- No significant expenses were incurred

Description of expenses:

- SCADA Desktop Computer was refurbished
- 13 lateral water services were rerouted from old existing 2" and 3" water main on Main Street to 6" water main on Main Street.

Details on the notices submitted in accordance with subsection 18 (1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre:

Date of Incident	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
November 2, 2015	Total Coliforms	107	counts/100 mL	Precautionary notice to boil issued. Three (3) re-samples taken, a re-sample at the sampling site (Post Office, 70 Main St.), an upstream sample (Marydale's, 76 Main St.) and a downstream sample (St. Mary's Church). When re-sampling the Post Office, the hot water valve was turned off and the tap was flushed for at least 10 minutes prior to sampling. The samples were tested for E.coli and Total Coliforms. Sample results show Total Coliform = 0 cfu/100 mL and E. Coli = 0 cfu/100 mL for all samples. The precautionary notice at the Post Office was lifted; operators suggested to the Post Office staff that they should flush the hot water tank periodically. The 107 cfu/100mL total coliform sample was likely caused by contamination from hot water during sampling of cold water at a blended tap. Future sampling will refrain from blended taps if feasible and the hot water valve will be turned off and the tap will be flushed for at least 10 minutes if samples need to be taken at a blended tap.	November 5, 2015

Table 1. Microbiological testing done under Schedule 10, 11 or 12 of Regulation 170/03 during this reporting Period

Location	Number of Samples	Range of E.coli Results		Range of Total Coliforms Results		Number of HPC Samples	Range of HPC Samples	
		Minimum	Maximum	Minimum	Maximum		Minimum	Maximum
Raw (RW)	52	0	7	0	69	-	-	-
Treated (TW)	52	0	0	0	0	52	0	5
Distribution (DW)	113	0	0	0	107	53	0	400

Table 2. Operational testing done under Schedule 7, 8 or 9 during the period covered by this Annual Report.

	Number of Grab Samples	Range of Results	
		Minimum	Maximum
Turbidity, Filter 1 (NTU)	8760	0	0.91
Turbidity, Filter 2 (NTU)	8760	0	0.68
Free Chlorine Residual, Treated Water (mg/L)	8760	0.9	1.34
Free Chlorine Residual, Distribution Water (mg/L)	325	0.65	1.31

NOTE: Record the unit of measure if it is not milligrams per litre.

NOTE: For continuous monitors use 8760 as the number of samples

Table 3. Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Date of Order of MDWL	Parameter	Date Sampled	Result	MDWL Allowable Annual Average Concentration
January 20, 2011 MDWL #250-101 (Issue 2)	Filter Backwash Suspended Solids (composite)	Monthly	3.5 mg/L	25 mg/L

Table 4. Summary of Inorganic parameters tested during this reporting period or most recent sample results

Parameter	Sample Date (mm/dd/yyyy)	Sample Result	Exceedance
Antimony: Sb (ug/L) - TW	1/6/2015	0.18	No
Arsenic: As (ug/L) - TW	1/6/2015	0.4	No
Barium: Ba (ug/L) - TW	1/6/2015	13.9	No
Boron: B (ug/L) - TW	1/6/2015	13	No
Cadmium: Cd (ug/L) - TW	1/6/2015	0.003	No
Chromium: Cr (ug/L) - TW	1/6/2015	< 0.03	No
Mercury: Hg (ug/L) - TW	1/6/2015	0.02	No
Selenium: Se (ug/L) - TW	1/6/2015	< 1.0	No
Uranium: U (ug/L) - TW	1/6/2015	0.185	No
Fluoride (mg/L) - TW	1/7/2013	0.1	No
Nitrite (mg/L) - TW	1/6/2015	< 0.003	No
Nitrite (mg/L) - TW	4/7/2015	< 0.003	No
Nitrite (mg/L) - TW	7/13/2015	< 0.003	No
Nitrite (mg/L) - TW	10/7/2015	< 0.003	No
Nitrate (mg/L) - TW	1/6/2015	0.266	No
Nitrate (mg/L) - TW	4/7/2015	0.28	No
Nitrate (mg/L) - TW	7/13/2015	0.248	No
Nitrate (mg/L) - TW	10/7/2015	0.255	No
Sodium: Na (mg/L) - TW	1/7/2013	6.21	No

NOTE: There is no "MAC" for Sodium. The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified 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.

NOTE: Sodium and Fluoride are sampled every 60 months. The most current sample for Sodium was taken on January 7, 2013. The next scheduled sampling for Sodium will be in January 2018. The most current sample for Fluoride was taken on January 7, 2013. The next scheduled sampling for Fluoride will be in January 2018.

Table 5. Summary of lead testing under Schedule 15.1 during this reporting period.

Location Type	Number of Samples	Range of Lead Results		Number of Exceedances
		Minimum	Maximum	
Plumbing	n/a	n/a	n/a	n/a
Distribution (ug/L)	4	0.02	0.25	0

NOTE: This system now qualifies for the plumbing exemption as per Ontario Regulation 170/03 Schedule 15.1-5 (9) (10). Four (4) distribution lead samples are only taken every 36 months. The most current samples were taken in 2015. The next set of lead samples are to be taken in 2018.

Table 6. Summary of Organic parameters sampled during this reporting period or most recent sample results.

Parameter	Sample Date	Result Value	Exceedance
Alachlor (ug/L) - TW	1/6/2015	< 0.02	No
Aldicarb (ug/L) - TW	1/6/2015	< 0.01	No
Aldrin+Dieldrin (ug/L) - TW	1/6/2015	< 0.01	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	1/6/2015	0.010	No
Azinphos-methyl (ug/L) - TW	1/6/2015	< 0.02	No
Bendiocarb (ug/L) - TW	1/6/2015	< 0.01	No
Benzene (ug/L) - TW	1/6/2015	< 0.32	No
Benzo(a)pyrene (ug/L) - TW	1/6/2015	< 0.004	No
Bromoxynil (ug/L) - TW	1/6/2015	< 0.33	No

Carbaryl (ug/L) - TW	1/6/2015	< 0.01	No
Carbofuran (ug/L) - TW	1/6/2015	< 0.01	No
Carbon Tetrachloride (ug/L) - TW	1/6/2015	< 0.16	No
Chlordane: Total (ug/L) - TW	1/6/2015	< 0.01	No
Chlorpyrifos (ug/L) - TW	1/6/2015	< 0.02	No
Cyanazine (ug/L) - TW	1/6/2015	< 0.03	No
Diazinon (ug/L) - TW	1/6/2015	< 0.02	No
Dicamba (ug/L) - TW	1/6/2015	< 0.2	No
1,2-Dichlorobenzene (ug/L) - TW	1/6/2015	< 0.41	No
1,4-Dichlorobenzene (ug/L) - TW	1/6/2015	< 0.36	No
DDT + metabolites (ug/L) - TW	1/6/2015	< 0.01	No
1,2-Dichloroethane (ug/L) - TW	1/6/2015	< 0.35	No
1,1-Dichloroethylene (ug/L) - TW	1/6/2015	< 0.33	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	1/6/2015	< 0.35	No
2,4-Dichlorophenol (ug/L) - TW	1/6/2015	< 0.15	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	1/6/2015	< 0.19	No
Diclofop-methyl (ug/L) - TW	1/6/2015	< 0.4	No
Dimethoate (ug/L) - TW	1/6/2015	< 0.03	No
Dinoseb (ug/L) - TW	1/6/2015	< 0.36	No
Diquat (ug/L) - TW	1/6/2015	< 1.0	No
Diuron (ug/L) - TW	1/6/2015	< 0.03	No
Glyphosate (ug/L) - TW	1/6/2015	< 1.0	No
Heptachlor+hepachlor epoxide (ug/L) - TW	1/6/2015	< 0.01	No
Lindane (ug/L) - TW	1/6/2015	< 0.01	No
Malathion (ug/L) - TW	1/6/2015	< 0.02	No
Methoxychlor (ug/L) - TW	1/6/2015	< 0.01	No
Metolachlor (ug/L) - TW	1/6/2015	< 0.01	No
Metribuzin (ug/L) - TW	1/6/2015	< 0.02	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	1/6/2015	< 0.3	No
Paraquat (ug/L) - TW	1/6/2015	< 1.0	No
Parathion (ug/L) - TW	1/6/2015	< 0.02	No
PCB (ug/L) - TW	1/6/2015	< 0.04	No
Pentachlorophenol (ug/L) - TW	1/6/2015	< 0.15	No
Phorate (ug/L) - TW	1/6/2015	< 0.01	No
Picloram (ug/L) - TW	1/6/2015	< 1.0	No
Prometryne (ug/L) - TW	1/6/2015	< 0.03	No
Simazine (ug/L) - TW	1/6/2015	< 0.01	No
Temephos (ug/L) - TW	1/6/2015	< 0.01	No
Terbufos (ug/L) - TW	1/6/2015	< 0.01	No
Tetrachloroethylene (ug/L) - TW	1/6/2015	< 0.35	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	1/6/2015	< 0.14	No
Triallate (ug/L) - TW	1/6/2015	< 0.01	No
Trichloroethylene (ug/L) - TW	1/6/2015	< 0.44	No
2,4,6-Trichlorophenol (ug/L) - TW	1/6/2015	< 0.25	No
2,4,5- Trichlorophenoxy acetic acid (ug/L) - TW	1/6/2015	< 0.22	No
Trifluralin (ug/L) - TW	1/6/2015	< 0.02	No
Vinyl Chloride (ug/L) - TW	1/6/2015	< 0.17	No
THM (ug/L) - DW	2015 (Quarterly)	26	No

*Annual average of THMs

Table 7. List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	Date of Sample
n/a	n/a	n/a	n/a

NOTE: This is required only if DWS category is large municipal residential, small municipal residential, large municipal non-residential, small municipal non-residential, large non municipal non-residential)