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February 25, 2014

Town of Moosonee  
P.O. Box 727  
5 First Avenue  
Moosonee, ON  
P0L 1Y0

**Attention: Shannon McGillivray, Chief Administrative Officer**

**RE: Moosonee Drinking Water System  
2013 Annual Report**

Dear Shannon,

Please find attached the 2013 Annual Operations Report for the Moosonee drinking water system, in accordance with Section 11(1) of O. Reg. 170/03. This report covers the period from January 1 to December 31 and meets the requirement of being prepared by February 28 of this year.

Please ensure that a copy of this report is given, without charge, to every person who requests a copy. In addition, please make certain that effective steps are taken to advise residents that copies of the report are available, and of how a copy can be obtained.

Finally, as per Schedule 22 of O. Reg. 170/03, please ensure that a copy of the report is given to the members of municipal council no later than March 31, 2014.

If you have any questions regarding the report, we would be pleased to address them and you should contact the undersigned accordingly.

Sincerely,

AMERICAN WATER CANADA CORP.

Greg Prangley  
Project Manager, Ontario Regional Projects

c. R. Grahlman, AWC Moosonee

## 2013 ANNUAL REPORT FOR WATER SYSTEMS

### Part 1 – ANNUAL REPORT (as required by O. Reg. 170/03, Section 11)

Drinking-Water System Number:	260007114
Drinking-Water System Name:	Moosonee Drinking Water System
Drinking-Water System Owner:	Corporation of the Town of Moosonee
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1-December 31, 2013

Complete if your Category is Large Municipal Residential or Small Municipal Residential	Complete for all other Categories
Does your Drinking-Water System serve more than 10,000 people? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Number of Designated Facilities served: n/a
Is your annual report available to the public at no charge on a web site on the Internet? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Did you provide a copy of your annual report to all Designated Facilities you serve? <input type="checkbox"/> Yes <input type="checkbox"/> No
Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection. <b>Municipal Office</b> 5 First Avenue Moosonee, ON Tel: (705)336-2993	Number of Designated Facilities served: n/a Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? <input type="checkbox"/> Yes <input type="checkbox"/> No

#### 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

#### Did you provide a copy of your 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
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#### Indicate how you notified system users that your annual report is available, and is free of charge.

<input type="checkbox"/> Public access/notice via the web	<input checked="" type="checkbox"/> Public access/notice via Government Office	<input type="checkbox"/> Public access/notice via a newspaper
<input checked="" type="checkbox"/> Public access/notice via Public Request	<input type="checkbox"/> Public access/notice via a Public Library	<input checked="" type="checkbox"/> Public access/notice via other method local bulletin boards and the community television channel_

#### Describe your Drinking Water System

Surface water supply from the Moose River. Water treatment plant rated at 3000 m <sup>3</sup> /day consisting of a dual train package unit with in-line flash mixing, two-stage flocculation, upflow solids contact clarifier with automatic sludge withdrawal, and dual media filters with air scour/water backwash. There are
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separate chemical feed systems for primary coagulant, coagulant aid, disinfection and pH adjustment. Sludge is gravity settled in the clarifier then thickened and dewatered in a sludge bagging system for disposal at the local landfill. There is a 2140 m<sup>3</sup> reservoir for treated water storage.

List all water treatment chemicals used over this reporting period

Coagulant - polyaluminum chloride  
Coagulant aid - polymer  
Disinfection – sodium hypochlorite  
pH adjustment – caustic soda

Please provide a brief description and a breakdown of monetary expenses incurred

Removal and repair of one high lift pump ~\$25,000

Provide 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

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
April 6, 2013	Pressure (main break)	<20psi	Repaired break; repressurized. Precautionary BWA issued; resampled	April 12, 2013
May 28, 2013	Pressure (main break)	<20psi	Repaired break; repressurized. Precautionary BWA issued; resampled	May 31, 2013
July 16, 2013	Total THMs	103.4µg/L (4 quarter running avg.)	Flushed system and resampled	July 25, 2013
Oct. 16, 2013	Total THMs	129.4µg/L (4 quarter running avg.)	Flushed system and resampled	Oct. 17, 2013
Nov. 2, 2013	Pressure (main break)	<20psi	Repaired break; repressurized. Precautionary BWA issued; resampled	Nov. 8, 2013
Nov. 16, 2013	Pressure (main break)	<20psi	Repaired break; repressurized. Precautionary BWA issued; resampled	Nov. 26, 2013
Nov. 22, 2013	Total coliforms (from main break resample)	3	BWA continued; resampled	Nov. 26, 2013

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period

	Number of Samples	Range of E.Coli Results (min #) - (max #)	Range of Total Coliform Results (min #) - (max #)	Number of HPC Samples	Range of HPC Results (min #) - (max #)
Raw	53	<2-300	14-300	n/a	n/a
Treated	53	0	0	53	<10-20
Distribution	142	0	0-3	53	<10-120

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report

	Number of Grab Samples	Range of Results (min #) – (max #)	Units
Filter #1 effluent turbidity	8760	0.00-2.00*	NTU
Filter #2 effluent turbidity	8760	0.00-2.00*	NTU
Chlorine	8760	0.22-5.00**	mg/L
Fluoride (If the DWS provides fluoridation)	n/a	n/a	

\* There were no incidents of water exceeding the regulatory limit (1.0NTU) entering the distribution system. All occurrences of greater than 1.0NTU were due to backwashing and calibrations. This flow goes to waste

\*\* There were no instances where treated water going into the distribution system had a chlorine residual of less than 0.5mg/L. Low readings from SCADA were due to calibrations and system pH fluctuations. Readings of 5.0mg/L are not representative of the actual chlorine residual. In-house verifications were conducted during these times. An increase or decrease in raw water pH causes the chlorine analyzer values to fluctuate into this range

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

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
None				

**Summary of Inorganic parameters tested during this reporting period or the most recent sample results**

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	10/22/2013	<0.5	µg/L	No
Arsenic	10/22/2013	<1	µg/L	No
Barium	10/22/2013	8.2	µg/L	No
Boron	10/22/2013	<2	µg/L	No
Cadmium	10/22/2013	<0.1	µg/L	No
Chromium	10/22/2013	<1	µg/L	No
Lead-see results below				
Mercury	10/22/2013	<0.1	µg/L	No
Selenium	10/22/2013	<1	µg/L	No
Sodium	10/22/2013	14.9	mg/L	Yes
Uranium	10/22/2013	<1	µg/L	No
Fluoride	10/22/2013	<0.1	mg/L	No
Nitrite	01/15/2013	<0.05	mg/L	No
Nitrate	01/15/2013	0.14	mg/L	No
Nitrite	04/02/2013	<0.05	mg/L	No
Nitrate	04/02/2013	0.86	mg/L	No
Nitrite	07/10/2013	<0.05	mg/L	No
Nitrate	07/10/2013	0.19	mg/L	No
Nitrite	10/08/2013	<0.05	mg/L	No
Nitrate	10/08/2013	<0.1	mg/L	No

**Summary of Lead Results during this reporting period (Winter: Dec. 15/12-April 15/13; Summer: June 15-Oct. 15/13)**

Sampling Period	Range of Results (µg/L) from Residential Samples (# of Samples taken)	Non-residential locations	Distribution System	Any Adverse Water Quality Incidents?
Winter	No samples required	n/a	<1-1.26 (2)	No
Summer	No samples required	n/a	0.14-0.42 (2)	No

**Summary of Organic parameters tested during this reporting period or the most recent sample results**

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
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Summary of Organic parameters tested during this reporting period or the most recent sample results				
Alachlor	10/22/2013	ND	µg/L	NO
Aldicarb	10/22/2013	ND	µg/L	NO
Aldrin + Dieldrin	10/22/2013	ND	µg/L	NO
Atrazine + N-dealkylated metabolites	10/22/2013	ND	µg/L	NO
Azinphos-methyl	10/22/2013	ND	µg/L	NO
Bendiocarb	10/22/2013	ND	µg/L	NO
Benzene	10/22/2013	ND	µg/L	NO
Benzo(a)pyrene	10/22/2013	ND	µg/L	NO
Bromoxynil	10/22/2013	ND	µg/L	NO
Carbaryl	10/22/2013	ND	µg/L	NO
Carbofuran	10/22/2013	ND	µg/L	NO
Carbon Tetrachloride	10/22/2013	ND	µg/L	NO
Chlordane (Total)	10/22/2013	ND	µg/L	NO
Chlorpyrifos	10/22/2013	ND	µg/L	NO
Cyanazine	10/22/2013	ND	µg/L	NO
Diazinon	10/22/2013	ND	µg/L	NO
Dicamba	10/22/2013	ND	µg/L	NO
1,2-Dichlorobenzene	10/22/2013	ND	µg/L	NO
1,4-Dichlorobenzene	10/22/2013	ND	µg/L	NO
Dichlorodiphenyltrichloroethane (DDT) + metabolites	10/22/2013	ND	µg/L	NO
1,2-Dichloroethane	10/22/2013	ND	µg/L	NO
1,1-Dichloroethylene (vinylidene chloride)	10/22/2013	ND	µg/L	NO
Dichloromethane	10/22/2013	ND	µg/L	NO
2,4-Dichlorophenol	10/22/2013	ND	µg/L	NO
2,4-Dichlorophenoxy acetic acid (2,4-D)	10/22/2013	ND	µg/L	NO
Diclofop-methyl	10/22/2013	ND	µg/L	NO
Dimethoate	10/22/2013	ND	µg/L	NO
Dinoseb	10/22/2013	ND	µg/L	NO
Diquat	10/22/2013	ND	µg/L	NO
Diuron	10/22/2013	ND	µg/L	NO
Glyphosate	10/22/2013	ND	µg/L	NO
Heptachlor + Heptachlor Epoxide	10/22/2013	ND	µg/L	NO
Lindane (Total)	10/22/2013	ND	µg/L	NO
Malathion	10/22/2013	ND	µg/L	NO
Methoxychlor	10/22/2013	ND	µg/L	NO
Metolachlor	10/22/2013	ND	µg/L	NO
Metribuzin	10/22/2013	ND	µg/L	NO
Monochlorobenzene	10/22/2013	ND	µg/L	NO
Paraquat	10/22/2013	ND	µg/L	NO
Parathion	10/22/2013	ND	µg/L	NO
Pentachlorophenol	10/22/2013	ND	µg/L	NO
Phorate	10/22/2013	ND	µg/L	NO

**Summary of Organic parameters tested during this reporting period or the most recent sample results**

Picloram	10/22/2013	ND	µg/L	NO
Polychlorinated Biphenyls(PCB)	10/22/2013	ND	µg/L	NO
Prometryn	10/22/2013	ND	µg/L	NO
Simazine	10/22/2013	ND	µg/L	NO
THM (NOTE: show latest annual average)	Q1-Q4 2013	129.4	µg/L	YES
Temephos	10/22/2013	ND	µg/L	NO
Terbufos	10/22/2013	ND	µg/L	NO
Tetrachloroethylene	10/22/2013	ND	µg/L	NO
2,3,4,6-Tetrachlorophenol	10/22/2013	ND	µg/L	NO
Triallate	10/22/2013	ND	µg/L	NO
Trichloroethylene	10/22/2013	ND	µg/L	NO
2,4,6-Trichlorophenol	10/22/2013	ND	µg/L	NO
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	10/22/2013	ND	µg/L	NO
Trifluralin	10/22/2013	ND	µg/L	NO
Vinyl Chloride	10/22/2013	ND	µg/L	NO

ND=Non-detect (below measurable limit)

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

Parameter	Sample Date	Result Value	Unit of Measure	ODWS Criteria
Total THMs (annual avg.)	2013 (Q1-Q4)	129.4	µg/L	100

## Part 2 – SUMMARY REPORT (as required by O. Reg. 170/03, Schedule 22)

### Non-Compliance with Legislations, Regulations, Approvals & Orders

During this period, the Facility was operated in full compliance with the Act, the regulations and the Facility's approval, save and except for the following:

- 1) **There was not sufficient monitoring of flow as required by the Permit and Licence or Approval issued under Part V of the SDWA**  
**Actions Required:** The owner and operating authority must ensure compliance with Condition 2.0 of Schedule C to Licence No. 232-101  
**Action Taken:** A contingency plan was created to procure and install replacement critical equipment in a timely manner
  
- 2) **The owner did not have evidence indicating that all chemicals and materials that come in contact with water within the drinking water system met the AWWA and ANSI standards in accordance with the Permit and Licence issued under Part V of the SDWA**  
**Actions Required:** Ensure that chemicals used in the operation of a drinking water system that come into contact with water within the system shall meet all applicable standards  
**Actions Taken:** The operating authority requested and obtained Director authorization to continue using the current brand of sodium hydroxide at the Moosonee WTP
  
- 3) **All continuous monitoring equipment utilized for sampling and testing required by O. Reg. 170/03, or approval or order, were not equipped with alarms or shut-off mechanisms that satisfied standards described in Schedule 6**  
**Actions Required:** Provide a written action plan with timelines that ensure the audible alarm requirements or shutdown requirements of subsection 6-5(1)5 or 6-5(1.1) of Schedule 6 to O. Reg. 170/03 are met  
**Actions Taken:** An action plan was put in place to install alarm phones in the WTP
  
- 4) **Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was not performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and/or was not recording data with the prescribed format**  
**Actions Required:** The owner and operating authority must ensure compliance with continuous monitoring requirements of Subsections 6-5(1)1 and 2 of Schedule 6 to O. Reg. 170/03. A contingency plan must be created to ensure that all continuous data will be recorded during computer maintenance and equipment replacement activities  
**Actions Taken:** A contingency plan was created that includes a Standard Operating Procedure that describes when and how often grab samples of free chlorine residuals are required to be taken when data recording devices are undergoing replacement, maintenance or repair

System Capability Assessment			
Comparison of Flow Rates (m <sup>3</sup> /d):			
Month	Average Flow	Maximum Flow	Max Instantaneous flow (L/s)
January	785	886	12.6
February	893	1003	13.4
March	844	962	12.9
April	923	1159	15.7
May	824	1137	21.9
June	719	978	22.3
July	682	1002	20.1

August	662	939	15.9
September	656	755	11.7
October	641	826	13.3
November	695	973	16.2
December	703	823	15.3
<b>AVERAGE</b>	751	n/a	n/a
<b>MAXIMUM</b>	923	1159	22.3
<b>SYSTEM CAPACITY</b>	2998	2998	34.7 L/s
<b>% CAPACITY</b>	25.1%	38.7%	n/a