The Corporation of the
Municipality of Wawa

Wawa Drinking Water System

ANNUAL AND SUMMARY REPORTS FOR 2015

Prepared by:

Water & Sewer Department
Infrastructure Services

February 2016

Wawa Drinking Water System

ANNUAL AND SUMMARY REPORTS 2015

Prepared for:
The Corporation of the Municipality of Wawa

Prepared by:
Water & Sewer Department
Infrastructure Services

February 2016

SIGNATURE PAGE

Wawa Drinking
Water System Annual and Summary
Reports 2015

Prepared by: **Municipality of Wawa**
Infrastructure Services
Water & Sewer Department

Mark McRae - Water and Wastewater Lead Hand **Date**

Marc Liard - Water and Wastewater Operator

Gary Mercier - Water and Wastewater Operator

Received and Reviewed on behalf of
The Corporation of the Municipality of Wawa

James Neufeld, Director **Date**
Infrastructure Services

Presented to Council: March 1, 2016
Date

Presentation Confirmed by Resolution **RC16048**

Wawa Drinking Water System
Annual and Summary Report for 2015

Table of Contents

Signature Page ..... (i)
Table of Content 1
Appendices 1

1.0 Introduction

1.1 Requirements of the Summary Report 3
1.2 Background 3
1.3 Facility Specifics 4
1.4 Format 4

2.0 System Requirements

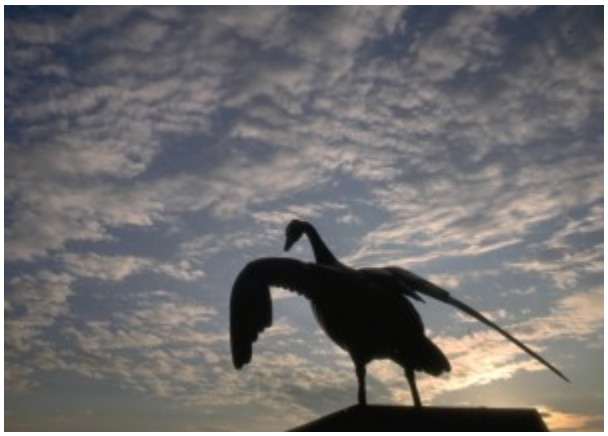
2.1 The Act and Regulations
2.1.1 General 4
2.1.2 Municipal Drinking Water license 4
2.1.3 Drinking Water Works Permit 4
2.1.4 Permit to Take Water 4
2.1.5 M.O.E.C.C. Inspection Report dated October 08, 2015 5
2.1.6 Drinking Water Quality Management Standard 5

2.2 Operational Checks, Sampling and Testing
2.2.1 Continuous Monitoring Equipment 6
2.2.2 Free Chlorine Residual 6
2.2.3 Turbidity 6
2.2.4 Fluoride 7
2.2.5 Table – Annual Summary of Operational Checks for 2015 7
2.2.6 Microbiological Sampling and Testing 8
2.2.7 Chemical Testing 8
2.2.8 Table - Summary of lead testing under Schedule 15.1 9

3.0 System Performance 10

3.1 Table of Water Quantities Taken 10
3.2 Table of Annual Summary of Flow for 2015 11

Appendix A Wawa Drinking Water System Inspection report dated October 08, 2015
Appendix B Wawa Drinking Water System 2015 Annual Report
Appendix C Drinking Water Advisory dated November 26, 2014
Appendix D The Municipality of Wawa THM Action



Summary Report for the

Municipality 2015

As required by

Schedule 22 of Ontario Regulation 170/03

1.0 Introduction

1.1 Requirements of the Summary Report

The 2015 Summary Report for the Municipality of Wawa Drinking Water System is being submitted to satisfy Schedule 22 of the Ontario Regulation 170/03, the requirement to prepare and distribute a summary report of water quality. As per Ontario Regulation 170/03, the summary report must contain the following information:

- List the requirements of the Safe Water Drinking Act, the corresponding regulations, the system's approval, drinking water works permit, municipal drinking water license, any orders applicable to the system that were not met at any time during the period of January 01 to December 31, 2015, and specify the duration of any non-compliant situations;
- For each period of non-compliance, describe the measures and corrective actions taken to restore the system's integrity;
- Provide a summary of the quantities and flow rates of the water supplied during the period of January 01 to December 31, 2015, including maximum daily flows, instantaneous peak flows and monthly average flows;
- A comparison of the summary to the rated capacity and flow rates approved in the system's approval, drinking water works permit or municipal drinking water license.

1.2 Background

The Wawa water supply system serves the Community of Wawa – sometimes referred to as the Wawa Townsite and the Michipicoten River Village – which are located within the Municipality of Wawa, District of Algoma. The facility is owned, maintained and operated by The Corporation of the Municipality of Wawa and serves approximately **3000** people. There are no major industrial users in the community.

The Wawa Water Treatment Plant, located at 40C Broadway Avenue, at the north-east corner of Ganley Street and McKinley Avenue, was constructed in accordance with Certificate of Approval **7008-648JTL** from the Ministry of the Environment and remedied the deficiencies of the original plant. This certificate has since been amended as noted in Section 2.1.2. It includes low lift pumping station, a membrane filtration system, and disinfection utilizing sodium hypochlorite, fluoridation using hydrofluosilicic acid, chlorine contact cells, treated water storage, high lift pumping and a standby generator. The water treatment plant has a rated capacity of **7880 m^3/day.**

1.3 Facility Specific

i. The Wawa Water Treatment Plant is a Class II Plant. This type of facility requires the Overall Responsible Operator (ORO) have a Class II Operator License. In our situation, the Water and Wastewater Lead Hand possess a Class II Water Treatment License and a Class II Water Distribution License and he is the Designated ORO.

ii. Maximum rate of Raw Water Taking: 25000 m^3/day

iii. Waterworks Number: 210000050

1.4 Format

Chapter 2 of this report deals with the performance of the system and compliance with the requirements of the Act, Regulations, the system's approval, drinking water works permit, municipal drinking water license and any orders applicable to the system that were not met at any time during the period covered by the report.

Chapter 3 presents conclusions of the performance of the system.

2.0 SYSTEM REQUIREMENTS

2.1 The Act and Regulations

2.1.1 General:

The system was in compliance with the Act and Regulations during 2015, according to the "M.O.E.C.C. Inspection Report". The inspection report identified no items requiring correction.

2.1.2 Municipal Drinking Water License:

MUNICIPAL DRINKING WATER LICENCE, License Number: 231-101, Issued August 04, 2011

2.1.3 Drinking Water Works Permit:

DRINKING WATER WORKS PERMIT, Permit Number: 231-201, Issued August 03, 2011

2.1.4 Permit to take Water:

The new Permit to Take Water (PTTW) # 8801-A3ZKAL, which renews, and replaces PTTW #1086-88UQXZ, was issued to The Corporation of The Municipality of Wawa on November 24, 2015.

2.1.5 M.O.E.C.C. Inspection Report dated October 08, 2015:

The Ministry of the Environment and Climate Change carried out an inspection of the Wawa Water System on October 08, 2015, inspection number: 1-C2NG9. This inspection, by Ministry Inspector Stephen Rouleau, is conducted annually or more often as required and can be either announced, in which the operators have advanced notification of the inspection, or unannounced, wherein no notice is given. The report was submitted to the Municipality of Wawa on February 18, 2015.

The Inspection Report, which follows a structured format, outlines the design, operating requirements and observations of the Inspector, along with recommendations and orders, where required. Additional items are identified as ***"Best Practices"*** and serve as guidance for the Municipality and the Operators. The report is attached as ***Appendix A***.

There was no ***Non-Compliance with regulatory requirements and action required.***

2.1.6 Drinking Water Quality Management Standard (DWQMS):

"The Drinking Water Quality management System "***(DWQMS)*** is a 'Made in Ontario' management standard developed specially by the drinking water sector for municipal residential drinking water systems. It is also a tool for owners and operators of a drinking system to help ensure that consistent processes and procedures are in place to manage production and delivery of high quality drinking water.

The development and implementation of the Municipal Drinking Water Licensing Program is based on **Justice O'Connor's** recommendations in the **Walkerton Inquiry Report**. ***A municipal drinking water license is an approval that is issued by the Ministry of the Environment to owners under the Safe Drinking Water Act, 2002 (SDWA) for the operation of municipal residential drinking water systems.***

The Municipality of Wawa Drinking Water System received their **Certificate of Accreditation for a Full Scope of the Drinking Water Quality Management System** (DWQMS) on December 17, 2013.

2.2 Operational Checks, Sampling and Testing

2.2.1 Continuous Monitoring Equipment:

In Accordance with the Certificate of Approval, the Wawa Water Treatment Plant is equipped with continuous monitoring equipment to sample and test for free chlorine residual, turbidity and fluoride concentration in the water leaving the plant. In addition, these parameters and others such as PH are measured at critical points in the treatment sequence to assist with operational decision making. All of the data is transmitted to and archived in a **SCADA *(Supervisory Control and Data Acquisition)*** computer in the main control room. The **SCADA** system analyzes and archives the data and generates daily, monthly and yearly reports. Operational set points are programmed into the **SCADA** system which triggers an auto dialer if an alarm condition occurs. The auto dialer notifies operational personnel of any potential problems.

2.2.2 Free Chlorine Residual:

At the Wawa Water Treatment Plant, free chlorine residual is monitored continuously and recorded every second going into the chlorine contact chambers. This is consistent with the requirements in *Schedule 7 of Regulation 170/03* that indicated that**…"sampling and testing for free chlorine residual is carried out by continuous monitoring equipment in the treatment process at or near a location where the intended contact time has just been completed in accordance with the Ministry's *Procedure for Disinfection of Drinking Water in Ontario."***

Chlorine residual readings of the water entering the clear wells for the year was averaged at 1.12 mg/l and for water being pumped to the distribution system was averaged at of 0.89 mg/l. Refer to ***Table 2.2.5*** on page 7 for the minimum and maximum.

2.2.3 Turbidity:

At the Wawa Water Treatment Plant, turbidity is continuously monitored in the effluent from each of the three membrane filter skids and recorded every second, consistent with *Regulation 170/03*. From January 01, 2015 to December 31, 2015 the average turbidity from all three skids was 0.01 Nephelometric Turbidity Units (N.T.U.).

The Ministry's *Procedure for Disinfection of Drinking Water in Ontario* further requires that filtered water turbidity from membrane filtration processes be less than or equal to 0.10 NTU in 95% of the measurements each month in order to *claim 2.0 + log cryptosporidium removal credit*. Information from the operations at the plant indicates that this condition was met.

The turbidity for the water being pumped to distribution is also monitored and recorded every second. From January 01, 2015 to December 31, 2015, the average was 0.03 NTU. Refer to ***Table 2.2.5*** below for the minimum and maximum.

2.2.4 Fluoride:

At the Wawa Water Treatment Plant, fluoride is continuously monitored in the discharge from the high lift pumps and recorded at one second intervals. The average of the concentration recorded for the period of January 01, 2015 to December 31, 2015 was 0.59 mg/l. However, Regulation 170/03 (Schedule 7, sub.7.4) only requires fluoride testing once every day.

As per ***Ontario regulation 169/03 for Ontario Drinking Water Quality Standards*** the ***Maximum Allowable Concentration*** for fluoride is **1.5 mg/l** for system that provide fluoridation, and if you have an exceedance of the ***Maximum Allowable Concentration***, it is to be treated as an indicator of adverse water quality and must be reported to the proper authorities. There were no fluoride adverse incidents. Refer to *Table 2.2.5* below for the minimum and maximum**.**

Table 2.2.5

Annual Summary of Operational Checks for 2015

	Number of Samples	Maximum	Average	Minimum
Free Chlorine Residual Entering "CT" chamber	Online Analyzer (sample every second)	5.02 mg/l	1.12 mg/l	0.00 mg/l
Free Chlorine Residual Pumped to the Distribution System	Online Analyzer (sample every second)	5.01 mg/l	0.89 mg/l	0.00 mg/l
Turbidity Effluent from each of the Three Membrane filter Skids	Online Analyzer (sample every second)	0.611 ntu	0.01 ntu	0.00 ntu
Fluoride residual pumped to the distribution System	Online Analyzer (sample every second)	1.44 mg/l	0.59 mg/l	0.00 mg/l
Turbidity Readings pumped to the distribution System	Online Analyzer (sample every second)	10.06 ntu	0.03 mg/l	0.00 mg/l

Note: The minimum and maximum residual do not show true because when performing routine maintenance on analyzers, turning power off – and back on the analyzers will get "spikes" in the reading. After maintenance we will do a few grab samples to calibrate unit. This has been discussed and accepted by the Ministry of the Environment and Climate Change in the past.

2.2.6 Microbiological Sampling and Testing:

The Regulation requires that;

a) In the distribution system, a minimum of twelve samples must be taken monthly and tested for:

- Escherichia Coli or E-Coli;
- Total Coliforms; and,
- Heterotrophic Plate Count (HPC) (25% of the samples tested for this).

At least one of these samples must be taken every week.

b) Treated water samples at the Wawa Water Treatment Plant are to be taken at least once every week and tested for:

- E-Coli or Fecal Coliform;
- Total Coliforms; and,
- Heterotrophic Count.

c) Raw water samples at the Water Treatment Plant are to be taken at least once every week and tested for:

- Escherichia Coli or E-Coli; and,
- Total Coliform.

Testing has conformed to the requirements of Regulation 170/03.

2.2.7 Chemical Testing:

In accordance with *Ontario Regulation 170/03, Schedule 13 – Chemical Sampling and Testing*, for **Large Municipal Residential System** with surface water supply, the following testing is to be performed:

Annual Testing for

- Schedule 23 – Inorganic parameters;
- Schedule 24 – Organic parameters ; and,
- Lead – new mandatory testing since December 2007 – of testing for lead in the distribution system and into household plumbing. Refer to ***Table 2.2.8*** on the following page for results from the 2015 lead sampling in the Municipality.

Table 2.2.8

Summary of lead testing under Schedule 15 1 during this reporting period

Location Type	Number of Samples	Range of Lead Results (min#) – (max #)	Number of Exceedances
Plumbing	0		0
Distribution	4	<1.0 – 4.8	0

Note: As per the Amended Reg.170/03 (Drinking Water System) made under the Safe Drinking Water Act, 2002, the Community Lead Testing Program (Schedule 15.1) ***The Municipality of Wawa is now exempt from plumbing sampling for lead. As per Drinking Water System Regulation 170/03, made under the Safe Drinking water Act 2002, schedule 15.1-4 subsection 10.***

Quarterly Testing for

- Trihalomethanes (THM) ; and,
- Nitrates and Nitrites.

Every 60 Months for

- Sodium

A review of the Municipality's records confirmed that all testing was performed as required during this reporting period. All laboratory results were satisfactory.

In 2014, the annual average for THM's in Wawa was 112.9 ug/l and it exceeded the current allowable level of 100 ug/l. This does pose any short-term or acute health risk but the Algoma Public Health Unit issued a drinking water advisory for the whole Municipality on November 26, 2014 (see Appendix C).

The Municipality worked on reducing the THM's in the drinking water system throughout 2015. See Appendix D for the THM Action Plan. As a result of the effort taken by the Municipality, the THM's were reduced to 98.6 ug/l as of October 22, 2015. The Algoma Public Health Unit has not lifted their drinking water advisory.

(Trihalomethanes are formed as a by-product predominantly when chlorine is used to disinfect water for drinking. They represent one group of chemicals generally referred to as disinfection by-products. They result from the reaction of chlorine or bromine with organic matter present in the water being treated.)

In addition, the Municipality of Wawa was selected years ago by the Ministry of Environment and Climate Change to participate in a Drinking Water Surveillance Program (DWSP). This program is voluntary and no cost to the Municipality. Samples are routinely taken and sent to the M.O.E.C.C. lab in Etobicoke, Ontario for analysis. The operators in Wawa find it to be another avenue for monitoring water quality for the Municipality.

3.0 SYSTEM PERFORMANCE

At the Wawa Water Treatment Plant, flow is monitored continuously in the discharge to the distribution system and recorded on the **SCADA** system. Daily reports are generated that indicate the average, minimum, maximum and total monthly and yearly flow. Below are the charts for Water Quantities Taken and Summary of Flows.

3.1 Table of Water Quantities Taken

Water Quantities Taken - 2015

Maximum Daily Volume in m^3/day

	Wawa Water Treatment Plant Rate of Raw water Taking		**Wawa Water Treatment Finished Water to Distribution**
Maximum Daily Volume Allowed	25000.00 m^3/day		7880 m^3/day
January	4267.5		2582.7
February	4861.3		3408.3
March	4864.1		2958.7
April	4863.5		2910.8
May	4652.0		2563.4
June	3593.6		2026.8
July	3626.9		2049.9
August	3559.8		1997.4
September	3356.6		2058.0
October	3959.2		2103.9
November	3760.1		2159.0
December	3911.2		2448.2
Highest % of Maximum Volume	**19.4 %**		**43.2 %**

3.2 Table of Annual Summary of Flow for 2015

Water Total / Average / Peak Flows - 2015

Month	Total Consumption m^3	Average Daily Flow m^3/day	Maximum Daily Flow m^3/day	Instantaneous Peak Flow (L/s)	Wawa Monthly Consumption m^3	Net MRV Monthly Consumption m^3
January	76341.0	2559.39	2582.7	75.8	73744.54	2596.46
February	73246.8	2615.95	3408.3	96.5	70821.91	2424.89
March	88580.8	2952.69	2958.7	86.0	83931.34	4649.46
April	82869.0	2762.3	2910.8	158.0	78521.88	4347.12
May	66402.4	2142.0	2593.4	94.7	63571.25	2831.15
June	56223.2	1874.11	2026.8	99.0	53587.92	2635.28
July	57498.7	1854.80	2049.9	82.3	55130.01	2368.69
August	57811.4	1864.88	1997.4	79.1	55124.48	2686.92
September	55263.5	1842.11	2058.0	93.4	50807.37	4456.13
October	56222.5	1813.60	2103.9	88.0	53451.38	2771.12
November	59110.9	1970.30	2159.0	93.0	56572.11	2538.79
December	66272.2	2137.80	2448.2	87.0	63791.33	2480.87

		Average flow for 2015 m^3	Maximum flow for 2015 m^3	Peak flow for 2015 l/s	Wawa Consumption 2015 m^3	M.R.V. Consumption 2015 m^3
Totals	**795842.4**	**2199.16**	**3408.3**	**158.0**	**759055.52**	**36786.88**

The Wawa Water Treatment Plant has an approved, rated treatment capacity of 7880 m^3/day which includes an allowance of 392 m^3/day to serve Michipicoten River Village.

The maximum day flow in 2015 was 3408.3 m^3/day, which is approximately 43.2% of the total rated capacity and 45.5 % of the rated capacity if the amount for Michipicoten River Village is excluded.

In 2015, the Maximum recorded instantaneous flow rate was 158.0 l/s that occurred during the month of April.

APPENDIX A

Wawa Drinking Water System

Inspection Report dated

October 08, 2015

Ministry of the Environment and Climate Change

Sault Ste. Marie Area Office
70 Foster Drive, Suite 110
Sault Ste. Marie ON P6A 1W7
Tel.: 705 942-6354
Fax: 705 942-6327
Toll Free: 1-800-965 -9990

Ministère de l'Environnement et de l'Action en matière de changement climatique

Bureau du secteur de Sault Ste. Marie
70, promenade Foster, Bureau 110
Sault Ste. Marie ON P6A 6V4
Tél. : 705 942-6354
Téléc. : 705 942-6327
Sans frais : 1-800-965-9990

Ontario

email only

February 18, 2016

James Neufeld, Director of Infrastructure Services
Municipality of Wawa
40 Broadway Avenue
P.O. Box 500
Wawa, ON P0S 1K0

Drinking Water System Inspection 2015-2016

The Ministry of the Environment and Climate Change recently conducted an inspection at the Wawa Water Treatment Plant and of the sampling and operational data available. Please find a copy of the resulting report attached.

The inspection found that the plant operators were operating the facility in accordance with the Safe Drinking Act and associated regulations and policies.

Several recent changes in operations were seen as making significant improvements to the systems operations. These included improved communications, enhanced control of the fluoride system, tower improvements actions/plans to reduce THM production, lessen ice formation, and to prevent environmental damage during draining/flushing, submission of an informative/sound THM reduction and sampling plan, and the work to replace the control valve and booster pump for the Pinewood Drive zone.

A review of the Trihalomethane (THM) data indicates that for the last four quarters the running average was below Ontario's drinking water standard of 100 ug/l. However, several samples collected in 2015 from the distribution system were found to contain over 100 ug/l. It is our understanding that the Drinking Water Advisory issued November 26, 2014 by Algoma Public Health currently remains in place.

Please note that there have been several recent regulatory changes in the sampling methods, parameters and/or reporting measures required for drinking water monitoring, including THMs. A copy of the MOECC notice is included with the Drinking Water Report.

It is recommended that a meeting be scheduled to discuss the current/future THM reduction and monitoring plans. If you have any questions regarding the attached report or the recent changes please contact me at any time

Yours truly,

Stephen Rouleau, Senior Environmental Officer
Water Inspection Program
email: stephen.rouleau@ontario.ca

cc: Chris Wray, Wawa
Marnie Managhan, MOECC
Sheri Cleaves, APH

Ontario

Ministry of the Environment and Climate Change

WAWA DRINKING WATER SYSTEM

Inspection Report

Site Number:	210000050
Inspection Number:	1-C2NG9
Date of Inspection:	Oct 08, 2015
Inspected By:	Stephen Rouleau

TABLE OF CONTENTS

OWNER INFORMATION..... 02
CONTACT INFORMATION..... 02
INSPECTION DETAILS..... 02
DWS COMPONENTS DESCRIPTION..... 03
INSPECTION SUMMARY..... 05
INTRODUCTION..... 05
TREATMENT PROCESSES..... 05
OPERATIONS MANUALS 07
LOGBOOKS 07
SECURITY..... 07
CERTIFICATION AND TRAINING..... 07
WATER QUALITY MONITORING..... 07
WATER QUALITY ASSESSMENT..... 08
REPORTING & CORRECTIVE ACTIONS..... 08
NON COMPLIANCE WITH REGULATORY REQUIREMENTS & ACTIONS REQUIRED..... 09
SUMMARY OF BEST PRACTICE ISSUES & RECOMMENDATIONS.. 10
SIGNATURES..... 12

APPENDICES

APPENDIX A REGULATORY AMENDMENTS BULLETIN
APPENDIX B INSPECTION RATING RECORD

OWNER INFORMATION:

Company Name:	WAWA, THE CORPORATION OF THE MUNICIPALITY OF		
Street Number:	40	**Unit Identifier:**	
Street Name:	BROADWAY Ave		
City:	WAWA		
Province:	ON	**Postal Code:**	P0S 1K0

CONTACT INFORMATION

Type:	Owner	**Name:**	Chris Wray
Phone:	(705) 856-2244	**Fax:**	
Email:	cwray@wawa.ca		
Title:	CAO/Clerk-Treasurer		

Type:	Owner	**Name:**	James Neufeld
Phone:	(705) 856-2244	**Fax:**	
Email:	jneufeld@wawa.ca		
Title:	Director of Infrastructure Services		

Type:	Other - specify	**Name:**	Peluch John
Phone:	(705) 856-4703	**Fax:**	
Email:	john.peluch@ontario.ca		
Title:	District Manager - MNR		

Type:	Other - specify	**Name:**	Jonathon Bouma
Phone:	(705) 759-5286	**Fax:**	
Email:	jbouma@algomapublichealth.com		
Title:	Manager - Algoma Public Health		

INSPECTION DETAILS:

Site Name:	WAWA DRINKING WATER SYSTEM
Site Address:	40 BROADWAY AVE WAWA P0S 1K0
County/District:	Michipicoten
MOECC District/Area Office:	Sault Ste. Marie Area Office
Health Unit:	ALGOMA PUBLIC HEALTH
Conservation Authority	N/A
MNR Office:	N/A
Category:	Large Municipal Residential

Site Number: 210000050
Inspection Type: Announced
Inspection Number: 1-C2NG9
Date of Inspection: Oct 08, 2015
Date of Previous Inspection:

COMPONENTS DESCRIPTION

Site (Name): MOE DWS Mapping
Type: DWS Mapping Point **Sub Type:**
Comments:
Not Applicable

Site (Name): SYSTEM CLASSIFICATION
Type: **Sub Type:**
Comments:
The Municipality of Wawa is comprised of the Town of Wawa and Michipicoten River Village, with a population of approximately 3,200. The water treatment and distribution systems are owned and operated by the Municipality of Wawa. The water treatment system is a Class 2 WT subsystem, and the distribution system is a Class 1 WD subsystem. The treatment plant is rated at a capacity of 7,800 m3/d.

Site (Name): RAW WATER, WAWA LAKE
Type: Source **Sub Type:** Surface
Comments:
The intake for the water supply is located approximately 144 m offshore in Wawa Lake, at a depth of 10.7 m below low water level. The intake is housed in a timber crib structure, equipped with coarse screens. The 623 mm I.D. cast iron pipe discharges by gravity to a wet well at the low lift pumphouse. Three 45.6 L/s VFD pumps are used to supply raw water to the treatment plant. A line from the treatment plant provides sodium hypochlorite to the low lift discharge header for pre-chlorination, if required.

Site (Name): TREATED WATER
Type: **Sub Type:** Pumphouse
Comments:
The water treatment plant was constructed in 2006 and is a membrane filtration process. Raw water is pumped from the low lift station to a common header which feeds three Pall membrane systems, each consisting of a feed and backwash tank, feed/recirculation and reverse filtrate pump, 0.4 mm strainer, and 24 cartridge membrane rack. Filtered water is discharged to a contact tank where chlorine is injected to provide the necessary disinfection CT, and then to an under-floor reservoir prior to discharge to the distribution system. Sodium hypochlorite is used for pre-chlorination, primary and secondary disinfection, and membrane cleaning. Hydrofluosilicic acid is also added to the filtered water for dental health protection. Residue from the filter backwash and acid cleaning can be discharged to the municipal sanitary sewer system or to the storm sewer system (if it meets the discharge criteria).

Continuous analyzers are in place for turbidity, chlorine residual and fluoride monitoring. Flow meters are used to monitor raw and treated flow as well as flow into each filter train.

Site (Name): DISTRIBUTION

Type:

Sub Type:

Comments:

The distribution system provides water for both domestic consumption and fire protection for the townsites of Wawa and Michipicoten River Village. Both communities are part of the Municipality of Wawa. There are approximately 1,350 service connections, and water consumption meters were installed in 2012. A new main was installed to connect Michipicoten River Village (MRV) to the Wawa system in November 2006. This line has pressure reducing valves located prior to connecting to a 455 m3 storage tower. Chlorination equipment is available at the tower for the purpose of triming the secondary disinfection as required. The wells and pump house for the old MRV system were decommissioned in 2007.

INSPECTION SUMMARY

INTRODUCTION

* The primary focus of this inspection is to confirm compliance with Ministry of the Environment and Climate Change (MOECC) legislation as well as evaluating conformance with ministry drinking water related policies and guidelines during the inspection period. The ministry utilizes a comprehensive, multi-barrier approach in the inspection of water systems that focuses on the source, treatment and distribution components as well as management practices.

This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O.Reg. 170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.

This report is based on a "focused" inspection of the system. Although the inspection involved fewer activities than those normally undertaken in a detailed inspection, it contained critical elements required to assess key compliance issues. This system was chosen for a focused inspection because the system's performance met the ministry's criteria, most importantly that there were no deficiencies as identified in O.Reg. 172/03 over the past 3 years. The undertaking of a focused inspection at this drinking water system does not ensure that a similar type of inspection will be conducted at any point in the future.

This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.

CAPACITY ASSESSMENT

* There was sufficient monitoring of flow as required by the Permit and Licence or Approval issued under Part V of the SDWA

* The owner was in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the Permit and Licence or Approval issued under Part V of the SDWA.

TREATMENT PROCESSES

* The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit.

* The owner/operating authority was in compliance with the requirement to prepare Form 1 documents as required by their Drinking Water Works Permit during the inspection period.

* The owner/operating authority was in compliance with the requirement to prepare Form 2 documents as required by their Drinking Water Works Permit during the inspection period.

TREATMENT PROCESSES

* The owner/operating authority was in compliance with the requirement to prepare Form 3 and associated documents as required by their Drinking Water Works Permit during the inspection period.

* Records indicated that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a Permit, Licence or Approval issued under Part V of the SDWA at all times that water was being supplied to consumers.

* Records confirmed that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/l free or 0.25 mg/l combined.

* The primary disinfection equipment was equipped with alarms or shut-off mechanisms that satisfied the standards described in Section 1-6 (1) of Schedule 1 of Ontario Regulation 170/03.

* The Operator-in-Charge had ensured that all equipment used in the processes was monitored, inspected, and evaluated.

TREATMENT PROCESS MONITORING

* Primary disinfection chlorine monitoring was being conducted at a location approved by Permit, Licence or Approval issued under Part V of the SDWA, or at/near a location where the intended CT had just been achieved.

* Continuous monitoring of each filter effluent line was being performed for turbidity.

* The secondary disinfectant residual was measured as required for the distribution system.

* Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test.

* All continuous monitoring equipment utilized for sampling and testing required by O. Reg. 170/03, or approval or order, were equipped with alarms or shut-off mechanisms that satisfied the standards described in Schedule 6.

* Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format.

TREATMENT PROCESS MONITORING

* **All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.**

  The MOECC would like to acknowledge the work done in 2015 to review the fluoride dosing system and procedures. Based on the information received several minor issues were identified and corrected as a result of this evaluation.

  Fluoride levels at the time of the inspection were on average being maintained within the therapeutic range (0.6 - 0.8 mg/L) recommended by Algoma Public Health and the Ontario Ministry of Health.

OPERATIONS MANUALS

* **The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.**

* **The operations and maintenance manuals did meet the requirements of the Permit and Licence or Approval issued under Part V of the SDWA.**

LOGBOOKS

* **Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.**

SECURITY

* **The owner had provided security measures to protect components of the drinking-water system.**

CERTIFICATION AND TRAINING

* **The overall responsible operator had been designated for each subsystem.**

* **Operators in charge had been designated for all subsystems which comprised the drinking-water system.**

* **Only certified operators made adjustments to the treatment equipment.**

WATER QUALITY MONITORING

* **All microbiological water quality monitoring requirements for distribution samples were being met.**

* **All microbiological water quality monitoring requirements for treated samples were being met.**

WATER QUALITY MONITORING

* **All inorganic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

* **All organic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

* **All trihalomethanes water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

  The Maximum Acceptable Concentration (MAC) for Trihalomethane in Ontario is a 100 ug/l limit based on as a running annual average of quarterly results. MACs are established for parameters which when present above a certain concentration, have known or suspected adverse health effects. The length of time the MAC can be exceeded without health effects will depend on the nature and concentration of the parameter. This limit can be found in Schedule 2 of Ontario Regulation 169/03 "Ontario Drinking Water Quality Standards" made under the Safe Drinking Water Act (SDWA).

  The running average exceeded 100 ug/l in the Wawa drinking water system as a result of a sample collected October 17, 2014. The municipality, Algoma Public Health and the MOECC have conducted regular meetings, collected additional samples and have reviewed both recent and historical data for possible causes or trends.

  Please note that as of January 1st, 2016 laboratories are no longer responsible for calculating a drinking water system's running annual average (RAA). The municipal Operating Authority will be responsible for calculating the RAA and reporting it to the MOECC. The method for calculating the RAA has also changed (a copy of the Regulatory Amendments Bulletin is attached to this report).

  The drinking water system Operating Authority will be required to calculate new RAA at the end of each quarter and notify existing authorities (MOECC and Algoma Public Health) of any adverse test results in writing within seven days of the end of every calendar quarter. Immediate contact with the existing authorities by telephone for an RAA over 100 ug/l is no longer required. Additionally as a result of the recent changes; resamples will not be required as part of the prescribed corrective actions for adverse results for THMs.

  A review of the data indicates that during the most recent four quarters (ending December 31, 2015) the running average was less then 100 ug/l. However, several individual test results during 2015 were above 100 ug/l.

* **All nitrate/nitrite water quality monitoring requirements prescribed by legislation were conducted within the required frequency for the DWS.**

* **All sodium water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

* **The required daily samples were being taken at the end of the fluoridation process.**

* **All water quality monitoring requirements imposed by the Permit and Licence or Approval issued under Part V of the SDWA were being met.**

* **All sampling requirements for lead prescribed by schedule 15.1 of O. Reg. 170/03 were being met.**

WATER QUALITY MONITORING

* Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.

WATER QUALITY ASSESSMENT

* Records show that all water sample results taken during the review period met the Ontario Drinking Water Quality Standards (O. Reg. 169/03).

REPORTING & CORRECTIVE ACTIONS

* Corrective actions (as per Schedule 17) had been taken to address adverse conditions, including any other steps that were directed by the Medical Officer of Health.

* Corrective actions as directed by the Medical Officer of Health had been taken by the owner and operating authority to address exceedances of the lead standard.

* All required notifications of adverse water quality incidents were immediately provided as per O. Reg. 170/03 16-6.

* All reporting requirements for lead sampling were complied with as per schedule 15.1-9 of O. Reg. 170/03.

* Where required continuous monitoring equipment used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person responded in a timely manner and took appropriate actions.

NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED

This section provides a summary of all non-compliance with regulatory requirements identified during the inspection period, as well as actions required to address these issues. Further details pertaining to these items can be found in the body of the inspection report.

Not Applicable

SUMMARY OF RECOMMENDATIONS AND BEST PRACTICE ISSUES

This section provides a summary of all recommendations and best practice issues identified during the inspection period. Details pertaining to these items can be found in the body of the inspection report. In the interest of continuous improvement in the interim, it is recommended that owners and operators develop an awareness of the following issues and consider measures to address them.

Not Applicable

SIGNATURES

Inspected By:

Stephen Rouleau

Signature: (Provincial Officer):

Reviewed & Approved By:

Marnie Managhan

Signature: (Supervisor):

Review & Approval Date: 02/22/2016

Note: This inspection does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they apply or may apply to this facility. It is, and remains, the responsibility of the owner and/or operating authority to ensure compliance with all applicable legislative and regulatory requirements.

APPENDIX A

REGULATORY AMENDMENTS BULLETIN

Regulatory Amendments
UPDATE Bulletin

Ministry of the Environment & Climate Change

Safe Drinking Water Branch

An update for Ontario Regulation 170/03 Systems

CHANGES TO O. REG 170/03 AND O. REG 169/03

Attention owners and operators of drinking water systems,

Upcoming changes to Ontario Drinking Water Quality Standards (OWDQS), and testing and reporting requirements found in Ontario Regulation 170/03 and 169/03 under the Safe Drinking Water may impact your drinking water system

Ontario is acting on internationally recognized scientific research and expert advice to align Ontario with current science and best practices.

To reduce the burden on drinking water system owners and operators, the changes will be phased-in over the next four years.

Effective January 1, 2016:

1. Removal of 13 pesticides from the standards and testing requirements

You will no longer need to test for 13 pesticides. These pesticides have not been detected in Ontario drinking water for at least 10 years and have been removed from the list of drinking water standards and the list of organic chemical testing requirements:

Aldicarb
Aldrin + Dieldrin
Bendiocarb
Chlordane (total)
Cyanazine
Dichlorodiphenyltrichloroethance (DDT) + metabolites
Dinoseb
Heptachlor + Heptachlor Epoxide
Lindane (total)
Methoxychlor
Parathion
Temephos
2,4,5 – Trichlorophenoxy acetic acid (2,4,5-T)

2. Addition of 2 methyl-4-chlorophenoxyacetic acid (MCPA)

You will need to include the test for MCPA when you are scheduled to test for Schedule 24 organic chemical parameters (once every one, three, or five years depending on your system and source).

Ontario

You need to submit a Laboratory Services Notification (LSN) form to the Ministry of the Environment and Climate Change (MOECC) to indicate the licensed laboratory that will be testing your MCPA samples. You must submit this form before your Schedule 24 sampling cycle date. Email the form to LSB.Reg170_LSB@ontario.ca.

If you are unable to get MCPA included with the rest of the Schedule 24 parameters by your normal sample date for the first test cycle following January 1, 2016, the MCPA test can still be carried out separately as long as it is done prior to the end of the first, third, or fifth calendar year, depending on your system and source.

Click here for a list of Ontario Licensed Laboratories.

3. New sampling, testing and reporting requirements for trihalomethanes (THMs)
a) Calculating and Reporting THM samples

Laboratories are no longer responsible for calculating a drinking water system's running annual average (RAA). You will be responsible for calculating the RAA and reporting it to the ministry.

You will be required to calculate a new RAA and notify existing authorities of any adverse test results within seven days of the end of every calendar quarter. You will no longer be required to make contact with existing authorities by telephone for a THM report.

Resamples will no longer be required as part of the prescribed corrective actions for adverse results for THMs because multiple test results are already used in calculating the THM RAA.

How to calculate the Running Annual Average (RRA) for THMs

Starting January 1, 2016, a new calculation method for THMs will come into effect. The Ontario standard for THMs is 0.100 mg/L, expressed as a RAA of quarterly testing results.

The quarters are defined as:

- January 1st to March 31st
- April 1st to June 30th
- July 1st to September 30th
- October 1st to December 31st

The **RAA of calendar quarterly results** for THM must be calculated each calendar quarter using the following formula:

$$[A+B+C+D] \div 4$$

"A" is the average of all* the results from the samples tested in that calendar quarter

"B" is the average of all* the results from the samples tested in the calendar quarter immediately after "A"

"C" is the average of all* the results from the samples tested in the calendar quarter immediately after "B"

"D" is the average of all*the results from the samples tested in the calendar quarter immediately after "C"

*If more than one test is taken in a quarter, the previous calculation **using only the highest THM sample result will be invalid**. All THM sample results must be used to determine the new average value for each calendar quarter.

b) Reduced THM sampling schedule for small systems

A reduced THM sampling schedule will be available to small municipal and non-municipal year round residential systems. If none of your system's THM sample results from the last 12 consecutive calendar quarters exceed half of the THM standard (0.100 mg/L), you will not need to submit THM samples for the next eight consecutive quarters.

Following eight consecutive quarters without sampling, THM samples must be submitted for four consecutive quarters to establish your reduced sampling schedule of every third year.

Once on the reduced schedule, if your system's treatment equipment, water chemistry, or water source changes at any time, contact the ministry to determine if you are still eligible..

Additional future changes:

January 1, 2017:

- New testing requirements for HAAs
- Updated standards for carbon tetrachloride, benzene, vinyl chloride, chlorate, chlorite and MCPA

January 1, 2018:

- Updated standard for arsenic

January 1, 2020:

- New standard for HAAs and reporting requirements along with an opportunity for reduced sampling of HAAs for smaller systems

For additional information please contact your local water inspector or the Public Information Centre.

We are committed to providing accessible customer service.

If you need accessible formats or communications supports, please contact us.

APPENDIX B

INSPECTION RATING REPORT

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2015-2016)

DWS Name:	WAWA DRINKING WATER SYSTEM
DWS Number:	210000050
DWS Owner:	Wawa, The Corporation Of The Municipality Of
Municipal Location:	Michipicoten
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Focused
Inspection Date:	October 8, 2015
Ministry Office:	Sault Ste. Marie Area Office

Maximum Question Rating: 555

Inspection Module	Non-Compliance Rating
Capacity Assessment	0 / 30
Treatment Processes	0 / 110
Operations Manuals	0 / 28
Logbooks	0 / 14
Certification and Training	0 / 28
Water Quality Monitoring	0 / 124
Reporting & Corrective Actions	0 / 88
Treatment Process Monitoring	0 / 133
TOTAL	**0 / 555**

Inspection Risk Rating	**0.00%**

FINAL INSPECTION RATING:	**100.00%**

Inspection Rating Record Generated On 22-FEB-16 (Inspection ID: 1-C2NG9).

Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2015-2016)

DWS Name:	WAWA DRINKING WATER SYSTEM
DWS Number:	210000050
DWS Owner:	Wawa, The Corporation Of The Municipality Of
Municipal Location:	Michipicoten
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Focused
Inspection Date:	October 8, 2015
Ministry Office:	Sault Ste. Marie Area Office

Maximum Question Rating: 555

Inspection Risk Rating	**0.00%**
FINAL INSPECTION RATING:	**100.00%**

Inspection Rating Record Generated On 22-FEB-16 (Inspection ID: 1-C2NG9).

APPENDIX B

Wawa

Drinking Water System

Waterworks # 210000050

Annual Report

2015

WAWA WATER SYSTEM 2015 ANNUAL REPORT

Drinking-Water System Number:	**210000050**
Drinking-Water System Name:	Wawa Water Supply System
Drinking-Water System Owner:	The Corporation of the Municipality of Wawa
Drinking-Water System Category:	Municipal Residential – Large
Period being reported:	01-01-15 to 31-12-15

Complete if your Category is Large Municipal Residential or Small Municipal Residential

Does your Drinking-Water System serve more than 10,000 people? Yes [ ] No [X]

Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No [ ]

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

Municipal Office
40 Broadway Avenue
Wawa, Ontario
P0S 1K0

Complete for all other Categories.

Number of Designated Facilities served:

N/A

Did you provide a copy of your annual report to all Designated Facilities you serve?
Yes [ ] No [X]

Number of Interested Authorities you report to: N/A

Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?
Yes [ ] No [X]

Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

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
- - - NONE - - -	

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?
Yes [ ] No [X]

Indicate how you notified system users that your annual report is available, and is free of charge.

[X] Public access/notice via the web
[ ] Public access/notice via Government Office
[X] Public access/notice via a newspaper
[X] Public access/notice via Public Request
[ ] Public access/notice via a Public Library
[ ] Public access/notice via other method _____

Describe your Drinking-Water System

Water Treatment Plant consisting of a membrane filtration process with the intake from Wawa Lake. Raw water is pumped through the membrane filters to an under floor reservoir where it is chlorinated. Sodium hypochlorite is used for pre-chlorination, primary and secondary disinfection, and membrane cleaning. Hydrofluorosilicic acid is added to filtered water before distribution. Residue from the filter backwash and acid cleaning can be discharged to the municipal sanitary sewer system or to the storm sewer system. Continuous analyzers are in place for turbidity, chlorine residual and fluoride monitoring. Flow meters are used to monitor raw water flow into each filter train and treated and chlorinated water entering the under floor reservoir.

A transmission main connects the Wawa water distribution system to the elevated water storage tank at the Michipicoten River Village, where "touch-up" chlorination facilities, using sodium hypochlorite, are installed.

List all water treatment chemicals used over this reporting period

- **Sodium hypochlorite**
- **Hydrofluorosilicic acid**

Were any significant expenses incurred to?

[X] Install required equipment
[ ] Repair required equipment
[X] Replace required equipment
[ ] Maintenance

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

WTP – replaced two mechanical seals on high lift pumps - $ 2,500.00

WTP – replaced SCADA computer and software - $ 25,000.00

WTP – replaced faulty controller in plant PLC - $ 8,000.00

Pinewood Drive – replaced faulty PRV (pressure reducing Valve) - $ 12,000.00

Booster Station – replaced faulty fire pump (for fire protection for Pinewood Drive) - $ 15,000.00

M.R.V.(Michipicoten River Village) – Purchased (not installed) PAX water mixers for the water storage tower - $ 26,000.00

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*	*Unit of Measure*	*Corrective Action*	*Corrective Action Date*
Oct.27, 2014	THM (Trihalomethanes) AWQI 121269	112.7 yearly average	Ug/l	Ongoing testing and flushing Running Annual Average as of Oct. 22, 2015 is 98.6	Oct.22, 2015
April 16, 2015	Lead Sample AWQI 123245	18.6	Ug/l	Flushed and resample	April 17, 2015
Aug.06, 2015	High Chlorine Spikes Leaving Water Plant Precautionary AWQI 125491	4.6	Mg/l	Replaced diaphragm kit and tubing on touch up chlorination pump and replaced injector (chlorine) for touch up chlorination. Did several chlorine tests around town and average was between 0.62 mg/l to 0.91 mg/l in the distribution system	Aug.19, 2015

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 Or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)	Number of HPC Samples	Range of HPC Results (min #)-(max #)
Raw	53	<1 - 60	<1 - 78	N/A	N/A
Treated	53	0 - 0	0 - 0	53	0 - 0
Distribution	212	Absent	Absent	61	0 - 3

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

Water Treatment Plant

	Number of Grab Samples	Minimum	Average	Maximum
Turbidity (NTU)	8760	0.00	0.03	10.06
Chlorine (mg/l)	8760	0.00	0.89	5.01
Fluoride (mg/l)	8760	0.00	0.59	1.44

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

**NOTE:Minimum andMaximum levels are caused by instrument spikes because of maintenance to the instruments.*

Distribution System

	Number of Samples	Minimum	Average	Maximum
Chlorine Residual (mg/l)	365	0.57	0.81	1.35

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
Certificate of Approval 7805-76ZKUC	Waste Water Suspended Solids	N/A	None	No Discharge
Certificate of Approval 7805-76ZKUC	Waste Water Chlorine Residual	N/A	None	No Discharge

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	Jan.27, 2015	<0.60	ug/l	No
Arsenic	Jan.27, 2015	1.1	ug/l	No
Barium	Jan.27, 2015	<10	ug/l	No
Boron	Jan.27, 2015	<50	ug/l	No
Cadmium	Jan.27, 2015	<0.10	ug/l	No
Chromium	Jan.27, 2015	<1.0	ug/l	No
*Lead		See below	ug/l	No
Mercury	Jan.27, 2015	<0.10	ug/l	No
Selenium	Jan.27, 2015	<1.0	ug/l	No
Sodium	Jan.27, 2015	6.14	mg/l	No
Uranium	Jan.27, 2015	<2.0	ug/l	No
Fluoride	Jan.27, 2015	0.08	mg/l	No
Nitrite	Jan.27, 2015	<0.010	mg/l	No
Nitrate	Jan.27, 2015	0.069	mg/l	No

*only for drinking water systems testing under Schedule 15.2; this includes large municipal non-residential systems, small municipal non-residential systems, non-municipal seasonal residential systems, large non-municipal non-residential systems, and small non-municipal non-residential systems

Summary of lead testing under Schedule 15.1 during this reporting period

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

Note: The Municipality of Wawa is now exempt from plumbing sampling for lead. As per Drinking water System Regulation 170/03 , made under the Safe Drinking water Act 2002, schedule 15.1-4 subsection 10.

Location Type	Number of Samples	Range of Lead Results (min#) – (max #)	Number of Exceedances
Plumbing	**0**		**0**
Distribution	**4**	**<1.0 – 4.8**	**0**

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	Jan.27, 2015	<0.10	ug/l	No
Aldicarb	Jan.27, 2015	<1.0	ug/l	No
Aldrin + Dieldrin	Jan.27, 2015	<0.040	ug/l	No
Atrazine + N-dealkylated metobolites	Jan.27, 2015	<0.20	ug/l	No
Azinphos-methyl	Jan.27, 2015	<0.10	ug/l	No
Bendiocarb	Jan.27, 2015	<0.20	ug/l	No
Benzene	Jan.27, 2015	<0.50	ug/l	No
Benzo(a)pyrene	Jan.27, 2015	<0.010	ug/l	No
Bromoxynil	Jan.27, 2015	<0.20	ug/l	No
Carbaryl	Jan.27, 2015	<0.20	ug/l	No
Carbofuran	Jan.27, 2015	<0.20	ug/l	No
Carbon Tetrachloride	Jan.27, 2015	<0.50	ug/l	No
Chlordane (Total)	Jan.27, 2015	<0.30	ug/l	No
Chlorpyrifos	Jan.27, 2015	<0.10	ug/l	No
Cyanazine	Jan.27, 2015	<0.10	ug/l	No
Diazinon	Jan.27, 2015	<0.10	ug/l	No
Dicamba	Jan.27, 2015	<0.20	ug/l	No

1,2-Dichlorobenzene	Jan.27, 2015	<0.50	ug/l	No
1,4-Dichlorobenzene	Jan.27, 2015	<0.50	ug/l	No
Dichlorodiphenyltrichloroethane (DDT) + metabolites	Jan.27, 2015	<0.40	ug/l	No
1,2-Dichloroethane	Jan.27, 2015	<0.50	ug/l	No
1,1-Dichloroethylene (vinylidene chloride)	Jan.27, 2015	<0.50	ug/l	No
Dichloromethane	Jan.27, 2015	<5.0	ug/l	No
2-4 Dichlorophenol	Jan.27, 2015	<0.30	ug/l	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	Jan.27, 2015	<0.20	ug/l	No
Diclofop-methyl	Jan.27, 2015	<0.20	ug/l	No
Dimethoate	Jan.27, 2015	<0.10	ug/l	No
Dinoseb	Jan.27, 2015	<0.20	ug/l	No
Diquat	Jan.27, 2015	<1.0	ug/l	No
Diuron	Jan.27, 2015	<1.0	ug/l	No
Glyphosate	Jan.27, 2015	<5.0	ug/l	No
Heptachlor + Heptachlor Epoxide	Jan.27, 2015	<0.10	ug/l	No
Lindane (Total)	Jan.27, 2015	<0.10	ug/l	No
Malathion	Jan.27, 2015	<0.10	ug/l	No
Methoxychlor	Jan.27, 2015	<0.10	ug/l	No
Metolachlor	Jan.27, 2015	<0.10	ug/l	No
Metribuzin	Jan.27, 2015	<0.10	ug/l	No
Monochlorobenzene	Jan.27, 2015	<0.50	ug/l	No
Paraquat	Jan.27, 2015	<1.0	ug/l	No
Parathion	Jan.27, 2015	<0.10	ug/l	No
Pentachlorophenol	Jan.27, 2015	<0.50	ug/l	No
Phorate	Jan.27, 2015	<0.10	ug/l	No
Picloram	Jan.27, 2015	<0.20	ug/l	No
Polychlorinated Biphenyls(PCB)	Jan.27, 2015	<0.035	ug/l	No
Prometryne	Jan.27, 2015	<0.10	ug/l	No
Simazine	Jan.27, 2015	<0.10	ug/l	No
THM (NOTE: show latest annual average)		98.62	ug/l	No
Temephos	Jan.27, 2015	<0.10	ug/l	No
Terbufos	Jan.27, 2015	<0.20	ug/l	No
Tetrachloroethylene	Jan.27, 2015	<0.50	ug/l	No
2,3,4,6-Tetrachlorophenol	Jan.27, 2015	<0.50	ug/l	No
Triallate	Jan.27, 2015	<0.10	ug/l	No
Trichloroethylene	Jan.27, 2015	<0.50	ug/l	No
2,4,6-Trichlorophenol	Jan.27, 2015	<0.50	ug/l	No
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	Jan.27, 2015	<0.20	ug/l	No
Trifluralin	Jan.27, 2015	<0.10	ug/l	No
Vinyl Chloride	Jan.27, 2015	<0.20	ug/l	No

THM – Summary Table

Date of Test	*Location*	*Results*	*Value*
Jan.27, 2015	Mission Tower	99	Ug/l
Apr.14, 2015	Mission Tower	70.5	Ug/l
July 14, 2015	Mission Tower	110	Ug/l
Oct.22, 2015	Mission Tower	115	Ug/l

Average THM's for the year 2015 is 98.62 Ug/l with the maximum acceptable concention of 100 ug/l (A)
"A" – The standard for THM's is expressed as a running annual average.

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

APPENDIX C

Wawa Drinking Water System

Algoma Public Health

Drinking Water Advisory Dated:

November 26, 2014

Algoma
PUBLIC HEALTH
Santé publique Algoma

Dr. Kimberley Barker, MD CCFP MPH FRCPC
Medical Officer of Health
www.algomapublichealth.com

ADVISORY

To Consumers of the Wawa Municipal Water System:

November 26, 2014

THM levels exceed Ontario Drinking Water Standards

Algoma Public Health has reviewed water quality data for the Wawa Municipal water system and is advising consumers that Trihalomenthane (THMs) levels exceed Ontario Drinking Water Quality Standards. The current allowable level for THMs in a drinking water supply in Ontario is 100 micrograms per liter, and the current level in the drinking water supply in Wawa has been calculated to be 112.9 micrograms per liter.

You will be notified when the level of THMs have returned to acceptable levels.

This advisory applies to water consumed directly, ice made from this water, or mixed with drinks such as juice or powdered drink mixes, baby formulas, etc.

This notification does not pose any short-term or acute health risk. All bacterial indicators for this water system are satisfactory.

Chlorine is used to protect the water supply from microorganisms, such as bacteria and viruses. When naturally occurring organic material is present, chlorine can produce THMs.

The high levels of THMs are due to an increase in organic material in the water source and chlorine levels introduced at the plant. At this time, chlorine levels have already been reduced to levels that will decrease THM production while still providing adequate treatment of the water. Options for a longer-term solution are being explored at this time.

.../2

THMs will naturally dissipate when the water is exposed to air, and are removed easily by activated carbon type filters. If you would like to reduce the level of THMs in your drinking water you can:

- Store water in an open container in the refrigerator for 24 hours
- Use water treatment devices containing activated carbon (ie. Brita filter or similar)
- Aerate the water in a blender
- Use commercially available bottled water for drinking and other consumption purposes.

Where can I get more information?

Visit the Algoma Public Health website at **www.algomapublichealth.com** or contact the Environmental Health Department of Algoma Public Health at 1-888-356-2551.

For healthier communities,

Nick Roscoe, C.P.H.I.(C)
Public Health Inspector

NR/jal

Enclosure

Algoma
PUBLIC HEALTH
Santé publique Algoma

TRIHALOMETHANES IN DRINKING WATER

What are Trihalomethanes?

Trihalomethanes (THMs) are a byproduct of the water treatment process. They are formed when naturally occurring organic substances found in raw water react with chlorine used to treat the water. This reaction produces "disinfection by-products" the most common of which are THMs. The four most common THMs in drinking water are chloroform, bromodichloremathane, chlorodibromaomethane and bromoform.

What are the health risks?

Current evidence is that THMs do **not** pose an immediate health risk. Studies suggest that long-term exposure (e.g. 35 years) to high levels of THMs may be linked to a slightly increased risk of some types of cancer, particularly bladder cancer.

Why do we use chlorine if it creates these byproducts?

Chlorination continues to be the best choice to treat drinking water. Its use, since the early 1900's, has been a huge public health benefit in largely eliminating plagues such as cholera and typhoid and reducing other health problems caused by waterborne viruses and bacteria (e.g. E. coli). The benefits of chlorinating drinking water are considered much greater than the risk of health effects from THMs.

I am pregnant. Should I stop drinking the water?

It is very important to maintain fluid intake during pregnancy. Based on current knowledge, the potential risks of adverse pregnancy outcomes associated with drinking water containing THMs are much lower than the risks of serious illness and death that could result from drinking water that has not been properly disinfected.

Pregnant women may wish to speak with their doctor for advice. It is important that pregnant women continue to drink sufficient water according to their doctor's recommendations.

What options exist to reduce THMs?

Several options are available to the homeowner concerned about the level of THMs in their tap water: The effectiveness of the options depends on which THMs are in the water.

- Use bottled water (best method)
- Aerate the water in a blender
- Store it in the refrigerator for 24 hours
- Water treatment devices containing activated carbon

What is being done to reduce the THM levels in the drinking water?

Algoma Public Health is actively involved in the remedial plans being implemented by the Municipality and the Ministry of Environment to address the elevated THM levels. The goal is to reduce the THM levels and maintain low levels over the long term.

Information adapted from: Health Canada (September 2008)
www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/trihalomethanes/index-eng.php

APPENDIX D

The Municipality of Wawa
THM Action Plan

The Municipality of Wawa
THM Action Plan

Recent background

In the July 2014 the results from the quarterly samples collected and analyzed for the distribution system in Michipocoten River Village exceeded the regulated concentration of Trihalomethanes (THM). Categorizing this as an adverse result is calculated on the basis of running average (RA) from the results of quarterly samples from the distribution system. A second high result occurred in October pushing the quarterly average to exceed the regulation requirement. Algoma Public Health (APH) and the Ministry of the Environment and Climate Control (MOECC) were notified of this result, as required by Safe Drinking Water and Ontario Regulation 170/03. The municipal response protocols require staff to follow and comply with direction from the APH in such circumstances since exceedance of this parameter is a potential threat to environmental safety, or, long term, to community health, (although not an immediate threat). Staffs at MOECC were consulted regarding the activities planned. Staff undertook a series of flushing and sample collection exercises after the July result to reduce THM's in the system and endeavor to avoid a repeat exceedance, without success. Consequently the following, more aggressive actions have been implemented.

Present and proposed actions

- Reducing the chlorine dosing at the WTP. The reduction in dosing will lower the free chlorine leaving the WTP. This is the chemical element added for disinfection but it reacts with organic components in the water to form THMs. The chlorine residual in the distribution system is being maintained in accordance with Ministry of the Environment and Climate Change requirements.
- Reducing the volume of water in the elevated reservoir. The reservoir is then refilled with fresh water to reduce concentrations of THMs which may have accumulated. This will be done multiple times.
- Flushing water mains which end in the identified neighborhoods have been undertaken and will be repeated.
- Requested and received approval from MOECC for "research sampling", (these sample results are not included in the regulated THM reporting and therefore do not contribute to the running average, (RA)). Resample the distribution water.
- The operation of water "bleeders" in the distribution system will be closely monitored to reduce the overall volume of water produced by the WTP. A cautious approach is necessary since these bleeders have been necessary in the past to prevent the freezing of water mains in certain sections of the municipality.
- Recent sample results have shown a reduction in THM concentrations leaving the WTP. These results are not conclusive proof, as yet, that the THM levels will remain consistently below the concentration limit of 100 ug/l RA.

- It is suspected that there is a seasonal fluctuation in THM concentrations. This may be related to increased organic material building in the distribution system and/ or temperature in the summer months (i.e. higher water temperature promoting chemical reactions). Sampling will be conducted to determine if this is occurring.
- Chlorine dosing at the WTP and possibly injecting supplemental chlorine using the stand-by system in the Village must be balanced to ensure sufficient levels to meet contact requirements.
- A Clean-In-Place procedure was performed on the membrane filters by staff. This procedure involves a wash with Citric Acid and Chlorine.
- All process and storage components at the treatment plant have been drained and cleaned for the first time since the facility was commissioned.
- After the second high sample results the tanks were again drained, flushed and recommissioned.

Next steps

- If the concentrations of organics cannot be reduced in the treated water, the use of alternative disinfectants such as chloramines or chlorine gas may be investigated.
- The membranes filters will be closely monitored to ensure that they are operating as effectively/ efficiently as possible. The backwash cycle may be reviewed with a goal of reducing production of THM's in the plant during the water treatment process.
- The membrane manufacturer has been requested to review the condition and function of our membranes a process to validate that everything is in order.
- The option of pre-chlorination or aeration could be evaluated. Other things could be considered such as reducing the pH or coagulation.
- Reducing the operating level of the clear wells and the storage reservoir can be evaluated to determine if this would have an impact on THM formation,
- The municipality continues the 1/4ly compliance meeting. MOECC and APH are invited to these meeting which are also a requirement of the municipality's water works accreditation. The progress on reducing THM concentrations formation will be reviewed at each meeting. Adjustments to the Action Plan will be ongoing based on progress being achieved toward THM reduction.

Conclusions and recommendations

- Progress is being made in reducing the chlorine dosing and flushing of the distribution system as well as reducing the volume in the elevated reservoir and by refreshing the stored treated water. These actions will continue.
- The seasonality of the increased THM concentrations will be evaluated.
- Testing may be conducted to determine the effectiveness of pre-chlorination and aeration. This would include investigation of other options such as lowering the pH.
- Optimization of the chlorine dosing and location of dosing will be investigated as well as the use of the Village injection point for supplemental chlorination. This will include evaluation of the filter backwash cycles and chlorine residual in the distribution system
- Continue to meet monthly with MOECC and APH.
- Seasonal flushing will be reviewed with the goal of reducing the length of time treated water is held in the system and I conjunction with higher water temperature.

- Summer monitoring of water temperature will occur to ascertain the optimum period to drain and flush the treatment plant components. It is speculated that this will be during early August as this is the period when the highest THM's and water temperature have demonstrated a trend.
- The elevated reservoir should be cleaned soon and on a regular cycle.
- Circulation of water in the elevated reservoir should be designed and enabled in 2015.
- The volume of water in storage at the reservoir should be lowered and turned over more frequently during the warm water season and the winter period when ice is formed.
- The booster station and control valve serving Pinewood Drive need to be replaced to enable regular flushing of the system in this zone.

Financial

A number of cost elements are involved with the solutions proposed. Following are cost estimates

Additional sample collection and analysis (per round)	$370
Clean process tanks in plant	$8,000
Install circulation in elevated reservoir	$Undefined
Replace Fire Booster Pump	$14,500
Replace Pressure Reducing Valve	$11,000