

Town of New Tecumseth 2016 Tottenham Drinking Water System Annual Report



Prepared in accordance with Section 11 of Ontario Regulation 170/03

For the Period of

January 1 to December 31, 2016

System Rating: Water Distribution and Supply Subsystem Class II

Drinking Water System No.: 220001085
Municipal DW License No.: 123-102, Issue No. 2

February 1, 2017

Table of Contents

1.	INTRODUCTION	1
2.	REPORTING REQUIREMENTS (Section 11 - O.Reg.170/03)	1
2.1	Availability of Annual Water Report	1
2.2	Description of Drinking-Water System.....	1
2.3	Water Treatment Chemicals.....	1
2.4	Significant Expenses Incurred	2
2.5	Sampling and Testing.....	2
2.5.1	<i>Schedule 7 - Operational Checks.....</i>	2
2.5.2	<i>Schedule 10 - Microbiological Sampling and Testing.....</i>	2
2.5.3	<i>Schedule 13 - Chemical Testing.....</i>	2
2.5.4	<i>Schedule 15.1 – Lead.....</i>	2
2.5.5	<i>Schedule 16 – Reporting of Adverse Test Results and Other Problem and</i>	3
	<i>Schedule 17 – Corrective Actions.....</i>	3
2.6	Municipal Drinking Water License (MDWL) No. 123-102 Requirement	3

Tables

Schedule 7 Operational Testing

Table 1 – Summary of Raw Samples – Turbidity

Table 1.1 – Summary of Treated and Distribution Samples – Free Chlorine

Schedule 10 Microbiological Testing

Table 2 – Summary of Distribution System Samples

Table 2.1 – Summary of Treated Water Samples

Table 2.2 – Summary of Raw Water Samples

Schedule 13 Chemical Testing (THMs, Nitrate and Nitrite)

Table 3 – Summary of Treated Water Samples – Inorganics

Table 3.1 – Summary of Treated Water Samples – Organics

Table 3.2 – Summary of Treated Water Samples – Nitrite and Nitrate

Table 3.4 – Summary of Treated Water Samples – Sodium and Fluoride

Schedule 15 Lead

Table 4 – Summary of Lead Samples

Schedule 16 and 17

Table 5 – Details of Adverse Water Quality Incidents (AWQIs) and Corrective Actions)

Municipal Drinking Water Licence Requirement

Table 6.1 – Summary of Treated Water Samples – Trihalomethanes

Table 6.2 – Summary of Treated Water Samples - Iron

1. INTRODUCTION

In accordance with Ontario Regulation 170/03 (O.Reg.170/03): Drinking Water Systems, the Town of New Tecumseth has prepared this Annual Report which is required to be completed no later than February 28th of every year. This report covers the period of January 1st to December 31st, 2016 and the information provided complies with the reporting requirements outlined in Section 11 of O.Reg.170/03.

A summary of the Town of New Tecumseth's drinking water system description is outlined below:

Drinking-Water System Number:	220001085
Drinking-Water System Name:	Tottenham Water Supply System
Drinking-Water System Owner:	Corporation of the Town of New Tecumseth
Drinking-Water System Category:	Large Municipal Residential

2. REPORTING REQUIREMENTS (Section 11 - O.Reg.170/03)

2.1 Availability of Annual Water Report

This report has been prepared in accordance with Section 11 of Ontario Regulation 170/03 and is available, free of charge as follows:

- via the Town of New Tecumseth website (<http://newtecumseth.ca/>)
- via Public Request (email: drinkingwater@newtecumseth.ca or phone 705-435-3900 ext. 1432)

The users of water from the Town of New Tecumseth Tottenham Drinking Water System are advised through the Town of New Tecumseth's website and local newspaper when this report is available and how to obtain a copy.

2.2 Description of Drinking-Water System

The Tottenham Well Supply System consists of four groundwater production wells that are grouped into two general locations: Well #4 & #5 (Walkem Drive Wells) and Wells #6A & #7 (Coventry Park Wells). The water from these wells is conveyed through dedicated mains to the Mill Street Reservoir. The Reservoir has one active cell with a storage capacity of approximately 900 m³. The system includes a 4,500 m³ elevated storage tank.

The Tottenham Reservoir is the central location for the Supervisory Control and Data Acquisition (SCADA) system that provides various monitoring and control over the Tottenham Water System.

The Tottenham Water Supply system distributes treated water to approximately 5,143 consumers (based on 2016 Census from Statistics Canada). There are 1,650 service connections, comprising of residential, institutional, commercial and industrial consumers. In addition, there are approximately 22 kilometers of water main and 141 hydrants.

2.3 Water Treatment Chemicals

The following water treatment chemicals were utilized during the reporting period:

- Sodium Hypochlorite (12%)
- Sodium Silicate

2.4 Significant Expenses Incurred

The following major expenses were incurred during the reporting period to install, repair or replace required equipment:

A brief summary and value of the expenses incurred, including those outlined above, are as follows:

Maintenance Activity	Costs Incurred (2016)
Flow Meter Calibration	\$1,645
SCADA and Server Upgrades (all water and wastewater)	\$98,109
Valve Chamber Replacement and Chamber decommission	\$20,702

2.5 Sampling and Testing

Drinking water samples were collected and tested in accordance of O.Reg. 170/03 and tested in accordance with O.Reg. 169/03.

2.5.1 Schedule 7 - Operational Checks

Operational checks including raw water turbidity, and free chlorine (treated and distribution) were conducted in accordance with Schedule 7 of O.Reg.170/03. The operational testing conducted during this reporting period are summarized in Table 1 of this report.

2.5.2 Schedule 10 - Microbiological Sampling and Testing

Microbiological testing on raw, treated and distribution water samples were conducted in accordance with Schedule 10-2, 10-3 and 10-4 of O.Reg.170/03. The microbiological testing and sampling conducted during this reporting period are summarized in Tables 2, 2.1 and 2.2 of this report.

In addition to the required microbiological testing from O. Reg. 170/03 (i.e. Total Coliform and E. Coli) Tables 2.1 and 2.2, include bacteriological health-related parameter; Heterotrophic Plate Count (HPC). HPC is a useful operational tool for monitoring general bacteriological water quality throughout the treatment process and in the distribution system. HPC results are not an indicator of water safety and, as such, should not be used as an indicator of potential adverse human health effects.

2.5.3 Schedule 13 - Chemical Testing

Chemical testing for organic and inorganic parameters was conducted on treated water samples in accordance with Schedule 13, Sections 13.2 (Schedule 23), 13.4 (Schedule 24), 13.8 and 13.9. The latest 36-month and 60-month test results are summarized in Table 3 of this report.

Chemical testing for trihalomethanes (THMs) and nitrate and nitrite were taken quarterly in accordance with Schedule 13.6 and 13.7 of O.Reg 170/03 respectively. THMs sampling is performed in the distribution system and nitrate and nitrites sampling is performed at the reservoir (treated samples). The latest test results are summarized in Table 3 (nitrate and nitrite) and in Table 6.1 (THMs) of this report.

2.5.4 Schedule 15.1 – Lead

Lead and Alkalinity samples are collected from several locations within the distribution system in accordance with O. Reg 170/03 Schedule 15.1. Lead samples are required to be done every three year and was completed in

2014. Alkalinity samples are required to be sampled between December 15th and April 15th and June 15th and October 15th every year. The latest test results are summarized in Table 4 of this report.

2.5.5 *Schedule 16 – Reporting of Adverse Test Results and Other Problem and Schedule 17 – Corrective Actions*

Adverse water quality incidents (AWQI) were reported in accordance with Schedule 16 and corrective actions related to each incident were completed in accordance with Schedule 17. A summary of the AWQI's and associated corrective actions that occurred during this reporting period is included in Table 5 of this report.

2.6 *Municipal Drinking Water Licence (MDWL) No. 123-102 Requirement*

In addition to the sampling and monitoring required under O.Reg 170/03, Schedule C: System Specific Conditions for the Tottenham Distribution System requires sampling, testing and monitoring for THMs monthly basis commencing July 2016 and Iron sampling on a quarterly basis also commencing July 2016. The latest test results required under the MDWL is included in Table 6.1 and 6.2.

Tables

**Table 1 - Schedule 7 Operational Checks
Summary of Raw and Treated Samples – Turbidity**

Sampling Location	Number of Samples	NTU (min/max)
Raw Water Turbidity		
Well #4	11	0.17/0.71
Well #5	11	0.13/0.96
Well #6A	11	0.12/0.88
Well #7	11	0.17/2.42

**Table 1.1 - Schedule 7 Operational Checks
Summary of Treated and Distribution Samples – Free Chlorine**

Sampling Location	Number of Samples	mg/L (min/max)
Treated Water Free Chlorine		
Tottenham Reservoir	*8760	1.08/2.20
Distribution Water Free Chlorine		
Walkem Drive	*8760	0.32/2.20

Notes:

- *8760 represents Continuous Monitoring
- Low chlorine residuals that are recorded by continuous monitoring equipment during equipment malfunctions or power outages are not considered to be an adverse event. These incidents are responded to by operations staff for resolution. Also, the value of 0.00 recorded by the continuous chlorine analyzer could be a result of equipment abnormality / SCADA issue / maintenance work or calibration.

**Table 2 - Schedule 10 Microbiological Sampling and Testing
Summary of Distribution System Samples**

Source	Number of Samples	E.Coli (min/max)	Total Coliform (min/max)	HPC (min/max)
Distribution System				
Routine Sampling Points	262	0/0	0/0	0/6200
Other (main breaks, new construction)	111	0/0	0/1	0/1
Total Distribution Samples	373			

**Table 2.1 - Schedule 10 Microbiological Sampling and Testing
Summary of Treated Water Samples**

Source	Number of Samples	E.Coli (min/max)	Total Coliform (min/max)	HPC (min/max)
Treated Water				
Mill Street Reservoir	52	0/0	0/0	0/11
Total Number of Treated Samples	52			

**Table 2.2 - Schedule 10 Microbiological Sampling and Testing
Summary of Raw Water Samples**

Source	Number of Samples	E.Coli (min/max)	Total Coliform (min/max)
Raw Water			
Well #4	52	0/0	0/0
Well #5	52	0/0	0/0
Well #6A	52	0/0	0/0
Well #7	52	0/0	0/0
Total Number of Raw Samples	208		

Notes:

**Table 3 - Schedule 13 Chemical Sampling and Testing
Summary of Treated Water Samples – Inorganics**

Parameter	Sample Date (mm/dd/yr)	Result Value	Exceedance	Standard
Mill Street Reservoir				
Antimony	02/23/2015	0.16	No	6.0
Arsenic	02/23/2015	0.9	No	25
Barium	02/23/2015	113	No	1000
Boron	02/23/2015	66.5	No	5000
Cadmium	02/23/2015	<0.003	No	5.0
Chromium	02/23/2015	<0.03	No	50
Mercury	02/23/2015	0.01	No	1.0
Selenium	02/23/2015	<1	No	10
Uranium	02/23/2015	0.011	No	20

Notes:

- Results expressed in ug/L
- MDL – Maximum Detection Limit Results expressed in ug/L

**Table 3.1 - Schedule 13 Chemical Sampling and Testing
Summary of Treated Water Samples – Organics**

Parameter	Sample Date (mm/dd/yr)	Result Value	Exceedance	Standard
Mill Street Reservoir				
Alachlor	02/23/2015	0.02<MDL	No	5.0
Aldicarb	02/23/2015	0.01<MDL	No	9.0
Aldrin+Dieldrin	02/23/2015	0.01<MDL	No	0.7
Atrazine+N-dealkylated metabolites	02/23/2015	0.01<MDL	No	5.0
Azinphos-methyl	02/23/2015	0.02<MDL	No	20.0
Bendiocarb	02/23/2015	0.01<MDL	No	40.0
Benzene	02/23/2015	0.32<MDL	No	5.0
Benzo(a)pyrene	02/23/2015	0.004<MDL	No	0.01
Bromoxynil	02/23/2015	0.33<MDL	No	5.0
Carbaryl	02/23/2015	0.01<MDL	No	90.0
Carbofuran	02/23/2015	0.01<MDL	No	90.0
Carbon Tetrachloride	02/23/2015	0.16<MDL	No	5.0
Chlordane (Total)	02/23/2015	0.01<MDL	No	7.0
Chlorpyrifos	02/23/2015	0.02<MDL	No	90.0
Cyanazine	02/23/2015	0.03<MDL	No	10.0
Diazinon	02/23/2015	0.02<MDL	No	20.0
Dicamba	02/23/2015	0.20<MDL	No	120
1,2-Dichlorobenzene	02/23/2015	0.41<MDL	No	200
1,4-Dichlorobenzene	02/23/2015	0.36<MDL	No	5.0
Dichlorodiphenyltrichloroethane (DDT) + metabolites	02/23/2015	0.01<MDL	No	30.0
1,2-dichloroethane	02/23/2015	0.35<MDL	No	5.0
1,1-Dichloroethylene (vinylidene chloride)	02/23/2015	0.33<MDL	No	14.0
Dichloromethane	02/23/2015	0.35<MDL	No	50.0
2,4-Dichlorophenol	02/23/2015	0.15<MDL	No	900
2,4-Dichlorophenoxy acetic acid (2,4-D)	02/23/2015	0.19<MDL	No	100
Diclofop-methyl	02/23/2015	0.40<MDL	No	9.0
Dimethoate	02/23/2015	0.03<MDL	No	20.0
Dinoseb	02/23/2015	0.36<MDL	No	10.0
Diquat	02/23/2015	1<MDL	No	70.0
Diuron	02/23/2015	0.03<MDL	No	150
Glyphosate	02/23/2015	1<MDL	No	280
Heptachlor + Heptachlor Epoxide	02/23/2015	0.01<MDL	No	3.0
Lindane (Total)	02/23/2015	0.01<MDL	No	4.0
Malathion	02/23/2015	0.02<MDL	No	190
Methoxychlor	02/23/2015	0.01<MDL	No	900
Metolachlor	02/23/2015	0.01<MDL	No	50.0
Metribuzin	02/23/2015	0.02<MDL	No	80.0
Monochlorobenzene	02/23/2015	0.3<MDL	No	80.0
Paraquat	02/23/2015	1<MDL	No	10.0
Parathion	02/23/2015	0.02<MDL	No	50.0
Pentachlorophenol	02/23/2015	0.15<MDL	No	60.0
Phorate	02/23/2015	0.01<MDL	No	2.0
Picloram	02/23/2015	1<MDL	No	190
Polychlorinated Biphenyls (PCB)	02/23/2015	0.04<MDL	No	3.0
Prometryne	02/23/2015	0.03<MDL	No	1.0
Simazine	02/23/2015	0.01<MDL	No	10.0
Temephos	02/23/2015	0.01<MDL	No	280
Terbufos	02/23/2015	0.01<MDL	No	1.0
Tetrachloroethylene (perchloroethylene)	02/23/2015	0.35<MDL	No	30.0
2,3,4,6-Tetrachlorophenol	02/23/2015	0.20<MDL	No	100
Triallate	02/23/2015	0.01<MDL	No	230
Trichloroethylene	02/23/2015	0.44<MDL	No	5.0
2,4,6-Trichlorophenol	02/23/2015	0.25<MDL	No	5.0
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	02/23/2015	0.22<MDL	No	280
Trifluralin	02/23/2015	0.02<MDL	No	45.0
Vinyl Chloride	02/23/2015	0.17<MDL	No	2.0

Notes:

- Results expressed in ug/L
- MDL – Maximum Detection Limit

**Table 3.2 - Schedule 13 Chemical Sampling and Testing
Summary of Treated Water Samples – Nitrite and Nitrate**

Parameter	Sample Date (mm/dd/yr)	Result Value	Exceedance	Standard
Mill Street Reservoir				
Nitrite	01/11/2016	0.003 <MDL	No	1.0
	04/18/2016	0.003 <MDL		
	07/18/2016	0.003 <MDL		
	10/11/2016	0.003 <MDL		
Nitrate	01/11/2016	0.028	No	10.0
	04/18/2016	0.031		
	07/18/2016	0.030		
	10/11/2016	0.032		

Notes:

- Results expressed in mg/L

**Table 3.3 - Schedule 13 Chemical Sampling and Testing
Summary of Treated Water Samples – Sodium and Fluoride**

Parameter	Sample Date (mm/dd/yr)	Result Value	Exceedance	Standard
Mill Street Reservoir				
Sodium	12/10/2012	44.3	No	200*
Fluoride	01/13/2014	0.20	No	1.5

Notes:

- Results expressed in 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.

**Table 4 – Schedule 15.1 Lead
Summary of Lead Samples**

Parameter	Sample Date (mm/dd/yr)	Number of Samples	Range of Results (min max)	Exceedance	Standard
Lead (Distribution System)	04/07/2014 10/14/2014	7	0.18 – 2.34 µg/l	No	10
Alkalinity (Distribution System)	04/11/2016 10/11/2016	6	206 – 208 (mg/l)	No	30 – 500*

Notes:

*Aesthetic Objective under the Ontario Drinking Water Standards, Objectives and Guidelines

**Table 5 – Details of Adverse Water Quality Incidents (AWQIs) and Corrective Actions
(Schedule 16 & 17)**

AWQI #	Incident Date (mm/dd/yr)	Location	Parameter	Result	Unit of Measure	Corrective Action Taken	Corrective Action Date (mm/dd/yr)
128545	03/09/2016	Distribution System	Total Coliform	1	cfu/100 ml	Main flushed and water tested for chlorine residual March 11 th . Residual at 1.14 mg/l. Re-samples at adverse location and upstream March 11 th . Results all negative. No further action required.	03/13/2016

**Table 6.1 – Municipal Drinking Water Licence (MDWL) No. 123-102 Requirement
Summary of Distribution Water Samples – Trihalomethanes**

Date	THM Results	THM Quarterly Average	THM Running Annual Average	Exceedance	Standard
Distribution – Nolan Road Sampling Station					
January 11, 2016	69.0	69.0	90.3	No	100
April 18, 2016	96.0	96.0			
July 13, 2016	81.0	100.0			
August 15, 2016	116.0				
September 12, 2016	103.0	96.0			
October 11, 2016	58.0				
November 14, 2016	121.0				
December 12, 2016	109.0				

Notes:

- Results expressed in ug/L

**Table 6.2 – Municipal Drinking Water License (MDWL) No. 123-102 Requirement
Summary of Treated Water Samples - Iron**

Parameter	Sample Date (mm/dd/yr)	Results
Mill Street Reservoir		
Iron	07/18/2016	698
Iron	10/11/2016	726

Notes:

- Results expressed in ug/L