

Ministry of the Environment  
and Climate Change

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



Safe Drinking Water  
Branch

Direction du contrôle la qualité de  
l'eau potable

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September 14, 2015

The Corporation of the Township of Mapleton  
7275 Sideroad 16  
Drayton, ON  
N0G 1P0

Attention: Mr. Brad McRoberts  
Director of Public Works

**RE: 2015-16 Inspection Report for the Moorefield Drinking Water System**

Dear Mr. McRoberts,

I would like to thank you and the team at the Ontario Clean Water Agency for the assistance provided to me during my recent inspection of the Moorefield Drinking Water System (DWS # 220069732). Attached is the final report for this inspection, with inspection report number 1-BZMT9.

In order to measure individual inspection results, the Ministry has established an inspection compliance risk framework based on the principles of the Inspection, Investigation & Enforcement (II&E) Secretariat and advice of internal/external risk experts. The Inspection Summary Rating Record (IRR), included as Appendix A of the inspection report, provides the Ministry, the system owner and the local Public Health Units with a summarized quantitative measure of the drinking water system's annual inspection and regulated water quality testing performance. Please note the attached IRR methodology memo describing how the risk rating model has improved to better reflect the health related and administrative non-compliance found in an inspection report. IRR ratings are published (for the previous inspection year) in the Ministry's Chief Drinking Water Inspector's Annual Report. If you have any questions or concerns regarding the rating, please contact Lisa Williamson, Drinking Water Program Supervisor, at 519-837-6386.

Feel free to contact me at (519) 826-4274 if you have any questions related to this inspection.

Best regards,

A handwritten signature in black ink, appearing to read 'Martha Weber', written in a cursive style.

Martha Weber  
Provincial Officer  
Water Inspection Program  
Guelph District Office

Cc via email: Scott Craggs, West Highlands Hub, OCWA  
Lisa Benoit, West Highlands Hub, OCWA  
Shawn Zentner, Wellington-Dufferin-Guelph Health Unit  
Sandra Cooke, Grand River Conservation Authority  
District Office File (SI WE MA HI 540)



**Ministry of the Environment and Climate Change**

**MOOREFIELD DRINKING WATER SYSTEM  
Inspection Report**

<b>Site Number:</b>	260069732
<b>Inspection Number:</b>	1-BZMT9
<b>Date of Inspection:</b>	Aug 20, 2015
<b>Inspected By:</b>	Martha Weber

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**Moorefield Drinking Water System  
DWS# 260069732  
2015/16 Focused Inspection Report**

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**OWNER INFORMATION:**

**Company Name:** MAPLETON, THE CORPORATION OF THE TOWNSHIP OF  
**Street Number:** 7275 **Unit Identifier:**  
**Street Name:** SIDEROAD 16 Rd  
**City:** DRAYTON  
**Province:** ON **Postal Code:** N0G 1P0

**CONTACT INFORMATION**

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**Type:** Owner **Name:** Brad McRoberts  
**Phone:** (519) 638-3313 x41 **Fax:** (519) 638-5113  
**Email:** bmcroberts@mapleton.ca  
**Title:** Director of Public Works

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**Type:** Operating Authority **Name:** Scott Craggs  
**Phone:** (519) 941-1938 x228 **Fax:** (519) 941-1794  
**Email:** scraggs@ocwa.com  
**Title:** OCWA - Operations Manager

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**Type:** Operating Authority **Name:** Lisa Benoit  
**Phone:** (519) 941-1938 x225 **Fax:** (519) 941-1794  
**Email:** lbenoit@ocwa.com  
**Title:** Process & Compliance Technician

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**INSPECTION DETAILS:**

**Site Name:** MOOREFIELD DRINKING WATER SYSTEM  
**Site Address:** 5 HILWOOD DRIVE ST MOOREFIELD N0G 2K0  
**County/District:** Mapleton  
**MOECC District/Area Office:** Guelph District  
**Health Unit:** WELLINGTON-DUFFERIN-GUELPH HEALTH UNIT  
**Conservation Authority:** N/A  
**MNR Office:** N/A  
**Category:** Large Municipal Residential  
**Site Number:** 260069732  
**Inspection Type:** Announced  
**Inspection Number:** 1-BZMT9  
**Date of Inspection:** Aug 20, 2015  
**Date of Previous Inspection:** Sep 25, 2014

**COMPONENTS DESCRIPTION**

**Site (Name):** Moorefield Raw Well PW-1**Type:** Source**Sub Type:** Ground Water**Comments:**

According to Water Well Record #6711853 (two pages with audit numbers 162524 and 162525), Well PW-1 was originally drilled in July 1995 to a depth of 390 ft. The more recent Water Well Record # 6714414 shows that in August 2002 the original casing was removed and the hole was enlarged to allow for a larger casing and also grouting. Neat cement grout was installed in the annular space from ground level to a depth of 250 ft. The well is located outside the pumphouse and is equipped with a submersible pump rated at 11.0 L/s at a total dynamic head of 49 m. The well is complete with a 150 mm diameter discharge pipe from the well to the water pumphouse. A magnetic flow meter, located in the pumphouse, measures the rate and amount of water extracted from Well PW-1.

**Site (Name):** Moorefield Raw Well PW-2**Type:** Source**Sub Type:** Ground Water**Comments:**

According to Water Well Record #6714415, Well PW-2 was drilled in September 2002 to a depth of 300 ft. The annular space is filled with neat cement grout from ground level to 240 ft below grade. The well is located outside the pumphouse, adjacent to Well PW-1, and is equipped with a submersible pump rated at 7.0 L/s at a total dynamic head of 64 m. The well is complete with a 150 mm diameter discharge pipe from the well to the water pumphouse. A magnetic flow meter, located in the pumphouse, measures the rate and amount of water extracted from Well No. PW-2.

**Site (Name):** Moorefield Treated**Type:** Treated Water POE**Sub Type:** Pumphouse**Comments:**

The Moorefield Drinking Water System is located at Lot 10, Concession 10 in Moorefield, Ontario. Water is pumped from either Well PW-1 or PW-2 and disinfected with a 12 percent sodium hypochlorite solution. Each well has a dedicated 200 L capacity sodium hypochlorite solution tank and two metering pumps (one duty and one standby), each rated at a minimum of 2.2 L/hr, for pre-chlorination. After injection with sodium hypochlorite, water is directed to a 7.7 m diameter by 8.6 m tall (387 m<sup>3</sup>) water standpipe for contact time. The tank also provides storage capacity for equalization and emergencies.

Four high lift pumps (3 duty and 1 standby), each having a rated capacity of 4.0 L/s at a total dynamic head of 54.1 m, transport treated water to the distribution system. Three pressure tanks, each with a capacity of 1,200 L, maintain adequate high-lift pump cycling time. A magnetic flow meter measures the rate and amount of treated water supplied to the distribution system. An online chlorine analyzer and turbidimeter are also installed downstream of the treatment equipment. An outdoor 60 kW diesel generator set including a sub-base fuel tank provides standby power for the facility.

**Site (Name):** Moorefield Distribution System**Type:** Other**Sub Type:** Other**Comments:**

The Moorefield distribution system supplies potable water to a population of approximately 550 people. There are about four kilometers of watermains, which are reported to be comprised of 150 mm diameter PVC pipe. There are six blow-off valves and no fire hydrants within the system.

**Site (Name):** MOE DWS Mapping**Type:** DWS Mapping Point**Sub Type:**

**Comments:**

Not Applicable

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## 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.

The Moorefield Drinking Water System is owned by the Township of Mapleton and operated by the Ontario Clean Water Agency (OCWA).

This inspection report covers a review period of October 1, 2014 to July 31, 2015.

Municipal Drinking Water Licence (MDWL) #105-102 was issued December 17, 2010 and expires December 16, 2015. Drinking Water Works Permit (DWWP) #105-202 was issued December 16, 2010.

Permit to Take Water (PTTW) #4651-6JTS55 was revoked and replaced by PTTW #1401-9KXJW5 on June 24, 2014.

According to classification certificate #3825, dated June 14, 2006, this system is a Class 1 Water Distribution and Supply Subsystem.

### SOURCE

- \* The owner was maintaining the production well(s) in a manner sufficient to prevent entry into the well of surface water and other foreign materials.
- \* Measures were in place to protect the groundwater and/or GUDI source in accordance with a Permit and Licence or Approval issued under Part V of the SDWA.

According to Water Well Record #6714414, the annular space for well PW-1 was filled with neat cement grout from ground level to a depth of 250 feet. According to Water Well Record #6714415, the annular space for well PW-2 was filled with neat cement ground from ground level to a depth of 240 feet.



## SOURCE

Sections 16.2.7 - 16.2.9 of Schedule B in the MDWL requires that an inspection schedule for all wells associated with the drinking water system be included in the operations and maintenance manual. There must be inspection and maintenance procedures for the entire well structure of each well including all above and below grade components, and remedial action plans for situations where an inspection indicates non-compliance with respect to regulatory requirements and/or risk to raw well water quality.

OCWA has established a well inspection program that requires inspections of the production wells on monthly, 5 year, and 10 year timelines. The 10 year inspection includes a detailed assessment of the wells, including below grade components, and is scheduled to be conducted next in 2017 for both wells.

## CAPACITY ASSESSMENT

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

Schedule C of the Municipal Drinking Water Licence requires continuous monitoring of flow from treatment into the distribution system (Section 2.1.1) and from the wells into the treatment subsystem (Section 2.1.2). For each production well, and for treated water entering the distribution system, a magnetic meter is in place to monitor flow. These meters were last verified for accuracy on September 10, 2014.

- \* **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.**

Section 1 of Schedule C in the Municipal Drinking Water Licence allows a rated capacity from the treatment system into the distribution system of 1,555 m<sup>3</sup>/day, and maximum flow rates from the wells into the treatment system of 11 L/s for well PW-1 and 7 L/s for well PW-2. It has been identified by Approvals Branch that the intention is for the Licence to include rated capacity limits but not limits for flow rate into the treatment system. The raw water flow rate limits are intended to be removed at the pending issuance of the updated Municipal Drinking Water Licence. A review of flow records indicates there were no exceedances of the limits established in the Licence.

## 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.**

Any discrepancies from the Permit description are captured by Form 2's and Director's Notifications, to be incorporated into the updated version of Licence and Permit.

- \* **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.**
- \* **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.**

The Moorefield Drinking Water System obtains water from ground water sources. The treatment system consists of disinfection using chlorine and is capable of achieving an overall performance that provides, at a minimum, 2-log (99%) removal or inactivation of viruses prior to the first consumer. The minimum required CT value for this system has been determined to be 4 mg/L·min, and a free chlorine residual of 0.19 mg/L has been deemed to be the minimum level required to achieve the required CT, with a goal of a minimum operating free chlorine residual of 0.6 mg/L.

Records provided for the inspection period indicate that proper disinfection was achieved at all times water was being supplied to consumers.

### TREATMENT PROCESSES

- \* 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 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 chlorine residual monitoring occurs after treated water has left the storage tank in which primary disinfection occurs.

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

O. Reg. 170/03, Schedule 7, Section 7.2 requires at least seven distribution samples to be taken each week and tested immediately for chlorine residual. Unless one sample is taken on each day of the week, there is a requirement for at least 48 hours to pass between the sets of four samples and three samples used to complete the seven sample requirement.

OCWA operators conduct daily distribution chlorine residual monitoring, and records indicate this monitoring was completed every day of the inspection review period.

- \* 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.  
  
Low chlorine residual alarms are programmed to alert the operator if the treated free chlorine residual level drops to 0.5 mg/L. In addition, if the residual drops to 0.5 mg/L, the raw well pumps will lock out and cease to pump water into the disinfection tank. At the time of inspection, the low chlorine residual alarm was tested and found to be working as expected.
- \* 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.
- \* All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.

### OPERATIONS MANUALS

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

### OPERATIONS MANUALS

- \* 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.

For the population of approximately 550 residents, O.Reg 170/03, Section 10-2 of Schedule 10 requires at least eight distribution samples to be taken every month, with at least one of the samples being taken in each week. These samples are to be tested for E. coli and total coliforms, and 25 percent of the samples are to be tested for general bacteria population expressed as colony counts on a heterotrophic plate count. A review of sampling records shows that samples were taken and tested as required, with sample numbers going above and beyond the minimum number every month.

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

In O.Reg 170/03, Section 10-3 of Schedule 10 requires a treated sample be taken at least once every week and be tested for E. coli, total coliforms and general bacteria population expressed as colony counts on a heterotrophic plate count. A review of records shows that samples were taken as required.

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

Inorganics sampling was completed on July 6, 2015, and had previously been conducted on July 16, 2012.

### WATER QUALITY MONITORING

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

Organics sampling was completed on July 6, 2015, and had previously been conducted on July 16, 2012.

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

Trihalomethane sampling was conducted every three months as required, and the latest Running Annual Average was calculated to be 15 µg/L.

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

Nitrate and nitrite sampling was conducted every three months as required.

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

Sodium sampling was last conducted on July 11, 2011.

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

Fluoride sampling was last conducted on July 11, 2011.

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

For the December 15, 2014 to April 15, 2015 and June 15, 2015 to October 15, 2015 periods, samples were taken at two distribution locations and tested for pH and alkalinity as required under the plumbing exemption sampling schedule.

- \* **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

- \* **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.**

### OTHER INSPECTION FINDINGS

- \* **The following issues were also noted during the inspection:**

Regarding logbooks, a best practice item was observed in that the entries in the wellhouse logbook contain blank lines between daily entries. This is not an ideal practice as it can allow for the recording of information at a later date within the existing log entry.

RECOMMENDATION: It is suggested that the Operating Authority consider crossing out empty lines from daily log entries to avoid the potential for the back entry of information.

**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.

### 1. The following issues were also noted during the inspection:

Regarding logbooks, a best practice item was observed in that the entries in the wellhouse logbook contain blank lines between daily entries. This is not an ideal practice as it can allow for the recording of information at a later date within the existing log entry.

**Recommendation:**

It is suggested that the Operating Authority consider crossing out empty lines from daily log entries to avoid the potential for the back entry of information.

**SIGNATURES**

Inspected By:

Martha Weber

Signature: (Provincial Officer):



Reviewed &amp; Approved By:

Lisa Williamson

Signature: (Supervisor):



Review &amp; Approval Date:

14 SEP 2015

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**

### **Inspection Rating Record**



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

DWS Name:	MOOREFIELD DRINKING WATER SYSTEM
DWS Number:	260069732
DWS Owner:	Mapleton, The Corporation Of The Township Of
Municipal Location:	Mapleton

Regulation: O.REG 170/03  
 Category: Large Municipal Residential System  
 Type Of Inspection: Focused  
 Inspection Date: August 20, 2015  
 Ministry Office: Guelph District

Maximum Question Rating: 454

Inspection Module	Non-Compliance Rating
Source	0 / 28
Capacity Assessment	0 / 30
Treatment Processes	0 / 81
Operations Manuals	0 / 28
Logbooks	0 / 14
Certification and Training	0 / 28
Water Quality Monitoring	0 / 112
Reporting & Corrective Actions	0 / 21
Treatment Process Monitoring	0 / 112
<b>TOTAL</b>	<b>0 / 454</b>

Inspection Risk Rating	0.00%
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<b>FINAL INSPECTION RATING:</b>	<b>100.00%</b>
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Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2015-2016)

DWS Name: MOOREFIELD DRINKING WATER SYSTEM
DWS Number: 260069732
DWS Owner: Mapleton, The Corporation Of The Township Of
Municipal Location: Mapleton

Regulation: O.REG 170/03  
Category: Large Municipal Residential System  
Type Of Inspection: Focused  
Inspection Date: August 20, 2015  
Ministry Office: Guelph District

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Maximum Question Rating: 454

Inspection Risk Rating	0.00%
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<b>FINAL INSPECTION RATING:</b>	<b>100.00%</b>
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