APPENDIX "D"

# City of Barrie
# Water Operations Branch

# Drinking Water System
# 2016 Municipal Summary Report
# Schedule 22, O.Reg. 170/03

For the Period of

**JANUARY 1 TO DECEMBER 31, 2016**

| | |
|---|---|
| **System Rating:** | Water Treatment Subsystem Class IV<br>Water Distribution and Supply Subsystem Class IV<br>Water Distribution Subsystem Class II |
| **Drinking Water System No.:** | 220001192 |
| **Municipal Drinking Water Licence No.:** | 014-101, Issue No. 3 |

Effective Date: 2017-02-28

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## APPENDICES

## 1 Introduction

The City of Barrie Water Operations Branch (the Branch) has prepared this summary report to satisfy the requirements of Schedule 22-2 of Ontario Regulation 170/03 (O.Reg.170/03). Schedule 22-2 (1) and (1)(a) require that the owner of a drinking water system ensure that a report is prepared in accordance with subsections (2) and (3) for the preceding calendar year. The summary report must be provided to the members of the municipal council, in the case of drinking water systems owned by a municipality, and must be available no later than March 31 of each year.

This report includes the period from January 1, 2016 to December 31, 2016, and the information provided complies with the reporting requirements outlined in Schedule 22-2 (2) and (3) of O.Reg.170/03.

## 2 Schedule 22-2 Reporting Requirements

Schedule 22-2 requires that the report include the following:

- Schedule 22-2 (2) requires:
    - List the requirements of the Act, the regulations, the system's approval, drinking water works permit, municipal drinking water licence, and any orders applicable to the system that were not met at the time during the period covered by the report; and
    - For each requirement referred to above that was not met, specify the duration of the failure and the measures that were taken to correct the failure.
- Schedule 22-2 (3) requires:
    - A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows; and
    - A comparison of the summary referred to above to the rated capacity and flow rates approved in the system's approval, drinking water works permit or municipal drinking water licence.

## 3 Evidence of Compliance

### 3.1 Compliance with Schedule 22-2 (2)

The following sections discuss the requirements in Schedule 22-2 (2).

#### 3.1.1 Orders

The Branch was not issued any orders during the 2016 reporting period pertaining to the requirements of:

- Safe Drinking Water Act (SDWA) and associated Regulations;
- System Approvals;
- Municipal Drinking Water Licence; and
- Drinking Water Works Permit.

The Branch was issued an order during the 2016 reporting period pertaining to the requirements of:

- Section 13 of the Health Protection and Promotion Act.

The Boil Water Order (the Order) was issued on October 18, 2016 following the break of both a watermain and sanitary line within the same trench, with suspected cross-contamination. The Branch responded to the incident immediately and resolved the incident in consultation with the Simcoe Muskoka District Health Unity (SMDHU) and the local MOECC Inspector. Impacted services were provided an alternate water supply until the infrastructure was repaired and the situation was remediated, including receipt of adequate analytical laboratory results confirming the potable water infrastructure was acceptable for use. The Order was rescinded on November 24, 2016.

A copy of the Order and the letter rescinding the Order is included in Appendix A for reference.

### 3.1.2 MOECC Drinking Water System Inspection

The MOECC conducted an annual inspection of portions of the Municipal Drinking Water System (the System) from November 2015 to February 2016, inclusive. Following the System inspection, the MOECC issued a report summarizing the findings, including regulatory non-compliances and recommendations and best practice issues, if applicable.

The MOECC conducted an annual inspection of portions of the System from November 2016 to January 2017, inclusive. The report summarizing the findings was not available for inclusion in this report.

#### 3.1.2.1 2015 Drinking Water System Inspection Findings

One (1) recommendation was reported in the 2015 MOECC Inspection Report issued on March 2, 2016. The inspection findings noted a recommendation that the Branch complete visual inspections of below grade chambers where distribution Air Relief Valve (ARV) and Pressure Reducing Valve (PRV) components were located. The Branch responded to the recommendation by creating work orders in the Computerized Maintenance Management System (CMMS). Details of the recommendation are noted in the MOECC Inspection Summary.

A copy of the MOECC Drinking Water System Inspection Summary is included in Appendix B for reference.

#### 3.1.2.2 Historical Drinking Water System Inspection Findings

The Branch summarized the regulatory non-compliances, MOECC recommendations for best practices that were received as a result of inspections, and actions taken by the Branch in response to inspection findings on the MOECC Drinking Water System Inspection Summary, which spans the 2010 to 2015 reporting periods, inclusive.

A copy of the MOECC Drinking Water System Inspection Summary is included in Appendix B for reference.

### 3.2 Compliance with Schedule 22-2 (3)

#### 3.2.1 Drinking Water System Production and Flow Rates

In accordance with Schedule 22-2 (3) and in order to assist the Owner in assessing the capability of the system to meet existing and planned uses of the system, the Branch prepared a summary of the quantities of water supplied during the reporting period, including monthly average and maximum daily flows in comparison to the rated capacities. The flows presented below are reported in Mega Litres (ML) to reflect the large quantities of water produced by the system.

The Branch supplied 13,853 ML of water in the reporting period. The average monthly flow from all sources within the drinking water system was 1,154 ML, which ranged from 505 ML (SWTP) to 28 ML (Well 15).

The Branch was approved to supply a total of 148.26 ML (148,264,000 L) of water per day from fifteen (15) sources, with approved capacity of each source ranging from 6.55 ML/day (various sources) to 60.00 ML/day (SWTP). The maximum volume of water supplied in any day (maximum day flow) from each source ranged from 4.29 ML (Well 13) to 26.92 ML (SWTP) during the reporting period, as illustrated in the Flow Summary graph included in Appendix C. Each source was operated within its respective permitted capacity during the reporting period, with the exception of Well 3A, 4A and 19 which were not operated in 2016.

The 2013 Council approved Water Supply Master Plan concluded that based on the maximum day water demand projections, the City of Barrie's current groundwater supply is sufficient to service Zones 1, 2N and 3N until 2031. However, the current surface water supply is not sufficient to meet maximum day demands from Zones 2S and 3S (including the annexation lands) until the year 2031. The maximum day demand projections for Zones 2S and 3S exceed the SWTP capacity by approximately 2MLD based on current demands. It is estimated that a 2 MLD reduction in water demand is potentially feasible through

the implementation of water efficiency measures. In the event that maximum day demands exceed reduction due to water efficiency, the Master Plan further recommends that the City proceed with optimization of existing unit processes at the SWTP and minor upgrades including:

- Upgrading one of the existing 15.75 MLD pumps to 31.5 MLD at the low lift pumping station
- Increasing the primary membrane operating temperature above 8°C
- Undertaking consultation with the supplier and minor upgrades required to achieve "sprint" production capacity

A copy of the summary tables and figures are included in Appendix C for reference.

## 4 Closure

It is the belief of the Branch that this report satisfies the requirements of O.Reg. 170/03, Schedule 22. If you have any questions concerning the contents of this report, please contact the Supervisor of Compliance and Technical Support at the Branch.

# Appendix A Orders

simcoe muskoka
DISTRICT HEALTH UNIT

# ORDER
## Made pursuant to Section 13 of the *Health Protection and Promotion Act*, R.S.O. 1990, c. H.7

| Barrie Drinking Water System | City of Barrie | |
|---|---|---|
| Premise Name | Owner/Operator | |
| Distribution system and plumbing for #'s 36, 40, 42, 44, 46 Brennan Ave. & 229 Kempview Lane | City of Barrie | 10/18/2016 |
| Premise Address | Municipality | Date (Month/Day/Year) |

I, Steve Borgh a Public Health Inspector for the Simcoe Muskoka District Health Unit order you to take the following actions:

- Notify all users to boil water or use an alternate source of drinking water.
- Investigate the issue and take all reasonable steps to ensure the distribution system is not compromised and that the water is safe for consumption.
- For temporary connections: flush until desired residual is maintained at all taps, provide two sets of Microbiological samples at least 24 hours apart. For each of the 6 homes affected: once two consecutive sets of satisfactory samples are received, notify the users that the water is considered potable.
- For affected main: follow all procedures relating to a category 2 with Sewage contamination under the Ontario Watermain Disinfection Procedure

Contact the Simcoe Muskoka District Health Unit after all mitigation strategies and corrective actions have been completed before this Order is rescinded.

**THE REASONS FOR THIS ORDER ARE THAT:**

An assessment of the above mentioned drinking water system owned and operated by you was made on September 1, 2016 by Karen Kivilahti, Public Health Inspector for the Environmental Health Department of the Simcoe Muskoka District Health Unit, at which time the following condition(s) were noted:

- There was a break to both the watermain and sanitary line within the same trench with suspected cross-contamination.

**I AM OF THE OPINION, ON REASONABLE AND PROBABLE GROUNDS, THAT:**

1. A health hazard exists in the health unit served by me; and
2. The requirements specified in this Order are necessary in order to decrease the effect of or eliminate the health hazard.

**NOTICE**

**TAKE NOTICE THAT** you are entitled to a hearing by the Health Services Appeal and Review Board in accordance with section 44 of the *Health Protection and Promotion Act,* R.S.O. 1990, c. H.7, if you deliver to the Medical Officer of Health for Simcoe Muskoka District Health Unit at 15 Sperling Drive, Barrie, Ontario L4M 6K9 and to the Health Services Department Appeal and Review Board at 151 Bloor Street West, 9th Floor, Toronto, Ontario, M5S 2T5, notice in writing, requesting a hearing within fifteen (15) days after service of this Order.

**AND TAKE FURTHER NOTICE THAT** although a hearing may be requested, this Order takes effect when it is served upon you.

**FAILURE** to comply with this Order is an offence for which you may be liable, on conviction, to a fine of not more than $5,000.00 in the case of a person or to a fine of not more than $25,000.00 in a case of a corporation, for every day or part of each day on which the offence occurs or continues.

THIS ORDER IS GIVEN BY:

Steve Borgh

Public Health Inspector, C.P.H.I. (C),
Health Protection Service
Simcoe Muskoka District Health Unit

Served upon: Chris Harper (Print Name) Received by: (Signature)

Date: 16/10/19 Time: 2:05 pm

simcoe muskoka
DISTRICT HEALTH UNIT

November 24, 2016

Barrie Drinking Water System
#'s 36, 40, 42, 44, 46 Brennan Ave. & 229 Kempview Lane
Barrie, ON

Attention: City of Barrie

We have received the necessary satisfactory test results and supporting information from City of Barrie.

The boil water order issued by the Simcoe Muskoka District Health Unit is hereby rescinded.

All users originally notified may be informed that the advisory has been lifted.

Yours truly,

Steven C. Borgh
C.P.H.I. (C)
Public Health Inspector
Simcoe Muskoka District Health Unit


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**Midland:**
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# Appendix B MOECC Drinking Water System Inspection Summary

# Ministry of Environmental and Climate Change
# Drinking Water System Inspection Summary

| Item No | Applicable Requirement | MOECC Non-Compliance With Regulatory Requirements | Actions Taken | MOECC Recommendations and Best Practice Issues | Actions Taken |
|---|---|---|---|---|---|
| **2015** | | | | | |
| 1 | N/A | None | None | The municipality consider effecting a twice-yearly visual check of all below grade chambers where distribution system ARV and PRV components are located where there is a risk of water intrusion or at a minimum, the recommended inspection schedule suggested by the manufacturer. Literature from the manufacturer of the most common ARV and PRV devices installed within the distribution system provides a recommendation of annual inspection to ensure correct operation. | Creation of CMMS cyclical work orders to ensure once yearly inspection. Wet ARV and PRV inspection results will render a follow up inspection scheduled within 6 months and every 6 months thereafter until found dry, and return to annual inspection cycle. |
| **2014** | | | | | |
| 1 | Ontario Water Resources Act: Permit to Take Water #5183-8EZKMA | The owner was not in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the Permit and License or Approval issued under Part V of the Safe Drinking Water Act.<br><br>**WOB Summary:**<br>Well 15 ran at a flow rate (112 L/s actual, allowed 106 L/s) beyond PTTW maximums for several months, on one day the well ran beyond the daily allowed $m^3$ (9742.2 $m^3$ actual, allowed 9100 $m^3$). | CAR 40 (closed) - SCADA set-points table was updated to include the maximum flow rate (L/s) allowed by the PTTW, improvements to the eRIS reporting tool were implemented to prompt operators to make comment on any anomalous values. | After a period of seven or more consecutive days when a production source is offline, the owner and the operating authority for the system ensure that no drinking water is supplied to a user of water after that period from that source, until raw and treated water microbiological samples have been taken and the results of the tests have been received by the owner and the operating authority. | Revised SOP to reflect Best Practice |

| Item No | Applicable Requirement | MOECC Non-Compliance With Regulatory Requirements | Actions Taken | MOECC Recommendations and Best Practice Issues | Actions Taken |
|---|---|---|---|---|---|
| 2 | SDWA: O.Reg.170/03 | Records did not confirm 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.<br><br>**WOB Summary:**<br>SCADA reports indicated several occasions where a value below critical set-points was recorded. OIC comments did not provide sufficient explanation as to the cause or reason for the anomalous value. Secondary records (work orders) did not contain sufficient information to provide an adequate explanation. | CAR 44 (closed) - improvements to the eRIS reporting tool were implemented to prompt operators to make comment on any anomalous values. | None | None |
| **2013** | | | | | |
| 1 | SDWA: O.Reg.170/03 | Records did not confirm 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.<br><br>**WOB Summary:**<br>SCADA reports indicated several occasions where a value below critical set-points was recorded. OIC comments did not provide sufficient explanation as to the cause or reason for the anomalous value. Secondary records (work orders) did not contain sufficient information to provide an adequate explanation. | CAR 26 (closed) - Report and Trending data was found to be extracted from different SCADA controllers producing values that were inconsistent. Report data switched to pull from trending data. Values are now consistently found on both reports and trending. | None | None |

| Item No | Applicable Requirement | MOECC Non-Compliance With Regulatory Requirements | Actions Taken | MOECC Recommendations and Best Practice Issues | Actions Taken |
|---|---|---|---|---|---|
| 2 | SDWA: O.Reg.170/03 | All continuous monitoring equipment utilized for sampling and testing required by O. Reg. 170/03, or approval or order, was not equipped with alarms or shut-off mechanisms that satisfied the standards described in Schedule 6.<br><br>**WOB Summary:**<br>Well #12 set-point was 0.09 mg/L above the minimum CT value and not the required 0.10mg/L required. Well #11 and #15 both allowed the well to start when chlorine residual was below the lockout threshold but above the minimum CT threshold on several occasions. SCADA system was displaying flat lines (frozen values) that were not commented on in the SCADA logbook. | CAR 24 (closed) - SCADA programming updated such that alarms and lockouts respond correctly. Operators instructed to comment on all flat lines. | None | None |
| 3 | SDWA: O.Reg.170/03 | All microbiological water quality monitoring requirements for treated samples were not being met.<br><br>**WOB Summary:**<br>Well #18 was used as a production source without first collecting required microbiological samples. Weekly samples collected for the week of April 21, 2013 were not delivered to the lab (left in sample fridge). This situation was not discovered until the following week. | CAR 25 (closed) - Well out of service process reviewed and updated. Operators instructed to ensure wells are not started until samples have been collected. Supervisor reviewing chain of custodies to ensure correct samples are collected. | None | None |
| **2012** | | | | | |
| 1 | N/A | None | None | The Owner should take every reasonable effort to meet the target to have 50% of valves in the distribution system exercised each year. Exercising valves is a valuable undertaking for system integrity, and can be crucial during emergency situations. | Efforts taken to improve valve-turning results. Valve turning remains below 10% per year. |

| Item No | Applicable Requirement | MOECC Non-Compliance With Regulatory Requirements | Actions Taken | MOECC Recommendations and Best Practice Issues | Actions Taken |
|---|---|---|---|---|---|
| 2 | N/A | None | None | As the Surface Water Treatment Plant is a tenant of the City of Barrie Facilities Department, Facilities Staff have access to the SWTP. As these employees are not Certified Operators there is some concern over access control to treatment and process areas. In addition, as there are antennae installed at the tower locations, persons who are not Certified Operators have access to the sites. It is recommended that efforts be taken to ensure that only appropriate personnel have access to components of the drinking water system. Control over access to drinking water system treatment equipment and components is important to protecting the drinking water system. | Facilities Staff entering the Low Lift Pumping Station are required to sign into the on site logbook denoting work undertaken. When accessing the Surface Water Treatment Plant Facilities Staff must advise the OIC of the work to be completed. |
| 3 | N/A | None | None | During the inspection review period, it was indicated that SCADA upgrades are being undertaken for the groundwater system. It is recommended that the Owner develop reports from trending data that are specific to primary and secondary treatment, and contain information that is critical to ensuring safe drinking water is provided to customers. Consideration should be given to removal of less significant data. | Several reports were created in eRIS for both the SWS and GWS groups. MOECC specific inspection reports exist to provide only critical data to the MOECC Inspector. |

| Item No | Applicable Requirement | MOECC Non-Compliance With Regulatory Requirements | Actions Taken | MOECC Recommendations and Best Practice Issues | Actions Taken |
|---|---|---|---|---|---|
| **2011** | | | | | |
| 1 | Ontario Water Resources Act: Permit to Take Water #5183-8EZKMA | The Permit to Take Water (PTTW) imposed conditions beyond limiting takings and the owner had not complied with the conditions of the PTTW.<br><br>**WOB Summary:**<br>Weekly monitoring of water levels at several wells was not completed on several occasions. When levels were collected work orders were recorded as "-" or "NR" on several occasions even though logbooks indicated that the levels were collected. | CAR 13 (closed) - Work orders were updated to clearly indicate the requirement to collect the static water levels. Static value reading being incorporated into SCADA system by end of year 2012. | It is recommended that the Owner of the Barrie Drinking Water System take steps to improve the quality and organization of records and logbooks, to facilitate the assessment of compliance. Such improvements could include, but are not limited to; making logbook entries legible, including more detail in logbook entries, where transcription of data is undertaken ensure the record is complete and label data in such a manner that it reflects the data recorded. | Logbook training provided to Operators. |
| 2 | SDWA: O.Reg.170/03 | All microbiological water quality monitoring requirements for treated samples were not being met.<br><br>**WOB Summary:**<br>For several weeks both the GWS and SWS failed to indicate the requirement for the lab (SGS) to analyze for Heterotrophic Plate Counts (HPC). As a result HPC parameter was not tested for. | CAR 14 (closed) - Chain of custody updated such that all sources are pre-checked for HPC testing. Distribution chain of custodies updated with highlighting to remind Operator to include 25% HPC tests. | It is recommended that the operators for both the groundwater and surfacewater treatment plants receive additional training with regards to CT, and understand the values required to ensure adequate primary disinfection is achieved at each source under his/her responsibility. | Disinfection training provided to Operators. |
| 3 | SDWA: DWWP MDWL | All water quality monitoring requirements imposed by the Permit and License or Approval issued under Part V of the SDWA were not being met.<br><br>**WOB Summary:**<br>Well 5 UV transmittance values were not collected weekly as required. In some instances work orders indicated that the value was measured but no value was recorded. | CAR 15 (closed) - Work order process updated to ensure appropriate work orders are distributed in absence of the Lead Hand. Verification by UPCs will ensure that Lead Hand is notified of errors and omissions. | None | None |

| Item No | Applicable Requirement | MOECC Non-Compliance With Regulatory Requirements | Actions Taken | MOECC Recommendations and Best Practice Issues | Actions Taken |
|---|---|---|---|---|---|
| 4 | SDWA: O.Reg.170/03 | All changes to the system registration information were not provided within ten (10) days of the change.<br><br>**WOB Summary:**<br>The City of Barrie Drinking Water System Profile was not updated to indicate that the Surface Water Treatment Plant was an entry point into the drinking water system; nor did the profile indicate that Lake Simcoe was being used as a raw water source. | CAR 16 (closed) - QMS Team Strategy was updated to reflect which role is responsible for completion of the notification document. | None | None |
| **2010** | | | | | |
| 1 | SDWA: O.Reg.170/03 | Records did not confirm 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.<br><br>**WOB Summary:**<br>On several occasions the distribution system residual was recorded below 0.05 mg/L. | CAR not issued - no actions required as per MOECC Inspection Report as all instances of chlorine below 0.05 mg/L were reported to the MOECC as required. | None | None |
| 2 | SDWA: DWWP MDWL | Turbidity monitoring of raw water was not being conducted in accordance with this provision.<br><br>**WOB Summary:**<br>Raw water turbidity was not collected at Wells 12, 14, 15 and 17 on several occasions. | CAR not issued - no actions required as per MOECC Inspection Report as GWS was already in the process of moving treated water turbidity analyzers to the raw water inlet. | None | None |

# Appendix C Tables and Figures

## Drinking Water System Usage

| Source | Approved Daily Capacity (ML/day) | Maximum Day Flow (ML/day) | Average Day Flow (ML/day) | Monthly Average Flow (ML/month) | Annual Total Volume (ML) |
|---|---|---|---|---|---|
| Well 5 | 6.55 | 5.38 | 1.31 | 40 | 481 |
| Well 7 | 6.55 | 6.05 | 2.69 | 82 | 986 |
| Well 9 | 6.55 | 5.26 | 1.67 | 51 | 610 |
| Well 11 | 9.10 | 6.92 | 2.51 | 77 | 920 |
| Well 12 | 9.10 | 7.33 | 1.36 | 42 | 499 |
| Well 13 | 6.55 | 4.29 | 1.44 | 44 | 527 |
| Well 14 | 9.10 | 8.64 | 3.17 | 97 | 1,160 |
| Well 15 | 9.10 | 8.54 | 0.91 | 28 | 333 |
| Well 16 | 7.86 | 5.77 | 1.50 | 46 | 549 |
| Well 17 | 11.23 | 8.87 | 2.52 | 77 | 921 |
| Well 18 | 11.23 | 8.72 | 2.21 | 67 | 809 |
| SWTP | 60.00 | 26.92 | 16.57 | 505 | 6,065 |
| System | 148.26 | 58.77 | 37.85 | 1,154 | 13,853 |