TO:	**GENERAL COMMITTEE**
SUBJECT:	**WATER OPERATIONS BRANCH - 2017 DRINKING WATER SYSTEM REPORTS**
PREPARED BY AND KEY CONTACT:	**C. MARCHANT, MANAGER OF WATER OPERATIONS EXT. 6145**
SUBMITTED BY:	**J. THOMPSON, P.ENG., CMM III IP, PMP DIRECTOR OF ENVIRONMENTAL SERVICES**
GENERAL MANAGER APPROVAL:	**R. FORWARD, MBA, M.Sc., P.ENG. GENERAL MANAGER OF INFRASTRUCTURE AND GROWTH MANAGEMENT**
CHIEF ADMINISTRATIVE OFFICER APPROVAL:	**MICHAEL PROWSE, CHIEF ADMINISTRATIVE OFFICER**

RECOMMENDED MOTION

1. That the Appendices “A” through “F” attached to Staff Report ENV001-18, regarding the City of Barrie’s Drinking Water System be received for information purposes.

PURPOSE & BACKGROUND

2. The purpose of this Staff Report is:

   a) To summarize the System operating year of January 1, through to December 31, 2017; provide information to the City Council on the performance of the System; and to satisfy the regulatory requirements of the Safe Drinking Water Act (SDWA), including the Drinking Water Quality Management Standard (DWQMS) and regulatory reporting requirements under Section 11 and Schedule 22 of O.Reg. 170/03. This report is a compilation of information that demonstrates the commitment of the Water Operations Branch (the Branch) to providing safe drinking water while being transparent and financially accountable; and

   b) To solicit from Council an acknowledgement of their receipt of the Annual Report and Municipal Summary Report.

3. The “Water Operations Branch 2017 Drinking Water System Report” summarizes the operating year of January 1, 2017, through to December 31, 2017.

4. There are two (2) specific reporting requirements related to O.Reg. 170/03:

   a) Section 11 requires that an Annual Report be prepared not later than February 28 of each year. This report provides a brief description of the System; chemicals used; a breakdown of monetary expenses related to required equipment; a summary of all test results; a summary of adverse reports and corrective actions taken. In addition, the report entitled, “2017 Drinking Water System Operations Report”, must be available to the public upon request and be posted for viewing on the City of Barrie website.

b) Schedule 22 requires a summary report be prepared not later than March 31 of each year and a copy forwarded to members of municipal council to enable the owner of the drinking water system to assess the capability of the system to meet existing and planned uses of the system. This report entitled, "Municipal Summary Report", lists the non-compliances in respect to the SDWA, O.Reg. 170/03, the Municipal Drinking Water License, the Drinking Water Works Permit, and orders applicable to the System received, and the corrective measures that were taken in respect to the non-compliances. It also summarizes the quantities of the water supplied during the reporting year, including monthly average and maximum daily flows, along with a comparison to the rated capacities.

5. In addition, under the DWQMS, there is an obligation for the Operating Authority to report the results of the management reviews, the identified deficiencies, decisions, and action items to the Owner.

ANALYSIS

6. The System consists of a Surface Water Treatment Plant (SWTP) and associated Low Lift Pumping Station (LLPS), 12 ground water wells, three (3) in-ground storage facilities, three (3) elevated storage reservoirs and seven (7) booster stations, distribution water mains and associated hydrants, valves, and appurtenances in five (5) major pressure zones throughout the City. Source water for the SWTP is drawn from Kempenfelt Bay (the Bay) of Lake Simcoe. Water supplied from the groundwater system relies on wells drilled into a deep aquifer that is not under the direct influence of surface water. The distribution system consists of approximately 3,737 hydrants and approximately 629 km of water main and transmission main serving approximately 43,956 services providing water to approximately 147,000 customers.

7. The total annual production for 2017 was 13,048 ML with an average daily flow of 36 ML and a maximum daily flow of 53 ML in the month of July 2017.

8. The total cost to operate the System was approximately $1,505.14/ML. The total production and treatment costs amounted to approximately $451.84/ML. Total distribution system operating costs amounted to approximately $4,484/km of watermain.

9. Approximately 89% of the projected budget was consumed and approximately 95% of the projected water revenues were collected; therefore, approximately $6,609,821 was transferred to the Water Rate Reserve Fund.

10. More than 2,900 samples were collected for independent laboratory analysis under the regulatory sampling program for chemical and microbiological parameters in 2017. The analytical results are used to assess and optimize system performance, develop corrective actions, ensure safe water for consumption and to meet legislative requirements.

11. Zero (0) Adverse Water Quality Incidents (AWQIs) were reported in 2017.

12. The MOECC conducted an annual inspection of portions of the System from November 2016 to February 2017, 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. One (1) non-compliance with regulatory requirements, was reported in the 2016 MOECC Inspection Report issued on February, 2017. The inspection findings noted a non-compliance which the Branch promptly responded to.

13. The QMS was subject to an external audit in December 2017. The re-accreditation audit included an off-site desktop audit of the Operational Plan. There were zero (0) non-conformances identified by the external auditor, indicating 100% conformance with regulatory requirements, and accreditation was maintained for the 2017/2018 operating year.

ENVIRONMENTAL MATTERS

14. There are no environmental matters related to the recommendation other than regulatory compliance.

ALTERNATIVES

15. As this Report is being presented as required legislatively, and for information purposes only, no alternatives are presented.

FINANCIAL

16. There are no direct financial implications associated with the recommended motions.

LINKAGE TO COUNCIL STRATEGIC PRIORITIES

17. The recommendations included in this Staff Report are not specifically related to any of City Council's Strategic Priorities but is a requirement of ongoing service delivery.

APPENDICES

a) Appendix "A" – 2017 Drinking Water System, Operations Report
b) Appendix "B" – 2017 Annual Report, Section 11, Ontario Regulation (O.Reg.) 170/03
c) Appendix "C" – 2017 Lead Testing Report, Schedule 15.1, O.Reg. 170/03
d) Appendix "D" – 2017 Municipal Summary Report, Schedule 22, O.Reg. 170/03
e) Appendix "E" – Ministry of Environment and Climate Change (MOECC) Standard of Care
f) Appendix "F" –Quality Management System (QMS) Management Review Meeting Minutes

Appendix A

2017 Operations Report to Council

City of Barrie
Water Operations Branch

Drinking Water System
Operations Report

For the Period of

JANUARY 1, 2017 TO DECEMBER 31, 2017

System Rating:	Water Treatment Subsystem Class IV Water Distribution and Supply Subsystem Class IV Water Distribution Subsystem Class II
Drinking Water System No.:	220001192
Municipal Drinking Water Licence No.:	014-101, Issue No. 5

Effective Date: 2018-02-26

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1 Introduction

The purpose of this report is to summarize the City of Barrie (the City) Municipal Drinking Water System (the System) operating year from January 1, 2017 to December 31, 2017 and to provide information to City Council on the operation and performance of the System. This report is a compilation of information that demonstrates the commitment of the Water Operations Branch (the Branch) to providing safe drinking water while remaining transparent, financially accountable and demonstrating initiative to drive continual improvement.

The Branch's commitment to the aforementioned is driven by the following five (5) priorities:

1. To ensure the delivery of safe drinking water that met or exceeded regulatory requirements
2. To ensure the delivery of safe drinking water that met or exceeded expectations and promoted customer confidence
3. To employ and retain a respectful, competent, motivated and adaptive workforce that was dedicated to teamwork, continual learning and improvement for the long term
4. To continually improve operational performance in a timely, sustainable and cost effective manner
5. To maintain an effective balance between expenditures and revenues

The following sections provide details of the 2017 achievements that support the Branch priorities listed above.

2 Program Review

2.1 Water Operations Branch

2.1.1 Branch Services

The primary objective of the Branch is the production and delivery of potable water via our two sources; 1) twelve (12) active groundwater wells located throughout the city and 2) the Surface Water Treatment Plant that draws water from Lake Simcoe from the intake within Kempenfelt Bay.

Automated meter reading technology provides for continuous water meter reading and analysis of consumption profiles and system dynamics. The Branch maintains customer water meters at peak performance for accurate water meter consumption readings, resulting in accurate revenue generation. Customer service is provided through service call processes relating to new meter installation, meter repair and replacement, leaking meter repairs, water quality complaints, service flushing, and high bill investigations.

Compliance and conformance is achieved by way of the Branch's Quality Management System (QMS). Training is an integral part of operating and maintaining the System. The Compliance and Technical Support Section provides development and implementation of programs that ensure compliance and improves Branch efficiencies associated with regulatory and accreditation requirements.

The Branch provides other services including assisting with fire flow testing for new building designs, subsurface infrastructure locates, review of design drawings, and the installation, inspection, and commissioning of commercial water services on private property. Additionally, the Backflow Prevention Program provides protection of the drinking water system from cross-connection contamination.

2.1.2 Training

The Branch Management Team recognizes the importance of employee training as it fosters improved performance, creates adaptability and is a legislated requirement for certified operators. The System is comprised of 3 types of subsystems as defined under provincial O.Reg. 128/04: a Class 4 Water Treatment subsystem, a Class 4 Water Distribution and Supply subsystem and a Class 2 Water Distribution subsystem; therefore, water operators require up to 50 hours of training annually based on the highest system worked in per year. In 2017, approximately 3,228 hours of staff training occurred to

satisfy minimum requirements of operator training. Twenty (20) operators were awarded certificate renewals and six (6) operators were awarded certification upgrades during this reporting period.

2.1.3 Research and Educational Partnerships

In partnership with both the University of Toronto and University of Waterloo, the Branch provides sponsorship to the Natural Sciences and Engineering Research Council which supports university students in advanced studies and promotes discovery research. Not only does the partnership allow the Branch to participate in water treatment research but it also helps guide the research conducted by these schools. The current research work being conducted by the Universities is primarily associated with Surface Water Treatment Plant processes and includes a small scale replica “pilot plant” located within the Plant, which allows Staff to actively participate in the research projects and be some of the first benefactors of the research being conducted.

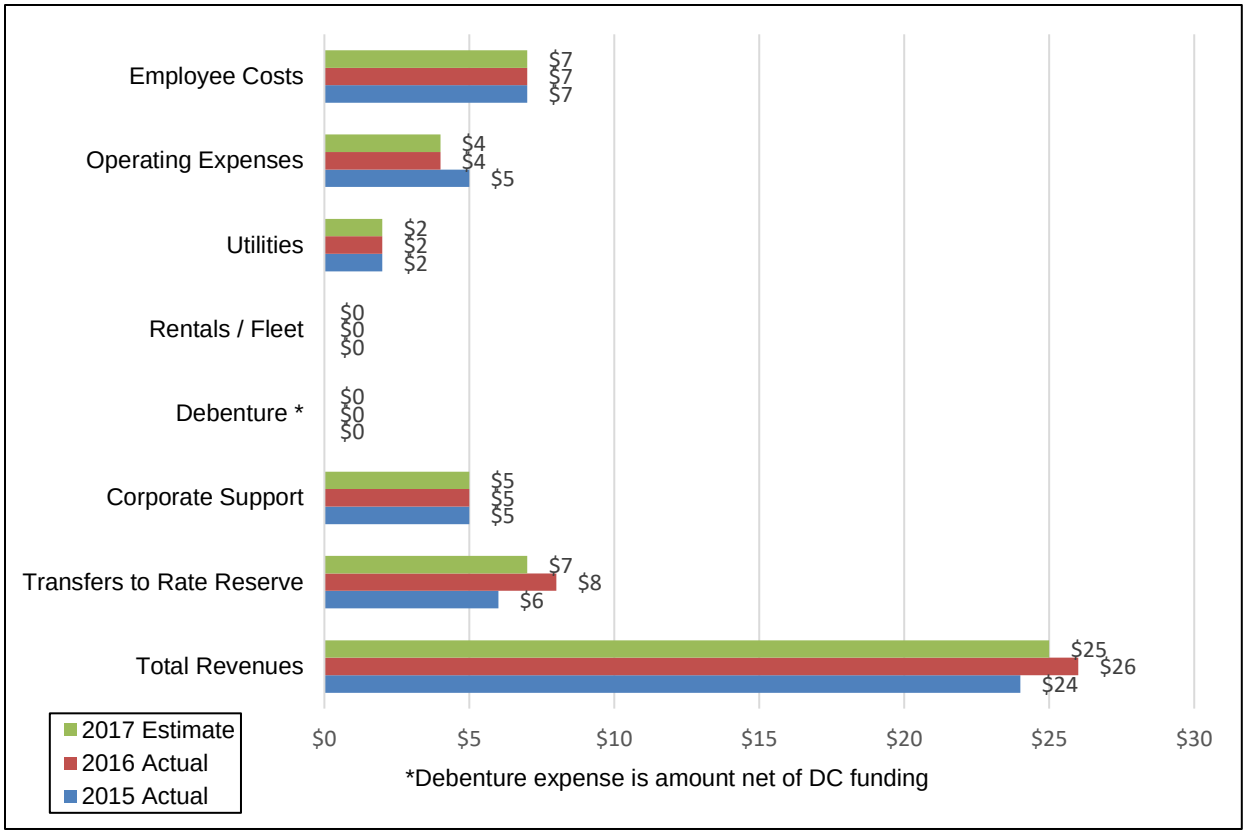
2.1.4 Budget and Costs

Approximately 89% of the projected operating budget funds were utilized and approximately 95% of the projected water revenues were collected; as such, approximately $6,609,821 was transferred to the Water Rate Reserve Fund. References to financials within this report are based on the 2017 ledger prior to finalization and excludes debenture costs.

Accounts for utilities (natural gas and hydro) in both the Surface Water Supply and Ground Water Supply Sections were under spent, however the Branch relies on Energy Management staff to establish these budgets each year. Planned annual well maintenance was not completed at two well sites as initially scheduled, resulting in underspending of approximately $170,000 in Contracted Services within the Ground Water Supply Section. This was due to further works being required at other locations within the same maintenance schedule. Maintenance of these sites will be included within the 2018 maintenance schedule. Additionally, a warmer winter meant less overtime spending across the Water Distribution and Water Customer Services Sections as staff had fewer watermain breaks and service leaks to deal with in afterhours/overtime situations, normally associated with more severe, extended cold winter temperatures.

The graph below illustrates the total revenues of the Branch and demonstrates the distribution of revenues.

Figure 1 – Water Operations Revenues and Fund Allocation



In accordance with O.Reg. 453/07, the Operating Authority developed a financial plan to promote sustainability of the drinking water system. The scope of the Financial Plan spans a six (6) year period and contains details of the financial position, financial operations, and cash flow of the System. The Financial Plan was updated in October of 2015 and a copy of which can be found at www.barrie.ca.

The operation of the System is primarily divided in four (4) groups of services which are distributed among the five (5) organizational sections of the Branch. These four (4) groups are:

- Water Treatment Services
- Water Distribution Services
- Water Customer Services
- Compliance and Technical Support

Details regarding the performance and operations of the above noted Sections are discussed in the sections below.

2.2 Water Treatment Services

Water Treatment is the first step to ensuring the production and distribution of safe drinking water. This includes water treatment, storage tank monitoring, operation and maintenance, and water sampling.

Water treatment within the System consists of the operation and maintenance of the Groundwater System, which generally supplies the north service area of the city and the Surface Water Treatment Plant, which generally supplies the south service area with potable water. Reservoir monitoring, operation, and maintenance activities were conducted to ensure the availability of adequate quantities and required pressures in the distribution system for consumption and firefighting purposes.

The Surface Water Treatment Plant completed its seventh (7th) full calendar year of operation in 2017. The Plant was designed to achieve 98% efficiency and during 2017, the annual efficiency of the Surface Water Treatment Plant averaged 97.6%. Although, the Surface Water Treatment Plant appears to be operating slightly below the designed efficiency, the remaining 0.3% is attributed to pilot plant usage, service water usage and treated wastewater produced by filter backwashes discharging to the sanitary sewer.

The total annual water production for 2017 was 13,048 ML, with the average daily flow of 36 ML, representing a decrease from 2016 of 805 ML and 2 ML respectively. In 2017, a maximum daily flow of 53 ML occurred in July 2017. Typically, changes in peak and maximum days are contributed to seasonal fluctuations in weather. For example, a hot, dry summer with drought-like conditions typically results in a higher than normal peak and maximum day production volumes; the opposite is also true, a colder, wet summer typically results in lower than normal peak and maximum day production volumes which was the trend during 2017.

2.2.1 Preventative Maintenance Highlights

The following sections summarize the significant maintenance activities that were completed within the treatment services Sections in 2017.

2.2.1.1 Groundwater Supply

In 2017, the Groundwater Supply Section completed the following significant maintenance activities:

- Exterior cleaning of Ferndale Water Tower
- Well rehabilitation works to reduce sand production at Centennial Well 15
- Pump replacement at Johnson Well 9
- Calibrated all system flow meters and pressure transmitters.
- Continued development and implementation of the Supervisory Control and Data Acquisition (SCADA) reporting software
- Overhauled all turbidity monitoring equipment
- Cleaned all silicate tanks within the System
- Completed Backflow Prevention and Cross Connection control plumbing upgrades
- Upgraded fuel systems on emergency back-up generators to ensure currency with the Technical Standards and Safety Act
- Interior and exterior cleaning of Bayfield Tower
- Overcoat painting with new corporate logo on Bayfield Tower
- Well and pump maintenance performed at two (2) well locations: Sarjeant Well 7, Brownwood Well 16

2.2.1.2 Surface Water Supply

In 2017, the Surface Water Supply Section completed the following significant maintenance activities associated with the Surface Water Treatment Plant:

- Contracted services completed camera inspections of the Low Lift wet well and intake pipe
- Employed the use of remote submersible camera to complete video inspections of internal tanks and reservoirs
- Conducted multiple rounds of membrane repairs to maintain filter integrity and efficiency
- Improved the level of service of the internal laboratory by expanding the suite of parameters being analyzed, which allowed Operators to realize efficiencies within the treatment processes
- Ongoing studies completed in partnership with University of Toronto realized efficiencies which extended the life span of the Granular Activated Carbon (GAC) media, while still achieving the desired taste and odour removal aesthetic objectives

2.3 Water Distribution Services

The potability of drinking water in the distribution system is controlled through water quality monitoring, preventative and reactive maintenance. Staff conduct various activities on a routine basis, including field inspections, sampling, and testing, as a means of monitoring the performance of the distribution system.

The Branch conducts regular system flushing to ensure that the water quality at the extents of the distribution system meets or exceeds aesthetic objectives and regulatory requirements for disinfection. Regular maintenance and repairs of watermains, service connections, hydrants, valves, and controls preserve the integrity of the infrastructure. The Branch is also responsible for hydrant repairs, while contracted services perform general hydrant maintenance, including snow removal and bi-annual hydrant fitness checks.

2.3.1 Swabbing Program

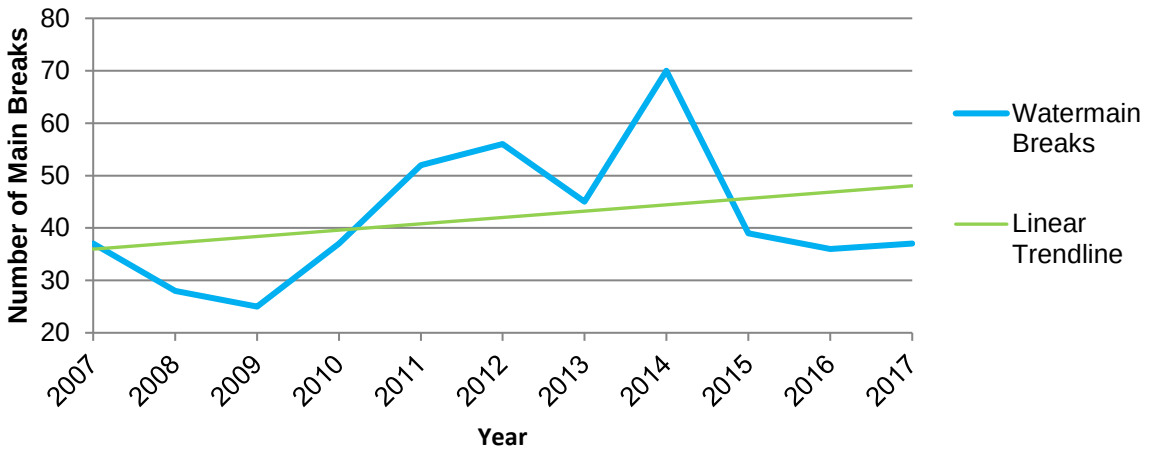
In 2017, 37 km of watermain swabbing was completed in the northwest portion of the City, representing approximately 5.8 % of the System. The program is assisted by a Field Liaison person ('Green Vest') assigned to ensure customers are informed and concerns are addressed immediately. Positive feedback from field staff and customers regarding the level of service continue with the use of programs like the use of a Field Liaison Person ("Green Vest") and increased public communications prior to, and during the annual Swabbing Program. In 2018, it is the intention of the Branch to complete all swabbing in-house without the assistance of contracted staff, utilizing heat mapping capabilities within the Branch's CMMS to identify focused areas where water quality complaints have been received.

2.3.2 Watermain Breaks and Frozen Services

The number of watermain breaks increased by 3% in 2017 compared to 2016, with thirty-seven (37) watermain breaks in 2017 compared to thirty-six (36) watermain breaks in 2016. There were zero (0) incidents of frozen services in 2017, which was the same trend observed in 2016.

The graph below illustrates the historical trend of watermain breaks that occurred in the preceding ten (10) years.

Figure 2 – Watermain Breaks



2.3.3 Frozen Services Mitigation

A special Frozen Service Mitigation project was approved by Council in the spring of 2015 to repair or replace services known to be prone to freezing, initiated as a result of the hundreds of water services that froze during the exceptionally cold winters of 2014 and 2015. In most cases, the work entails moving the affected service underneath a storm culvert and insulating between the service and the culvert. This project is now administered by the Engineering Department as part of the Capital Plan. The project is anticipated to extend at least four (4) years to mitigate approximately three hundred and thirty-two (332) services prone to freezing. To date, approximately one-hundred and thirty-two (132) water services have been lowered or otherwise adjusted to prevent future freezing. Seventy (70) services were mitigated in 2017 as a part of this project.

2.3.4 System Growth, Rehabilitation and Renewal

New infrastructure is installed and commissioned in accordance with the City's Design Guidelines, in addition to the new MOECC Watermain Disinfection Procedure. In 2017, the Branch continued to update applicable Policies, Standard Operating Procedures (SOPs) and other documentation to reflect the regulatory changes and ensured applicable staff were trained in the implementation of the SOPs and Policies.

Infrastructure works completed in 2017 are summarized as follows:

- A large (750mm) diameter concrete transmission watermain on Ashford and Madelaine Drives between Big Bay Point Road and Mapleview Drive East. The new watermain was designed to create redundancy of water supply to pressure Zone 3S and eventually connect supply from the Surface Water Treatment Plant to a proposed drinking water storage facility on Salem Road.
- Fourteen (14) watermain construction projects were completed, which resulted in the commissioning of 8.9 km of new watermain.
- Thirty-two (32) Industrial, Commercial, Institutional (ICI) servicing projects were commissioned and completed.

2.3.5 Performance Indicators

The key performance indicators for the Water Distribution Services section are outlined below for 2017 with a comparison to those from the 2016 reporting period.

Table 1 - Water Distribution Services Key Performance Indicators

Description	2016	2017
Watermain Breaks	36	37
Hydrants Repaired/Replaced	351	294
Watermain Valves Inspected and Cycled	605	819
Service Repairs/Replacement	62	29
Curb Box Repairs/Replacement	452	200
Frozen Services	0	0
Frozen Service Mitigation Project (Services Upgraded)	19	70
Industrial/Commercial/Institutional (ICI) Watermain Tappings	32	17
Length of Watermain Commissioned (km)	1.9	8.9

2.4 Water Customer Services

Customer Service continues to be a priority for the Branch, striving to provide added value by offering a wide range of services. Customers are able to obtain information regarding drinking water quality and regulatory requirements, and obtain access to call out and scheduled appointment services for the resolution of water quality, water meter, and billing related concerns.

Nine (9) certified water operators are responsible for ensuring approximately 43,956 services maintain access to quality water at the tap. In 2017, a total of 168 new water meters were installed in residential and ICI applications, representing a 34% decrease from the previous year. This decrease is attributed to a reduction in the amount of new development within the City in 2017; however it is anticipated that the amount of new water meter installations will increase significantly in the coming years, as development projects are initiated in the annexed lands.

Continuous monitoring of water consumption is accomplished through Automated Metering Infrastructure (AMI). Ongoing efforts of staff ensure that greater than 99% of all water meters provide up-to-date, accurate meter readings for billing purposes throughout each quarter of the year.

As an Ontario 1Call member, the Branch utilizes three (3) Utilities Technicians within the Water Customer Services Section to ensure utility locates are provided for all corporately owned buried infrastructure. As per the Underground Infrastructure Notification System Act (UINSA), locate requests received are completed within the mandatory five (5) business days, unless otherwise negotiated with the locate requestor. The level of service mandated and achieved for this service was 100% in 2017.

2.4.1 Water Quality Investigations

Water quality complaint investigations that required action from field staff averaged twelve (12) complaints per month in 2017, a substantial decrease over the value reported in 2016 (24.8 complaints per month). The observed decrease is attributed, in large part, to two factors; the first, being an average to mild winter; and the second factor being the strategic deployment of automated flushing stations (flush boxes). In 2017, zero (0) "No Water" complaints were received resulting from frozen services due to a mild winter. The deployment of flush boxes was completed based on 2016 water quality complaint data that was logged and geographically mapped using data extracted from the Computerized Maintenance Management System (CMMS). As a result, water quality complaints in the areas where flush boxes are deployed are greatly reduced.

2.4.2 Watermain Flushing Program

In 2017, Water Customer Services continued to focus its flushing efforts on areas of the distribution system that were prone to water quality complaints and often serviced by aging infrastructure, as well as areas that had not been flushed in recent years. As such, pressure Zones 2N, 3N and a portion of Zone 2S were flushed in 2017. Additionally, thirty four (34) flush boxes were deployed in April 2017 and remained in service until November 2017. Each of these flush boxes operates on a daily basis for approximately one (1) hour and assist in maintaining adequate chlorine residuals and aesthetic water quality objectives within the Distribution System.

2.4.3 Performance Indicators

The key performance indicators for the Water Customer Services section are outlined below for the 2017 with a comparison to those reported in 2016.

Table 2 – Water Customer Services Key Performance Indicators

Description	2016	2017
New Water Meter/SmartPoint Installations – Residential and ICI	229	168
Water Quality Investigations – Residential and ICI (Includes: coloured water, low pressure/flow, no water, taste, odour)	298	146
Chargeable Service Calls – (Includes: illegal use of water, replace service valve, turn service off/on, financial turn off/on, pool fill, gate valve install/remove)	712	637

2.5 Compliance and Technical Support

The Compliance and Technical Support Section is responsible for regulatory conformance/compliance and reporting with respect to the System, as well as development and implementation of quality/risk management and optimization functions for the Branch. The core responsibilities of the Compliance and Technical Support Section include the: Backflow Prevention Program, CMMS, QMS and technical support as it relates to water infrastructure.

Significant achievements of the Compliance and Technical Support Section for the 2017 year are detailed under each of the following subsections.

2.5.1 Backflow Prevention Program

The Backflow Prevention Program has completed its ninth (9th) year of a planned 5-10 year implementation period. In 2017, the program focused on increasing clarity of the Backflow Prevention By-law and continued communication efforts to Barrie's ICI/Multi-residential community. As a result of an

increased focus and staff efforts, the new Backflow Prevention By-law (2017-121) was passed and the program is on track to accomplishing full implementation by the end of 2018.

2.5.2 Computerized Maintenance Management System

The CMMS is primarily used to facilitate the maintenance of the System to ensure that the System remains in a fit state of repair in accordance with the requirements of the Safe Drinking Water Act (SDWA). The CMMS ensures that operations and maintenance information is appropriately recorded regarding work completed on the System assets via scheduled and un-scheduled work activities. In 2017, the total percentage of emergency operational work performed on water assets was 1.34%, demonstrating the effectiveness of current preventative maintenance schedules.

2.5.3 Quality Management System

The Municipal Drinking Water License Program pursuant to the SDWA and the associated Drinking Water Quality Management Standard requires the Operating Authority to establish a QMS. The QMS is used to establish Standard Operating Procedures and Policies to ensure work associated with, and completed within the System is accomplished in a consistent manner that aligns with and adheres to regulatory requirements.

The QMS was subject to an external audit in December 2017 that evaluated the degree of conformity that the QMS had with regulated requirements. The re-accreditation audit included an off-site desktop audit of the Operational Plan. There were zero (0) non-conformances identified by the external auditor, indicating 100% conformance with regulatory requirements, as a result accreditation was maintained for the 2017/2018 operating year.

2.5.3.1 Management Review

The Branch continued to implement procedural and process improvements in 2017. A component of the continual improvement process was Management Review, which identifies deficiencies and establishes action plans. Management Review meetings were conducted on a quarterly basis on the following dates: April 19, July 24 and November 01, 2017, and February 5, 2018.

The following summarizes the highlights from the 2017 Management Review meetings:

1. There were no reported Adverse Water Quality Incidents (AWQIs) reported in 2017.
2. The total annual production volume of 13,048 ML in 2017 remained consistent with usage trends of the last few years, with only a slight decrease in production compared to 2016.
3. With the addition of the surface water source in 2011, Centennial Park Wells 12 and 15, and Heritage Park Wells 11 and 14 continued to demonstrate noticeable increases in artesian conditions.
4. A combined total of 30,080 work activities were performed in 2017 by the Groundwater Supply, Surface Water Supply, Water Customer Services and Water Distribution Services Sections of the Branch.
5. An emergency mock scenario was conducted on September 15, 2017. The scenario involved a widespread illness outbreak affecting both the groundwater and surface water systems and involved several other functional groups within the Corporation including; Corporate Communications, Emergency Management and Wastewater Operations.
6. One (1) Internal Audit focused on the new MOECC watermain Disinfection Procedure. Results yielded one (1) Continual Improvement Process (CIP) Report and nineteen (19) Opportunities for Improvement.
7. The 2017 External Audit was a “year two” (Y2) audit in the three (3) year cycle, and was conducted through an off-site desktop review. There were zero (0) non-conformances identified by the external auditor and the System accreditation was maintained for the 2017/2018 operating year.
8. The Branch used many tools such as staff suggestion boxes, crew meetings and Branch-wide staff meetings, to improve and strengthen communications within the Branch and across the operational Sections, to ensure that all staff contributed to the success of the Branch and its continual improvement objectives.

A copy of the Management Review Meeting Minutes are included in Appendix F for reference.

3 Closure

It is the belief that this report provides a summary on the operational and performance success of the Branch for 2017. If you have any questions concerning the contents of this report, please contact the Supervisor of Compliance and Technical Support at the Branch.

The Branch staff listed below contributed to the preparation and review of this document.

Chris Marchant
Manager of Water Operations

Jamey Adams
Supervisor of Surface Water Supply

Jason Giffen
Supervisor of Water Distribution Services

Chris Harper, C.E.T.
Supervisor of Water Customer Services

Diane Moreau, B.E.S.
Supervisor of Compliance and Technical Support

David Truax, C.E.T.
Supervisor of Groundwater Supply

Jeanette Dumais, C.Tech.
Operations Project Coordinator

Appendix B

2017 Annual Report, Section 11

Ontario Regulation 170/03

City of Barrie
Water Operations Branch

Drinking Water System
2017 Annual Report
Section 11, O.Reg. 170/03

For the Period of

JANUARY 1, 2017 TO DECEMBER 31, 2017

System Rating:	Water Treatment Subsystem Class IV Water Distribution and Supply Subsystem Class IV Water Distribution Subsystem Class II
Drinking Water System No.:	220001192
Municipal Drinking Water Licence No.:	014-101, Issue No. 5

Effective Date: 2018-02-26

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1 Introduction

The City of Barrie Water Operations Branch (the Branch) prepared this report to satisfy the requirements of Section 11 of Ontario Regulation (O.Reg.) 170/03. Section 11 (1) which requires that the owner of a drinking water system ensure that a report is prepared in accordance with subsection (3) and (6) for the preceding calendar year. The annual report must be prepared no later than February 28 of each year.

This report covers the period of January 1 to December 31, 2017 and the information provided complies with the reporting requirements outlined in Section 11 of O.Reg.170/03.

A summary of the City of Barrie's Municipal Drinking Water System (the System) description is outlined below:

- Drinking-Water System Number: 220001192
- Drinking-Water System Name: City of Barrie Drinking Water System
- Drinking-Water System Owner: Corporation of the City of Barrie
- Drinking-Water System Category: Large Municipal Residential

2 Reporting Requirements under Section 11 - O.Reg.170/03

Section 11 requires that the report include the following information relating to the period covered by the report:

- Include a statement of where a report prepared under Schedule 22 will be available for inspection by any member of the public during normal business hours without charge.
- Contain a brief description of the drinking water system, including a list of water treatment chemicals used by the system;
- Describe any major expenses incurred to install, repair or replace required equipment;
- Summarize any reports made to the Ministry of Environment and Climate Change (MOECC) for Adverse Water Quality Incidents (AWQIs);
- Summarize the results of tests required under O.Reg. 170/03, or under an approval, municipal drinking water licence or order, including an Ontario Water Resources Act order, if tests required under this Regulation in respect of a parameter were not required during that period, summarize the most recent results of tests of that parameter; and
- Describe any corrective actions taken.

3 Evidence of Compliance

3.1 Availability of the Annual Report

In accordance with Section 11 of O.Reg. 170/03, a copy of the annual report is available to the public, free of charge from the City of Barrie website and from the Branch by request.

The public was advised of the report's availability and how to obtain a copy, without charge, on the City of Barrie's website and in a local newspaper on March 1, 2018

3.2 Description of the Municipal Drinking Water System

The System consists of a Surface Water Treatment Plant (SWTP) and associated low lift pumping station (LLPS), 12 groundwater wells, 3 in-ground storage facilities, 7 booster stations, and 3 elevated storage towers.

Treatment at the SWTP consists of primary screening, flocculation, membrane filtration, granular activated carbon contactors (for taste and odor control), and disinfection with chlorine gas. Primary disinfection is achieved through chlorine contact time (CT) in the four baffled wall chlorine contact chamber and reservoir. Secondary disinfection is achieved by boosting the chlorine residual of the treated water upon entry into the distribution system from the SWTP's reservoir. Re-chlorination to maintain the chlorine residual in the distribution system is available at Harvie Road Booster Station/Reservoir and Mapleview Tower.

Treatment at each of the well stations consists of iron sequestration by addition of sodium silicate and disinfection with chlorine gas. Primary disinfection is achieved through CT prior to the first consumer, with the exception of Well 5 which achieves primary disinfection utilizing ultraviolet disinfection. Secondary disinfection is maintained throughout the distribution system with booster chlorination applied at 7 locations throughout the distribution system.

The distribution system consists of approximately 3,737 hydrants and approximately 628.7 kilometers of water main and transmission main ranging in sizes from 100mm to 1200mm and as of February 2017, delivering drinking water to a population of approximately 147,000 customers.

3.3 Water Treatment Chemicals

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

- Polyaluminum Chloride – Pre-filtration Coagulant – SWTP
- Chlorine – Primary and Secondary Disinfection – SWTP and Wells
- Sodium Silicate – Iron and Manganese Sequestration – Wells

3.4 Significant Expenses Incurred

A brief summary of the major expenses incurred during the reporting period to install, repair or replace required equipment, and value of each, is included in Table 1.

Table 1 – Summary of Expenses Incurred

Activity	Costs Incurred (2017)
Upgraded fuel systems at 13 Groundwater sites to comply with TSSA Fuels Safety Program	$131,300
Watermain break repairs (37)	$252,000
Hydro excavation contractors for water infrastructure repairs	$91,200

3.5 Operational Checks, Sampling and Testing

O.Reg. 170/03 and the Municipal Drinking Water Licence (MDWL) specified the operational checks and sampling requirements for the System. O.Reg. 169/03 specified drinking water quality standards and maximum concentrations of analytical parameters which were acceptable.

In general, during the reporting period, operational checks were completed and drinking water samples were collected in accordance with O.Reg. 170/03 and the MDWL, with one exception of Well 3A which was not in service; therefore no operational checks or regulated samples were collected. In general, the laboratory results for analyzed samples met the requirements and did not exceed the applicable standards stipulated in O.Reg. 169/03.

The laboratory results for all analyzed samples regulated by O.Reg. 170/03 and the MDWL were compared to the standards presented in O.Reg. 169/03 and summarized in Table 3 through Table 11, included in Appendix A for reference.

Additional details of the sampling and testing conducted in 2017 are discussed below in Section 3.5.1 through 3.5.5, inclusive.

3.5.1 Schedule 7 – Operational Checks – O.Reg. 170/03

Operational checks including: treated and distribution free chlorine and raw and treated turbidity was conducted in accordance with Schedule 7 of O.Reg.170/03, with the exception of Well 3A which was not in service.

The operational checks conducted during this reporting period were summarized in Table 3, included in Appendix A for reference.

3.5.2 Schedule 10 – Microbiological Sampling and Testing – O.Reg. 170/03

Raw, treated and distribution water samples were analyzed for microbiological parameters specified in Schedule 10-2, 10-3 and 10-4 of O.Reg. 170/03. Laboratory results for all samples analyzed for microbiological parameters met the requirements and did not exceed the applicable standards stipulated in O.Reg. 169/03.

Pursuant to the Ontario Public Health Inspector's Guide (OPHIG), dated 2013, and in addition to the sampling and analysis required by O.Reg. 170/03 and O.Reg. 169/03, respectively, raw, treated and distribution drinking water samples were analyzed for bacteriological health-related parameters including: Heterotrophic Plate Count (HPC), and Background bacteria (Background). The presence of HPC and Background is an unusual occurrence in properly disinfected drinking water; HPC and Background counts greater than 200 per 100 mL reflects deterioration of water quality and an increase risk of illness from non-coliform bacterial pathogens.

Laboratory results for all samples analyzed for E.coli, Total Coliforms and Background met the requirements and did not exceed the applicable standards stipulated in O.Reg. 169/03 and the OPHIG, with the exception of the raw water samples collected before treatment on the dates detailed below:

Table 2 – Summary of E.coli, Total Coliform and Background Presence

Date of Sample	E.coli	Total Coliform	Background>200
SWTP – Raw Water			
2017-01-03		X	
2017-01-23		X	
2017-01-30		X	
2017-02-06		X	
2017-02-21		X	
2017-02-27		X	X
2017-03-06		X	
2017-03-27		X	
2017-04-03		X	X
2017-04-10		X	
2017-04-18		X	
2017-05-01		X	
2017-05-08		X	
2017-05-15		X	X
2017-06-05		X	
2017-06-19			X
2017-06-26		X	
2017-07-04			X
2017-07-17		X	
2017-08-08	X	X	X
2017-08-14	X	X	X
2017-08-21	X	X	
2017-09-11	X	X	X
2017-09-18	X		X
2017-10-02	X	X	
2017-10-16	X	X	X
2017-10-23			X
2017-11-13			X
2017-11-20		X	
2017-11-27			X
2017-12-04	X	X	X
2017-12-18			X
2017-12-27		X	

The analytical results for the aforementioned samples from the SWTP were typical for surface waters. The samples analyzed for microbiological and bacteriological parameters during this reporting period were summarized in Table 4, included in Appendix A for reference.

3.5.3 Schedule 13 – Chemical Testing – O.Reg. 170/03

Treated water samples collected from the Water Distribution and Supply Subsystem were analyzed for organic and inorganic chemical parameters in accordance with O.Reg. 170/03, Schedule 13, Section 13.2 (Schedule 23), Section 13.4 (Schedule 24), Section 13.8, and Section 13.9. Analytical results for all samples analyzed for organic and inorganic chemical parameters met the requirements and did not exceed the applicable standards stipulated in O.Reg. 169/03.

If analysis required under O.Reg. 170/03 with respect to an analytical parameter was not required during the reporting period; the most recent analytical results for that parameter was included in this report, in accordance with O.Reg. 170/03, s.11 (6) (b).

Treated water samples collected from the distribution system were analyzed for Trihalomethanes (THMs) in accordance with O.Reg. 170/03, Schedule 13.6. Treated water samples collected from the well stations were analyzed for nitrates and nitrites in accordance with 13.7 of O.Reg.170/03. Laboratory results for all samples analyzed for THM, nitrate and nitrite parameters met the requirements and did not exceed the applicable standards stipulated in O.Reg. 169/03.

The samples analyzed for organic and inorganic chemical parameters during this reporting period were summarized in Table 5, included in Appendix A for reference.

The samples analyzed for THMs during this reporting period were summarized in Table 6, included in Appendix A for reference.

The samples analyzed for sodium, fluoride, nitrate and nitrite parameters during this reporting period were summarized in Table 7, included in Appendix A for reference.

3.5.4 Schedule 15.1 – Lead – O.Reg. 170/03

Lead samples were collected from the plumbing at industrial and commercial locations and several hydrants within the distribution system during the winter sampling period in accordance with Schedule 15.1. Amendments made under the MDWL requiring solely the collection of five (5) Industrial, Commercial & Institutional (ICI) samples and ten (10) Distribution samples to be collected during the reporting periods of December 15, 2016 to April 15, 2017 and June 15 to October 15, 2017.

Analytical results indicated lead concentrations below the established limit of 10 mg/L for all of the locations sampled with the exception of one sample collected from an ICI facility. As required, a second sample from the aforementioned location was collected to confirm the limit exceedance. As a result, the property owner, MOECC Spills Action Centre and the Simcoe Muskoka District Health Unit were notified. The reported exceedance is a result of private plumbing not the distribution system and therefore, did not require further action from the Branch.

The samples analyzed for lead during this reporting period were summarized in Table 8, included in Appendix A for reference.

3.5.5 Municipal Drinking Water Licence

In addition to the sampling and monitoring required by O.Reg. 170/03, Schedule C: System Specific Conditions of the MDWL required additional sampling, testing and monitoring at select wells of analytical parameters including select Volatile Organic Compounds (VOC), and sodium, as well as, monitoring of the UV disinfection system installed at Well 5. Analytical results for all samples analyzed for select VOCs and sodium were below the applicable standards stipulated in O.Reg. 169/03.

The samples analyzed for select VOCs and sodium during the reporting period were summarized in Table 9 and Table 10, respectively, included in Appendix A for reference. UV monitoring documented during this reporting period was summarized in Table 11, included in Appendix A for reference.

3.6 Reporting and Corrective Actions

3.6.1 Schedule 16 – Reporting of Adverse Test Results and Other Problems

No Adverse Water Quality Incidents (AWQIs) were reported during the 2017 reporting period in accordance with Schedule 16 of O.Reg. 170/03.

3.6.2 Schedule 17 – Corrective Actions

No corrective action was necessary related to reporting AWQI, as a requirement of O.Reg. 170/03, Schedule 17.

4 Closure

It is the belief of the Branch that this report satisfies the requirements of Section 11 of O.Reg. 170/03. 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 - Tables

Table 3 – Schedule 7 Operational Checks

Sample Location	Sample Count	Free Chlorine		Turbidity			
		(min)	(max)	(min)	(max)	(min)	(max)
		Treated Water		Raw Water		Treated Water	
Well 5	**8760	0.03	2.00	0.00	9.99	--	--
Well 7	**8760	0.29	1.78	0.06	10.00	--	--
Well 9	**8760	0.47	1.66	0.00	3.15	--	--
Well 11	**8760	0.40	1.80	0.01	9.99	--	--
Well 12	**8760	0.28	1.58	0.06	2.20	--	--
Well 13	**8760	0.05	1.66	0.00	10.00	--	--
Well 14	**8760	0.30	2.00	0.01	10.00	--	--
Well 15	**8760	0.34	1.22	0.02	10.00	--	--
Well 16	**8760	0.30	2.00	0.00	6.35	--	--
Well 17	**8760	0.20	2.00	0.01	10.00	--	--
Well 18	**8760	0.13	2.00	0.01	8.43	--	--
Surface Water Treatment Plant	**8760	0.00	5.00	0.00	98.35	0.00	11.12
Bayfield Tower	**8760	0.00	2.00	--	--	--	--
Ferndale Tower	**8760	0.00	2.00	--	--	--	--
Mapleview Tower	**8760	0.44	2.00	--	--	--	--
Anne Reservoir	**8760	0.17	2.00	--	--	--	--
Harvie Reservoir	**8760	0.00	1.75	--	--	--	--
Sunnidale Reservoir	**8760	0.00	2.00	--	--	--	--

Notes:

** 8760 - Represents continuous monitoring

-- - Analysis not required

NTU - Turbidity measured in Nephelometric Turbidity Units

mg/L - Free Chlorine measured in milligrams per litre

Table 4 – Schedule 10 Microbiological Sampling and Testing

Sample Location	E.Coli		Total Coliform		Background		HPC		Sample Count
	(min)	(max)	(min)	(max)	(min)	(max)	(min)	(max)	
Distribution									
North Sampling Points	0	0	0	0	--	--	0	1,830	792
South Sampling Points	0	0	0	0	--	--	0	1,470	778
Other (i.e., main breaks, maintenance)	0	0	0	0	0	0	0	1	20
								Sub-Total Distribution Samples	1590
Treated Water									
Well 5	0	0	0	0	0	0	0	240	54
Well 7	0	0	0	0	0	0	0	190	50
Well 9	0	0	0	0	0	0	0	20	52
Well 11	0	0	0	0	0	0	0	90	53
Well 12	0	0	0	0	0	2	0	370	53
Well 13	0	0	0	0	0	20	0	120	52
Well 14	0	0	0	0	0	0	0	210	55
Well 15	0	0	0	0	0	14	0	270	44
Well 16	0	0	0	0	0	0	0	260	46
Well 17	0	0	0	0	0	22	0	220	53
Well 18	0	0	0	0	0	0	0	40	53
Surface Water Treatment Plant	0	0	0	0	0	1	0	580	53
								Sub-Total Treated Samples	618
Raw Water									
Well 5	0	0	0	0	0	5	--	--	52
Well 7	0	0	0	0	0	56	--	--	50
Well 9	0	0	0	0	0	6	--	--	51
Well 11	0	0	0	0	0	2	--	--	52
Well 12	0	0	0	0	0	0	--	--	52
Well 13	0	0	0	0	0	0	--	--	51
Well 14	0	0	0	0	0	0	--	--	53
Well 15	0	0	0	0	0	1	--	--	43
Well 16	0	0	0	0	0	136	--	--	46
Well 17	0	0	0	0	0	0	--	--	52
Well 18	0	0	0	0	0	3	--	--	52
Surface Water Treatment Plant	0	9	0	81	0	1300	--	--	52
								Sub-Total Raw Samples	606

Notes:

CFU/100mL - E. coli, Total Coliform and Background results are expressed as Colony Forming Units (CFU)/100mL

CFU/1mL - Heterotrophic Plate Count (HPC) results are expressed as CFU/1mL

-- - Analysis not required

Table 5 – Schedule 13 Chemical Sampling and Testing – Inorganics and Organics

Sample Location		Well 5	Well 7	Well 9	Well 11	Well 12	Well 13	Well 14	Well 15	Well 16	Well 17	Well 18	SWTP
Date Sampled		2015-04-21	2015-04-21	2015-04-14	2015-04-14	2015-11-09	2015-04-14	2015-05-06	2015-04-21	2015-04-14	2015-04-14	2015-04-14	2017-09-06
	MDL	Analytical Result											
Treated Water - Inorganic Parameters													
Antimony	0.02	0.17	0.04	0.22	0.18	<MDL	0.17	<MDL	0.03	0.18	0.39	0.28	<RL
Arsenic	0.2	0.4	0.3	<MDL	<MDL	0.4	0.2	<MDL	0.4	0.3	0.4	0.6	0.6
Barium	0.01	175	234	97.3	262	281	85.2	171	247	95.9	261	232	27
Boron	(0.2) 2	24.3	17.2	9.8	18.3	29	18	17.7	15.3	14.8	12.5	18.8	19
Cadmium	0.003	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Chromium	0.03	<MDL	<MDL	0.39	<MDL	<MDL	0.22	<MDL	<MDL	0.13	<MDL	<MDL	<RL
Mercury	0.01	<MDL	<MDL	0.02	<MDL	0.02	0.01	0.01	<MDL	<MDL	<MDL	<MDL	<RL
Selenium	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Uranium	0.002	0.425	0.291	1	1.03	0.552	0.845	0.358	0.148	1.13	0.248	0.214	0.22
Treated Water - Organic Parameters													
Alachlor	0.02	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Aldicarb	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	--
Aldrin+Dieldrin	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	--
Atrazine+metabolites	0.01	<MDL	<MDL	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Azinphos-methyl	0.02	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Bendiocarb	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	--
Benzene	0.32	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Benzo(a)pyrene	0.004	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Bromoxynil	0.33	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Carbaryl	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Carbofuran	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Carbon Tetrachloride	0.16	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Chlordane (Total)	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	--
Chlorpyrifos	0.02	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Cyanazine	0.03	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	--
Diazinon	0.02	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Dicamba	0.20	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
1,2-Dichlorobenzene	0.41	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
1,4-Dichlorobenzene	0.36	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Dichlorodiphenyltrichloroethane (DDT) + metabolites	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	--
1,2-dichloroethane	0.35	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
1,1-Dichloroethylene (vinylidene chloride)	0.33	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Dichloromethane	0.35	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
2,4-Dichlorophenol	0.015	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
2,4-Dichlorophenoxy acetic acid (2,4-D)	0.19	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Diclofop-methyl	0.40	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Dimethoate	0.03	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Dinoseb	0.36	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	--
Diquat	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Diuron	0.03	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Glyphosate	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Heptachlor + Heptachlor Epoxide	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	--
Lindane (Total)	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	--
Malathion	0.02	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
MCPA	0.00012	--	--	--	--	--	--	--	--	--	--	--	<RL
Methoxychlor	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	--
Metolachlor	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Metribuzin	0.02	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Monochlorobenzene	0.3	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Paraquat	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Parathion	0.02	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	--
Pentachlorophenol	0.15	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Phorate	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Picloram	1	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Polychlorinated Biphenyls (PCB)	0.04	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Prometryne	0.03	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Simazine	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Temephos	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	--
Terbufos	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Tetrachloroethylene (perchloroethylene)	0.35	<MDL	<MDL	<MDL	0.5	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
2,3,4,6-Tetrachlorophenol	0.20	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Triallate	0.01	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Trichloroethylene	0.44	<MDL	<MDL	<MDL	0.49	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
2,4,6-Trichlorophenol	0.25	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	0.22	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	--
Trifluralin	0.02	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL
Vinyl Chloride	0.17	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<RL

Notes:

- A change in contracted laboratory and testing methods in 2017. Results reported with both MDL and RL where applicable.

ug/L - All units presented in micrograms

-- - Analysis not required

<MDL - Analytical result did not exceed the laboratory Method Detection Limit (MDL)

(#) # - MDL for analysis completed in 2015 indicated in brackets "()". MDL for analysis completed in 2016 indicated without brackets.

SWTP - Surface Water Treatment Plant

Table 6 – Schedule 13 Chemical Sampling and Testing – Trihalomethanes

Parameter	Running Annual Average
	2017
Trihalomethanes	42.3

Notes:

ug/L - All units reported in micrograms per litre

Table 7 – Schedule 13 Chemical Sampling and Testing – Sodium, Fluoride, Nitrite and Nitrate

Parameter	MDL/RL	Date Sampled	Analytical Results											
		Sample Location	Well 5	Well 7	Well 9	Well 11	Well 12	Well 13	Well 14	Well 15	Well 16	Well 17	Well 18	SWTP
Sodium	0.01 MDL	2016-05-17	--	--	--	--	127	--	--	--	--	--	--	--
		2016-05-30	--	--	--	--	131	--	--	--	--	--	--	--
		2016-09-06	--	--	--	--	--	--	--	--	--	--	--	30.8
Fluoride	0.06 MDL	2016-05-17	--	--	--	--	0.08	--	--	--	--	--	--	--
		2016-09-06	--	--	--	--	--	--	--	--	--	--	--	0.08
Nitrite	0.003 MDL 0.01 RL	2017-01-05	--	--	--	--	--	--	--	<MDL	--	--	--	--
		2017-03-06	<MDL	<MDL	<MDL	<MDL	0.003	<MDL	<MDL	<MDL	--	<MDL	--	<MDL
		2017-03-07	--	--	--	--	--	--	--	--	--	--	<MDL	--
		2017-06-05	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
		2017-09-05	<RL	<RL	<RL	<RL	<RL	<RL	<RL	--	--	<RL	<RL	--
		2017-09-06	--	--	--	--	--	--	--	--	--	--	--	<RL
		2017-09-29	--	--	--	--	--	--	--	<RL	<RL	--	--	--
		2017-10-05	--	--	--	--	--	--	--	--	--	--	--	--
		2017-11-27	--	--	--	--	--	--	--	--	--	--	--	<RL
		2017-12-04	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	--
Nitrate	0.006 MDL 0.01 RL	2017-01-05	--	--	--	--	--	--	--	<MDL	--	--	--	--
		2017-03-06	<MDL	<MDL	3.55	0.529	<MDL	1.50	0.043	<MDL	--	<MDL	--	0.202
		2017-03-07	--	--	--	--	--	--	--	--	--	--	<MDL	--
		2017-06-05	<MDL	<MDL	3.7	0.038	<MDL	1.59	0.543	<MDL	1.10	<MDL	<MDL	0.157
		2017-09-05	<RL	<RL	4	0.6	<RL	1.7	<RL	--	--	<RL	<RL	--
		2017-09-06	--	--	--	--	--	--	--	--	--	--	--	0.2
		2017-09-29	--	--	--	--	--	--	--	<RL	0.8	--	--	--
		2017-10-05	--	--	--	--	--	--	--	--	--	--	--	--
		2017-11-27	--	--	--	--	--	--	--	--	--	--	--	0.2
		2017-12-04	<RL	<RL	3.7	0.5	<RL	1.6	<RL	<RL	1.1	<RL	<RL	--

Notes:

- A change in contracted laboratory and testing methods in 2017. Results reported with both MDL and RL where applicable.

-- - Analysis not required

<MDL - Analytical result did not exceed the laboratory Method Detection Limit (MDL)

<RL - Analytical Result did not exceed the laboratory Reporting Limit (RL)

ug/L - All units reported in micrograms per litre

SWTP - Surface Water Treatment Plant

Table 8 – Schedule 15.1 – Lead

Parameter	Sample Count	Range of Results	
		(min)	(max)
Lead (Plumbing)	22	0.16	19.1
Lead (Distribution System)	22	<RL	2.18

Notes:

ug/L - All units reported in micrograms per litre
RL - Laboratory Reporting Limit

Table 9 – Municipal Drinking Water Licence – Raw Water Sampling and Testing – Volatile Organic Compound

Parameter	Analytical Results							
	(min)	(max)	(min)	(max)	(min)	(max)	(min)	(max)
Sample Location	**Well 11**		**Well 12**		**Well 14**		**Well 15**	
Benzene	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Carbon Tetrachloride	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
1,2-Dichlorobenzene	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
1,4-Dichlorobenzene	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
1,1-Dichloroethylene	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
1,2-Dichloroethane	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Dichloromethane	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Monochlorobenzene	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Tetrachloroethylene	<RL	0.44	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Trichloroethylene	<MDL	<MDL	<MDL	<MDL	<RL	0.84	<MDL	<MDL
Vinyl Chloride	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Cis-1,2-Dichloroethylene	<RL	2.1	0.8	0.8	0.5	1.1	0.4	3.4

Notes:
- A change in contracted laboratory testing methods in 2017. Results reported with both MDL and RL where applicable.

ug/L - All units reported in micrograms per litre unless otherwise noted

<MDL - Analytical result did not exceed the laboratory Method Detection Limit (MDL)

<RL - Analytical result did not exceed the laboratory Reporting Limit (RL)

Table 10 – Municipal Drinking Water Licence – Raw Water Sampling and Testing - Sodium

Sample Location	Sodium	
	(min)	(max)
*Well 3A	41.2	46.2
Well 9	37.6	41.7
Well 11	44.8	80
Well 12	121	134
Well 13	44.6	55.7
Well 14	46.3	71.9

Notes:

mg/L - All units reported in milligrams per litre

* - Although 3A was not in service, analytical results required as a condition of the MDWL

Table 11 – Municipal Drinking Water Licence – Ultra Violet Monitoring

Parameter	Minimum	Well 5	
		(min)	(max)
UV Dosage *Monitored Continuously*	40	0	98.4
UVT *Monitored Weekly*	NA	85	99.6

Notes:

NA - Not applicable

(mJ/cm^2) - UV Dosage measured in millijoules per centimeter squared

% - UVT measured in percent

Appendix C

2017 Lead Testing Report, Schedule 15.1

Ontario Regulation 170/03

Ontario Ministry of the Environment

O.Reg. 170/03 Community Lead Testing – End of Period Report

(O. Reg. 170/03 under Schedule 15.1)

Instructions

Please complete this form and fax/email directly to:

Ministry of the Environment
Drinking Water Programs Branch

Fax: 416 212-0607

Email: leadsubmission.moe@ontario.ca

Use this form to submit a report to the ministry as required under Section 15.1-9 (6.1) under Schedule 15.1 of O.Reg. 170/03. If you require assistance in completing the form report, please call 1 866 793-2588 (toll free).

The most current version of this form report is posted on the Ministry of the Environment web site at www.ontario.ca/drinkingwater

Part A: Drinking Water System Information

1. Drinking Water System Name

Barrie Drinking Water System

2. **Drinking Water System (DWS) Number** *(Ministry assigned 9 digits number starting with "2".)*

220001192

3. Drinking Water System Owner

Barrie, The Corporation of the City of

4. **Report Period** *(Year: yyyy)*

a) ☐ Summer (June 15th to October 15th) b) ☑ Winter (December 15th to April 15th) 5. Year: 2017

Part B: Report Submission Information

	Plumbing	Distribution
6. Number of individual samples	10	10
7. Number of sampling points (Locations)	5	N/A
8. Number of individual sample exceedances	0	0
9. Number of sampling points with an exceedance during the period	0	N/A
10. Percentage of sample points with an exceedance	0.00	N/A
11. Is the system required to have a Corrosion Control Plan prepared under Section 15.1-11 under Schedule 15.1 of O.Reg.170/03?	☐ Yes	☑ No
12. Do the reduced sampling & frequency requirements of Section 15.1-5 under Schedule 15.1 of O.Reg.170/03 apply to the system?	☑ Yes	☐ No
13. Do the plumbing sample exemptions of Section 15.1-5 (9) under Schedule 15 of O.Reg.170/03 apply to the system?	☐ Yes	☑ No

Part C: Form Submission Information

I declare that all the information provided on this form and any attachment(s) is true and correct to the best of my knowledge.

Prepared by *(print name)*	Signature	Date *(yyyy/mm/dd)*	Telephone No. *(including area code)*
Mrs. Diane Moreau		2017/04/10	705 792-7920

Collection of information on this form is collected by the Drinking Water Management Division on behalf of the Ministry of the Environment in accordance with the *Safe Drinking Water Act, 2002* (SDWA) and its regulations. The collection, use and dissemination of this information are governed by the *Freedom of Information and Protection of Privacy Act* (FOIPPA). The information gathered herein will be used for the purpose of corrosion control, and may be used for secondary purposes including reporting, investigating and law enforcement under the SDWA and its regulations. Information contained on this form, including personal information, may be disclosed to other government agencies including municipalities, public health unit employees, the Ministry of Health and Long Term Care, the Ministry of Education and the Ministry of Community and Social Services pursuant to section 42 of FOIPPA for the consistent purpose of administering programs related to drinking water safety.

Ontario Ministry of the Environment

O.Reg. 170/03 Community Lead Testing – End of Period Report

(O. Reg. 170/03 under Schedule 15.1)

Instructions

Please complete this form and fax/email directly to:

Ministry of the Environment
Drinking Water Programs Branch

Fax: 416 212-0607

Email: leadsubmission.moe@ontario.ca

Use this form to submit a report to the ministry as required under Section 15.1-9 (6.1) under Schedule 15.1 of O.Reg. 170/03. If you require assistance in completing the form report, please call 1 866 793-2588 (toll free).

The most current version of this form report is posted on the Ministry of the Environment web site at www.ontario.ca/drinkingwater

Part A: Drinking Water System Information

1. Drinking Water System Name

Barrie Drinking Water System

2. **Drinking Water System (DWS) Number** *(Ministry assigned 9 digits number starting with "2".)*

220001192

3. Drinking Water System Owner

Barrie, The Corporation of the City of

4. **Report Period** *(Year: yyyy)*

a) ☑ Summer (June 15th to October 15th) b) ☐ Winter (December 15th to April 15th) 5. Year: 2017

Part B: Report Submission Information

	Plumbing	Distribution
6. Number of individual samples	12	12
7. Number of sampling points (Locations)	5	N/A
8. Number of individual sample exceedances	3	
9. Number of sampling points with an exceedance during the period	1	N/A
10. Percentage of sample points with an exceedance	20.00	N/A
11. Is the system required to have a Corrosion Control Plan prepared under Section 15.1-11 under Schedule 15.1 of O.Reg.170/03?	☐ Yes	☑ No
12. Do the reduced sampling & frequency requirements of Section 15.1-5 under Schedule 15.1 of O.Reg.170/03 apply to the system?	☑ Yes	☐ No
13. Do the plumbing sample exemptions of Section 15.1-5 (9) under Schedule 15 of O.Reg.170/03 apply to the system?	☐ Yes	☑ No

Part C: Form Submission Information

I declare that all the information provided on this form and any attachment(s) is true and correct to the best of my knowledge.

Prepared by *(print name)*	Signature	Date *(yyyy/mm/dd)*	Telephone No. *(including area code)*
Diane Moreau		2017/10/05	705-739-4220 x 6158

Collection of information on this form is collected by the Drinking Water Management Division on behalf of the Ministry of the Environment in accordance with the *Safe Drinking Water Act, 2002* (SDWA) and its regulations. The collection, use and dissemination of this information are governed by the *Freedom of Information and Protection of Privacy Act* (FOIPPA). The information gathered herein will be used for the purpose of corrosion control, and may be used for secondary purposes including reporting, investigating and law enforcement under the SDWA and its regulations. Information contained on this form, including personal information, may be disclosed to other government agencies including municipalities, public health unit employees, the Ministry of Health and Long Term Care, the Ministry of Education and the Ministry of Community and Social Services pursuant to section 42 of FOIPPA for the consistent purpose of administering programs related to drinking water safety.

Appendix D

2017 Municipal Summary Report, Schedule 22

Ontario Regulation 170/03

City of Barrie
Water Operations Branch

Drinking Water System
2017 Municipal Summary Report
Schedule 22. O.Reg. 170/03

For the Period of

JANUARY 1, 2017 TO DECEMBER 31, 2017

System Rating:	Water Treatment Subsystem Class IV Water Distribution and Supply Subsystem Class IV Water Distribution Subsystem Class II
Drinking Water System No.:	220001192
Municipal Drinking Water Licence No.:	014-101, Issue No. 5

Effective Date: 2018-02-26

CONTENTS

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, 2017 to December 31, 2017, 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 2017 reporting period.

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 2016 to January 2017, inclusive. Following the System inspection, the MOECC issued a report summarizing the findings, including regulatory non-compliances and recommendations and best practice issues.

3.1.2.1 2016 Drinking Water System Inspection Findings

One (1) non-compliance with regulatory requirements and three (3) recommendations were reported in the 2016 MOECC Inspection Report issued on February 6, 2017.

The inspection findings noted the owner was not maintaining the well(s) in a manner sufficient to prevent entry into the well of surface water or other foreign materials. The Branch responded by conducting a replacement of the well vent screen at John St – WPS 05.

The three (3) recommendations outlined in the Report were as follows:

1) A recommendation to assess potential risk to the natural environment and collect information on the discharge effluent from generator cooling water and sand separator purge water that discharges directly to Kempenfelt Bay from Heritage Park Well Pumping Station 14 and test for the following parameters:
   - average individual and total volumes
   - assessment of total suspended solids
   - a comparative of temperatures of each process discharging to Kempenfelt Bay

   The Branch responded by conducting sampling at the location for the three (3) required parameters noted above and continue to refine the process and track progress.

2) A recommendation that the municipality consider labelling the bottle of deionized water used for verification of the UV unit at John St – WPS 05 with the date of filling, replacing the deionized water every 3 months, and replacing the current wide mouth container with a laboratory wash bottle.

   The Branch responded with replacement of the bottle with a laboratory type wash bottle, labelled, identifying the contents and applied the date filled.

3) A recommendation that the municipality consider assessing the secondary containment capacity of the bulk chemical storage at the Surface Water Treatment Plant to ensure sizing is capable of containing 110% of the volume of the largest container as per the MOECC's Guidelines for environmental protection measures at chemical and waste storage facilities.

   The Branch responded and verified that secondary containment is in excess of the MOECC's required capacity.

A copy of the MOECC Drinking Water System Inspection Summary is included in Appendix A 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 2011 to 2016 reporting periods, inclusive.

A copy of the MOECC Drinking Water System Inspection Summary is included in Appendix A 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 Megalitres (ML) to reflect the large quantities of water produced by the system.

The Branch supplied 13,048 ML of water in the reporting period. The average monthly flow from all sources within the drinking water system was 1,087 ML, which ranged from 481 ML (SWTP) to 31 ML (Well 5).

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 3.61 ML (Well 13) to 26.92 ML (SWTP) during the reporting period, as illustrated in

the Flow Summary graph included in Appendix B. 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 2017.

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 B 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 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
2016					
1	R.R.O., 1990 Reg. 903-Wells SDWA: Subsection 1-2(1) O.Reg. 170/03	The owner was not maintaining the well(s) in a manner sufficient to prevent entry into the well of surface water or other foreign materials. **WOB Summary:** Well pump vent screen situated at the base of the vertical turbine pump developed corrosion over time and was noticed to be situated on an angle during inspection, which led to the MOECC inspector identifying the part as no longer attached effectively.	Action immediately taken to repair the well pump vent screen at John St – WPS 05. Repair documented and communicated to MOECC Inspector on 2017/01/09.		Addition of field to the CMMS cyclical work order to include check well pump vent screen. This activity is conducted 3 times per week.
2				The municipality is strongly advised to assess potential risk to the natural environment and collect information on the discharge effluent from generator cooling water and sand separator purge water that discharges directly to Kempenfelt Bay from Heritage Park Well Pumping Station 14. Test for the following parameters: • average individual and total volumes • assessment of total suspended solids • a comparative of temperatures of each process discharging to Kempenfelt Bay	Branch conducted sampling on the three (3) requested parameters. Additional work required to determine best practice with respect to preventative maintenance cycle for the sand separator at applicable well stations.
3				It is the recommendation that the municipality consider labelling the bottle of deionized water used for verification of the UV unit at John St – WPS 05 with the date of filling, replacing the deionized water every 3 months, and replacing the current wide mouth container with a laboratory wash bottle.	Bottle replaced with the laboratory type wash bottle, labelled with permanent marker identifying the contents and date filled.

Item No	Applicable Requirement	MOECC Non-Compliance With Regulatory Requirements	Actions Taken	MOECC Recommendations and Best Practice Issues	Actions Taken
4				It is recommended that the municipality consider assessing the secondary containment capacity for the bulk chemical storage to ensure sizing is capable of containing 110% of the volume of the largest container as per the Ministry's Guidelines for environmental protection measures at chemical and waste storage facilities.	Engineers' drawings referenced and volumes calculated to verify secondary containment is in excess of the required 110% capacity. Verification sent via email to the MOECC inspector on 2017-02-15
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. **WOB Summary:** 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. **WOB Summary:** 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. **WOB Summary:** 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. **WOB Summary:** 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. **WOB Summary:** 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.
2011					

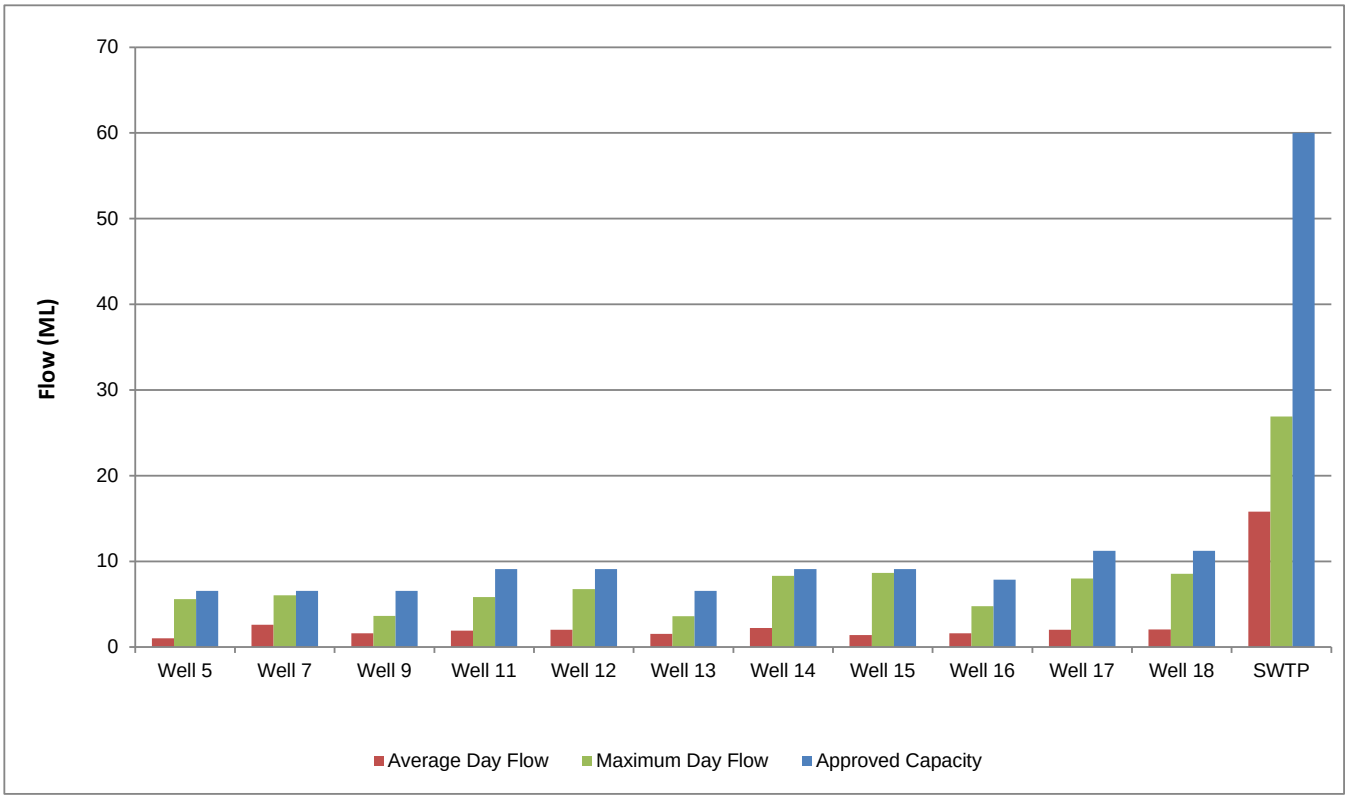
Item No	Applicable Requirement	MOECC Non-Compliance With Regulatory Requirements	Actions Taken	MOECC Recommendations and Best Practice Issues	Actions Taken
1	Ontario Water Resources Act: Permit to Take Water #5183-8EZKMA	The Permit to Take Water (PTTW) imposed conditions beyond limiting takings and the owner had not complied with the conditions of the PTTW. **WOB Summary:** 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. **WOB Summary:** 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 surface water 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. **WOB Summary:** 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. **WOB Summary:** 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

Appendix B 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	5.59	1.01	30.67	368.02
Well 7	6.55	6.02	2.59	78.86	946.32
Well 9	6.55	3.62	1.60	48.61	583.38
Well 11	9.10	5.82	1.91	58.17	697.99
Well 12	9.10	6.76	2.02	61.44	737.28
Well 13	6.55	3.61	1.53	46.47	557.67
Well 14	9.10	8.31	2.24	68.09	817.04
Well 15	9.10	8.64	1.39	42.42	509.03
Well 16	7.86	4.76	1.60	48.58	582.95
Well 17	11.23	7.98	2.03	61.66	739.87
Well 18	11.23	8.54	2.03	61.82	741.83
SWTP	60.00	26.92	15.80	480.52	5,766.24
System	148.26	53.21	35.75	1,087	13,048



Appendix E

Ministry of the Environment and Climate Change

Standard of Care

TAKING CARE OF YOUR DRINKING WATER

A Quick Guide For Members Of Municipal Councils

If you are a municipal councillor, this quick guide is intended to help you better understand the Safe Drinking Water Act, 2002 (SDWA) and provide information about your statutory standard of care responsibilities. You are encouraged to also read ***Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils***. It provides more details about these responsibilities as well as information about how Ontario's drinking water is protected.

Ontarians expect safe, high quality drinking water. It is a matter vital to public health. As a member of a municipal council, you have an important role to play to ensure that your community has access to safe, high quality drinking water — and you are legally obliged to do so.

THREE THINGS TO REMEMBER AS A MUNICIPAL COUNCILLOR:

It's Your Duty. The Safe Drinking Water Act, 2002 includes a statutory standard of care for individuals who have decision-making authority over municipal drinking water systems or who oversee the operating authority of the system. This can extend to municipal councillors. There are legal consequences for not acting as required by the standard of care, including possible fines or imprisonment.

Be Informed. Ask questions. Get answers. You don't have to be an expert in drinking water operations, but you do need to be informed about them. Your decisions can have an impact on public health. Seek advice from those with expertise and act prudently on that advice.

Be Vigilant. Complacency can pose one of the greatest risks to drinking water systems. It is critical that you never take drinking water safety for granted or assume all is well with the drinking water systems under your care and direction. The health of your community depends on your diligent and prudent oversight of its drinking water.

> *"Water is unique as a local service. It is, of course, essential to human life and to the functioning of communities, (and) the consequences of a failure in the water system (are) most seriously felt by those who depend on it locally. Municipal ownership, and the ensuing responsibilities, should provide a high degree of public accountability in relation to the local water system."*
> — Justice Dennis O'Connor,
> 2002 Report of the Walkerton Inquiry

Legal Disclaimer – This quick guide should not be viewed as legal or other expert advice. For specific questions regarding the legal application of the Safe Drinking Water Act, 2002 and its regulations, please consult a lawyer and/or consult the text of the Act at ***www.e-laws.gov.on.ca***.

Ontario

Key Sections of the SDWA for Municipal Councillors

Section 11: Duties of Owners and Operating Authorities

Section 11 of the SDWA describes the legal responsibilities of owners and operating authorities of regulated drinking water systems. It is important for you to understand the scope of your municipality or operating authority's day-to-day responsibilities.

Owners and operators are responsible for ensuring their drinking water systems:

- provide water that meets all prescribed drinking water quality standards
- operate in accordance with the act and its regulations, and are kept in a fit state of repair
- are appropriately staffed and supervised by qualified persons
- comply with all sampling, testing and monitoring requirements
- meet all reporting requirements

Examples of actions required of owners and operators under Section 11:

- Sampling and testing of drinking water with a frequency appropriate to the type, size and users of the system in accordance with the act and corresponding regulations
- Using an accredited and licensed laboratory for drinking water testing services
- Reporting of adverse test results that exceed any of the standards in the Ontario Drinking Water Quality Standards Regulation, both verbally and in writing, to the local medical officer of health and the Ministry of the Environment and Climate Change (MOECC)
- Obtaining a drinking water licence for a municipal residential drinking water system from the MOECC, which includes a financial plan
- Ensuring the drinking water system is operated by an accredited operating authority
- Hiring certified operators or trained persons appropriate to the class of the system
- Preparing an annual report to inform the public on the state of the municipality's drinking water and the system providing it, and an annual summary report for the owners of the drinking water system

Section 19: Your Duty and Liability – Statutory Standard of Care

Section 19 of the SDWA expressly extends legal responsibility to people with decision-making authority over municipal drinking water systems and those that oversee the accredited operating authority for the system. It requires that they exercise the level of care, diligence and skill with regard to a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation and that they exercise this due diligence honestly, competently and with integrity.

Meeting your statutory standard of care responsibilities

Meeting the statutory standard of care is the responsibility of:

- the owner of the municipal drinking water system
- if the system is owned by a municipality, every person who oversees the accredited operating authority or exercises decision-making authority over the system – **potentially including but not limited to members of municipal councils**
- if the municipal drinking water system is owned by a corporation other than a municipality, every officer and director of the corporation

Maintaining an Appropriate Level of Care

Standard of care is a well-known concept within Ontario legislation.

For example, the Business Corporations Act requires that every director and officer of a corporation act honestly and in good faith with a view to the best interests of the corporation and exercise the care, diligence and skill that a reasonably prudent person would in comparable circumstances.

Statutory standards of care address the need to provide diligent oversight. What is considered to be an appropriate level of care will vary from one situation to another. As a municipal councillor, it is important to educate yourself on this statutory requirement and to gain an understanding of the operation of drinking water systems in your community to help you meet the standard of care requirements.

You are not expected to be an expert in the areas of drinking water treatment and distribution. Section 19 allows for a person to rely in good faith on a report of an engineer, lawyer, accountant or other person whose professional qualifications lend credibility to the report.

Enforcing the Statutory Standard of Care

As a municipal councillor, you need to be aware that not meeting your statutory standard of care responsibilities comes with serious consequences. Section 19 provides the province with an enforcement option when needed.

A provincial officer has the authority to lay a provincial offence charge against a person to whom the standard applies. The range of penalties includes maximum fines of up to $4 million for a first offence and provision for imprisonment for up to five years. No minimum penalties are established. Actual penalties would be decided by the courts depending on the severity and consequences of the offence.

It is important to note the difference between the provision of the Municipal Act, 2001, that limits the personal liability of members of municipal councils and officials, and the standard of care imposed under the SDWA. Under sections 448-450 of the Municipal Act, 2001, municipal council members and officials have relief from personal civil liability when they have acted in good faith. However, despite that protection, municipal councillors and officials that are subject to the duty imposed by Section 19 of the SDWA could be penalized if a prosecution is commenced and a court determines they have failed to carry out the duty imposed under that section.

☑ Actions You Can Take – to be better informed about your drinking water oversight responsibilities.

General

- ☐ Read ***Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils,*** which provides more details about your responsibilities as well as information about how Ontario's drinking water is protected and reference material on drinking water.
- ☐ Consider taking the Standard of Care training with the Walkerton Clean Water Centre. Get course details and session offerings at **www.wcwc.ca** or by phoning toll free 1-866-515-0550.
- ☐ Learn about drinking water safety and its link to public health. Speak to water system and public health staff to learn more.
- ☐ Become familiar with your municipal drinking water system. Ask your water manager to give a presentation to council and/or arrange a tour of your drinking water facilities.
- ☐ Review the reports of the Walkerton Inquiry, specifically sections related to municipal government (Chapter 7 in Report I, Chapters 10 and 11 in Report II). The reports are available online at **www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton**.
- ☐ Become further acquainted with drinking water legislation and regulations, available on the Ontario Government e-Laws website at **www.e-laws.gov.on.ca**.

Drinking Water Operational Plan

- ☐ Ask your operating authority to speak to your municipal council about your operational plan.
- ☐ Consider and act on any advice (including identified deficiencies and action items) identified during the annual management review process.
- ☐ Review the Quality Management System policy in your operational plan and its commitments.
- ☐ Ask your operating authority to show how it is meeting these commitments.

Drinking Water Reports and Inspections

- ☐ Obtain and thoroughly review copies of the most recent annual and summary reports.
- ☐ Ask for explanations of any information you don't understand.
- ☐ Consider, act on and correct any deficiencies noted in the reports.
- ☐ Review your annual inspection results and ask questions if there is any indication of declining quality.
- ☐ Clarify any technical terms.
- ☐ Ask how deficiencies are being addressed.
- ☐ Review your system's standing in the ratings reported in the Chief Drinking Water Inspector's Annual Report. If your rating is less than 100 per cent, ask why.
- ☐ Consider, act on and correct any deficiencies highlighted in the inspection.

Infrastructure Planning

- ☐ Find out what maintenance, rehabilitation and renewal plans are in place for your drinking water system.
- ☐ Ask your operating authority to present the findings of its annual infrastructure review.

Communicating with Your Operating Authority

- ☐ Determine when and how your operating authority will communicate to you as an owner.
- ☐ Find out what information is made available to the public and how.

Emergency Planning for Drinking Water

- ☐ Ask your operating authority to review the drinking water emergency plan with council and to explain what responsibilities have been assigned to the owner.
- ☐ Know who will be the spokesperson during a drinking water emergency.
- ☐ Ensure critical staff have taken necessary training on emergency procedures and have participated in testing.

Drinking Water System Operators

- ☐ Ensure there are sufficient resources for appropriate levels of training for municipal staff involved in operating a drinking water system.
- ☐ Confirm that an overall responsible operator (ORO) has been designated and that procedures are in place to ensure all required staff and contractors are certified.
- ☐ Check to see if drinking water operator succession planning is being done and that measures are taken to address any current or anticipated challenges to recruiting skilled employees.
- ☐ Ensure your municipality or operating authority has contingency plans in place for situations where your certified operators may not be available (e.g. labour disputes, illnesses, vacancies, etc.) and, if activated, confirm that these contingency plans have been, where required, approved by the Ministry of the Environment and Climate Change and are working.

Source Protection Planning

- ☐ Review the source protection plan for your area and find out what actions are being taken to protect vulnerable areas around your drinking water sources.
- ☐ Find out if your municipality has appointed risk management officials and inspectors to support source protection planning and whether you are sharing these duties with other municipalities or delegating to a local source protection authority.

For more information, call the Ministry of the Environment and Climate Change at **1-800-565-4923**
Email: **drinking.water@ontario.ca**

PIBS 9810e

Appendix F

Quality Management System
Management Review Meeting Minutes

QMS Meeting

Date: 2017-04-19

Time: 8:30 am to 9:30 am

Meeting Type: QMS Q1 Management Review

File: n:\igm\enviro\water ops - cts\admin\a02-staff commit and mtgs\minutes - qms management team meetings\2017 mgmt. review\q1.docx

Water Operations Branch

Facilitator: Jeanette Dumais (JD) **Recording: Jeanette Dumais (JD)**	**Absent:** **Jamey Adams (JA)**	**Attendees:** ☒ **Amanda Inglis-Petahtegoose (AIP)** ☒ **Diane Moreau (DM)** ☒ **Dave Truax (DT)**	☒ **Jeanette Dumais (JD)** ☒ **Jennifer Barrick (JB)** ☒ **Diana Smith (DS)** ☒ **Jason Giffen (JG)**	☒ **Kari Anne Last (KL)** ☒ **Chris Harper (CH** ☒ **Chris Marchant (CM)**

Agenda

1. Review of the Q1 PowerPoint Presentation – Items will be recognized as slide numbers with title

Agenda Item	Discussion/Decision
1. Slide 2,3 - Incidents of Adverse Drinking Water Tests	JD – there have been none to date to report for the first quarter. This is quite the accomplishment for the Water Operations Branch
2. Slide 4,5 and 6 – Deviations from Critical Control Points and Limit Response Actions – Flushing	JD – reviewed all graphs with the group for all activities per zone, volumes flushed over 100m^3 and deviations for chlorine residual and turbidity per zone DM – commented that not all Work Orders may be captured by the date the review is conducted as we should avoid postponing review due to that lag in our system DM – to discuss further with the UPCs how we will gather this information in subsequent quarters to ensure accuracy upon Q4 Management Review that feeds Annual Report AIP – suggests that for all parameters we should consider building each quarter on the previous such that Q1 + Q2 etc. so that for annual report there is a final source for the information required. Action Log Item 17-032: Complete the excel work book for each quarter and work on building how to incorporate the previous quarter's information. For example: Q2 graph 1 and year to Date graph 2. Assigned to JD with a completion date of July 1, 2017.
3. Slide 7 and 8 – Deviations from SCADA Set-Points	JD – the exceedances report is not yet finalized with Eramosa and may be made redundant during an upcoming upgrade DM – noted that previously we were tracking AWQIs for this and as noted none were recorded for this quarter JD – no deviations from SCADA set points had yet to be received from the SWS in order to include in this review period. DM – requests that JD run the eRIS report entitled Exceedances Report and send to herself and DT to review. Action Log Item 17-033: Run the Exceedances Report for the first quarter of 2017 and send to DM and DT to review. Assigned to JD with a completion date of April 21, 2017.
4. Slide 9 and 10 – Operational Performance – System Wide Production	JD – reviewed the graph with the group keeping in mind this is the same graph as is provided for the Monthly Operations Report. No comments from the group. DM – commented to the group that other graphs that were previously reviewed in Management Reviews were maintained as a large excel spreadsheet populated with data exported from our eRIS database. In review with CM regarding consistency of data provided for Annual Report/Monthly Operations Report/Quarterly Management Review/NWWBI, further discussion with BMT is needed to create the metrics and KPIs that we would benefit from moving forward. Currently to obtain these graphs from eRIS we need eclipse and do not have the program or the expertise to create these yet.

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

Agenda Item	Discussion/Decision
5. Slide 11 and 12 – Operational Performance - Sectional Work Orders	JD – the group reviewed the number of Work Orders completed successfully in the GWS and SWS sections of 99% and 96% respectively JD – the group reviewed the number of Work Orders completed successfully from the WCS and WDS section of 82% and 73% respectively JG – commented that the "regulatory" category should not apply to this section. Work activities such as leak investigation look as though they are classified incorrectly. This will be fixed for Q2 based on discussion with DM and the UPCs. DM – has met with UPCs regarding reporting and templates for these items. Again this will be reflected in the Q2 Work Order numbers for this section. CH – noted that other activities include leak alarms from Wamco installations, batch flushing and flush box installations contributed the incomplete Work Orders for the WCS section
6. Slide 13 – Operational Performance – Backflow	JD – reviewed the graphic as provided from the backflow group with comments regarding the review that was conducted which made some changes to properties included and excluded from the program JG – remarked on the significant advancement of the program in the last couple of years, group agreed.
7. Slide 14 and 15 - Operational Performance – Call-Outs	CM – noted that WPS 16 had the highest number of call-outs DT – comment that the flow meter at Brownwood Station caused these alarms and has since been rectified. DT also commented that Sunnidale is a large contributor of GWS alarms
8. Slide 16 – Operational Performance – Main Breaks	JD – reviewed the 4 graphs with the group: Material/Size/Nature/Cause and noted that AIP suggested we take a look into age also JB – commented that Mike Munshaw completed work on this previously that could be used as a resource moving forward JD – noted that CAM provides this data quite effectively for us for the NWWBI project DM – noted that she would like to start discussion with the UPCs to see what would be involved to have age added to the current CMMS main break report
9. Slide 17 – Raw Water Supply and Drinking Water Trends - Sodium	JD – reviewed the graph with the group. No comment from the group.
10. Slide 18,19,20,21,22 and 23 – Raw Water Supply and Drinking Water Trends - VOCs	JD – reviewed each graph with the group (6 in total) DM – discussed with the group the diminishing result at WPS 5 and migration and rise of CIS 1,2 DCE found at WPS 11 DT – noted that he would like to see on the graphs a statement indicating that the zero mark (base of the graph) is in fact the MDL Action Log Item 17-034: Add the note to each of the VOC graphs presented that the base of the graph is the current MDL for that parameter. Assigned to JD with a completion date of July 1, 2017.
11. Slide 24 and 25 – Raw Water Supply and Drinking Water Trends – In-House Lab Sampling	JD – reviewed the trending graphs provided through eRIS of Raw and Treated Water for: Alkalinity, Colour, Hardness, Nitrogen, pH and Temperature JD – noted that spikes on the colour, nitrogen and temperature graphs may warrant investigation, JA absent therefore unable to comment DS – commented that she will review these anomalies KL – noted that causes for these could include pump start-ups as well as operations staff taking the correct SCADA tag

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

Agenda Item	Discussion/Decision
12. Slide 26 – Raw Water Supply and Drinking Water Trends - THMs	JD – reviewed the THM calculator with the group DM – requested that we note the O.Reg. 169/03 Standard for the RAA as 100 ug/L and the O.Reg. 170/03 Standard for any single result (s.13-6.(4)1.) as 50 ug/L on the next presentation table. Action Log Item 17-035: Add the O.Reg 169/03 and O.Reg. 170/03 requirements to the THM RAA calculator. Assigned to JD, with a completion date of July 1, 2017.
13. Slide 27,28,29 and 30 – Raw Water Supply and Drinking Water Trends – 2016 Golder and Assoc. Report Summary	JD – read aloud the summary and recommendation of last years' report DM – noted for the group that whenever we receive the report we will review it in the following quarter. Historically the timelines have changed from year to year so it will be reviewed in any quarter with which it is received moving forward DM – provided a brief history of the project for new staff (KL, DS and JG) that may have not been familiar with the yearly voluntary program
14. Slide 31 and 32 – Raw Water Supply and Drinking Water Trends – Source Water Protection Report Summary	DT – commented that as part of the RMP he has obtained quotes for the spill kits that are to be placed at all GWS sites DM – commented that a review of the RMP may need to be conducted to ensure we are meeting the required timelines as outlined in the plan
15. Summary of Consumer Feedback	JD – reviewed 2 graphs with the group: Water Quality Complaints by Type and @Liveconx vs. CMMS CM – concerned about the results of the comparison and would like further review Action Log Item: 17-036: CTS to review @liveconx vs. CMMS Report with WCS for accuracy and make any required changes. Assigned to JD and BJM with a completion date of April 21st, 2017.

Minutes Reviewed By
☒ Amanda Inglis-Petahtegoose (AIP)
☒ Diane Moreau (DM)
☒ Jeanette Dumais (JD)
☒ Jennifer Barrick (JB)
☒ Kari Anne Last (KL)
☒ Diana Smith (DS)
☒ Chris Marchant (CM)
☒ Chris Harper (CH)
☒ Dave Truax (DT)
☒ Jamey Adams (JA)
☒ Jason Giffen (JG)

Next Meeting: 2017-07-18

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

QMS Meeting

Date: 2017-07-24

Time: 8:30 am to 12:30 pm

Meeting Type: QMS Q2 Management Review

File: \\barrie.ca\files\IGM\Enviro\Water Ops - CTS\Admin\A02-Staff Commit and Mtgs\Minutes - QMS Management Team Meetings\2017 Mgmt. Review\Q2

Water Operations Branch

Facilitator: Diana Smith (DS) **Recording: Diana Smith (DS)**	**Absent:** **Dave Truax (DT)** **Jennifer Barrick (JB)** **Kari-Anne Last (KL)**	**Attendees:** **☒ Amanda Inglis-Petahtegoose (AIP)** **☒ Diane Moreau (DM)** **☒ Jamey Adams (JA)**	**☒ Jeanette Dumais (JD)** **☒ Chris Marchant (CM)** **☒ Chris Harper (CH)** **☒ Jason Giffen (JG)**	**☒ Diana Smith (DS)**

Agenda

1. Review of the Q2 PowerPoint Presentation

Agenda Item	Discussion/Decision
1. Incidents of Adverse Drinking Water Tests	There were no adverse incidents for second quarter.
2. Deviations from Critical Control Point Limits and Response Actions – Deviations from SCADA Set Points	Presented table created by SWS for Deviations from SCADA Set Points. The data presented was different than previously reviewed; JA will review and provide comment if required. A similar report to be created by GWS for future management review. Action Log Item 17-054: Review SWS data for Deviations from SCADA Set Points for Q2. Assigned to JA with a completion date of September 6, 2017.
3. Deviations from Critical Control Point Limits and Response Actions – Flushing	Reviewed all graphs with the group for all activities per zone, volumes flushed over 100 m^3 and deviations for chlorine residual and turbidity per zone, comparing Q1 vs. Q2 for 2017. A decision was made against including the post swabbing hydrant flushing data in the graphs for future as it is a different type of activity. A decision was made to compare each quarter to the corresponding period of the previous year (e.g., Q1 of 2016 vs Q1 of 2017), as well as year over year comparison to assess the state of the system, when presenting data going forward at Management Review meetings. A decision was made not to include the total # of work orders completed vs. total flushing volume as per what is listed in Crystal reports from City works at this time. Action Log Item 17-032: Reassigned to DS to work on data and graphs for Q3 management review with a completion date of November 1, 2017.
4. Operational Performance – System Production	Reviewed the graph with the group; no comments, discussion or decisions were generated.
5. Operational Performance – Sectional Work Orders	The group reviewed the number of work orders completed successfully by each Section and the number of outstanding work orders from Q1. SWS provided the following explanation of the data provided: • Outstanding Work Orders from the previous quarter(s) – 45 of the 46 hardcopy Work Orders from Q1 have been accounted for; however, there were still some missing from Q2. JA will follow up. WCS provided the following explanation of the data provided: • Emergency Maintenance Work Orders – 2 noted as outstanding have been closed since report was generated from CMMS. • Urgent Maintenance Work Orders –1 outstanding was assigned to WCS in error and should be reassigned to WDS.

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

Agenda Item	Discussion/Decision
	WDS provided the following explanation of the data provided: • Emergency Maintenance Work Orders – 1 outstanding was a duplicate and should be removed, 1 was related to a project and will not be closed until the project is complete. • Urgent Maintenance Work Orders – JG to follow up and provide an explanation of 2 outstanding Work Orders. • Preventative Maintenance Work Orders – Valve turning and deficiencies make up the majority of the 148 outstanding Work Orders. • Regulatory Work Orders – JG to follow up and provide an explanation of 5 outstanding Work Orders. GWS was unavailable to provide comment on data presented for that Section. Action Log Item 17-055: Review missing work orders for SWS for Q2. Assigned to JA with a completion date of September 6, 2017. Action Log Item 17-056: Review Urgent Maintenance Work Orders and Regulatory work orders still outstanding for WDS for Q2. Assigned to JG with a completion date of September 6, 2017.
6. Operational Performance – Backflow	Reviewed the graph as provided from backflow group. Group commented that progress is great and were surprised that there are only 259 premises remaining which require isolation.
7. Operational Performance – Call outs	Presented the data that was provided by UPC for the GWS and SWS Sections. Group liked the way information was presented to be able to compare Quarter to quarter each year as well as yearly overall totals. The following comments were collected regarding the GWS data: • Abnormally high callouts were recorded for Big Bay Booster Station, Tiffin St, and Bayfield Tower. • Abnormally low (no) call outs were recorded for Sunnidale. • The name for the Tiffin station has been revised to Sarjeant on the MDWL and DWWP; the Management Review presentation should be revised to reflect the change. The following comments were collected regarding the SWS data: • Q1 total callouts was not added correctly in the spreadsheet. It says 32 and should be 31; correct for future reviews. • On slide 18 the Graph for SWS showed wrong year for 2017 (showed 2016 and should be 2017); correct for future reviews. Action Log Item 17-057: Update F20-07 for WPS07 from Tiffin to Sarjeant to align with MDWL and DWWP. Assigned to DS with a completion date of September 6, 2017. Action Log Item 17-058: Review callouts for GWS regarding high and absent numbers for Big Bay Booster, Tiffin St, Bayfield Tower and Sunnidale Reservoir. Assigned to DT with a completion date of September 6, 2017.
8. Operational Performance – Locates	Locates is a new item added to Management Review. The graph represents locates completed under the Ontario1Call (ON1Call) service; from June 2014 (subscription initiation) to present date. The following comments were collected regarding the data: • The graph revealed that the quantity of Locates complete in 2017 was lower than 2016 and May 2017 and June 2017 were much lower than expected. • The discrepancy between Locate volumes decreasing from 2016 to 2017 may in part be the result of public education by WOB encouraging that requests be placed for smaller work areas to reduce the amount of relocates resulting from locate expiration. In addition, continued development of Alternate Locate Agreements (ALAs) may also contribute. • Time required to complete a Locate may be a better metric for tracking performance given that the scope of a project results in varying resource requirements to complete a Locate, e.g., 30 min for a small project vs 3 hrs for a larger project). DigSmart may have the capability to track labour on the ticket. Additional discussion outside of Management Review will be required to assess the best metric for evaluating the performance of Locates. Action Log Item 17-059 Review locates information with the Section Lead Hand to ensure accuracy and quantity of relocates for data from 2016 and 2017. Assigned to DS with a completion date of September 6, 2017. Action Log Item 17-060: Review presentation of locate information for future Management Review. Assigned to DS with a completion date of January 1, 2018.

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

Agenda Item	Discussion/Decision
9. Operational Performance – Main Breaks	Presented data on total number of watermain breaks between April and June, inclusive comparing monthly average in 2014 through 2017, inclusive; watermain breaks in April were more than double the same month in 2016 but did not exceed the peak in 2015, while watermain breaks in May and June were at an all-time low in 2017 compared to the preceding years. Additional graphs were presented highlighting watermain breaks based on pipe size, pipe material, pipe age, break type and break cause. The following comments were collected regarding the data: • The graph illustrating the monthly average of watermain breaks should incorporate a way to represent a zero (0) value so that it does not look like there is missing data. DS to look into for future graphs. • The report from CMMS shows differences in material and size from the asset tags versus the information documented on the Work Order by the Operator. WOB needs to determine how to assess which record is correct and which is the best source of information from which reports should be developed (asset vs. work order). A resolution may be to remove material and size from the Work Order template as it should be tagged to the asset and the Operator should just be verifying the information from the asset information and making corrections to that information. • The graph labelled “Main Break by Type” contains a category titled “Not determined (in litigation)”. The “(in litigation)” was included in error; the category label should be corrected to “Not determined”. Action Log Item 17-061: Review watermain break graphs to see if there is a way to represent a zero (0) value so does not look like missing data. Assigned to DS with a completion date of 2017-11-01. Action Log Item 17-062: Review Watermain Break Report Work Order template (specifically related to material and size on form as it should be under the asset information). Assigned to DM & JG with a completion date of 2017-09-06.
10. Raw water supply and drinking water quality trends – Sodium	Reviewed graph with the group. WPS11 – Heritage illustrated a significant decrease in the sodium concentration. Follow up with Q3.
11. Raw water supply and drinking water quality trends – VOC’s	Reviewed graphs with the group. The trends indicate that cis 1, 2-Dichloroethylene is trending upward at WPS #11 - Heritage, but the same parameter is trending downward at WPS #14 - Heritage. Action Log Item 17-034 was reassigned to DS to add comment on VOC graph that base of the graph is the current MDL for the parameter due to changes in assignment of elements. Revised target date of 2017-11-01.
12. In house lab data – SWTP	Presented in-house lab data graphs. The following comments were collected regarding the data: • There was one instance for which hardness had no result as the number was not recorded on the in house lab data sheet. • Nitrogen in raw and treated water samples is illustrated as a zero (0) value where the samples were sent to external lab. The analysis completed by the external lab was conducted as TKN in place of Nitrogen, the two analytical results are not directly comparable. • pH spike in treated water was due to a calibration being completed.
13. Drinking Water Quality Trends – THM’s	Reviewed data with group. The following comments were collected regarding the data: • Sampling points for THMs were based on collecting one from each water source (SWS and GWS). • Going forward only include on the presentation the data associated with the 4 quarters which represent the running annual averages. Action Log Item 17-035 was reassigned to DS to work on THM and RAA calculator along with Reg requirements on the spreadsheet. Revised target date of 2017-10-01.

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

Agenda Item	Discussion/Decision
14. Summary of Consumer Feedback	Reviewed 2 graphs with the group: “Water quality complaints by type” and the “@liveconx Report vs. CMMS Report”. The following comments were collected regarding the data: • The information presented has already been brought to attention of the Section Lead Hand and BLT. • The discrepancies identified have been brought up at recent BLT meeting. BLT will determine a path forward for resolution. • A resolution may be to hand in paperwork for overtime with time sheets to justify the request. Action Log Item 17-063 was created to review afterhours call out paper work process and how to manage and track. Assigned to DM and BLT with a completion date of 2017-10-04
15. Results of Internal Audit	Reviewed summary of Audit. No comments provided from the group.
16. Changes Affecting QMS	Reviewed recent and upcoming DWQMS and MDWL changes that need to focus on. The following comments were collected regarding the information: • Although the watermain disinfection procedure does not officially come into effect until November 2017, WOB has already implemented the applicable procedures and documentation and have been operating under the premise that the procedure is in effect; therefore, the implementation of the revised MDWL will have no significant impact on operations. • Changes to wording regarding NSF372 clarifies when NSF372 is required, and when it is not required. Product exemptions will still need to be added to the MDWL during subsequent license renewals. • Chlorine monitoring for wells is being looked into by KL Action Log Item 17-064 was created to review how chlorine monitoring is being completed at wells as per MDWL and DWWP. Assigned to KL with a completion date of 2017-10-04.
17. Operational Plan, Currency and Updates	Presented elements reviewed by BMT to date. These included: • Element 2 – Quality Management System Policy • Element 3 – Commitment & Endorsement • Element 4 – Quality Management System Representative • Element 5 – Document and Records Control • Element 11 – Personnel Coverage • Element 12 – Communication • Element 14 – Review and provision of infrastructure • Element 15 – Infrastructure maintenance, rehabilitation and renewal • Element 17 – Measurement and Recording Equipment Calibration and Maintenance • Element 19 – Internal Audits • Element 20 – Management Review

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

QMS Meeting

Meeting Type: QMS Q2 Management Review
Date: 2017-07-24

Minutes Reviewed By
☒ Amanda Inglis-Petahtegoose (AIP)
☒ Diane Moreau (DM)
☒ Jeanette Dumais (JD)
☒ Jennifer Barrick (JB)
☒ Kari-Anne Last (KL)
☒ Diana Smith (DS)
☒ Chris Marchant (CM)
☒ Chris Harper (CH)
☒ Dave Truax (DT)
☒ Jamey Adams (JA)
☒ Jason Giffen (JG)

Next Meeting: 2017-10-24

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

QMS Meeting

Date: 2017-11-01

Time: 1:30 pm to 2:45pm

Meeting Type: QMS Q3 Management Review

File: N:\IGM\Enviro\Water Ops - CTS\Admin\A02-Staff Commit and Mtgs\Minutes - QMS Management Team Meetings\2017 Mgmt. Review

Water Operations Branch

Facilitator: Diana Smith (DS) **Recording: Jennifer Barrick (JB)**	**Absent:** **Diane Moreau (DM)** **David Truax (DT)** **Kari Anne Last (KL)** **Jeanette Dumais (JD)**	**Attendees:** **☒ Jennifer Barrick (JB)** **☒ Diana Smith (DS)**	**☒ Jamey Adams (JA)** **☒ Chris Harper (CH)** **☒ Jason Giffen (JG)**	**☒ Chris Marchant (CM)**

Agenda

1. Review of the Q3 PowerPoint Presentation

Agenda Item	Discussion/Decision
1. Incidents of Adverse Drinking Water Tests	There were 3 lead exceedances reported for the third quarter
2. Deviations from Critical Control Point Limits and Response Actions – Deviations from SCADA Set Points	Presented table created by SWS for Deviations from SCADA set points for 3rd quarter. The data presented had quite a few “air in turbidity analyzer” isolated events incidents during 3rd quarter. Question as to what this meant. JA commented that it was the side effect of MIT’s or maintenance. JA commented that it may be the terminology being used when reporting the incidents. The SCADA Minimum Set Points (T16-02) and Deviations from SCADA Set Points (F20-02) form are currently being updated which may help clarify things when completing these reports. A similar report to be created for GWS but there are currently issues with correct tags being used in eRIS. Discussion on possibly using a paper or electronic version for reporting in the future until reports can be created consistently.
3. Deviations from Critical Control Point Limits and Response Actions – Flushing	Reviewed all graphs with the group for all activities per zone, volumes flushed over 100 m^3 and deviations for chlorine and turbidity per zone. Did comparisons of Q3 for 2016 to Q3 for 2017. Q4 Management Review will provide yearly comparison of data for 2016 vs. 2017 as well as comparing Q4 2016 to Q4 2017. Action Log Item 17-088 was created to complete yearly comparisons of flushing data for Q4 management review. Assigned to KB with a completion date of January 24, 2018.
4. Operational Performance - System Production	Reviewed the graph with the group. JA would like to see comparison of SWS vs GWS for future review. Action Log Item 17-089 was created to do a comparison of SWS vs. GWS production for Q4 management review. Assigned to KB with a completion date of January 24, 2018.
5. Operational Performance – Sectional Work Orders	The group reviewed the number of work orders completed successfully by each Section and the number of outstanding work orders from Q2. GWS was unavailable to provide comment on data presented for that section. CM commented about outstanding work orders from GWS – Corrective Maintenance and Preventative Maintenance. What are they for? Would like follow up. SWS provided the following explanation of the data provided: • The actual number of outstanding work orders should actually be higher than what is listed on the slide as there are other past outstanding work orders not accounted for in the reported numbers. Would like to see total number of outstanding work orders not completed on future management review and not just those from the previous quarter.

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

Agenda Item	Discussion/Decision
	WDS provided the following explanation of the data provided: • Many of the outstanding regulatory work orders are in project files and stay there until work is completed. Suggestion to check regulatory wording for categorization • Miscellaneous work orders could be ones waiting to be cancelled or possible template issues. WCS provided the following explanation of the data provided: • BJ doing a good job staying on top of work order management. Management would like to see number of outstanding work orders beside the % so they have a better understanding of number missing for the current quarter. Action Log Item 17-090 was created to follow up with DT regarding outstanding work orders from Q3 for Corrective Maintenance and Preventative Maintenance. Assigned to DS with a completion date of December 6, 2017. Action Log Item 17-091 was created to request a report for outstanding work orders for each section and provide to respective Supervisor for follow up. Assigned to DS with a completion date of December 6, 2017. Action Log Item 17-092 was created to update Summary of Operational Performance (F20-07) to change wording to include all outstanding work orders not completed, to include number as well as percentage of outstanding work orders for current quarter being reported and to highlight the regulatory column. Assigned to DS with a completion date of December 6, 2017.
6. Operational Performance – Backflow	Reviewed the graph as provided from backflow group. Group commented that number outstanding is small. Passing of the Backflow Prevention Bylaw will hopefully help with the last few locations left.
7. Operational Performance – Call Outs	Presented the data that was provided by UPC for the GWS and SWS Sections. Group liked the presentation of the comparison for each Quarter and on a yearly basis for past 5 years. The following comments regarding callouts for GWS from Q2 were provided from DT prior to meeting: • Big Bay Booster – 3 call outs were for Utility power issues, and there was an issue after valve maintenance that caused call outs which is unusual and is fixed. • WPS07 – Sarjeant had 5 call outs from the chlorine system caused by cylinder change over, vacuum alarm and scales and 3 were caused by the turbidity acting up and resulted in replacing the light source. • Bayfield Tower – chlorine spikes during flow change over. It was thought that this issue was fixed. GWS has since made some changes and will see if they worked when reporting in Q4. The following comments were collected regarding the GWS data: • Abnormally high callouts were recorded for Bayfield Tower and WPS17 - Cross St • High callout numbers overall equaling > 1 calls per day for after hours. The following comments were collected regarding the SWS data: • Possible slightly higher callouts due to SCADA computer upgrades done during Q2 causing some issues to occur in Q3 Action Log Item 17-093 was created to follow up with DT regarding high number of call outs for Q3 for Bayfield Tower and WPS17 – Cross St. Assigned to DS with a completion date of December 6, 2017. Action Log Item 17-094 was created to follow up with DT regarding > 1 call per day for after hours for GWS. Assigned to DS/CM with a completion date of January 24, 2018.
8. Operational Performance – Locates	CM reported that BJ is following up with DigSmart and working with Annie Zhang on the reports and discrepancies in the numbers.

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

Agenda Item	Discussion/Decision
9. Operational Performance – Main Breaks	Presented data on total number of watermain breaks between July and September, inclusive and did comparison to monthly average from 2014 through 2016. Additional graphs were presented highlighting watermain breaks on pipe size, pipe material, pipe age, break type and break cause. The following comments were collected regarding the data: • Need to differentiate the current year comparison to the average of 2014-2016. Suggestion to add definition to the bottom of the graph to depict current year is in comparison to the average of past years. • One main break from 1910-1919. Seems like an old pipe and would like to confirm age on asset ID and work order. DS provided comment that no simple way to depict a 0 on the graph apart from adding data labels to the specific columns. Action Log Item 17-095 was created to update Watermain Break graph to include comment that the graph depicts the current year in comparison to the average of the past 3 years. Assigned to DS with a completion date of December 6, 2017. Action Log Item 17-096 was created to review data from main breaks to determine if 1 break had a main age between 1910 and 1919. Assigned to DS with a completion date of December 6, 2017.
10. Raw water supply and drinking water quality trends – Sodium	Reviewed graph with the group. The following comments were collected regarding the data: • What are the depths of wells at WPS11, WPS12, WPS14 and WPS15? Include in future graph to see if any correlation between depth and sodium results • Look into how long we have been testing for Sodium and maybe present data to see further trending back from 2012 and see how they have been increasing and any difference in well depths? Action Log Item 17-097 was created to update Sodium trending data beyond 2012 to see how the results have been increasing and any difference in correlation to well depth. Assigned to KB with a completion date of January 24, 2018.
11. Raw water supply and drinking water quality trends – VOC's	Presented information regarding changes to reporting limits with the use of a new sub-contracted lab. Reviewed graphs with the group. There were some questions regarding results and would like to have a closer look once receive more data from new sub-contracted lab.
12. Drinking Water Quality Trends – THM's & HAA's	Reviewed data with the group.
13. In house lab data – SWTP	Presented in house lab data graphs The following comments were collected regarding the data: • Look into comparing more data than just 1 quarter (possibly 1-2 years' worth of data) • pH will be reviewed to determine if obtaining results from SCADA or bench top and see if able to do any correlations between the benchtop pH and SCADA pH Action Log Item 17-098 was created to update in house lab data graphs to include data from 2 years to be able to see further trending for the SWTP data. Would like to include a rolling 2 years' worth of data. Assigned to KB with a completion date of January 24, 2018. Action Log Item 17-099 was created to follow up with JA on comparison of SCADA and bench top pH and see if any correlations between the data. Assigned to KB with a completion date of January 24, 2018.
14. Summary of Consumer Feedback	Review graphs with the group. The following comments were collected regarding the data:

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

Agenda Item	Discussion/Decision
	• Large number of complaints regarding low pressure. Any correlation to maintenance or work being created in the area? • Still large number of outstanding work orders not being created in CMMS from after call from @liveconx Action Log Item 17-100 was created to follow up with CH regarding any correlation between work being completed and call outs for low pressure. Assigned to DS with a completion date of December 6, 2017. Action Log Item 17-101 was created to follow up with CH regarding work orders for water quality complaints from Q3 not in CMMS that are in relation to calls from @liveconx. Assigned to DS with a completion date of December 6, 2017.
15. Summary of Risk Assessment	Reviewed the summary of 3 year risk assessment. No comments provided from the group.
16. Summary from Emergency Response Training Scenario	Reviewed the summary of the emergency training scenario and the feedback from the scenario. No comments provided from the group.
17. Changes Affecting QMS	Reviewed recent and upcoming changes with the group. No comments provided from the group.
18. Operational Plan, Currency and Updates	Presented elements reviewed by BMT to date. These included: • Element 1 – Quality Management System • Element 2 – Quality Management System Policy • Element 3 – Commitment & Endorsement • Element 4 – Quality Management System Representative • Element 5 – Document and Records Control • Element 6 – Drinking Water System • Element 9 – Organizational Structure, Roles , Responsibilities and Authorities • Element 11 – Personnel Coverage • Element 12 – Communication • Element 14 – Review and Provision of Infrastructure • Element 15 – Infrastructure Maintenance, Rehabilitation and Renewal • Element 17 – Measurement and Recording Equipment Calibration and Maintenance • Element 18 – Emergency Management • Element 19 - Internal Audits • Element 20 – Management Review

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

QMS Meeting

Meeting Type: QMS Q3 Management ReviewQMS Q3 Management Review
Date: November 1, 2017

Minutes Reviewed By
☒ Chris Marchant (CM)
☒ Diane Moreau (DM)
☒ David Truax (DT)
☒ Jamey Adams (JA)
☒ Jason Giffen (JG)
☒ Chris Harper (CH)
☒ Jeanette Dumais (JD)
☒ Jennifer Barrick (JB)
☒ Diana Smith (DS)
☒ Kaitlyn Beardsall

Next Meeting: February 5, 2018

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

QMS Meeting

Date: 2018-02-05

Time: 2:00 pm to 4:00 pm

Meeting Type: QMS Q4 Management Review

File: N:\IGM\Enviro\Water Ops - CTS\Admin\A02-Staff Commit and Mtgs\Minutes - QMS Management Team Meetings\2017 Mgmt. Review

Water Operations Branch

Facilitator: Kaitlyn Beardsall (KB) **Recording: Diana Smith (DS)**	**Absent: Dave Truax (DT)**	**Attendees:** ☒ **Kaitlyn Beardsall (KB)** ☒ **Diane Moreau (DM)** ☒ **Jeanette Dumais (JD)**	☒ **Jennifer Barrick (JB)** ☒ **Diana Smith (DS)** ☒ **Chris Marchant (CM)** ☒ **Jason Giffen (JG)**	☐ **Dave Truax (DT)** ☒ **Chris Harper (CH)** ☒ **Jamey Adams (JA)**

Agenda

1. Review and accept Q3 Management Review Meeting Minutes
2. Review of the Q4 PowerPoint Presentation

Agenda Item	Discussion/Decision
1. Review Q3 Management Review Minutes	Approved with 1 minor change to Item #5 to wording for regulatory templates to regulatory categorization.
2. Q3 Action Items follow up	Reviewed Action items with management. There are 2 items still outstanding that required further follow up and will be provided for next quarterly management review.
3. Incidents of Adverse Drinking Water Tests	Reviewed table presented. There were 3 lead exceedances that occurred in Q3, and no AWQI's reported for all of 2017.
4. Deviations from Critical Control Point Limits and Response Actions – Deviations from SCADA Set Points	Presented table created by SWS for Deviations from SCADA set points for 4th quarter There is work being done to create a paper version for reporting for both GWS and SWS to ensure consistency between the 2 sections and what is being reported for Critical Control Points until reports can be created from eRIS.

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

Agenda Item	Discussion/Decision
5. Deviations from Critical Control Point Limits and Response Actions – Flushing	Reviewed all graphs with the group for all activities per zone, volumes flushed over 100 m^3 and deviations for chlorine and turbidity per zone for Q4 data. Did comparisons of 2016 totals to 2017 totals for all categories. Total number of flushing activities (graph) is the number for all of 2017 and not the total number of deviations in the years. The graphs that follow represent the deviations. High turbidity (>2 NTU on start-up – aesthetic objective). Discussion on whether we want to increase to 5 NTU. The team decided to keep the existing aesthetic objective for the time being. Action Log Item 18-007 was created to discuss turbidity deviation limit for flushing. Assigned to KB with a completion date of May 1, 2018.
6. Results of External Audit	Reviewed the results from the external Audit completed by SAI Global as an S2 Surveillance Audit.
7. Operation Performance – System Production	Reviewed the graph with the group.
8. Operational Performance – SWS vs GWS Production	Reviewed the graph with the group. Trending for GWS is slightly downward, SWS seems fairly stable.

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

9. Operational Performance – Sectional Work Order Summaries	The group reviewed the number of work orders completed successfully by each Section and the number of outstanding work orders. GWS was unavailable to provide comment on data presented for that section. There are 9 regulatory work orders outstanding requiring follow up SWS – no outstanding work orders. WDS provided the following explanation of the data provided: • Emergency – 1 work order outstanding was a duplicate and has since been fixed • Urgent – 1 outstanding work order that is going to be reviewed to determine what and where it is • Preventative Maintenance & Corrective Maintenance – A large number or work orders were created but not required, some are duplicates, some are old work orders that were done but paperwork was never completed. A large number of work orders were provided to UPC to be completed • Regulatory – these are mainly in the project files. WCS provided the following explanation of the data provided: • Regulatory – All were created for lead and will not be completed until the spring. • Emergency – 8 work orders outstanding. 5 are investigate leak and were provided to be processed and 1 work order is missing. There were 2 that were processed since the data was extracted from CMMS • There are approximately 600 work orders that have been completed but need to be closed in CMMS. Overtime approved with Admin to get caught up by end of the month. Sectional Work Order Summary – 2017 Totals. Need to look at a new way to present the data to BMT. It was noted that work orders created for projects will be tied to a project file and will be able to identify project work orders from the ones that are outstanding for the section. Action Log Item 18-008 was created to follow up with DT as to reason why GWS regulatory work orders not completed for 2017 Q4. Assigned to KB with a completion date of 2018-03-07. Action Log Item 18-009 was created to follow up on WDS outstanding Urgent work order not completed for 2017 Q4. Assigned to KB with a completion date of 2018-03-07. Action Log Item 18-010 was created to look into a new way to present the data for section work order summary for yearly totals. Assigned to KB with a completion date of 2018-05-01.

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

Agenda Item	Discussion/Decision
10. Operational Performance – Call Outs	Presented the data that was provided by UPC for the GWS and SWS Sections. Group liked the comparison for each quarter and on a yearly basis for past 5 years. The following comments were collected regarding the GWS data: • Abnormally high callouts were recorded for John St and PRV's The following comments were collected regarding the SWS data: • No real seasonal fluctuations that might influence the number of callouts each quarter On GWS and SWS comparison graph - Correct GWS 2013 total number of call outs. Shows 216 and should be 536. Action Log Item 18-011 was created to follow up with DT regarding high number of callouts for Q4 for WPS05 - John St and PRV's. Assigned to KB with a completion date of 2018-03-07. Action Log Item 18-012 was created to correct the GWS and SWS comparison graph of after-hours callouts for GWS 2013 total number of callouts needs to be corrected from 216 to 536. Assigned to KB with a completion date of 2018-03-07.
11. Operational Performance – Backflow	Reviewed the graph as provided by the backflow group. There are still 147 still outstanding. Possibly new metrics coming out for Backflow group once these are completed.
12. Operational Performance – Locates	This report is still not working correctly. CM to follow up with IT about progress on the report.

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

Agenda Item	Discussion/Decision
13. Operational Performance – Watermain Breaks	Presented data on total watermain breaks between October and December, inclusive and did comparison to monthly average from 2014 through 2016. Additional graphs were presented highlighting watermain breaks on pipe size, pipe material, pipe age, break type and break cause. The following comments were collected regarding the data: • 1 Contractor hit – Caroline St where a contractor hit a hydrant and then the contractor repaired it. • There were discrepancies between reports generated monthly and numbers added up giving a total of 34 watermain breaks, versus a yearly reported created at the end of the year reporting 39 watermain breaks. It was found that 3 watermain break work orders were created outside the reporting period (e.g. break occurred in March but work order created in July). There were also 2 work orders to be changed to service leaks as they were reported incorrectly. Total number of watermain breaks for 2017 was 37. • Discussion on Work order creation dates versus occurrence dates – some reports pull from the occurrence date and not the creation date. There is a need to review as some works are being missed when they are created outside the timeline for when a report was generated. • There is still one watermain break work order for 45 Royal Oak Drive outstanding from June. Possibly still in project files. Action Log Item 18-013 was created to follow up on CMMS reports and creation date versus occurrence dates and how some occurrences are getting missed on monthly reports versus the year-end report. Assigned to KB with a completion date of 2018-05-01. Action Log Item 18-014 was created to follow up on outstanding watermain break for 45 Royal Oak Drive from June. Assigned to KB with a completion date of 2018-03-07.
14. Raw Water Supply and Drinking Water Quality Trends - Sodium	Review graph with the group. Going to look at possibly separating out each well station or grouping some of the stations together going forward as we are adding data from 2004 onwards. Will provide data at future management review meeting.
15. Raw Water Supply and Drinking Water Quality Trends – VOCs	Reviewed information regarding changes to reporting limits with the use of a new sub-contracted lab. Reviewed graphs with the group. The following comments were collected regarding the data: • The graphs are not depicting much on their own. We receive an annual summary from Golder regarding VOC's and some trending analysis. Further discussion is needed on whether to continue with this set of graphs or not. Action Log Item 18-015 was created to follow up with BMT as to whether they want to continue with the VOC graphs from monthly data or just report summary from Golder report. Assigned to KB with a completion date of 2018-05-01.

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

Agenda Item	Discussion/Decision
16. Drinking Water Quality Trends – THMs & HAAs	Reviewed data with the group.
17. Raw Water Supply and Drinking Water Quality Trends – SWTP in-house lab data	Presented in house lab data graphs for Q4 as well as data for each parameter for 2 years. The following comments were collected regarding the data: • There have been some changes in the processes being used for collecting samples as well as the test methods for many of the parameters. • It was noticeable that temperature affects pH and can be seen when comparing these 2 parameters alongside each other.
18. Raw Water Supply and Drinking Water Quality Trends – SWTP SCADA pH vs. In-house lab pH	Reviewed graphs with the group. The following comments were collected regarding the data: • SCADA pH is collected at the LLPS and Lab pH is collected in the lab from a line that runs off the raw water line at the LLPS and then runs up to the SWTP lab. • The comparison between the pH was minimal. • SWTP is going to add temperature to the graph and see the comparison between temp and pH for the LLPS. JA will review for operational purposes for SWTP only. • The Team decided that in the future, this graph can be removed from Management Review. Action Log Item 18-016 was created to remove the graph comparing SCADA pH to In House Lab pH from future management review. Assigned to KB with a completion date of 2018-05-01.
19. Summary of Consumer Feedback – Water Quality Complaints	Reviewed graphs with the group. The following comments were collected regarding the data: • The “No water” calls that came in were customers that had no water but upon investigation it was verified to be internal plumbing issues. • Further investigation to be done to determine if it is possible to heat map the water complaints for low pressure to see if they correlate to work being done in the area. Action Item 17-100 already generated from Q3 and still being reviewed. • Work orders and/or service requests continue to remain outstanding for after hour water quality complaint calls. Issue to be discussed between management. CIP was created for issue and still under review.

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

Agenda Item	Discussion/Decision
20. Changes affecting QMS	Reviewed recent changes with the group. No comments provided from the group.
21. Resources needed to maintain QMS	No resources needed at this time to maintain QMS.
22. Results of Infrastructure Review	CM provided comments. Long term infrastructure needs related to the drinking water system are established in coordination with the Engineering Department and driven by the Water/Wastewater Master Plan that details specific growth projections and the subsequent infrastructure investments/upgrades required to ensure the provision of an adequate potable water supply. New Capital infrastructure projects as well as replacement and renewal projects are driven by the Engineering Department with Water Operations being consulted throughout the design and commissioning phases of each project. Based on these continual discussions with management in Engineering, Water Operations management is confident that the Branch's infrastructure needs are being sufficiently addressed through the projects identified in the current Capital Plan
23. Operational Plan, Currency and Updates	Presented elements reviewed by BMT to date. These included: • Element 1 – Quality Management System • Element 2 – Quality Management System Policy • Element 3 – Commitment & Endorsement • Element 4 – Quality Management System Representative • Element 5 – Document and Records Control • Element 6 – Drinking Water System • Element 7 – Risk Assessment • Element 8 – Risk Assessment Outcomes • Element 9 – Organizational Structure, Roles, Responsibilities and Authorities • Element 10 – Competencies • Element 11 – Personnel Coverage • Element 12 – Communication • Element 13 – Essential Supplies and Services • Element 14 – Review and Provision of Infrastructure • Element 15 – Infrastructure Maintenance, Rehabilitation and Renewal • Element 16 – Sampling, Testing & Monitoring • Element 17 – Measurement and Recording Equipment Calibration and Maintenance • Element 18 – Emergency Management • Element 19 – Internal Audits • Element 20 – Management Review • Element 21 – Continual Improvement The ones in red were reviewed during Q4.

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

Agenda Item	Discussion/Decision
24. Summary of Staff Suggestions	Reviewed staff suggestions related to QMS. There was 1 suggestion to create management review metric for CTS. Some suggestions were provided including: • Action log items – decided to show ones completed • CIPs • OFIs • Other significant events Action Log Item 18-017 was created to add in some metrics for CTS for 2018 Management Reviews including completed action log items, CIPs completed, OFI's completed. Assigned to KB with a completion date of 2018-05-01.
25. Summary of Continual Improvement	Reviewed information provided regarding some areas where continual improvement is easily tracked. Included: • MOECC Inspection • Internal Audit • OFI's from CIP's
26. New Business	Voluntary General Chemistry Sampling – Location and Parameters The following comments were collected: • Iron and total hardness are common customer requests received by WOB. • Look at aesthetic objectives (taste, colour, odour) parameters • The Team decided to add general chemistry back to all well sites – need to discuss parameters, if there are any that can be eliminated, frequency of samples (quarterly, annually), and whether or not any sampling on treated water (like Iron) should be included for comparative treatment efforts. • Discussion occurred about possibly having WCS take the samples at the well locations for General Chemistry depending on frequency. BMT to discuss this further. • Discussion occurred over the General Chemistry samples used to be collected at the boundaries between GWS and SWS during the first couple of years that the SWTP was open. Further discussion required if this sampling should be started again, along with the frequency and locations. BMT to discuss at the next BMT meeting. Action Log Item 18-018 was created to discuss General Chemistry parameters, frequency of sample collection and any treated water sampling to show treatment efforts. Include discussion about GWS and SWS boundary sampling. Assigned to DM with a completion date of 2018-03-07.

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**

Minutes Reviewed By
☒ **Kaitlyn Beardsall (KB)**
☒ **Diane Moreau (DM)**
☒ **Jeanette Dumais (JD)**
☒ **Jennifer Barrick (JB)**
☒ **Diana Smith (DS)**
☒ **Dave Truax (DT)**
☒ **Chris Harper (CH)**
☒ **Jamey Adams (JA)**
☒ **Chris Marchant (CM)**
☒ **Jason Giffen (JG)**

Next Meeting: April 2018

**** Refer to QMS Action Log for specific details regarding action items assigned during QMS Meetings**