THE CORPORATION OF THE TOWN OF ST. MARYS

2016 SUMMARY REPORT FOR THE DRINKING WATER SYSTEM

MUNICIPAL DRINKING WATER SYSTEM NO. 220000521

Report Prepared for the:
Reporting Period of January 1, 2016 through December 31, 2016

Report Prepared By:
Renee Hornick, Operations Manager
Ontario Clean Water Agency on behalf of the Town of St. Marys

TABLE OF CONTENTS

TABLES:

APPENDICIES:

1.0 INTRODUCTION

The delivery of potable drinking water in Ontario is regulated by the Ministry of the Environment and Climate Change (MOECC) under the Safe Drinking Water Act (SDWA, 2002). Ontario Regulation (O.Reg.) 170/03 came into effect on June 1, 2003 which detailed requirements for owners and operators of municipal drinking water systems. Schedule 22 of O. Reg. 170/03 prescribes the need for all owners of a licensed drinking water system to produce annual Summary Reports.

The Summary Report for the reporting period must be provided to members of the Municipal Council no later than March 31 of the following year.

1.1 BACKGROUND / OVERVIEW

The raw source water supply for the Town of St. Marys is drawn from three drilled wells, referred to as Production Wells No. 1, 2A and 3. All three wells are collectively referred to as the St. Marys Well Supply under water works number #220000521.

The Water Supply and Distribution System operates under a Municipal Drinking Water Licence (No. 056-101, issued October 15, 2014), Drinking Water Works Permit (No. 056-201, issued September 30, 2014) and a Permit to Take Water (PTTW) (No. 5303-AASQEC).

1.2 LEGISLATED REQUIREMENTS

Municipalities throughout Ontario have been required to comply with Ontario Regulation (O.Reg.) 170/03 made under the Safe Drinking Water Act (SDWA, 2002) since June of 2003. This act was enacted following the recommendations made by Commissioner O'Connor after the Walkerton Inquiry.

The Safe Drinking Water Act's purpose is to protect human health through the control and regulation of drinking-water systems. O.Reg. 170/03 specifies drinking water testing for microbiological parameters, chemical parameters, the use of licensed laboratories, treatment requirements and reporting requirements.

Summary Reports for Municipalities, as stated in "Schedule 22" of O.Reg. 170/03 requires Annual Reports be submitted to the owners of Large Municipal Residential Systems and Small Municipal Systems. The Summary Reports are required to be submitted to members of Council no later than March 31 of each year. The Summary Report must list the requirements of the SDWA, 2002, the regulations, the system's approval as well as any order that the system failed to meet at any time during the reporting period covered, including the duration of the failure, and the measures taken to correct the failure, if any.

The annual Summary Report for Council is one requirement under O.Reg.170/03. In addition, an annual report for the Ministry of the Environment and Climate Change (MOECC) Drinking Water Information System is also required and must be made available to the Public. Both the annual and Summary Reports for the Town of St. Marys are available at the Municipal Operations Center, and on the Town of St. Marys official website.

1.3 ANNUAL REPORTING REQUIREMENTS

For the Town of St. Marys Drinking Water System, the MOECC requires four different reports as detailed in the following table:

Drinking Water System Annual Reporting Requirements			
Report Name	**Description**	**Legislation or Regulation**	**Submitted to:**
Summary Report for Municipalities (Schedule 22)	• Summary well information • Description of any failure to meet requirements of an Act, regulations or the system's approval	O. Reg. 170/03, Schedule 22	Council and available for inspection by the public @ MOC & Website
Annual Report (Section 11)	• Description of system • Water quality test results • Adverse test results and corrective action • Major expenses to repair, replace or install equipment	O. Reg. 170/03, Schedule 11	Posted on the Town of St. Marys Website & MOC
Water Taking Report	• Electronic submission of water taking data	O. Reg. 387/04	Ministry of the Environment and Climate Change
Industrial and Commercial water usage report	• Electronic submission of water usage data for industrial and commercial users	O. Reg. 450/07	Ministry of the Environment and Climate Change

Table A: Town of St. Marys Drinking Water System Annual Reports

The annual Summary Report is required to list the requirements of the Act (SDWA, 2002), the requirements of 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 any time during the period covered by the report. In addition, for each requirement referred to in clause (a) that was not met, specify the duration of the failure and the measures that were taken to correct the failure. (O.Reg. 170/03 s 22 (2)).

The report is also required to include the following information for the purpose of enabling the owner of the system to assess the capability of the system to meet existing and planned uses of the system:

- 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 flow rates; and,

- A comparison of the summary referred to in Paragraph 1 to the rated capacity and flow rates approved in the system's approval, drinking water works permit or municipal drinking water licence, or if the system is receiving all of its water from another system under an agreement pursuant to subsection 5 (4), to the flow rates specified in the written agreement.

2.0 DESCRIPTION OF WATER WORKS

2.1 OVERVIEW

The Corporation of the Town of St. Marys is the owner and operator of a "Large, Municipal, Drinking Water System" supplied by a ground water source. The system provides potable water to approximately 3,100 residential, industrial, institutional and commercial users. A total of three (3) bedrock wells are connected to the water distribution system, each equipped with pumping, treating and monitoring components. The MOECC has classified all three wells as "GUDI" (Groundwater Under the Direct Influence of Surface Water) with effective in-situ filtration. The remainder of the system consists of a booster pump station (used only during a fire emergency) and one elevated water storage tank facility for system pressure regulation.

2.2 MUNICIPAL WELLS

The drinking water system for the Town of St. Marys is serviced by three bedrock groundwater wells. The wells are identified as Well No. 1, Well No. 2A and Well No. 3, respectively.

2.2.1 WELL NO. 1

According to Well Record #5001709, Production Well # 1 ("PW1" – identified as Well No. 1) was drilled on March 1, 1971 by International Water Supply Ltd. Well No. 1 is located south of the Trout Creek watercourse and east of St. George Street within the Town of St. Marys, Ontario. Well No. 1 is located within the 100 year flood plain of Trout Creek.

The Well Record indicates that a steel casing was installed and cemented within the borehole annulus to a depth of approximately 12.3 metres below ground surface. Below the 12.3 m steel casing, the borehole was left open within the limestone bedrock. In 2005, a Pumphouse was constructed around Well No. 1, at which time the well was extended to an elevation approximately 2 metres above the 100 year flood plain of Trout Creek.

A Hydrogeological Investigation entitled *"Town of St. Marys, Ontario, Perth County – Hydrogeologic Investigation, 2001-2002",* prepared by International Water Consultants Ltd. and International Water Supply Ltd., dated July 19, 2002 (referred to herein as "Hydrogeologic Investigation") was prepared for the Town of St. Marys.

The Hydrogeologic Investigation indicated that Production Well # 1 (Well No. 1) is periodically under the influence of surface water, and has partially effective in-situ filtration. According to the conclusions of the Peer Review document entitled "Town of St. Marys Water Supply System – GUDI Evaluation" (Peer Review) prepared by Jagger Hims Limited on behalf of the Ministry of the

Environment and Climate Change, dated January 10, 2003, Well No. 1 is considered to be a GUDI well without effective filtration. A final technical evaluation of the Hydrogeologic Investigation and the Peer Review was conducted by the MOECC and it was concluded that Well No. 1 is groundwater under the direct influence ("GUDI") of surface water with effective in-situ filtration.

Well No. 1 Component Appurtenances

The following is a summary of the appurtenances for Well No. 1:

- A 406 millimetre (mm) diameter, 45.5 m deep drilled groundwater production well is located east of the intersection of Timms Lane and St. George Street, immediately south of Trout Creek (NAD83: UTM Zone 17: 0489966 m East, 4789866 m North). The well is equipped with a line-shaft type vertical turbine well pump with variable frequency drive and pump-to-waste functionality. It is rated at a maximum flow of 3,600 litres per minute (L/min), with a 200 mm discharge line connected to the well pump header in the Pumphouse described below;

- A well Pumphouse, housing Well No. 1 and the following treatment and control facilities, including:

    - A 200 mm diameter pump header from the well, with check valve, air relief valve, raw water flow meter, shutoff valves, and raw water and treated water sampling tap;
    - A 100 mm line to waste;
    - A 200 mm diameter treated water header having a continuous chlorine analyzer and turbidity analyzer complete with automatic shutdown of well pump capability, connected to a 200 mm diameter feeder-main supplying the distribution system

- A treatment facility located approximately 20 m north of the well Pumphouse (inside former reservoir building), housing treatment and control facilities including:

    - One (1) ultraviolet disinfection system capable of providing a minimum dosage of 40 mJ/cm^2 of 254 nm wavelength complete with well pump shutdown on lamp failure;
    - Gas chlorination disinfection system, rated at 24 kg/day, consisting of one dual cylinder scale, one chlorine booster pump, and duplex automatic switchover regulator;
    - 78 m of 600 mm diameter watermain, followed by 26 m of 300 mm diameter watermain to provide chlorine contact prior to first customer;

2.2.2 WELL NO. 2A

According to the Well Record (A011221), Production Well #2A (PW2A, Identified as Well No. 2A) was drilled on September 29, 2005 by International Water Supply Ltd. Well No. 2A is located to the south of the Trout Creek watercourse and west of the Wellington Street Right-of-Way (ROW) within the 100 year flood plain of Trout Creek. As such, the casing for Well No. 2A has been significantly extended above the grade of the surrounding land to account for possible flooding issues.

According to information presented on the Well Record, the well is 365 mm in diameter and was drilled to a depth of approximately 46 metres. The Well Record indicates that a steel casing was installed and sealed with bentonite and sand cement grout within the borehole annulus to a depth of approximately 18 metres below grade. Below the 18 metres in depth, the borehole was left open within the limestone bedrock. Well No. 2A is classified as a GUDI well.

Well No. 2A Component Appurtenances

The following is a summary of the appurtenances for Well No. 2A:

- A 305 mm diameter, 44.5 m deep drilled groundwater production well located between the Wellington and Water Street Right-of-Ways (ROWs), north of the Queen Street ROW and immediately south of the Trout Creek watercourse (NAD 83: UTM Zone 17: 0488390 m East, 4789710 m North). Well No. 2A is equipped with a line-shaft type vertical turbine well pump, rated at 3,636 L/min at 89.2 m Total Dynamic Head (TDH), with a 200 mm discharge line connected to the well pump header in the Pumphouse described below.

- A well Pumphouse, housing treatment and control facilities including:

    - A 200 mm diameter pump header from the well, with check valve, air relief valve, raw water flow meter, shutoff valves, and raw and treated water sampling tap;
    - A 100 mm line to waste;
    - A gas chlorination disinfection system, consisting of one dual cylinder scale, one chlorine booster pump, one chlorine regulator, rated at 22.7 kg/day with feed line discharging into the common well pump header in the Pumphouse, and one continuous chlorine residual analyzer;
    - One ultraviolet disinfection system capable of providing a minimum dosage of 40 mJ/cm^2 of 254 nm wavelength complete with pump shutdown on lamp failure;
    - A 200 mm diameter treated water header having a continuous chlorine analyzer and turbidity analyzer complete with automatic shutdown of well pump capability, connected to a 200 mm diameter feeder-main supplying the distribution system.
    - 79 metres of 600 mm diameter watermain to provide chlorine contact time prior to the first customer.

2.2.3 WELL NO. 3

According to Well Record #5003118, Production Well # 3 (PW3, identified as Well No. 3) was drilled on June 10, 1984 by International Water Supply Ltd. This well is located within approximately 50 metres of the western bank of the Thames River, located to the east of Thomas Street and to the north and south of Westover Street and Park Street respectively. The well is within the confines of Pumphouse #3. According to the information presented within the Engineer's Report, the well is 406 mm in diameter and was drilled to a depth of approximately 47.4 m. The Well Record indicates that a steel casing was installed and sealed with grout within the borehole annulus to a depth of approximately 12.3 metres below grade, below which the borehole was left open within the limestone bedrock.

The Hydrogeologic Investigation concluded that Well No. 3 is not considered to be a GUDI well, and is receiving effective in-situ filtration. The author of the Hydrogeologic Investigation did indicate that this conclusion is tempered by a lack of particle count data during significant precipitation events and more elevated total coliforms in 2002. The Peer Review that was conducted assessed Well No. 3 to be a GUDI well with effective in-situ filtration. It is inferred that the Peer Review reclassification of Well No. 3 to a GUDI well was based on a lack of particle count data during significant precipitation events.

Well No. 3 Component Appurtenances

A 406 mm diameter, 47.4m deep drilled groundwater production well located on the southeast side of Thomas Street, southwest of Park Street, adjacent to the Thames River (NAD 83: UTM Zone 17: 0488010 East, 4789040 North). Well No. 3 is equipped with a line-shaft type vertical turbine well pump with variable frequency drive and pump-to-waste functionality. Well No. 3 is rated at a maximum flow of 3,636 L/min at 89.2 TDH, with a 200 mm discharge line connected to the well pump header in the Pumphouse described below;

- A well Pumphouse, housing treatment and control facilities including:
  - A 200 mm diameter pump header from the well, with check valve, air relief valve, raw water flow meter, shutoff valves and raw water and treated water sampling taps;
  - A 200 mm discharge to waste line with pressure relief valve and orifice plate for flow measurement;
  - One (1) ultraviolet disinfection system capable of providing a minimum dosage of 40 mJ/cm^2 of 254 nm wavelength complete with well pump shut down on lamp failure;
  - Gas chlorination disinfection system, rated at 24 kg/day, consisting of one (1) dual cylinder scale, one (1) chlorine booster pump and duplex automatic switchover regulator;
  - 171 m of 400 mm diameter watermain, followed by 40 m of 300 mm diameter watermain to provide chlorine contact prior to first customer.

- A 200 mm diameter treated water header having a continuous chlorine analyzer and turbidity analyzer complete with automatic shutdown of well pump capability, connected to a 200 mm diameter feeder main supplying the distribution system.

2.3 ELEVATED WATER STORAGE FACILITY

The St. Marys elevated water storage facility is located on the Southern side of the Victoria Street ROW, approximately 250 m west of James Street South in the Town of St. Marys, Ontario. It has a storage capacity of 1,820 cubic meters (m^3) and was constructed in 1986 and put into service in 1987. The static water head from the ground level to the overflow is 37.9 m. The facility includes a valve chamber, yard piping and tele-metering control system.

2.4 JAMES STREET BOOSTER STATION

The James Street Booster Station provides additional system pressure to the south industrial lands when private fire systems are activated. It has a rated capacity of 154L/s at 52 m TDH. This facility serves industrial lands within the southeast area of the Town.

2.5 DISTRIBUTION SYSTEM

The distribution system has been constructed with a combination of materials including ductile iron (main material), cast iron, small amounts of asbestos cement piping, and more recently, polyvinyl chloride (PVC) pipe. There are approximately 2,800 residential connections, 33 industrial / institutional connections and 187 commercial connections on the system which serves approximately 6,800 individuals.

3.0 ANNUAL DATA SUMMARY FOR 2016

3.1 FLOW DATA

The Town of St. Marys utilizes continuous monitoring equipment at each Pumphouse for flow measurements. The flow measuring devices are monitored by the Supervisory Control and Data Acquisition (SCADA) System and include remote system monitoring and data storage. In addition, these units are calibrated in accordance with the manufacturer's specifications at a minimum of once per year. Operations staff monitors the SCADA flow trends and review the flow and volume data for compliance with system approvals every 72 hours (as required by O.Reg. 170/03, Schedule 6; (1)).

3.1.1 DAILY FLOW RATES

In accordance with Permit to Take Water (PTTW) No. 5303-AASQEC, Section 3.0, the Town of St. Marys drinking water system shall not exceed the rated capacity for the maximum flow rates into the treatment system, trains or stages set out at 60 Litres per second (L/sec). There were 2 flow exeedences during the 2016 reporting period. The first event occurred on April 13, 2016 at Well #3 for less than 15 minutes and was related to a watermain break that occurred on Pellisier Street. The second event occurred on June 9, 2016 at Well #1 and was related to flow testing by International Water Supply (IWS).

3.1.2 DAILY WATER TAKING

In accordance with PTTW No. 8158-7P6SFJ and PTTW No. 5303-AASQEC which came into effect on May 4, 2016, Condition 3.2, Table A, the Town of St. Marys drinking water system shall not be operated to exceed the rated capacity of 5,184 cubic metres per day (m^3/day) per well. The maximum total combined taking from any combination of Well No 1, 2A and 3 shall not exceed 10,368 m^3/day. The quantity of water which was supplied both combined and individually during the 2016 reporting period remained below the terms and conditions of the PTTW provision.

The maximum daily volume per individual well for 2016 was 3,873.41 m^3/day which was reported for Well No. 1. This was approximately 74.7% of the maximum daily volume (in m^3/day) allowed under the PTTW. The annual average of daily flow was approximately 2,969.43 m^3/day for all three wells or 29% of the maximum volume. More specifically, Well No. 1 was reported to have an annual average of 1,798.87 m^3/day, (32% of maximum allowed daily water volume), Well No. 2A was reported to have an annual average of 1,672.01 m^3/day (28% of maximum allowed daily water volume) and Well No. 3 was reported to have an annual average of 943.71 m^3/day (18% of maximum allowed daily water volume)

A summary and graphical representation of the maximum and average daily flows per well may be referenced in Table 1 for the 2016 calendar year.

The maximum combined daily volume for the calendar year of 2016 was 4,285.75 m3/day on June 21, 2016. This represents approximately 41% of the maximum combined allowable usage for the Town of St. Marys.

A summary and graphical representation of the maximum and average combined daily flows may be referenced in Table 1 for the 2016 calendar year.

3.2 REGULATORY SAMPLE RESULTS SUMMARY

The Town of St. Marys is required to complete mandatory water sampling and testing throughout the course of a year as required by O.Reg. 170/03. Sample requirements consist of both chemical and microbiological parameters in addition to distribution checks. The frequencies at which the samples and distribution checks are completed are set by the MOECC.

3.2.1 MICROBIOLOGICAL TESTING

Microbiological testing is conducted under Schedule 10, 11 or 12 of O.Reg. 170/03. The following is a summary of testing completed during the 2016 reporting period. This information is also provided in the Annual Report provided to the MOECC as required by O.Reg. 170/03. A copy of the Annual Report, as submitted to the MOECC for the reporting period of 2016 may be referenced in Appendix A.

The Town of St. Marys collected 150 raw water samples in 2016. Of those 151 samples, E. Coli was reported to range from 0 – 1 Colony Forming Unit (CFUs) per 100 ml. Total Coliform was reported to range from 0 – 44 cfu/100ml. Raw water samples are collected by the Town to assess source water quality and results indicated above are for water which had not be subjected to treatment applications.

The Town also collected 149 treated samples in 2016. Of those samples collected and analyzed, E. Coli and Total Coliforms were not reported in any of the treated samples. The Town also analyzes treated water samples for Heterotrophic Plate Count (HPC) analysis. Results reported in 2016 indicated a range from 0 – 10 cfu/100ml. HPC analysis is an indicator test completed by the Town for water quality purposes, and is not utilized for water safety.

In addition, the Town also collected 230 distribution samples in 2016. Of those samples collected and analyzed, E. Coli and Total Coliforms were not reported in any of the distribution samples. The Town also analyzes distribution water samples for Heterotrophic Plate Count (HPC) analysis. Results reported in 2016 indicated a range from less than 0 – 220 cfu/1ml.

A summary review of microbiological testing for the 2016 calendar year may be referenced in Appendix A in the Annual Report.

3.3 ADVERSE TEST RESULTS

In accordance with Schedule 16 of O.Reg. 170/03, all required notifications of adverse water quality incidents were provided to the Spills Action Centre (SAC) and to the Medical Officer of Health (MOH). In 2016, there was two adverse test results/incidents which was reported to SAC and the MOH.

For more details regarding the adverse events, please refer Appendix A - 2016 Annual Drinking Water Report.

3.3.1 SODIUM

Sodium in the Town of St. Marys water supply is naturally occurring and is mostly attributed to the nature of the deep bedrock wells. The levels of sodium in the water are of interest because at higher levels it can impart a salty taste to the water and persons on sodium reduced diets need to know the sodium levels in the drinking water so that they can monitor their sodium intake. Specifically, the *Technical Support Document for Ontario Drinking Water – Standards, Objectives and Guidelines*, Ministry of the Environment and Climate Change, June 2003, indicates the following regarding sodium:

"The aesthetic objective for sodium in drinking water is 200 mg/L at which it can be detected by a salty taste. Sodium is not toxic. Consumption of sodium in excess of 10 grams per day (g/day) by normal adults does not result in any apparent adverse health effects. In addition, the average intake of sodium from water is only a small fraction of that consumed in a normal diet. A maximum acceptable concentration for sodium in drinking water has, therefore, not been specified. Persons suffering from hypertension or congestive heart disease may require a sodium restricted diet, in which case, the intake of sodium from drinking water could become significant. It is therefore recommended that the measurement of sodium levels be included in routine monitoring programs of water supplies. The local Medical Officers of Health should be notified when the sodium concentration exceeds 20 mg/L, so that this information may be passed on by local physicians. Softening using a domestic water softener increases the sodium level in drinking water and may contribute to a significant percentage to the daily sodium intake for a consumer on a sodium restricted diet. It is recommended that a separate unsoftened supply be retained for cooking and drinking purposes."

Sodium is a principal chemical in bodily fluids, and it is not considered harmful at normal levels of intake from combined food and drinking water sources. However, increased intake of sodium in drinking water may be problematic for people with hypertension, heart disease or kidney problems that require them to follow a low sodium diet. Residents of the Town of St. Marys on sodium

restricted diets may want to discuss concerns related to sodium intake from drinking water with their doctor.

The latest available analytical results for sodium were conducted in January 2015. The results indicated that sodium concentrations ranged from 33.6 mg/L to 61.1 mg/L.

3.4 TREATMENT CHEMICALS

The Town of St. Marys employs a two stage primary disinfection process consisting of UV light (UV reactor's 254nm – equivalent UV pass through dose of at least 20 mJ/cm^2) combined with chemical disinfection so as to provide an overall 4.0 log inactivation of viruses.

Chlorine gas is released from a liquid chlorine cylinder by a pressure reducing and flow control valve operating at a pressure less than atmospheric. The gas is led to an injector in the water supply pipe where highly pressurized water is passed through a venture orifice creating a vacuum that draws the chlorine into the water stream. Adequate mixing and contact time is provided after injection to ensure complete disinfection of remaining pathogens. Secondary disinfection introduces and maintains chlorine residual in the drinking water distribution system. Given the operational benefits of secondary disinfection, operators should strive to maintain a chlorine residual throughout the system to control regrowth and to provide an indication of system integrity. Overall, a chlorine residual in the distribution system provides three main benefits:

1. It can limit the growth of biofilm within the distribution system and its associated taste and odour problems (LeChevallier, 1998; White, 1999).

2. It may provide some protection in the event of microbial contamination in the distribution system, depending on the magnitude of the event and the susceptibility of the containing microorganisms to chlorine.

3. Most importantly, a rapid drop in disinfectant residual may provide an immediate indication of treatment process malfunction or a break in the integrity of the distribution system (LeChevallier, 1998; Health Canada, 2002).

Chlorine gas usage and rates are monitored throughout the course of the year so as to provide information regarding the use and quantity being used within the treatment and distribution system.

A summary of chlorine gas (Cl_2) used during both the primary and secondary processes for Well No. 1, 2A and 3 may be referenced in Tables 3, 4 and 5, respectively. In addition, average water level and monthly precipitation data are included. Also detailed in the tables is the approximate volume (cubic metres) of water which is being produced per kg of chlorine within the treatment and distribution system.

4.0 SYSTEM FAILURES AND CORRECTIONS

Every year, the MOECC conducts a full system inspection for the water system for the Town of St. Marys. At such time, the MOECC conducts on-site inspections of the various components of the municipal water system as well as reviewing all system documents and records for the previous year to verify that the Town of St. Marys is operating the water system in compliance to MOECC regulations.

4.1 SUMMARY OF NON-COMPLIANCE ITEMS

Schedule 22 of Ontario Regulation 170/03 requires that all non-compliance with applicable legislation be discussed in the Summary Report. The MOECC carried out their annual system inspection on September 2, 2016.

There were one non-compliance to report for the 2016 reporting period.

During the inspection period, it was found that log records entries made by the operators lacked clarity, and unambiguous identification of each entry made at the time by the operator.
The Operating Authority shall conduct a review of O. Reg. 128/04, "Certification of Drinking Water System Operators and Water Quality Analyst" and provide a training/coaching session to each Operator to ensure compliance with all prescribed regulatory record keeping requirements. From herein log records entries made by the Operators (OIC) shall be completed in chronological order with clarity, and unambiguously distinguish each entry made at the time by the Operator. Additionally, the Operator must be diligent, and make certain that recording of events in the logbook is conducted within a timeframe that is as close as possible to the occurrence to ensure accurate record keeping is maintained.

Staff has been trained on the requirements of logbook entry and now understand their legal responsibility to meet regulatory compliance with all record keeping.

.

5.0 COMMUNITY LEAD TESTING PROGRAM

In 2007, the MOECC amended the Drinking Water Systems Regulation (O.Reg. 170/03) made under the Safe Drinking Water Act, 2002 and introduced the new Community Lead Testing Program (Schedule 15.1 of the Regulation).

Under this program, all municipal and non-municipal drinking water systems are required to collect additional samples from private residences, non-residential buildings as well as the distribution system to check for lead in the drinking water.

Under the community Lead Testing Program, samples are collected during the period from December 15 to April 15 (under winter conditions) and June 15 to October 15 (under summer conditions). Following the community Lead Testing Program completed in 2009, the Town of St. Marys applied, and was granted regulatory relief for reduced sampling requirements for the community Lead Testing Program.

By obtaining regulatory relief regarding the community Lead Testing Program, the sample frequency was reduced to two consecutive periods ("winter" and "summer") of semi-annual testing, completed once every three years.

2012 marked the return of the community lead testing program for the Town of St. Marys, with sample rounds being completed in both the "Winter" and "Summer" periods, under reduced sampling requirements. The community lead testing program was a voluntary program for residents within the Town, however enough residents participated in the program to successfully meet the Town's sampling requirements.

Both sampling rounds in 2012 reported that no more than 10 percent (%) of plumbing samples exceeded the MOECC standard of 10 µg/L. As such, given the positive results observed during two consecutive sample rounds, the Town of St. Marys is now exempt from future plumbing sample requirements. Future lead monitoring within the drinking water system will be completed according to O.Reg. 170/03, Section 15.1-5 (10).

TABLE 1
Flow Rate Summaries

TABLE 1
2016 FLOW RATE SUMMARY (MUNICIPAL DRINKING WATER WELLS NO. 1, 2A AND 3)

Month	Well No. 1		Well No. 2A		Well No. 3	
	Average Flow (Litres/Sec)	Maximum Flow (Litres/Sec)	Average Flow (Litres/Sec)	Maximum Flow (Litres/Sec)	Average Flow (Litres/Sec)	Maximum Flow (Litres/Sec)
January	46.67	50.49	44.65	49.28	43.17	48.75
February	43.55	51.64	45.90	50.52	44.15	49.85
March	48.95	51.96	43.76	50.87	43.88	50.39
April	51.51	55.40	44.52	52.90	46.69	81.66
May	47.51	51.99	46.95	52.59	42.47	52.20
June	48.11	60.11	43.84	54.32	35.50	49.07
July	47.62	50.50	44.32	48.23	40.53	47.21
August	47.01	50.99	39.41	47.68	41.79	47.95
September	47.51	52.02	43.35	47.95	40.33	47.39
October	46.95	53.89	43.98	47.61	40.36	47.14
November	49.62	53.91	41.91	47.85	38.08	53.09
December	50.88	55.72	44.14	47.90	41.59	48.16

NOTES:

Average Flow - Average flow recorded at the well during the month

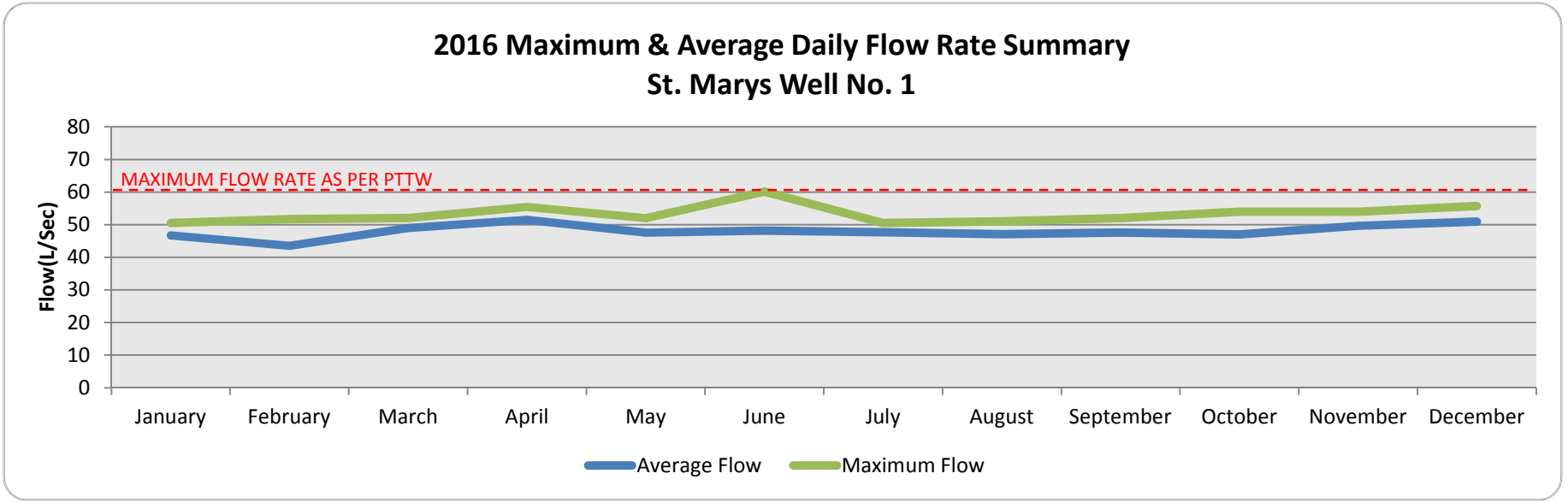
Maximum Flow - Maximum flow recorded at the well during the month

L/Sec - Litres per Second

Approved Rated Capacity - 60 litres per second

TABLE 1
2016 FLOW RATE SUMMARY (MUNICIPAL DRINKING WATER WELLS NO. 1, 2A AND 3)
MUNICIPAL DRINKING WATER WELL NO. 1 - FLOW COMPARISON

Month	January	February	March	April	May	June	July	August	September	October	November	December
Average	46.67	43.55	48.95	51.51	47.51	48.11	47.62	47.01	47.51	46.95	49.62	50.88
Maximum	50.49	51.64	51.96	55.4	51.99	60.11	50.5	50.99	52.02	53.89	53.91	55.72



NOTES:

Average Flow - Average flow recorded at the well during the month

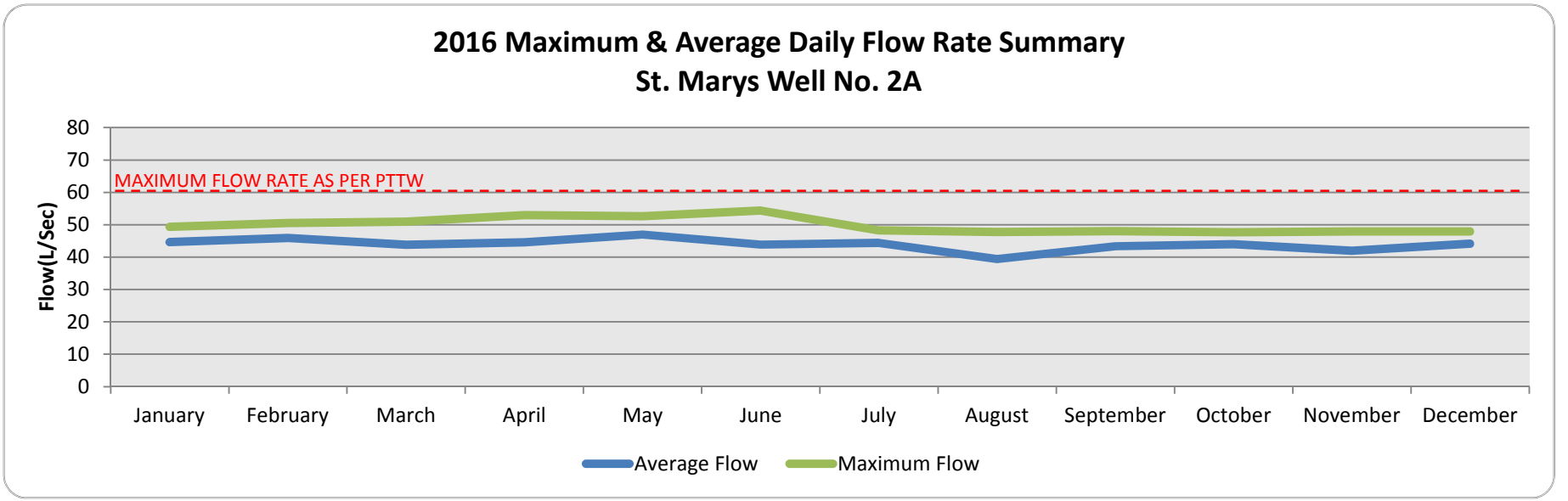
Maximum Flow - Maximum flow recorded at the well during the month

L/Sec - Litres per Second (Values presented on this page are expressed in litres per second)

Approved Rated Capacity - 60 litres per second

TABLE 1
2016 FLOW RATE SUMMARY (MUNICIPAL DRINKING WATER WELLS NO. 1, 2A AND 3)
MUNICIPAL DRINKING WATER WELL NO. 2A - FLOW COMPARISON

Month	January	February	March	April	May	June	July	August	September	October	November	December
Average	44.65	45.9	43.76	44.52	46.95	43.84	44.32	39.41	43.35	43.98	41.91	44.14
Maximum	49.28	50.52	50.87	52.9	52.59	54.32	48.23	47.68	47.95	47.61	47.85	47.9



NOTES:

Average Flow - Average flow recorded at the well during the month

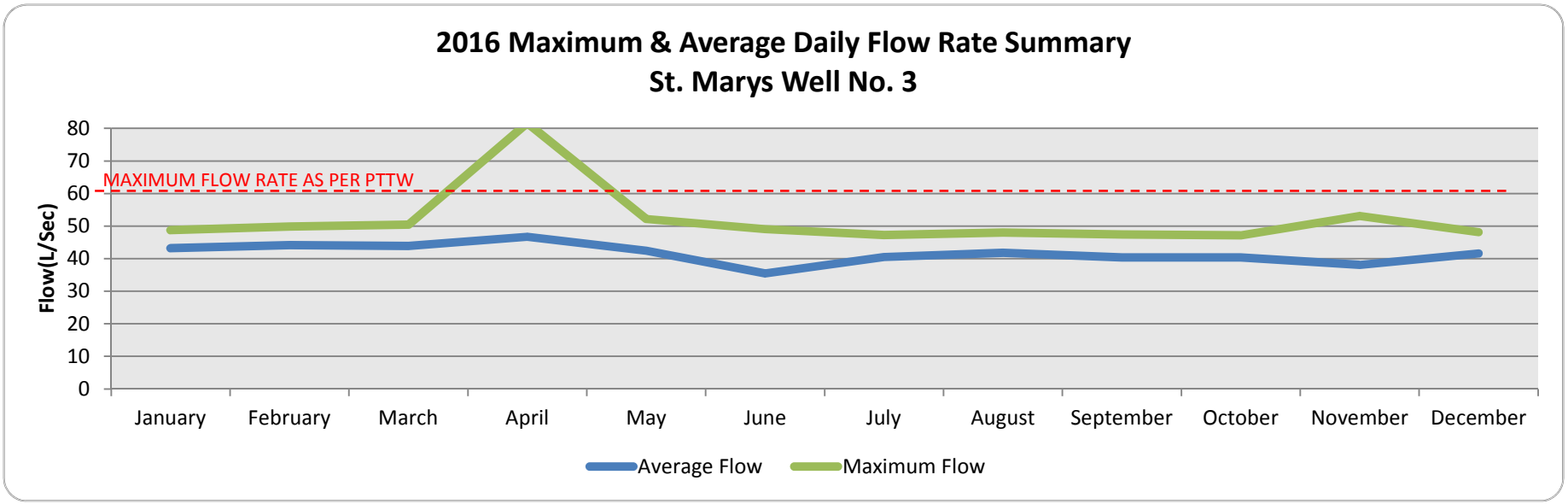
Maximum Flow - Maximum flow recorded at the well during the month

L/Sec - Litres per Second (Values presented on this page are expressed in litres per second)

Approved Rated Capacity - 60 litres per second

TABLE 1
2016 FLOW RATE SUMMARY (MUNICIPAL DRINKING WATER WELLS NO. 1, 2A AND 3)
MUNICIPAL DRINKING WATER WELL NO. 3 - FLOW COMPARISON

Month	January	February	March	April	May	June	July	August	September	October	November	December
Average	43.17	44.15	43.88	46.69	42.47	35.5	40.53	41.79	40.33	40.36	38.08	41.59
Maximum	48.75	49.85	50.39	81.66	52.2	49.07	47.21	47.95	47.39	47.14	53.09	48.16



NOTES:

Average Flow - Average flow recorded at the well during the month

Maximum Flow - Maximum flow recorded at the well during the month

L/Sec - Litres per Second (Values presented on this page are expressed in litres per second)

Approved Rated Capacity - 60 litres per second

TABLE 2
Annual Flow Report

Ontario Clean Water Agency

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Facility Works Number: 220000521
Facility Name: ST MARYS DRINKING WATER SYSTEM
Facility Classification: Class 2 Water Distribution and Supply
Service Population: 6293.0
Total Design Capacity: 5184.0 m3/day

	01/2016	02/2016	03/2016	04/2016	05/2016	06/2016	07/2016	08/2016	09/2016	10/2016	11/2016	12/2016	Total	Avg	Max
Well #1 / Flow - m³/d															
Maximum	2,637.51	3,152.07	3,149.58	3,332.66	3,463.86	3,873.41	3,692.93	3,504.80	2,917.26	2,813.86	3,017.77	2,017.73			3,873.41
Mean	1,497.64	1,347.44	1,469.63	2,255.98	1,905.78	2,359.83	2,338.09	2,215.03	1,690.53	1,340.62	1,338.92	1,020.79		1,798.87	
Minimum	154.37	93.01	324.99	851.60	44.34	345.69	372.13	359.94	484.40	158.28	72.78	260.87			
Total	31,450.40	29,643.71	36,740.79	56,399.41	47,644.47	68,434.94	63,128.33	66,450.80	18,595.78	28,153.03	28,117.34	16,332.67	491,091.67		
Well #1 / Flush to Waste: Total - m3/day	674.0	696.0	702.0	1,320.0	714.0	993.0	654.0	803.0	274.0	1,944.0	636.0	499.0			
Well #2 / Flow - m³/d															
Maximum	2,503.20	3,194.87	2,730.00	2,823.13	3,274.85	3,595.11	3,500.27	1,857.54	3,337.21	3,141.26	2,777.44	3,156.98			3,595.11
Mean	1,432.3	1,451.9	1,748.9	1,058.5	1,736.4	1,481.5	1,695.1	1,036.1	2,083.7	2,062.7	1,780.2	1,748.6		1,672.01	
Minimum	117.68	60.07	33.24	48.63	272.92	217.83	304.73	46.42	33.39	240.36	41.17	572.65			
Total	34,374.2	29,037.4	33,228.8	17,994.6	34,727.6	31,112.2	30,512.0	8,288.7	58,342.7	51,566.8	48,065.8	52,456.5	429,707.33		
Well #2 / Flush to Waste: Total - m3/day	626.0	603.0	613.0	516.0	255.0	180.0	63.0	127.0	381.0	286.0	464.0	656.0			
Well #3 / Flow - m³/d															
Maximum	2,901.84	2,863.25	2,754.50	2,220.71	2,970.93	2,630.52	2,462.92	2,685.52	2,315.17	1,258.33	1,462.32	1,746.15			2,970.93
Mean	1,030.88	1,277.48	1,146.12	938.56	929.51	730.32	714.64	1,312.78	986.28	719.70	567.60	692.74		943.71	
Minimum	70.92	61.40	143.08	233.23	25.66	2.05	51.36	153.54	185.67	122.81	5.11	85.68			
Total	23,710.13	24,272.04	22,922.40	19,709.66	18,590.24	11,685.18	13,578.11	30,193.89	16,766.68	9,356.08	9,081.56	12,469.23	212,335.20		
Well #3 / Flush to Waste: Total - m³/d	147.00	191.00	215.00	330.00	114.00	107.00	78.00	118.00	125.00	113.00	139.00	167.00	1,842.08		
Total of Well #1, Well 2A and Well #3 - m3/month	89,534.71	82,953.17	92,892.01	94,103.71	100,962.34	111,232.28	107,218.45	104,933.37	93,705.14	89,075.87	85,264.71	81,258.44	1,133,134.20		111,232.28

TABLE 3
Chlorine Gas Summary and Flow
Well #1

TABLE 3
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 1
JANUARY 1 - DECEMBER 31, 2016

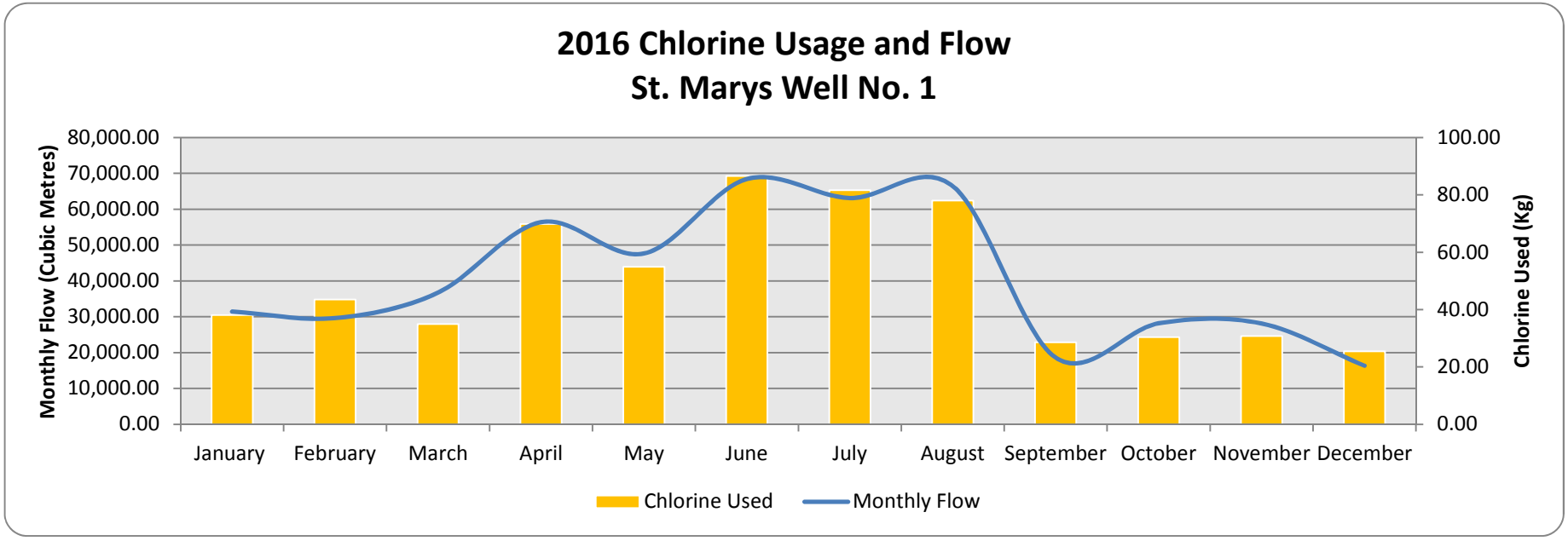
Month	Total Flow (Treated) (m^3)	Cl_2 Used (Kgs)	m^3 produced per Kg/Cl_2	Avg. Cl_2 Feed Rate (Kg/Day)	Avg. Cl_2 Residual (mg/L)	Average Water Levels Static (ft)	Average Water Levels Dynamic (ft)	Precipitation (Estimated) (mm)
January	31,450.40	38.10	825.47	6.4	1.1	55.22	62.75	104.00
February	29,643.71	43.54	680.84	6.4	1.06	52.64	57.11	67.00
March	36,740.79	34.92	1052.14	6.4	1.06	49.40	55.90	123.50
April	56,399.41	69.90	806.86	6.7	1.08	42.00	47.07	66.00
May	47,644.47	54.88	868.16	6.8	1.2	48.50	65.60	47.90
June	68,434.94	86.60	790.24	6.8	1.2	63.00	64.70	49.10
July	63,128.33	81.65	773.16	6.8	1.27	63.00	72.00	48.20
August	66,450.80	78.00	851.93	6.8	1.31	67.23	79.60	113.90
September	18,595.78	28.60	650.20	6.7	1.32	64.00	72.00	40.70
October	28,152.03	30.40	926.05	6.6	1.1	63.33	72.60	61.00
November	28,117.34	30.80	912.90	7	1.22	62.29	73.54	70.60
December	16,332.67	25.40	643.02	7.2	1.12	59.25	70.20	114.70
Minimum	**16,332.67**	**25.40**	**643.02**	**6.4**	**1.06**	**42.00**	**47.07**	**40.70**
Maximum	**68,434.94**	**86.60**	**1052.14**	**7.2**	**1.32**	**67.23**	**79.60**	**123.50**
Average	**40,924.22**	**50.23**	**815.08**	**7**	**1.17**	**57.49**	**66.09**	**75.55**
Totals	**491,090.67**	**602.79**						

NOTES:

m^3 - Cubic Metres
Cl_2 - Chlorine
Kg - Kilogram
L - Litre
ft - Feet
mm - Milimetre

TABLE 3
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 1
WELL NO. 1 - CHLORINE GAS USAGE AND FLOW

Month	January	February	March	April	May	June	July	August	September	October	November	December
Monthly Flow	31,450.40	29,643.71	36,740.79	56,399.41	47,644.47	68,434.94	63,128.33	66,450.80	18,595.78	28,153.03	28,117.34	16,332.67
Cl_2 Used	38.1	43.54	34.92	69.9	54.88	86.6	81.65	78	28.6	30.4	30.8	25.4



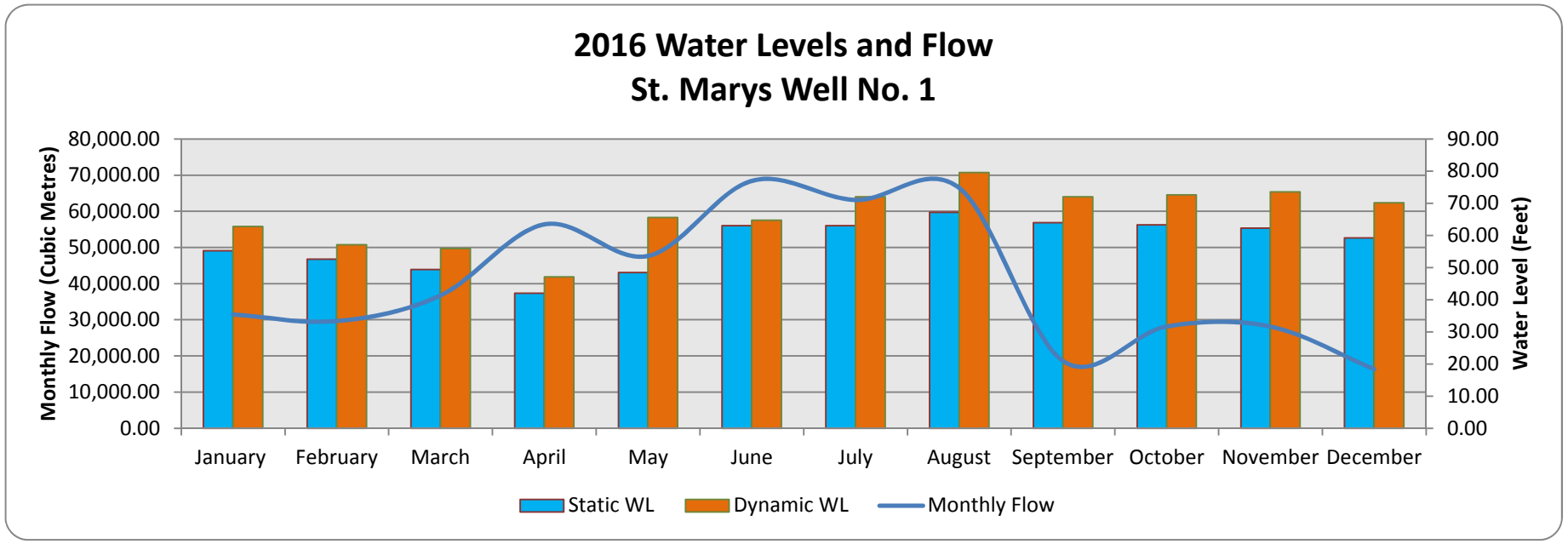
NOTES:

Monthly Flow - Total flow volume from the well as recorded by the flow meter

Chlorine Used - Total amount (Kg) of Chlorine used during each month at the well

TABLE 3
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 1
WELL NO. 1 - WATER LEVELS AND FLOW

Month	January	February	March	April	May	June	July	August	September	October	November	December
Monthly Flow	31,450.40	29,643.71	36,740.79	56,399.41	47,644.47	68,434.94	63,128.33	66,450.80	18,595.78	28,152.03	28,117.34	16,332.67
Static Level	55.22	52.64	49.4	42	48.5	63	63	67.23	64	63.33	62.29	59.25
Dynamic Level	62.75	57.11	55.9	47.07	65.6	64.7	72	79.6	72	72.6	73.54	70.2



NOTES:

Monthly Flow - Total flow volume from the well as recorded by the flow meter

Static Level - Groundwater Level when pump is not running

Dynamic Level - Groundwater Level when the pump is running

TABLE 4
Chlorine Gas Summary and Flow
Well #2A

TABLE 4
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 2A
JANUARY 1 - DECEMBER 31, 2016

Month	Total Flow (Treated) (m^3)	Cl_2 Used (Kgs)	m^3 produced per Kg/Cl_2	Avg. Cl_2 Feed Rate (Kg/Day)	Avg. Cl_2 Residual (mg/L)	Average Water Levels Static (ft)	Average Water Levels Dynamic (ft)	Precipitation (Estimated) (mm)
January	34,374.18	45.80	750.53	7.8	1.16	56.36	62.00	104.00
February	29,037.42	47.60	610.03	16.1	1.24	54.15	61.86	67.00
March	33,228.82	44.91	739.90	16.33	1.21	49.88	60.80	123.50
April	17,994.64	21.77	826.58	16.5	1.14	41.46	50.25	66.00
May	34,727.63	39.91	870.15	16	1.22	46.93	58.71	47.90
June	31,112.16	52.62	591.26	15.88	1.19	64.50	66.00	49.10
July	30,512.01	52.16	584.97	16.14	1.26	57.90	68.00	48.20
August	8,288.68	11.79	703.03	16.29	1.31	56.64	68.86	113.90
September	58,342.68	75.30	774.80	16.1	1.32	63.67	71.25	40.70
October	51,566.76	74.84	689.03	16.1	1.24	60.46	69.44	61.00
November	48,065.81	76.20	630.78	15.8	1.27	58.00	70.40	70.60
December	52,456.54	71.67	731.92	15.5	1.21	60.57	71.00	114.70
Minimum	**8,288.68**	**11.79**	**584.97**	**7.8**	**1.14**	**41.46**	**50.25**	**40.70**
Maximum	**58,342.68**	**76.20**	**870.15**	**16.5**	**1.32**	**64.50**	**71.25**	**123.50**
Average	**35,808.94**	**51.21**	**708.58**	**15**	**1.23**	**55.88**	**64.88**	**75.55**
Totals	**429,707.33**	**614.57**						

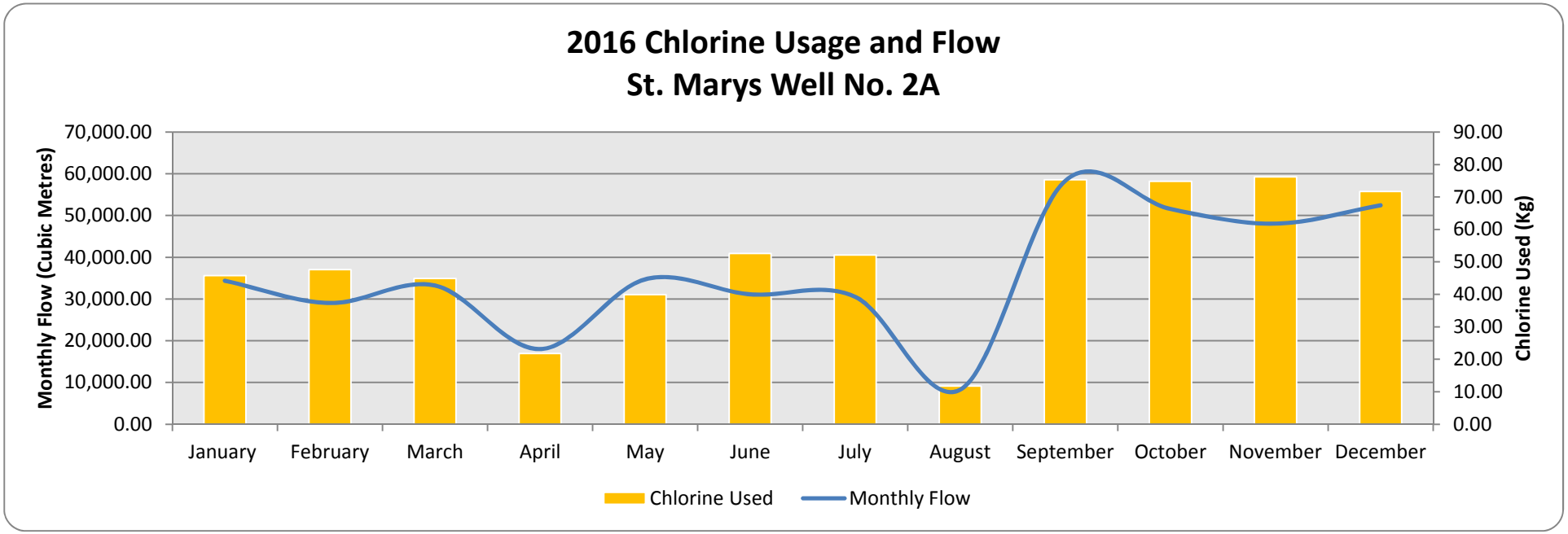
NOTES:

m^3 - Cubic Metres
Cl_2 - Chlorine
Kg - Kilogram
L - Litre
ft - Feet
mm - Milimetre

TABLE 4
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 2A

WELL NO. 2A - CHLORINE GAS USAGE AND FLOW

Month	January	February	March	April	May	June	July	August	September	October	November	December
Monthly Flow	34,374.18	29,037.42	33,228.82	17,994.64	34,727.63	31,112.16	30,512.01	8,288.68	58,342.68	51,566.76	48,065.81	52,456.54
Cl_2 Used	45.8	47.6	44.91	21.77	39.91	52.62	52.16	11.79	75.3	74.84	76.2	71.67



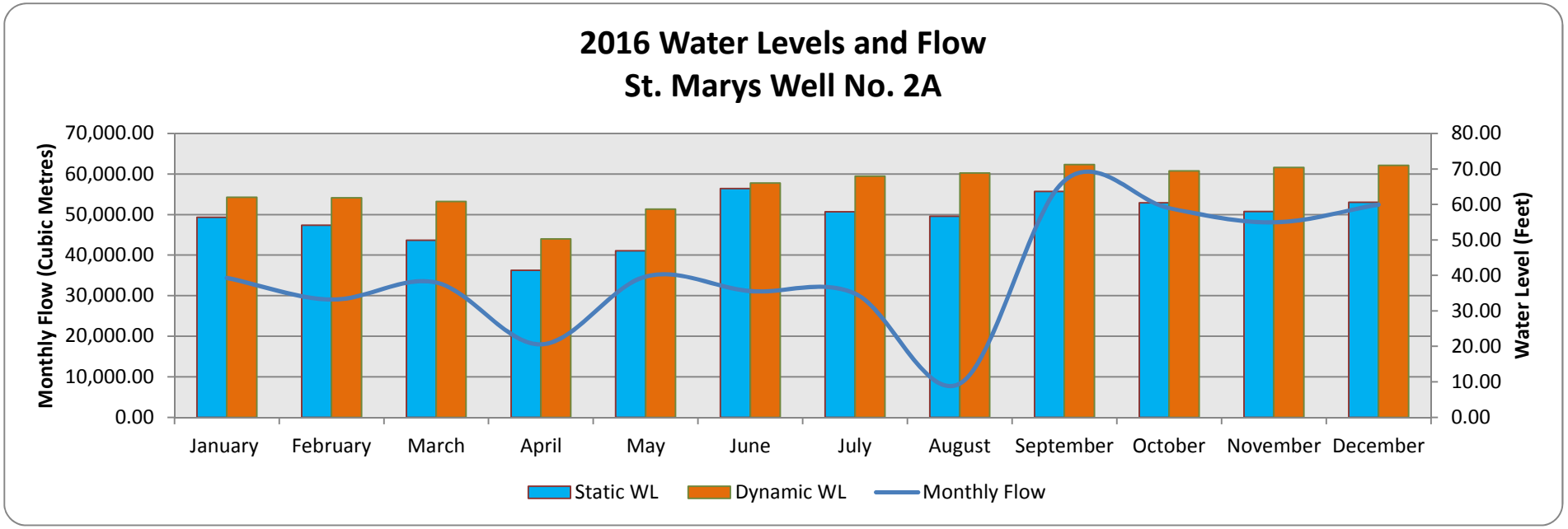
NOTES:

Monthly Flow - Total flow volume from the well as recorded by the flow meter

Chlorine Used - Total amount (Kg) of Chlorine used during each month at the well

TABLE 4
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 2A
WELL NO. 2A - WATER LEVELS AND FLOW

Month	January	February	March	April	May	June	July	August	September	October	November	December
Monthly Flow	34,374.18	29,037.42	33,228.82	17,994.64	34,727.63	31,112.16	30,512.01	8,288.68	58,342.68	51,566.76	48,065.81	52,456.54
Static Level	56.36	54.15	49.88	41.46	46.93	64.5	57.9	56.64	63.67	60.46	58	60.57
Dynamic Level	62	61.86	60.8	50.25	58.71	66	68	68.86	71.25	69.44	70.4	71



NOTES:

Monthly Flow - Total flow volume from the well as recorded by the flow meter
Static Level - Groundwater Level when pump is not running
Dynamic Level - Groundwater Level when the pump is running

TABLE 5
Chlorine Gas Summary and Flow
Well #3

TABLE 5
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 3
JANUARY 1 - DECEMBER 31, 2016

Month	Total Flow (Treated) (m^3)	Cl_2 Used (Kgs)	m^3 produced per Kg/Cl_2	Avg. Cl_2 Feed Rate (Kg/Day)	Avg. Cl_2 Residual (mg/L)	Average Water Levels Static (ft)	Average Water Levels Dynamic (ft)	Precipitation (Estimated) (mm)
January	23,710.13	30.80	769.81	6.00	1.22	62.00	70.40	104.00
February	24,272.04	36.30	668.65	6.20	1.05	52.60	66.64	67.00
March	22,922.40	27.70	827.52	6.30	1.16	50.64	62.30	123.50
April	19,709.66	31.30	629.70	6.30	1.22	51.66	55.50	66.00
May	18,590.24	28.60	650.01	6.20	1.15	48.00	58.67	47.90
June	11,685.18	10.90	1072.03	6.40	1.06	54.71	62.29	49.10
July	13,578.11	16.30	833.01	7.20	1.23	56.86	69.67	48.20
August	30,193.89	40.40	747.37	7.20	1.41	58.83	67.60	113.90
September	16,766.68	30.40	551.54	7.00	1.43	62.10	70.09	40.70
October	9,356.08	21.32	438.84	6.60	1.24	57.80	69.67	61.00
November	9,081.56	9.53	952.94	6.50	1.23	52.83	67.00	70.60
December	12,469.23	19.05	654.55	6.40	1.35	52.50	66.91	114.70
Minimum	**9,081.56**	**9.53**	**438.84**	**6.00**	**1.05**	**48.00**	**55.50**	**40.70**
Maximum	**30,193.89**	**40.40**	**1072.03**	**7.20**	**1.43**	**62.10**	**70.40**	**123.50**
Average	**17,694.60**	**25.22**	**733.00**	**6.53**	**1.23**	**55.04**	**65.56**	**75.55**
Totals	**212,335.20**	**302.60**						

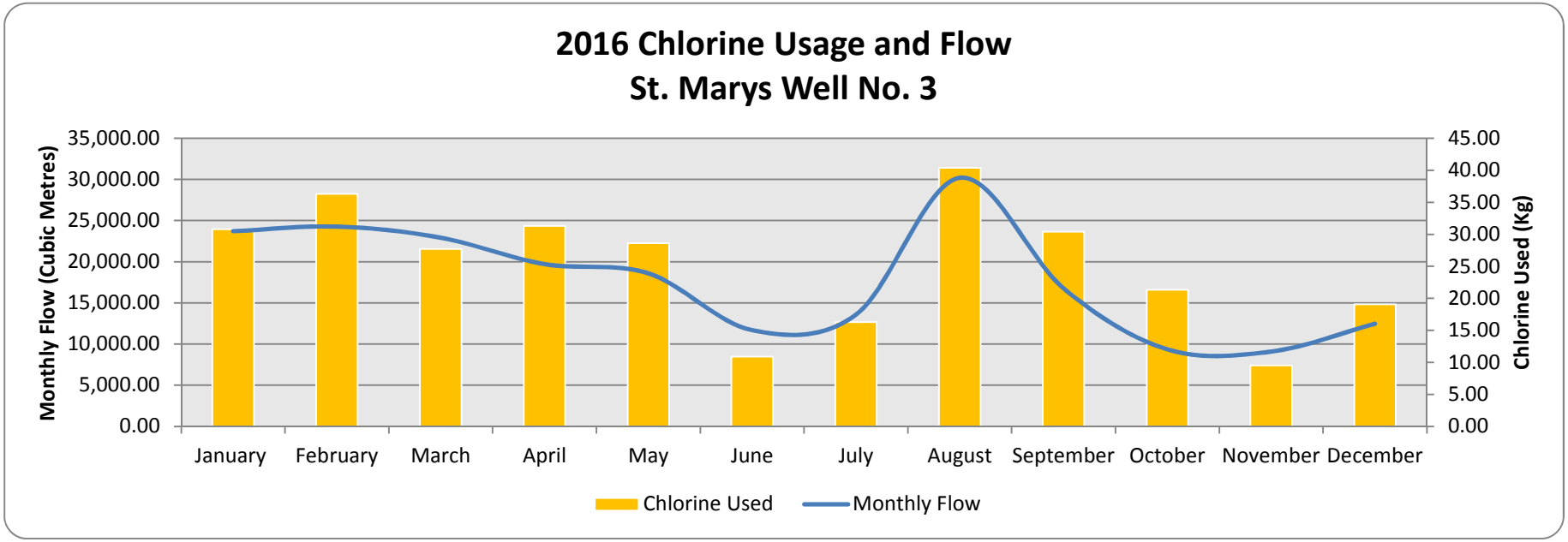
NOTES:

m^3 - Cubic Metres
Cl_2 - Chlorine
Kg - Kilogram
L - Litre
ft - Feet
mm - Milimetre

TABLE 5
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 3

WELL NO. 3 - CHLORINE GAS USAGE AND FLOW

Month	January	February	March	April	May	June	July	August	September	October	November	December
Monthly Flow	23,710.13	24,272.04	22,922.40	19,709.66	18,590.24	11,685.18	13,578.11	30,193.89	16,766.68	9,356.08	9,081.56	12,469.23
Cl_2 Used	30.8	36.3	27.7	31.3	28.6	10.9	16.3	40.4	30.4	21.32	9.53	19.05



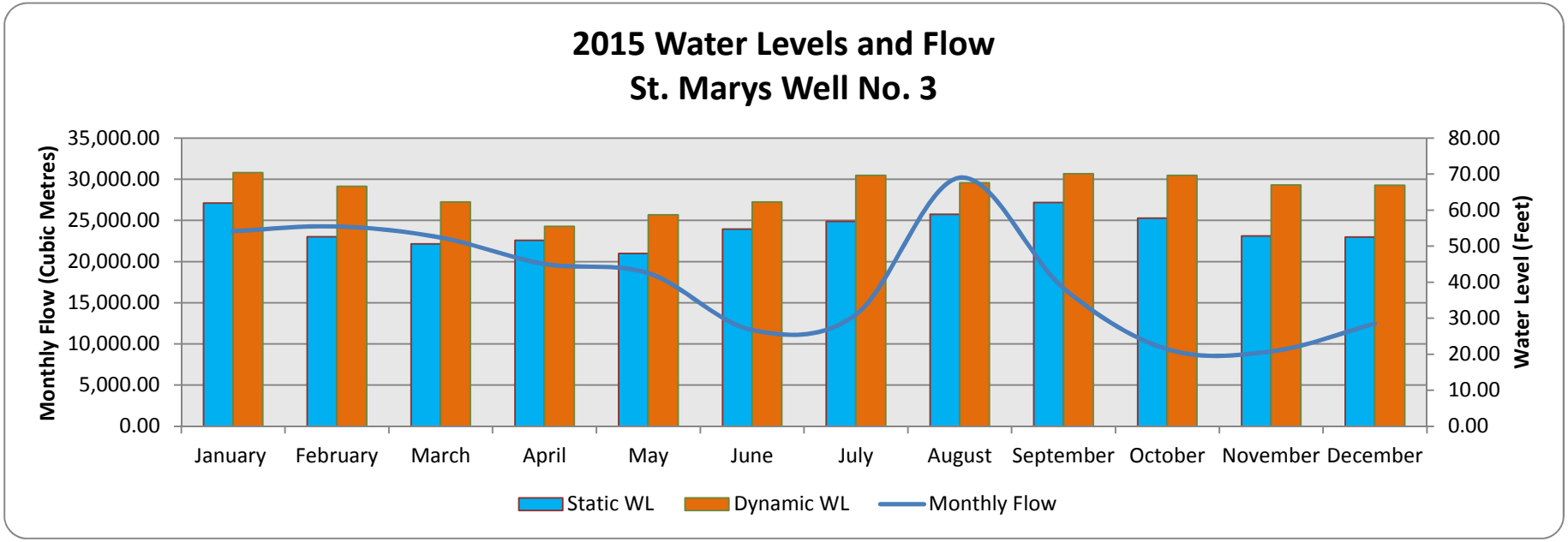
NOTES:

Monthly Flow - Total flow volume from the well as recorded by the flow meter

Chlorine Used - Total amount (Kg) of Chlorine used during each month at the well

TABLE 5
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 3
WELL NO. 3 - WATER LEVELS AND FLOW

Month	January	February	March	April	May	June	July	August	September	October	November	December
Monthly Flow	23,710.13	24,272.04	22,922.40	19,709.66	18,590.24	11,685.18	13,578.11	30,193.89	16,766.68	9,356.08	9,081.56	12,469.23
Static Level	62	52.6	50.64	51.66	48	54.71	56.86	58.83	62.1	57.8	52.83	52.5
Dynamic Level	70.4	66.64	62.3	55.5	58.67	62.29	69.67	67.6	70.09	69.67	67	66.91



NOTES:

Monthly Flow - Total flow volume from the well as recorded by the flow meter
Static Level - Groundwater Level when pump is not running
Dynamic Level - Groundwater Level when the pump is running

APPENDIX A
2016
Annual Drinking Water Report

APPENDIX A - 2016 ANNUAL REPORT – TOWN OF ST. MARYS

Drinking-Water System Number:	220000521
Drinking-Water System Name:	St. Marys Well Supply
Drinking-Water System Owner:	The Corporation of the Town of St. Marys
Drinking-Water System Category:	Large, Municipal, Residential
Period being reported:	January 1, 2016 to December 31, 2016

	Complete for all other Categories.
Does your Drinking-Water System serve more than 10,000 people? No	Number of Designated Facilities served: 0
Is your annual report available to the public at no charge on a web site on the Internet? Yes	Did you provide a copy of your annual report to all Designated Facilities you serve? n/a
Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.	Number of Interested Authorities you report to:
Municipal Operations Center, 408 James Street South www.townofstmarys.com	Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? n/a

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system: n/a

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water? n/a

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

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

Describe your Drinking-Water System

Each of the pump houses #1, 2A and 3 house a vertical turbine pump, each rated at 60 L/s capacity. These draw water from all three wells. Water passes air release valves, a backflow check valve, pressure gauges, the primary UV light disinfection unit, flow meter, the chlorine gas injection point and actuator control valve and then into the contact chamber piping located underground.

List all water treatment chemicals used over this reporting period

Chlorine gas for primary and secondary disinfection

Were any significant expenses incurred to:

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

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

New Water Services on Queen Street East from Water Street to Peel Street - $291,000
Queen Street E Widening - $46,000
Glass Street Extension - $171,000
Variable Frequency Drive replacement for Well #2 - $29,600.00

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
Apr. 13/16	Potential contamination – stones in main during watermain repair	Visual of stones in watermain	n/a	Flushed the area and took bacti samples	Apr. 19/16
Dec. 9/16	Low chlorine due to dead-end line at 74 Edison Street	0.00 mg/l chlorine residual	mg/l	Flushed watermain until residual of 0.50 mg/l was achieved. (approx. 15 mins)	Dec. 9/16

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

	Number of Samples	Range of E.Coli or Fecal Results (min -max) cfu/100ml	Range of Total Coliform Results (min –max) cfu/100ml	Number of HPC Samples	Range of HPC Results (min –max) cfu/1mL spread plate
Raw	151	0 – 1	0 – 44	1	1
Treated	150	0 – 0	0 – 0	150	0 - 10
Distribution	230	0 – 0	0 – 0	66	0 – 220

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

	Number of Grab Samples	Range of Results min -max	Unit of Measure
Turbidity	8760*	Well 1 0.06 – 2.00 Well 2A 0.08 – 0.13 Well 3 0.08 – 0.61	NTU
Chlorine	8760*	Well 1 0.61 – 1.56 Well 2A 0.69 – 1.92 Well 3 0.40 – 1.50	mg/L
Fluoride (If the DWS provides fluoridation)	N/A	N/A	N/A

*- continuous monitoring

Additional testing carried out in accordance with the requirement of an approval, order or other legal instrument.

Treated Water	Sample Date (mm/dd/yyyy)	Sample Result
UV Transmittance % - TW1	1/5/2016	95.0
UV Transmittance % - TW1	4/16/2016	93.7
UV Transmittance % - TW1	7/4/2016	95.1
UV Transmittance % - TW1	10/11/2016	94.4
UV Transmittance % - TW2A	1/5/2016	91.4
UV Transmittance % - TW2A	4/16/2016	94.5
UV Transmittance % - TW2A	7/4/2016	93.9
UV Transmittance % - TW2A	10/04/2016	93.6
UV Transmittance % - TW3	1/5/2016	95.8
UV Transmittance % - TW3	4/13/2016	95.5
UV Transmittance % - TW3	7/4/2016	95.7
UV Transmittance % - TW3	10/04/2016	96.1

Schedule 24 - Inorganic parameters

Treated Water	Sample Date (mm/dd/yyyy)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Antimony: Sb (ug/L) - TW1	1/12/2016	0.02	6.0	No	No
Antimony: Sb (ug/L) - TW2A	1/12/2016	<MDL 0.02	6.0	No	No
Antimony: Sb (ug/L) - TW3	1/12/2016	0.06	6.0	No	No
Arsenic: As (ug/L) - TW1	1/12/2016	0.3	25.0	No	No

Arsenic: As (ug/L) - TW2A	1/12/2016	0.3	25.0	No	No
Arsenic: As (ug/L) - TW3	1/12/2016	<MDL 0.2	25.0	No	No
Barium: Ba (ug/L) - TW1	1/12/2016	134	1000.0	No	No
Barium: Ba (ug/L) - TW2A	1/12/2016	83.6	1000.0	No	No
Barium: Ba (ug/L) - TW3	1/12/2016	102	1000.0	No	No
Boron: B (ug/L) - TW1	1/12/2016	34.3	5000.0	No	No
Boron: B (ug/L) - TW2A	1/12/2016	45.8	5000.0	No	No
Boron: B (ug/L) - TW3	1/12/2016	47.5	5000.0	No	No
Cadmium: Cd (ug/L) - TW1	1/12/2016	0.094	5.0	No	No
Cadmium: Cd (ug/L) - TW2A	1/12/2016	0.022	5.0	No	No
Cadmium: Cd (ug/L) - TW3	1/12/2016	0.037	5.0	No	No
Chromium: Cr (ug/L) - TW1	1/12/2016	<MDL 0.03	50	No	No
Chromium: Cr (ug/L) - TW2A	1/12/2016	<MDL 0.03	50	No	No
Chromium: Cr (ug/L) - TW3	1/12/2016	<MDL 0.03	50	No	No
Mercury: Hg (ug/L) - TW1	1/12/2016	<MDL 0.01	1.0	No	No
Mercury: Hg (ug/L) - TW2A	1/12/2016	<MDL 0.01	1.0	No	No
Mercury: Hg (ug/L) - TW3	1/12/2016	0.01	1.0	No	No
Selenium: Se (ug/L) - TW1	1/12/2016	0.84	10.0	No	No
Selenium: Se (ug/L) - TW2A	1/12/2016	0.51	10.0	No	No
Selenium: Se (ug/L) - TW3	1/12/2016	0.62	10.0	No	No
Uranium: U (ug/L) - TW1	1/12/2016	1.30	20.0	No	No
Uranium: U (ug/L) - TW2A	1/12/2016	1.82	20.0	No	No
Uranium: U (ug/L) - TW3	1/12/2016	2.47	20.0	No	No
Additional Inorganics					
Fluoride (mg/L) - TW1	1/21/2015	0.97	1.5	No	No
Fluoride (mg/L) - TW2A	1/21/2015	1.23	1.5	No	No
Fluoride (mg/L) - TW3	1/21/2015	1.14	1.5	No	No
Nitrite (mg/L) - TW1	1/5/2016	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW1	4/13/2016	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW1	7/4/2016	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW1	10/11/2016	<MDL 0.003	1.0	No	No

Nitrite (mg/L) - TW2A	1/5/2016	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW2A	4/16/2016	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW2A	7/4/2016	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW2A	10/4/2016	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW3	1/5/2016	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW3	4/13/2016	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW3	7/4/2016	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW3	10/4/2016	0.004	1.0	No	No
Nitrate (mg/L) - TW1	1/5/2016	1.59	10.0	No	No
Nitrate (mg/L) - TW1	4/13/2016	3.72	10.0	No	No
Nitrate (mg/L) - TW1	7/4/2016	0.992	10.0	No	No
Nitrate (mg/L) - TW1	10/11/2016	0.49	10.0	No	No
Nitrate (mg/L) - TW2A	1/5/2016	0.402	10.0	No	No
Nitrate (mg/L) - TW2A	4/16/2016	1.25	10.0	No	No
Nitrate (mg/L) - TW2A	7/4/2016	0.633	10.0	No	No
Nitrate (mg/L) - TW2A	10/4/2016	0.348	10.0	No	No
Nitrate (mg/L) - TW3	1/5/2016	0.408	10.0	No	No
Nitrate (mg/L) - TW3	4/13/2016	1.02	10.0	No	No
Nitrate (mg/L) - TW3	7/4/2016	0.616	10.0	No	No
Nitrate (mg/L) - TW3	10/4/2016	0.265	10.0	No	No
Sodium: Na (mg/L) - TW1	1/21/2015	33.6	20*	Yes	Yes
Sodium: Na (mg/L) - TW2A	1/21/2015	61.1	20*	Yes	Yes
Sodium: Na (mg/L) - TW3	1/21/2015	50.6	20*	Yes	Yes

Summary of lead testing under Schedule 15.1 during this reporting period

Location Type	Date Sampled	Number of Samples	pH Range	Range of Alkalinity (min – max) mg/L	Range of Lead Results (min – max) ug/L	Number of Exceedances
Distribution	Feb. and August 2016	6	6.55 – 7.25	256 - 279	0.25 – 1.57	0

Schedule 23 - Organic parameters

Treated Water	Sample Date (mm/dd/yyyy)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Alachlor (ug/L) - TW1	1/12/2016	<MDL 0.02	5.00	No	No
Alachlor (ug/L) - TW2A	1/12/2016	<MDL 0.02	5.00	No	No
Alachlor (ug/L) - TW3	1/12/2016	<MDL 0.02	5.00	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW1	1/12/2016	0.03	5.00	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW2A	1/12/2016	<MDL 0.01	5.00	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW3	1/12/2016	<MDL 0.01	5.00	No	No
Azinphos-methyl (ug/L) - TW1	1/12/2016	<MDL 0.05	20.00	No	No
Azinphos-methyl (ug/L) - TW2A	1/12/2016	<MDL 0.05	20.00	No	No
Azinphos-methyl (ug/L) - TW3	1/12/2016	<MDL 0.05	20.00	No	No
Benzene (ug/L) - TW1	1/12/2016	<MDL 0.32	5.00	No	No
Benzene (ug/L) - TW2A	1/12/2016	<MDL 0.32	5.00	No	No
Benzene (ug/L) - TW3	1/12/2016	<MDL 0.32	5.00	No	No
Benzo(a)pyrene (ug/L) - TW1	1/12/2016	<MDL 0.004	0.01	No	No
Benzo(a)pyrene (ug/L) - TW2A	1/12/2016	<MDL 0.004	0.01	No	No
Benzo(a)pyrene (ug/L) - TW3	1/12/2016	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW1	1/12/2016	<MDL 0.33	5.00	No	No
Bromoxynil (ug/L) - TW2A	1/12/2016	<MDL 0.33	5.00	No	No
Bromoxynil (ug/L) - TW3	1/12/2016	<MDL 0.33	5.00	No	No
Carbaryl (ug/L) - TW1	1/12/2016	<MDL 0.05	90.00	No	No
Carbaryl (ug/L) - TW2A	1/12/2016	<MDL 0.05	90.00	No	No
Carbaryl (ug/L) - TW3	1/12/2016	<MDL 0.05	90.00	No	No
Carbofuran (ug/L) - TW1	1/12/2016	<MDL 0.01	90.00	No	No
Carbofuran (ug/L) - TW2A	1/12/2016	<MDL 0.01	90.00	No	No
Carbofuran (ug/L) - TW3	1/12/2016	<MDL 0.01	90.00	No	No
Carbon Tetrachloride (ug/L) - TW1	1/12/2016	<MDL 0.16	5.00	No	No

Carbon Tetrachloride (ug/L) - TW2A	1/12/2016	<MDL 0.16	5.00	No	No
Carbon Tetrachloride (ug/L) - TW3	1/12/2016	<MDL 0.16	5.00	No	No
Chlorpyrifos (ug/L) - TW1	1/12/2016	<MDL 0.02	90.00	No	No
Chlorpyrifos (ug/L) - TW2A	1/12/2016	<MDL 0.02	90.00	No	No
Chlorpyrifos (ug/L) - TW3	1/12/2016	<MDL 0.02	90.00	No	No
Diazinon (ug/L) - TW1	1/12/2016	<MDL 0.02	20.00	No	No
Diazinon (ug/L) - TW2A	1/12/2016	<MDL 0.02	20.00	No	No
Diazinon (ug/L) - TW3	1/12/2016	<MDL 0.02	20.00	No	No
Dicamba (ug/L) - TW1	1/12/2016	<MDL 0.20	120.00	No	No
Dicamba (ug/L) - TW2A	1/12/2016	<MDL 0.20	120.00	No	No
Dicamba (ug/L) - TW3	1/12/2016	<MDL 0.20	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW1	1/12/2016	<MDL 0.41	200.00	No	No
1,2-Dichlorobenzene (ug/L) - TW2A	1/12/2016	<MDL 0.41	200.00	No	No
1,2-Dichlorobenzene (ug/L) - TW3	1/12/2016	<MDL 0.41	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW1	1/12/2016	<MDL 0.36	5.00	No	No
1,4-Dichlorobenzene (ug/L) - TW2A	1/12/2016	<MDL 0.36	5.00	No	No
1,4-Dichlorobenzene (ug/L) - TW3	1/12/2016	<MDL 0.36	5.00	No	No
1,2-Dichloroethane (ug/L) - TW1	1/12/2016	<MDL 0.35	5.00	No	No
1,2-Dichloroethane (ug/L) - TW2A	1/12/2016	<MDL 0.35	5.00	No	No
1,2-Dichloroethane (ug/L) - TW3	1/12/2016	<MDL 0.35	5.00	No	No
1,1-Dichloroethylene (ug/L) - TW1	1/12/2016	<MDL 0.33	14.00	No	No
1,1-Dichloroethylene (ug/L) - TW2A	1/12/2016	<MDL 0.33	14.00	No	No
1,1-Dichloroethylene (ug/L) - TW3	1/12/2016	<MDL 0.33	14.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW1	1/12/2016	<MDL 0.35	50.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW2A	1/12/2016	<MDL 0.35	50.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW3	1/12/2016	<MDL 0.35	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW1	1/12/2016	<MDL 0.15	900.00	No	No
2,4-Dichlorophenol (ug/L) - TW2A	1/12/2016	<MDL 0.15	900.00	No	No
2,4-Dichlorophenol (ug/L) - TW3	1/12/2016	<MDL 0.15	900.00	No	No

2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW1	1/12/2016	<MDL 0.19	100.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW2A	1/12/2016	<MDL 0.19	100.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW3	1/12/2016	<MDL 0.19	100.00	No	No
Diclofop-methyl (ug/L) - TW1	1/12/2016	<MDL 0.40	9.00	No	No
Diclofop-methyl (ug/L) - TW2A	1/12/2016	<MDL 0.40	9.00	No	No
Diclofop-methyl (ug/L) - TW3	1/12/2016	<MDL 0.40	9.00	No	No
Dimethoate (ug/L) - TW1	1/12/2016	<MDL 0.03	20.00	No	No
Dimethoate (ug/L) - TW2A	1/12/2016	<MDL 0.03	20.00	No	No
Dimethoate (ug/L) - TW3	1/12/2016	<MDL 0.03	20.00	No	No
Diquat (ug/L) - TW1	1/12/2016	<MDL 1	70.00	No	No
Diquat (ug/L) - TW2A	1/12/2016	<MDL 1	70.00	No	No
Diquat (ug/L) - TW3	1/12/2016	<MDL 1	70.00	No	No
Diuron (ug/L) - TW1	1/12/2016	<MDL 0.03	150.00	No	No
Diuron (ug/L) - TW2A	1/12/2016	<MDL 0.03	150.00	No	No
Diuron (ug/L) - TW3	1/12/2016	<MDL 0.03	150.00	No	No
Glyphosate (ug/L) - TW1	1/12/2016	<MDL 1	280.00	No	No
Glyphosate (ug/L) - TW2A	1/12/2016	<MDL 1	280.00	No	No
Glyphosate (ug/L) - TW3	1/12/2016	<MDL 1	280.00	No	No
Malathion (ug/L) - TW1	1/12/2016	<MDL 0.02	190.00	No	No
Malathion (ug/L) - TW2A	1/12/2016	<MDL 0.02	190.00	No	No
Malathion (ug/L) - TW3	1/12/2016	<MDL 0.02	190.00	No	No
2-Methyl-4-chlorophenoxyacetic acid MCPA (mg/L) – TW1	1/12/2016	<MDL 0.00012	0.10	No	No
2-Methyl-4-chlorophenoxyacetic acid MCPA (mg/L) – TW2A	1/12/2016	<MDL 0.00012	0.10	No	No
2-Methyl-4-chlorophenoxyacetic acid MCPA (mg/L) – TW3	1/12/2016	<MDL 0.00012	0.10	No	No
Metolachlor (ug/L) - TW1	1/12/2016	<MDL 0.01	50.00	No	No
Metolachlor (ug/L) - TW2A	1/12/2016	<MDL 0.01	50.00	No	No
Metolachlor (ug/L) - TW3	1/12/2016	<MDL 0.01	50.00	No	No
Metribuzin (ug/L) - TW1	1/12/2016	<MDL 0.02	80.00	No	No

Metribuzin (ug/L) - TW2A	1/12/2016	<MDL 0.02	80.00	No	No
Metribuzin (ug/L) - TW3	1/12/2016	<MDL 0.02	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW1	1/12/2016	<MDL 0.3	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW2A	1/12/2016	<MDL 0.3	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW3	1/12/2016	<MDL 0.3	80.00	No	No
Paraquat (ug/L) - TW1	1/12/2016	<MDL 1	10.00	No	No
Paraquat (ug/L) - TW2A	1/12/2016	<MDL 1	10.00	No	No
Paraquat (ug/L) - TW3	1/12/2016	<MDL 1	10.00	No	No
PCB (ug/L) - TW1	1/12/2016	<MDL 0.04	3.00	No	No
PCB (ug/L) - TW2A	1/12/2016	<MDL 0.04	3.00	No	No
PCB (ug/L) - TW3	1/12/2016	<MDL 0.04	3.00	No	No
Pentachlorophenol (ug/L) - TW1	1/12/2016	<MDL 0.15	60.00	No	No
Pentachlorophenol (ug/L) - TW2A	1/12/2016	<MDL 0.15	60.00	No	No
Pentachlorophenol (ug/L) - TW3	1/12/2016	<MDL 0.15	60.00	No	No
Phorate (ug/L) - TW1	1/12/2016	<MDL 0.01	2.00	No	No
Phorate (ug/L) - TW2A	1/12/2016	<MDL 0.01	2.00	No	No
Phorate (ug/L) - TW3	1/12/2016	<MDL 0.01	2.00	No	No
Picloram (ug/L) - TW1	1/12/2016	<MDL 1	190.00	No	No
Picloram (ug/L) - TW2A	1/12/2016	<MDL 1	190.00	No	No
Picloram (ug/L) - TW3	1/12/2016	<MDL 1	190.00	No	No
Prometryne (ug/L) - TW1	1/12/2016	<MDL 0.03	1.00	No	No
Prometryne (ug/L) - TW2A	1/12/2016	<MDL 0.03	1.00	No	No
Prometryne (ug/L) - TW3	1/12/2016	<MDL 0.03	1.00	No	No
Simazine (ug/L) - TW1	1/12/2016	<MDL 0.01	10.00	No	No
Simazine (ug/L) - TW2A	1/12/2016	<MDL 0.01	10.00	No	No
Simazine (ug/L) - TW3	1/12/2016	<MDL 0.01	10.00	No	No
Terbufos (ug/L) - TW1	1/12/2016	<MDL 0.01	1.00	No	No
Terbufos (ug/L) - TW2A	1/12/2016	<MDL 0.01	1.00	No	No
Terbufos (ug/L) - TW3	1/12/2016	<MDL 0.01	1.00	No	No

Tetrachloroethylene (ug/L) - TW1	1/12/2016	<MDL 0.35	30.00	No	No
Tetrachloroethylene (ug/L) - TW2A	1/12/2016	<MDL 0.35	30.00	No	No
Tetrachloroethylene (ug/L) - TW3	1/12/2016	<MDL 0.35	30.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW1	1/12/2016	<MDL 0.20	100.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW2A	1/12/2016	<MDL 0.20	100.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW3	1/12/2016	<MDL 0.20	100.00	No	No
Triallate (ug/L) - TW1	1/12/2016	<MDL 0.01	230.00	No	No
Triallate (ug/L) - TW2A	1/12/2016	<MDL 0.01	230.00	No	No
Triallate (ug/L) - TW3	1/12/2016	<MDL 0.01	230.00	No	No
Trichloroethylene (ug/L) - TW1	1/12/2016	<MDL 0.44	50.00	No	No
Trichloroethylene (ug/L) - TW2A	1/12/2016	<MDL 0.44	50.00	No	No
Trichloroethylene (ug/L) - TW3	1/12/2016	<MDL 0.44	50.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW1	1/12/2016	<MDL 0.25	5.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW2A	1/12/2016	<MDL 0.25	5.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW3	1/12/2016	<MDL 0.25	5.00	No	No
Trifluralin (ug/L) - TW1	1/12/2016	<MDL 0.02	45.00	No	No
Trifluralin (ug/L) - TW2A	1/12/2016	<MDL 0.02	45.00	No	No
Trifluralin (ug/L) - TW3	1/12/2016	<MDL 0.02	45.00	No	No
Vinyl Chloride (ug/L) - TW1	1/12/2016	<MDL 0.17	2.00	No	No
Vinyl Chloride (ug/L) - TW2A	1/12/2016	<MDL 0.17	2.00	No	No
Vinyl Chlorine (ug/L) – TW3	1/12/2016	<MDL 0.17	2.00	No	No
Trihalomethanes – farthest point in the distribution system (ug/L)	Running average	20.75	100	No	No

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards. n/a