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2016 Water Works Summary Report

Large Municipal Residential Systems

O. Reg. 170/03, Sch. 22; O. Reg. 249/03, s. 24; O. Reg. 253/05, s. 18.

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Executive Summary

The production and delivery of potable water in Ontario is regulated by the Ministry of the Environment and Climate Change (MOECC) under the **Safe Drinking Water Act, 2002, S.O. 2002, c. 32** (formerly the Ontario Water Resources Act). Regulated systems must meet the requirements of the **Safe Drinking Water Act, 2002, S.O. 2002, c. 32** and its regulations. Most notably: the Drinking Water Systems Regulation Ontario Regulation (O.Reg.) 170/03 sets out treatment and testing requirements for all categories of regulated water systems; O.Reg. 169/03 covers the Ontario Drinking Water Quality Standards; and O.Reg 128/04 covers the necessity for Certification of Drinking Water System Operators and Water Quality Analysts.

Since the implementation of the Act, several amendments to O. Reg. 170/03 have taken place. There are amendments requiring additional resources and costs, such as the Community Lead Testing initiative and Quality Management Systems, while others streamlined legislative requirements to make the new regulations feasible for the vast majority of municipalities.

Among other obligations, the O.Reg. 170/03 prescribes the need for all owners of licensed water works to produce an Annual Summary Report as indicated in Schedule 22. This Summary Report is filed annually for the previous calendar year (January 1st through December 31st) and must contain the following information:

- List of requirements of the Safe Drinking Water Act (SDWA), the regulations, the system's approval, drinking water works permits and the municipal drinking water license
- Any orders applicable to the system that were not met at any time during the period covered by the report. If any failures were identified, specify the duration of the failure and describe the measures taken to correct the situation;
- Summary of quantities and flow rates of the water supplied during the reporting period, including monthly averages and maximum daily flows; and
- A comparison of the summary of quantities and flow to the rated capacities and flows approved in the systems approval, drinking water works permit or municipal drinking water license.

An Annual Report, to fulfill Section 11 of Ontario Regulation 170/03, has been completed separately and details the drinking water quality of all of the CGS owned and operated drinking water systems. This annual report is available for viewing on the City of Greater Sudbury's website (http://www.greatersudbury.ca/living/sewer-and-water/water-source/water-quality-reports/) and notices have been posted in local newsprint for those that do not have access to a computer, one can be accessed at any of the CGS Citizen Service Centers to view.

The City of Greater Sudbury is listed as the Owner of five large municipal, residential drinking water systems and one independent distribution system. The one distribution system (Vermilion) receives its water from a "donor system" which is operated by Vale. The City of Greater Sudbury is supplied from this "donor system" wherein water is purchased by the CGS from Vale and supplied to consumers through a CGS owned distribution system. The following reports are written to comply with the Condition that each of these facilities produces an Annual Summary Report as per Schedule 22 of O. Reg. 170/03. Table 1 provides a summary of the various water systems throughout the City.

Table 1 - Overview of the City's Water Systems

Name	Owner	Type of Facility	Source of Water	Community Serviced
Sudbury Drinking Water System - Wanapitei	City of Greater Sudbury	Surface water conventional treatment plant and Ultraviolet irradiation, Fluoridation, Corrosion control added, Distribution system	Wanapitei River	Sudbury, Coniston, Wanapitei, Markstay, Garson
Sudbury Drinking Water System - David Street		Surface water Membrane Filtration and Ultraviolet irradiation, Fluoridation, Corrosion control added, Distribution system	Ramsey Lake	Sudbury (West and South sections)
Sudbury Drinking Water System - Garson		Wells with disinfection, Fluoridation, Distribution system	Groundwater	Garson (east of Penman Dr.)
Dowling Drinking Water System	City of Greater Sudbury	Wells with disinfection and Ultraviolet irradiation, Fluoridation, Distribution system	Groundwater	Dowling
Valley Drinking Water System	City of Greater Sudbury	Wells with disinfection and Ultraviolet irradiation, Fluoridation, Corrosion control added for supply to Capreol, Distribution system	Groundwater	Valley East, Azilda, Chelmsford & Capreol

Falconbridge Drinking Water System	City of Greater Sudbury	Wells with disinfection, Fluoridation, Corrosion control added, Distribution system	Groundwater	Falconbridge
Onaping /Levack Drinking Water System	City of Greater Sudbury	Wells with disinfection, Fluoridation, Corrosion control added, Distribution system	Groundwater	Onaping & Levack
Vermilion River Water Treatment Plant	Vale	Surface water conventional treatment plant, Fluoridation and Corrosion control added	Vermilion River	Vermilion Distribution System
Vermilion Distribution System	City of Greater Sudbury	Distribution System	Vermilion River WTP	Lively, Naughton, Whitefish, Copper Cliff, Walden Industrial Park

Due to the significant impact of the Drinking Water Protection Regulation and continuing Source Water Protection legislation, virtually all of the City's water works have had to undergo some level of upgrading. It should not be assumed that these upgrades are the result of any detected incidents of poor water quality. The upgrades at the City water works are necessary to reduce the risk of potable water contamination as deemed necessary by the MOECC. The level of acceptable risk is stipulated through mandatory compliance with O. Reg. 170/03.

The last several years have seen a number of upgrades at most CGS water facilities and throughout various sections of the distribution systems. It is important to understand that this is part of the required process of the Regulations and the MOECC's statutory Standard of Care to ensure all citizens have access to and receive safe drinking water. The regulation stipulates that water works owners will continually monitor water works performance, and review levels of treatment versus current standards and emerging technologies. The Ministry of the Environment and Climate Change (MOECC) is responsible for the enforcement of regulations and conducts regular, announced and unannounced, inspections of all of our facilities every year. MOECC inspections "grading" has given the CGS water systems a **99.3%** for all of our systems through the 2016 inspection regimen. The public expects that responsible Owners will be diligent in their duty to care for public water supplies.

The Community Lead Testing Initiative was mandated by the MOECC in 2007 and falls under O. Reg. 170/03, Schedule 15.1. Although there have been challenges in garnering enough volunteers for the program, the City is continuing with the initiative. The City has completed sixteen periods of lead

sampling to date. Results have been positive and demonstrated that lead is not a concern for the City of Greater Sudbury. There have been issues in the Onaping/Levack system, which has seen considerable improvement with the recent corrosion control additive and pH adjustment measures. To date, 3788 samples have been collected throughout all of our Drinking Water Systems. There have been a total of 59 private residences or commercial establishments and one distribution sample in excess of the standard, representing less than 1.5% of all samples. The initiative will continue into the foreseeable future but the City has been able to act on new legislative provisions put forth by the MOECC. Drinking water systems that have demonstrated less than 10% of one half the Maximum Allowable Concentration (MAC) over six rounds of lead sampling will no longer be required to test in private residents or commercial establishments. Drinking Water Systems that have a population over 50,000 will continue to be required to test for Lead, but at a reduced number, providing the same criteria as listed above for half MAC have been met.

The City is well organized to manage the existing water works systems. Further, staff have been pro-active to ensure all necessary measures are taken to achieve compliance with the Regulations and the various Drinking Water Permits and Licenses. The water works owned and operated by the City have been managed with the standard of care expected by the public and as legislated by the government. All necessary upgrades have been completed or are being planned and implemented in accordance with applicable standards.

Reviewed by:

Date: FEB 22 2017

Julie Friel
Manager Water Treatment

Approved by:

Date: FEB 22, 2017

Nick Benkovich
Director, Water and Wastewater Services

SECTION 1 – LEGISLATIVE AND REGULATORY REQUIREMENTS

Regulated systems must meet the requirements of Ontario's *Safe Drinking Water Act, 2002* and its regulations. Most notably, the Drinking Water Systems Regulation sets out treatment and testing requirements for all categories of regulated water systems, including non-municipal and municipal non-residential operations. Some of the CGS systems are classified as Class IV and therefore require Operators of the same level of Certification. Related regulations made under the Act:

1.1 O.REG. 128/04 CERTIFICATION OF DRINKING-WATER SYSTEM OPERATORS AND WATER QUALITY ANALYSTS

This Regulation was filed on May 14, 2004 (Last amendment: O.Reg. 466/10). Section 29 lists Operator training requirements and the number of training hours required for operators. Class IV Water Treatment Operators will require 14 hours of continuing education with an additional 36 hours of on-the-job practical training, for a minimum of 50 hours total of annual training. The continuing education that is used to meet the training requirements must be approved by the MOECC Director using criteria which includes the following:

a. The training course must have documented learning objectives.

b. The training course must be planned and be provided by a qualified training provider.

c. The training course must include a means to verify that the participants have learned the material covered in the course

d. The training course must cover subject matter that is directly related to the duties typically performed by an operator.

The on-the-job practical training that is used to meet the training requirements must meet a criterion that includes the following:

a. The training must have documented learning objectives.

b. The training must be provided by a trainer with expertise in the subject matter that is being covered.

c. The training must be in respect of subject matter that is directly related to the duties typically performed by an operator

Note: The annual number of hours of training set out in Table 1 may be averaged over the three years during which an operator's certificate is valid but shall not be reduced or prorated for an operator who is employed on a part-time basis.

Table 1 – Annual Training for Operators

Type and Class of Subsystem in Which The Operator is Employed	Training Requirements	Minimum Total Hours
Limited Groundwater or Limited Surface Water	7 hours or more of continuing education, with the remaining hours to at least the minimum total as on-the-job practical training	20
Class I Water Treatment or Class I Distribution or Class I Distribution and Supply	7 hours or more of continuing education, with the remaining hours to at least the minimum total as on-the-job practical training	30
Class II Water Treatment or Class II Distribution or Class II Distribution and Supply	12 hours or more of continuing education, with the remaining hours to at least the minimum total as on-the-job practical training	35
Class III Water Treatment or Class III Distribution or Class III Distribution and Supply	14 hours or more of continuing education, with the remaining hours to at least the minimum total as on-the-job practical training	40
Class IV Water Treatment or Class IV Distribution or Class IV Distribution and Supply	14 hours or more of continuing education, with the remaining hours to at least the minimum total as on-the-job practical training	50

O. Reg. 128/04, s. 29, Table 1

1.2 O. REG. 242/05 COMPLIANCE AND ENFORCEMENT

This Regulation (Last amendment: O.Reg. 328/08) lists the requirements for inspections. What to do when deficiencies and contraventions are found. This regulation also deals with enforcement, investigations and notices required once investigations have been completed.

1.3 O. REG. 172/03 DEFINITIONS OF "DEFICIENCY" AND "MUNICIPAL DRINKING-WATER SYSTEM"

Ontario Regulation 172/03 (Last Amendment: O.Reg. 329/08), provides definitions of words and expressions within the Safe Drinking Water Act and associated Regulations.

1.4 O. REG. 171/03 DEFINITIONS OF WORDS AND EXPRESSIONS USED IN THE ACT

Ontario Regulation 171/03 (Last amendment: O.Reg. 336/13) - Provides definitions of words and expressions within the Safe Drinking Water Act and associated Regulations.

1.5 O. REG. 170/03 DRINKING WATER SYSTEMS

This Regulation was filed in 2004 (Last amendment: O.Reg. 374/15). This regulation outlines the requirements for:

1) Types of Drinking Water Systems
2) Required reports (annual, summary reports)
3) Retention of record
4) Treatment equipment requirements
5) Types of Treatment
6) Operational Checks, Sampling and Testing
7) Use of accredited laboratories
8) Maintenance and Operational Checks
9) Microbiological Sampling and Testing
10) Chemical Sampling and Testing
11) Reporting Adverse Test Results and Other Problems
12) Corrective Action
13) Engineers' Reports
14) Inorganic Parameters
15) Organic Parameters

1.6 O. REG. 248/03 DRINKING WATER TESTING SERVICES

Ontario Regulation 248/03 (Last amendment: O.Reg. 416/09) - Drinking-Water Testing Services is the regulation governing accredited laboratories that came into effect October 31, 2004.

1) Lists systems that do not require drinking-water testing license
2) Lists prescribed tests of the Safe Drinking Water Act
3) Lists person(s) to do water quality analysis
4) Lists the types of tests that can be conducted for the sole purpose of carrying out research or Criteria for drinking-water testing services
5) Conditions of drinking-water testing license
6) Handling samples
7) Testing records
8) Laboratory qualifications and accreditation

1.7 O. REG. 169/03 ONTARIO DRINKING WATER QUALITY STANDARDS

Ontario Regulation 169/03 (Last amendment: O.Reg 373/15). This regulation sets out standards in Schedules 1, 2 and 3 as prescribed drinking-water quality standards. Included in this regulation are the compliance standards.

1.8 O. REG. 453/07 FINANCIAL PLANS

Ontario Regulation 169/03 (Last amendment: O.Reg 69/08). This regulation sets out the requirement to produce and have approved by council of the municipality a financial plan. Included in this regulation are the requirements of the financial plan for license renewals.

1) Financial plans must be approved by a resolution that is passed by a council
2) Financial plans must apply to a period of at least six years
3) Financial plans must include:

i. Details of the proposed or projected financial position of the drinking water system itemized by,
   A. total financial assets,
   B. total liabilities,
   C. net debt,
   D. non-financial assets that are tangible capital assets, tangible capital assets under construction, inventories of supplies and prepaid expenses, and
   E. changes in tangible capital assets that are additions, donations, write downs and disposals.

ii. Details of the proposed or projected financial operations of the drinking water system itemized by,
   A. total revenues, further itemized by water rates, user charges and other revenues,
   B. total expenses, further itemized by amortization expenses, interest expenses and other expenses,
   C. annual surplus or deficit, and
   D. accumulated surplus or deficit.

iii. Details of the drinking water system's proposed or projected gross cash receipts and gross cash payments itemized by,
   A. operating transactions that are cash received from revenues, cash paid for operating expenses and finance charges,
   B. capital transactions that are proceeds on the sale of tangible capital assets and cash used to acquire capital assets,
   C. investing transactions that are acquisitions and disposal of investments,

D. financing transactions that are proceeds from the issuance of debt and debt repayment,
E. changes in cash and cash equivalents during the year, and
F. cash and cash equivalents at the beginning and end of the year.

iv. Details of the extent to which the information described in subparagraphs i, ii and iii relates directly to the replacement of lead service pipes as defined in section 15.1- 3 of Schedule 15.1 to Ontario Regulation 170/03 (Drinking Water Systems), made under the Act.

4) Make the financial plan available to the public, free of charge.

SECTION 2 - PLANT SPECIFIC REVIEW

2.1 Plant Specific Requirements

This Section of the report provides details on measures taken by the City to ensure compliance with Terms and Conditions of the Municipal Drinking Water Licenses, Drinking Water Works Permits, Acts, Regulations or any MOECC orders the systems may have been under during the reporting period. This section of the report also provides details on the specifics of the systems, any non-compliance issues along with actions taken by the City to rectify the situations, as well as flow data with comparison to allowable limits. This flow comparison is to allow for a basic overview of the systems performance and allows for review and planning of possible future expansions if required.

A more detailed description of the water works is provided at the start of each sub-section. The description is provided for reference purposes only, and to ensure that the compliance measures remain in context. All non-compliance items and the corrective actions taken are summarized in table format and appended to the particular plant section in this report. The most recent Municipal Drinking Water License and Drinking Water Works Permit that was valid at the time of this report is also listed in the particular plant section.

Sudbury Drinking Water System - Wanapitei
DWS# 210001111

Municipal Drinking Water License: 016-106
Issue Number: 2
April 13, 2015
Drinking Water Works Permit: 016-206
Issue Number: 4
April 13, 2015

The Wanapitei WTP is a surface water plant which draws water from the Wanapitei River. Proportionally, the plant supplies approximately 60% of the water for Sudbury; however, most of the water produced is delivered to New Sudbury, Coniston, Wanapitei, Markstay, and parts of downtown. Garson, west of Falconbridge Rd. and O'Neil Dr., is also supplied by this plant. The plant was constructed in the 1970's at the onset of Regional Government. Since the original construction, the plant has undergone upgrading to enhance treatment efficiency, increase production, and to reduce energy costs. Completed projects in 2016 and the associated approximate costs included: Phase II of plant and intake upgrades including communications, filter to waste capabilities, automated valves, addition of VFD drives to selected high lift pumps, feed automation to chemical systems, new lime system, security gate, security cameras and HVAC for fluoride room $9 002 000, reactivator inspections and repairs $35 000, Health and Safety upgrades $18 600. Capital improvements to various distribution infrastructure projects totaled approximately $1 750 000.

The water supply for the plant is the Wanapitei River. The raw water quality is reasonably reliable but is, however, subject to some change, which is typical of most rivers. The watershed area for the Wanapitei River is vast with much in its natural state.

The river water quality varies depending on seasonal changes and local weather patterns. Some process parameters affected by these changes include:

- Temperature;
- Turbidity; and
- Color.

The changing raw water quality requires careful observation by the water plant operators to ensure necessary process and chemical adjustments are made to effectively treat the water.

The Wanapitei WTP incorporates conventional technologies to treat the water. The raw water undergoes initial treatment with chlorine dioxide for taste and odor control and/or chlorine for pre-disinfection. Raw

water is further subjected to chemical coagulation with alum to form a floc. The coagulated water passes through one of two settling tanks, referred to as reactivators, for the flocculation and sedimentation process. The water then passes through one of four, dual media, filter beds. The filtered water is treated with hydrated lime for pH/alkalinity adjustment; with chlorine to maintain disinfection; with fluoride to comply with Sudbury and District Health Unit requirements; and with polyphosphate to reduce corrosion in the distribution system. The final process the finished water undergoes is irradiation by ultraviolet light. The plant is designed to be capable of achieving, at all times, at least 99.99% removal or inactivation of viruses by the time water enters the distribution system.

The distribution system incorporates a large diameter concrete pressure pipe to deliver water to Sudbury and Coniston. The communities are networked with an extensive distribution system including numerous booster stations. The system pressure is regulated by the water level in the Ellis Water Reservoir. Most of the pipes in the distribution system are less than 50 years old and much of the system is plastic pipe.

Water quality throughout the distribution system is monitored through regular sampling in accordance with O. Reg. 170/03.

Non-Compliance with Act, Regulations, Order or Approvals

Table 2 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during the 2016 reportable period.

Table 2 - Wanapitei Water Treatment Plant

Item	Non-Compliance	Measure Taken to Ensure Compliance
MOECC Inspection Issues	NONE	N/A
MOECC Orders	NONE	N/A

2016 Adverse Water Quality Incident Report

Table 3 provides 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 and the Sudbury and District Health Unit.

Table 3 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
131710	2016/11/01	Pressure	>20	psi	Resample/Re-test and flush hydrants after pressure was <20	2016/11/01

Annual Flow Summary

Table 4 provides a summary of the quantities of flow rates with a comparison to rated capacities as listed in the systems Municipal Drinking Water License during the 2016 reportable period.

Table 4 - Annual Flow Summary (Sudbury Plants)

	Wanapitei Water Treatment Plant					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	600,095	19,358	29,340.21	449.60	54,000	54
February	525,972	18,137	21,399.48	356.29	54,000	40
March	629,629	20,311	30,058.01	417.42	54,000	56
April	570,788	19,026	28,772.47	358.35	54,000	53
May	652,512	21,049	24,384.00	393.55	54,000	45
June	611,348	20,378	22,864.00	605.50	54,000	42
July	734,096	23,681	25,028.00	364.88	54,000	46
August	791,316	25,526	28,948.00	376.61	54,000	54
September	721,292	24,043	27,296.00	386.53	54,000	51
October	625,060	20,163	24,076.00	311.72	54,000	45
November	622,780	20,759	23,940.00	353.49	54,000	44
December	567,456	18,305	21,040.00	339.01	54,000	39
Total	7,652,344					

Sudbury Drinking Water System - David Street
DWS# 220003537

Municipal Drinking Water License: 016-106
Issue Number: 2
April 13, 2015
Drinking Water Works Permit: 016-206
Issue Number: 4
April 13, 2015

The David St. WTP is a surface water plant, which draws water from Ramsey Lake. Proportionally, the plant services approximately 40% of Sudbury, however, most of the water produced at the David St. WTP is normally delivered to the south, west and downtown areas of Sudbury. The plant was originally over 100 years old but has undergone numerous upgrades to meet changing needs. The plant completed retrofits with Zenon membrane ultra filtration technologies and ultraviolet irradiation in 2004 to ensure the treatment system meets the requirements in O. Reg. 170/03. The plant is designed to be capable of achieving, at all times, at least 99.99% removal or inactivation of viruses by the time water enters the distribution system.

The water supply for the David St. WTP is Ramsey Lake. Under the Clean Water Act and careful review by the Source Water Protection Committee and City staff, provisions are being established to maintain and improve the source water quality.

The City is planning to have the David St. plant remain an integral part of the water works system for many years. Projects completed for 2016 and the associated approximate costs included: replacing butterfly valve and pneumatic actuators $25 000. The portion of the distribution system supplied by the David Street WTP includes parts of downtown Sudbury, the south and west ends of Sudbury. In addition, the Ellis Reservoir is part of the distribution network for Sudbury. The Ellis Reservoir is a 36.4 million liter, dual cell, water storage facility that is also fed by the Wanapitei WTP. As is common with many older distribution networks, the Sudbury pipe system is prone to line breaks, complaints of discolored water and difficulties maintaining adequate chlorine residual. Two new sodium hypochlorite pumps were installed at the reservoir to ensure rechlorination of the storage facilities $12 000. Capital projects undertaken in 2016 included various watermain repairs, replacements and relining totaling approximately $910 400.

Water quality throughout the distribution system is monitored through regular sampling in accordance with O. Reg. 170/03.

Non-Compliance with Act, Regulations, Order or Approvals

Table 5 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during the 2016 reportable period.

Table 5 - David Street Water Treatment Plant

Item	Non-Compliance	Measure Taken to Ensure Compliance
MOECC Inspection Issues	NONE	N/A
MOECC Orders	NONE	N/A

2016 Adverse Water Quality Incident Report

Table 6 provides 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 and the Sudbury and District Health Unit.

Table 6 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
128429	2016/02/16	UVT	>4hrs	%Trans	Analyser repair and Re-test	2016/02/16
128916	2016/03/06	Fluoride	1.50	mg/L	Resample/Re-test	2016/03/06
128485	2016/03/06	Fluoride	1.50	mg/L	Resample/Re-test	2016/03/06
132122	2016/12/25	Fluoride	1.50	mg/L	Resample/Re-test	2016/12/25
132146	2016/12/31	Chlorine	<4.00	mg/L	Flush surge tank and retest	2016/12/31

Annual Flow Summary

Table 7 provides a summary of the quantities of flow rates with a comparison to rated capacities as listed in the systems Municipal Drinking Water License during the 2016 reporting period.

Table 7 - Annual Flow Summary

	David Street Water Treatment Plant					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	537,270	17,331	26,719.73	319.47	40,000	67
February	577,830	19,925	26,805.96	319.30	40,000	67
March	506,986	16,354	24,304.11	342.16	40,000	61
April	519,488	17,316	21,845.69	352.57	40,000	55
May	426,905	13,771	22,494.61	351.37	40,000	56
June	601,268	20,042	27,603.00	323.33	40,000	69
July	476,131	15,359	26,620.54	351.27	40,000	67
August	415,362	13,399	21,018.72	330.95	40,000	53
September	387,232	12,908	25,629.00	326.89	40,000	64
October	431,941	13,934	18,401.71	329.71	40,000	46
November	390,300	13,010	19,963.42	321.88	40,000	50
December	455,170	14,683	19,821.27	322.75	40,000	50
Total	5,725,883					

Sudbury Drinking Water System - Garson

DWS# 220003485

Municipal Drinking Water License: 016-106
Issue Number: 2
April 13, 2015
Drinking Water Works Permit: 016-206
Issue Number: 4
April 13, 2015

The Garson water works is a communal groundwater system consisting of three wells, and servicing the community of Garson east of Penman Ave and O'Neil Dr East. The three wells are:

- Garson Well No.2;
- Garson Well No.1; and
- Garson Well No.3.

Garson Well No.2 is situated within a pump house on the east side of Falconbridge Highway at Spruce Street. The system includes a Variable Frequency Drive (VFD) vertical turbine well pump, disinfection with sodium hypochlorite and fluoride injection as mandated by the Sudbury and District Health Unit. There is no standby power at Garson Well No. 2. The City of Greater Sudbury operated the well pump house on behalf of Vale and now, as the sole owner/operator, the water is directly connected to the public distribution network.

The other two wells in Garson, No.'s 1 and 3, are situated on the south side of Falconbridge Road at Orell Street. The two wells are in close proximity to each other but are housed in separate buildings, both of which contain the vertical turbine well pumps. The discharges from the well pumps enter a common building which houses the disinfection and fluoride injection equipment. The well supply historically provided very good quality water with no record of bacteriological contamination. During preparation of the First Engineers' Report, in March 2001, a hydrogeological assessment was made of each of the wells. It was concluded that it is unlikely that any of the wells are under the direct influence of surface water. The raw water was therefore found to be in general conformance with the ODWS. Notwithstanding the historical good water quality, the aquifer used in the Garson well supply has a recharge area which includes the developed area of Garson. With direction and consultation from the Sudbury and District Health Unit and the Ministry of the Environment and Climate Change (MOECC), the CGS committed to undertaking a Groundwater Monitoring Program for Tetrachloroethylene. Although TCE levels found during audit sampling are well below regulatory limits, the City is proactively sampling and monitoring these levels. In 2012, four monitoring wells were drilled in the area and sampling and graphing of results

is completed regularly by staff to augment historical data. Review of all data is undertaken by staff to ensure the safety of the water source and public.

The community of Garson extends from Skead Road at the north to Garson-Coniston Road at the south. The pipe network is connected to the water supply from Sudbury at the intersection of Falconbridge Road and O'Neil Drive West, therefore the community is serviced from the Sudbury Distribution system West of Penman Avenue. In the event that all of the three wells were to fail, the Garson system is connected to the Sudbury Distribution System by way of a pressure valve and would have water supplied from Sudbury. The pipe network is a combination of new and older pipes and frost penetration can be an issue in Garson.

Water quality throughout the distribution system is monitored through regular sampling in accordance with O. Reg. 170/03.

Non-Compliance with Act, Regulations, Order or Approvals

Table 8 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during the 2016 reportable period.

Table 8 - Garson Wells and Distribution System

Item	Non-Compliance	Measure Taken to Ensure Compliance
MOECC Inspection Issues	NONE	N/A
MOECC Orders	NONE	N/A

2016 Adverse Water Quality Incident Report

Table 9 provides 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 and the Sudbury and District Health Unit.

Table 9 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
131550	2016/10/17	Fluoride	1.50	mg/L	Resample/Re-test	2016/10/17

Annual Flow Summary

Table 10 provides a summary of the quantities of flow rates with a comparison to rated capacities as listed in the systems Municipal Drinking Water License during the 2016 reportable period.

Table 10 - Flow Summary (Garson Wells)

	Garson Well #1					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	7,190	232	356.46	16.58	1,572	23
February	7,253	250	475.37	16.56	1,572	30
March	7,426	240	486.02	16.17	1,572	31
April	8,563	285	590.73	16.73	1,572	38
May	7,464	241	632.30	17.97	1,572	40
June	8,438	281	635.07	19.38	1,572	40
July	8,916	288	702.56	16.96	1,572	45
August	8,869	286	443.13	16.11	1,572	28
September	7,951	265	562.02	15.95	1,572	36
October	7,406	239	437.69	15.81	1,572	28
November	9,139	305	598.10	16.90	1,572	38
December	9,295	300	496.39	17.17	1,572	32
Total	97,910					

Table 10 - Flow Summary (Garson Wells) continued

	Garson Well #3					
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**Instantaneous Peak Flow L/s**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	7,938	256	439.75	29.51	3,275	13
February	5,922	204	319.17	29.42	3,275	10
March	6,831	220	311.88	30.02	3,275	10
April	7,785	260	495.92	29.32	3,275	15
May	12,638	408	858.85	36.22	3,275	26
June	13,781	459	1,239.01	33.53	3,275	38
July	15,320	494	1,243.95	34.09	3,275	38
August	9,480	306	800.91	32.11	3,275	24
September	8,353	278	467.44	29.13	3,275	14
October	7,371	238	482.56	30.56	3,275	15
November	10,009	334	1,031.94	34.03	3,275	32
December	11,593	374	935.35	33.38	3,275	29
Total	117,021					

	Garson Well #2					
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**Instantaneous Peak Flow L/s**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January	22,100	713	866.29	30.97	2,981	29
February	17,667	609	779.34	32.93	2,981	26
March	18,937	611	761.03	33.67	2,981	26
April	16,389	546	942.69	30.67	2,981	32
May	22,201	716	1,051.49	36.99	2,981	35
June	23,297	777	1,222.47	34.60	2,981	41
July	16,850	544	809.32	31.47	2,981	27
August	19,686	635	966.34	33.93	2,981	32
September	18,618	621	1,164.69	30.32	2,981	39
October	21,835	704	1,210.85	30.46	2,981	41
November	15,242	508	986.32	33.90	2,981	33
December	15,559	502	892.45	34.04	2,981	30
Total	228,381					

Dowling Wells and Distribution System
DWS# 210001665

Municipal Drinking Water License: 016-103
Issue Number: 2
April 13, 2015
Drinking Water Works Permit: 016-203
Issue Number: 3
April 13, 2015

The Dowling water works is a communal groundwater system, which supplies water to the community of Dowling. The water works includes two wells with well pump houses, a distribution network of in-ground piping and an elevated water storage tank. The entire water system was developed with subsidy from the MOECC in the 1970's. The ownership and operation of the water works was transferred to the Regional Municipality of Sudbury and it is now owned and operated by the City of Greater Sudbury.

The Riverside well and pump house includes a vertical turbine supply pump, disinfection with gas chlorine, ultraviolet irradiation along with fluoride injection as mandated by the Sudbury and District Health Unit. The Lionel well and pump house has similar facilities plus a diesel generator for standby power. Both facilities have automatic valving to waste raw water for a few minutes upon start-up of a well pump.

The water supply source for the Dowling wells is an unconfined aquifer of sand and gravel deposits located within the Onaping river watershed. Due to the unconfined nature of the soils and the proximity to the river, the MOECC has characterized the water source as potentially groundwater under the direct influence of surface water (potentially GUDI).

Studies were conducted in 2002 with the resulting submission of a GUDI study on July 1, 2002. This study was reviewed and accepted by the MOECC and as a result, both wells were deemed to be GUDI with effective in situ filtration. As such, additional treatment and disinfection would be required. The prior recommendations of the consultant included that, while the wells have met the MOECC criteria for "potentially under the influence of surface water", adequate natural filtration of the water exists. Based on the conclusions by the MOECC, the well systems have had ultraviolet irradiation added to enhance disinfection to comply with the treatment requirements of the ODWS.

The distribution network in Dowling has been relatively reliable and is not exposed to as severe frost depths as other areas of the City. Further, the elevated water storage provides a measure of security to

the water system in the event of power interruptions and watermain breaks. Water quality throughout the distribution system is monitored through regular sampling in accordance with O. Reg. 170/03.

Non-Compliance with Act, Regulations, Order or Approvals

Table 11 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during 2016 reportable period.

Table 11 - Dowling Wells and Distribution System

Item	Non-Compliance	Measure Taken to Ensure Compliance
MOECC Inspection Issues	NONE	N/A
MOECC Orders	NONE	N/A

2016 Adverse Water Quality Incident Report

Table 12 provides 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 and the Sudbury and District Health Unit.

Table 12 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
NONE						

Annual Flow Summary

Table 13 provides a summary of the quantities of flow rates with a comparison to rated capacities as listed in the systems Municipal Drinking Water License during the 2016 reportable period.

Table 13 - Flow Summary (Dowling Wells)

	Lionel Well					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	7,076	228	724.16	27.63	3,640	20
February	5,904	204	599.56	27.22	3,640	16
March	6,422	207	724.39	26.80	3,640	20
April	4,446	148	513.03	27.63	3,640	14
May	4,544	147	592.05	26.80	3,640	16
June	5,767	192	891.01	25.98	3,640	24
July	8,850	285	627.07	26.39	3,640	17
August	7,388	238	624.61	27.22	3,640	17
September	10,930	364	916.82	25.15	3,640	25
October	5,448	176	668.15	26.39	3,640	18
November	5,454	182	661.53	25.15	3,640	18
December	6,056	195	605.09	24.74	3,640	17
Total	78,285					

	Riverside Well					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	6,300	203	579.77	31.34	3,640	16
February	6,255	216	580.22	30.52	3,640	16
March	5,740	185	765.30	30.93	3,640	21
April	5,010	167	542.66	31.34	3,640	15
May	6,615	213	637.40	30.93	3,640	18
June	11,989	400	985.36	30.10	3,640	27
July	5,831	188	661.74	30.10	3,640	18
August	6,442	208	646.76	30.10	3,640	18
September	4,126	138	671.72	30.10	3,640	18
October	7,512	242	602.96	30.10	3,640	17
November	5,151	172	626.03	29.69	3,640	17
December	5,384	174	588.02	30.10	3,640	16
Total	76,355					

Blezard Valley/Capreol Drinking Water System
DWS# 210000737

Municipal Drinking Water License: 016-105
Issue Number: 3
April 13, 2015
Drinking Water Works Permit: 016-205
Issue Number: 2
April 13, 2015

In 2010, the Blezard Valley and Capreol well supply systems were considered to be one complete system as both of the systems are connected. As such, one Drinking Water System (DWS) number and one Municipal Drinking Water License and Works Permit has been assigned to the entire system. This report will identify the works by geographical area where appropriate.

The Blezard Valley portion of the system is a multi-well groundwater system servicing the communities of Hanmer, Blezard Valley, Val Caron, McCrea Heights, Azilda and Chelmsford. Eleven groundwater wells are situated throughout the Valley and each are located in well pump houses. The communities are interconnected with distribution piping and three water storage tanks located in each of Val Caron, Azilda and Chelmsford.

The water works were originally constructed by the MOECC in the 1970's then transferred to the Regional Municipality of Sudbury. With amalgamation, the ownership was transferred to the City of Greater Sudbury. All upgrades from the original MOECC system were constructed by the City.

Each well pump house contains a vertical turbine well pump, gas chlorine disinfection equipment and fluoride injection equipment as mandated by the Sudbury and District Health Unit. Some of the well pump houses incorporate standby diesel generators, summarized as follows:

- Well A – Deschene;
- Well B – Kenneth;
- Well C – Philippe;
- Well D – Frost;
- Well E - Notre Dame
- Well Q - Chenier; and
- Well R – R Well.

The water supply source is a common groundwater aquifer characterized as a shallow sand and gravel aquifer. This well field extends approximately 7.5 km (west to east) from Val Therese to Hanmer. A preliminary hydrology study performed during the preparation of the First Engineers' Report classified all of the wells as not under the direct influence of surface water. Due to the shallow nature of the aquifer and the lack of a confining clay layer the MOECC requested further study.

The GUDI study was submitted in August of 2002. An amended PTTW was received on February 23, 2003. The amended PTTW acknowledged the opinion of the hydrogeology study, which states that the wells are not GUDI. As such, no additional filtration is required and the wells may supply water provided they meet MOECC Procedures for Disinfection of Drinking Water.

The wells in the Valley system did not meet chemical disinfection CT (Concentration (mg/L) x Time (minutes)) requirements, therefore, all the wells were upgraded in 2007 to incorporate ultraviolet irradiation to deal with CT issues.

As previously noted, the Valley well system is a relatively shallow aquifer and the community has developed extensively around the wells. Some of the wells are located immediately adjacent to residential homes, commercial establishments and major arterial roadways. Two new water wells were developed (Wells Q and R) and commissioned in 2012, increasing the capacity to supply the additional demands in Blezard Valley.

Completed projects in 2016 and the associated approximate costs included: Chelmsford tank Repairs $10 000, Kenneth Well well rehabilitation, pump motor and liner $58 000. The distribution system in the Valley is very extensive and contains many areas with dead-ends. System pressure is regulated by the level of the three storage tanks situated in Azilda, Chelmsford and Val Caron. During the reporting period the City operated the distribution system with good control of the chlorine residuals. This is due in part to the age of the distribution network, and the good source of raw water quality.

The Capreol Well portion of the system draws water from two (2) wells to service the community of Capreol. The wells include:

- Well J; and
- Well M.

In the event that these two wells fail and due to the fact that Capreol does not have backup water storage facilities, the Blezard Valley wells can supply water through the Capreol Boosters located on site at M well. This system, started in 2004, was completed and commissioned in 2007, ensuring a continued water supply to Capreol.

The source of water for the Capreol wells is groundwater. Wells J and M draw from a common unconfined aquifer comprised mostly of sands and gravels. Although neither of the wells have any record of bacteriological contamination, the unconfined nature of the aquifer required these wells to be characterized as potentially groundwater under the influence of surface water (potentially GUDI).

Wells J and M are located within approximately 30 meters of each other on the east side of Greens Lake and west of MR 84. Wells J and M are housed in separate well houses and have vertical turbine well pumps. A common discharge from the wells undergoes treatment in the form of disinfection by gas chlorination, ultraviolet irradiation, and fluoridation, as mandated by the Sudbury and District Health Unit. Corrosion control for the system is accomplished with the addition of a polyphosphate. Both facilities have automatic valving to waste raw water for a few minutes upon start-up of a well pump. Standby power with an automatic transfer switch for Wells J and M is available from a diesel generator located in Well M pump house.

A previous PTTW for Capreol required further hydrogeological studies to be conducted in Capreol to determine if the wells were in fact under influence of surface water. The results of the study were necessary to determine if a filtration system would be required to ensure that the water quality remains in compliance with the ODWS at all times. The studies, referred to as GUDI studies, were completed for Wells M and J and submitted to the MOECC on June 30, 2002. The response from a review by MOECC found these wells to be potentially under influence of surface water with effective in situ filtration and as such required upgrades to meet the ODWS disinfection and log removal criteria. Upgrades have been completed and the system achieves the required log removals and enhanced the disinfection process.

The distribution system in Capreol was developed in conjunction with the growth of the industrial development. Some of the pipe network is therefore, relatively old. The frost depths in Capreol extend to extreme depths during cold winters, which impose additional stresses on the integrity of the distribution system. A second line was added to the distribution system so now two 350 mm water mains run in parallel along MR84 to the Town of Capreol. The distribution system is comprised of PVC, cast iron and ductile piping and serves approximately 3300 residents.

Water quality throughout the distribution system is monitored through regular sampling in accordance with O. Reg. 170/03.

Non-Compliance with Act, Regulations, Order or Approvals

Table 14 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during the 2016 reportable period.

Table 14 - Blezard Valley/Capreol Wells Supply

Item	Non-Compliance	Measure Taken to Ensure Compliance
MOECC Inspection Issues	NONE	N/A
MOECC Orders	NONE	N/A

2016 Adverse Water Quality Incident Report

Table 15 provides 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 and the Sudbury and District Health Unit.

Table 15 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
130167	2016/07/10	Fluoride	1.50	mg/L	Resample/Re-test	2016/07/10
131123	2016/09/07	Fluoride	1.50	mg/L	Resample/Re-test	2016/09/07
131138	2016/09/08	Fluoride	1.50	mg/L	Resample/Re-test	2016/09/08
129061	2016/4/06	Pressure	>20	psi	Re-test chlorine	2016/4/06
129095	2016/04/08	UVT	>4hrs	%T	Maintain analyser and Re-test	2016/04/08
131312	2016/09/27	Chlorine	>4.00	mg/L	Flushing mains/pipes	2016/09/27
129977	2016/06/28	Main break	NA	NA	Bibed hydrants to ensure potable water	2016/06/28

Annual Flow Summary

Tables 16 and 17 provides a summary of the quantities of flow rates with a comparison to rated capacities as listed in the systems Municipal Drinking Water License during the 2016 reportable period.

Table 16 – Annual Flow Summary (Valley Wells)

	Well "A" Deschene					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	24,466	789	1,428.03	18.84	1,798	79
February	13,184	455	929.61	18.56	1,798	52
March	14,219	459	939.30	18.67	1,798	52
April	10,241	341	945.28	18.78	1,798	53
May	13,854	447	924.79	18.90	1,798	51
June	23,859	795	1,256.92	18.84	1,798	70
July	19,937	643	1,097.57	18.89	1,798	61
August	10,310	333	992.72	19.53	1,798	55
September	10,243	341	710.51	18.58	1,798	40
October	16,482	532	1,550.97	19.31	1,798	86
November	15,843	528	1,414.96	19.14	1,798	79
December	12,906	416	682.16	18.87	1,798	38
Total	185,544					

	Well "B" Kenneth					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	33	1	21.70	12.36	2,288	1
February	6,392	220	892.45	19.80	2,288	39
March	9,633	311	978.61	19.02	2,288	43
April	6,854	228	646.26	18.62	2,288	28
May	11,117	359	864.26	16.89	2,288	38
June	16,413	547	963.98	16.15	2,288	42
July	2,626	85	765.82	15.64	2,288	33
August	1	0	1.07	71.23	2,288	0
September	0	0	0.00	0.00	2,288	0
October	0	0	0.00	0.00	2,288	0
November	7,524	251	695.76	22.81	2,288	30
December	13,231	427	856.67	18.05	2,288	37
Total	73,824					

Table 16 – Annual Flow Summary (Valley Wells) continued

	Well "C" Phillipe					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	23,169	747	1,131.41	25.47	2,288	49
February	13,512	466	1,026.08	24.94	2,288	45
March	15,896	513	1,062.79	24.57	2,288	46
April	14,927	498	1,255.26	24.84	2,288	55
May	18,086	583	1,196.24	25.01	2,288	52
June	29,308	977	1,659.76	24.75	2,288	73
July	23,062	744	1,401.29	24.22	2,288	61
August	17,236	556	1,384.48	24.53	2,288	61
September	10,614	354	1,190.97	25.03	2,288	52
October	16,599	535	1,196.40	24.74	2,288	52
November	18,330	611	1,341.86	24.52	2,288	59
December	17,182	554	1,192.35	25.08	2,288	52
Total	217,921					

	Well "D" Frost					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	23,556	760	1,414.24	25.34	2,288	62
February	30,249	1,043	1,944.91	25.74	2,288	85
March	32,539	1,050	1,876.62	26.27	2,288	82
April	19,952	665	2,015.67	26.68	2,288	88
May	20,962	676	1,410.88	26.45	2,288	62
June	30,865	1,029	1,637.19	25.71	2,288	72
July	32,646	1,053	1,920.75	25.25	2,288	84
August	20,937	675	1,375.84	25.59	2,288	60
September	16,735	558	1,187.01	26.17	2,288	52
October	3,215	104	1,206.84	25.15	2,288	53
November	7,358	245	853.89	25.90	2,288	37
December	22,132	714	1,822.35	24.48	2,288	80
Total	261,146					

Table 16 – Annual Flow Summary (Valley Wells) continued

	Well "E" Notre Dame					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	24,660	795	1,825.41	22.46	3,105	59
February	20,124	694	1,824.80	23.31	3,105	59
March	30,649	989	2,435.04	34.33	3,105	78
April	55,016	1,834	2,472.09	30.63	3,105	80
May	52,828	1,704	2,481.21	30.98	3,105	80
June	42,870	1,429	2,462.23	30.55	3,105	79
July	38,680	1,248	2,423.90	30.07	3,105	78
August	24,534	791	1,694.28	29.50	3,105	55
September	39,264	1,309	2,426.85	29.62	3,105	78
October	38,964	1,257	2,442.27	29.92	3,105	79
November	18,681	623	1,478.92	29.68	3,105	48
December	2,958	95	766.92	29.02	3,105	25
Total	389,228					

	Well "F" Linden					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	46,937	1,514	2,005.90	24.89	3,269	61
February	39,167	1,351	2,049.44	42.80	3,269	63
March	52,431	1,691	2,608.04	31.70	3,269	80
April	41,705	1,390	2,583.26	32.21	3,269	79
May	50,005	1,613	2,094.27	32.29	3,269	64
June	56,869	1,896	2,611.21	40.63	3,269	80
July	31,491	1,016	2,603.02	80.00	3,269	80
August	54,304	1,752	2,426.96	80.00	3,269	74
September	51,003	1,700	2,451.02	39.83	3,269	75
October	53,372	1,722	2,458.02	80.00	3,269	75
November	60,167	2,006	2,609.77	29.55	3,269	80
December	43,972	1,418	2,430.69	30.05	3,269	74
Total	581,423					

Table 16 – Annual Flow Summary (Valley Wells) continued

	Well "G" Pharand					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	21,839	704	1,027.57	22.09	2,290	45
February	16,258	561	1,129.56	21.86	2,290	49
March	16,978	548	1,110.17	21.33	2,290	48
April	13,532	451	1,110.05	21.40	2,290	48
May	17,242	556	1,096.55	21.81	2,290	48
June	24,505	817	1,298.07	21.92	2,290	57
July	27,700	894	1,767.07	21.51	2,290	77
August	17,855	576	1,244.97	21.86	2,290	54
September	13,650	455	1,053.53	23.95	2,290	46
October	18,148	585	1,357.17	22.76	2,290	59
November	16,338	545	1,189.61	21.05	2,290	52
December	17,303	558	1,645.18	21.32	2,290	72
Total	221,348					

	Well "H" Michelle					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	20,029	646	1,490.07	25.64	2,290	65
February	18,019	621	1,468.98	26.88	2,290	64
March	12,513	404	839.47	25.39	2,290	37
April	8,890	296	589.02	17.87	2,290	26
May	10,107	326	733.87	18.10	2,290	32
June	20,988	700	1,242.20	18.37	2,290	54
July	18,635	601	1,043.33	25.93	2,290	46
August	12,611	407	1,005.82	27.04	2,290	44
September	10,948	365	754.66	17.28	2,290	33
October	15,910	513	1,234.31	26.93	2,290	54
November	18,863	629	1,485.48	28.57	2,290	65
December	15,644	505	1,492.06	27.03	2,290	65
Total	183,157					

Table 16 – Annual Flow Summary (Valley Wells) continued

	Well "Q" Chenier					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	49,596	1,600	1,901.88	25.42	2,333	82
February	36,974	1,275	1,901.88	25.67	2,333	82
March	38,426	1,240	1,901.63	25.65	2,333	82
April	44,790	1,493	1,901.75	25.74	2,333	82
May	45,277	1,461	1,901.88	25.87	2,333	82
June	45,959	1,532	1,901.88	25.53	2,333	82
July	43,946	1,418	1,901.88	26.27	2,333	82
August	56,053	1,808	1,902.00	25.88	2,333	82
September	36,842	1,228	1,901.88	25.92	2,333	82
October	32,426	1,046	1,740.50	25.95	2,333	75
November	40,184	1,339	1,901.88	25.91	2,333	82
December	44,939	1,450	1,901.88	26.13	2,333	82
Total	515,412					

	Well "R"					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	59,497	1,919	2,594.13	33.68	3,162	82
February	59,031	2,036	2,594.13	33.61	3,162	82
March	53,916	1,739	2,593.75	33.03	3,162	82
April	43,041	1,435	1,851.13	33.42	3,162	59
May	50,062	1,615	2,594.00	33.37	3,162	82
June	55,413	1,847	2,524.75	33.71	3,162	80
July	57,264	1,847	2,594.00	33.72	3,162	82
August	59,698	1,926	2,594.00	33.29	3,162	82
September	58,513	1,950	2,594.50	33.51	3,162	82
October	57,947	1,869	2,594.50	33.03	3,162	82
November	41,793	1,393	2,701.75	32.85	3,162	85
December	71,660	2,312	2,594.25	33.18	3,162	82
Total	667,835					

Table 16 – Annual Flow Summary (Valley Wells) continued

	WELL CURRENTLY NOT IN USE **"I" Well**					
	Total Flow m^3	**Average Daily Flow m^3/d**	**Maximum Daily Flow m^3/d**	**Instantaneous Peak Flow L/s**	**MDWL Maximum Flow m^3/d**	**% Capacity**
January		0			1,973	0
February		0			1,973	0
March		0			1,973	0
April		0			1,973	0
May		0			1,973	0
June		0			1,973	0
July		0			1,973	0
August		0			1,973	0
September		0			1,973	0
October		0			1,973	0
November		0			1,973	0
December		0			1,973	0
Total	0					

Table 17 - Annual Flow Summary (Capreol Wells)

	"J" Well					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	23,829	769	2,070.05	37.40	3,273	63
February	23,369	806	2,114.19	28.14	3,273	65
March	17,734	572	2,038.50	27.27	3,273	62
April	28,896	963	2,058.21	27.14	3,273	63
May	21,307	687	2,007.14	30.65	3,273	61
June	17,266	576	2,097.56	30.55	3,273	64
July	20,703	668	2,098.44	27.78	3,273	64
August	18,784	606	1,836.19	27.36	3,273	56
September	25,847	862	1,965.59	28.50	3,273	60
October	34,231	1,104	1,839.20	28.52	3,273	56
November	16,894	563	1,687.55	29.19	3,273	52
December	40,163	1,296	1,964.54	27.24	3,273	60
Total	289,023					

	"M" Well					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	12,511	404	2,241.17	31.19	3,927	57
February	27,431	946	2,148.66	30.94	3,927	55
March	30,560	986	2,145.03	31.02	3,927	55
April	26,249	875	2,105.73	30.70	3,927	54
May	35,430	1,143	1,995.25	33.83	3,927	51
June	23,851	795	2,182.84	38.68	3,927	56
July	23,645	763	2,101.98	32.45	3,927	54
August	19,885	641	1,727.48	35.63	3,927	44
September	18,824	627	1,818.26	33.84	3,927	46
October	9,936	321	1,681.23	33.79	3,927	43
November	16,065	536	1,599.11	33.42	3,927	41
December	46	1	33.67	26.72	3,927	1
Total	244,433					

Falconbridge Drinking Water System
DWS# 240000020

Municipal Drinking Water License: 016-101
Issue Number: 2
April 13, 2015
Drinking Water Works Permit: 016-201
Issue Number: 2
April 13, 2015

In April 2009, the City of Greater Sudbury purchased the Falconbridge Wells and Storage Tank from Xstrata. The Falconbridge well system consists of 3 drilled wells:

- Falconbridge Well No. 5
- Falconbridge Well No. 6, and
- Falconbridge Well No. 7

Each well is equipped with a submersible pump. All three wells share a common treatment building that includes stand-by power, chlorine gas for disinfection, and a corrosion inhibitor. The wells are located north of the Sudbury Airport and were developed by Xstrata, now called Glencore. Water is supplied south to the Town of Falconbridge and north via the Western Main to the Greater Sudbury Airport and Glencore's Nickel Rim Mine reservoir. There is a booster pump for supplying water to Nickel Rim reservoir when a well pump is not operating. The City sells water to Glencore and two industrial clients along the South transmission line and fluoridates the water, as mandated by the Sudbury and District Health Unit, before it enters the Falconbridge Municipal distribution system.

The distribution network in Falconbridge is relatively old and exposed to severe frost depths. Further, the elevated water storage provides a measure of security to the water system in the event of power interruptions and watermain breaks but its future is being explored. Other components of the distribution system include a fluoridation building, booster pumping station and a pressure regulating valve.

Water quality throughout the distribution system is monitored through regular sampling in accordance with O. Reg. 170/03.

Non-Compliance with Act, Regulations, Order or Approvals

Table 18 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during 2016 reportable period.

Table 18 - Falconbridge Wells

Item	Non-Compliance	Corrective Measures Taken
MOECC Inspection Issues	NONE	N/A
MOECC Orders	NONE	N/A

2016 Adverse Water Quality Incident Report

Table 19 provides 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 and the Sudbury and District Health Unit.

Table 19 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
129337	2016/05/02	Fluoride	1.50	mg/L	Resample/Re-test	2016/05/02

Annual Flow Summary

Table 20 provides a summary of the quantities of flow rates with a comparison to rated capacities as listed in the systems Municipal Drinking Water License during the 2015 reportable period.

Table 20 – Annual Flow Summary (Falconbridge Wells)

	Falconbridge Well #5					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	6,085	196	1,087.38	15.74	1,417	77
February	4,987	172	1,104.33	15.84	1,417	78
March	10,555	340	1,154.87	15.63	1,417	81
April	11,394	380	930.50	16.03	1,417	66
May	12,096	390	1,212.91	16.06	1,417	86
June	6,654	222	1,125.86	15.99	1,417	79
July	7,734	249	971.17	15.84	1,417	69
August	13,398	432	1,076.85	15.95	1,417	76
September	5,307	177	834.33	15.80	1,417	59
October	7,988	258	865.02	15.91	1,417	61
November	9,633	321	1,094.85	16.33	1,417	77
December	11,708	378	906.44	16.00	1,417	64
Total	107,539					

	Falconbridge Well #6					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	10,933	353	948.74	15.02	1,417	67
February	4,628	160	980.32	14.86	1,417	69
March	4,139	134	1,041.47	14.78	1,417	73
April	8,612	287	1,008.10	14.83	1,417	71
May	13,725	443	1,069.09	14.69	1,417	75
June	9,782	326	1,147.78	14.99	1,417	81
July	12,404	400	1,032.16	14.88	1,417	73
August	8,081	261	835.64	14.68	1,417	59
September	12,800	427	862.07	14.59	1,417	61
October	7,096	229	903.54	14.22	1,417	64
November	885	30	335.99	14.02	1,417	24
December	6,145	198	973.00	14.36	1,417	69
Total	99,230					

Table 20 – Annual Flow Summary (Falconbridge Wells) continued

	Falconbridge Well #7					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	8,636	279	914.04	15.24	1,417	64
February	17,472	602	1,086.70	15.29	1,417	77
March	14,102	455	1,040.03	15.27	1,417	73
April	5,254	175	850.14	15.34	1,417	60
May	4,482	145	1,047.74	15.40	1,417	74
June	15,453	515	1,160.94	15.48	1,417	82
July	6,572	212	966.11	15.37	1,417	68
August	2,960	95	968.66	15.40	1,417	68
September	4,959	165	868.90	15.50	1,417	61
October	8,888	287	853.65	15.33	1,417	60
November	14,339	478	973.71	15.34	1,417	69
December	7,993	258	1,015.43	15.42	1,417	72
Total	111,110					

Onaping/Levack Drinking Water System
DWS# 220003519

Municipal Drinking Water License: 016-102
Issue Number: 2
April 13, 2015
Drinking Water Works Permit: 016-202
Issue Number: 2
April 13, 2015

In 2010, the Onaping well supply system, Onaping distribution and Levack distribution were considered to be one complete system as all of the systems are connected. As such, one Drinking Water System (DWS) number and one Certificate of Approval had been assigned to the entire system. The CofA has since been changed to the listed Drinking Water License and Works Permits. This report will identify the works by geographical area where appropriate.

The Onaping Potable Water System was constructed in 1971 and owned by Xstrata. In 2009 the City of Greater Sudbury purchased the system from Xstrata and completed all major upgrades required to supply potable water to the communities of Onaping and Levack. The system was commissioned in November of 2009. The new Onaping/Levack system includes three drilled wells:

- Onaping Well No. 3,
- Onaping Well No. 4, and
- Onaping Well No. 5

Onaping Wells 3 and 4 are housed in a single pump house and Onaping Well 5 is in a separate building, but all feed into a common treatment building. The treatment building houses one well (Well 5) and provides chlorine gas injection for disinfection, fluoridation, as mandated by the Sudbury and District Health Unit, chemical addition for corrosion control and stand-by power. An elevated storage tank with re-chlorination capabilities, a Pressure Control/Booster building with stand-by power, a Pressure control facility on Fraser Crescent and the distribution piping complete the system.

Completed projects in 2016 and the associated approximate costs included: Onaping Well Rehabilitation #5 well inspection, column assembly and impeller $62 000 and Onaping Booster station new Variable Frequency Drive for a pump $6 655

The Levack distribution system was a recipient of water from the Vale wells in the Levack area but that changed with the acquisition of the Onaping wells and commissioning in November 2009. Water is no

longer supplied from Vale and the connection has been terminated. Water is entirely provided by the Onaping wells and both Onaping and Levack distribution systems are connected.

Water quality throughout the distribution system is monitored through regular sampling in accordance with O. Reg. 170/03.

Non-Compliance with Act, Regulations, Order or Approvals

Table 21 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during the 2016 reportable period.

Table 21 – Onaping/Levack Wells

Item	Non-Compliance	Corrective Measures Taken
MOECC Inspection Issues	NONE	N/A
MOECC Orders	NONE	N/A

2016 Adverse Water Quality Incident Report

Table 22 provides 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 and the Sudbury and District Health Unit.

Table 22 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
128654	2016/03/22	Fluoride	1.50	mg/L	Resample/Re-test	2016/03/22

Annual Flow Summary

Table 23 provides a summary of the quantities of flow rates with a comparison to rated capacities as listed in the systems Municipal Drinking Water License during the 2016 reportable period.

Table 23– Annual Flow Summary (Onaping/Levack Wells)

	Onaping Well #3					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	20,144	650	1959.45	30.34	5,184	38
February	23,722	818	2384.82	30.68	5,184	46
March	44,268	1,428	2409.38	29.81	5,184	46
April	26,188	873	1993.06	30.74	5,184	38
May	11,858	383	1898.35	30.50	5,184	37
June	12,877	429	1846.50	29.89	5,184	36
July	19,519	630	1877.51	30.00	5,184	36
August	19,073	615	1726.87	30.24	5,184	33
September	27,795	927	1856.75	29.55	5,184	36
October	16,115	520	1887.54	29.68	5,184	36
November	7,364	245	2298.55	29.85	5,184	44
December	10,594	342	2298.82	29.68	5,184	44
Total	239,517					

	Onaping Well #4					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	15,213	491	1750.16	27.85	5,184	34
February	16,890	582	1994.36	27.83	5,184	38
March	2,452	79	883.98	29.08	5,184	17
April	16,658	555	2185.95	28.63	5,184	42
May	13,684	441	1989.41	28.27	5,184	38
June	16,910	564	1846.82	28.47	5,184	36
July	8,621	278	1654.15	27.14	5,184	32
August	7,812	252	1547.60	28.27	5,184	30
September	16,171	539	1953.27	28.58	5,184	38
October	33,683	1,087	1800.13	28.58	5,184	35
November	15,194	506	2173.21	28.39	5,184	42
December	18,566	599	2254.34	28.04	5,184	43
Total	181,854					

Table 23– Annual Flow Summary (Onaping/Levack Wells) continued

	Onaping Well #5					
	Total Flow m^3	Average Daily Flow m^3/d	Maximum Daily Flow m^3/d	Instantaneous Peak Flow L/s	MDWL Maximum Flow m^3/d	% Capacity
January	14,762	476	1916.09	52.74	5,184	37
February	12,444	429	1921.87	38.85	5,184	37
March	11,749	379	2379.48	42.44	5,184	46
April	13,543	451	1952.19	40.42	5,184	38
May	29,870	964	2182.92	32.85	5,184	42
June	20,147	672	1851.09	36.34	5,184	36
July	21,362	689	2255.79	43.80	5,184	44
August	18,121	585	1721.51	33.29	5,184	33
September	1,824	61	1297.53	61.05	5,184	25
October	1,612	52	1197.91	60.44	5,184	23
November	35,646	1,188	2381.26	33.62	5,184	46
December	38,937	1,256	2830.29	46.94	5,184	55
Total	220,017					

Vermilion Distribution System
DWS# 260006789

Municipal Drinking Water License: 016-104
Issue Number: 2
April 13, 2015
Drinking Water Works Permit: 016-204
Issue Number: 3
April 13, 2015

The Vermilion distribution system is a standalone distribution system that receives water from a “donor” system. The City of Greater Sudbury purchases water from Vale, the owner of the Vermilion water treatment facility, which acts as the donor for the CGS Vermilion distribution system. Vale has responsibility for the treatment facility and must also comply with O. Reg. 170/03. The Vale water treatment facility is not the subject of this report.

The City owns and operates the distribution network in the communities of Copper Cliff, Lively, Naughton and Whitefish. The system also includes the Walden Water Storage Tank and Walden Metering Chamber. Additional service was provided in 2005 to supply Atikameksheng Anishnawbek, formerly known as the Whitefish Lake First Nation Reserve. The City has obligations to test, maintain and report on this distribution system as part of the MOECC regulations.

Water quality throughout the distribution systems is monitored through regular sampling in accordance with O. Reg. 170/03.

Non-Compliance with Act, Regulations, Order or Approvals

Table 24 provides a summary of any requirements of the Act, Regulations, Orders, or Approval that the system failed to meet during the 2016 reportable period.

Table 24 - Vermilion Distribution System

Item	Non-Compliance	Measure Taken to Ensure Compliance
MOECC Inspection Issues	NONE	N/A
MOECC Orders	NONE	N/A

2016 Adverse Water Quality Incident Report

Table 25 provides 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 and the Sudbury and District Health Unit.

Table 25 - Adverse Water Quality Incidents

AWQI #	Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
None						

Annual Flow Summary – N/A