



2015 Water Works Summary Report

**Large Municipal
Residential Systems**

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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, 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	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 **99.68%** for all of our systems through the 2015 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 fourteen 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, 3405 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 2% 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 proactive 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: _____

Juie Friel
Water Supervisor III (Acting)

Approved by:

Date: _____

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 Where 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, what is deemed as 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 licence 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 2015 and the associated approximate costs included: plant process energy optimization study, (\$35,000); repair to various operational equipment, (\$33,203); repairs to plant roof structure, (\$78,394); and

upgrades to the lime system, (\$19,056). Capital improvements to various distribution infrastructure projects totaled approximately \$2,942,000.

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 2015 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

2015 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
122485	2015/02/10	Pressure	<20	psi	Resample/Re-test;	2015/02/12
125904	2015/08/24	Chlorine Residual	0.00	mg/L	Resample/Re-test;	2015/08/24

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 2015 reportable period.

Table 4 - Annual Flow Summary (Sudbury Plants)

Wanapitei Water Treatment Plant							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	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	853,331	27,527	39,529.45	477.81	54,000	73	395,954	12,773	19,067.38	495.34	40,000	48
February	739,242	26,402	31,466.71	469.25	54,000	58	400,439	14,301	21,284.17	485.51	40,000	53
March	886,550	28,598	34,982.25	418.74	54,000	65	645,892	20,835	29,772.70	528.09	40,000	74
April	859,337	28,645	39,421.80	475.13	54,000	73	418,324	13,944	19,180.00	488.58	40,000	48
May	877,385	28,303	32,943.55	479.16	54,000	61	423,329	13,656	17,974.44	490.46	40,000	45
June	862,762	28,759	39,853.91	478.65	54,000	74	370,709	12,357	17,412.29	455.08	40,000	44
July	873,291	28,171	30,132.46	472.95	54,000	56	540,610	17,439	25,078.01	490.70	40,000	63
August	857,171	27,651	33,616.48	474.96	54,000	62	485,409	15,658	27,054.02	319.67	40,000	68
September	807,305	26,910	33,240.46	465.90	54,000	62	481,500	16,050	26,982.56	355.53	40,000	67
October	839,640	27,085	30,344.36	472.78	54,000	56	360,479	11,628	22,944.24	317.60	40,000	57
November	809,195	26,973	28,446.70	468.29	54,000	53	349,660	11,655	17,517.32	317.90	40,000	44
December	800,572	25,825	27,716.63	505.20	54,000	51	352,064	11,357	15,543.59	317.29	40,000	39
Total	10,065,781					62%	5,224,369					54%

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. For this reason the City has made a significant financial investment in the upgrading of this plant. Projects completed for 2015 and the associated approximate costs included: replacing butterfly valve and pneumatic actuators, (\$25,868); HVAC upgrades, (\$170,000); repairs to various operational equipment, (\$25,974) and Ramsey Lake outfall structure upgrades, (\$45,000).

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. Capital projects undertaken in 2015 included various watermain repairs, replacements and relining totaling approximately \$450,000.

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 2015 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

2015 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
122292	2015/01/15	Fluoride	1.50	mg/L	Resample/Re-test	2015/01/15
124679	2015/07/03	Fluoride	7.83	mg/L	Resample/Re-test	2015/07/04
127278	2015/11/06	Sodium	52.8	mg/L	Resample/Re-test	2015/11/13
127425	2015/11/17	Pressure	0	psi	Flushing mains/pipes	2015/11/19

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 2015 reporting period.

Table 7 - Annual Flow Summary

Wanapitei Water Treatment Plant							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	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	853,331	27,527	39,529.45	477.81	54,000	73	395,954	12,773	19,067.38	495.34	40,000	48
February	739,242	26,402	31,466.71	469.25	54,000	58	400,439	14,301	21,284.17	485.51	40,000	53
March	886,550	28,598	34,982.25	418.74	54,000	65	645,892	20,835	29,772.70	528.09	40,000	74
April	859,337	28,645	39,421.80	475.13	54,000	73	418,324	13,944	19,180.00	488.58	40,000	48
May	877,385	28,303	32,943.55	479.16	54,000	61	423,329	13,656	17,974.44	490.46	40,000	45
June	862,762	28,759	39,853.91	478.65	54,000	74	370,709	12,357	17,412.29	455.08	40,000	44
July	873,291	28,171	30,132.46	472.95	54,000	56	540,610	17,439	25,078.01	490.70	40,000	63
August	857,171	27,651	33,616.48	474.96	54,000	62	485,409	15,658	27,054.02	319.67	40,000	68
September	807,305	26,910	33,240.46	465.90	54,000	62	481,500	16,050	26,982.56	355.53	40,000	67
October	839,640	27,085	30,344.36	472.78	54,000	56	360,479	11,628	22,944.24	317.60	40,000	57
November	809,195	26,973	28,446.70	468.29	54,000	53	349,660	11,655	17,517.32	317.90	40,000	44
December	800,572	25,825	27,716.63	505.20	54,000	51	352,064	11,357	15,543.59	317.29	40,000	39
Total	10,065,781					62%	5,224,369					54%

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 2015 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

2015 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
124641	2015/07/02	Sodium	24.5	mg/L	Resample/Re-test	2015/07/03
126418	2015/09/18	Chlorine Residual	0.02	mg/L	Resample/Re-test	2015/09/18
127276	2015/11/06	Sodium	58.5	mg/L	Resample/Re-test	2015/11/17

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 2015 reportable period.

Table 10 - Flow Summary (Garson Wells)

	Garson Well #1						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	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	4,627	149	301.87	16.46	1,572	19	4,471	144	703.27	31.07	3,275	21
February	5,359	191	331.31	17.95	1,572	21	3,465	124	558.77	32.54	3,275	17
March	7,519	243	343.70	16.87	1,572	22	4,974	160	550.99	29.99	3,275	17
April	7,485	250	354.18	15.94	1,572	23	4,028	134	405.89	28.84	3,275	12
May	7,624	246	336.37	17.96	1,572	21	6,765	218	1,099.86	31.16	3,275	34
June	7,779	259	506.53	18.34	1,572	32	9,151	305	1,132.32	33.25	3,275	35
July	8,469	273	379.71	17.99	1,572	24	11,556	373	1,079.56	32.30	3,275	33
August	8,660	279	373.33	17.94	1,572	24	6,031	195	843.14	33.28	3,275	26
September	9,666	322	567.13	16.82	1,572	36	8,417	281	1,281.91	33.99	3,275	39
October	8,680	280	608.54	15.86	1,572	39	6,307	203	511.63	29.82	3,275	16
November	7,163	239	359.46	15.39	1,572	23	9,848	328	934.18	31.60	3,275	29
December	7,736	250	404.22	15.23	1,572	26	8,633	278	591.66	31.47	3,275	18
Total	90,767					26%	83,646					25%

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	27,483	887	1,361.21	33.10	2,981	46
February	25,651	916	1,356.35	35.62	2,981	45
March	27,574	889	1,149.88	33.27	2,981	39
April	27,986	933	1,126.75	32.77	2,981	38
May	29,771	960	1,333.37	36.56	2,981	45
June	29,095	970	1,377.29	35.33	2,981	46
July	31,785	1,025	1,323.91	39.55	2,981	44
August	26,884	867	1,074.64	35.02	2,981	36
September	19,306	644	1,085.80	35.96	2,981	36
October	21,752	702	1,137.55	35.51	2,981	38
November	21,497	717	1,059.42	33.38	2,981	36
December	21,768	702	907.50	31.79	2,981	30
Total	310,552					40%

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. Projects completed for 2015 and the associated approximate costs included: Dowling storage tank safety inspection and Health & Safety upgrades, (\$12,500)

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 the 2015 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

2015 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
127321	2015/11/10	Sodium	35.0	mg/L	Resample/Re-test	2015/11/20

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 2015 reportable period.

Table 13 - Flow Summary (Dowling Wells)

	Lionel Well						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	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	9,054	292	714.86	27.22	3,640	20	3,108	100	516.04	31.34	3,640	14
February	7,279	251	609.15	26.80	3,640	17	3,425	118	572.19	30.93	3,640	16
March	4,196	135	574.54	26.80	3,640	16	8,297	268	593.91	30.52	3,640	16
April	2,780	93	475.71	27.63	3,640	13	9,315	311	726.94	31.34	3,640	20
May	3,565	115	155.77	27.63	3,640	4	9,939	321	830.55	31.34	3,640	23
June	8,091	270	734.96	27.22	3,640	20	3,844	128	653.88	30.93	3,640	18
July	6,071	196	677.48	27.22	3,640	19	5,590	180	488.66	30.10	3,640	13
August	4,812	155	501.07	25.57	3,640	14	6,203	200	609.93	29.69	3,640	17
September	9,618	321	782.81	25.98	3,640	22	2,434	81	557.59	30.10	3,640	15
October	2,060	66	595.27	25.57	3,640	16	9,424	304	602.11	30.52	3,640	17
November	4,659	155	572.99	27.22	3,640	16	8,591	286	742.33	30.52	3,640	20
December	6,274	202	555.53	27.63	3,640	15	7,209	233	608.36	31.34	3,640	17
Total	68,459					16%	77,379					17%

Valley 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, McCreagh 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 2015 and the associated approximate costs included: Azilda tank cleaning and inspection, (\$6,600); Chelmsford and Val Caron tank safety inspections and Health & Safety upgrades, (\$12,000); and Linden well control upgrades and installation of new standby power generator, (\$340,000).

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. Capital projects undertaken in 2015 included various watermain repairs, replacements and relining totaling approximately \$190,000.

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 onsite 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 2015 reportable period.

Table 14 - Blezard Valley/Capreol Wells Supply

Item	Non-Compliance	Measure Taken to Ensure Compliance
MOECC Inspection Issues	<p>1. 72 hour trending review was not completed for Q & R well during various dates in Mar 2014.</p> <p>2. In accordance with Sched. 10 of O. Reg. 170/03, one raw sample is to be taken per well, per week. This was not done during the week of Aug 3, 2014</p>	<p>New forms had been issued and instruction passed to operators to used only the new form. No further action required.</p> <p>Oversight was immediately reported and administrative steps taken to avoid recurrence. No further action required.</p>
MOECC Orders	NONE	N/A

2015 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
122704	2015/03/04	Fluoride	1.55	mg/L	Flushing mains/pipes	2015/03/04
123412	2015/04/28	Fluoride	1.67	mg/L	Resample/Re-test	2015/04/30
123870	2015/06/02	Sodium	34.4	mg/L	Resample/Re-test	2015/06/02
124100	2015/06/12	Fluoride	1.50	mg/L	Resample/Re-test	2015/06/12
125368	2015/07/30	Fluoride	1.50	mg/L	Resample/Re-test	2015/07/30

126541	2015/09/25	Fluoride	>1.50	mg/L	Flushing mains/pipes	2015/09/25
126616	2015/09/29	Fluoride	1.62	mg/L	Resample/Re-test	2015/09/29
127320	2015/11/10	Sodium	72.6	mg/L	Resample/Re-test	2015/11/17
127496	2015/11/24	Fluoride	1.65	mg/L	Resample/Re-test	2015/11/24

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 2015 reportable period.

Table 16 – Annual Flow Summary (Valley Wells)

	Well "A" Deschene						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	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	18,061	583	1,353.61	18.61	1,798	75	11,847	382	731.00	14.62	2,288	32
February	17,013	608	1,078.98	18.69	1,798	60	7,954	284	644.78	13.34	2,288	28
March	20,374	657	975.91	15.59	1,798	54	12,434	401	821.26	85.00	2,288	36
April	14,359	479	845.24	18.75	1,798	47	12,477	416	676.30	17.60	2,288	30
May	18,843	608	909.72	18.86	1,798	51	9,006	291	690.54	16.64	2,288	30
June	21,396	713	1,059.53	18.88	1,798	59	616	21	284.46	13.23	2,288	12
July	25,362	818	1,423.76	18.78	1,798	79	13,848	447	772.00	14.23	2,288	34
August	18,807	607	1,084.88	18.81	1,798	60	9,000	290	620.66	16.14	2,288	27
September	22,676	756	1,437.65	18.63	1,798	80	9,229	308	726.46	74.64	2,288	32
October	19,747	637	1,066.05	18.80	1,798	59	0	0	0.00	0.00	2,288	0
November	12,179	406	1,243.02	18.70	1,798	69	212	7	156.20	80.26	2,288	7
December	16,946	547	822.25	18.55	1,798	46	0	0	0.00	0.00	2,288	0
Total	225,763					62%	86,623					22%

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Well "C" Philippe							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	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	21,135	682	1,348.27	24.98	2,288	59	37,101	1,197	1,868.19	27.46	2,288	82
February	20,952	748	1,356.56	25.04	2,288	59	34,413	1,229	1,789.08	25.97	2,288	78
March	26,128	843	1,326.49	25.08	2,288	58	29,539	953	1,320.73	25.27	2,288	58
April	22,411	747	1,076.58	25.00	2,288	47	39,137	1,305	1,897.31	26.16	2,288	83
May	24,560	792	1,305.38	25.44	2,288	57	36,044	1,163	1,980.97	26.49	2,288	87
June	19,762	659	1,077.69	24.81	2,288	47	49,482	1,649	1,996.40	68.71	2,288	87
July	30,739	992	1,431.17	24.50	2,288	63	33,553	1,082	1,927.67	26.66	2,288	84
August	26,122	843	1,435.26	24.77	2,288	63	38,691	1,248	1,966.20	27.17	2,288	86
September	20,741	691	1,136.12	24.39	2,288	50	34,104	1,137	1,914.04	25.98	2,288	84
October	29,329	946	1,660.82	24.81	2,288	73	37,994	1,226	1,967.61	26.74	2,288	86
November	19,520	651	1,507.00	24.34	2,288	66	38,581	1,286	1,925.16	25.89	2,288	84
December	25,548	824	1,265.69	24.31	2,288	55	28,981	935	1,891.53	26.41	2,288	83
Total	286,947					58%	437,620					82%

Well "E" Notre Dame							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	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	29,184	941	2,016.31	24.34	3,105	65	32,236	1,040	2,143.84	37.53	3,269	66
February	29,906	1,068	1,885.56	23.58	3,105	61	28,488	1,017	2,165.83	29.01	3,269	66
March	24,647	795	1,282.08	23.36	3,105	41	48,116	1,552	2,136.65	26.39	3,269	65
April	22,546	752	1,246.09	23.10	3,105	40	41,880	1,396	2,167.24	26.43	3,269	66
May	31,936	1,030	1,902.43	23.84	3,105	61	29,106	939	2,204.93	32.19	3,269	67
June	26,338	878	1,524.82	24.07	3,105	49	31,217	1,041	1,556.09	26.92	3,269	48
July	32,166	1,038	1,792.49	23.83	3,105	58	42,035	1,356	2,206.76	83.26	3,269	68
August	34,821	1,123	1,945.79	23.84	3,105	63	30,674	989	1,972.64	24.84	3,269	60
September	41,736	1,391	1,952.48	23.72	3,105	63	14,284	476	1,959.03	23.90	3,269	60
October	12,757	412	1,700.63	23.38	3,105	55	7,458	241	1,363.31	24.41	3,269	42
November	23,344	778	1,802.22	22.23	3,105	58	46,593	1,553	2,016.91	26.87	3,269	62
December	30,416	981	1,746.58	22.41	3,105	56	47,458	1,531	2,001.75	24.61	3,269	61
Total	339,797					56%	399,545					61%

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Well "G" Pharand							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	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	19,551	631	887.36	22.39	2,290	39	10,566	341	990.84	27.19	2,290	43
February	22,343	798	1,313.88	22.23	2,290	57	7,785	278	579.00	23.44	2,290	25
March	23,674	764	1,218.98	22.33	2,290	53	16,278	525	949.56	25.42	2,290	41
April	20,741	691	1,328.24	23.23	2,290	58	16,571	552	944.30	26.67	2,290	41
May	24,825	801	1,149.77	22.78	2,290	50	19,488	629	916.92	25.60	2,290	40
June	27,416	914	1,310.15	22.56	2,290	57	22,801	760	1,341.81	25.37	2,290	59
July	26,070	841	1,349.81	23.08	2,290	59	24,211	781	1,426.63	29.81	2,290	62
August	20,811	671	1,158.40	22.15	2,290	51	16,924	546	924.69	21.90	2,290	40
September	25,216	841	1,167.59	22.23	2,290	51	19,903	663	927.97	22.36	2,290	41
October	26,492	855	1,719.21	22.49	2,290	75	20,445	660	1,043.84	26.47	2,290	46
November	17,243	575	1,317.67	22.17	2,290	58	15,245	508	1,047.22	24.40	2,290	46
December	20,768	670	1,196.36	22.08	2,290	52	17,793	574	935.88	27.09	2,290	41
Total	275,150					55%	208,010					44%

"I" Well (not in use)							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	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	0	0.00	0.00	1,973	0	43,501	1,403	1,900.82	25.99	2,333	81
February	0	0	0.00	0.00	1,973	0	43,184	1,542	1,900.86	26.37	2,333	81
March	0	0	0.00	0.00	1,973	0	48,947	1,579	1,901.06	25.67	2,333	81
April	0	0	0.00	0.00	1,973	0	42,233	1,408	1,900.84	25.79	2,333	81
May	0	0	0.00	0.00	1,973	0	53,416	1,723	1,900.85	25.60	2,333	81
June	0	0	0.00	0.00	1,973	0	45,489	1,516	1,901.88	25.89	2,333	82
July	0	0	0.00	0.00	1,973	0	57,873	1,867	1,901.88	25.25	2,333	82
August	0	0	0.00	0.00	1,973	0	51,962	1,676	1,901.88	25.07	2,333	82
September	0	0	0.00	0.00	1,973	0	48,484	1,616	1,901.88	25.71	2,333	82
October	0	0	0.00	0.00	1,973	0	47,942	1,547	1,901.88	26.29	2,333	82
November	0	0	0.00	0.00	1,973	0	38,899	1,297	1,901.63	25.77	2,333	82
December	0	0	0.00	0.00	1,973	0	36,322	1,172	1,901.88	25.68	2,333	82
Total	0					0%	558,252					82%

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	61,666	1,989	2,592.07	34.63	3,162	82
February	57,285	2,046	2,592.05	33.77	3,162	82
March	61,367	1,980	2,592.09	33.25	3,162	82
April	54,965	1,832	2,592.07	33.77	3,162	82
May	54,716	1,765	2,591.93	33.77	3,162	82
June	53,294	1,776	2,594.00	34.50	3,162	82
July	65,226	2,104	2,594.25	33.47	3,162	82
August	59,079	1,906	2,884.50	33.76	3,162	91
September	65,196	2,173	2,594.25	33.66	3,162	82
October	57,805	1,865	2,594.00	34.89	3,162	82
November	53,288	1,776	2,627.88	33.61	3,162	83
December	65,746	2,121	2,594.13	33.45	3,162	82
Total	709,633					83%

Table 17 - Annual Flow Summary (Capreol Wells)

"J" Well							"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	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	28,846	931	2,178.24	30.50	3,273	67	31,495	1,016	2,248.69	35.17	3,927	57
February	26,744	955	2,226.33	28.56	3,273	68	27,664	988	2,253.78	36.58	3,927	57
March	29,808	962	2,163.33	31.71	3,273	66	28,457	918	2,144.43	31.81	3,927	55
April	31,632	1,054	2,197.26	29.19	3,273	67	23,991	800	2,396.58	34.27	3,927	61
May	16,820	543	2,134.86	28.50	3,273	65	41,126	1,327	2,240.81	31.40	3,927	57
June	36,393	1,213	2,090.60	30.42	3,273	64	23,930	798	2,406.47	44.85	3,927	61
July	9,209	297	2,039.77	27.49	3,273	62	21,641	698	2,079.74	35.75	3,927	53
August	14,788	477	2,024.65	27.40	3,273	62	17,050	550	2,034.23	33.77	3,927	52
September	8,457	282	2,037.06	27.79	3,273	62	13,737	458	1,942.22	31.33	3,927	49
October	26,740	863	1,963.41	28.90	3,273	60	29,276	944	1,987.03	30.46	3,927	51
November	24,783	826	2,112.26	30.65	3,273	65	21,496	717	1,937.50	30.21	3,927	49
December	30,567	986	2,045.44	27.87	3,273	62	12,177	393	2,062.82	31.23	3,927	53
Total	284,787					64%	292,040					55%

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.

Completed projects in 2015 and the associated approximate costs included: Falconbridge tank pillar rehabilitation, (\$40,000); Falconbridge tank safety inspections and Health & Safety upgrades, (\$25,000).

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 the 2015 reportable period.

Table 18 - Falconbridge Wells

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

2015 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
125454	2015/08/04	Fluoride	1.64	mg/L	Resample/Re-test	2015/08/04
127195	2015/11/02	Fluoride	2.0	mg/L	Resample/Re-test	2015/11/02
127275	2015/11/06	Sodium	25.3	mg/L	Resample/Re-test	2015/11/17

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						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	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	610	20	385.65	15.78	1,417	27	12,928	417	917.73	14.89	1,417	65
February	10,615	379	980.72	16.58	1,417	69	10,185	364	1,001.08	14.88	1,417	71
March	11,348	366	993.77	16.46	1,417	70	10,728	346	1,021.49	14.77	1,417	72
April	5,842	195	963.58	16.55	1,417	68	8,494	283	980.10	14.86	1,417	69
May	7,432	240	888.19	15.53	1,417	63	7,211	233	859.62	15.03	1,417	61
June	8,971	299	886.11	16.13	1,417	63	6,498	217	851.41	15.05	1,417	60
July	6,470	209	846.48	16.27	1,417	60	8,027	259	898.43	15.09	1,417	63
August	7,873	254	836.09	15.85	1,417	59	8,545	276	891.46	14.86	1,417	63
September	8,795	293	839.21	15.86	1,417	59	5,781	193	970.25	14.97	1,417	68
October	7,772	251	810.50	16.07	1,417	57	5,450	176	759.03	14.79	1,417	54
November	7,184	239	809.12	16.05	1,417	57	9,144	305	875.99	14.88	1,417	62
December	4,865	157	751.03	15.90	1,417	53	5,379	174	801.19	14.88	1,417	57
Total	87,777					59%	98,370					64%

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	13,017	420	952.98	15.30	1,417	67
February	5,468	195	999.16	15.36	1,417	71
March	7,665	247	1,040.71	15.19	1,417	73
April	12,149	405	1,028.33	15.18	1,417	73
May	12,005	387	917.25	15.25	1,417	65
June	8,198	273	876.36	15.31	1,417	62
July	9,407	303	905.88	15.21	1,417	64
August	6,800	219	891.02	15.32	1,417	63
September	8,957	299	860.45	15.24	1,417	61
October	8,692	280	781.63	15.29	1,417	55
November	5,339	178	818.98	15.26	1,417	58
December	13,291	429	837.63	15.51	1,417	59
Total	110,988					64%

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 2015 and the associated approximate costs included: Onaping storage tank inspection, (\$7,500)

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 2015 reportable period.

Table 21 – Onaping/Levack Wells

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

2015 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
126005	2015/08/28	Fluoride	1.50	mg/L	Resample/Re-test	2015/08/28
126011	2015/08/28	Fluoride	1.50	mg/L	Resample/Re-test	2015/08/28
127499	2015/11/24	Sodium	65.7	mg/L	Resample/Re-test	2015/11/27
127886	2015/12/31	Fluoride	1.58	mg/L	Resample/Re-test	2015/12/31

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 2015 reportable period.

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

	Onaping Well #3						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	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	33,820	1,091	2490.64	30.58	5,184	48	16,468	531	2222.13	27.41	5,184	43
February	16,347	584	2405.99	30.19	5,184	46	13,443	480	2131.68	27.31	5,184	41
March	10,949	353	1949.60	30.19	5,184	38	10,808	349	2224.11	27.05	5,184	43
April	28,622	954	2395.60	30.19	5,184	46	24,144	805	2243.97	27.10	5,184	43
May	20,255	653	2408.90	30.19	5,184	46	15,102	487	2166.62	28.31	5,184	42
June	17,983	599	2428.14	30.19	5,184	47	14,760	492	2234.81	27.24	5,184	43
July	41,657	1,344	2427.17	30.19	5,184	47	21,108	681	2110.71	27.07	5,184	41
August	37,126	1,198	2402.44	30.19	5,184	46	12,743	411	2186.92	26.97	5,184	42
September	36,794	1,226	2430.78	30.38	5,184	47	32,020	1,067	2209.06	27.03	5,184	43
October	33,249	1,073	2454.43	29.94	5,184	47	20,867	673	2066.85	27.58	5,184	40
November	15,111	504	1896.68	30.04	5,184	37	8,109	270	1755.60	27.12	5,184	34
December	22,057	712	2058.00	30.20	5,184	40	1,768	57	532.61	27.56	5,184	10
Total	313,970					45%	191,340					39%

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	49,814	1,607	3590.82	59.36	5,184	69
February	70,296	2,511	3900.23	57.26	5,184	75
March	100,791	3,251	4561.13	60.52	5,184	88
April	70,856	2,362	4571.44	60.05	5,184	88
May	88,494	2,855	4385.92	60.82	5,184	85
June	78,159	2,605	4385.76	58.97	5,184	85
July	51,068	1,647	4387.94	59.71	5,184	85
August	56,396	1,819	4388.06	59.85	5,184	85
September	50,581	1,686	4384.46	58.10	5,184	85
October	56,891	1,835	4821.24	61.02	5,184	93
November	28,032	934	2089.13	58.28	5,184	40
December	24,417	788	1792.29	54.94	5,184	35
Total	725,795					76%

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.

Completed projects in 2015 and the associated approximate costs included: Walden tank safety inspection and Health & Safety upgrades, (\$7,000).

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 2015 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

2015 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