Ontario

Ministry of the Environment

POWASSAN DRINKING WATER SYSTEM

Drinking Water System Inspection Report

DWS Number:	220000576
Inspection Number:	1-9ZXTA
Date of Inspection:	Feb 12, 2013
Inspected By:	Cameron Adams

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OWNER INFORMATION:

Company Name:	POWASSAN, THE CORPORATION OF THE MUNICIPALITY OF		
Street Number:	466	**Unit Identifier:**	
Street Name:	MAIN St		
City:	POWASSAN		
Province:	ON	**Postal Code:**	P0H 1Z0

CONTACT INFORMATION

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Title:	Clerk-Treasurer		

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Title:	Formen - Public Works		

Type:	Owner	**Name:**	Scott Toebes
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Title:	Asssistant - Public Works		

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CONTACT INFORMATION

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Title:	Supervisor - Timmins / North Bay - SDWB		

INSPECTION DETAILS:

DWS Name:	POWASSAN DRINKING WATER SYSTEM
DWS Address:	POWASSAN
County/District:	Powassan
MOE District/Area Office:	North Bay Area Office
Health Unit:	NORTH BAY PARRY SOUND DISTRICT HEALTH UNIT
Conservation Authority	North Bay Mattawa Conservation Authority
MNR Office:	North Bay Regional Office
DWS Category:	Large Municipal Residential
DWS Number:	220000576
Inspection Type:	Unannounced
Inspection Number:	1-9ZXTA
Date of Inspection:	Feb 12, 2013
Date of Previous Inspection:	Sep 21, 2011

DRINKING WATER SYSTEM COMPONENTS DESCRIPTION

Site (Name):	MOE DWS Mapping		
Type:	DWS Mapping Point	**Sub Type:**	
Comments:			
Not Applicable			

Site (Name):	Well #1 (Raw Water)		
Type:	Source	**Sub Type:**	Ground

Comments:

Well # 1 is a drilled well 23.2 m deep with 3.8 m of screen. The well is equipped with a 19 kW (25 hp) submersible pump with a rated capacity of 15.2 L/second at a total dynamic head of 92.2m.

Site (Name): Well #2 (Raw Water)
Type: Source **Sub Type:** Ground
Comments:

Well # 2 is a drilled well 18.6 m deep with 7.6 m of screen. The well is equipped with a 22.5 kW (30Hp) submersible pump rated at 15.2 L/second at a total dynamic head of 92 m.

The well is located within the Genesee Creek flood plain.

Site (Name): Treated Water
Type: Treated Water POE **Sub Type:** Pumphouse
Comments:

The treatment process at the Powassan Drinking Water System is comprised of primary and secondary disinfection using 12% sodium hypochlorite. A 49 m length of 600 mm serpentine pipe has been installed below grade at the pump house to provide the minimum 15 minutes of contact time before the first consumer. The system is equipped with flow meters, metering pumps, chemical solution tanks with spill containment, as well as a standby diesel generator set for backup power supply.

Site (Name): In-Ground Resevoir
Type: Other **Sub Type:** Reservoir
Comments:

A new 1278 cubic metre dual-celled in-ground reservoir was brought on line in April 2009. The reservoir is located at the end of McRae Drive and has an operating high water level of 310 m. The facility has a prefabricated re-chlorination building located on top of an in-ground valve chamber. The demolition of the previously existing 900 cubic metre standpipe was completed in 2009. An eight kW natural gas generator was installed at the site in 2010 to supply backup power for the reservoir level monitoring and re-chlorination equipment.

Site (Name): Distribution
Type: Other **Sub Type:** Other
Comments:

The distribution system services an approximate population of 1071 connected residents. The First Engineer's Report estimated the distribution system at approximately 9.2 km. The system was comprised of asbestos concrete, polyvinyl chloride and cast iron piping in 100 mm, 150 mm and 200 mm diameters. In 2008, the municipality installed or replaced watermains on Clark St, Joseph St, Chisholm St, Edward St, South St, and a portion along Big Bend Ave. All replaced and new watermains are 250 mm polyvinyl chloride and have been brought into service.

INSPECTION SUMMARY

INTRODUCTION

* **The primary focus of this inspection is to confirm compliance with Ministry of the Environment legislation and control documents, as well as conformance with Ministry drinking water related policies for the inspection period. The Ministry is implementing a rigorous and comprehensive approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as water system management practices.**

This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O.Reg.170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.

Ministry of Environment Drinking Water Inspector Cameron Adams completed the physical inspection of the Powassan Drinking Water System on Tuesday February 12, 2013 and Wednesday February 13, 2013. The review and inspection of the well supply and the associated distribution system was conducted with the assistance of Maureen Lang, Municipal Clerk-Treasurer, Frank Young, Municipal Public Works Foreman, Scott Toebes, Municipal Public Works Assistant, Natalie Wagar, OCWA Process Compliance Technician, and John Hemingway, OCWA Operator.

The inspection included a tour and physical review of the components of the Drinking Water System and a review of the system documents for the period from the last inspection completed September 21, 2011 to the date of the current inspection.

Specifically, this included a review and assessment of operating practices in relation to the following documents:

•Legislation in effect during the inspection period.

•Municipal Drinking Water Licence # 266-101 Issue #1 issued May 25, 2011

•Drinking Water Works Permit # 266-201 Issue #1 issued May 19, 2011

•Permit to Take Water # 82-P-5292 issued June 6, 2002

•Permit to Take Water # 7346-8VFJKR issued June 21, 2012

SOURCE

* **The drinking water system management was aware of the potential sources of pollution or activities that could impair source water quality as contained in the approved Assessment Report.**

  The drinking water system is located within the of the source protection area covered by the North Bay-Mattawa Conservation Authority.

* **The owner was maintaining the production well(s) in a manner sufficient to prevent entry into the well of surface water and other foreign materials.**

* **Measures were in place to protect the groundwater and/or GUDI source in accordance with a Permit and Licence or Approval issued under Part V of the SDWA.**

PERMIT TO TAKE WATER

PERMIT TO TAKE WATER

* **The owner had a valid PTTW for all of the production sources.**

  Permits to Take Water 82-P-5292 issued June 6, 2002 and Permit to Take Water 7346-8VFJKR issued June 21, 2012 were in effect during inspection period.

* **The maximum water takings were in accordance with those allowed under the PTTW.**

  The Permit to Take Water allows a maximum combined water taking of 1313 cubic metres per day. The maximum recorded water taking during the inspection period was 1021 cubic metres on December 25, 2012.

CAPACITY ASSESSMENT

* **There was sufficient monitoring of flow as required by the Permit and Licence or Approval issued under Part V of the SDWA**

  Flow meters are in place to monitor the flow from each well. Total plant flow to the distribution system is calculated as the sum of the production from both wells.

  Well # 2 was not being used as a production well from early August, 2012 to the date of this inspection due to operational concerns related to damage to the systems Process Logic Controller (PLC) from an August 2012 storm event.

* **Flow measuring devices were not calibrated or verified in accordance with the requirements of a Permit and Licence or Approval issued under Part V of the SDWA.**

  The system's Municipal Drinking Water Licence # 266-101 Issue #1 issued May 25, 2011, Schedule C, Section 3.2 states that If the manufacturer's instructions do not indicate how often to check and calibrate a flow measuring device, the equipment must be checked and calibrated at least once every year during which the drinking water system is in operation.

  The system flow meters were last calibrated on November 1, 2011, a period of 15 months to the date of this inspection.

  It is also of note that this is a repeat non-compliance, as the prior calibration of the flow meters was a period of 14 and one half months after the previous August 17, 2010 calibrations. This represents two consecutive terms exceeding the regulated one year interval.

  The inspecting officer received documentation before the release of this inspection report indicating the flow meters were calibrated on February 26, 2013.

  Failure to ensure flow meters are checked and calibrated at least once every year as stated in the Licence constitutes a violation of Section 140 (1) (5) for the Safe Drinking Water Act, 2002.

  Please refer to item # 1 of the Non-Compliance with Regulatory Requirements and Actions Required section of this report for further direction related to this item.

* **The owner was in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the Permit and Licence or Approval issued under Part V of the SDWA.**

  The Municipal Drinking Water Licence and Permit to Take Water allow a maximum combined water taking of 1313 cubic metres per day. The maximum recorded water taking during the inspection period was 1021 cubic metres on December 25, 2012.

* **Records of flows and any capacity exceedances were made in accordance with the Permit and Licence or Approval issued under Part V of the SDWA.**

  Daily flow is recorded by the Supervisory Control and Data Collection System (SCADA) on a 24 hour basis. There was no record of an exceedance of the facilities rated capacity within the inspection period.

TREATMENT PROCESSES

TREATMENT PROCESSES

* **The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit.**

  A review of the equipment requirements of the Drinking Water Works Permit and was completed by way of a walk through the plant following the water processes. All equipment specified was present at the time of the inspection.

  However, at the time of the inspection, Well # 2 was not being used. The flow transmitter equipment linking the Well #2 flow meter to the PLC panel had not been repaired since it was damaged during the August 2012 storm event.

  Also, the control and monitoring module for the backup power supply that was damaged in the August storm event had not repaired as of the date of this inspection.

  This latter item has resulted in the loss or automated backup of the line hydro source for the well supply. Also, it leaves the unit at risk if manual operation is required due to the loss of the associated protection of the control functions. These functions are designed to automatically shut the generator down in case of events that could lead to damage of the unit.

* **The owner/operating authority was in compliance with the requirement to prepare Form 2 documents as required by their Drinking Water Works Permit during the inspection period.**

* **Records did not indicate that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a Permit, Licence or Approval issued under Part V of the SDWA at all times that water was being supplied to consumers.**

  Schedule 1-3. of O. Reg. 170/03 requires the owner of a drinking water system that obtains water from a raw water supply that is ground water shall ensure provision of water treatment equipment that is designed to be capable of achieving, at all times, primary disinfection in accordance with the Ministry's Procedure for Disinfection of Drinking Water in Ontario, including at least 99 per cent removal or inactivation of viruses by the time the water enters the distribution system.

  Additionally, the operating authorities Chlorination Contact Time Standard Operating Procedure designates that Primary Disinfection requires a minimum free chlorine residual of 0.45 mg/L at the end of the 49 metre, 600millimetre diameter serpentine contact pipe which discharges directly into the distribution.

  A review of the circumstances related to an adverse water quality incident reported for December 23, 2012 indicated that water not having met primary disinfection was passed on to the distribution and system users for approximately 64 minutes. Further, the review of another adverse water quality incident reported for December 25, 2012 indicated that water having not met primary disinfection was passed on to the distribution and system users system users for 24 minutes.

  Failure to ensure that all water passed on to the distribution system has met primary disinfection in accordance with the Ministry's Procedure for Disinfection of Drinking Water in Ontario constitutes a violation of Schedule 1-3. of O. Reg. 170/03.

  Please refer to item # 2 of the Non-Compliance with Regulatory Requirements and Actions Required section of this report for further direction related to this item.

* **Records confirmed that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/l free or 0.25 mg/l combined.**

  The records for testing that was completed within the distribution indicated that free chlorine residuals were above 0.05 mg/L.

TREATMENT PROCESSES

* **The owner had evidence indicating that all chemicals and materials that come in contact with water within the drinking water system met the AWWA and ANSI standards in accordance with the Permit and Licence issued under Part V of the SDWA.**

* **Up-to-date plans for the drinking-water system were available in accordance with the Permit and Licence issued under Part V of the SDWA.**

  However, there was no copy of the distribution layout located at the pumphouse at the time of the two previously mentioned adverse water quality events,

* **The facility and equipment did not appear to be maintained or in a fit state of repair.**

  Section 11(1)(ii) of the Safe Drinking Water Act states that every owner and operating authority shall ensure that at all times the drinking water system is maintained in a fit state of repair.

  A review of the equipment requirements of the Works Permit indicated that all equipment specified was present at the time of the inspection.

  However, at the time of the inspection, Well # 2 was not being used. The flow transmitter equipment linking the Well # 2 flow meter to the PLC panel had not been repaired since it was damaged during the August 2012 storm event. Shortly after the inspection the repair of the flow transmitter was completed. However, the use of Well # 2 was suspended pending resolution of erroneous system operation errors that were observed when it was in use.

  The control and monitoring module for the backup power supply that was damaged in the August storm event had not been repaired as of the date of this inspection.

  This latter item has resulted in the loss of automated backup of the line hydro source for the well supply. Also, it leaves the unit at risk if manual operation is required due to the loss of the associated protection of the control functions. Shortly after the inspection the inspecting officer was advised that the operating authority was making arrangements to have the equipment repaired.

  It was also noted from the review of inspection data that the values reported on the Monthly Process Data Report for raw and treated water average peak flows are either indicating erroneous average peak flow data or ongoing average peak flow exceedances.

  Failure to ensure that all the equipment is maintained in a fit state of repair constitutes a violation of Section 11(1)(ii) of the Safe Drinking Water Act.

  Please refer to item # 3 of the Non-Compliance with Regulatory Requirements and Actions Required section of this report for further direction related to this item.

* **The Operator-in-Charge had ensured that all equipment used in the processes was monitored, inspected, and evaluated.**

  This is facilitated by way of the process data collection rounds that are completed as part of the plant attendance protocols.

* **Based on information provided by the owner/operator, it was not likely that contaminants entering the floor drains would have come in contact with the source water or treated water.**

  Floor drains and analyser waste streams are directed to an engineered Soak Away Pit located outside the pumphouse.

* **Measures were taken to ensure that pesticides were not applied, stored, or mixed in the immediate vicinity of source(s), treatment, and storage facilities.**

TREATMENT PROCESS MONITORING

TREATMENT PROCESS MONITORING

* **Primary disinfection chlorine monitoring was being conducted at a location approved by Permit, Licence or Approval issued under Part V of the SDWA, or at/near a location where the intended CT had just been achieved.**

  The samples to confirm compliance with primary disinfection are taken from the treated water line in the pumphouse. This sample stream is collected from the end of the 49 metre, 600 mm diameter, chlorine contact piping.

* **Operators were not aware of the operational criteria necessary to achieve primary disinfection within the drinking water system.**

  As noted earlier in this report, a review of the circumstances related to an adverse water quality incident reported for December 23, 2012 indicated that water not having met primary disinfection, by having a free chlorine residual below 0.45 mg/L, was passed on to the distribution and system users for approximately 64 minutes. Further, the review of another adverse water quality incident reported for December 25, 2012 indicated that water having not met primary disinfection was passed on to the distribution and system users system users for approximately 24 minutes.

  In both of the cases the Operator in Training who responded to the alarms was incorrectly of the opinion that the pumphouse discharge was passed directly to the systems in-ground reservoir prior to distribution to users. The Operator in Training had phoned the Operator acting as the Operator in Charge for the facility and reviewed his findings on his arrival at the facility and his planned corrective actions. There was no record presented that indicated the Operator in Charge corrected the Operator in Training error in indicating that water was directed to the in-ground reservoir prior to being directed to users.

  Please refer to item # 1 of the Summary of Best Practices issues and Recommendations section of this report for further direction related to this item.

* **The secondary disinfectant residual was measured as required for the distribution system.**

  A review of the records indicated the required monitoring of the distribution free chlorine residuals was complied with by the collection of four samples on one day of the week and three samples being taken at least 48 hours after the first sampling. The lowest recorded residual in the distribution for the grab sampling completed to meet this legislated monitoring was 0.25 mg/L on April 10, 2012.

* **Records confirmed that the maximum free chlorine residual in the distribution system was less than 4.0 mg/L or that the combined chlorine residual was less than 3.0 mg/L.**

* **Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test.**

  However, the on-site review of the continuous trending data was not available to the operators from the August 3, 2012 storm event until August 14, 2012. During this period the well supply was being operated in hand pending completion of repairs to the automated control infrastructure.

* **Samples for chlorine residual analysis were tested using an acceptable portable device.**

  A Hach Pocket Colorimeter II is used for the required monitoring.

* **All continuous monitoring equipment utilized for sampling and testing required by O. Reg. 170/03, or approval or order, were equipped with alarms or shut-off mechanisms that satisfied the standards described in Schedule 6.**

  However, the Process Logic Controller's automatic well pump shutoff function was determined to have been in the disabled setting for the period of the two previously noted adverse water quality incidents that resulted in improperly disinfected water being passed to users.

TREATMENT PROCESS MONITORING

* **Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format.**

* **All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.**

  This was confirmed by a review of the work orders which were on record for the facility.

DISTRIBUTION SYSTEM

* **The owner had up-to-date documents describing the distribution components as required.**

  A current sketch is in place and AutoCAD drawings are being produced.

* **There is a backflow prevention program, policy and/or bylaw in place.**

  Backflow prevention devices are in place at identified high hazard locations.

* **The owner had a program or maintained a schedule for routine cleanout, inspection and maintenance of reservoirs and elevated storage tanks within the distribution system.**

  The facilities in-ground reservoir was commission in 2009. The owner is planning on setting up a five year inspection cycle schedule.

* **Existing parts of the distribution system that were taken out of service for inspection, repair or other activities that may lead to contamination, and all new parts of the distribution system that came in contact with drinking water, were disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit.**

* **The owner had implemented a program for the flushing of watermains as per industry standards.**

* **Records confirmed that disinfectant residuals were routinely checked at the extremities and "dead ends" of the distribution system.**

* **A program was in place for inspecting and exercising valves.**

  This is conducted as part of the flushing activities noted above. It is of note that 17 of the system valves were identified as having deficiencies.

* **There was a program in place for inspecting and operating hydrants.**

  This is also conducted as part of the flushing activities noted above. It is of note that four of the system hydrants valves were identified as having deficiencies.

* **There was a by-law or policy in place limiting access to hydrants.**

  Only authorized persons have access to hydrants.

DISTRIBUTION SYSTEM

* **The owner has undertaken efforts to identify, quantify and reduce sources of apparent water loss.**

  The community recently installed residential flow meters and plan to investigate the potential of having a water loss survey conducted by industry specialists.

* **The distribution system pressure was monitored to alert the operator of conditions which may have lead to loss of pressure below the value under which the system is designed to operate.**

  This is also conducted as part of the flushing activities noted above. Also system pressure is monitored at the pumphouse.

* **Based on the records available the owner was able to maintain proper pressures in the distribution system.**

OPERATIONS MANUALS

* **Operators and maintenance personnel did not have ready access to operations and maintenance manuals.**

  Section 28 of O. Reg. 128/04 states that the owner or operating authority of a subsystem shall ensure that operators and maintenance personnel in the subsystem have ready access to comprehensive operations and maintenance manuals that contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the subsystem.

  The review of the December 23, 2012 adverse water quality incident indicated that the Standard Operating Procedures manual for the facility was not available for the Operator to review as it had been removed from the pumphouse at some time prior to the event. Documentation on the layout of the distribution system was also not readily available.

  Failure to ensure that all operators and maintenance personnel working in the subsystem have ready access to comprehensive operations and maintenance manuals that contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the subsystem constitutes a violation of O.Reg. 128/04.

  Please refer to item # 4 of the Non-Compliance with Regulatory Requirements and Actions Required section of this report for further direction related to this item.

* **The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.**

* **The operations and maintenance manuals did meet the requirements of the Permit and Licence or Approval issued under Part V of the SDWA.**

LOGBOOKS

* **Logs for the drinking water subsystem(s) contained the required information.**

  Shortly after the inspection the owner put a legal logbook with numbered pages in place for the distribution subsystem.

* **Logbook entries were made in chronological order.**

LOGBOOKS

* The record system allowed the reader to unambiguously identify the person who made the logbook entry.

* Entries in the logbook were made only by appropriate and authorized personnel.

* Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.

* For every required operational test and every required sample, a record was made of the date, time, location, name of the person conducting the test and result of the test.

* The operator-in-charge ensured that records were maintained of all adjustments made to the processes within his or her responsibility.

* Logs or other record keeping mechanisms were available for at least five (5) years.

CONTINGENCY/EMERGENCY PLANNING

* Spill containment was provided for process chemicals and/or standby power generator fuel.

* Clean-up equipment and materials were in place for the clean up of spills.

* Standby power generators were tested under normal load conditions.

SECURITY

* All storage facilities were completely covered and secure.

* Air vents and overflows associated with reservoirs and elevated storage structures were equipped with screens.

* The owner had provided security measures to protect components of the drinking-water system.

CONSUMER RELATIONS

* Water conservation was being practiced by the owner or operating authority.

  Water metering is now also in place.

CONSUMER RELATIONS

* **Required documents were available free-of-charge during normal business hours at a location accessible to the public.**

* **The owner did take effective steps to advise users of the water system of the availability of Annual Reports, including posting a copy on a web site, if applicable.**

  Notices are included in the water bills and the report is available on the web site.

CERTIFICATION AND TRAINING

* **The overall responsible operator had been designated for each subsystem.**

  Don Michaud has been designated as the overall responsible operator for the well supply subsystem and Frank Young has been designated as the overall responsible operator for the distribution subsystem.

* **Operators in charge had been designated for all subsystems which comprised the drinking-water system.**

* **All activities that were undertaken by uncertified persons in the DW subsystems were overseen by persons having the prescribed qualifications.**

* **All operators possessed the required certification.**

* **Only certified operators made adjustments to the treatment equipment.**

* **Operator certificates or water quality analyst certificates were displayed in a conspicuous location at the workplace or at the premises from which the subsystem was managed.**

* **The subsystem had been replaced or altered, since the issuance of the existing subsystem certificate of classification and the owner applied for the re-determination of the type and class of the subsystem or had determined that the alteration(s) was not sufficient to trigger an application.**

  A redetermination was completed shortly after the in-ground reservoir was commissioned in 2009 and it was determined that the distribution subsystem would remain designated as a class I distribution subsystem.

* **The classification certificates of the subsystems were conspicuously displayed at the workplace or at premises from which the subsystem was managed.**

* **An adequately licenced operator was designated to act in place of the overall responsible operator when the overall responsible operator was unable to act.**

  Gerry Duguay is designated as the backup overall responsible operator for the treatment subsystem and Scott Toebes is designated as the backup overall responsible operator for the distribution subsystem.

CERTIFICATION AND TRAINING

* **The owner/operating authority was aware of the operator training and record keeping requirements, and they were taking reasonable steps to ensure that all operators receive the required training.**

WATER QUALITY MONITORING

* **All microbiological water quality monitoring requirements for raw water samples were not being met.**

  Schedule 10-4. (1) of O. Reg. 170/03 requires the owner of a drinking water system and the operating authority for the system shall ensure that a water sample is taken at least once every week from the drinking water system's raw water, before any treatment is applied to the water.

  (2) If the drinking water system obtains water from a raw water supply that is ground water, or is deemed under section 2 to obtain water from a raw water supply that is surface water, the owner of the system and the operating authority for the system shall ensure that a sample is taken under subsection (1) from each well in the system.

  (3) The owner of the drinking water system and the operating authority for the system shall ensure that each of the samples taken under subsection (1) is tested for,

  (a) Escherichia coli; and

  (b) Total Coliforms.

  A review of the sampling data for the inspection period indicated that Well # 2 raw water was not sampled for the week of October 11, 2011.

  Failure to collect a raw water microbiological sample from each well at least once each week constitutes a violation of O. Reg. 170/03.

  Please refer to item # 5 of the Non-Compliance with Regulatory Requirements and Actions Required section of this report for further direction related to this item.

* **All microbiological water quality monitoring requirements for distribution samples were being met.**

  The population served by the drinking water system is estimated at 1071. A total of nine distribution samples must be collected and tested each month for this population. A review of the distribution microbiological sampling shows that this requirement has been satisfied within the inspection period.

* **All microbiological water quality monitoring requirements for treated samples were being met.**

  A review of the treated water microbiological sampling shows that one treated water sample is being collected and tested per week as required by O.Reg.170/03 Schedule 10-3

* **All inorganic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

  O. Reg. 170/03 Schedule 13-2 requires inorganic sampling and testing every three years for the community's well supply. A review of the inorganic water sampling history shows that samples were collected and tested on February 15, 2012. This demonstrates compliance with the regulatory requirements.

* **All organic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

  O. Reg. 170/03 Schedule 13-4 requires organic sampling and testing every three years for the community's well supply. A review of the organic water sampling history shows that samples were collected and tested on February 15, 2012. This demonstrates compliance with the regulatory requirements.

WATER QUALITY MONITORING

* **All trihalomethanes water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

  O. Reg. 170/03 Schedule 13-6(2) requires trihalomethanes sampling and testing every three months for the drinking water system. A review of the trihalomethanes sampling history shows that samples were collected and tested on October 11, 2011, February 15, 2012, May 28, 2012, September 10, 2012 and December 19, 2012 during the inspection period. This demonstrates compliance with the regulatory requirements. The running four quarter average for total trihalomethanes was 3.3 micrograms per litre after the December 19, 2012 sampling.

* **Trihalomethane samples were being collected from a point in the distribution system or connected plumbing system that was likely to have an elevated potential for the formation of trihalomethanes.**

* **All nitrate/nitrite water quality monitoring requirements prescribed by legislation were conducted within the required frequency for the DWS.**

  O. Reg. 170/03 Schedule 13-7 requires nitrite and nitrate sampling and testing every three months for the drinking water system. Nitrate and nitrite sampling and testing was completed at the same time as the trihalomethanes sampling noted above. Similarly, this demonstrates compliance with the regulatory requirements for nitrate/nitrite sampling.

* **All sodium water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

  O. Reg. 170/03 Schedule 13-8 requires sodium sampling and testing every 60 months for the drinking water system. A review of the sodium sampling history shows that samples were last collected and tested on February 15, 2012. This demonstrates compliance with the regulatory sampling requirements.

* **All fluoride water quality monitoring requirements prescribed by legislation were conducted within the required frequency.**

  As fluoridation is not practiced at Powassan, O. Reg. 170/03 Schedule 13-9 requires fluoride sampling and testing for fluoride every 60 months. A review of the fluoride water sampling history shows that samples were collected and tested on February 18, 2009. This demonstrates compliance with the regulatory requirements.

* **The owner ensured that water samples were taken at the prescribed location.**

* **Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.**

* **Turbidity was not being tested at least once every month from each well that is supplying water to the system.**

  Schedule 7-3 (1.1) of O. Reg. 17/03 requires the owner of a drinking water system and the operating authority for the system shall ensure that a water sample is taken at least once every month, from a location that is before raw water enters the treatment system, and is tested for turbidity. And that if the drinking water system obtains water from a raw water supply that is ground water, the owner of the system and the operating authority for the system shall ensure that a sample is taken under subsection (1) from each well that is supplying water to the system.

WATER QUALITY MONITORING

A review of the facilities Monthly Data Summary Sheets for the facility did not indicate that raw water sampling and testing was completed for the months of January, August and September 2012.

Failure to ensure that one raw water sample from each well is collected and tested for turbidity each month constitutes a violation of O. Reg. 170/03.

Please refer to item # 6 of the Non-Compliance with Regulatory Requirements and Actions Required section of this report for further direction related to this item.

* **The drinking water system owner had submitted written notices to the Director that identified the laboratories that were conducting tests for parameters required by legislation, Order Certificate of Approval (OWRA) or a Permit, Licence or Approval issued under Part V of the SDWA.**

* **Based on information provided by the owner/operator, samples were being taken and handled in accordance with instructions provided by the drinking-water system's laboratories.**

* **The owner indicated that the required records are kept and will be kept for the required time period.**

WATER QUALITY ASSESSMENT

* **The audit samples collected by the inspector met the applicable Ontario Drinking Water Quality Standards and/or the aesthetic objectives or operation guidelines. The results of the audit sampling are summarized as follows:**

Samples of the distribution water were collected during the inspection for chlorine residual and microbiological analysis. The analytical results for these samples are included in the appendices of this report.

* **Records show that all water sample results taken during the review period met the Ontario Drinking Water Quality Standards (O. Reg. 169/03).**

REPORTING & CORRECTIVE ACTIONS

* **All specified corrective actions (as per Schedule 17) were not taken to address adverse conditions.**

Schedule 17-2 of O. Reg. 170/03 states that if a report is required to be made under section 16-4 of Schedule 16 in respect of water that has not been properly disinfected, the owner of the drinking water system and the operating authority for the system shall ensure that the following corrective action is taken:

1. Immediately restore the proper disinfection.
2. Take such other steps as are directed by the medical officer of health.

As noted earlier in this report, a review of the circumstances related to an adverse water quality incident reported for December 23, 2012 indicated that water not having met primary disinfection, by having a free chlorine residual below 0.45 mg/L, was passed on to the distribution and system users for approximately 64 minutes. Further, the review of another adverse water quality incident reported for December 25, 2012 indicated that water having not met primary disinfection was passed on to the distribution and system users system users for approximately 24 minutes.

In both of the cases the Operator in Training who responded to the alarms was incorrectly of the opinion that the pumphouse discharge was passed directly to the systems in-ground reservoir prior

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to distribution to users. The Operator in Training had phoned the Operator acting as the Operator in Charge for the facility and reviewed his findings on his arrival at the facility and his planned corrective actions. There was no record presented that indicated the Operator in Charge corrected the Operator in Training's error in indicating that water was directed to the in-ground reservoir prior to being directed to users.

Based on an incorrect understanding of the distribution system layout the Operator in Training indicated that he had reported to the Ministry's Spills Action Centre and the Medical Officer of Health's representative that he had flushed back to waste the improperly disinfected water and that no improperly disinfected water had been passed on to the system users. He also noted that one other water main located close to the pumphouse fed water directly to a school which was closed at the time for the Christmas vacation.Based on this information the Medical Officer of Health's representative required actions were to collect two sets of microbiological samples separated 24 to 48 hours apart and report back.

On January 11, 2012 the Ministry of Environment inspecting officer contacted the Manager of Environmental Health at the North Bay Parry Sound District Health Unit and reviewed the as-built lay out of the distribution system and the fact that a review of the two December 2012 incidents indicated that improperly disinfected not having met primary disinfection requirements had been passed on to users of the drinking water system.

In view of the potential serious consequences that may have resulted from the incorrect information given to the Health Unit at the time of the incidents, the Medical Officer of Health sent a letter to the system's operating authority. The letter, dated January 25, 2013, required the operating authority to acknowledge the error in reporting that improperly disinfected water was not passed to the system users for the December 23, 2012 and December 25, 2012 events.

Additionally the operating authority was directed that operational staff were to be trained on the layout of the facilities they operated and their associated distribution. The aim of this was to ensure operational staff would be able to correctly identify when improperly disinfected water was passed on to users of the system.

The response to the letter from the operating authority outlined a staff training plan. However the letter failed to correct the original verbal reporting error indicating that no improperly disinfected water was directed to the system users in both the December events.

Failure to undertake corrective actions in response to an adverse condition including any other steps as directed by the Medical Officer of Health constitutes a violation of O. Reg. 170/03.

Please refer to item # 7 of the Non-Compliance with Regulatory Requirements and Actions Required section of this

* **All required notifications of adverse water quality incidents were immediately provided as per O. Reg. 170/03 16-6.**

* **All required written notices of adverse water quality incidents were provided as per O. Reg. 170/03 16-7.**

* **In instances where written notice of issue resolution was required by regulation, the notice was provided as per O. Reg. 170/03 16-9.**

* **Where required continuous monitoring equipment used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person responded in a timely manner and took appropriate actions.**

REPORTING & CORRECTIVE ACTIONS

* **The Annual Report containing the required information was prepared by February 28th of the following year.**

* **Summary Reports for municipal council were completed on time, included the required content, and were distributed in accordance with the regulatory requirements.**

* **All changes to the system registration information were provided within ten (10) days of the change.**

NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED

This section provides a summary of all non-compliance with regulatory requirements identified during the inspection period, as well as actions required to address these issues. Further details pertaining to these items can be found in the body of the inspection report.

1. **Flow measuring devices were not calibrated or verified in accordance with the requirements of a Permit and Licence or Approval issued under Part V of the SDWA.**

   The systems Municipal Drinking Water Licence # 266-101 Issue #1 issued May 25, 2011, Schedule C, Section 3.2 states that If the manufacturer's instructions do not indicate how often to check and calibrate a flow measuring device, the equipment must be checked and calibrated at least once every year during which the drinking water system is in operation.

   The system flow meters were last calibrated on November 1, 2011, a period of 15 months to the date of this inspection.

   It is also of note that this is a repeat non-compliance, as the prior calibration of the flow meters was a period of 14 and one half months after the previous August 17, 2010 calibrations. This represents two consecutive terms exceeding the regulated one year interval.

   The inspecting officer received documentation before the release of this inspection report indicating the flow meters were calibrated on February 26, 2013.

   Failure to ensure flow meters are checked and calibrated at least once every year as stated in the Licence constitutes a violation of Section 140 (1) (5) for the Safe Drinking Water Act, 2002.

   Action(s) Required:

   1

   The operating authority shall put in place a procedure to ensure compliance with the required frequency of calibration of at least once every year for the systems flow meters.

   2

   The operating authority shall supply the inspecting officer a copy of the procedure and the means by which they will ensure the procedure is complied with on an ongoing basis.

2. **Records did not indicate that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a Permit, Licence or Approval issued under Part V of the SDWA at all times that water was being supplied to consumers.**

   Schedule 1-3. of O. Reg. 170/03 requires the owner of a drinking water system that obtains water from a raw water supply that is ground water shall ensure provision of water treatment equipment that is designed to be capable of achieving, at all times, primary disinfection in accordance with the Ministry's Procedure for Disinfection of Drinking Water in Ontario, including at least 99 per cent removal or inactivation of viruses by the time the water enters the distribution system.

   Additionally, the operating authorities Chlorination Contact Time Standard Operating Procedure designates that Primary Disinfection requires a minimum free chlorine residual of 0.45 mg/L at the end of the 49 metre, 600millimetre diameter serpentine contact pipe which discharges directly into the distribution.

   A review of the circumstances related to an adverse water quality incident reported for December 23, 2012 indicated that water not having met primary disinfection was passed on to the distribution and system users for approximately 64 minutes. Further, the review of another adverse water quality incident reported for December 25, 2012 indicated that water having not met primary disinfection was passed on to the distribution and system users system users for 24 minutes.

   Failure to ensure that all water passed on to the distribution system has met primary disinfection in accordance with the Ministry's Procedure for Disinfection of Drinking Water in Ontario constitutes a violation of Schedule 1-3. of O. Reg. 170/03.

   Action(s) Required:

   1

The operating authority shall ensure that all staff working at the facility are trained to ensure that they recognize that to meet the required primary disinfection that a minimum free chlorine residual of 0.45 mg/L is required at the end of the 49 metre, 600millimetre diameter serpentine contact pipe which discharges directly into the distribution system.

2

The operating authority shall supply the inspecting officer a notice of the completion of the training and a copy of the documentation used to present and support the training.

3. **The facility and equipment did not appear to be maintained or in a fit state of repair.**

Section 11(1)(ii) of the Safe Drinking Water Act states that every owner and operating authority shall ensure that at all times the drinking water system is maintained in a fit state of repair.

A review of the equipment requirements of the Works Permit indicated that all equipment specified was present at the time of the inspection.

However, at the time of the inspection, Well # 2 was not being used. The flow transmitter equipment linking the Well # 2 flow meter to the PLC panel had not been repaired since it was damaged during the August 2012 storm event. Shortly after the inspection the repair of the flow transmitter was completed. However, the use of Well # 2 was suspended pending resolution of erroneous system operation errors that were observed when it was in use.

The control and monitoring module for the backup power supply that was damaged in the August storm event had not been repaired as of the date of this inspection.

This latter item has resulted in the loss of automated backup of the line hydro source for the well supply. Also, it leaves the unit at risk if manual operation is required due to the loss of the associated protection of the control functions. Shortly after the inspection the inspecting officer was advised that the operating authority was making arrangements to have the equipment repaired.

It was also noted from the review of inspection data that the values reported on the Monthly Process Data Report for raw and treated water average peak flows are either indicating erroneous average peak flow data or ongoing average peak flow exceedances.

Failure to ensure that all the equipment is maintained in a fit state of repair constitutes a violation of Section 11(1)(ii) of the Safe Drinking Water Act.

Action(s) Required:

1

The operating authority shall develop action plans with completion dates for

(a) The repair of the control and monitoring module for the backup power supply.

(b) The resolution of the erroneous system operational errors that were observed when Well # 2 was in use after the repair of the flow transmitter.

(c)The investigation and remediation required to ensure that the raw and treated water average peak flows are accurately reported for the water takings.

2

The operating authority shall supply the inspecting officer a plan, with targeted completion dates for the repairs, within two weeks of the release of this inspection report.

3

The operating authority shall supply the inspecting officer a notice of completion when the above noted activities are completed.

4. **Operators and maintenance personnel did not have ready access to operations and maintenance manuals.**

Section 28 of O. Reg. 128/04 states that The owner or operating authority of a subsystem shall ensure that operators and maintenance personnel in the subsystem have ready access to comprehensive operations and maintenance manuals that contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the subsystem.

The review of the December 23, 2012 adverse water quality incident indicated that the Standard Operating Procedures manual for the facility was not available for the Operator to review as it had been removed from the pumphouse at some time prior to the event. Documentation on the layout of the distribution system was also not readily available.

Failure to ensure that all operators and maintenance personnel working in the subsystem have ready access to comprehensive operations and maintenance manuals that contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the subsystem constitutes a violation of O.Reg. 128/04.

Action(s) Required:

1

The operating authority shall develop and put in place a procedure to ensure that at all times the operators and maintenance personnel in the subsystem have access to comprehensive operations and maintenance manuals that contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the subsystem.

2

The procedure shall include a protocol by which the manuals may be updated which will not lead to the removal of the older manuals from the drinking water system until the updated manuals are onsite at facility.

2

The operating authority shall develop the procedure and supply the inspecting officer a copy of the procedure within 30 days of the receipt of this inspection report,

5. **All microbiological water quality monitoring requirements for raw water samples were not being met.**

Schedule 10-4. (1) of O. Reg. 170/03 requires the owner of a drinking water system and the operating authority for the system shall ensure that a water sample is taken at least once every week from the drinking water system's raw water, before any treatment is applied to the water.

(2) If the drinking water system obtains water from a raw water supply that is ground water, or is deemed under section 2 to obtain water from a raw water supply that is surface water, the owner of the system and the operating authority for the system shall ensure that a sample is taken under subsection (1) from each well in the system.

(3) The owner of the drinking water system and the operating authority for the system shall ensure that each of the samples taken under subsection (1) is tested for,

(a) Escherichia coli; and

(b) Total Coliforms.

A review of the sampling data for the inspection period indicated that Well # 2 raw water was not sampled for the week of October 11, 2011.

Failure to collect a raw water microbiological sample from each well at least once each week constitutes a violation of O. Reg. 170/03.

Action(s) Required:
Prior to the completion of this inspection report the operating authority supplied the inspecting officer with information that a notification had been prepared and distributed to all of the OCWA staff which clearly identifies the raw water microbiological sampling and testing requirements for the Powassan drinking water system.

No further action required.

6. **Turbidity was not being tested at least once every month from each well that is supplying water to the system.**

Schedule 7-3 (1.1) of O. Reg. 17/03 requires the owner of a drinking water system and the operating authority for the system shall ensure that a water sample is taken at least once every month, from a location that is before raw water enters the treatment system, and is tested for turbidity. And that if the drinking water system obtains water from a raw water supply that is ground water, the owner of the system and the operating authority for the system shall ensure that a sample is taken under subsection (1) from each well that is supplying water to the system.

A review of the facilities Monthly Data Summary Sheets for the facility did not indicate that raw water sampling and testing was completed for the months of January, August and September 2012.

Failure to ensure that one raw water sample from each well is collected and tested for turbidity each month constitutes a violation of O. Reg. 170/03.

Action(s) Required:
Prior to the completion of this inspection report the operating authority supplied the inspecting officer with information that a notification had been prepared and distributed to all of the OCWA staff to ensure that a raw water sample is taken from each well at least once every month and is tested for turbidity.

No further action required.

7. **All specified corrective actions (as per Schedule 17) were not taken to address adverse conditions.**

Schedule 17-2 of O. Reg. 170/03 requires that the operating authority for the system shall take such other steps as are directed by the Medical Officer of Health.

A review of the adverse water quality incidents reported for December 23, 2012 indicated that water not having met primary disinfection, by having a free chlorine residual below 0.45 mg/L, was passed on to the distribution and system users for approximately 64 minutes. Further, the review of another adverse water quality incident reported for December 25, 2012 indicated that water having not met primary disinfection was passed on to the distribution and system users system users for approximately 24 minutes.

In both of the cases the Operator in Training who responded to the alarms was incorrectly of the opinion that the pumphouse discharge was passed directly to the systems in-ground reservoir prior to distribution to users.

In view of the potential serious consequences that may have resulted from the incorrect information the Medical Officer of Health sent a letter to the operating authority that required the operating authority to acknowledge the error in reporting that improperly disinfected water was not passed to the system users.

The response from the operating authority letter failed to correct the original verbal reporting error indicating that no improperly disinfected water was directed to the system users in both the December events.

Failure to undertake corrective actions in response to an adverse condition including any other steps as directed by the Medical Officer of Health constitutes a violation of O. Reg. 170/03.

Action(s) Required:
On March 15, 2012, prior to the completion of this inspection report, the operating authority submitted an addendum to the December 23, 2012 and December 25, 2012 Adverse Water Quality Incidents reports that clearly identified that improperly disinfected water had been directed to the distribution system for both of the events. This action is deemed to be a correction of the original verbal reporting error.

In addition the above noted notification update, the operating authority shall:

1

Train all staff on the importance of ensuring that the information given to the Health Unit accurately reflects the facts related to the Adverse Water Quality Incident.

2

The operating authority shall supply the inspecting officer a notice of completion when the above noted activity has been completed.

SUMMARY OF BEST PRACTICE ISSUES AND RECOMMENDATIONS

This section provides a summary of all best practice issues identified during the inspection period. Details pertaining to these items can be found in the body of the inspection report. Best Management Practices are recommendations and not mandatory requirements, but may lead to safe drinking water for the consumer.

In the interest of continuous improvement in the interim, it is recommended that owners and operators develop an awareness of the following practices and consider measures to implement them so that all drinking water systems continuously improve their processes.

1. **Operators were not aware of the operational criteria necessary to achieve primary disinfection within the drinking water system.**

   As noted earlier in this report, a review of the circumstances related to an adverse water quality incident reported for December 23, 2012 indicated that water not having met primary disinfection, by having a free chlorine residual below 0.45 mg/L, was passed on to the distribution and system users for approximately 64 minutes. Further, the review of another adverse water quality incident reported for December 25, 2012 indicated that water having not met primary disinfection was passed on to the distribution and system users system users for approximately 24 minutes.

   In both of the cases the Operator in Training who responded to the alarms was incorrectly of the opinion that the pumphouse discharge was passed directly to the systems in-ground reservoir prior to distribution to users. The Operator in Training had phoned the Operator acting as the Operator in Charge for the facility and reviewed his findings on his arrival at the facility and his planned corrective actions. There was no record presented that indicated the Operator in Charge corrected the Operator in Training error in indicating that water was directed to the in-ground reservoir prior to being directed to users.

   Recommendation:
   It is strongly recommended that all operating staff attending the Powassan Drinking Water System be trained on the following:

   1. The requirement to have a minimum free chlorine residual of 0.45mg/L at the end of the system's contact piping to achieve primary disinfection.

   2. The requirement to process an Adverse Water Quality Incident under Schedule 16.4 of O. Reg. 170/03 for improperly disinfected water being passed on to users if water is directed past the end of the contact piping having a free chlorine residual of less than 0.45mg/L.

   3. It is further strongly suggested that a Standard Operating Procedure be put in place covering the requirements noted above and that a copy of the Standard Operating Procedure binder be kept at the pumphouse at all times.

SIGNATURES

Inspected By: Signature: (Provincial Officer):

Cameron Adams

Cameron R Adams

Reviewed & Approved By: Signature: (Supervisor):

Scott Milne

Review & Approval Date:

April 2, 2013

Note: This inspection does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they apply or may apply to this facility. It is, and remains, the responsibility of the owner and/or operating authority to ensure compliance with all applicable legislative and regulatory requirements.