

Public Water System Annual Report

March 22, 2010

Lac du Bonnet Water Treatment Facility

Town of Lac du Bonnet

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Water system Emergency# 204-345-3891

Operator: Kyle Molinski, Public Works Supervisor/ Senior Operator

Business hours # 204-345-8693

Emergency# 204-345-3891

Alternate # 204-345-3570

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Introduction:

The 2009 Annual Report on the Lac du Bonnet Water Treatment Facility summarizes the Utilities ability to produce safe potable water.

1. Description of the water system:

The Lac du Bonnet water system provides potable drinking water to a population of 1009 residents (2007 Census) as well as many other bulk and pail fill users. Treated water produced at our facility not only meets, but exceeds all health and aesthetic objectives to date as stated in the *Guidelines for Canadian Drinking Water Quality*.

1.1 Water supply source + Intake Structures

Lac du Bonnet Water Treatment Facility receives surface water from the Winnipeg River System located approximately ½ a kilometer South East of the Water Plant, The Wet Well is fed by gravity from the Winnipeg River. It then pumps water using 2 pumps to the Water Treatment Facility when required and each pump takes a turn daily pumping water so these pumps are always in use and ready to supply water. This Wet Well station is located @ the East end of McIntosh Street along the River bank, it has a maintained, pre-heated diesel generator for a back-up power supply and instantly starts up if there is a power failure to ensure operations of all equipment in this building needed to supply water to the treatment facility.

1.2 Water Treatment Process

The Lac du Bonnet Water Treatment Facility use a multi barrier treatment process to treat the raw water from the river, it uses a state of the art (built in 2003) Actiflo system which entails the raw water to be pumped into a flash mix station along with a coagulant chemical which is pumped by a metering pump, which helps draw particles out of the water it then flows under a small barrier wall where a coagulant aid (Polymer lt22s) is pumped by a metering pump to another mixing station where silica sand is pumped through a hydro-cyclone unit, the sand, along with the coagulant and polymer, help bond even the smaller particles together to be sent into the Maturation mixer which is a slow mixing process to form larger particles called floc. After this maturation mixing station it flows under another barrier wall and comes up through a set of settling tubes, where most of the particles joined together settle out and are removed and the sand and sludge from the water are recycled through the hydro-cyclone system where the sludge is run to waste and the sand is re-used. The water from this point continues to flow upwards to a set of weirs and is then sent to 2 multi- media gravity filters where most of the remaining Turbidity (nephelometric turbidity units (NTU)) is removed from the water. It then flows through the UV system using ultra violet lights to neutralize or kill bacteria, and from this point flows into the Clear Well which at this point the water is chlorinated(disinfected) by sodium hypochlorite (liquid chlorine) pumped by a metering pump. It is then monitored and tested daily for chlorine residuals. As per the *Drinking water safety act* the Lac du Bonnet water plant must ensure that a disinfectant residual of at least:

* 0.5 mg/L of free chlorine is detectable at the point where water enters the distribution system, after a minimum contact time of 20 minutes.

*0.1 mg/L of free chlorine is detectable at all times at any point in the distribution system.

1.3 Water storage reservoirs:

The reservoirs contain treated water to be supplied to the residents and other users at all times, they consist of 3 chambers beneath the plant and one exterior reservoir directly south of the plant. The exterior chamber holds 1,246,000L, chamber 1 beneath the plant holds 278,000 L, chamber 2 beneath the plant holds, 99,600 L, and chamber 3 holds 91,000 L, to come to a total of 1,714,600 L of treated water. The water used is replenished every day.

1.4 Distribution System

The distribution system consists of 3 turbine pumps at the treatment facility. One is the Jockey pump which pumps all the time and is smaller than the duty pumps 1+2. Both duty pumps 1 and 2 are the same size but take turns pumping water only as required. When the distribution system calls for more water the pumps moderately increase in speed and when the system needs less they gradually decrease in speed to slow the flow. The distribution underground consists of many different sizes and types of piping including: cast iron, pvc and copper, and sizes vary from 3/4" up to 10" in diameter.

1.5 # of Connections, types of users and population served

There are 514 connections to our distribution system, and users consist of commercial, home and bulk and pail fill users. The population served to date is 1009.

1.6 Classification and certification

This Treatment facility is a level 2 classification which means that the operator must take proper Courses and exams @ Red River College to be able to legally operate this facility. The proper Certification is level 2 as well, which is maintained by staff.

2. Disinfection system in use

2.1 Type of disinfection system being used:

The Lac du Bonnet Treatment facility disinfects the water by using 2 disinfection barriers in addition to an advanced filtration system, one being a liquid 12% sodium hypochlorite solution which is added to the water after the ultraviolet light (UV) system by a metering pump which is calibrated for dosages weekly, these are part of a multi-barrier system. It is important to have a multi-barrier system for if one thing should fail you have a back up or another source to repair the problem ie: we have one chlorinator used at all times, a second one online and ready to go plus an additional pump on the shelf as well so if one should fail there is another, as well the system is fully alarmed and if one of the units in the process should fail, there is an alarm set off which in turn notifies the operator by a telephone call and shuts down the system until the operator is there. There is a back-up power supply as well in the facility to ensure in the event of a power failure that we can not only treat the water but supply safe drinking water at all times.

2.2 Equipment monitoring requirements and redundancy program:

Chlorine residuals are monitored 24/7/365 by a online analyzer and twice daily manually by the operator and bi-weekly in the distribution system as per our operating license, and are recorded on monthly forms which are sent to the drinking water officer for review at the end of every month.

As required by the drinking water safety act the Lac du Bonnet Water treatment operators ensure continuous disinfection is maintained at the plant by keeping stock of all spare parts for the chlorinator plus 1 complete back up chlorinator ready to use at all times.

2.3 Disinfectant residual overall performance and results

For 2008, the Lac du Bonnet Water Treatment facility has met all regulatory requirements in regards to monitoring and reporting disinfection residuals leaving the facility and in the distribution system

3. List of water quality standards:

The province of Manitoba has adopted a number of water quality standards from the *Guidelines for Canadian drinking water quality*, developed by Health Canada. The parameters are health-based and they express the (MAC) Maximum Acceptable Concentrations for drinking water. Concentration values in excess constitute a health related issue and require corrective actions. The 2008 results are as follows:

<u>Parameter</u>	<u>Quality Standard</u>
Total coliform and E.coli	Less than one E.coli and total coliform bacteria detectable per 100 mL in all treated and distributed water
Chlorine residuals	* A free chlorine residual of at least 0.5mg/L in water entering the distribution sytem following a min. contact time of 20 minutes * A free chlorine residual of at least 0.1mg/L at all times at any point in the distribution system
Total Trihalomethanes(to include bromodichloromethane, bromoform, chloroform, dibromochloromethane	Less than or equal to 0.10mg/L as an annual average of quarterly samples
Turbidity	*Less than or equal to 0.3 NTU in 95% of the measurements in a month of the effluent from each operating particulate filter * Not exceed 0.3 NTU for more than 12 consecutive hours of filter operation or for 2 consecutive daily measurements

* Not exceed 1.0 NTU for any continuous or daily measurement

3.1 Disinfection Monitoring and reporting Regulatory Requirements PWS Performance

Free chlorine residual entering distribution system	> 0.5 mg/L	100%
Frequency of testing entering distribution system	Daily	100%
Free Chlorine residual in distribution system	>0.1 mg/L	100%
Frequency of testing in distribution system	Bi-weekly	100%
Report Submissions	Monthly	100%

The Public Water system has met the terms and conditions of the operating license pertaining to disinfection monitoring and reporting for 2009.

3.2 Bacteriological Monitoring and reporting

	Regulatory requirement	PWS Performance
Number of raw/incoming water samples	26	27
Number of treated water samples	26	27
Number of distribution water samples	26	27
Frequency of testing	Bi-weekly	100%
Total Coliform present in samples	0 TC per 100ml	100%
E. Coli present in samples	0 EC per 100ml	100%

Water samples were submitted to the lab on Sept.29th 2009 and were received past the allowable holding time of 24hrs and were analyzed for Presence/absence methods. As these methods do not provide a numeric value, water samples were resubmitted and confirmed the absence results.

3.3 Physical Monitoring and Reporting

Chemically assisted, rapid gravity filtration		
Process	Regulatory requirement	PWS performance process
	< 0.3 NTU in at least 95%	100%
	Of the samples taken per month	
	Not to exceed 0.3 NTU	100%
	For more than 12 continuous hours where continuous measurements are taken	
Frequency of testing	Continuous	100%
Report Submissions	Monthly	100%

The Pubic Water System has met their regulatory requirements for 2009. To maintain due diligence and to keep good practice, the WTP operator reported 3 corrective actions reports on 3

separate events. These events were related to general maintenance of the on-line turbidity equipment. The treatment plant was not in production at the time of these occurrences and they were not related to finished water production and corrective action reporting was not required.

3.4 Disinfection By-products Monitoring and Reporting

	Regulatory Requirements	PWS performance
Trihalomethane sampling requirements	4 times per year	N/A
Total Trihalomethane Standard	0.10 mg/L	N/A
Bromodichloromethane sampling	4 times per year	N/A
Bromodichloromethane Standard	0.016 mg/L	N/A

The standards for Trihalomethanes is based on a running average of quarterly samples taken seasonally (usually submitted in March, June, September and December) which were completed for 2008. Sampling THM's are required on a Bi-annual basis and will be sampled and submitted quarterly in 2010.

Health Canada initially established the Bromodichloromethane (BDCM) guideline because studies at the time indicated that there may be acute health effects associated with the compound. More recent research shows that BDCM does not have an acute health effect and Health Canada has rescinded the BDCM guideline. Manitoba water utilities are no longer required to meet the 0.016mg/L BDCM standard. Although it has been rescinded BDCM continues to be a component of Total THM's and their concentrations will be monitored accordingly, and we will continue to make every effort to reduce total THM concentrations(including BDCM) to as low of a level as possible.

Haloacetic acids are also chlorine disinfection by-products found in drinking water. In 2008, Health Canada established a guideline of 0.08mg/L for HAA's. It is anticipated that this guideline will be adopted as a standard in Manitoba in the future. HAA analysis was submitted in 2008 and the results for our system were 0.018mg/L which is below the guideline.

3.5 Water Chemistry Analyses

The Office of Drinking Water submitted water samples from the Lac du Bonnet PWS for chemical analyses on May 26th 2009. This action is considered to fulfill the general chemistry monitoring requirement outlined in our Operating License. The report (attached) indicated that the treated water met all health related guidelines as stipulated in health Canada's Guidelines for Canadian Drinking Water Quality. (http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potb/guide/index_e.html), in addition we submit quarterly samples ourselves in the months of March, June, September and December as a part of our ongoing monitoring of the performance of the treatment facility.

4. Water System Incidents and corrective actions

The corrective action form was introduced in the *operational guidelines for monitoring and reporting-public and semi-public water systems*. This form is to be completed in instances where a non-compliance issue is observed but easily fixed.

The form specifies the following non-compliance incidents

- * Low disinfection residual entering the distribution system, 21(1) MR 40/2007
- * Low disinfection residual in the distribution system, 22 MR 40/2007
- * Filtered water turbidity exceeding the turbidity standards, 6(1) MR 41/2007
- * Low positive total coliform (<10 CFU/100mL) 3 MR 41/2007
- * Other- small water main repairs etc.

Once completed the form is to be signed by the operator-in-charge and sent to the regional drinking water officer at the end of each month. Copies must be kept for a minimum of 24 months. There were 3 separate reports made in 2009, but were not required as the plant was not in operation and general maintenance was being performed on the on-line turbidity units. These were only submitted to keep good practice.

5. Drinking water safety orders and actions taken:

In 2009, no drinking water safety orders were issued for the Lac du Bonnet Public Water System.

6. Boil Water advisories issued and actions taken in response

In 2009, no boil water advisories were issued for the Lac du Bonnet public water system.

7. Warnings issued or charges laid on the system in accordance with The drinking Water Safety Act

In 2009, no charges laid or warnings were received by the Lac du Bonnet Public water system.

8. System expansion and/or increased production

In June of 2009 until mid November many of the old aging cast iron lines were replaced with new c-900 piping including 1st, 2nd and 3rd St. Back lanes, Down Park St. From 1st to Minnewawa and Lake from 1st to Minnewawa St., including Minnewawa from McArthur to Park St., also from 4th to Minnewawa along McArthur was replaced as well. Johnson Lane also received new piping.

There were many new connections for the end user installed as well and not one of the rate payers were out of water for a long period of time due to above ground temporary services provided. In 2010 the project will commence again in June to finish this project. Although all lines were not replaced, most of the problematic areas were replaced and finished in 2009's project.

9. Summary:

The Town of Lac du Bonnet PWS has fulfilled its obligations for 2009 in complying with the terms and conditions of its operating license PWS-08-168 issued pursuant to the Manitoba Drinking water Safety Act and regulations.

Manitoba



Water Stewardship

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MAR 29 2010

PWS 106.00

March 24, 2010

TOWN OF
LAC DU BONNET

Town of Lac du Bonnet
Mayor and Council
Box 339
Lac du Bonnet, MB R0E 1A0

Town of Lac du Bonnet - Public Water System Annual Audit – 2009 Supplement

Dear Mayor and Council:

The intent of this letter is to supplement the 2009 Public Water System Annual Audit dated February 23, 2010 and to amend the 2009 Audit letter where indicated below.

As stated in the audit letter, the information used to determine the performance and compliance of your public water system is based on information submitted to this office. If the water systems records conflict with the assessment, the water system can provide information to this regard and the audit letter would be amended accordingly.

Provincial regulations require chlorine residuals be maintained at or above 0.1 mg/L Free chlorine and to be measured on a periodic basis. In order to comply with this requirement, water systems are to take chlorine measurements at the same time and location of the bacterial testing within the distribution system and to record the measurement(s) on the laboratory sample submission form. The laboratory provides the Office of Drinking Water with the results of the bacterial testing and the chlorine residual measurements recorded on the sample submission form by your operator.

The 2009 audit contained a Disinfection Monitoring and Reporting table indicating a 96% performance with regard to submission of chlorine residual measurements from location(s) within the distribution system. Your operator has provided a copy of the sample submission form for that sampling period. The form indicated that the measurements were taken and recorded appropriately. As such, the table in the original audit should be amended with the following table:

Disinfection Monitoring and Reporting	Regulatory Requirement	PWS Performance
Free chlorine residual entering the distribution system Section 21(1) a - MR 40/2007	≥ 0.5 mg/L	100 %
Frequency of testing entering the distribution system Schedule A - MR 40/2007	Daily	100 %
Free chlorine residual in the distribution system Section 22 a - MR 40/2007	≥ 0.1 mg/L	100 %
Frequency of testing in the distribution system Schedule A - MR 40/2007	Bi-weekly	100 %
Report submissions Section 25(2) - MR 40/2007	Monthly	100 %
<u>Comments:</u> The Public Water System has met the terms and conditions of their operating licence as they pertain to disinfection monitoring and reporting for 2009.		

The 2009 Public Water System audit summary stated that the Town of Lac du Bonnet had two documents past due:

- Water and sewer main repair document
- Compliance Plan

As of this date, the Compliance Plan and a draft water and sewer main repair document have been submitted in a form satisfactory to the Office of Drinking Water.

Please do not hesitate to contact me regarding this letter or any other drinking water related issues; (204) 346-6062.

Sincerely,



Melanie Betsill
Drinking Water Officer

copy: Colleen Johnson, CAO
Kyle Molenski, Public Works Supervisor