PUBLIC WATER SYSTEM ANNUAL REPORT

-2011-

TOWN OF BEAUSEJOUR

WATER WORKS DEPARTMENT

General Office: (204) 268-7550

Water Works Shop: (204) 268-7561

Water Treatment Plant: (204) 268-7563

After Hours Emergency: (204) 268-7555

E-mail: townoffice@townofbeausejour.com

Web Site: http://www.ourhomeyourhome.ca/

Date updated:

March 30, 2012

Updated by:

Jeff Matychak, C.E.T.
Director of Operations
Town of Beausejour

TABLE OF CONTENTS

1.0 Introduction …… 1

2.0 Purpose ……..…. 1

3.0 Description Water Supply, Treatment, and Monitoring …… 1

- 3.1 Water Supply Source ……. 1
- 3.2 Water Treatment …… 2
- 3.3 List of Water Quality Standards …… 3
- 3.4 Disinfection …… 5
- 3.5 Bacterial Monitoring Raw and Treated Water ……6

4.0 Description Water Distribution System ……..6

5.0 Classification and Certification ……...7

6.0 Water System Incidents and Corrective Actions …….……8

7.0 Drinking Water Orders And Corrective Actions Taken ……..8

8.0 Boil Water Advisories Issued and Actions Taken in Response ……..8

9.0 Warning Issued or Charges Laid on the System in Accordance with Drinking Water Safety Act ……8

10.0 Major Expenses Incurred …….. 9

11.0 System Expansion and/or Increased Production ..……..……9

12.0 Future System Expansion and/or Increased Production ……10

1.0 Introduction:

The operation of all public water systems in Manitoba is regulated in part by the "Drinking Water Safety Regulation (MR40/2007), which came into force on March 1, 2007. Section 32(1) of the Regulation (MR40/2007) requires all public water systems serving 1000 or more people to produce an annual report about the operation of the system.

2.0 Purpose:

The purpose of this annual report is to provide the residents of Beausejour:

1. Easy access to information related to the quality of the water they consume and the system that produces and transports to the taps in their homes.
2. Assurance that the quality of the water they consume meets all the requirements for aesthetic objectives as stated in the "Guidelines for Canadian Drinking Water Quality" and the health objectives consistent with the standards listed on the Public Water System Operating Licence PWS-08-203 issued by Manitoba Water Stewardship – Office of Drinking Water.
3. A report on the accountability of the Town of Beausejour to be in compliance with the regulatory requirements governing the provision of safe drinking water.
4. Answers to questions most often asked.

3.0 Description of the Water Supply, Treatment, & Monitoring

.1 Water Supply Source:

The Town of Beausejour draws water from the Lower Carbonate Aquifer, which lies approximately 70-80 feet below the ground surface. The major recharge for this aquifer is the Ross area south of Hwy. #15, south east of Beausejour. The Town has a Water Rights Licence #2005-023 that allows it to with draw up to 450 cubic decameters (364.82 acre feet) annually from the aquifer.

Three raw water supply wells have been drilled into this aquifer. All three wells are located on the Water Treatment Plant property at 914 Park Avenue. Well #1 was drilled in 1957 and is housed with-in the Water Treatment Plant building. This well was developed to produce water at a rate of 125 imperial gallons per minute. Well #2 was drilled in 1962 and is housed in a separate building in the south east corner of the property near Ashton Avenue. This well was developed to produce water at a rate of 200 imperial gallons per minute. Well #3 was drilled in 1995 and is housed in a separate building along the east side of the property about midway between Park Avenue and Ashton Avenue. This well was developed to produce water at a rate of 300 imperial gallons per minute.

Well #1 on its own cannot supply enough water to meet the normal daily demand for water by the Town. It is exercised on a regular schedule and samples are drawn quarterly to ensure the water remains fresh and safe. It can be run in conjunction with Well #2 to supply raw water to the Treatment Plant in times of high demand.

Under normal operating conditions Wells #2 and #3 alternate to supply raw water to the Water Treatment Plant. The treated water is stored in the under ground reservoir. The level of water in the under ground reservoir controls the operation of the well pumps and the Water Treatment Plant to keep the level in the reservoir between 13 and 14 feet. During periods of high demand the Treatment Plant Controls are set so that either Well #3 is run or Well #1 and Well #2 are run together to supply water at higher rates.

A natural gas fired 55 KW Onan Stand-by Generator c/w Automatic Transfer Switch supplies power to the Water Treatment Plant and Well Pumps in the event of a power outage.

.2 Water Treatment:

The original Water Treatment Plant was built in 1957 to house Well #1 and two pressure filters 5.5 feet in diameter, piping and related equipment. The two filters have a rated filter capacity of 125 gal per minute. In 1962 an addition was built onto the Water Treatment plant for two more pressure filters. A second addition to the Water Treatment Plant was built in 1976. This addition houses two more pressure filters bring the total number of filers to six for a rated total filter capacity of 375 gal. per minute. The reported rated capacity of the Treatment Plant is actually 300 imperial gallons per minute to allow for filter maintenance and in house water use. The 1976 addition included a separate room for the gas chlorination equipment.

As with all ground water sources, the raw water Beausejour draws from the aquifer contains dissolved minerals and metals. With the exception of iron, the raw water meets all the drinking water standards as set out by the “Guidelines for Canadian Drinking Water Quality” 6th Edition, 1996 including updates to April 1999.

Iron does not pose a health concern, but is listed under aesthetic water quality parameters. Iron can cause staining of laundry and plumbing fixtures. Iron can also cause build up of materials in the distribution piping reducing the overall capacity of the system.

The treatment process to remove iron from the raw water is a chemical free process. Compressed air is injected into the flow of water immediately up stream of the filters. The air is broken up into many tiny bubbles by what is called an atomerator. The atomerator distributes the bubbles uniformly through the water column. The oxygen in the air reacts with the dissolved iron to form a solid precipitate, which is removed by filtration. The iron precipitate is flushed out of the filters to waste during the regular backwash cycle. Excess air introduced to the water is vented through air bleed valves at the top of each filter.

Because the raw water is drawn from a carbonate aquifer it also contains considerable quantities of dissolve calcium carbonate. This causes the water to be considered hard. Evidence of the hardness can be seen by the soap ring in the sink after you wash your hands and the scale build up in kettles, coffee makers and hot water tanks.

The Beausejour water treatment process does not treat for hardness. Those people wishing to have the luxury of soft water for their laundry and baths can install their own individual water softeners. The modern water softeners have the ability to measure the water being treated by the unit and can determine the optimal time to regenerate the ion exchange media. The Town recommends that home owners to set their softeners to 23 grains of hardness for the best results. The Town also recommends that after power outages the owners adjust their softener clocks to the correct time. Softeners are set to regenerate during the night when water is not normally being used. If they regenerate when water is in use they impart a salty taste to the water.

.3 List of Water Quality Standards

Table #1 list the results of the analysis of Beausejour water samples to the Aesthetic Objectives as set by "Guidelines for Canadian Drinking Water Quality" 6th Edition, 1996, updates to April 1999.

TABLE 1

TOWN OF BEAUSEJOUR
WATER QUALITY COMPARISON TO "GUIDELINE FOR CANADIAN DRINKING WATER" FOR POTABILITY (Aesthetic Criteria) IN WATER

Conventional Parameters Aesthetic Criteria			Raw Water	Treated Water	Aesthetic Objective	Units
Total Dissolved Solids			460	512X	500	mg/l
Dissolved Chloride Cl			34.1	36.6	250	mg/l
Dissolved Sulfate SO4			58.1	60.9	500	mg/l
ph, laboratory			8.44	8.50	6.5-8.5	ph units
Total Alkalinity CaCO3			313	316		mg/l
Bicarbonate Alkalinity HCO3			362	359		mg/l
Carbonate Alkalinity CO3			7.54	10.3		mg/l
Hydroxide Alkalinity OH			<0.4	<0.4		mg/l
Copper Cu			0.0114	0.0056	1.0	mg/l
Iron Fe			2.73X	0.11	0.3	mg/l
Manganese Mn			0.032	0.015	0.05	mg/l
Sodium Na			24.8	25.9	200	mg/l
Zinc Zn			0.012	<0.050	5.0	mg/l

mg/l = milligrams per liter
< = Less than detection limit
X = result is outside the aesthetic limit

Table #2 lists those water quality standards for a ground water supply source adopted by the Province of Manitoba from the "Guidelines for Canadian Drinking Water Quality" 6th Edition,1996, including updates to April 1999 developed by Health Canada. For the parameters tested, results are categorized by health concerns. Any parameter in excess of the maximum accepted concentration, constitute a health related issue and require corrective action.

TABLE 2 **For the Year 2011**

TOWN OF BEAUSEJOUR
WATER QUALITY COMPARISON TO PWS-08-203 LICENCE WATER QUALITY STANDARDS FOR POTABILITY (Health Criteria at point of Use) IN WATER

Conventional Parameters Health Criteria				**Quality Standard**	**Test Frequency**	**Test Results**	**Units**
Total Coliform & Ecoli				No TC & EC	Bi-weekly	100% Passed	per 100ml
Chlorine Residual				>0.5 WTP	Daily	100% Compliance	mg/l
				Distribution (0.1)	Periodically	100% Compliance	mg/l
Dissolved Fluoride	F			1.5	One Raw & One Treated Sample every three Years	0.22	mg/l
Nitrate and Nitrite	N			10		0.16	mg/l as N
Arsenic	As			0.025		0.0005	mg/l
Lead	Pb			0.01		0.0001	mg/l
Uranium	U			0.02		0.0005	mg/l
Trichloroethylene				0.005		<0.50	mg/l
Tetrachloroethylene				0.03		<0.50	mg/l
Benzene				0.005		<0.50	mg/l

mg/l = milligrams per liter
< = less than detection limit

The results in Table #1 and Table #2 are from the analysis of water samples collected by Manitoba Water Stewardship – Office of Drinking Water's Chemistry Audit sampled on December 1, 2011 and submitted to ALS Environmental for analysis. These results for these parameters were part of the Office of Drinking Water's Chemical Audit. As a groundwater source, a chemical analysis is only required every 3 years. The next chemical analysis will be required by 2014.

.4 Disinfection:

The final step in the water treatment process is disinfection. Disinfection is defined as the selective destruction or inactivation of potential disease causing organisms in water. The chemical most commonly used is chlorine. The "Drinking Water Safety Act" requires that a disinfectant residual level of at least:

- 0.5 mg of free chlorine per litre of water is detectable at the point where water enters the distribution system, after a minimum contact time of 20 minutes.
- 0.1 mg of free chlorine per litre of water is detectable at all times at any point in the distribution system.

The Town of Beausejour uses chlorine gas to disinfect the water. Chlorine in a gaseous form is injected at rate determined by the pumping rate of each pump through an injector into a separate stream of water under distribution system pressure. This stream of water/chlorine is then injected into the treated water as it leaves the water treatment plant for storage in the under ground reservoir.

The "Drinking Water and Safety Act" requires that disinfection is continuously maintained. The Town of Beausejour operates two chlorinators each mounted separately on its own 68kg tank of chlorine gas. Normally only one chlorinator is in operation at any time. Once its tank runs empty the system switches over to the other chlorinator automatically. In this manor one chlorinator is in reserve back up at all times. The Town also keeps a stock of spare parts required for the chlorination system as well as a complete new chlorinator.

The "Drinking Water Safety Act" requires that the disinfection residuals are monitored daily at the water treatment plant and periodically at various points in the distribution system and recorded on the appropriate monitoring forms. These forms are sent to the regional "Drinking Water Officer" at the end of each month. Table 3 records the results of the Provincial Annual audit for 2011.

Table 3 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 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 Schedule A – MR 40/2007	Bi-weekly	100%
Report submissions Section 25(2) – MR 40/2007	Monthly	100%
Comments: The Public Water System has met their regulatory requirements for 2011.		

. 5 Bacterial Monitoring of Raw and Treated Water

As per Provincial regulatory requirements, every two weeks the Town collects three samples; one from the raw water entering the water treatment plant (Note: samples are alternated between wells #2 & #3, and an extra sample is submitted for well#1 when required.), one from treated water leaving the water treatment plant, and one of the water from the distribution system, and submits them to Maxxam Analytics to test for the presence or absence of Total Coliform Bacteria and E-Coli Bacteria. Table 4 records the results of the Provincial Annual Audit for 2011.

Table 4 Bacteriological Monitoring and Reporting

	Regulatory Requirement	Beausejour Public Water System Performance
Number of raw/incoming water samples Schedule A – MR 40/2007	26	100%
Number of treated water samples Schedule A – MR 40/2007	26	100%
Number of distribution water samples Schedule A – MR 40/2007	26	100%
Frequency of testing Schedule A – MR 40/2007	Bi-weekly	100%
Total Coliform present in samples Section 3(1) a – MR 41/2007	< 1 TC per 100mL	100%
E – Coli present in samples Section 3(1) a – MR 41/2007	< 1 EC per 100mL	100%
Comments: The Public Water System has met their regulatory requirements for 2011.		

4.0 Description of Water Distribution System:

Water leaving the Treatment Plant is stored in the concrete underground reservoir located immediately to the south of the plant. The reservoir capacity is 750,000 gallons. Under normal water use this approximately three days of reserve supply.

Two 25 horsepower service pumps alternate to supply water to the distribution system. Excess water pumped to the distribution system is stored in the Water Tower (Elevated Reservoir). The Water Tower has a storage capacity of 62,500 gallons. The water level in the tower controls the operation of the service pumps and supplies the water pressure to the distribution system. The normal range of operation for the water tower level is 85 to 97 percent. This represents a variance of approximately one half pound per square inch of water pressure. At the base of the Water Tower the pressure is 43 pounds per square inch.

A natural gas fired Fire Pump is available to supply water to the distribution system in the event of a power failure. The water level in the water tower controls the operation of the Fire Pump. The range of operation with the Fire Pump for the water Tower level is 65 to 97 per cent.

The water distribution system is made up 27,764 meters (91,089 feet) of water main piping ranging from 1" up to 10". The 10" and 8" water mains serve as arterial branches while the majority of the piping is 6" in diameter. The system is complimented by 166 fire hydrants and 224 main valves. 69 % of the piping material is cast or ductile iron installed between 1957 and 1985. The remaining 31% of piping material is PVC plastic pipe installed after 1985.

5.0 Classification and Certification:

Regulations M.R. 77/2003 and M.R. 162/2005 under the Environment Act(C.C.S.M. c. E125) regulate the Classification of all Water or Wastewater Facilities and the Certification of all Water and Wastewater Facility Operators in Manitoba.

All Water and Wastewater Facilities were required to make application for Classification before January 3, 2006. The Classification for Beausejour Water Treatment (WT) and Water Distribution (WD) is Class I WT (Iron Removal); Class II WD.

As of September 1, 2006 all owners of Water and Wastewater Systems must employ only Provincially Certified Operators. The two Operators assigned to the Water Works Department are Certified as follows:

Soren Thogersen	Lead Hand Utility	WT Class I	WD Class II
Darryl Mazur	Operator 1 Level 3	WT Class I	WD Class II

In addition to the Operators normally assigned to the Utility, the Town of Beausejour requires all other operators in Works and Operations to have or obtain Provincial Certification. The Certification level of the other staff in Works and Operations is as follows:

Jeff Matychak	Director of Operations	WT Class I	WD Class II
Allan Murash	Lead Hand Public Works	WT Class II	WD Class II
Andy Severinsen	Operator 2 Level 3	WT Class I	WD Class I
Dave Brown	Operator 1 Level 2	WT Class I	WD Class I
Kevin Mazur	Operator 1 Level 1	WT Class I	WD Class I
John Proceviat	Operator 2 Level 1	WT Training	WD Class I

The Town continually supports its Operators by sending them to training Courses and Seminars. All new and existing staff receive the necessary training and related education to write the required examinations to obtain their Provincial Operators Certification.

The Town continues to maintain an Operator On-Call Program. Works and Operations Operators rotate to take on On-Call duties. To report an emergency to the Town please call (204)268-7555 and leave a message. The Operator On-Call will be paged and alerted to the emergency. New staff members do not participate in the Operator On-Call Program until they are Provincially Certified Operators.

6.0 Water System Incidents and Corrective Actions:

1. April 23, 2011 a water main break appeared at approximately 9:00 AM at the corner of Fifth Street North and Gertrude Avenue. The water was turned off April 27, 2011 at 8:00 AM while the repair was being made. A section of pipe 10.7 meters (35.0 feet) long was cut out of the water main and was replaced with C900 PVC pipe. A new main valve and 90 degree bend was installed at the corner of Fifth St. N. and Gertrude Ave. A sacrificial Zinc Anode was attached to the copper service at 326 Fifth Street North. Normal water service was restored at 6:00 PM the same day.

2. July 26, 2011 a water main break appeared at approximately 8:00 AM at 133 Fifth Street South. The water was turned off July 27, 2011 at 8:00 AM while the repair was being made. A small pinhole leak was found approximately1.0 meter (3.3 feet) South of the service connection for 132 Fifth Street South. The leak was repair by cleaning the water main and placing a Stainless Steel Repair Clamp over the leak. A sacrificial Zinc Anode was attached to the water main once the repair was complete. Normal water service was restored at 12:30 PM the same day.

3. November 17, 2011 a water main break appeared at approximately 9:00 AM in front of the hydrant 23.7 meters (78 feet) West of 614 Atlantic Avenue. The water was turned off November 24, 2011 at 10:00 AM while the repair was being made. A small pinhole leak was found and repaired by cleaning the water main and placing a Stainless Steel repair clamp over the leak. Normal water service was restored at 2:00 PM the same day.

7.0 Drinking Water Orders and Corrective Actions Taken:

In 2011, no Drinking Water safety Orders were issued.

8.0 Boil Water Advisories Issued and Actions Taken in Response:

In 2011, no Boil Water Advisories were issued.

9.0 Warnings Issued or Charges Laid on the System in Accordance with The Drinking Water Safety Act:

No charges or warnings were issued in 2011.

10.0 Major Expenses Incurred:

1. Completed the Woodridge water distribution system looping by installing 115.4 meters (380 feet) of new 150mm (6") PVC water main from James Avenue to Woodridge Drive at a cost of $56,298.90. Looping of water mains within the system is important because it eliminates dead ends where the water can become stale. Also, it provides options in supplying continuous service to an area should a portion of the mains servicing it have to be shut down for maintenance or repair.

2. A new pump was purchased for Well#2 at a cost of $11,604.00. This new pump is being used as a spare should the original pump fail. By having a back-up pump on hand we are able to replace the existing pump in a timely manor without having Well#2 offline for an extended period of time.

3. Hydrant extensions were purchased for $7,527.97. These extensions were installed in areas where the existing road elevation is much higher than the surrounding ditches. This difference in elevation was causing problems in winter when drifting snow would cover the hydrants making them hard to locate and access.

4. Repairs were performed to the chimney shoot in the Reservoir Building after a damaged casing reveled asbestos insulation was becoming air-born. These repairs included carefully removing the asbestos insulation and replacing it with ROXUL insulation. The asbestos insulation was removed and replace for a total of $6,687.50.

11.0 System Expansion and/or Increased Production:

1. Repairs to the existing Cathodic Protection System to reduce the chances of water main breaks. This system consists of Rectifier Stations that put out low current to a number of Sacrificial Anodes located all over Town. With much of the system offline, the goal is to make repairs to the existing Cathodic Protection System, which would give our water mains some protection against corrosion.

2. Eight new water services were connected to the existing water mains in the distribution system.

3. Engineering for the Twinning of the Supply Line from the Water Treatment Plant to the Reservoir Building. This will allow for adequate back up to the reservoir should the existing line fail.

4. A filter audit for the Water Treatment Plant will be purposed to Council for the 2011 budget. Seeing as how the two original filters were installed in 1957, the addition of two more filters was completed in 1962 and the final addition of two filters was completed in 1976; a filter audit should be performed in the near future. Depending on the recommendations of the filter audit, if filter upgrades are required it could increase the production of our Water Treatment Plant.

12.0 Future System Expansion and/or Increased Production:

1. Twinning the Supply Line from the Water Treatment Plant to the Reservoir Building. This will allow for adequate back up to the reservoir should the existing line fail.

2. Replacing both the service pumps and fire pump in the Reservoir Building. At this time the Town will look at replacing the controls for this system as they are becoming unreliable.