

**Assessment Studies of
Water and Wastewater Systems
and Associated Water Management Practices
at Bear River First Nation
Bear River, NS (Site #06038)
Atlantic Region**

For
Indian and Northern Affairs Canada
Atlantic Region

By
MGI Limited
Fredericton, NB

March 2002



A member of the  Family of Companies

MGI Limited

466 Hodgson Road
Fredericton, New Brunswick
Canada E3C 2G5

Tel. 506.458.1248
Fax 506.462.7646
Email mgi.nb@mgi-limited.com
Web www.mgi-limited.com
www.CRAworld.com

March 28, 2002

Public Works & Government Services Canada
1713 Bedford Row
Halifax, NS
B3J 3C9

MGI File 10294B

Attention: Shauna Pierce

Re: Assessment Study - Bear River First Nation, Bear River, NS (Site #06038)

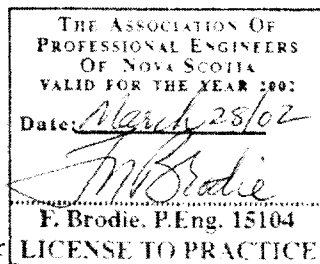
Dear Ms. Pierce:

Please find enclosed our report on the assessment of the water and wastewater systems at the Bear River First Nation community located in Bear River, NS.

We trust this report meets your requirements. If you have any questions, please call Neil Brodie at 506-458-1248.

Sincerely,
MGI LIMITED

F. Neil Brodie, P.Eng.
Senior Project Manager



Monique P. Little
for Troy Small, M.Sc.
Project Hydrogeologist

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1.0 Overview

MGI Limited was retained by Public Works & Government Services Canada on behalf of Indian and Northern Affairs Canada to conduct an inspection of the water and wastewater system of the Bear River First Nation community located in Bear River, NS. As homes in the community obtain their potable water supply by private wells and individual septic systems for sewage services the following methodology was used:

- 1) Review of available data from Indian and Northern Affairs Canada and Health Canada;
- 2) Liaison with Bear River First Nation community representative to schedule a site visit;
- 3) Site visit and interview with community representative (i.e. Chief, Community Health Representative, etc.);
- 4) Physical inspection of community infrastructure;
- 5) Discussion with local well driller and septic system installers on general bedrock conditions, water levels, when necessary for supplemental information; and
- 6) Draft and final report preparation discussing risks and possible mitigation if necessary.

Provided below is background information on the Bear River First Nation community.

Date of Visit:	January 15, 2002
Inspector(s)/Interviewer(s):	Troy Small
Site Address:	PO Box 210, Bear River, NS, B0S 1B0
Phone #:	902-467-3802
Fax#:	902-467-4143
Tribal Council Affiliation:	Confederacy of Mainland Micmacs
Chief:	Frank Meuse
Location:	Bear River, NS
Population:	~100
# Housing Units:	~42

2.0 Water System Findings

2.1 Water Source and Design

Approximately 31 homes in the community receive their potable water from private on-site wells. The remaining eleven homes in the community receive their potable water from one of seven community wells. The community wells serve the following locations: three community wells each serve two/three residences; two wells serve four units on Pineridge Road; one well serves the Band Office and Community Hall and one well serves the new Community Centre. The two wells in the Pineridge road area pump water to a small pumphouse building (located south of Pineridge Road) equipped with one pressure tank that distributes potable water to the four homes in the area. The majority of the potable water wells in the community are reportedly 150 mm in diameter, approximately 60 metres in depth with approximately 6 metres of casing. There is only one residence located at the north end of the community that is known to have a water shortage problem (wells in this area are reportedly 90 metres in depth). However, most wells in the community are known to yield 1.0 - 1.5 IGPM. The Capital Projects Manager (Steven Pictou)

responsible for the community water wells reported that wells in the community range from less than one year old to approximately 30 years of age. Newly drilled wells in the community are being installed by W&R Drilling Company. All homes in the community have private on-site septic systems and approximately 50 percent of the homes in the community also have furnace oil tanks. The Capital Projects Manager noted that the Band has a furnace oil tank maintenance program that includes regular visual tank inspection and yearly furnace maintenance. The community also has a domestic landfill located in the southeast portion of the community. The landfill was reported to be inactive but the burning of garbage/debris was noted during the site visit. The landfill is not expected to impact potable water in the community as it is located approximately 300 metres down gradient of the nearest potable water well.

The Capital Construction Manager noted the historical presence of coliform bacteria exceeding GCDWQ guidelines in the potable water wells at several residences in the community. The construction manager also noted that three residences in the community () are equipped with ultraviolet (UV) disinfection units for treatment of the potable water. In addition, one home in the community (David Meuse) is equipped with a UV disinfection unit and air injector for manganese removal. The 2001 Community Asset Report also recommends that UV disinfection units should be installed at each of the community water wells. Available Health Canada data (1995 - 2001) identified the presence of total coliform bacteria at approximately 17 homes/community buildings and fecal coliform bacteria was also identified at two of these 17 locations. The occurrence of total coliform bacteria above GCDWQ guidelines (>10 counts) was noted at five locations between 2000 and 2001. As such Health Canada recommended that the potable water wells at several residences be disinfected using sodium hypochlorite (regular household Javex) as per Health Canada protocols. The available Health Canada chemical water quality data (1991 - 2000) noted that colour, iron, manganese and turbidity regularly exceed GCDWQ aesthetic objectives throughout the community. In addition, pH was noted to periodically exceed aesthetic objectives at one residence in the community. The isolated occurrence of elevated hardness levels was noted at another residence. The high risk rating is due to the recurring bacterial presence at several potable water wells in the community.

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The Capital Construction Manager noted that surface water infiltration into potable water wells is suspected to be causing coliform bacteria presence in the potable water. He also noted bacteria contamination is most prevalent during wet periods (spring and fall). In approximately 1999/2000 Health Canada conducted a video inspection of a residential well (Joe Harlow) that had a recurring bacterial contamination problem. The inspection noted that the well casing was cracked and did not have a drive shoe. The well was subsequently capped and a new well constructed. One well in the community is reported to have a below grade well head that should be extended above grade to prevent surface water from infiltrating the well.

The community is not equipped with fire hydrants but the Village of Bear River provides fire protection.

2.2 Operation and Sample Collection

The band is responsible for the maintenance and operation of private wells and water treatment units in the community. As noted in Section 2.1, following the presence of coliform bacteria in potable water wells the applicable community residents were instructed to disinfect their wells using sodium hypochlorite as per Health Canada protocols. The community does not have operation and maintenance manuals for the private wells or water treatment units and there are no spare parts kept on-site.

Health Canada conducts bacteriologic sampling at each home in the community approximately once per year. The band is equipped with a Coli-Lert unit for on-site bacterial analyses. The Community Health Representative (Lorraine Melanson) collects water samples from approximately three locations in the community each month (different locations each month) and as requested by community residents. The Coli-Lert analytical results are immediately forwarded to Health Canada for review and the results are included in the attached Health Canada data (Appendix I). A review of the Coli-Lert and Health Canada data from 2000 and 2001 identified the presence of total coliform bacteria at approximately six locations in the community although no boil orders have been issued in the community. The Coli-Lert analyses did not identify the presence of fecal coliform (*E. coli*) bacteria at any of these locations.

The Bear River First Nation community has a designated person responsible for the proper maintenance of the private potable water wells and septic systems in the community. The Capital Projects Manager (Steven Pictou) has approximately four years on the job experience but he is not certified by the ACWWA and has not had any formal training. The Community Health Representative (Lorraine Melanson) is responsible for water sample collection and analyses using the Coli-Lert unit and accepts responsibility for the water wells in the absence of Steven Pictou. In addition, two community members that work directly for the Capital Projects Manager are available to conduct routine maintenance on the water and septic systems during vacations and illness. The Capital Projects Manager appears to be knowledgeable of the wells in the community that historically have had problems.

3.0 Wastewater System Findings

3.1 Wastewater Collection and Treatment

All of the homes in the community have private septic systems except for the four units located on Pineridge Road that have individual septic tanks draining to one contour drainage system. The Capital Construction Manager noted that septic systems in the community are constructed by a licensed contractor and Health Canada designs and inspects any new septic system installations or upgrades. He also noted that most individual septic systems are less than ten years in age and are predominately the contour design systems. Soil conditions in the community are noted to be predominately sandy and bedrock in the community is reported to be at approximately three metres depth. However, the depth to groundwater is not known and the construction manager noted that some raised septic beds may exist in the community. Soil conditions in a particular area of the community are inspected prior to the installation of any new septic systems. No current problems with the private septic systems were noted during the site visit.

3.2 Operation

As noted in Section 3.1, the Capital Construction Supervisor is responsible for ensuring proper maintenance of the septic systems in the community and a local contractor (Connell Septic) conducts a yearly maintenance program. The maintenance program includes visually inspecting septic systems in the community and providing the construction manager with recommended system upgrades. Each septic tank is cleaned approximately every three years or as required using a vacuum truck.

4.0 Discussion and Recommendations

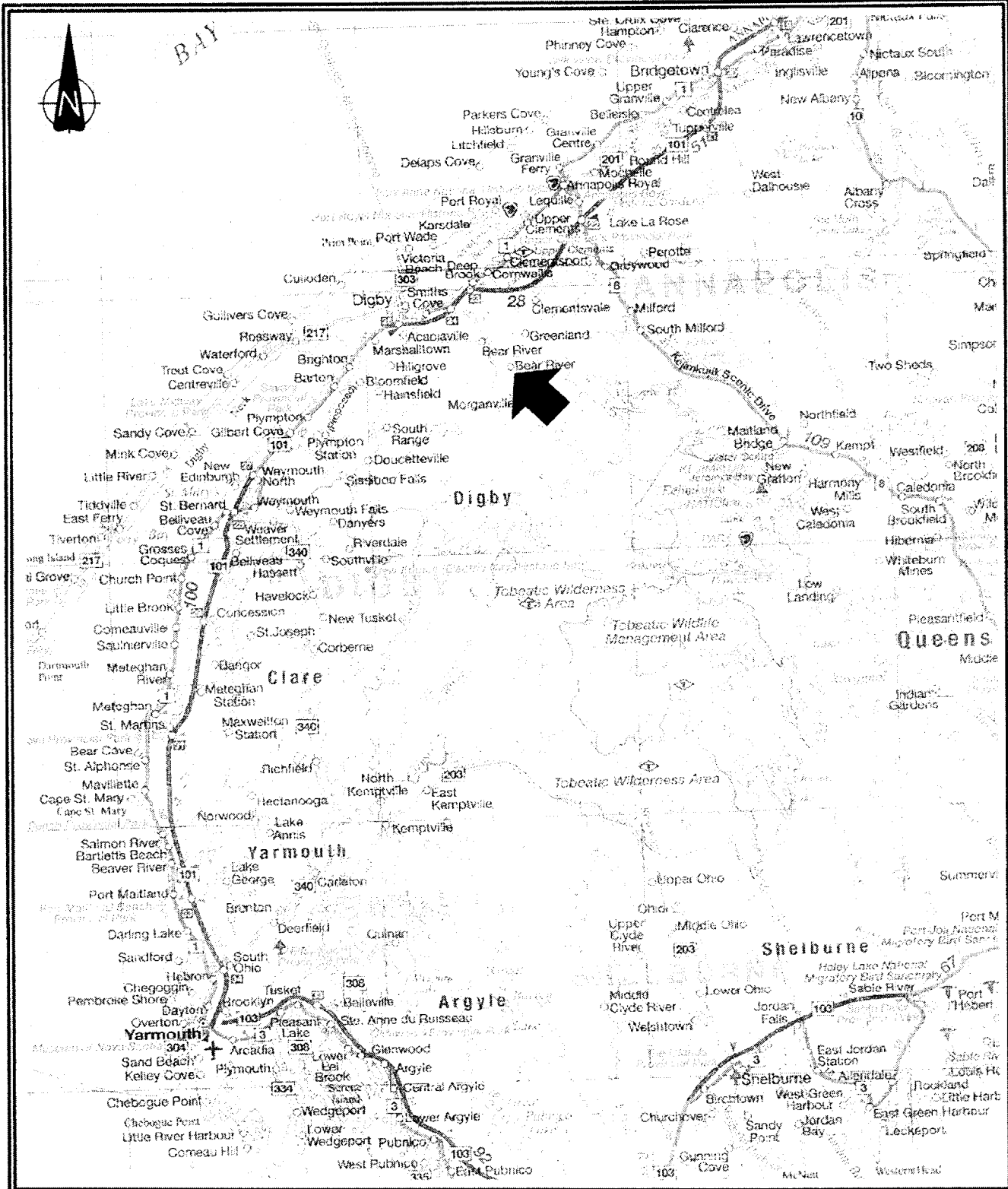
Issue #1 The site visit noted that several potable water wells in the community have recurring bacterial presence and turbidity values exceeding GCDWQ guidelines. The bacteria impact is assumed due to surface water infiltrating the wells. Several aesthetic parameters such as iron, manganese and colour were noted as continually exceeding GCDWQ aesthetic objectives throughout the community. During the site visit it was noted that four homes in the community are equipped with UV disinfection units for potable water treatment. In addition, the 2001 Community Asset Report recommends that UV disinfection units should be installed at each of the seven community water wells. One well in the community is reported to have a below grade well head.


Recommendation: A video inspection of the potable water wells that have recurring bacteria presence should be completed to determine if the wells are properly constructed. As required, wells that have a cracked well casing, do not have a drive shoe or are somehow compromised should be decommissioned and an alternate well constructed. Alternately, consideration could be given to decommissioning the private potable wells in the community and supply potable water to the homes via one (or more) community well. A study should be completed to determine if a central community water system(s) can feasibly meet the water demands of the community and improve water quality in the community. The community water well(s) should be constructed in areas of the community that are upgradient of the existing residences and in areas not scheduled for future development to limit the potential for contamination. In the interim, the seven community wells should be equipped with UV disinfection equipment, as recommended by the 2001 Community Asset Report, for treatment of the potable water prior to consumption. It should be noted that turbidity values at each well must be reviewed prior to UV installation as elevated turbidity levels will greatly reduce the effectiveness of the UV disinfection unit. An alternate water treatment technology may be required in areas with elevated turbidity levels in the potable water supply. Any wells in the community that have a below grade well head should be extended above grade and properly capped to prevent the potential for surface water infiltration.

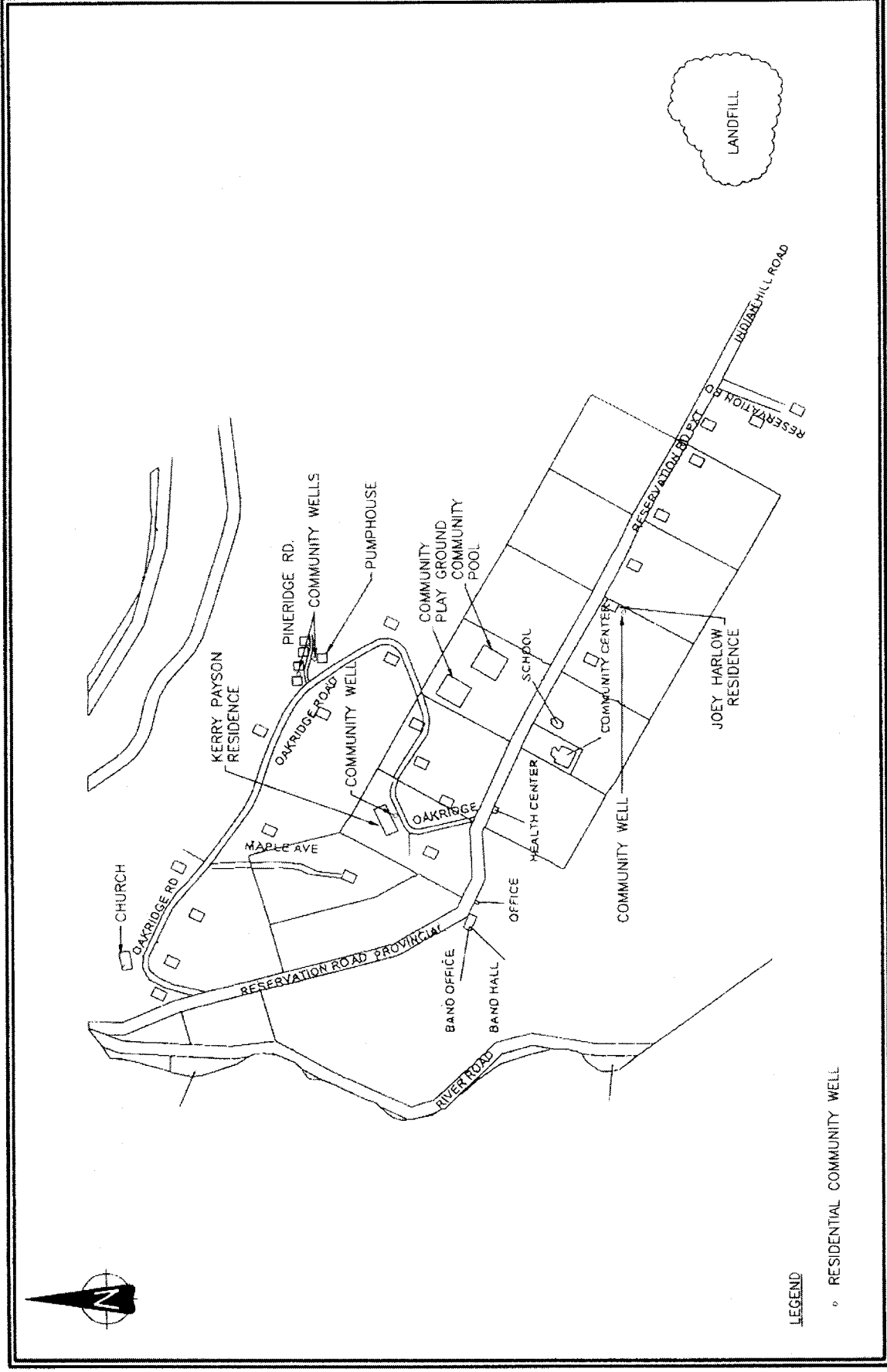
5.0 Conclusions

Overall Community Risk Assessment

Water		Wastewater	
A. Water Source	Medium	A. Effluent Receiving	N/A
B. Design	High	B. Design	Low
C. Operations	Low	C. Operations	Low
D. Reporting	Low	D. Reporting	N/A
E. Operators	Low	E. Operators	Low
F. Statistical Data	High	F. Statistical Data	Low



 A member of the Family of Companies	TITLE SITE LOCATION (SITE #06038)		DATE Feb. 2002	PROJECT NO. 102948
	PROJECT ASSESSMENT STUDIES OF WATER & WASTEWATER SYSTEMS ATLANTIC CANADA FIRST NATION COMMUNITIES BEAR RIVER FIRST NATION, BEAR RIVER, NS.		SCALE Unknown	FIGURE NO. 1
			DRAWN GBS	



LEGEND
 ◦ RESIDENTIAL COMMUNITY WELL

TITLE	SITE PLAN (SITE #06038)		
	PROJECT	ASSESSMENT STUDIES OF WATER & WASTE WATER SYSTEMS ATLANTIC CANADA FIRST NATION COMMUNITIES BEAR RIVER FIRST NATION, BEAR RIVER, NS.	
DATE	Feb. 2002	PROJECT NO.	10294B
SCALE	NTS	FIGURE NO.	2
DRAWN	GBS		



Appendix A
Water Testing Results

HEALTH CANADA DATABASE

Water Quality Data - Bacteriological Sampling

BEAR RIVER MICMAC FIRST NATION RESERVE

		PARAMETERS TESTED:	
SAMPLE LOCATION	DATE	TOTAL COLIFORM /100ml	FECAL COLIFORM (ecoli) /100 ml
Band Office	05/02/95	absent	absent
Band Office	05/30/95	absent	absent
Band Office	08/22/95	PRESENT	absent
Band Office	09/13/95	absent	absent
Band Office	11/17/95	absent	absent
Band Office	11/22/95	absent	absent
Band Office	01/04/96	absent	absent
Band Office	02/29/96	absent	absent
Band Office	04/24/96	absent	absent
Band Office	05/31/96	PRESENT	absent
Band Office	06/25/96	absent	absent
Band Office	08/20/96	PRESENT	absent
Band Office	09/09/96	absent	absent
Band Office	11/04/96	absent	absent
Band Office	10/08/96	absent	absent
Band Office	01/14/97	absent	absent
Band Office	05/01/97	absent	absent
Band Office	02/19/97	absent	absent
Band Office	07/15/97	absent	absent
Band Office	08/13/97	absent	absent
Band Office	09/05/97	absent	absent
Band Office	11/06/97	absent	absent
Band Office	12/10/97	absent	absent
Band Office	01/27/98	absent	absent
Band Office	04/20/98	absent	absent
Band Office	06/16/98	absent	absent
Band Office	08/11/98	absent	absent
Band Office	11/06/98	absent	absent
Band Office	11/30/98	absent	absent
Band Office	01/06/99	absent	absent
Band Office	02/11/99	absent	absent
Band Office	07/07/99	absent	absent
Band Office	07/12/99	absent	absent
Band Office	07/15/99	absent	absent
Band Office	02/14/01	0	0
s.19(1)	09/09/96	absent	absent
	02/29/96	absent	absent
	08/13/97	PRESENT	absent
	09/05/97	absent	absent
	01/27/98	absent	absent
	02/28/00	0	0
	09/28/00	0	0
	01/04/96	absent	absent
	03/25/99	absent	absent
	09/09/96	PRESENT	absent
11/04/96	absent	absent	

s.19(1)

02/19/97	absent	absent
10/08/97	absent	absent
12/10/97	absent	absent
08/11/98	absent	absent
07/07/99	absent	absent
03/06/00	absent	absent
11/04/96	absent	absent
06/16/98	absent	absent
11/06/98	PRESENT	absent
11/30/98	PRESENT	PRESENT
12/16/98	PRESENT (CA)	absent
01/06/99	PRESENT	absent
09/02/99	absent	absent
08/11/98	absent	absent
05/13/99	absent	absent
02/18/00	0	0
04/26/00	59.1	0
05/10/00	0	0
05/30/00	0	0
06/15/00	absent	absent
09/20/00	0	0
02/19/97	absent	absent
04/15/99	absent	absent
02/28/00	0	0
11/21/00	0	0
08/20/96	absent	absent
09/09/96	PRESENT	absent
11/04/96	absent	absent
10/08/96	PRESENT	absent
01/14/97	absent	absent
08/11/98	PRESENT	absent
11/06/98	PRESENT	absent
11/30/98	absent	absent
05/13/99	absent	absent
02/28/00	0	0
01/06/01	0	0
12/10/97	absent	absent
08/13/97	absent	absent
12/10/97	PRESENT	absent
02/13/98	PRESENT	absent
02/27/98	PRESENT	PRESENT
06/16/98	PRESENT	absent
08/11/98	PRESENT	PRESENT
11/06/98	PRESENT	PRESENT
11/30/98	PRESENT	absent
12/16/98	absent (CA)	absent
01/06/99	PRESENT	absent
02/11/99	PRESENT	absent
02/23/99	PRESENT	absent
03/04/99	PRESENT	absent
04/15/99	2	absent
04/20/99	absent	absent
04/22/99	1	absent
04/27/99	6.4	absent

s.19(1)

	04/29/99	1	absent
	05/04/99	2	absent
	05/06/99	1	absent
	05/11/99	absent	absent
	05/13/99	1	absent
	04/20/99	absent	absent
	04/22/99	1	absent
	05/20/99	absent	absent
	05/26/99	absent	absent
	06/01/99	1	absent
	06/11/99	165.2	absent
	06/15/99	3.1	absent
	06/17/99	5.3	absent
	06/23/99	absent	absent
	07/15/99	38.4	absent
	08/11/99	absent	absent
	08/24/99	4.2	absent
	09/02/99	absent	absent
	01/12/00	absent	absent
	01/25/00	0	0
	05/12/00	0	0
	05/26/99	absent	absent
	04/20/99	absent	absent
	04/20/98	absent	absent
	04/20/99	absent	absent
	08/10/00	2	0
	08/15/00	23.8	0
	08/15/00	0	0
	01/06/01	0	0
Health Centre	04/15/99	absent	absent
Health Centre	09/03/99	absent	absent
Health Centre	11/16/00	0	0
Health Centre	01/06/01	0	0
Health Centre	02/14/01	0	0
	08/20/96	absent	absent
	06/25/96	absent	absent
	05/31/96	absent	absent
	04/24/96	absent	absent
	08/11/98	absent	absent
	03/23/00	absent	absent
	11/23/99	0	0
	05/02/95	absent	absent
	05/30/95	absent	absent
	04/22/99	absent	absent
	01/12/00	17.8	absent
	01/21/00	59.1	absent
	02/14/00	40.6	absent
	02/16/00	PRESENT	absent
	02/22/00	>200.5	absent
	02/24/00	0	0
	04/26/00	0	0
	09/28/00	0	0
	02/29/96	absent	absent
	05/31/96	absent	absent

s.19(1)

11/04/96	absent	absent
02/19/97	absent	absent
05/01/97	absent	absent
02/29/96	absent	absent
04/24/96	absent	absent
05/31/96	absent	absent
07/12/99	PRESENT	absent
08/24/99	absent	absent
11/23/99	absent	absent
03/08/00	0	0
11/16/00	2	0
11/21/00	0	0
05/31/96	absent	absent
03/06/00	absent	absent
02/19/97	absent	absent
02/29/96	absent	absent
01/06/99	PRESENT	absent
11/06/98	absent	absent
11/21/00	0	0
04/20/98	absent	absent
08/12/99	absent	absent
01/12/00	absent	absent
07/07/00	0	0
02/11/99	PRESENT	absent
02/23/99	absent	absent
05/04/00	0	0
01/12/00	absent	absent
11/07/00	1	0
11/15/00	1	0
11/21/00	3.1	0
12/12/00	>200.5	0
01/11/01	0	0
01/19/01	0	0
10/08/96	absent	absent
11/23/99	absent	absent
04/22/99	absent	absent
02/29/96	absent	absent
05/31/96	absent	absent
09/09/96	absent	absent
11/04/96	absent	absent
02/19/97	absent	absent
10/08/97	absent	absent
12/10/97	absent	absent
08/11/98	absent	absent
07/07/99	absent	absent
03/06/00	absent	absent
11/06/97	absent	absent
11/06/98	absent	absent
04/20/99	absent	absent
03/10/00	0	0
05/01/97	absent	absent
02/13/98	absent	absent
11/21/00	0	0
02/11/99	absent	absent

s.19(1)

	04/22/99	200.5	absent
	04/28/99	absent	absent
	05/11/99	absent	absent
	05/04/00	0	0
	05/02/95	absent	absent
	09/09/96	absent	absent
	01/27/98	absent	absent
	04/20/99	absent	absent
	01/04/96	absent	absent
	04/20/99	absent	absent
	06/01/99	absent	absent
	02/28/00	0	0
	11/06/97	absent	absent
	12/10/97	absent	absent
	05/17/00	0	0
School	05/30/95	absent	absent
School	08/22/95	absent	absent
School	01/04/96	absent	absent
School	02/29/96	absent	absent
School	04/24/96	absent	absent
School	06/25/96	absent	absent
School	08/20/96	absent	absent
School	11/04/96	absent	absent
School	10/08/96	absent	absent
School	01/14/97	absent	absent
School	02/19/97	absent	absent
School	05/01/97	absent	absent
School	07/15/97	absent	absent
School	08/13/97	absent	absent
School	09/05/97	absent	absent
School	11/06/97	absent	absent
School	12/10/97	absent	absent
School	01/27/98	absent	absent
School	04/20/98	absent	absent
School	06/16/98	absent	absent
School	08/11/98	absent	absent
School	11/30/98	absent	absent
School	01/06/99	absent	absent
School	04/15/99	absent	absent
School	09/02/99	>200.5	absent
School	09/09/99	absent	absent
School	01/12/00	5.3	absent
School	01/21/00	4.2	absent
School	02/18/00	0	0
School	02/28/00	0	0
School	09/20/00	129.8	0
School	09/28/00	0	0
School	11/07/00	7.5	0
School	11/15/00	6.4	0
School	11/21/00	0	0
School	11/28/00	0	0
School	01/06/01	5.3	0
School	02/14/01	0	0
School (Bass River)	05/31/96	absent	absent

School, Muinseeboo	05/02/95	absent	absent
Spring #1 Medicine Trail	06/20/00	>200.5	0
Spring #2 Medicine Trail	06/20/00	>200.5	0
Swimming pool	07/15/97	absent	absent
Swimming pool (Shallow End)	06/23/99	absent	absent
Swimming pool (Deep End)	07/15/99	absent	absent
Swimming pool (Shallow End)	07/15/99	absent	absent
Swimming pool (Deep End)	07/22/99	absent	absent
Swimming pool (Shallow End)	07/22/99	absent	absent
Swimming pool (Deep End)	08/11/99	absent	absent
Swimming pool (Shallow End)	08/11/99	absent	absent
Swimming pool (Deep End)	08/24/99	1	absent
Swimming pool (Shallow End)	08/24/99	absent	absent
Swimming pool (Deep End)	09/02/99	>200.5	absent
Swimming pool (Shallow End)	09/02/99	>200.5	absent
Swimming pool (Deep End)	09/09/99	>200.5	absent
Swimming pool (Shallow End)	09/09/99	>200.5	absent
	01/14/97	PRESENT	absent
	01/14/97	PRESENT	absent
	02/19/97	PRESENT	absent
	02/13/98	absent	absent
	04/15/99	absent	absent
	02/28/00	0	0
	08/12/99	absent	absent
		Craig	bearrivb

s.19(1)

HEALTH CANADA DATABASE
 DRINKING WATER QUALITY (CHEMICAL) DATA
 BEAR RIVER MICMAC FIRST NATION RESERVE

Parameters Sampled Health or Aesthetic Limit	mg/l → Date	aluminum 0.025 IMAC	arsenic 1.00 MAC	barium 5.00 IMAC	boron 0.005 MAC	cadmium 0.050 MAC	chromium 0.050 MAC	chloride <250 AO	colour <15 TCU AO	copper <1.0 AO	fluoride 1.5 MAC	hardness 80 - 100 MAC	iron <0.3 AO	L. I.	lead 0.01 MAC	manganese <0.05 AO	mercury 0.001 MAC	nitrate 45.00 MAC	pH 6.5 to 9.5 AO	selenium 0.010 MAC	sodium <200 AO	sulphate <500 AO	turbidity 1 NTU <5 NTU MAC & AO	zinc <5.0 AO	
Band Office	01/28/92		<0.002					6		0.3	47	0.44			0.16		<0.05	7.48		6	11		5.44		
Band Office	09/09/92		<0.002				5.5	6	<0.01	0.2	48.3	0.15		<0.002	0.16		<0.05	7.60		6.2	11		1.38	0.01	
Band Office	12/02/92														0.17								4.85		
Band Office	02/16/93														0.18								5.98		
Band Office	08/21/93		<0.002				6.4	33.3	<0.01	0.2	47.6	0.61		<0.002	0.15		<0.05	7.70		7	10		9.56	0.02	
Band Office	11/03/95						5.3	3	<0.01		51.6	0.02			0.08		<0.05	7.40		6.6	11		0.28	0.02	
Band Office	01/04/96		<0.002				5.9	<3	0.03	0.1	54.1	<0.02		0.002	0.06		<0.05	7.60		6.4	12		0.39	<0.01	
Band Office	05/31/96		0.006				4.5	<5	0.01	0.1	74	0.29		<0.002	0.08		<0.05	8.00		6.1	19		0.4	0.02	
Band Office	06/25/96														0.2									0.01	
Band Office - Citric	05/04/94								<0.01						0.002									0.03	
	09/09/96		<0.002				5.2	7	<0.01	0.2	71.9	0.17		0.002	0.15		<0.05	7.60		5.3	18		0.8	0.03	
	08/13/97						7.7	100	<0.01		5.87	0.1	-5		0.01		<0.05	6.40		5.9	3		5.7	<0.01	
	12/02/92		0.002				6.6	<3	0.14	0.1	57.3	<0.02		0.01	<0.01		<0.05	7.00		7.5	14		0.29	<0.01	
	10/25/94		0.002				7.5	3	<0.01	<0.1	58.6	<0.02		<0.002	<0.01		<0.05	7.50		6.9	15		0.13	<0.01	
	08/16/94		<0.002				23.3	<3	0.13	<0.1	58.5	0.04		<0.002	0.01		0.42	6.90		9.3	10		0.25	0.02	
	01/04/96		<0.002				7.1	3	0.03	<0.1	60.1	0.14		0.002	0.07		0.22	7.40		5	13		3.25	0.05	
	03/25/99		<0.002				7.9	2.5	0.04	0.1	57.7	0.03	-1.4	<0.002	<0.01		0.31	7.40		7	10.2		0.34	<0.01	
	09/09/96		0.002				7.7	39	<0.01	0.1	43.3	1.44		0.009	0.11		<0.05	7.60		7.4	6		3.5	0.09	
Ground Water	03/31/93	<0.005	<0.002	0.005	<0.005	<0.0005	<0.002	5.3	27	<0.01	0.2	46.8	0.7	<0.001	0.17	<0.00005	<0.05	7.80	<0.002	6	11		8.98	0.02	
	11/06/98		<0.002				7.5	<2.5	0.04	0.2	34.6	0.06	-2.3	<0.002	0.05		<0.05	7.10		6.1	9.8		0.1	0.03	
	08/26/99		<0.002				6.2	<2.5	<0.01	0.2	33.7	0.1	-1.7	<0.002	0.05		<0.05	7.80		5.4	11		0.34	<0.01	
	09/24/99		0.002				6.2	<2.5	0.01	0.2	34.7	0.06	-1.9	<0.002	0.03		<0.05	7.50		5.5	11.5		0.28	0.01	
	04/27/00		<0.002				6.5	350	0.15	<0.1	56.3	15.1	-2.3	0.003	0.13		3.41	6.90		9	21		373	0.08	
	05/17/00		<0.002				9	15	0.08	<0.1	66.4	0.31		<0.002	<0.01		1.53	6.90		11.8	41		74	0.02	
	06/15/00		<0.002				12	5	0.07	<0.1	85.8	0.3	-2	<0.002	<0.01		0.35	6.90		12.3	58		3.67	0.05	
	03/30/93		<0.002				5.7	12	<0.01	0.1	69.2	0.55		0.003	0.23		<0.05	7.45		5.2	18		5.02	<0.01	
	06/10/95		<0.002				5.7	12	<0.01	0.1	69.2	0.55		0.003	0.11		<0.05	7.60		5.2	18		5.02	<0.01	
	02/19/97	<0.10		<0.005	<0.10	<0.01	<0.02	9	<2.5	0.05	0.1	47.5	0.09	-1.4	<0.002	0.02		0.15	7.60	<0.10	4.9	8		0.52	0.02
	11/06/98		<0.002				7	<5	0.01	<0.1	5.15	<0.02	-2.1	<0.01	<0.01		0.37	7.80		24.2	4		0.1	<0.01	
	12/10/97		<0.002				7	<5	0.01	<0.1	5.15	<0.02	-2.1	<0.01	<0.01		<0.05	6.20		5.3	4		0.11	<0.01	
	05/04/92		<0.002				5.8	<3	0.07	<0.1	7.03	<0.02		<0.002	<0.01		0.07	7.10		5.7	7		<0.1	<0.01	
	08/13/97		<0.002				11.1	<5	0.06	<0.1	15.9	<0.02	-3.1	0.003	<0.01		0.84	6.80		6.8	6		0.2	<0.05	
	12/10/97		<0.002				17.4	<5	0.38	<0.01	16.3	0.05	-1.8	0.011	<0.01		0.39	6.20		8.5	5		2	0.05	
	02/13/98		<0.002				6.3	<2.5	0.2	<0.1	8.49	<0.02	-4.3	0.004	<0.01		0.14	6.30		5.4	5		0.15	<0.01	
	06/16/98		<0.002				9.1	<2.5	2.67	<0.1	14.1	0.05	-4.3	0.033	0.02		0.13	6.00		6.1	4.7		0.05	0.07	
	11/06/98		<0.002				7	<2.5	0.04	<0.1	8.94	<0.02	-4.3	<0.002	<0.01		0.22	6.30		4.6	5.2		0.06	<0.01	
	12/16/98		<0.002				6	<2.5	<0.01	0.3	38.5	0.05	-1.5	<0.002	0.11		<0.05	7.90		5.9	14		0.23	<0.01	
	08/26/99		<0.02				6.1	2.5	<0.01	0.2	41.2	0.02	-1.8	<0.002	0.08		<0.05	7.50		5.6	11		0.18	<0.01	
	08/17/00		<0.002																						

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HEALTH CANADA DATABASE
 DRINKING WATER QUALITY (CHEMICAL) DATA
 BEAR RIVER MICMAC FIRST NATION RESERVE

Parameters Sampled	mg/l -->	aluminum	arsenic	barium	boron	cadmium	chromium	chloride	colour	copper	fluoride	hardness	iron	L. I.	lead	manganese	mercury	nitrate	pH	selenium	sodium	sulphate	turbidity	zinc
Health or Aesthetic Limit	Date:	0.025	1.00	5.00	0.005	0.050	<250	<15 TCU	<1.0	1.5	80 - 100	<0.3	0.01	<0.05	0.001	45.00	6.5 to 8.5	0.010	<200	<500	1 NTU	<5 NTU	<5.0	
LOCATION		MAC	MAC	MAC	MAC	MAC	AO	AO	AO	MAC	MAC	AO	MAC	AO	MAC	AO	MAC	AO	MAC	AO	AO	MAC & AO	AO	
	11/06/97	<0.002					4.8	7	0.01	<0.1	11.7	0.36	-2.9	<0.002	0.03		0.25	7.20		6.5	4	1.5	0.01	
	12/10/97	<0.002					7	<5	0.02	<0.1	12.3	0.21	-3.1	<0.002	0.02		0.26	6.90		6.6	2	0.7	<0.05	
	01/26/94	<0.002					<1.0	<3	0.05	<0.1	52.6	0.3		<0.002	0.01		<0.05	6.80		7.8	15	1.4	0.02	
	08/09/94	<0.002					4.6	<3	0.09	<0.1	12.5	<0.02		<0.002	<0.01		0.21	6.60		5	4	0.25	0.03	
	04/20/98	<0.002					5.3	<5	0.19	<0.1	16.1	0.09	-2.9	<0.002	0.01		0.31	7.20		5	7	0.3	0.06	
	07/12/99	<0.002					18	5	<0.01	0.2	69.6	0.12	-1.2	0.004	0.04		<0.05	7.70		6.8	26	0.06	0.33	
Health Centre	09/24/99	<0.002					16	<2.5	<0.01	0.1	65.5	0.04	-1.5	<0.002	0.05		<0.05	7.40		6.1	25	0.19	<0.01	
Health Centre	02/16/00	<0.002					17	5	<0.01	0.1	61.9	<0.02	-1.5	<0.002	0.05		<0.05	7.50		6.4	22.5	<0.05	<0.01	
Health Centre	02/16/93	<0.002					5.6	<3	<0.01	<0.1	37	0.02		<0.002	<0.01		0.06	7.50		4.2	4	0.08	<0.01	
	06/21/93																			24.1				
	12/02/92	<0.002					8.3	11	<0.01	0.2	46.2	0.36		<0.002	0.08			7.10		8.6	17	1.68	<0.01	
	05/04/94	<0.002						<3		0.1		0.44		<0.002	<0.09		<0.05	7.58				2.15		
	06/25/96	<0.002					10.8	<5	<0.01	0.2	54.4	0.41		<0.002	<0.002		<0.05	7.60		6.8	18	1.6	<0.01	
	03/23/00	<0.002					7	<2.5	<0.01	0.1	0.17	0.02	-4.2	<0.002	<0.01		<0.05	7.30		27.6	13	0.28	<0.01	
	12/19/91											0.63			0.07								4.22	
	05/04/92											0.47			0.07				7.14				4.43	
	12/18/92						4.6	7	0.05	0.2	30.1	0.16		<0.002	0.02		<0.05	6.90		5.4	6	1.88	0.01	
	02/16/00	<0.002					6	5	0.04	0.3	30.8	<0.02	-2.4	<0.002	<0.01		<0.05	7.10		5.7	6.3	0.14	<0.01	
	06/16/92	<0.002								<0.1	45.1	0.06		0.009	<0.01		<0.05	7.29		5.7		0.43		
	05/31/96										1.16				0.43									<0.01
	02/19/97	<0.10		0.072	<0.10	<0.01	<0.02			<0.01	36.8	1.19		<0.002	0.46				<0.10					<0.01
	05/01/97	<0.10		<0.005	<0.10	<0.01	<0.02			<0.01	0.16			<0.002	<0.01				<0.10					<0.01
	10/08/97						5.4	<5	<0.01		0	<0.02			<0.01		<0.05	7.50		26.8	15	<0.10	<0.01	
	04/24/96											0.13			0.07									
	05/31/96											0.12			0.07									
	09/09/92						11.9	13	<0.01		84.1	0.21		<0.002	0.08		<0.05	7.80		20.9	20	3.3	<0.01	
	12/16/92	<0.002					14.5	36	0.01	<0.1	64	1.32		0.003	0.02		<0.05	6.90		7.6	9	32.6	0.07	
	01/14/93	<0.002									0.8	0.52			0.1			7.73				1.72		
	06/21/93							<3				0.02		<0.002	0.08					21.6		0.33		
	07/12/99	<0.002					30	15	0.1	0.7	66.8	1.03	-0.5	<0.002	0.09		<0.05	7.90		25.2	22	7.4	0.03	
	06/16/92	0.004									72.2	0.18		<0.002	0.02					10.1		2.22		
	12/12/94	0.003					16.9	3	<0.01	0.1	93.3	0.28		0.003	0.05		2.81	7.60		11.5	0	5.85	<0.01	
	03/23/00	<0.002					11	<2.5	0.01	<0.1	76.1	0.02	-1.2	<0.002	<0.01		0.59	7.39		4.7	6	0.4	0.04	
	06/21/93	<0.002					9.8	<3	0.05	<0.1	28.3	0.12		<0.002	0.01		<0.05	6.90		5	7	1.01	0.01	
	11/06/98	<0.002					30	<3	0.13	<0.1	46.2	0.23	-2.8	<0.002	0.03		<0.05	6.50		7.8	4.7	2.4	0.24	
	12/02/92	0.004					9	43	<0.01	0.3	40.3	1.64		<0.002	0.11		<0.05	7.10		7	7	1.3	<0.01	
	02/16/93							38				1.39											2.35	
	06/21/93							8				0.19					<0.01				29.3		2.41	
	08/23/93										0.22													
	11/23/94	<0.002					7.4	14	<0.01	0.2	48.5	1.1		0.004	0.09		<0.05	7.30		5.9	<2.0	4.74	0.03	
	02/18/00	<0.002					6.2	7.5	0.02	0.2	38.1	0.09	-1.9	0.003	0.03		<0.05	7.50		6.4	12	1.5	<0.01	
	06/21/93											0.18		<0.002	0.07								0.61	
	04/24/96											0.13			0.07								14.4	0.56
	03/30/93	<0.002					5.9	47	<0.01	0.1	37.7	1.39		<0.002	0.42		<0.05	7.50		6.3	12			
	05/31/96											1.16			0.43									<0.01
	02/19/97									<0.01	36.8	1.19		<0.002	0.46									<0.01
	05/01/97									<0.01	0.16		<0.02	<0.002	<0.01									<0.01
	10/08/97						5.4	<5	<0.01			<0.02			<0.01				7.50		26.8	15	<0.1	<0.01

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HEALTH CANADA DATABASE
 DRINKING WATER QUALITY (CHEMICAL) DATA
 BEAR RIVER MICMAC FIRST NATION RESERVE

Parameters Sampled		aluminum	arsenic	barium	boron	cadmium	chromium	chloride	colour	copper	fluoride	hardness	iron	L. L.	lead	manganese	mercury	nitrate	pH	selenium	sodium	sulphate	turbidity	zinc	
Health or Aesthetic Limit	mg/l --->	0.025	1.00	5.00	0.005	0.050	<250	<15 TCU	<1.0	1.5	80 - 100	<0.3			0.01	<0.05	0.001	45.00	6.5 to 8.5	0.010	<200	<500	1 NTU <5 NTU	<5.0	
LOCATION	Date:	IMAC	MAC	IMAC	MAC	MAC	MAC	AO	AO	AO	MAC	MAC	AO		MAC	AO	MAC	MAC	AO	MAC	AO	AO	MAC & AO	AO	
													0.43		<0.01									4.66	
	08/23/93							44	55	0.05	0.2	41.9	1.44	-1.4	0.004	0.02		<0.05	7.80		33.4	8.2	14	0.03	
	02/23/99	<0.002						21	<2.5	0.04	0.3	0.07	0.18	-4.2	<0.002	0.02		<0.05	7.60		34.8	8.8	0.99	0.03	
	11/06/98	<0.002						24	<3.0	<0.01	0.3	0.02	0.17	-3.6	<0.002	0.02		<0.05	7.40		36	10.9	0.84	<0.01	
	01/06/99	0.002						6.3	18	<0.01	0.2	32.6	0.74	-2	<0.002	0.13		<0.05	7.60		7.1	9	4.6	0.08	
	05/01/97	0.012								<0.01		36.8	1.06		<0.002	0.12				<0.10				0.02	
	07/15/97	<0.10		<0.005	<0.10	<0.01	<0.02																	<0.05	
	02/13/98	0.007						19.9	5	<0.01	0.1	54	0.59	-1.8	<0.002	0.01		<0.05	7.40		8.1	7	3.5	<0.01	
	01/06/99	0.003						44	<2.5	0.01	0.2	64.6	0.18	-2.4	<0.002	<0.01		<0.05	7.00		10.8	5.7	1.6	0.01	
	02/16/00	<0.002						8.2	7.5	<0.01	0.1	29.5	<0.02	-1.9	<0.002	<0.01		<0.05	7.50		6.2	6.1	0.27	<0.01	
	09/09/96	<0.10		<0.005	<0.10	<0.01	<0.02			0.02		63.6	0.1		<0.002	0.02				<0.10				0.01	
	01/27/98	<0.002						10.9	7	0.03	0.2	79.6	0.06	-0.9	<0.002	0.02		<0.05	7.70		8.6	15	0.5	<0.05	
	10/25/94												0.44			0.08								3.64	
	05/13/93	<0.002							8.0	<0.01	<0.1	245	5.47		<0.002	0.29		<0.05	6.77		39		47.3		
	08/09/94	<0.002						7.1	64.0	<0.01	0.1	57.8	1.77		0.003	0.12		<0.05	7.60		7.4	8	31.7	0.25	
	10/25/95												0.04		<0.01										
	11/06/97	<0.002						4.8	7	0.01	<0.1	11.7	0.36		<0.002	0.03		0.25	7.20		6.5	4	1.5	0.01	
	12/10/97	<0.002						7	<5	0.02	<0.1	12.3	0.21		<0.002	0.02		0.26	6.90		6.6	2	0.7	<0.05	
	11/03/95							5.8	<3	0.1		29.2	0.08		<0.01			0.1	7.00		5.8	9	0.39	0.02	
School	11/03/95									0.03	<0.1	31.9	0.02		<0.002	<0.01				<0.10				0.02	
School	05/01/97	<0.10		<0.005	<0.10	<0.01	<0.02								<0.002	<0.01		<0.05	7.30		5.2	10	0.37	0.02	
School, Muineboo	08/23/93		<0.002					5		<0.01	<0.01	26.7	<0.02		<0.002	<0.01		<0.05	6.80		5.8	9	1.07	0.09	
School, Muineboo	05/04/94		<0.002					5.1	<3	0.20	<0.1	26.5	0.11		0.004	0.01		<0.05							
School, Muineboo	10/25/94							6.1	<5	<0.01	<0.1	64.9	0.08	-1.2	<0.002	0.01		0.23	7.50		4.5	5	0.6	<0.05	
Warrington, Tanya	02/13/98		<0.002																					0.6	

s.19(1)

Appendix B
Photographs of Infrastructure



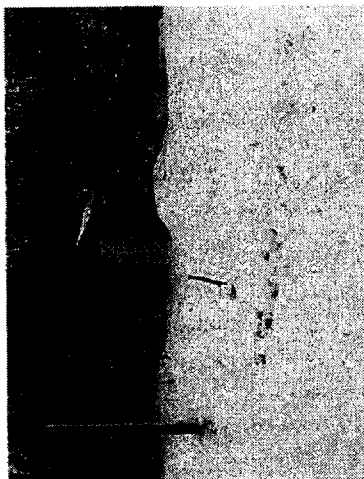
Coli-Lert unit in Health Centre.



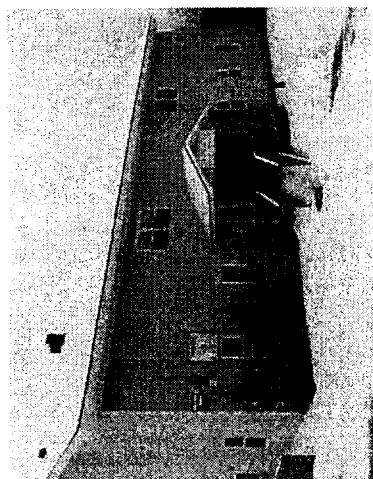
Community well on Pineridge Road.



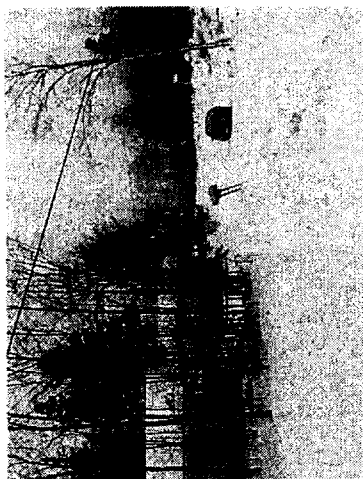
Health centre.



Pumphouse building and community well on Pineridge Road.

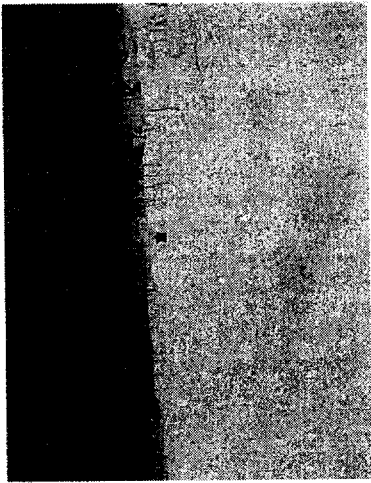


Band office.

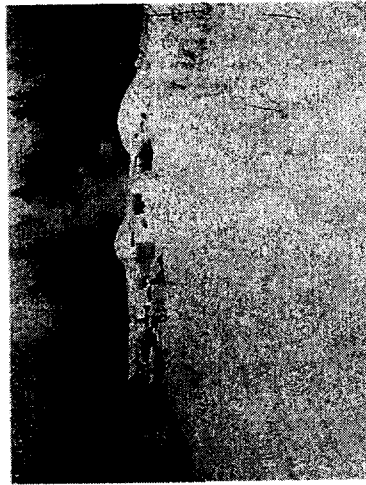


Pineridge Road.

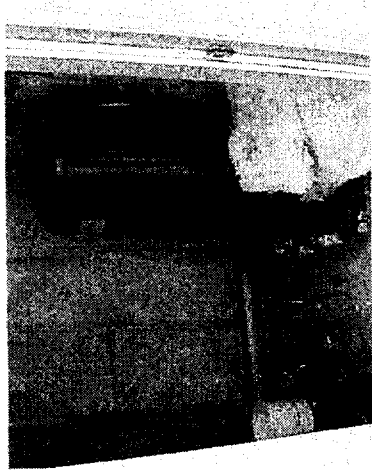
Bear River First Nation (Site # 06038)



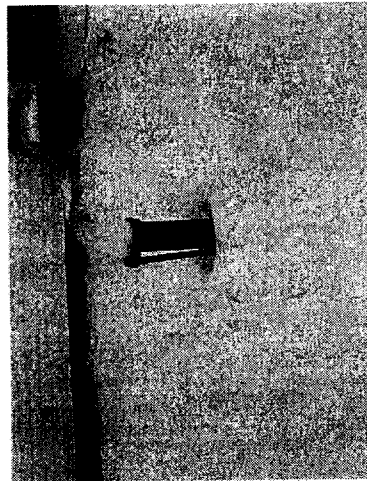
Community well at Joey Harlow residence.



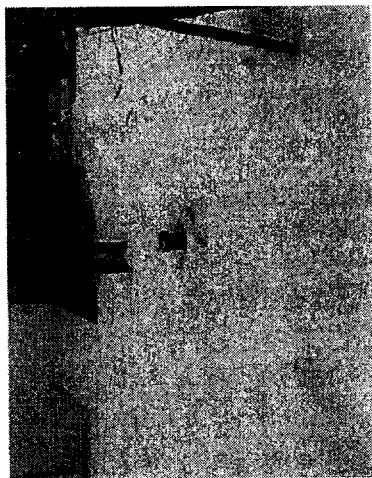
Community landfill.



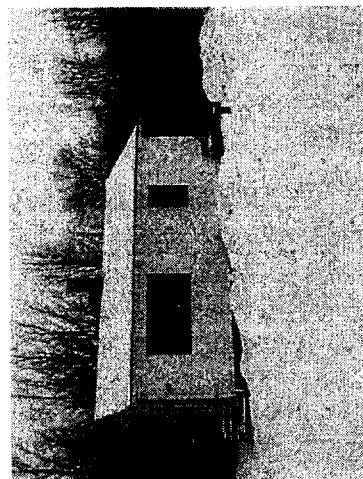
Pressure tank in Pineridge Road pumphouse.



Community well at Kerry Payson residence.



Second community well on Pineridge Road.



Community well at Kerry Payson residence.

Bear River First Nation (Site # 06038)